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Information technology — Open Systems Interconnection — Virtual Terminal Basic Class Service

Technologies de l'information — Interconnexion des systèmes ouverts — Service de classe de base de terminal virtuel

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Contents

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9040 was prepared by Technical Committee ISO/TC 97, *Information processing systems*.

Introduction

This International Standard is one of a set of standards produced to facilitate the interconnection of computer systems. It is related to other International Standards in the set as defined in the Reference Model for Open Systems Interconnection (ISO 7498). The Reference Model subdivides the area of standardization into a series of layers of specification, each of manageable size.

The purpose of this International Standard (ISO 9040) is to define the service provided in the Application Layer by the Virtual Terminal (VT) Basic Class Service.

The Virtual Terminal Basic Class Service is provided by the Virtual Terminal Basic Class Protocol specified in ISO 9041 and making use of services available from the Association Control Service Element (ACSE) in the Application Layer and the Presentation Service.

Information technology – Open Systems Interconnection – Virtual Terminal Basic Class Service

1 Scope

This International Standard defines, in an abstract way, the externally visible Basic Class Virtual Terminal Service within the OSI Application Layer in terms of

a) a model defining the interaction between users of the service;

b) the primitive actions and events of the service;

c) the parameter data associated with each primitive action and event;

d) the relationship between, and the valid sequences of, these actions and events.

The service defined in this International Standard is that which is provided by the OSI Basic Class Virtual Terminal Protocol (in conjunction with the Association Control Service Element and the Presentation Service) and which may be used by any user including other Application Service Elements. The relationship between the standards for Virtual Terminal Service, Virtual Terminal Protocol, ACSE, Presentation Layer Service and the user of the Virtual Terminal Service is shown in figure 1.

This International Standard also defines two standard default virtual terminal environment profiles and describes the form of registered virtual terminal environment profiles and control objects. Virtual terminal environment profiles define sets of virtual terminal environment parameters for use in the establishment of virtual terminal associations and subsequent negotiation. This International Standard also defines a structure of

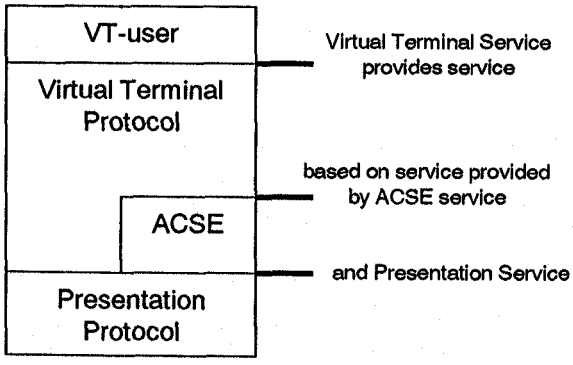

Figure 1 - Relationship of this International Standard to other OSI Application Layer Standards

ASN.1 Object Identifiers for the objects defined in this International Standard and for use in a register of virtual terminal objects.

This International Standard does not specify individual implementations or products, nor does it constrain the implementation of entities and interfaces within a computer system. There is, therefore, no requirement for conformance to this International Standard.

This International Standard applies to interactive applications requiring terminal oriented communication expressed in terms of the transmission and manipulation of graphical images having the following characteristics:

e) the images are composed of character-box graphic elements organised into a one, two or three dimensional structure;

f) attributes may be associated with any graphic element to qualify its mode of display.

Control information for the communication can be modelled using virtual terminal control objects, and multiple devices can be modelled using virtual terminal device objects linked to the other virtual terminal objects.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 646:1983, *Information processing – ISO 7-bit Coded Character Set for Information Interchange.*

ISO 2022:1986, *Information processing – ISO 7-bit and 8-bit Coded Character Sets - Code extension techniques.*

ISO 2375:1985, *Data Processing – Procedure for registration of escape sequences.*

ISO 6429:1988, *Information processing – Control functions for 7-bit and 8-bit coded character sets.*

ISO 7498:1984, *Information processing systems – Open Systems Interconnection – Basic Reference Model.*

ISO/TR 8509:1987, *Information processing systems – Open Systems Interconnection – Service conventions.*

ISO 8649:1988, *Information processing systems – Open Systems Interconnection – Service definition for Association Control Service Elements.*

ISO 8824:1987, *Information processing systems – Open Systems Interconnection – Specification for Abstract Syntax Notation One (ASN.1).*

ISO 8825:1987, *Information processing systems – Open Systems Interconnection – Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1).*

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

ISO 9834-4 [1)], *Information Processing Systems – Open Systems Interconnection – Procedures for Specific OSI Registration Authorities – Part 4: Register of VTE-profiles*

ISO 9834-5 [1)], *Information Processing Systems – Open Systems Interconnection – Procedures for Specific OSI Registration Authorities – Part 5: Register of VT Control Object Definitions*

The International Register of Coded Character Sets to be used with Escape Sequences. [2)]

3 Definitions

3.1 Global OSI definitions

This International Standard is based on the concepts developed in ISO 7498 and makes use of the following terms defined in it:

a) application entity;

b) Application Layer;

c) service data unit;

d) service access point.

It also makes use of the following terms defined in ISO/TR 8509:

e) service primitive;

f) service provider;

g) primitive;

h) request (primitive);

i) indication (primitive);

j) response (primitive);

k) confirm (primitive);

l) confirmed service;

m) non-confirmed service;

n) provider-initiated service.

3.2 Association Control Service Element definitions

This International Standard makes use of the following terms defined in ISO 8649:

a) application association;

b) application entity title;

c) application control service element (ACSE).

3.3 Virtual Terminal Service definitions

For the purpose of this International Standard, the following definitions apply:

3.3.1 VT-user: A user of the Virtual Terminal Service.

3.3.2 Application VT-user: The unique VT-user which can update the FDCO; if either VT-user can update this control object then neither VT-user has this designation.

3.3.3 Terminal VT-user: If one VT-user has the designation Application VT-user then the peer VT-user has the designation Terminal VT-user.

3.3.4 character-repertoire: A set of objects which can be represented by primary attribute values; one such object, represented by its primary attribute value, can occupy an array element in a display object when the character-repertoire is in use for that array element. A control object of character-string category also has an associated repertoire.

3.3.5 character-box graphic element: An atomic element of a character-repertoire where use of the repertoire has been agreed through negotiation by the VT-users.

3.3.6 primary attribute: The attribute of an array element of a display object which is a coded representation of the character-box graphic element assigned to that array element.

3.3.7 secondary attribute: The secondary attributes of an array element comprise the character-repertoire, see 3.3.4, and the rendition attributes.

3.3.8 rendition attributes: Those secondary attributes of an array element which qualify the character-box graphic element and provide information specifying how it is intended to be presented.

3.3.9 explicit modal default: The value for a secondary attribute, defined in a VTE, which is used by the text operation to update an array element if no other value is provided or already present; may also be used by the erase operation.

1) To be published.
2) Available from the European Computer Manufacturers Association (ECMA), 114 rue du Rhône, CH-1204 Genève, Switzerland.

3.3.10 display object: An abstract object, defined in this International Standard, for modelling the exchange of graphic information. It consists of a number of components, see 13.1.

3.3.11 array element: That part of a display object which can hold one character-box graphic element including its primary and secondary attribute values.

3.3.12 primitive display pointer: A set of one to three coordinate values which identify a particular element in a display object.

3.3.13 extended display pointer: A set of two to four coordinate values which identify a particular array element in a block defined on a display object.

3.3.14 display pointer: Used to refer to either the primitive display pointer or the extended display pointer; whether or not blocks are in use determines which is implied.

3.3.15 logical pointer: A set of two or three coordinate values which identify a particular array element in a field defined on a display object.

NOTE – The primitive display pointer and extended display pointer do not both exist simultaneously. However, when a logical pointer exists, it is in addition to either a display pointer or an extended display pointer.

3.3.16 control object: An abstract object, of a type defined in generic terms in this International Standard, for modelling the exchange of unstructured information of a single type.

NOTE – The primary application of a control object is for modelling the exchange of information of a control nature, as understood by the VT-users; the VT Service does not constrain the interpretation of this information.

3.3.17 device object: An abstract object used to model certain logical characteristics of real devices, and to link the various objects of a virtual terminal environment together and/or to real devices.

3.3.18 object updating device: A real device capable of generating values which (possibly after undergoing a transformation) are used by one of the peer VT-users to update either a display object or control object (or possibly both).

3.3.19 VT-association: An application association between two peer VT-users.

3.3.20 VT-environment (VTE): A set of parameters that together define the data structuring and operational characteristics for a particular VT-association. The VTE exists only during the lifetime of that VT-association. The parameters of the set are mutually related by a directed graph structure. The VTE may be modified during the existence of the VT-association by negotiation.

3.3.21 current-VTE: The single VTE which exists during the Data Handling phase or the Negotiation Quiescent phase; in the Data Handling phase it is a full-VTE whereas in the Negotiation Quiescent phase it is not a full-VTE.

3.3.22 draft-VTE: The VTE, if any, under negotiation. During negotiation, the draft-VTE is not necessarily a full-VTE.

3.3.23 VTE-parameter: An individual parameter of a VTE. Each VTE-parameter is given a unique name in the service which is used as the identifier for the VTE-parameter.

3.3.24 full-VTE: A VTE that is a complete directed graph of VTE-parameters in which all node parameters and terminal leaf parameters implied by all existing nodes from the root of the tree have values.

3.3.25 VT-context-value: A collective term for the set of object instances, their assigned values and the current-VTE for a particular VT-association. A VT-context-value exists only during the lifetime of the VT-association and is normally changing continuously during this time interval.

3.3.26 reset-context: The VT-context-value which will result after a VT-BREAK service. This context value is the context after the last successful current-VTE establishment; all objects will have their initial values. If no full-VTE has been established, there is no reset-context.

3.3.27 WAVAR access-right: An access-right which can be held by at most one VT-user at any time. It is used to ensure that control and display objects cannot be updated by both VT-users simultaneously.

3.3.28 access-rule: A characteristic defined for an object in a VTE which determines which VT-users can update the object at a particular time.

3.3.29 net-effecting: The conversion of a sequence of items, representing the content of one or more update operations (see 24.3), into a different, usually shorter sequence, which results in the same final states of the objects being updated.

3.3.30 concatenation: The connection of a sequence of queued update items (see 24.3) to form a single, new, queued update item.

3.3.31 segmentation: The division of a single, queued update item (see 24.3) into a sequence of new, queued update items.

3.3.32 A-mode (Asynchronous mode): A mode of operation using two display objects, one of which is updatable by the VT-user which initiated the VT-association and the other by the peer VT-user.

3.3.33 S-mode (Synchronous mode): A mode of operation using one two-way-alternate dialogue supporting one display object; at any time, the display object may only be updated by the single VT-user which owns the WAVAR access-right.

3.3.34 service: A distinct part of the total VT Service that is composed of a sequence of primitives taken from the set {request primitive, indication primitive, response primitive, confirm primitive}.

3.3.35 sequenced service: A Service for which an indication (or confirm) primitive resulting from a corresponding request (or response) primitive is initiated in sequence with all previously initiated sequenced indications (or confirms) and their corresponding requests (or responses).

3.3.36 non-sequenced service: A Service for which an indication (or confirm) primitive resulting from a corresponding request (or response) primitive is not necessarily initiated in sequence with all previously initiated indications (or confirmations) and their corresponding requests (or responses).

3.3.37 conditionally sequenced service: A Service for which

a) certain values for parameters of the service primitives result in sequenced operation, and

b) other values for parameters of the service primitives result in non-sequenced operation.

3.3.38 destructive service: A service that may cause the loss of information conveyed in previously initiated services without notification of this loss to either VT-user. Only non-sequenced services may be destructive, but not all non-sequenced services are destructive.

3.3.39 non-destructive service: A service that does not cause the loss of information conveyed in previously initiated services without notification to the VT-users.

3.3.40 service parameter: A parameter defined as part of a primitive within a VT service.

3.3.41 update-window: A mechanism associated with display object addressing which defines a range of coordinate values for an array below which an update operation cannot be performed. The absolute coordinate values in the range may increase in value during operation, but cannot decrease.

3.3.42 update-window-size: A positive, non-zero integer that defines the number of contiguous array elements within an update-window.

3.3.43 trigger: Where a control object has the trigger characteristic, any update to that control object causes delivery of queued updates and, in S-mode, transfers the WAVAR access–right to the peer VT-user.

3.3.44 VTE-profile: A pre-defined set of VTE-parameter values making up a VTE.

NOTE – Some VTE-profiles are parameterised such that values for profile arguments must be supplied by the VT-users.

3.3.45 default VTE-profile: A VTE-profile, defined in annex A, that is used to establish a VTE in the absence of a VT-user specified VTE-profile at VT-association establishment.

3.3.46 registered VTE-profile: A VTE-profile registered in a register of VT Objects administered by a Registration Authority established as defined in ISO 9834-4. It has assigned to it a unique ASN.1 OBJECT IDENTIFIER value.

3.3.47 registered control object: A control object registered in a register of VT Objects administered by a Registration Authority established as defined in ISO 9834-5. It has assigned to it a unique ASN.1 OBJECT IDENTIFIER value.

3.3.48 privately defined VTE-profile: A VTE-profile whose use has been agreed privately by means outside the scope of this International Standard; it is neither a default VTE-profile nor a registered VTE-profile.

3.3.49 VTE-profile argument: An argument of a parameterised VTE-profile which must be given a value to enable a full-VTE to be made from the VTE-profile. It can be a normal VTE-profile argument or a special VTE-profile argument. Each registered VTE-profile defines the applicable arguments and their semantics.

3.3.50 normal VTE-profile argument: A VTE-profile argument which corresponds exactly to a VTE-parameter and assumes the same identifier. A VTE-profile may also specify that other VTE-parameters are also defined by the value of such an argument.

3.3.51 special VTE-profile argument: A VTE-profile argument which does not correspond to a VTE-parameter (i.e., is not from the directed graph and has no standard identifier) but has a valid use as defined in the VTE-profile definition.

3.3.52 multiple interaction negotiation (MIN): A process which enables a draft-VTE to be modified or extended in stages to create a new full-VTE acceptable to the service provider and both VT-users.

3.3.53 MIN-initiator: The VT-user that initiated the VT-START-NEG service which was successful in causing the transition to Negotiation Active phase.

3.3.54 MIN-acceptor: The VT-user that accepted the VT-START-NEG service which was successful in causing the transition to Negotiation Active phase.

3.3.55 block: A structure element of the display object. A block is a rectangular area which supports relative addressing (relative to the origin of the block) for a sub-area within a Y-array.

3.3.56 field: A structure element of the display object. A field provides one-dimensional logical addressing over a designated subset of the array elements of a Y-array of a display object.

3.3.57 field-element: A rectangular area of a Y-array of a display object forming part of a field.

3.3.58 Field Definition Control Object (FDCO): A type of control object which holds the definition of fields for a display object as Field Definition Records.

3.3.59 Field Definition Record (FDR): Holds the status and definition of one field.

3.3.60 Field Entry Instruction Control Object (FEICO): A type of control object which holds data entry instructions as Field Entry Instruction Records.

3.3.61 Field Entry Pilot Control Object (FEPCO): A type of control object which holds data entry pilots as Field Entry Pilot Records.

3.3.62 Field Entry Instruction Record (FEIR): Holds a set of data entry rules as Field Entry Instructions (FEIs).

3.3.63 Field Entry Pilot Record (FEPR): Holds a data entry pilot consisting of field entry event, field entry conditions and a sequence of field entry reactions.

3.3.64 Field Entry Instruction (FEI): Applies a rule for controlled data entry into a field.

3.3.65 Field Entry Event (FEE): An event which may occur during controlled data entry and cause an entry reaction.

3.3.66 Field Entry Condition (FEC): A condition of the data entry which taken with an entry event predicates an entry reaction.

3.3.67 Field Entry Reaction (FER): A reaction to an entry event and entry condition defined in terms of operations on other objects in the virtual terminal service.

3.3.68 Transmission Policy Control Object (TPCO): A type of control object which holds variable values which determine how field contents are transmitted after a controlled data entry.

3.3.69 Context Control Object (CCO): A type of control object which provides the local context of the VT-user at certain stages of the data entry dialogue.

3.3.70 Reference Information Object (RIO): A container for information, separate from any display object, which can be referred to during a communication.

3.3.71 Termination Conditions Control Object (TCCO): A type of control object which holds termination conditions effective on the operation of one or more device objects linked to it.

3.3.72 termination-event: A locally defined atomic event related to input from an object updating device (for example, entering a character, pressing a function key, setting a flag) which the VT-users agree (through negotiation) to designate as causing input data to be delivered to the peer VT-user.

4 Abbreviations

4.1 General

ACSE	Association Control Service Element
ASN.1	Abstract Syntax Notation One
BNF	Backus-Naur Form
ECMA	European Computer Manufacturers Association
IRV	International Reference Version (of ISO 646)
ISO	International Organization for Standardization
MIN	Multiple Interaction Negotiation
OSI	Open Systems Interconnection
QOS	Quality of Service
VT	Virtual Terminal
VTE	Virtual Terminal Environment

4.2 Modes of operation

A-Mode	Asynchronous Mode
S-Mode	Synchronous Mode

4.3 VTE model components

ACS	Access Control Store
CCA	Conceptual Communication Area
CCO	Context Control Object
CDS	Conceptual Data Store
CO	Control Object
CSS	Control, Signal and Status store
DSD	Data Structure Definition
DO	Display Object
ECO	Echo Control Object
FDCO	Field Definition Control Object
FDR	Field Definition Record
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
RIO	Reference Information Object
TCCO	Termination Conditions Control Object
TCO	Termination Control Object
TPCO	Transmission Policy Control Object

4.4 Access-rules

NSAC	Not Subject to Access Control
WACA	Write Access Connection (VT-association) Acceptor
WACI	Write Access Connection (VT-association) Initiator
WAVAR	Write Access VARiable

5 Conventions

This International Standard uses the descriptive conventions contained in the ISO Service Conventions (ISO/TR 8509).

Additional conventions used are

a) a character string enclosed in angle brackets, i.e. <xxx>, denotes the equivalent ISO 646 mnemonic;

b) a character string of the form n...N, where n is usually 0 or 1, denotes the set of integers greater than or equal to n, i.e., no limit is defined in this International Standard;

c) an informal notation analogous to ASN.1 is used in places, with apparently similar terms; where exact ASN.1 notation or terminology is intended, the usage will be introduced by reference to ASN.1;

d) a syntax derived from Backus-Naur Form (BNF) is used for VTE-profile definitions; this is explained in annex A.

6 General features

Clauses 6 and 7 give an Overview of the Virtual Terminal Service defined in this International Standard.

6.1 Introduction

The Basic Class Virtual Terminal Service supports the interactive transfer and manipulation of graphic data by VT-users. This graphic data is structured in a manner which models the class of character-box oriented terminals. The basic structuring of graphic elements is limited to images consisting of character-box graphic elements arranged in a one, two or three dimensional array. Optional functional units provide additional structuring capabilities. Two modes of operation are defined for Basic Class, S-mode and A-mode.

6.2 Features of the Virtual Terminal Basic Class Service

The Virtual Terminal Basic Class Service offers the following services to the VT-user:

a) the means to establish a VT-association between two peer VT-users for the purpose of enabling virtual terminal information exchange;

b) the means to negotiate the VT functional units required;

c) the means to negotiate a consistent set of VTE-parameters;

d) the means to transfer and manipulate structured data in a way that is independent of the local representation of information used by each VT-user and that is independent of the way in which supporting communications media are used;

e) the means to control the integrity of the communication;

f) the means to terminate the VT-association either unilaterally or by mutual agreement;

g) the means to support either synchronous (S-mode) or asynchronous (A-mode) operation between the VT-users;

h) the means to exchange priority information to gain the immediate attention of a VT-user;

i) the means to terminate information transfer destructively and resynchronize the activity of the VT provider;

j) a facility for defining blocks in a display object [Blocks functional unit];

k) a facility for defining fields in a display object [Fields functional unit, also uses feature in n)];

l) additional optional access-rules for control objects in S-mode [Enhanced Access-rules functional unit];

m) means to control the asymmetry inherent in typical use of these features [uses the feature in l)];

n) a facility for defining control objects with content consisting of multiple data elements or a single partially- updateable structured data element [Structured Control Objects functional unit];

o) a facility for controlling data entry to fields using new standard types of control object [uses the feaure in n)];

p) a facility for storing and using update information in Reference Information Objects [RIOs functional unit];

q) a facility for establishing a VT-association with the capability to switch between the modes of operation when the VTE is changed.

6.3 VT Environment (VTE) and VTE-parameters

The transfer and manipulation of graphic data takes place within a VT-environment (VTE) defined by a logically consistent set of VTE-parameter values. Certain VTE-parameters are related in that a value for one VTE-parameter can constrain the existence of or permissible values for another VTE-parameter. These relationships are partly expressed by a directed graph for the VTE-parameters and partly by explicit definition.

One and only one full-VTE exists during data transfer. A full-VTE may be modified or replaced if negotiation facilities are available.

6.4 Virtual Terminal Environment Profiles

The Basic Class VT Service provides for the use of virtual terminal environment profiles (VTE-profiles) which are sets of VTE-parameters and VTE-parameter values for use in the negotiation of the VTE (see clause 11 and annex A).

6.5 Dialogue Control

The integrity of VT communication is maintained by Dialogue Control service facilities (by applying access-rules, delivery control and delivery acknowledgement, see clauses 9 and 24), and service primitive sequencing rules which provide integrity by detecting and resolving collisions (see clause 27).

7 Communication facilities

7.1 Establishment facility

The Establishment facility provides a service that establishes a VT-association and an initial VTE for that VT-association when a VT-user first invokes the Basic Class VT Service.

7.2 Termination facility

The Termination facility provides services which enable a VT-user to terminate a VT-association either in an orderly and non-destructive manner or in an immediate and potentially destructive manner. It also provides a service which enables the VT service provider to notify the VT-users when a VT-association is terminated in a potentially destructive way.

7.3 Negotiation facility

The Negotiation facility provides services which enable peer VT-users to select, modify and replace the current-VTE.

An initial VTE is established during VT-association establishment based on the VTE-profile specified. If the VT-user does not specify a VTE-profile during VT-association establishment, a default VTE-profile is used to establish the initial VTE. This VTE may subsequently be modified or replaced depending on the type of negotiation facilities available.

The type of negotiation facility available to the VT-users is determined by the VT functional units selected during VT-association establishment. In addition to the VTE-profile selection facility available during VT-association establishment, there are two other types of negotiation, i.e., switch profile negotiation and multiple interaction negotiation.

7.4 Data Transfer facility

The Data Transfer facility provides a service which enables a VT-user to update the contents of display and/or control objects to which the VT-user is currently permitted update access.

7.5 Delivery Control facility

The Delivery Control facility provides services which enable a VT-user to control, synchronise and optionally request acknowledgement of, the release to the peer VT-user of updates entered previously using the Data Transfer facility. This includes the (negotiable) ability to "quarantine" (i.e., hold back) such updates from such release until the release is requested.

7.6 Dialogue Management facility

In S-mode, the Dialogue Management facility enables the VT-users to request or cede ownership of the WAVAR access-right.

In A-mode, the Dialogue Management facility is not available.

7.7 Interrupt facilities

The Interrupt facilities are available in both modes of operation but can only be used in the Data Handling phase. There is a destructive interrupt facility and a non-destructive interrupt facility.

The **destructive interrupt** facility allows a VT-user to interrupt a previously initiated sequence of updates to display and control objects, discard all updates currently being exchanged and resume exchanging updates after the VT providers have resynchronized their activities.

The **non-destructive interrupt** facility allows VT-users to exchange priority information but without destroying non-priority information; it can be used as an "attention" signalling mechanism (via appropriately defined control objects, see clause 14).

7.8

8 Modes of operation

Clauses 8, 9 10 and 11 define general aspects of the Virtual Terminal Service.

The Virtual Terminal Basic Class Service supports two modes of operation. Each mode is characterised by its form of dialogue control. The initial mode of operation is selected when the VT-association is established. The ability to change modes on the establishment of a new VTE is also selected when the VT-association is established.

8.1 S-mode

S-mode (synchronous mode) has the following characteristics:

a) one or other VT-user may own the WAVAR access-right; ownership may be passed between the two VT-users;

b) only a single display object is supported with a single two-way-alternate dialogue. Update access to this display object is controlled by the WAVAR access-rule, see clause 9;

c) the VT-users may define and make use of termination condition parameters in device objects;

d) the access-rules available for any control object are as in clause 9, table 1.

8.2 A-mode

A-mode (asynchronous mode) has the following characteristics:

a) the WAVAR access right is not available;

b) two display objects are supported, each with a monologue. One display object has access-rule WACI and can only be updated by the VT-user which initiated the VT-association; the other display object has access-rule WACA and can only be updated by the VT-user which accepted the VT-association;