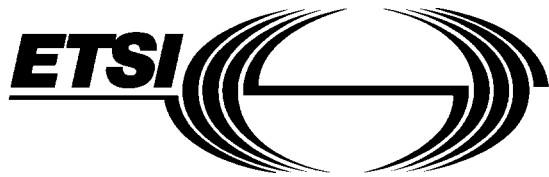




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Part 1: Q3 interface specification**

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## Foreword

This European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is part 1 of a multi-part standard covering the Q3 interface specification at the Access Network (AN) for configuration management of V5 interfaces and associated user ports as described below:

**Part 1: "Q3 interface specification";**

Part 2: "Managed Object Conformance Statement (MOCS) proforma specification".

The following multi-part standards are directly related to this ETS:

- ETS 300 377: "Q3 interface at the Local Exchange (LE) for configuration management of V5 interfaces and associated customer profiles";
- ETS 300 378: "Q3 interface at the Access Network (AN) for fault and performance management of V5 interfaces and associated user ports";
- ETS 300 379: "Q3 interface at the Local Exchange (LE) for fault and performance management of V5 interfaces and associated customer profiles".

Transposition dates	
Date of latest announcement of this ETS (doa):	31 March 1995
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 September 1995
Date of withdrawal of any conflicting National Standard (dow):	30 September 1995

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## Introduction

V5 interfaces, as described in ETS 300 324 (1994) and ETS 300 347 (1994), operate between an exchange and an Access Network (AN) to support various narrowband services. These interfaces and their associated user ports have to be managed by the Operations Systems (OSs) within the Telecommunications Management Network (TMN).

ITU-T Recommendation G.803 (1993) provides an abstracted view of telecommunications equipment, based on the essential functions that such equipment needs to perform. These functional components are modelled by objects, which represent the implementation-independent aspects of the equipment.

The following assumptions relating to the scope of this ETS were to be considered:

- existing protocols should be used where possible, and the focus of the ETS should be on defining the object models;
- the interface should not involve objects specific to the control of a leased line network which is not connected to the LE or of an external line test system;
- a model of the AN appears necessary. The model relevant to the present standards on the V5 interface and ports will be developed if it does not already exist elsewhere. Other object models outside the scope of this ETS may share the same physical Q3 interface;
- the definition of OS functionality is outside the scope of this ETS;
- security management is excluded from this ETS, but aspects of security relating to configuration management are included;

- configuration management includes provisioning and the provisioning activity may include testing, but this testing is not included in this ETS. It will be included in the specification relating to fault and performance management;
- the specification should cover the provisioning of national variants and type variants of lines. Existing modelling, such as the customer administration model, should be used for this, if possible;
- the specification should not cover general functions within the AN, such as multiplexing, cross-connection and transmission functions, unless some aspect impacts the configuration management of V5 interfaces and related ports;
- configuration management related to redundancy of V5 interfaces is within the scope of this ETS, both for multiple V5 interfaces and for the individual links within a V5.2 interface;
- the definition of an object model for a transparent channel on the V5 interface which supports the synchronization of OSs is outside the scope of this ETS;
- it is assumed that the relationship between directory numbers and equipment is kept in the OSs of the AN, so that the Q3 interface of the AN does not need to handle directory numbers.

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## 1 Scope

This European Telecommunication Standard (ETS) specifies the Q3 interface between an Access Network (AN) and the Telecommunications Management Network (TMN) for the support of configuration management functions for V5 interfaces, as described in ETS 300 324-1 [3] and ETS 300 347-1 [4], and their associated user ports. The management of transmission, media and services which are not related to V5 interfaces is outside the scope of this ETS.

The Q3 interface is the TMN interface between network elements or Q-adapters which interface to Operations Systems (OSs) without mediation and between OSs and mediation devices. The location of the Q3 interface is illustrated in annex G.

Generic modelling of leased line ports which are associated with a V5 interface is within the scope of this ETS, but the traffic from these ports can only be associated with 64 kbit/s bearer channels on the V5 interface.

The definition of OS functionality, and the specification of Qx interfaces and proprietary interfaces are outside the scope of this ETS.

This ETS does not constrain the logical or physical size of the AN or its geographical dispersion. The definition of the managed object class which represents an AN is outside the scope of this ETS.

Existing protocols are used where possible, and the focus of this ETS is on defining the object models.

NOTE: Configuration management includes provisioning and the provisioning activity may include testing, but this testing is not included in this ETS. It is included in the specification relating to fault and performance management, ETS 300 378-1 [6].

## 2 Normative references (standards.iteh.ai)

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] I-ETS 300 291: "Network Aspects (NA); Functional specification of Customer Administration (CA) on the Operations System/Network Element (OS/NE) interface".
- [2] ETS 300 297: "Integrated Services Digital Network (ISDN); Access digital section for ISDN basic access".
- [3] ETS 300 324-1 (1994): "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification".
- [4] ETS 300 347-1 (1994): "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 1: V5.2 interface specification".
- [5] ETS 300 377-1 (1994): "Signalling Protocols and Switching (SPS); Q3 interface at the Local Exchange (LE) for configuration management of V5 interfaces and associated customer profiles; Part 1: Q3 interface specification".
- [6] ETS 300 378-1: "Signalling Protocols and Switching (SPS); Q3 interface at the Access Network (AN) for fault and performance management of V5 interfaces and associated user ports; Part 1: Q3 interface specification".

- [7] ETS 300 379-1: "Signalling Protocols and Switching (SPS); Q3 interface at the Local Exchange (LE) for fault and performance management of V5 interfaces and associated customer profiles; Part 1: Q3 interface specification".
- [8] ITU-T Recommendation G.773 (1993): "Protocol suites for Q-interfaces for management of transmission systems".
- [9] CCITT Recommendation G.784 (1990): "Synchronous Digital Hierarchy (SDH) management".
- [10] CCITT Recommendation M.3010 (1992): "Principles for a telecommunications management network".
- [11] CCITT Recommendation M.3100 (1992): "Generic network information model".
- [12] ITU-T Recommendation Q.811 (1993): "Lower layer protocol profiles for the Q3 interface".
- [13] ITU-T Recommendation Q.812 (1993): "Upper layer protocol profiles for the Q3 interface".
- [14] CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".
- [15] CCITT Recommendation X.711 (1991): "Common management information protocol definition for CCITT applications".
- [16] CCITT Recommendation X.721 | ISO/IEC 10165-2 (1992): "Information technology - Open systems interconnection - Structure of management information: Definition of management information".
- [17] CCITT Recommendation X.731 | ISO/IEC 10164-2 (1992): "Information technology - Open systems interconnection - Systems management: State management function".
- [18] CCITT Recommendation X.732 | ISO/IEC 10164-3 (1992): "Information technology - Open systems interconnection - Systems management: Attributes for representing relationships".

### 3 Definitions

For the purposes of this ETS, the following definitions apply:

**Access Network (AN):** See ETS 300 324-1 [3].

**bearer channel:** See ETS 300 324-1 [3].

**Bearer Channel Connection (BCC):** See ETS 300 347-1 [4].

**Communication channel (C-channel):** See ETS 300 324-1 [3].

**Communication path (C-path):** See ETS 300 324-1 [3].

**control protocol:** See ETS 300 324-1 [3].

**D-channel signalling type (Ds-type) data:** ISDN D-channel signalling type data with Service Access Point Identifier (SAPI) not equal to 16, and not equal to 32 to 62 (see ETS 300 324-1 [3], subclause 8.4).

**envelope function address:** See ETS 300 324-1 [3].

**frame type (f-type) data:** ISDN D-channel data with SAPI in the range from 32 to 62 (see ETS 300 324-1 [3], subclause 8.4).

**Local Exchange (LE):** See ETS 300 324-1 [3].

**Operations System (OS):** See CCITT Recommendation M.3010 [10].

**packet type (p-type) data:** ISDN D-channel data with SAPI equal to 16 (see ETS 300 324-1 [3], subclause 8.4).

**Permanent Line (PL):** See ETS 300 324-1 [3].

**protection protocol:** See ETS 300 347-1 [4].

**provisioning variant:** See ETS 300 324-1 [3].

**semi-permanent leased line:** See ETS 300 324-1 [3].

**time slot number:** See ETS 300 324-1 [3].

**V5 interface:** See ETS 300 324-1 [3].

**V5 time slot:** Is an object class representing a 64 kbit/s channel of a V5 interface that is used as bearer or communication channel. It is a subclass of "CCITT Recommendation M.3100:1992":connectionTerminationPointBidirectional.

**V5 Trail Termination Point (TTP):** Is an object class representing a 2 Mbit/s interface that is used as V5.1 interface or as part of a V5.2 interface. It is a subclass of "CCITT Recommendation M.3100:1992":trailTerminationPointBidirectional.

**X interface:** See CCITT Recommendation M.3010 [10].

#### 4 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

AN	Access Network
ASN.1	Abstract Syntax Notation One (see CCITT Recommendation X.208 [14])
BA	Basic Access
BCC	Bearer Channel Connection
C-channel	Communication channel
C-path	Communication path
CTP	Connection Termination Point
DCC	Data Communications Channel
Ds-type	D-channel signalling type
f-type	frame type
FSM	Finite State Machine
ID	Identity, Identifier
ISDN	Integrated Services Digital Network
LE	Local Exchange
M/O	Mandatory/Optional
MPH	primitive between Physical layer and layer 2 Management
NE	Network Element
OS	Operations System
p-type	packet type
PL	Permanent Line
PRA	Primary Rate Access
PSTN	Public Switched Telephone Network
RDN	Relative Distinguished Name
SAPI	Service Access Point Identifier

TIB	Task Information Base
TMN	Telecommunications Management Network
TTP	Trail Termination Point

## 5 Information model diagrams

The entity relationship diagram is given in subclause 5.1 and the inheritance hierarchy (is-a relationships) and naming hierarchy (containment relationships) are given in subclauses 5.2 and 5.3, respectively.

### 5.1 Entity relationship diagram

Figures 1 to 4 show the overall relationships between the various entities. These correspond to the managed objects which are manipulated at the Q3 interface.

For V5.1 interfaces, bearer channels on user ports are associated with bearer time slots on a V5.1 interface by configuration over the Q3 interface of the AN. For V5.2, bearer channels on user ports are associated with bearer time slots on a V5.2 interface by the V5.2 Bearer Channel Connection (BCC) protocol. For both V5.1 and V5.2, the association of user signalling with communication paths and the association between communication paths and logical communication channels on the V5 interface is by configuration over the Q3 interface of the AN. The association of logical communication channels with physical communication time slots on the V5 interface is initially established over the Q3 interface, but can be changed for V5.2 interfaces by the V5.2 protection protocol.

The AN treats time slots on the V5.2 interface which are used for semi-permanent connections like any other bearer time slot on a V5.2 interface.

Signalling protocols and their associated communication are modelled using various objects which represent the communication paths and the communication time slots. There are six classes of communication path objects. There is a single class for all Integrated Services Digital Network (ISDN) signalling with an attribute to distinguish between Ds-type, p-type, and f-type data. There are classes for Public Switched Telephone Network (PSTN) signalling, the control protocol, the BCC protocol, link control protocol, and the protection protocol. In addition to these six communication path object classes, there is also an object class which represents communication channels.

There is one instance of the appropriate object class per communication path and per communication channel. These are contained in instances of v5Interface.

V5 control messages relating to provisioning are managed by an optional object on the Q3 interface. These messages may not be required once a TMN X interface or an integrated OS is available.

If control messages relating to provisioning are not supported on the Q3 interface then a default value for provisioning variant will be automatically used on the V5 interface. All V5 interfaces will use this default value unless actively changed via the Q3 interface. The value of this default is all zeroes.

Protection group 1 and its contained protection unit(s) are to be instantiated for the V5.2 case even if there is only one 2,048 Mbit/s link.

A Trail Termination Point (TTP) contains the Connection Termination Points (CTPs) at the higher network layer which it serves. This relationship allows the entity relationship diagram to be mapped onto the functional architecture (see annex D).

## 5.1.1 Overview

A single accessNetwork can contain a number of userPortTtps, a number of v5Interfaces, and a number of v5Ttps (which each represent a 2,048 Mbit/s link). There is a bi-directional association between each v5Interface and all of its related userPorts. Likewise there is a bi-directional relationship between each v5Interface and all of its related v5Ttps (2,048 Mbit/s links).

Each userPortTtp can contain a number of userPortBearerChannelCtps, one for each of its 64 kbit/s bearer channels. Each v5Ttp contains 31 v5TimeSlots which represent the CTPs corresponding to each of the 31 physical time slots which may be configured. Each userPortBearerChannelCtp can be associated with a unique v5TimeSlot for a V5.1 interface, but for the V5.2 case there is no corresponding association because the relationship is controlled by the V5.2 BCC protocol.

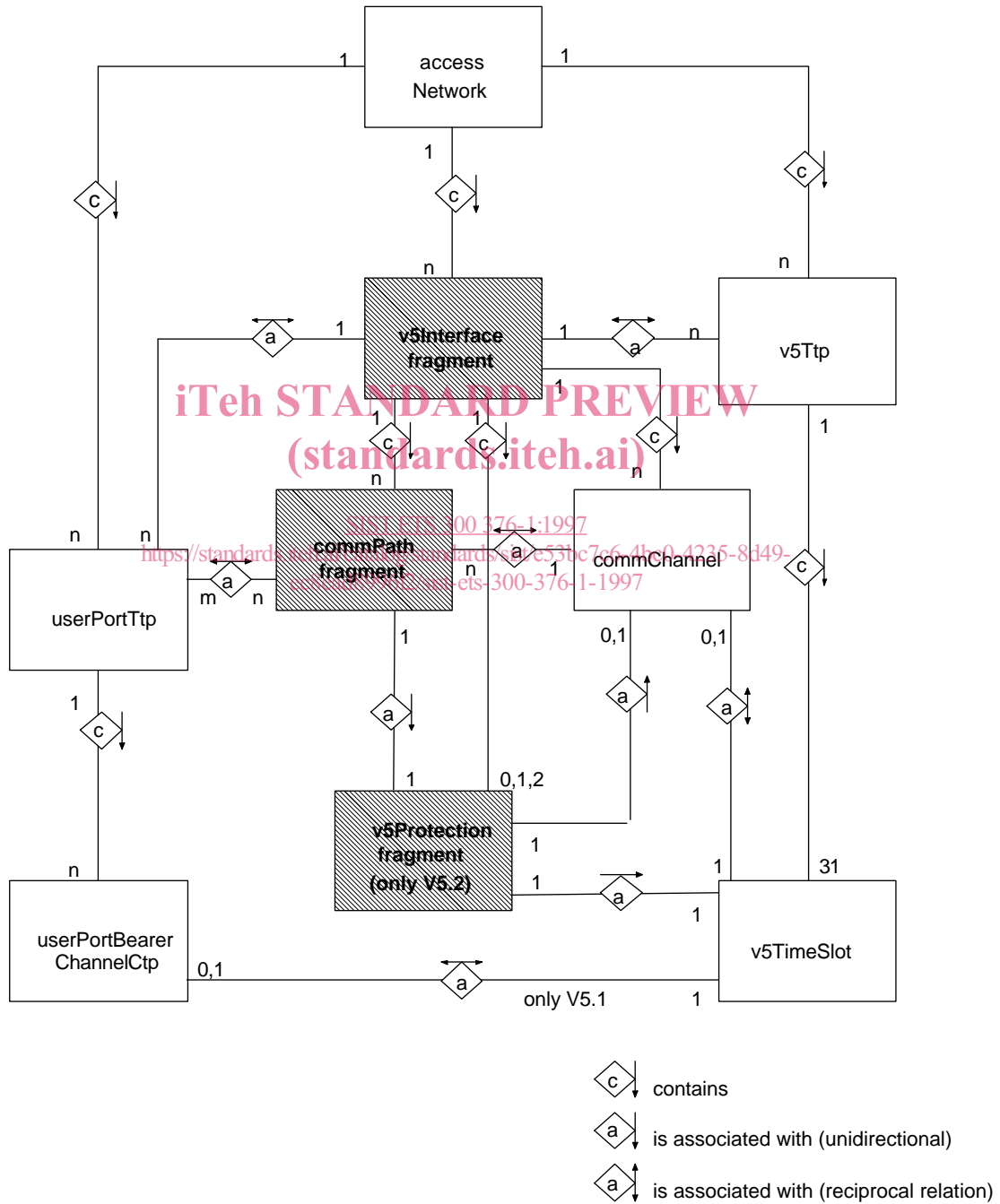


Figure 1: Entity relationship diagram - overview