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Telekomunikacijsko upravljavno omrežje (TMN)) - Vmesnik Q3 krajevne centrale (LE) za upravljanje okvar in delovanja vmesnikov V5 in pridruženih profilov stranke - 1. del: Specifikacija vmesnika Q3

Telecommunications Management Network (TMN); Q3 interface at the Local Exchange (LE) for fault and performance management of V5 interfaces and associated customer profiles; Part 1: Q3 interface specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Telecommunications Management Network (TMN).

The present document is part 1 of a multi-part EN covering the Q3 interface at the Local Exchange (LE) for fault and performance management of V5 interfaces and associated customer profiles, as identified below:

Part 1: "Q3 interface specification";

Part 2: "Managed Objects Conformance Statement (MOCS) proforma" (for further study).

National transposition dates	
Date of adoption of this EN:	15 October 1999
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Introduction

V5 interfaces, as described in EN 300 324-1 [2] and EN 300 347-1 [3], operate between a Local Exchange (LE) and an Access Network (AN) to support various narrowband Integrated Services Digital Network (ISDN) and Public Switched Telephone Network (PSTN) services. These interfaces and their associated user ports need to be managed by the Operations Systems (OSs) within the Telecommunications Management Network (TMN). This management is performed by means of Q3 interfaces.

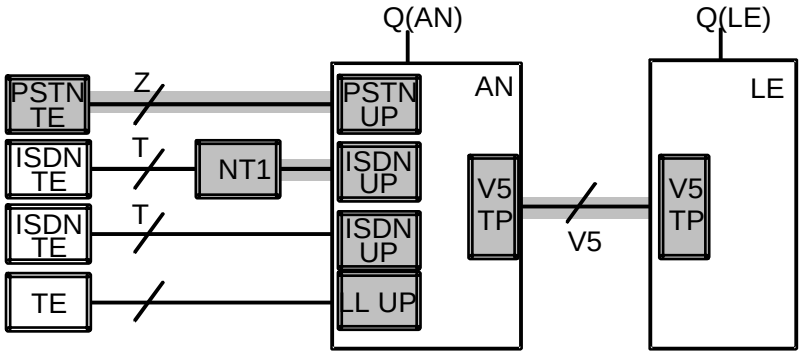
The companion standard on configuration management EN 300 377-1 [4] defines how the Q3 interface of a LE handles the configuration information for V5 interfaces and their associated customer profiles. The present document describes the extension to include fault and performance management.

Fault management of V5 interfaces and associated user ports is part of a management activity which is performed by the operator in order to detect failure conditions and to bring the customer access back to its normal state of operation whenever a deviation occurs.

Performance management of V5 interfaces and associated user ports is part of a management activity which is employed in order to maintain the quality of service levels agreed with the customers. The activities undertaken in performance management are monitoring, analysis and problem alerting, diagnosis, optimization and control.

A customer access is considered as being that part of the local network which extends from the network termination equipment up to and including the exchange termination.

Here, only these parts of the activities are covered which are related directly to a V5 interface between a LE and an AN or to that part of the customer access which extends from the AN to the network termination equipment. An ISDN access extends to but does not include the T reference point. An analogue access extends to and may include the Customer Premise Equipment (CPE) (see figure 1).



NOTE: Shaded areas are subject to V5 fault and performance management. User ports represent the different configurations for Line Circuit (LC), Line Termination (LT), Exchange Termination (ET) and Network Termination (NT) as indicated in EN 300 324-1 [2] and EN 300 347-1 [3].

Figure 1: Scope of V5 fault and performance management

The present document details only those functions and management information model components for which V5 specific descriptions are required. However, the use of other components which may be applicable from other specifications is not precluded. In this case, combined application incorporating both V5-specific and more generic aspects would result. For example, if log control is to be provided in conjunction with the V5 specific alarm reporting function (see annex A) then other specifications (e.g. ITU-T Recommendation X.735 [17]) are available to define this.

The management information model described in the present document complements that for configuration; both information models will normally share the same physical interface.

1 Scope

The present document specifies the Q3 interface between a Local Exchange (LE) and the Telecommunications Management Network (TMN) for the support of Fault and Performance Management functions for V5 interfaces, as described in EN 300 324-1 [2] and EN 300 347-1 [3], and their associated customer profiles. The management of transmission, media and services which are not related to V5 interfaces is outside the scope of the present document, as is the management of equipment. The present document includes the logging of faults and related functions.

For certain implementations, some test related functions like line monitoring, pattern injection for loop back tests and Dual Tone Multi-Frequency (DTMF) measurements may also be performed in the LE, e.g. due to economical reasons. A Q interface for these functions is required at the LE. As they are not V5 specific, this has to be handled within an overall LE test model which is outside the scope of the present document.

The location of the Q3 interface to which the present document refers is specified in EN 300 377-1 [4].

Existing protocols are used where possible, and the focus of the work is on defining the object models. The definition of Operations System (OS) functionality is outside the scope of the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] Void.

[2] EN 300 324-1: "V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification".

[3] EN 300 347-1: "V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 1: V5.2 interface specification".

[4] EN 300 377-1: "Q3 interface at the Local Exchange (LE) for configuration management of V5 interfaces and associated customer profiles; Part 1: Q3 interface specification".

[5] CEPT Recommendation T/S 54-08 E (1987): "ISDN subscriber access and installation maintenance".

[6] ITU-T Recommendation M.3010 (1996): "Principles for a telecommunications management network".

[7] ITU-T Recommendation M.3100 (1995): "Generic network information model".

[8] ITU-T Recommendation Q.821 (1993): "Stage 2 and stage 3 description for the Q3 interface; Alarm surveillance".

[9] ITU-T Recommendation Q.822 (1994): "Stage 1, stage 2 and stage 3 description for the Q3 interface; Performance management".

[10] CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notification One (ASN.1)".

[11] ITU-T Recommendation X.721 | ISO/IEC 10165-2 (1992): "Information technology; Open systems interconnection; Structure of management information: Definition of management information".

[12] Void.

[13] Void.

[14] Void.

[15] ITU-T Recommendation X.733 | ISO/IEC 10164-4 (1992): "Information technology; Open systems interconnection; Systems management: Alarm reporting function".

[16] ITU-T Recommendation X.734 | ISO/IEC 10164-5 (1992): "Information technology; Open systems interconnection; Systems management: Event report management function".

[17] ITU-T Recommendation X.735 | ISO/IEC 10164-6 (1992): "Information technology; Open systems interconnection; Systems management: Log control functions".

[18] ITU-T Recommendation X.738 | ISO/IEC 10164-13 (1993): "Information technology; Open systems interconnection; Systems management: Summarization function".

[19] ITU-T Recommendation X.739 | ISO/IEC 10164-11 (1993): "Information technology; Open systems interconnection; Systems management: Metric objects and attributes".

[20] Void.

[21] ITU-T Recommendation Q.831 (1997): "Fault and performance management of V5 interface environments and associated customer profiles".

[22] ITU-T Recommendation Q.835 (1999): "Line and line circuit test management of ISDN and analogue customer accesses".

[23] EN 300 378-1: "Telecommunication Management Network (TMN); Q3 interface at the Access Network (AN) for fault and performance management of V5 interfaces and associated user ports; Part 1: Q3 interface specification".

[24] ITU-T Recommendation Q.824.5 (1997): "Stage 2 and stage 3 description for the Q3 interface; Customer administration: Configuration management of V5 interface environments and associated customer profiles".

[25] EN 300 291-1: "Telecommunications Management Network (TMN); Functional specification of Customer Administration (CA) on the Operations System/Network Element (OS/NE) interface; Part 1: Single line configurations".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Access Network (AN): see EN 300 324-1 [2]

bearer channel: see EN 300 324-1 [2]

Bearer Channel Connection (BCC): see EN 300 347-1 [3]

Communication channel (C-channel): see EN 300 324-1 [2]

Communication path (C-path): see EN 300 324-1 [2]

control protocol: see EN 300 324-1 [2]

envelope function address: see EN 300 324-1 [2]

layer 3 address: see EN 300 324-1 [2]

leased lines: see EN 300 324-1 [2]

Local Exchange (LE): See EN 300 324-1 [2]

Operations System (OS): see ITU-T Recommendation M.3010 [6]

protection protocol: see EN 300 347-1 [3]

V5 interface: see EN 300 324-1 [2]

V5 interface messages: this term refers to all Function Elements (FEs) and other V5 protocol messages as defined in EN 300 324-1 [2] and EN 300 347-1 [3] which are communicated via the V5 interface

V5 time slot: see EN 300 324-1 [2]

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AIS	Alarm Indication Signal
AN	Access Network
ASN.1	Abstract Syntax Notation One (see CCITT Recommendation X.208 [10])
BCC	Bearer Channel Connection
C-channel	Communication channel
C-path	Communication path
CPE	Customer Premise Equipment
CRC	Cyclic Redundancy Check
DTMF	Dual Tone Multi-Frequency
ET	Exchange Termination
ID	Identity, identifier
ISDN	Integrated Services Digital Network
LAPV5	Link Access Protocol for V5 interface
LC	Line Circuit
LE	Local Exchange
LFA	Loss of Frame Alignment
LT	Line Termination
M/C/O	Mandatory/Conditional/Optional
NE	Network Element
NT	Network Termination
OS	Operations System
PM	Performance Management
PSTN	Public Switched Telephone Network
RAI	Remote Alarm Indication
RDN	Relative Distinguished Name
TIB	Task Information Base
TMN	Telecommunications Management Network
TTP	Trail Termination Point

4 Information model diagrams

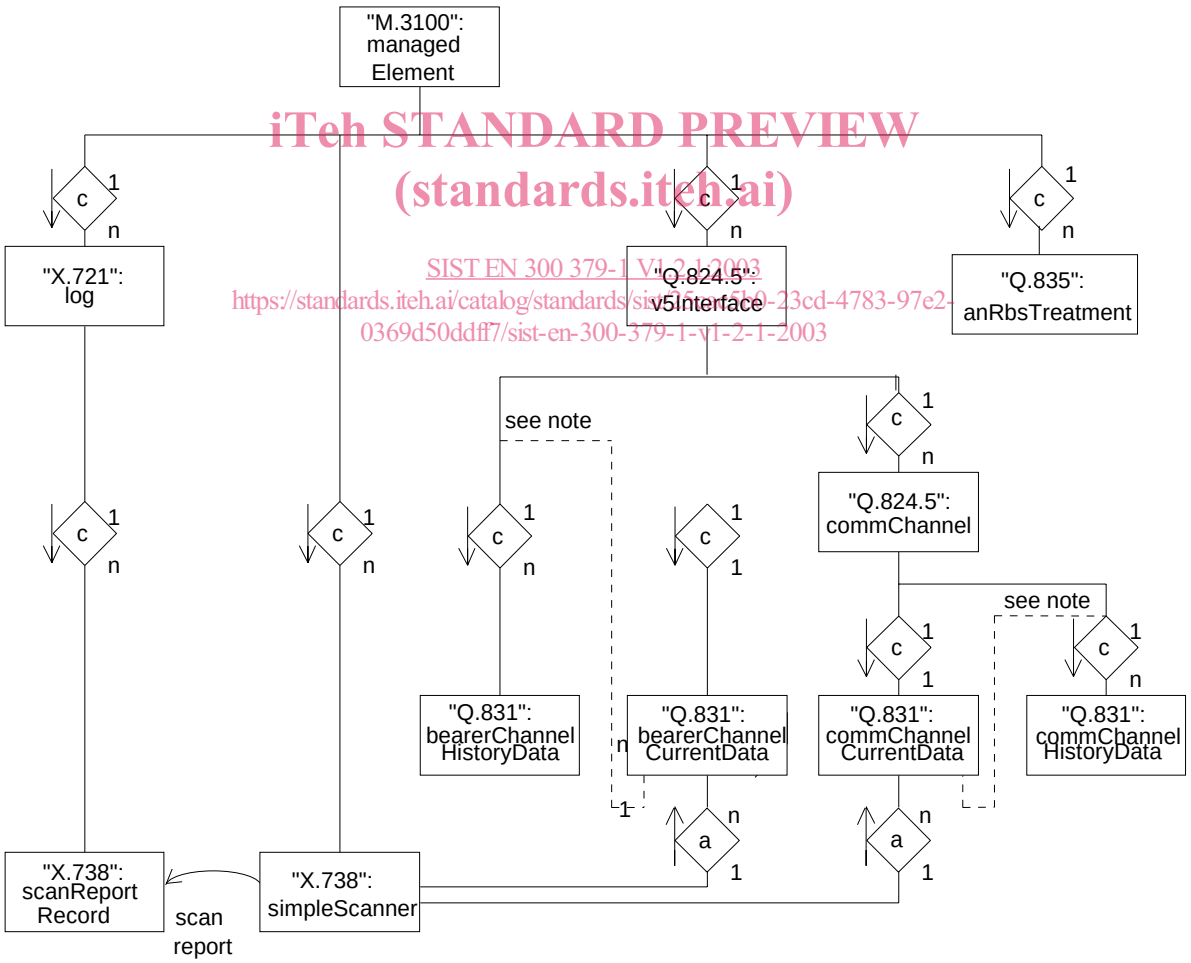
The entity relationship diagram is given in subclause 4.1 and the inheritance hierarchy (is-a relationships) and naming hierarchy (containment relationships) are given in subclauses 4.2 and 4.3, respectively.

4.1 Entity relationship diagram

Traffic measurements in the LE are concerned with bearer channel allocation and communication channel traffic characteristics. Subclasses of ITU-T Recommendation Q.822 [9] currentData object class are used to store traffic measurement data obtained from the object instance they are contained in. The current data is updated every 15 minutes.

The object class bearer channel current data has attributes for bearer channel oriented performance measurements of a V5.2 interface. The measurement results are obtained from the V5 Interface object instance representing the V5.2 interface. The object class comm channel current data is contained in an instance of comm channel. It has attributes for communication channel oriented measurements related to a V5 communication channel.

An instance of ITU-T Recommendation X.738 [18] simple scanner object class may be used to collect the traffic measurement results stored in comm channel current data and bearer channel current data object instances in a certain time interval. It generates a scan report notification being sent to the managing system. In addition, results may be logged in a scan report record object instance which is contained in a log object.



NOTE: History data objects may also be contained in the related current data objects.

Figure 2: Entity relationship diagram - V5 traffic measurement

Instead of generating scan reports, instances of the object classes bearer channel history data and comm channel history data may be used to store the traffic measurement results. New instances of these object classes are created at the end of each interval.