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Telekomunikacijsko upravljavno omrežje (TMN) - Funkcijska specifikacija administriranja stranke (CA) na vmesniku obratovalnega sistema/omrežnega elementa (OS/NE) - 2. del: Več vodovna konfiguracija

Telecommunications Management Network (TMN); Functional specification of Customer Administration (CA) on the Operations System/Network Element (OS/NE) interface; Part 2: Multi line configurations

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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 2 of a multi-part deliverable covering the Telecommunications Management Network (TMN); Functional specification of Customer Administration (CA) on the Operations System/Network Element (OS/NE) interface, as identified below:

Part 1: "Single line configurations";

Part 2: "Multi line configurations".

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Introduction

For the present document, the following priority was assigned for the scope of the customer administration model:

- modelling of analogue, digital and Integrated Services Digital Network (ISDN) multi line customer installation configurations.

Extendibility to cover all ETSI ISDN teleservices, bearer services and supplementary services, Private Branch Exchanges (PBXs), mobile customers, ATM, cordless and Universal Personal Telecommunication (UPT) customers, centrex, packet switching, the full range of CEPT services, non-standardized services (e.g. dual homing, etc.) is foreseen via subclassing (see entity-relationship diagram clause 5.1, and descriptions in clause 6.1).

In the present document, the customer administration model is restricted to modelling of semi-permanent customer data. Call processing and dynamic (state) information is no subject of the present document.

The present document is based on the ITU-T Recommendations Q.824.0 [9] to Q.824.4 [13] and on EN 300 291-1 [2], from which all relevant object classes were subclassed as far as necessary.

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1 Scope

The present document specifies the management aspects of Customer Administration (CA) for Public Switched Telephone Network (PSTN), and public Integrated Services Digital Network (ISDN), in line with descriptions in ETR 047 [22], and restricted to service provisioning and service configuration only. The identified requirements are documented in annex B of the present document. Within the present document, not only terminating, but as well originating aspects of ISDN and PSTN multi line configurations are considered.

The model is restricted to the Operations System to Network Element (OS/NE) interface.

The present document focuses on the configuration management aspects of multi line configurations, regarding the framework as given in EN 300 291-1 [2], in ITU-T Recommendations Q.824 series [9] to [13], in the CEPT Handbook [19] on services and facilities, in EN 300 650 [23] and in ITU-T Recommendation I.252.6 [7].

As far as necessary, object classes representing supplementary services required for multi line configurations are defined within 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.

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[1] ETSI ETS 300 062: "Integrated Services Digital Network (ISDN); Direct Dialling In (DDI) supplementary service; Service Description".

[2] ETSI EN 300 291-1 (V1.2.1): "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] ETSI EN 300 292 (V1.2.1): "Telecommunications Management Network (TMN); Functional specification of call routeing information management on the Operations System/Network Element (OS/NE) interface".

[4] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[5] ITU-T Recommendation E.502: "Traffic measurement requirements for digital telecommunication exchanges".

[6] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".

[7] ITU-T Recommendation I.252.6 (1988): "Line Hunting (LH)".

[8] ITU-T Recommendation M.3100: "Generic network information model".

[9] ITU-T Recommendation Q.824.0 (1995): "Common information".

[10] ITU-T Recommendation Q.824.1 (1995): "Stage 2 and stage 3 description for the Q3 interface - Customer administration: Integrated Services Digital Network (ISDN) basic and primary rate access".

[11] ITU-T Recommendation Q.824.2 (1995): "Integrated Services Digital Network (ISDN) supplementary services".

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[12] ITU-T Recommendation Q.824.3 (1995): "Stage 2 and stage 3 description for the Q3 interface - Customer administration: Integrated Services Digital Network (ISDN) optional user facilities".

[13] ITU-T Recommendation Q.824.4 (1995): "Stage 2 and stage 3 description for the Q3 interface - Customer administration: Integrated Services Digital Network (ISDN) teleservices".

[14] ITU-T Recommendation X.720 (ISO/IEC 10165-1): "Information technology - Open Systems Interconnection - Structure of management information: Management information model".

[15] ITU-T Recommendation X.721 (ISO/IEC 10165-2): "Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

[16] ITU-T Recommendation X.730 (ISO/IEC 10164-1): "Information technology - Open Systems Interconnection - Systems Management: Object management function".

[17] ITU-T Recommendation X.731 (ISO/IEC 10164-2): "Information technology - Open Systems Interconnection - Systems Management: State management function".

[18] ITU-T Recommendation X.732 (ISO/IEC 10164-3): "Information technology - Open Systems Interconnection - Systems Management: Attributes for representing relationships".

[19] CEPT Handbook on services and facilities offered to the subscribers in modern telephone systems (3rd Edition 1981).

[20] ETSI EN 301 479: "Integrated Services Digital Network (ISDN); Line Hunting (LH) supplementary service; Service description".

[21] ETSI ETR 010: "ISDN Standards Management (ISM); The ETSI Basic Guide on the European Integrated Services Digital Network (ISDN)".

[22] ETSI ETR 047: "Network Aspects (NA); Telecommunications Management Network (TMN) Management services".

[23] ETSI EN 300 650: "Integrated Services Digital Network (ISDN); Message Waiting Indication (MWI) supplementary service; Service description".

[24] ITU-T Recommendation Q.821: "Stage 2 and stage 3 description for the Q3 interface - Alarm Surveillance".

[25] ITU-T Recommendation X.711: "Information technology - Open Systems Interconnection - Common Management Information Protocol: Specification".

[26] ETSI ETS 300 345: "Integrated Services Digital Network (ISDN); Interworking between public ISDNs and private ISDNs for the provision of telecommunication services; General aspects".

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3 Definitions and abbreviations

3.1 Definitions

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

customer administration: function of managing customer service provisioning information on an exchange

multi line configuration: customer configuration where the customer installation (e.g. a PBX) may be accessed to the exchange by more than one line with a common directory number (see clause B.1 of EN 300 291-2)

pilot directory number: directory number with which the multi line configuration can be addressed

NOTE: In the case of a PBX, it may be the directory number which leads to the operator position of the PBX.

pilot line: physical line associated with a pilot directory number and is e.g. used to start sequential hunting

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The definitions of the managed object classes are described in clause 6 and formally defined in clause 7.

The definitions of all ISDN teleservices, bearer services and supplementary services may be found in the ETS/EN listed in clause 6 of ETR 010 [21].

3.2 Abbreviations

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

ASN.1	Abstract Syntax Notation One
ATM	Asynchronous Transfer Mode
BRA	Basic Rate Access
BRA	ISDN Basic Rate Access
DDI	Direct Dialling In
DSS1	Digital Signalling System No.1
GDMO	Guidelines for the Definition of Managed Objects
ISDN	Integrated Services Digital Network
LSN	Line Service Number
M/C/O	Mandatory/Conditional/Optional
MFC	Multi Frequency Code
NE	Network Element
OS	Operations System
PABX	Private Automatic Branch Exchange (with DDI)
PBX	Private Branch Exchange (without DDI)
PCM	Pulse Code Modulation
PDN	pilot directory number
PRA	ISDN primary rate access
PRA	Primary Rate Access
PSTN	Public Switched Telephone Network
QSIG	Q Signalling
RDN	Relative Distinguished Name
RSN	Remote Service Number
SCI	Subscriber Controlled Input
TIB	Task Information Base
TMN	Telecommunications Management Network
UPT	Universal Personal Telecommunications

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4 Functional requirements

The functional requirements are derived from the TIB A specified in ETR 047 [22] for the customer administration service.

The requirements as identified for multi line configurations are documented in annex B.

Customer administration is a management activity that the network operator performs in order to exchange with the customer all the customer related management data and functions required to offer a telecommunication service and to exchange with the network all the customer related management data and functions necessary for the network to produce that telecommunication service.

In a wide sense, this could include interactions for the purpose of service provision management, configuration administration, fault administration, charging (including detailed billing) administration, complaints administration, quality of service administration, traffic measurement administration, etc. Here, however, only customer administration in the more traditional sense of service provision and service configuration has been included.

The components of service mentioned hereafter are within the scope of the present document.

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4.1 Manage service provision

After receiving a customer order, find an available directory number and a suitable access port in an appropriate exchange and connect these.

4.2 Administer service facilities and supplementary services

Record user service requirements as data related to directory number. Some services can be both customer controlled and operator controlled.

Examples for service facilities and supplementary services are malicious call tracing, charging observation, traffic restriction, line hunt group withdrawal, etc.

4.3 Administer customer line

Administer line characteristics which are relevant for the local exchange (e.g. line status, traffic direction).

5 Information model diagrams

The following information model diagrams have been drawn for the purpose of clarifying the relations between the different object classes of customer administration. There are three different types of diagrams:

- entity relationship models, showing the relations of the different managed objects;
- inheritance hierarchy, showing how managed objects are derived from each other (i.e. the different paths of inherited characteristics of the different managed objects);
- naming hierarchy showing the derivation of names for managed objects (i.e. the different naming paths for instances of managed objects).

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These three different diagrams are only for clarification. The formal specification in terms of Guidelines for the Definition of Managed Objects (GDMO) templates and Abstract Syntax Notation One (ASN.1) type definitions are the relevant information for the implementation of the present document.

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5.1 Entity relationship diagrams

Figure 1 shows the relationships of the object classes defining an ISDN/PSTN customer configuration. The service fragment indicated in figure 1 is detailed in figure 2 of EN 300 291-1 [2].

Object classes defined in the present document are indicated in the entity relationship diagrams by **bold** letters.

The relationships of object classes defined in other documents are only shown as far as needed.

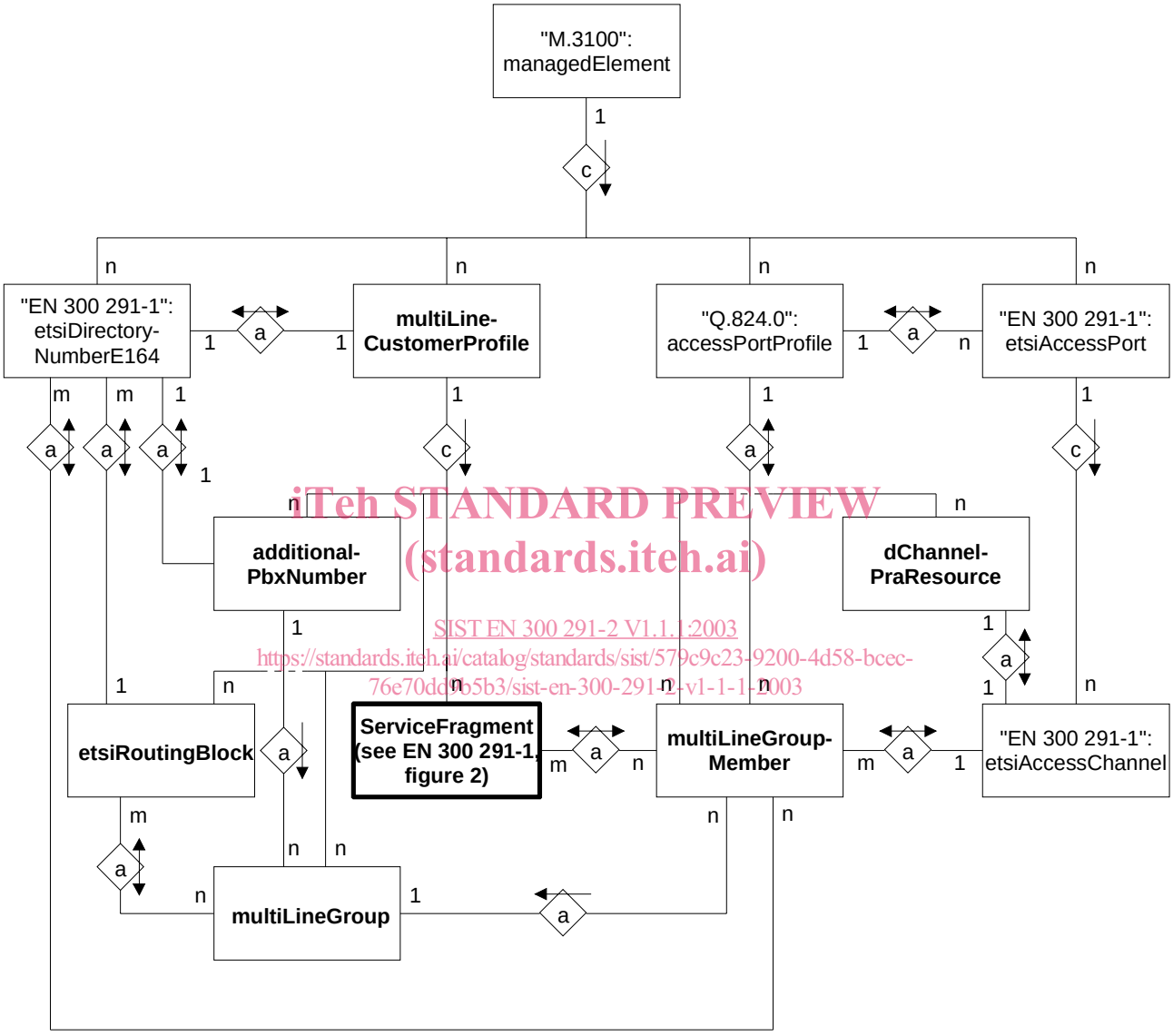

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Figure 1: Multi line customer configuration