SLOVENSKI STANDARD
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Digitalne izboljġane brezvrviļ ne telekomunikacije (DECT) - Digitalno omreġje z integriranimi storitvami (ISDN) - Profil specifikacije medsebojnega delovanja za protokol mobilnosti ISDN (IMIP) - 2. del: Medsebojno delovanje DECT/ISDN za podporo globalnega sistema mobilnih komunikacij (GSM)

Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); ISDN Mobility protocol Interworking specification Profile (IMIP); Part 2: DECT/ISDN interworking for Global System for Mobile communications (GSM) support

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT).

The present document is part 2 of a multi-part standard covering the ISDN Mobility protocol Interworking specification Profile (IMIP), as identified below:

Part 1: "DECT/ISDN interworking for Cordless Terminal Mobility (CTM) support";

Part 2: "DECT/ISDN interworking for Global System for Mobile communications (GSM) support".

National transposition dates	
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Introduction

The present document defines a profile for interworking between a DECT system and an Integrated Services Digital Network (ISDN) using the enhanced Digital Subscriber Signalling No. 1 (DSS1) protocol defined in EN 301 144-1 [13]. This ISDN protocol enables cordless terminals to have access to an ISDN infrastructure.

Part one defines the DECT/DSS1+ interworking for the CTM support.

Part two considers the DECT/DSS1+ interworking for the GSM support.

The present document specifies how DSS1+ procedures and information are mapped over the DECT air interface, and how they are provided and used by the DECT Fixed Part.

1 Scope

The present document specifies a set of technical requirements for Digital Enhanced Cordless Telecommunications (DECT) Fixed Parts (FP) supporting connection, via an ISDN interface, to a network supporting terminal mobility.

The present document covers the requirements necessary for the support of Cordless Terminal Mobility (CTM) (Part 1) and for the support of the DECT access to GSM via ISDN interfaces (Part 2).

The present document specifies the interworking procedures between the Digital Enhanced Cordless Telecommunications (DECT) air interface and the mobility management protocols defined for Integrated Services Digital Network (ISDN) interfaces.

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] ETS 300 011: "Integrated Services Digital Network (ISDN); Primary rate user-network interface; Layer 1 specification and test principles".

[2] ETS 300 012: "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".

[3] EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".

[4] EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".

[5] EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".

[6] EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".

[7] ETS 300 402: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer".

[8] EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[9] ETS 300 434-2: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for end system configuration; Part 2: Access profile".

[10] EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[11] ETS 300 788: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Integrated Services Digital Network (ISDN); DECT access to GSM via ISDN; Functional capabilities and information flows".

[12] EN 301 061-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Generic functional protocol for the support of supplementary services at the "b" service entry point for Virtual Private Network (VPN) applications; Part 1: Protocol specification".

[13] EN 301 144-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) and Signalling System No. 7 (SS7); Signalling application for the mobility management service on the alpha interface; Part 1: Protocol specification".

[14] CCITT Recommendation I.411 (1988): "ISDN user-network interfaces - Reference configurations".

[15] CCITT Recommendation X.219 (1988): "Remote operations: Model, notation and service definition".

[16] ISO/IEC 9646-7 (1995): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[17] EN 301 361-1:"Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); ISDN Mobility protocol Interworking specification Profile (IMIP); Part 1: DECT/ISDN interworking for Cordless Terminal Mobility (CTM) support".

[18] ETS 300 434-1: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for end system configuration; Part 1: Interworking specification".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in GAP [10] and the following apply:

DECT access network: physical entity that contains all of the elements of a DECT Fixed Part (FP) and that is attached to a GSM MSC

NOTE 1: A DECT access network provides a transparent access to the services of the GSM PLMN. This does however not exclude that it may in addition provide services and switching capabilities to its own users.

DECT Fixed Part (FP): physical grouping that contains all of the elements in the DECT network between the local network and the DECT air interface

NOTE 2: A DECT FP contains the logical elements of at least one fixed radio termination, plus additional implementation specific elements.

DECT location area: domain in which a DECT PP may receive and/or make calls as a result of a single location registration in the DECT access network

GSM location area: domain in which a DECT PP may receive and/or make calls as a result of a single location updating in the GSM network

NOTE 3: A GSM location area may cover more than one DECT location area.

GSM service provider: administration which offers global mobile telecommunication services to its subscribers

GSM services: services which are offered to the subscriber/user by a GSM Service Provider and which are defined by the appropriate GSM specifications

location registration: process whereby the position of a PP is determined to the level of one location area, and this position is updated in the network

location updating: process whereby the position of a PP is determined to the level of one location area, and this position is updated in the network

NOTE 4: DECT and GSM respectively use the terms location registration and location updating for actually similar processes.

MSC area: MSC area is the part of the network covered by an MSC. An MSC area may consist of one or several GSM location areas. An MSC area may also consist of one or several Base Station Controller (BSC) areas and/or one or several DECT location areas

network: totality of GSM and DECT access network elements through which the GSM service provider provides its services to the served user

Public Land Mobile Network (PLMN): PLMN is established and operated by an administration or for the specific purpose of providing land mobile telecommunication services to the public. A PLMN may be regarded as an extension of a network (e.g. ISDN); it is a collection of MSC areas within a common numbering plan (e.g. same National Destination Code) and a common routing plan. The MSCs are the functional interfaces between the fixed networks and a PLMN for call set-up. Functionally the PLMNs may be regarded as independent telecommunication entities even though different PLMNs may be interconnected through the Integrated Services Digital Network/Private Integrated Services Network (ISDN/PISN) and Packet Data Networks (PDNs) for forwarding of calls or network information. A similar type of interconnection may exist for the interaction between the MSCs of one PLMN

served user: user of a DECT PP who has a subscription with the GSM service provider. The DECT PP accepts the GSM Subscriber Identification Module (SIM) and optionally the DECT Authentication Module (DAM) with a GSM application

NOTE 5: For the purpose of the present document no distinction is made between the served user and its associated DECT PP.

3.2 Symbols

The symbols defined in this subclause are applied for procedures, features, services in the present document if not explicitly otherwise stated. The interpretation of status columns in all tables is as follows:

M	for mandatory to support (provision mandatory, process mandatory)
O	for optional to support (provision optional, process mandatory)
I	for out-of-scope (provision optional, process optional) not subject for testing
C	for conditional to support (process mandatory)
N/A	for not-applicable (in the given context the specification makes it impossible to use this capability)
X	ignore parameter or FP creates parameter

Provision mandatory, process mandatory means that the indicated feature, service or procedure shall be implemented as described in the present document, and may be subject to testing.

Provision optional, process mandatory means that the indicated feature, service or procedure may be implemented, and if implemented, the feature, service or procedure shall be implemented as described in the present document, and may be subject to testing.

NOTE: The used notation is based on the notation proposed in ISO/IEC 9646-7 [16].

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in GAP [10] and the following apply:

B	Business (environment)
BRA	Basic Rate Access
BSC	Base Station Controller
CC	Call Control
CI	Common Interface
DAM	DECT Authentication Module
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control layer
DSS1	Digital Subscriber Signalling System No. 1
DTMF	Dual Tone Multi-Frequency
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
GSM	Global System for Mobile communications
IAP	ISDN Access Profile
IE	Information Element
IMIP	ISDN Mobility protocol Interworking specification Profile
IMSI	International Mobile Station Identity
IPEI	International Portable Equipment Identity
IPUI	International Portable User Identity
ISDN	Integrated Services Digital Network
LAL	Location Area Level
LE	Local Exchange
MM	Mobility Management
MSC	Mobile Switching Centre
NCIC	Network Call Independant Connection
NT	Network Termination
NWK	NetWorK
P	Public (environment)
PHL	PHysical Layer
PISN	Private Integrated Services Network
PLMN	Public Land Mobile Network
PP	Portable Part
PRA	Primary Rate Access
PT	Portable radio Termination
R	Residential (environment)
SIM	Subscriber Identification Module
TMSI	Temporary Mobile Station Identity
TPUI	Temporary Portable User Identity

4 Feature definitions

For the purposes of the present document, the feature definitions in the following subclauses apply.

The number given in parentheses after the name of a feature is the item number used in the tables of the present document.

4.1 Network (NWK) features

See EN 300 444 [10].

4.1.1 Application features

The application features defined in the present document concern the interworking of the corresponding network layer features. Hence no new definitions are required.

5 General requirements

5.1 Architecture

5.1.1 Reference configuration

Reference configurations describe functional groupings by using reference points, as described in CCITT Recommendation I.411 for ISDN [14]. For GSM the reference configurations are shown in the alpha interface specification [13].

An overview of standard ISDN and GSM specific reference configurations is shown in figure 1.

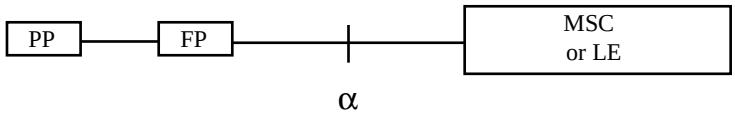

Figure 1: Standard ISDN and GSM specific reference configuration

5.1.2 Interfaces

This interworking profile is based on the alpha interface standard [13], which applies to GSM networks.

The present document covers both basic rate and primary rate access (BRA, PRA). Point to multi-point as well as point to point configurations are applicable.

5.2 Protocol model

The following figure provides an overview of the protocol model used to describe the protocol interworking within the FT. The present document is mainly concerned with the interworking between DECT mobility management procedures (invoked by means of messages and information elements at the air interface) and the MM components on the alpha interface (invoked by means of Remote Operations).

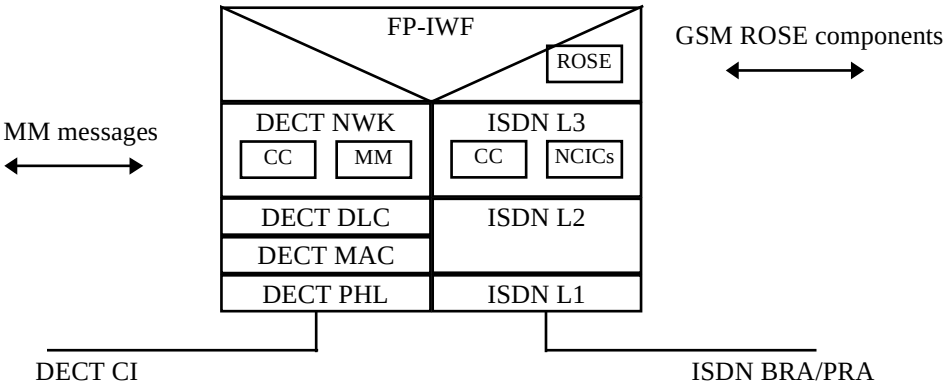

Figure 2: Protocol model

Table 1: Description of DECT and ISDN layers

Layers	DECT	ISDN
L4 to 6		EN 301 144-1 (GSM signalling application) [13] X.219 (ROSE) [15]
L3	EN 300 175-5 (NWK) [6]	ETS 300 403-1 (CC) [8] EN 301 061-1 (NCICs) [12]
L2	EN 300 175-4 (DLC) [5] EN 300 175-3 (MAC) [4]	ETS 300 402 [7]
L1	EN 300 175-2 [3]	ETS 300 011 (PRA) [1] ETS 300 012 (BRA) [2]

5.3 Identity usage

5.3.1 GSM identity

At the alpha interface, the GSM identity is used to uniquely identify a GSM user. At the air interface however, the DECT PP- identity is used to identity the user. The FP provides the mapping between the PP- identity and the GSM-Identity.

The present document assumes the following:

1) there is a one to one relation between the GSM identity (IMSI, TMSI) and the PP- identity (IPUI or TPUI);

2) there are no restrictions concerning the PP identity to be used at the air interface.

NOTE 1: The FT need not reject a PP- initiated request containing an identity type or length that may not be supported by the GSM network.

NOTE 2: The use of non-GSM identities (e.g. residential identities) for roaming to/from the residential area is outside the scope of the present document.

5.3.2 GSM number

The GSM number is the E.164 number that is dialled to call a GSM user.

In case CLIP is subscribed to, the network may provide the GSM number within the <<calling party number>> to the called user (GSM Network-> FP).

5.3.3 FP address

The FP-address is a globally unique E.164 number and corresponds to the address of the FP via which the PP is connected to the MSC or LE. The FP-address is required only in case of a point to multi-point configuration.

In case of an incoming call, the FP-address is conveyed inside the <<called party number>> (GSM Network -> FP).

In case of an outgoing call, the FP-address is transferred within a <<calling party number>> (FP -> GSM Network).