SLOVENSKI STANDARD
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Digitalne izboljġane brezvrviļ ne telekomunikacije (DECT) ï Globalni sistem mobilnih komunikacij (GSM) ï Profil vzajemnega delovanja (IWP) pri DECT/GSM ï Dostop in preslikava (opis postopka/protokola govorne storitve s pasovno ġirino 3,1 kHz)

Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); Access and mapping (protocol/procedure description for 3,1 kHz speech service)

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Foreword

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

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Date of adoption of this EN:	19 January 2001
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Introduction

The present document is a part of a set of standards for the Digital Enhanced Cordless Telecommunications/Global System for Mobile communications (DECT/GSM) Interworking Profile (IWP) concept that includes:

- general description of service requirements, functional capabilities and information flows, EN 300 466 [12];
- **access and mapping (protocol/procedure description for 3,1 kHz speech service), (the present document);**
- GSM Phase 2 supplementary services implementation, EN 300 703 [20];
- GSM Mobile Switching Centre (MSC) – DECT Fixed Part (FP), Fixed Interconnection, ETS 300 499 [13];
- implementation of bearer services, ETS 300 756 [21];
- implementation of short message services, point to point and cell broadcast, ETS 300 764 [22];
- implementation of facsimile group 3, ETS 300 792 [23].

The present document is based on DECT Common Interface (CI) specification EN 300 175, parts 1 to 8 [1] to [8] to enable DECT terminals to interwork in the public and private environment with DECT systems which are connected to a GSM core infrastructure.

In addition, the present document is based on the DECT Generic Access Profile (GAP), EN 300 444 [10] to enable the same DECT/GSM terminal to interwork with a DECT FP complying to the GAP requirements, irrespective of whether this FP provides residential, business or public access services. General attachment requirements and speech attachment requirements are based on TBR 6 [25] and TBR 10 [26].

The present document utilizes, in addition to the GAP only related features and procedures, the following:

- GSM authentication;
- derivation of the DECT ciphering key from the respective GSM cipher key;
- the GSM International Mobile Subscriber Identity (IMSI) and Temporary Mobile Subscriber Identity (TMSI);
- the GSM Location Area Identity (LAI);
- subscription management by use of Subscriber Identity Module (SIM); and
- adding/deleting a Public Land Mobile Network (PLMN) in the SIM forbidden PLMN list.

The present document defines a general purpose, but strict, mobility profile in terms of features, procedures, data structures, information elements and fields within the information elements at the DECT air interface in order to achieve full inter–operability between equipment, i.e. DECT systems and terminals, which fulfil the requirements of the present document. The present document also fulfils the minimum requirements of the GAP enabling backwards compatibility with the respective equipment.

Information on DECT access to the GSM PLMN may be found in ETR 159 [31]. Further details on the DECT system may be found in ETR 015 [27], ETR 043 [28], ETR 056 [29], and in EN 300 176 [9].

1 Scope

The present document specifies the Digital Enhanced Cordless Telecommunications (DECT) access protocols and Fixed Part (FP) and Portable Part (PP) interworking/mappings necessary to ensure that the Global System for Mobile communications (GSM) basic voice telephony service can be provided over DECT. To enable DECT terminals to interwork with DECT systems which are connected to the GSM infrastructure, from the DECT side the present document is based on EN 300 444 [10] and on the DECT Common Interface specification EN 300 175 parts 1 to 8 [1] to [8] (for the cases not covered by Generic Access Profile (GAP)), from GSM side the present document assumes interworking with GSM Public Land Mobile Network (PLMN) phase 2.

An air–interface profile is specified for a particular set of GSM services so that inter–operability of DECT equipment for these services can be achieved. Interworking functions/mappings are specified for Mobile Switching Centre (MSC) attachment for the DECT FP as the FP is using the A–interface towards the GSM MSC in the respect that the FP emulates a GSM Base Station Controller (BSC) with regards to the GSM messages which are relevant to the present document. Interworking functions/mappings for the PP are specified for MSC environment.

The provision of the GSM Subscriber Identity Module (SIM) and DECT Authentication Module (DAM) with the GSM Application (GA) within the DECT portable are also considered.

The present document covers a subset of ETS 300 557 [18] and ETS 300 590 [19] procedures as far as mapping is concerned and as far as this is required for support of 3,1 kHz speech service.

GSM functions of ETS 300 590 [19] which, in a DECT/GSM context, are relevant at the A-interface only, are out of the scope of the present document, as well as interfaces to non-GSM networks.

Specific interworking procedures/mappings for the support of supplementary services, data services, short message services and other GSM services are out of the scope of the present document. Basic support for service initiation/invocation is however supported by the present document.

A PP conforming to the present document should be capable of distinguishing a FP conforming to the present document from a FP conforming to the GAP and to access and react upon it accordingly.

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] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

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

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

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

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

[6] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".

[7] ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".

[8] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".

[9] ETSI EN 300 176: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification".

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

[11] ETSI ETS 300 331: "Digital Enhanced Cordless Telecommunications (DECT); DECT Authentication Module (DAM)".

[12] ETSI EN 300 466: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); General description of service requirements; Functional capabilities and information flows".

[13] ETSI ETS 300 499: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); Mobile services Switching Centre (MSC) - Fixed Part (FP) interconnection".

[14] ETSI ETS 300 508: "Digital cellular telecommunications system (Phase 2); International Mobile station Equipment Identities (IMEI) (GSM 02.16 version 4.6.1)".

[15] ETSI ETS 300 522: "Digital cellular telecommunications system (Phase 2); Network architecture (GSM 03.02)".

[16] ETSI ETS 300 523: "European digital cellular telecommunications system (Phase 2); Numbering, addressing and identification (GSM 03.03)".

[17] ETSI ETS 300 551: "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration (GSM 04.02)".

[18] ETSI ETS 300 557: "Digital cellular telecommunications system (Phase 2); Mobile radio interface; Layer 3 specification (GSM 04.08 version 4.23.1)".

[19] ETSI ETS 300 590: "Digital cellular telecommunications system (Phase 2); Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification (GSM 08.08 version 4.12.1)".

[20] ETSI EN 300 703: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); GSM Phase 2 supplementary services implementation".

[21] ETSI ETS 300 756: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); Implementation of bearer services".

[22] ETSI ETS 300 764: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); Implementation of short message service, point-to-point and cell broadcast".

[23] ETSI ETS 300 792: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); Implementation of facsimile group 3".

[24] ISO/IEC 9646–6: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 6: Protocol profile test specification".

[25] ETSI TBR 6: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".

[26] ETSI TBR 10: "Digital Enhanced Cordless Telecommunications (DECT); General Terminal Attachment Requirements; Telephony Applications".

[27] ETSI ETR 015: "Digital Enhanced Cordless Telecommunications (DECT); Reference document".

[28] ETSI ETR 043: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Services and facilities requirements specification".

[29] ETSI ETR 056: "Digital Enhanced Cordless Telecommunications (DECT); System description document".

[30] ETSI ETR 100: "European digital cellular telecommunications system (Phase 2); Abbreviations and acronyms (GSM 01.04)".

[31] ETSI ETR 159: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Wide area mobility using GSM".

[32] ETSI ETR 206: "Public Switched Telephone Network (PSTN); Multifrequency signalling system to be used for push-button telephones [CEPT Recommendation T/CS 46-02 E (1985)]".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

attach: the process whereby a PP within the coverage area of a FP to which it has access rights, notifies this FP that it is operative. The reverse process is detached, which reports the PP as inoperative

NOTE 1: An operative PP is assumed to be ready to receive calls.

authentication: the process whereby a DECT subscriber is positively verified to be a legitimate user of a particular FP

NOTE 2: Authentication is generally performed at call set–up, but may also be done at any other time (e.g. during a call).

bearer service: type of telecommunication service that provides a defined capability for the transmission of signals between user–network interfaces

NOTE 3: The DECT user–network interface corresponds to the top of the network layer (layer 3).

C–Plane: the control plane of the DECT protocol stacks, which contains all of the internal DECT protocol control, but may also include some external user information

NOTE 4: The C–Plane stack always contains protocol entities up to and including the network layer.

call: all of the Network (NWK) layer processes involved in one network layer peer–to–peer association

NOTE 5: Call may sometimes be used to refer to processes of all layers, since lower layer processes are implicitly required.

DECT Network (DNW): network that uses the DECT air interface to interconnect a local network to one or more portable applications. The logical boundaries of the DECT network are defined to be at the top of the DECT network layer

NOTE 6: A DNW is a logical grouping that contains one or more fixed radio termination plus their associated portable radio termination. The boundaries of the DECT network are not physical boundaries.

Fixed Part (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 7: A DECT FP contains the logical elements of at least one fixed radio termination, plus additional implementation specific elements.

fixed part GSM PLMN Attachment (DECT fixed part attached to a GSM MSC): definition of a functional environment where a DECT system (FP) is attached to a GSM MSC. The MSC in this case refers to a functional entity providing the required Mobility Management (MM) and Call Control (CC) functionality defined in the present document in order to communicate with the FP

Fixed radio Termination (FT): logical group of functions that contains all of the DECT processes and procedures on the fixed side of the DECT air interface

NOTE 8: A FT only includes elements that are defined in the DECT CI specification, EN 300 175, parts 1 to 8 [1] to [8]. This includes radio transmission elements together with a selection of layer 2 and layer 3 elements.

Generic Access Profile (GAP): defined part of the DECT CI specification EN 300 175, parts 1 to 8 [1] to [8], that ensures inter–operability between FPs and PPs for public business and residential access services

geographically unique identity: this term relates to FP identities, Primary Access Rights Identities (PARIs) and Radio Fixed Part Identities (RFPIs). It indicates that two systems with the same PARI, or respectively two Radio Fixed Parts (RFPs) with the same Radio Fixed Part Identity (RFPI), cannot be reached or listened to at the same geographical position

Global Network (GNW): telecommunication network capable of offering a long distance telecommunication service

NOTE 9: The term does not include legal or regulatory aspects, nor does it indicate if the network is a public or a private network.

globally unique identity: the identity is unique within DECT (without geographical or other restrictions)

handover: the process of switching a call in progress from one physical channel to another physical channel. These processes can be internal (see internal handover) or external (see external handover).

NOTE 10: There are two physical forms of handover, intra–cell handover and inter–cell handover. Intra–cell handover is always internal. Inter–cell handover can be internal or external.

incoming call: call received at a PP

inter–cell handover: the switching of a call in progress from one cell to another cell

internal handover: handover processes that are completely internal to one Fixed radio Termination (FT). Internal handover re–connects the call at the lower layers, while maintaining the call at the NWK layer

NOTE 11: The lower layer reconnection can either be at the Data Link Control (DLC) layer (connection handover) or at the Medium Access Control (MAC) layer (bearer handover).

inter–operability: capability of FPs and PPs, that enable a PP to obtain access to teleservices in more than one location area and/or from more than one operator (more than one service provider)

inter–operator roaming: roaming between FP coverage areas of different operators (different service providers)

Interworking Unit (IWU): unit that is used to interconnect sub–networks

NOTE 12: The IWU will contain the interworking functions necessary to support the required sub–network interworking.

intra–cell handover: switching of a call in progress from one physical channel of one cell to another physical channel of the same cell

intra–operator roaming: roaming between different FP coverage areas of the same operator (same service provider)

Local Network (LNW): telecommunication network capable of offering local telecommunication services

NOTE 13: The term does not include legal or regulatory aspects, nor does it indicate if the network is a public network or a private network.

locally unique identity: The identity is unique within one FP or location area, depending on application

location area: The domain in which a PP may receive (and/or make) calls as a result of a single location registration