



SLOVENSKI STANDARD
SIST EN 300 765-2 V1.2.1:2003
01-december-2003

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Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL)
Access Profile (RAP); Part 2: Advanced telephony services

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Ta slovenski standard je istoveten z: **EN 300 765-2 Version 1.2.1**
SIST EN 300 765-2 V1.2.1:2003
<https://standards.iteh.ai/catalog/standards/sist/db10811c-f295-4e53-983c-e02bbf585874/sist-en-300-765-2-v1-2-1-2003>

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ETSI EN 300 765-2 V1.2.1 (2001-02)

European Standard (Telecommunications series)

Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 2: Advanced telephony services

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Reference

REN/DECT-A0173-2

Keywords

DECT, GSM, RLL, FWA, WLL

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

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

Every EN prepared by ETSI is a voluntary standard. The present document may contain text concerning conformance testing of the equipment to which it relates. This text should be considered as guidance only and does not make the present document mandatory.

The present document is based on EN 300 175 parts 1 [1] to 8 [8], EN 300 444 [12], ETS 300 822 [16], and EN 301 649 [18]. The present document has been developed in accordance to the rules of documenting a profile specification as described in ISO/IEC 9646-6 [10].

The present document is part 2 of a two-part deliverable covering the Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP), as identified below:

- Part 1: "Basic telephony services"; <http://standards.iteh.ai/catalog/standards/sist/db1081fe-f293-4e53-983c-e02bbf585874/sist-en-300-765-2-v1-2-1-2003>
- Part 2: "Advanced telephony services".

National transposition dates	
Date of adoption of this EN:	9 February 2001
Date of latest announcement of this EN (doa):	31 May 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 2001
Date of withdrawal of any conflicting National Standard (dow):	30 November 2001

1 Scope

The present document specifies that set of technical requirements for Digital Enhanced Cordless Telecommunications (DECT) Fixed Part (FP) and DECT Cordless Terminal Adapter (CTA) for the support of the Radio in the Local Loop (RLL) Access Profile (RAP).

The objective of the present document is to ensure the air interface interoperability of DECT RAP CTAs and DECT RAP FPs and Wireless Relay Stations (WRSs) if applied.

EN 300 765-1 [15] contains the so-called "Plain Old Telephone Service (POTS)" services including analogue leased lines and 64 kbit/s bearer service. EN 300 765-1 [15] also provides for optional mobility features by supporting Generic Access Profile (GAP) Portable Part (PP) subscriber terminals and CTAs with WRS GAP functionality.

The present document contains telecommunication services as offered by Integrated Services Digital Network (ISDN), contemporary non-voiceband data services provided through, for example, a dedicated data port at the CTA, and support of digital leased lines. The provision of the mentioned services is not mandated by the present document, but if provided they shall be provided as defined (provision optional, process mandatory).

An objective is to use as much as possible from existing profiles: DECT/ISDN Intermediate ISDN access Profile (IIP) as defined in ETS 300 822 [16] and the Packet Radio Service as defined in EN 301 649 [18]. Therefore, most of the RAP features refer to features defined in other profiles and the necessary additional features (e.g. Operation, Administration and Maintenance (OA&M)) are listed and explained in the present document.

In addition, the present document defines additional features, services, procedures, etc. for the CTA and the FT, which are provision mandatory either in the CTA or in the FT, as well as some elements that are provision optional but still process mandatory. These features in particular define the operation and maintenance of CTAs in relation to the provided service (profile) in a public network.

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2 References

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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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [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 301 406: "Digital Enhanced Cordless Telecommunications (DECT); Harmonized EN for Digital Enhanced Cordless Telecommunications (DECT) covering essential requirements under article 3.2 of the R&TTE Directive; Generic radio".
- [10] ISO/IEC 9646-6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".
- [11] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
- [12] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [13] ETSI ETR 056: "Digital Enhanced Cordless Telecommunications (DECT); System description document".
- [14] ETSI ETS 300 700: "Digital Enhanced Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".
- [15] ETSI EN 300 765-1: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 1: Basic telephony services".
- [16] ETSI ETS 300 822: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for intermediate system configuration; Interworking and profile specification".
- [17] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".
- [18] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".
- [19] ETSI ETR 185: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".
- [20] ETSI ETS 300 297: "Integrated Services Digital Network (ISDN); Access digital section for ISDN basic access".
- [21] ISO 8802 (all parts): "Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

NOTE 1: 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 2: The DECT user-network interface corresponds to the top of the network layer (layer 3).

C-plane: 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 3: 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 4: Call may sometimes be used to refer to processes of all layers, since lower layer processes are implicitly required.

Cordless Terminal Adapter (CTA): physical grouping that contains a DECT portable termination and a line interface

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 5: A DECT FP contains the logical elements of at least one FT, plus additional implementation specific elements.

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

DECT intermediate fixed system: logical grouping that contains all the functions between the DECT DI reference point and the reference point on the fixed side of the DECT air interface

NOTE 7: The DECT Intermediate Fixed System (DIFS) = FT + (local network up to the fixed side ISDN reference point (including fixed side Interworking Unit (IWU)), see ETR 056 [13].

DECT intermediate portable system: logical grouping that contains all the functions between the DECT DI reference point and the ISDN S reference point on the portable side of the DECT air interface

NOTE 8: The DECT Intermediate Portable System (DIPS) = Portable radio Termination (PT) + Portable Application (PA) up to the portable side ISDN S reference point (including portable side IWU), see ETR 056 [13].

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 9: A FT only includes elements that are defined in the DECT Common Interface (CI) standard. This includes radio transmission elements together with a selection of layer 2 and layer 3 elements.

handover: process of switching a call in progress from one physical channel to another physical channel

NOTE 10: There are two physical forms of handover, intra-cell handover and inter-cell handover.

incoming call: call received at a CTA

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

internal handover: handover processes that are completely internal to one FT. Internal handover reconnect 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 MAC layer (bearer handover).

interoperability: capability of FPs and CTAs, that enables a CTA to obtain access to teleservices in more than one location area and/or from more than one operator (more than one service provider)

Interworking Unit (IWU): unit that is used to interconnect subnetworks

NOTE 12: The IWU will contain the interworking functions necessary to support the required subnetwork 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

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.

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

location registration: process whereby the position of a DECT PT is determined to the level of one location area, and this position is updated in one or more databases

NOTE 14: These databases are not included within a DECT FT.

MAC Connection (CONNECTION): association between one source MAC Multi-Bearer Control (MBC) entity and one destination MAC MBC entity. This provides a set of related MAC services (a set of logical channels), and it can involve one or more underlying MAC bearers.

mobility class 1: local area applications, for which terminals are pre-registered off-air with one or more specific fixed parts, and establishment of service and user parameters is therefore implicit, according to a profile-defined list

mobility class 2: private and Public roaming applications for which terminals may move between fixed parts within a given domain and for which association of service parameters is explicit at the time of service request

outgoing call: call originating from a CTA

Portable Application (PA): logical grouping that contains all the elements that lie beyond the DECT network boundary on the portable side

NOTE 15: The functions contained in the PA may be physically distributed, but any such distribution is invisible to the DECT network.

Portable Part (DECT Portable Part) (PP): physical grouping that contains all elements between the user and the DECT air interface. PP is a generic term that may describe one or several physical pieces.

NOTE 16: A DECT PP is logically divided into one PT plus one or more PAs.

Portable radio Termination (PT): logical group of functions that contains all of the DECT processes and procedures on the portable side of the DECT air interface

NOTE 17: A PT only includes elements that are defined in the DECT CI standard. This includes radio transmission elements (layer 1) together with a selection of layer 2 and layer 3 elements.

Radio Fixed Part (RFP): one physical sub-group of a FP that contains all the radio end points (one or more) that are connected to a single system of antennas

registration: ambiguous term that should always be qualified. See either location registration or subscription registration

service type A: low speed frame relay, with a net sustainable throughput of up to 24 kbits/s, optimized for bursty data, low power consumption and low complexity applications such as hand-portable equipment

service type B: high performance frame relay, with a net sustainable throughput of up to 552 kbits/s, optimized for high speed and low latency with bursty data. Equipment implementing the Type B profile shall inter-operate with Type A equipment.

service type C: non-transparent connection of data streams requiring Link Access Protocol (LAP) services, optimized for high reliability and low additional complexity. This builds upon the services offered by the type A or B profiles.

service type E: short message transfer or paging service which may be unacknowledged or acknowledged, optimized for small Service Data Units (SDUs), low PP complexity and ultra-low power consumption

service type F: application profile specifically supporting teleservices such as fax, building upon the services offered by the type A/B and C profiles, optimized for terminal simplicity, spectrum efficiency and network flexibility

subscription registration: infrequent process whereby a subscriber obtains access rights to one or more FPs

NOTE 18: Subscription registration is usually required before a user can make or receive calls.

Wireless Relay Station (WRS): physical grouping that combines elements of both PTs and FTs to relay information on a physical channel from one DECT termination to a physical channel to another DECT termination

NOTE 19: The DECT termination can be a PT or a FT or another WRS.

3.2 Symbols

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

M	Mandatory to support (provision mandatory, process mandatory);
O	Optional to support (provision optional, process mandatory);
I	out-of-scope (provision optional, process optional) not subject for testing;
C	Conditional to support (process mandatory);
N/A	Not Applicable (in the given context the specification makes it impossible to use this capability).

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 [11].

3.3 Abbreviations

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

AC	Authentication Code
ARI	Access Rights Identity
C	C reference point
C/O	Connection Oriented
CC	Call Control
CI	Common Interface
CPE	Customer Premises Equipment
CTA	Cordless Terminal Adapter
DECT	Digital Enhanced Cordless Telecommunications
DIFS	DECT Intermediate Fixed System
DIPS	DECT Intermediate Portable System
DLC	Data Link Control
DTE	Data Terminal Equipment
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
IE	Information Element
IIP	Intermediate ISDN access Profile
IP	Internet Protocol
IPUI	International Portable User Identity
ISDN	Integrated Services Digital Network
ISDN	Integrated Services Digital Network
IWU	Interworking Unit
LNW	Local Network
MAC	Medium Access Control
MBC	Multi-Bearer Control
MM	Mobility Management
NCP	PPP Network Control Protocol
NT1	Network Termination 1
NT2	Network Termination 2
NWK	Network
OA&M	Operation, Administration and Maintenance
P	P reference point
P	Public (environment)
PA	Portable Application
PARK	Portable Access Rights Key
PC	Personal Computer
PHL	Physical Layer

POT	Plain Old Telephone
POTS	Plain Old Telephone Service
PP	Portable Part
PPP	Point-to-Point Protocol
PSTN	Public Switched Telephone Network
PT	Portable radio Termination
R	R reference point
RAP	RLL Access Profile
RFP	Radio Fixed Part
RLL	Radio in the Local Loop
RSSI	Radio Signal Strength Indicator
S	S reference point
S/T	S/T reference point
SDU	Service Data Unit
T	T reference point
TA	Terminal Adapter
TE	Terminal Equipment
TE1	ISDN terminal
TI	Transaction Identifier
UAK	User Authentication Key
USB	Universal Serial Bus
WRS	Wireless Relay Station

4 Description of services

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4.1 Reference model (standards.iteh.ai)

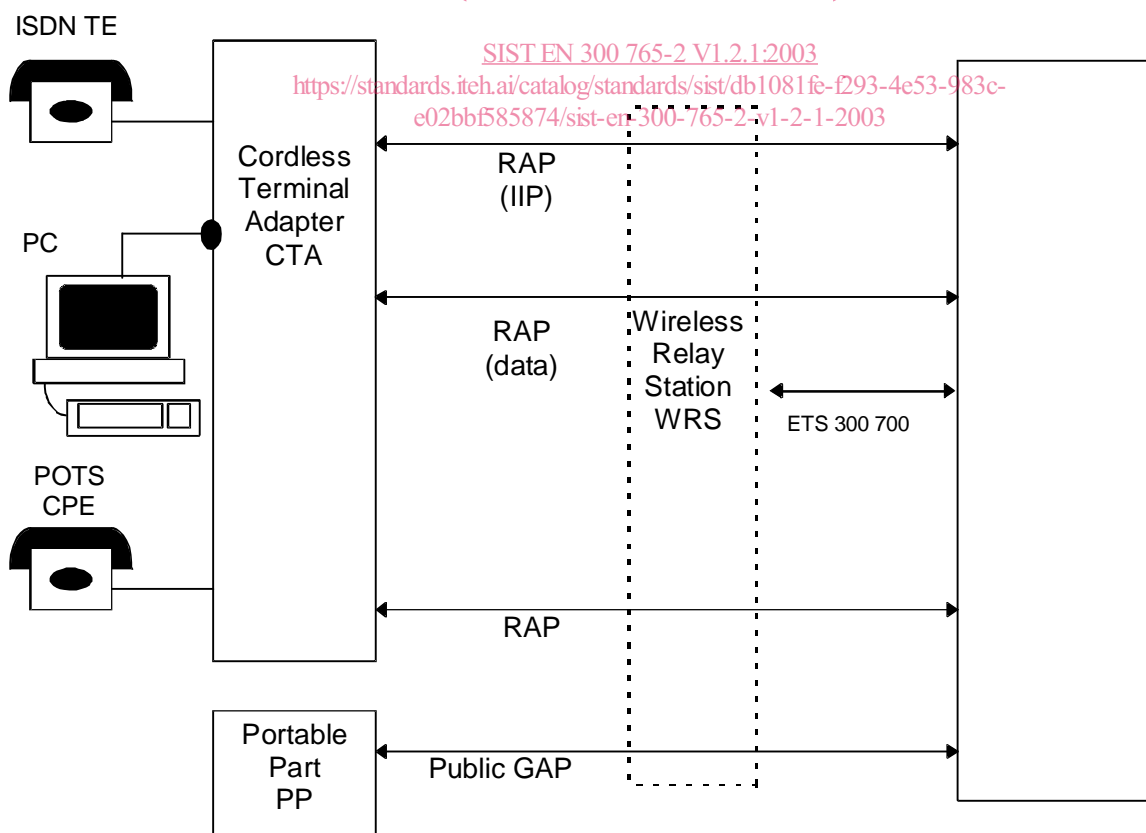


Figure 1: RAP Reference Model