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EUROPEAN
TELECOMMUNICATION
STANDARD

ETS 300 765-2

April 1998

Source: DECT

Reference: DE/DECT-050075-2

ICS: 33.020

Key words: DECT, GSM, RLL

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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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Foreword

This European Telecommunication Standard (ETS) has been produced by the Digital Enhanced Cordless Telecommunications (DECT) Project of the European Telecommunications Standards Institute (ETSI).

Every ETS prepared by ETSI is a voluntary standard. This ETS 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 this ETS mandatory.

This ETS is based on ETS 300 175 parts 1 to 8 [1] - [8], EN 300 444 [13], ETS 300 822 [19], ETS 300 701 [21], ETS 300 651 [22] and ETS 300 755 [23]. This ETS has been developed in accordance to the rules of documenting a profile specification as described in ISO/IEC 9646-6 [11].

This ETS forms part 2 of a 2 part ETS, as follows:

Part 1: "Basic telephony services";

Part 2: "Advanced telephony services".

Transposition dates	
Date of adoption of this ETS:	20 March 1998
Date of latest announcement of this ETS (doa):	31 July 1998
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 January 1999
Date of withdrawal of any conflicting National Standard (dow):	31 January 1999

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1 Scope

This European Telecommunication Standard (ETS) 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 this ETS is to ensure the air interface interoperability of DECT RAP CTAs and DECT RAP FPs and Wireless Relay Stations (WRSs) if applied.

ETS 300 765-1 [16] contains the so called "Plain Old Telephone Service (POTS)" services including analogue leased lines and 64 kbit/s bearer service. ETS 300 765-1 [16] also provides for optional mobility features by supporting Generic Access Profile (GAP) Portable Part (PP) subscriber terminals and CTAs with WRS GAP functionality.

This ETS 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 this ETS, 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 [19] and the data profile A/B.2 as defined in ETS 300 701 [21], data profile C.2 as defined in ETS 300 651 [22], and data profile F.2 as defined in ETS 300 755 [23]. 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 this ETS.

In addition, this ETS 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.

2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- | | |
|-----|---|
| [1] | ETS 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview". |
| [2] | ETS 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical layer (PHL)". |
| [3] | ETS 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer". |
| [4] | ETS 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer". |
| [5] | ETS 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer". |
| [6] | ETS 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing". |
| [7] | ETS 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features". |
| [8] | ETS 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission". |

- [9] I-ETS 300 176: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification".
- [10] TBR 6: "Radio Equipment and Systems (RES); Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".
- [11] ISO/IEC 9646-6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".
- [12] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation conformance statement".
- [13] EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [14] ETR 056: "Digital European Cordless Telecommunications (DECT); System description document".
- [15] ETS 300 700: "Digital European Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".
- [16] ETS 300 765-1: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 1: Basic telephony services".
- [17] ETR 246: "Digital European Cordless Telecommunications (DECT); Application of DECT Wireless Relay Station (WRS)".
- [18] ETR 310: "Digital Enhanced Cordless Telecommunications (DECT); Traffic capacity and spectrum requirements for multi-system and multi-service DECT applications co-existing in a common frequency band".
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- [19] ETS 300 822: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for intermediate system configuration; Interworking and profile specification".
- [20] ITU-T Recommendation I.411: (1993): "ISDN user-network interfaces - Reference configurations".
- [21] ETS 300 701: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Generic frame relay service with mobility (service types A and B, class 2)".
- [22] ETS 300 651: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Generic data link service; Service type C, class 2".
- [23] ETS 300 755: "Digital Enhanced Cordless Telecommunications (DECT); Data services profile; Multimedia Messaging Service (MMS) with specific provision for facsimile services; (Service type F, class 2)".
- [24] ETR 185: "Digital European Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".
- [25] ETS 300 297: "Integrated Services Digital Network (ISDN); Access digital section for ISDN basic access".
- [26] EN 301 240: "Digital Enhanced Cordless Telecommunications (DECT); Data Services Profile (DSP); Point-to-Point Protocol (PPP) interworking for internet access and general multi-protocol datagram transport".

- [27] RFC 1661 (1994): "The Point-to-Point Protocol (PPP)".
- [28] RFC 1662 (1994): "PPP in HDLC-like Framing".
- [29] ISO 8802: "Information technology -- Telecommunications and information exchange between systems -- Local and metropolitan area networks -- Specific requirements".

3 Definitions, abbreviations and symbols

3.1 DECT definitions

For the purposes of this ETS, the following definitions apply:

authentication: The 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: A 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: 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 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): A 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: A 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: A 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 [14].

DECT intermediate portable system: A 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 [14].

Fixed Radio Termination (FT): A 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: The 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: A call received at a CTA.

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 FT. Internal handover reconnects 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: The capability of FPs and CTAs, that enable 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): A 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: The switching of a call in progress from one physical channel of one cell to another physical channel of the same cell.

Local Network (LNW): A 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: The domain in which a CTA may receive (and/or make) calls as a result of a single location registration.

location registration: The 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): An 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: A call originating from a CTA.

Portable Application (PA): A 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): A 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): A 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: An 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: A 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: An 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: The 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): A 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 DECT abbreviations

For the purposes of this ETS, the following abbreviations apply:

AC	Authentication Code
ARC	Access Rights Class
ARD	Access Rights Details
ARI	Access Rights Identity
C/L	Connectionless
C/O	Connection Oriented
CC	Call Control
CI	Common Interface
CPE	Customer Premises Equipment
CTA	Cordless Terminal Adapter
DCK	Derived Cipher Key
DECT	Digital Enhanced Cordless Telecommunications
DIFS	DECT Intermediate Fixed System
DIPS	DECT Intermediate Portable System
DLC	Data Link Control
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
IE	Information Element
IIP	Intermediate ISDN access Profile
IP	Internet Protocol
IPII	International Portable User Identity
ISDN	Integrated Services Digital Network
IWU	Interworking Unit
LNW	Local Network
MAC	Medium Access Control
MBC	Multi-Bearer Control
MM	Mobility Management
MMS	Multimedia Messaging Services
NWK	Network
OA&M	Operation, Administration and Maintenance
P	Public (environment)
PA	Portable Application
PARI	Primary Access Rights Identity
PARK	Portable Access Rights Key
PHL	Physical Layer
PLI	Park Length Indicator
PP	Portable Part
PT	Portable radio Termination
PUN	Portable User Number
PUT	Portable User Type
RAP	RLL Access Profile
RFP	Radio Fixed Part
RFPI	Radio Fixed Part Identity
RLL	Radio in the Local Loop
RSSI	Radio Signal Strength Indicator
SDU	Service Data Unit
TE	Terminal Equipment
TI	Transaction Identifier
WRS	Wireless Relay Station

3.3 ISDN abbreviations

For the purposes of this ETS, the following abbreviations apply:

BRA	Basic Rate Access
C	C reference point
ISDN	Integrated Services Digital Network
NT1	Network Termination 1
NT2	Network Termination 2
P	P reference point
R	R reference point
S	S reference point
S/T	S/T reference point
T	T reference point
TA	Terminal Adapter
TE1	ISDN terminal

3.4 Other abbreviations

For the purposes of this ETS, the following abbreviations apply:

DTE	Data Terminal Equipment
LCP	PPP Link Control Protocol
NCP	PPP Network Control Protocol
PC	Personal Computer
PDA	Personal Digital Assistant
POT	Plain Old Telephone
POTS	Plain Old Telephone Service
PPP	Point-to-Point Protocol
PSTN	Public Switched Telephone Network
USB	Universal Serial Bus

3.5 Symbols

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

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 this ETS, 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 this ETS, and may be subject to testing.

NOTE: The used notation is based on the notation proposed in ISO/IEC 9646-7 [12].