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Digital Enhanced Cordless Telecommunications (DECT); Cordless Terminal Mobility (CTM); CTM Access Profile (CAP)

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ETSI EN 300 824 V1.2.2 (1999-09)

European Standard (Telecommunications series)

**Digital Enhanced Cordless Telecommunications (DECT);
Cordless Terminal Mobility (CTM);
CTM Access Profile (CAP)**

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ETSI

Postal address

F-06921 Sophia Antipolis Cedex - FRANCE

Office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE

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

Siret N° 348 623 562 00017 - NAF 742 C

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Internet

secretariat@etsi.fr

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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 based on EN 300 175, parts 1 to 8 [1] to [8] and EN 300 444 [12].

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Date of adoption of this EN:	27 August 1999
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1 Scope

The present document specifies that set of technical requirements for Digital Enhanced Cordless Telecommunications (DECT) Fixed Part (FP) and DECT Portable Part (PP) necessary for the support of the Cordless Terminal Mobility (CTM) Access Profile (CAP).

The objective of the present document is to ensure the air interface interoperability of DECT CAP PPs and DECT CAP FPs if applied.

The CTM service allows users of cordless terminals to be mobile within and between networks. Where radio coverage is provided and the cordless terminal has appropriate access rights the user shall be able to make calls from, and to receive calls at, any location within the fixed public and/or private networks, and may move without interruption of a call in progress.

The present document covers the DECT access requirements for CTM phase 2 as defined in the CTM phase 2 service description, EN 301 273 [14].

The main objectives of the CAP are:

- maintain compatibility with the DECT Generic Access Profile (GAP), identifying only components not mandatory in the GAP to be added to obtain capabilities needed in the CTM context;
- maintain compatibility with EN 300 175 parts 1 to 8 [1] to [8], for procedures not defined in the GAP.

The CTM access profile is seen as an extension of the GAP mandatory base covering the requirements for CTM phase 2.

CAP supports telephony teleservice and provides 32 kbit/s Adaptive Differential Pulse Code Modulation (ADPCM) speech bearer service.

CTM supplementary services with no impact on the air interface are not considered in the CAP.

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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] EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [2] EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical layer (PHL)".
- [3] EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [4] EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [5] EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".

- [6] EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [7] EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- [8] EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
- [9] ETS 300 176: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification".
- [10] TBR 6: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".
- [11] TBR 10 (1997): "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements; Telephony applications".
- [12] EN 300 444: "Digital European Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [13] TBR 22: "Radio Equipment and Systems (RES); Attachment requirements for terminal equipment for Digital Enhanced Cordless Telecommunications (DECT) Generic Access Profile (GAP) applications".
- [14] EN 301 273: "Cordless Terminal Mobility (CTM); Phase 2 Service description".
- [15] EN 300 745-1: "Integrated Services Digital Network (ISDN); Message Waiting Indication (MWI) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [16] ISO/IEC 9646-7 (1995): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
- [17] EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

attach: 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 detach, which reports the PP as inoperative.

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

authentication: process whereby a CTM subscriber is positively verified to be a legitimate user of the CTM service.

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: 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: 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.

external handover: process of switching a call in progress from one fixed part to another fixed part.

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 FT, plus additional implementation specific elements.

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 Common Interface (CI) standard. This includes radio transmission elements together with a selection of layer 2 and layer 3 elements.

geographically unique identity: 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 RFPI, can not be reached or listened to at the same geographical position.

NOTE 9: For PARI and RFPI see <https://standards.iteh.ai/catalog/standards/sist/29bc9917-336d-46a5-9325-581bf4161616/sist-en-300-824-v1-2-2-2003> abbreviations.

global network: telecommunication network capable of offering a long distance telecommunication service.

NOTE 10: 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: identity is unique within DECT (without geographical or other restrictions).

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

NOTE 11: There are two physical forms of handover, intra-cell handover and inter-cell handover.

incoming call: call received at a PP.

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 reconnects the call at the lower layers, while maintaining the call at the NWK layer.

NOTE 12: 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 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).

interoperator roaming: roaming between FP coverage areas of different operators (different service providers).

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

NOTE 13: 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.

intraoperator 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 14: 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: unique identity within one FP or location area, depending on application.

location area: domain in which a PP 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 15: 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 Medium Access Control (MAC) Multi-Bearer Control (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.

outgoing call: call originating from a PP.

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

NOTE 16: 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 17: 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 18: 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.

roaming: movement of a PP from one FP coverage area to another FP coverage area, where the capabilities of the FPs enable the PP to make or receive calls in both areas.

NOTE 19: Roaming requires the relevant FPs and PP to be interoperable.

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

NOTE 20: Subscription registration is usually required before a user can make or receive calls.

supplementary service: service that modifies or supplements a basic telecommunications service.

teleservice: type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users, according to protocols that are established by agreement.

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)

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 following abbreviations apply:

ADPCM	Adaptive Differential Pulse Code Modulation
ARC	Access Rights Class
ARD	Access Rights Details
ARI	Access Rights Identity
B	Business (environment)
CAP	CTM Access Profile
CC	Call Control
CI	Common Interface
CLIP	Calling Line Identification Presentation
CTM	Cordless Terminal Mobility
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control
EMC	Equipment Manufacturer Code
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Protocol
IE	Information Element
IPEI	International Portable Equipment Identity
IPUI	International Portable User Identity
ISDN	Integrated Services Digital Network
IWU	Interworking Unit
LA	Location Area
LAI	Location Area Identification
LAL	Location Area Level
LCE	Link Control Entity
LNW	Local Network
MAC	Medium Access Control
MBC	Multi-Bearer Control
MM	Mobility Management, a NWK layer functional grouping
MWI	Message Waiting Indication
NWK	Network, Layer 3 of the DECT protocol stack
P	Public (environment)
PA	Portable Application
PARI	Primary Access Rights Identity
PARK	Portable Access Rights Key
PHL	Physical Layer

PLI	Park Length Indicator
PMID	Portable part MAC Identity
PP	Portable Part
PSN	Portable equipment Serial Number
PT	Portable radio Termination
PUN	Portable User Number
PUT	Portable User Type
RES	A Response calculated by a PP
RFP	Radio Fixed Part
RFPI	Radio Fixed Part Identity
R	Residential (environment)
SAP	Service Access Point
SARI	Secondary Access Rights Identity
TARI	Tertiary Access Rights Identity
TPUI	Temporary Portable User Identity

4 Introduction

This profile is an extension of EN 300 444 [12] covering the requirements for CTM phase 2.

In the following clauses only differences with respect to EN 300 444 [12] are explicitly mentioned.

5 Feature definitions

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

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

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5.1 Network (NWK) features

The following differences from the GAP are applicable.

DECT external handover (CAP-N.1): External handover is the process of switching a call in progress from one Fixed Part (FP-1) to another Fixed Part (FP-2). This means the handover occurs between two independent systems, where each system has its own lower layers of protocol and has an independent set of network layer Service Access Points (SAPs). To make external handover possible, a common management entity above the two fixed terminations is necessary.

Emergency call (CAP-N.2): This service feature enables a user to make an emergency call even without a valid subscription, i.e. a fast and easy means of giving information about an emergency situation to the appropriate emergency organization (e.g. fire service, police and ambulance).

Display management (CAP-N.3): This feature enables a user to receive short alphanumeric indications displayed on the screen terminal. These indications could be associated with supplementary or value added services.

Message waiting indication (CAP-N.4): This feature enables a user to receive an indication of the status of a message server (e.g. a voice mailbox) to which the user has access to.

Detach (CAP-N.5): This feature enables a PT to report to the FT that the PT is not ready to receive calls.

Enhanced location registration (CAP-N.6): This feature enables automatic location registration of PT at expected intervals of time.

On-air modification of user parameters (CAP-N.7): This feature enables the FT to modify the active subscription data of the PT.

5.1.1 Application features

See EN 300 444 [12].

6 Service definitions

For the purposes of the present document, the following service definitions apply.

6.1 DLC service definitions

See EN 300 444 [12].

6.2 Medium Access Control (MAC) service definitions

The following differences from the GAP are applicable.

Tertiary Access Rights Identity (TARI) support (CAP-M.1): The ability to support in addition to the primary Access Rights Identity (ARI) and secondary ARIs tertiary ARIs that the FT does not broadcast and are only available to PT as a Yes/No answer upon a request including the wanted ARI. These may be used to reflect an inter-operators agreement allowing a portable to access more than one operator or services through FT.

RFP status (CAP-M.2): A service which indicates to the PP the status (busy or clear) of the RFP or the system (FP).

Extended fixed part capabilities (CAP-M.3): A service which indicates to the PP the extended capabilities of the FP.

Prolonged preamble diversity in RFP (CAP-M.4): The ability of the RFP to support antenna diversity based on the reception of a prolonged preamble.

Prolonged preamble diversity in PP (CAP-M.5): The ability of the PP to support antenna diversity based on the reception of a prolonged preamble.

Prolonged preamble transmission of the RFP (CAP-M.6): The ability of the RFP to transmit prolonged preamble if the PP supports prolonged preamble diversity.

Prolonged preamble transmission of the PP (CAP-M.7): The ability of the PP to transmit prolonged preamble if the RFP supports prolonged preamble diversity.

7 Interoperability requirements

7.1 General

The tables listed in this subclause define all the protocol elements i.e. features, services, and procedures which are mandatory, optional, and conditional under the provision of another protocol element, or out of the scope of the present document, or in some context not-applicable according to the definition of the status column as defined in subclause 3.3 for the CAP FP and PP. All optional elements shall be process mandatory according to the procedures described in the present document.

Protocol elements defined as mandatory, optional or conditional in this subclause shall further be defined in clauses 8, 9, 10, 11, 12, 13, 14 and 15 in detail either explicitly and/or as references to the DECT base standard, EN 300 175 parts 2 to 8, [2] to [8] and ETS 300 176 [9].

The requirements of TBR 6 [10], TBR 10 [11] and TBR 22 [13] shall be met by all equipment conforming to the present document.