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Digitalne izboljšane brezvrvične telekomunikacije (DECT) - Skupni vmesnik (CI) - 6. del: Identitete in naslavljanje

Digital Enhanced Cordless Telecommunications (DECT) - Common Interface (CI) - Part 6: Identities and addressing

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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Digital Enhanced Cordless Telecommunications (DECT).

The present document is part 6 of a multi-part deliverable ([1] to [8]). Full details of the entire series can be found in part 1 [1].

Further details of the DECT system may be found in TR 101 178 [i.1] and ETR 043 [i.2].

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1   Scope

The present document is one of the parts of the specification of the Digital Enhanced Cordless Telecommunications (DECT) Common Interface (CI).

This part specifies the identities and addressing structure of the Digital Enhanced Cordless Telecommunications (DECT) Common Interface (CI).

There are four categories of identities to be used for identification and addressing in a general DECT environment. These four categories are:

- Fixed Part (FP) identities;

- Portable Part (PP) identities;

- connection-related identities;

- equipment-related identities.

Fixed part identities and portable part identities are used for:

- access information from fixed parts to portable parts;

- access requests from portable parts;

- identification of portable parts;

- identification of fixed parts and radio fixed parts;

- paging;

- billing.

These identities support:

- different environments, such as residential, public or private;

- supply to manufacturers, installers, and operators of globally unique identity elements with a minimum of central administration;

- multiple access rights for the same portable;

- large freedom for manufacturers, installers, and operators to structure the fixed part identities, e.g. to facilitate provision of access rights to groups of DECT systems;

- roaming agreements between DECT networks run by the same or different owners/operators;

- indication of handover domains;

- indication of location areas, i.e. paging area;

- indication of subscription areas of a public service.

The present document also provides for length indicators and other messages that can override the default location and/or paging area and domain indications given by the structure of the identities.

Connection related identities are used to identify the protocol instances associated with a call and are used for peer-to-peer communication.

Equipment related identities are used to identify a stolen PP and to derive a default identity coding for PP emergency call set-up.

Coding of identity information elements for higher layer messages is found in EN 300 175-5 [5], clause 7.7.

User authentication and ciphering need additional key information and is outside the scope of the present document, but is covered in other parts of EN 300 175 [1] to [8], e.g. EN 300 175-7 [7].

The present document includes New Generation DECT, a further development of the DECT standard introducing wideband speech, improved data services, new slot types and other technical enhancements.

2   References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1   Normative references

The following referenced documents are necessary for the application of the present document.

[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]   Void.

[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 and audio coding and transmission".

[9]   Recommendation ITU-T E.164: "The international public telecommunication numbering plan".

[10]   Recommendation ITU-T E.212: "The international identification plan for public networks and subscriptions".

2.2   Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1]   ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A High Level Guide to the DECT Standardization".

[i.2]   ETSI ETR 043: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Services and facilities requirements specification".

[i.3]   ETSI TS 123 003: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification (3GPP TS 23.003)".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in EN 300 175-1 [1] apply.

3.2   Abbreviations

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

ARC	Access Rights Class
ARD	Access Rights Details
ARI	Access Rights Identity
BACN	Bank ACcount Number
BCD	Binary Coded Decimal
CACN	Credit Card ACcount Number
CBI	Collective Broadcast Identifier
CI	Common Interface
CMD	CoMmanD bit
CTM	Cordless Terminal Mobility
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control
EIC	Equipment Installer's Code
EMC	Equipment Manufacturer's Code
FIL	FILl bits
FMID	Fixed part MAC IDentity
FP	Fixed Part
FPN	Fixed Part Number
FPS	Fixed Part Sub-number
FT	Fixed radio Termination
GOP	GSM OPerator code
GSM	Global System for Mobile
ID	Identification
IMSI	International Mobile Subscriber Identity
IPEI	International Portable Equipment Identity
IPUI	International Portable User Identity
ISDN	Integrated Services Digital Network
LA	Location Area
LAI	Location Area Identification
LAL	Location Area Level
LAN	Local Area Network
lsb	least significant bit
LSIG	Link SIGnature
MAC	Medium Access Control
MCC	Mobile Country Code
MNC	Mobile Network Code
msb	most significant bit
N_T	Identities information, one N-channel message
NWK	NetWorK
PABX	Private Automatic Branch eXchange
PARI	Primary Access Rights Identity

PARK   Portable Access Rights Key
PARK{y}   PARK with value y for its park length indicator
PBX   Private Branch eXchange
PHL   PHysical Layer
PLI   Park Length Indicator
PLMN-Id   Public Land Mobile Network Identification
PMID   Portable part MAC IDentity
POC   Public Operator Code
PP   Portable Part
PSN   Portable equipment Serial Number
PSTN   Public Switched Telephone Network
PT   Portable radio Termination
PUN   Portable User Number
PUT   Portable User Type
Q_H Q field header
Q_T System information and multiframe marker
RFP   Radio Fixed Part
RFPI   Radio Fixed Part Identity
RPN   Radio fixed Part Number
SARI   Secondary Access Rights Identity
SP-id   Service Provider identity
TARI   Tertiary Access Rights Identity
TPUI   Temporary Portable User Identity
UMTS   Universal Mobile Telecommunication Systems
WRS   Wireless Relay Station

4 General description of FP and PP identities

Every radio FP broadcasts for its purpose a unique identity which contains a globally unique (to a service provider) Access Rights Identity (ARI). Every PP has both a Portable Access Rights Key (PARK) and an International Portable User Identity (IPUI). These operate as a pair. A PP is allowed to access any radio FP which broadcasts an ARI that can be identified by any of the portable access rights keys of that PP.

The IPUI is used to identify the portable in the domain defined by its related ARI. The IPUI can either be locally unique or globally unique.

Figure 4.1 illustrates the identity structure.
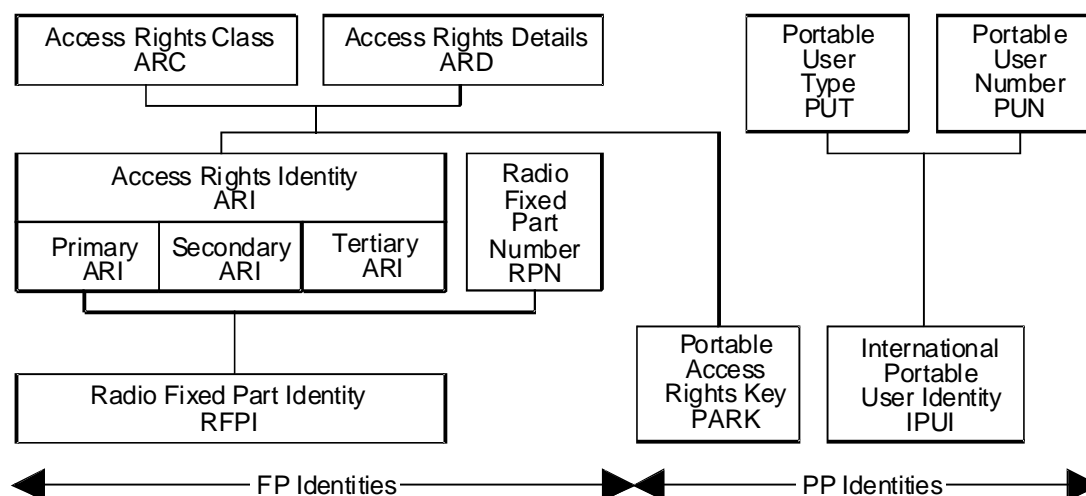
Figure 4.1: General identity structure

The common base for the DECT identity structure is the Access Rights Class (ARC) and Access Rights Details (ARD). These need to be known by both the FP and the PPs. In the FP the ARC and ARD are called Access Rights Identity (ARI), and in the PP they are called Portable Access Rights Key (PARK). The distinction between PARK and ARI is that each PARK can have a group of ARDs allocated, PARK{y}. "y" is the value of the PARK length indicator given in the PP subscription process.

Figure 4.2: Structure of PARK{y}

If the ARI is a primary ARI, i.e. PARI, it will form, together with a RFP number, the broadcast identity RFPI. ARIs can also be less frequently broadcast as Secondary Access Rights Identities (SARIs) and may also be available as Tertiary Access Rights Identities (TARIs), which are not broadcast, but are accessible upon request.

The PUT and PUN form the PP user's identity, IPUI. This identity can either be globally unique or locally unique. In addition to IPUIs, shorter temporary identities, TPUIs, may be used for paging.

A PP is identified by its pairs of PARK{y} and IPUI. A PP is only allowed to access a FP if one of its PARKs includes one of the ARIs of the FP, i.e. the PARI, a SARI or a TARI.

4.1   Combinations of ARIs, PARKs and IPUIs

DECT provides a flexible radio access technology for a large variety of private and public networks or systems. This leads to different requirements on e.g. sub-system grouping, distribution and installation of equipment, identity allocations and subscription.

Therefore five access rights classes A to E and a number of IPUIs have been defined to meet the need for a differentiation in the identity structures.

Table 4.1 gives an overview of likely combinations of the main identities. As described in clause 6.2 some flexibility is allowed in combinations of the IPUI types, e.g. IPUI type N could be used by a service provider in combination with any ARC.

Table 4.1: Combinations of identities ARI, PARK and IPUI

ARI class	Environment	SARI/ TARI	PARK class	IPUI type
A	Residential and private (PBX) single and small multiple cell systems	No	A	N, S
B	Private (PABXs) multiple cell	Yes	B	O, S, T
C	Public single- and multiple cell systems	Yes	C	P, Q, R, S, U
D	Public DECT access to a GSM/UMTS operator network	Yes	D	R
E	PP to PP direct communication (private)	Yes	E	N

5   FP identities

FP identities are used to inform PPs about the identity of a DECT FP and the access rights to that DECT FP and thereby reduce the number of access attempts from unauthorized portables.

A DECT FP broadcasts this information on the N_T-channel via all its Radio FPs (RFPs), at least once per multiframe. A PP needs to be able to interpret necessary parts of this broadcast information to detect the access rights to a system or even access rights agreements between system operators, i.e. operators A and B have a bilateral agreement permitting their users to roam between their systems. These agreements can change and cannot therefore be stored in PPs without updating them frequently. Therefore the FP handles access rights information which is embedded in the identity structure.

The DECT identity structure provides solutions for residential, public and private environments. This can also be extended to combinations between these environments, e.g. private groups of users within a public DECT network, and e.g. public users' access to private DECT networks.

The base for the identity structure is formed by the ARCs and the ARDs:

ARC: Shows the type of access to a DECT network, such as public, private or residential.

ARD: This number is unique to the service provider or to the equipment (e.g. in the case of residential and business applications this number is assigned by the manufacturer). Its structure depends on the ARC.

The ARC and ARD together form the basic identity, the ARI:

ARI: This identity is globally unique to a service provider, and shows the access rights related to this service provider. This identity may be applied to any number of FP installations. There are three categories of ARIs.

PARI: Primary ARI has to be broadcast. This is also the most frequently broadcast ARI in order to give a higher grade of service to users with these access rights. The PARI is broadcast over the N_T-channel (see note). The PARI (in conjunction with RPN) also carries information about domains of handover and location areas.

SARI: Secondary ARI. SARIs are less frequently broadcast than PARIs. They are sent as a SARI-list on the Q_T-channel. The message used for SARIs (there could be more than one SARI) is described in clause 5.6.

TARI: Tertiary ARI. The TARI is not broadcast at all and is only available as a (or in a) "TARI reply" message, which is an answer to a "TARI request" message including the relevant PARK{y}. See clause 5.6.6 and EN 300 175-3 [3], clauses 7.2.5.10 and 7.3.5.2.

NOTE: Several FPs may apply the same ARI. However, as a PARI it has to be geographically unique.

The classification of primary, secondary and tertiary access rights gives the possibility for operators or system owners to offer their subscribers/users an almost unlimited list of roaming agreements. This classification can be seen as an iceberg with the PARI visible on the top followed by a less visible SARI list and in the depth the invisible TARIs. The PP procedure for handling PARIs, SARIs and TARIs is described in clause 8.2.

Structure of ARI, see figure 5.1.

ARC	ARD
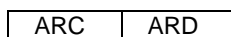
Figure 5.1: Structure of ARI

ARC: 8 available classes named A - H. Only classes A - E are currently defined.

ARD: Details, depends on the ARC.

One ARI together with a radio FP number, forms the RFPI. The ARI embedded in the RFPI is the PARI.