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



Reference

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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";

Part 2: "Advanced telephony services".

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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 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.

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 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

4.1 Reference model

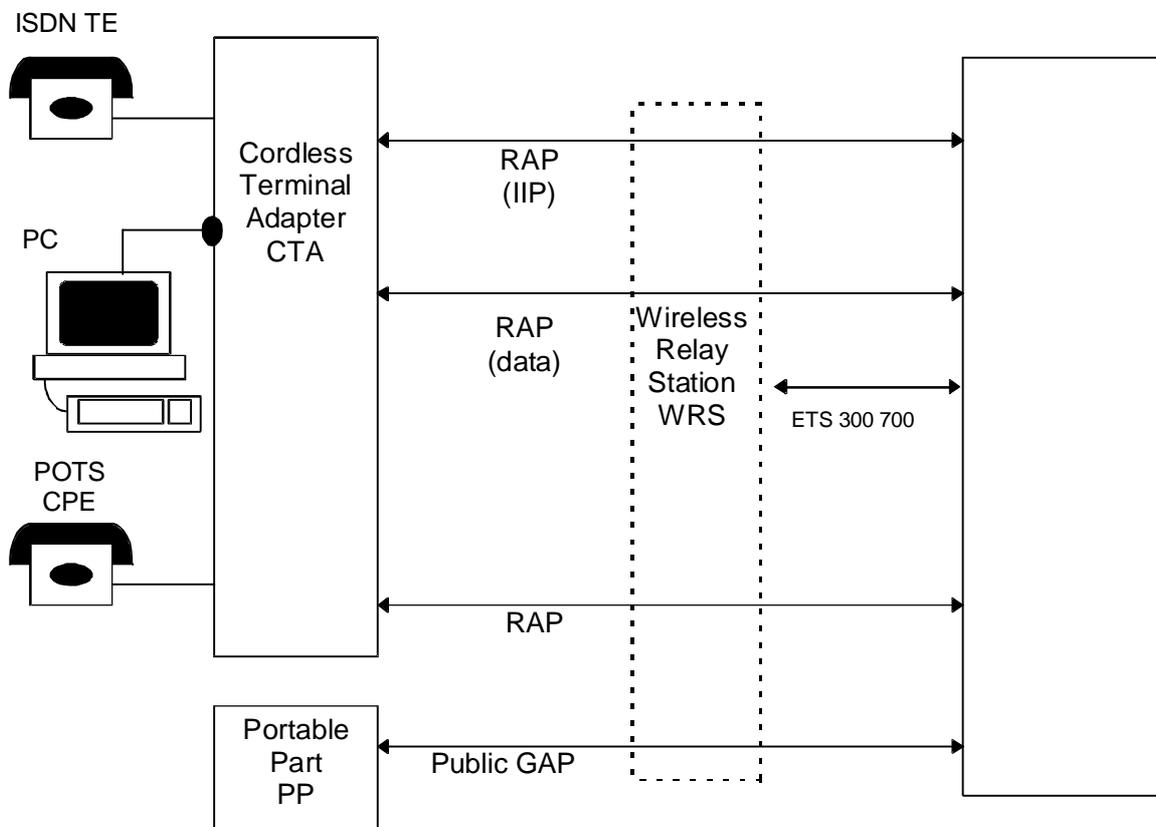


Figure 1: RAP Reference Model

4.2 Services & facilities

The Radio in the local loop Access Profile, RAP, Part 2 Advanced Telephony Services, allows the provision through DECT of a service level as currently available in the ISDN network, and extensions including non-voiceband data services and digital leased lines. Furthermore, features are added for the operation, administration, and maintenance of the equipment (CTAs) offering the mentioned services in the public RLL application.

4.2.1 ISDN services

For the definition of the ISDN services the present document refers to ETS 300 822 [16], referred to as the Intermediate ISDN access Profile (IIP).

The IIP applies when FP and PP together constitute a gateway between an ISDN network and an ISDN terminal. The FP and the PP have an IWU that maps the messages between the ISDN interface and the DECT air interface.

The IIP specifies how ISDN services can be provided over DECT. It is based on DECT Common Interface specification EN 300 175 parts [1] to [8] enable ISDN terminals to have cordless access to an ISDN infrastructure. Both public ISDN and private ISDN are within the scope of the IIP. For mobility and security, the IIP is based on EN 300 444 [12].

Using the IIP, the end-user has transparent access to the ISDN services and functions. In respect to bearer services, the following are supported: speech, 3,1 kHz audio, unrestricted 64 kbit/s data, packet data.

In ETS 300 822 [16], reference configurations are used to describe the functional groupings of DECT and ISDN and their relationships via reference points. In general, reference points may or may not correspond to a physical interface. The functional groupings and reference points are described in ITU-T Recommendation I.411 [17] for public ISDN.

The DECT intermediate system reference configurations are used where the DIFS and DIPS together form an intermediate system to connect an ISDN-terminal to an ISDN network.

The following figure shows the intermediate system reference configuration for public ISDN. Other reference configurations are given in the IIP, ETS 300 822 [16], but are out of scope for the present document, as they apply to private ISDN.

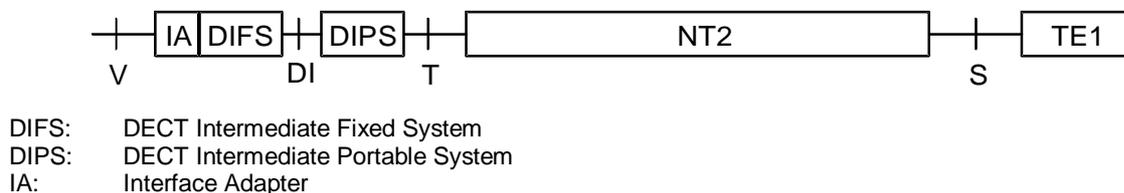


Figure 2: Intermediate system public ISDN reference configuration

4.2.2 Non-voiceband data services

The present document defines a number of advanced non-voiceband data services, based on the data services profiles as described in ETR 185 [19]. The data services profiles specify all the DECT air interface requirements to ensure interoperability between DECT FPs and PPs, or CTAs in the RLL case. This clause defines how certain data services which are particularly appropriate for RLL applications can be provided. However, the provision of these data services is optional.

The data services defined in this clause are as follows:

Table 1: Data services overview

Data service	Local network type	DECT profile
LAN service	Ethernet or Token Ring over LAN/FR/ATM	EN 301 649 [18] clause B.4 or B.5.
Internet access	Internet Protocol (IP) over LAN/FR/ATM	EN 301 649 [18] clause B.6.
Internet access over Point-to-Point Protocol (PPP)	PPP over PSTN/ISDN/FR/ATM	EN 301 649 [18] clause B.7.
Wireless V.24	PSTN/ISDN	EN 301 649 [18] clause C

For all DECT data profiles, the Mobility Class 2 shall apply as it contains CC and MM functionality required in the RLL application.

Clauses 4.2.2.1 to 4.2.2.4 define in detail the requirements for the provision of the data services as listed in table 1. Annex C provides additional information of the realization of CTA data ports.

4.2.2.1 LAN service

The LAN service allows the transparent transport of ISO 8802-3 [21] (Ethernet) or ISO 8802-5 [21] (Token Ring) frames between a CTA data port, and a FP network data port. This service provides a general data service based on an ISO 8802 [21] MAC service.

The LAN service is intended to provide connection of computer nodes connected to a local LAN to a node in the network at MAC level. It allows a wide variety of current and future application tailored protocols on top.

To provide the LAN service, the CTA and FP shall provide the requirements listed in EN 301 649 [18] (DPRS). Furthermore, the CTA and FP shall use the inter-working procedures described in EN 301 649 [18], clause B.4 or clause B.5, depending on the required LAN type.

4.2.2.2 Internet access

4.2.2.2.1 IP transport service

The IP transport service allows the transparent transport of IP datagrams between a CTA data port, and a FP network data port. The specifications in this clause are intended to ensure full interoperability between CTAs (PPs) and FPs, regardless of the CTA or FP data port implementation. Options for CTA data port implementation are given in annex C.

The IP transport service is intended to provide permanent internet connection of standalone computer nodes or LAN's using IP protocol. It allows the transparent transport of any application protocol over IP.

To provide internet access using the IP transport service, CTA and FP shall provide the requirements listed in EN 301 649 [18] (DPRS). CTA and FP shall use the interworking procedures described in EN 301 649 [18], clause B.6.

4.2.2.2.2 Internet over Point-to-Point Protocol (PPP) service

The internet over PPP service allows the transport of IP datagrams encapsulated over PPP between a CTA data port, and a FP data port. This service will provide the transport of PPP "protocol field" header over the air interface, allowing the provision of PPP services as authentication, dynamic IP allocation, multilink aggregation, PPP data compression, and any other service supported by PPP NCPs.

This service is intended for non-permanent dial-up connections, or for any other type of connection that might require any service provided by the PPP. The internet over PPP service also provides call control signalling.

To provide internet access using the internet over PPP service, CTA and FP shall provide the requirements and shall use the procedures described in EN 301 649 [18].

The specifications in this clause are intended to ensure full interoperability between CTAs (PPs) and FPs, and are only applicable to the DECT air interface, regardless of the CTA or FP implementation, and to the protocol stack presented in either, the CTA and FP data ports. The special cases of terminating the subscriber side of the PPP link inside the CTA, or terminating the network side of the PPP link in the FP IWU are specifically considered. In these cases interfaces without PPP are presented to the subscriber or network data ports.

4.2.2.3 Wireless V.24

This clause specifies the normative aspects of the wireless V.24 service as specified in the present document. The specifications in this clause are intended to ensure full interoperability between CTAs (PPs) and FPs, regardless of the CTA data port or FP IWU options given in annexes C and D.

To provide this service CTA and FP shall provide the requirements listed in EN 301 649 [18]. CTA and FP shall use the interworking procedures described in EN 301 649 [18], clause C.

5 Feature definitions

For the purposes of the present document, the feature definitions given in this clause apply.

The number given in square brackets after the name of a feature is the item number used in the tables of the present document.

NOTE: The numbering is aligned with EN 300 765-1 [15].

5.1 Network (NWK) features

The features apply only to operation and maintenance of the CTAs supporting the various types of services (ISDN, non-voiceband data, and digital leased lines) as described in clause 4.

Features in common for all CTAs, applying to the DECT part of the CTA, have been collected in clause 5.1.1, DECT CTA operation and maintenance features.

Features for the operation and maintenance specifically needed in combination with a particular type of service offered at a CTA (i.e. ISDN, non-voiceband data, and digital leased lines) are collected in separate clauses.

5.1.1 DECT CTA OA&M features

advanced file transfer [N.121]: ability to transfer file to the CTA

alarms [N.109]: ability of the CTA to indicate to the FP that a significant system event occurs or is about to occur which may seriously affect the systems ability to function

incoming maintenance transaction [N.102]: ability of the CTA to receive, and the FP to send OA&M messages

incoming WRS maintenance transaction [N.119]: ability of the WRS to receive OA&M messages from the FP

maintenance during call [N.104]: ability of the CTA and FT to exchange OA&M messages during an active call

maintenance during WRS MM operation [N.122]: ability of the WRS to exchange OA&M messages with the FP during an ongoing MM operation

on-air modification of user parameters [N.110]: ability of the CTA to accept FP initiated changes of subscription data

outgoing maintenance transaction [N.103]: ability of the CTA to send, and the FP to receive OA&M messages

outgoing WRS maintenance transaction [N.120]: ability of the WRS to send OA&M messages to the FP

physical resources fault [N.107]: ability of the CTA to corresponding OA&M messages to indicate the location of faults in the physical resources to the network management

remote configuration [N.115]: ability to configure the parameters of the CTA via OA&M messages

remote test [N.108]: ability of the FP to request the CTA to run specific tests

5.1.2 ISDN CTA specific OA&M features

Management of the ISDN digital access section as normally contained in the NT1 is covered by ETS 300 297 [20].

NOTE: However, ETS 300 297 [20] is standardized for a wired ISDN network. Applying the provisions contained in the mentioned standards to a wireless DECT RLL network needs adaptation and relaxation, and this is for further standardization outside the scope of the present document.

6 Interoperability requirements

6.1 General

The tables listed in this clause 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 clause 3.5 for the RAP FP and CTA. All optional elements shall be process mandatory according to the procedures described in the present document.

The requirements of EN 301 406 [9] shall be met by all equipment conforming to the present document.

6.2 NWK features

6.2.1 General

The NWK features of the following profiles shall be provided if the profile is supported:

- 1) the DECT-IIP as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18];

6.2.2 OA&M features

Table 2: NWK features status

Item number	Feature supported		Status	
	Name of feature	Ref.	CTA	FT
N.102	Incoming maintenance transaction	5.1.1	M	M
N.103	Outgoing maintenance transaction	5.1.1	M	M
N.104	Maintenance during call	5.1.1	M	M
N.107	Physical resources fault	5.1.1	M	M
N.108	Remote test	5.1.1	M	M
N.109	Alarms	5.1.1	O	O
N.110	On-air modification of user parameters	5.1.1	O	O
N.115	Remote configuration	5.1.1	O	O
N.119	Incoming WRS maintenance transaction	5.1.1	N/A	O
N.120	Outgoing WRS maintenance transaction	5.1.1	N/A	O
N.121	Advanced file transfer	5.1.1	O	O
N.122	Maintenance during WRS MM operation	5.1.1	N/A	O

6.3 DLC services

The DLC services of the following profiles shall be provided if the profile is supported:

- 1) the DECT-IIP as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18];

6.4 MAC services

6.4.1 General

The MAC services of the following profiles shall be provided if the profile is supported:

- 1) the DECT-ISDN intermediate system as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18];

6.4.2 Blind slot information

It is mandatory for RFPs that have blind slots, due to non-duplex bearer operation on that slot (i.e. those RFPs that have technological limitations such as a slow synthesizer), to periodically announce these blind slots (at least every 10 s). In the event the RFP announces blind slot information, such information may also include all blind slots due to an active bearer as well.

Not available (blind) slot means that the FP recommends the CTA not to attempt a set-up on this slot.

If the CTA receives blind slot information, it is mandatory for that CTA to use it in the process of channel selection. The CTA does not have to wait for the blind slot information before making the channel selection.

6.4.3 Improved channel selection rules

In addition to using the blind slot information before making the channel selection as defined in clause 6.4.2, the CTA is recommended to follow the algorithm defined below for single slot channel selection.

Without violating the basic DECT channel selection rules, for single slot channel selection the CTA should give priority to the following types of channels:

- 1) available channel candidates on even slot positions with an active channel on the adjacent slot position to the right;
- 2) available channel candidates on odd slot positions with an active channel on the adjacent slot position to the left.

NOTE: This algorithm results in packing of single slots into double slot locations (double slots are only allowed to start on even slot positions).

The DECT channel rules shall not be violated. This implies that the rules described above can only be applied to the channels that are within the same Radio Signal Strength Indicator (RSSI) band.

6.4.4 Advance timing

If the FT wants to align the PT transmission to the FT frame timing of a link by requesting the PT to compensate for the propagation delay in the active bearers with an FT, it shall send the MAC quality control message "advance timing request" (A field or B field, see EN 300 175-3 [3], clause 7.2.5.5).

The FT should send an advance timing message request as soon as it has a reliable measurement of the PT transmit timing.

It is recommended that the FT sends the advance timing request message only if the FT detects a PT timing difference from the nominal one greater than $(2 + 2^{0,868}) \mu\text{s}$ (see EN 300 175-3 [3]), i.e. if the FT receives the PT transmission outside the nominal FT receive window. It is recommended that the FT chooses the number of compensate bits in the advance timing request message such that the FT will finally receive the PT transmission in the FT receive window.

To guarantee a stable control loop, the FT shall not be allowed to use timing measurements older than 10 frames, at the transmission of the advance timing request message. Within a 10-frame time interval, the advance timing request message can be retransmitted until an acknowledged reception of the frame (Q-bit setting) has been received. In this time interval the PT is required to interpret only one of the received advance timing request messages. After receiving an acknowledged reception of the frame (Q-bit setting) upon transmission of the advance timing request message, the FT shall not send any advance timing request message during the next 10 s. If the FT receives an advance timing reject message from a PT, it shall not send any more advance timing request messages to that specific PT.

NOTE 1: Retransmissions of the advance timing request message are allowed if the PT indicates a bad reception of the message (through Q-bit setting).

NOTE 2: The 10 s timer is required to save signalling capacity and to allow PTs to alter the length of successive frames by up to 2 bits if they are not able to adjust the length of a single frame by the amount indicated in the advance timing request message (EN 300 175-2 [2], clause 4.2.7).

At the reception of the advance timing message, the PT can correct consequently its reference timer or send back to the FT an advance timing reject message, if the requested action is not supported. If advance timing is supported, the PT should update the transmit timing on the first occasion after the reception of the advance timing request message.

NOTE 3: In case the advance timing messages and procedure are not contemplated, the PT is expected to do nothing.

The advance timing increment and decrement parameters in the advance timing request message shall be interpreted as follows:

- a positive value shall result in an earlier transmission of the PT and a negative value shall result in a later transmission of the PT.

6.5 Physical Layer (PHL) services

The PHL services of the following profiles shall be provided if the profile is supported:

- 1) the DECT-IIP as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18].

6.6 NWK feature to procedure mapping

Table 3: NWK feature to procedure mapping

Feature/Procedure mapping				
Feature	Procedure	Ref.	Status	
			CTA	FP
N.102, Incoming maintenance transaction		5.1.1	O	O
	Incoming maintenance call	7.1.1.1 7.1.2.1	M	M
	Sending OA&M information	7.2	M	M
	Outgoing call during maintenance call	7.1.1.3 7.1.2.2	M	M
	Incoming call during maintenance call	7.1.1.4 7.1.2.1	M	M
	Claim Actions FT initiated	7.2.6.1	O	O
N.103, Outgoing maintenance transaction		5.1.1	M	M
	Outgoing maintenance call	7.1.1.2 7.1.2.2	M	M
	Sending OA&M information	7.2	M	M
	Outgoing call during maintenance call	7.1.1.3 7.1.2.2	M	M
	Incoming call during maintenance call	7.1.1.4 7.1.2.1	M	M
	Claim action CTA initiated	7.2.6.2	O	O
N.104, Maintenance during call		5.1.1	M	M
	Sending OA&M information	7.2	M	M
N.107, Physical resources fault		5.1.1	M	M
	Antenna fault	7.2.1	O	O
	RF unit plus logic fault	7.2.1	O	O
	Line interface unit fault	7.2.1	O	O
	Power supply unit fault	7.2.1	O	O
	Backup battery fault	7.2.1	O	O
	Network terminating fault	7.2.1	O	O
	General unit fault	7.2.1	M	M
N.108, Remote test		5.1.1	M	M
	Detect network terminating unit test	7.2.2	O	O
	Check for leakage to earth test	7.2.2	O	O
	Detect hazardous voltage test	7.2.2	O	O
	Detect mains power at CTA test	7.2.2	O	O
	Link quality test	7.2.2	O	O
	RSSI test	7.2.2	O	O
	Deliver number failed remote call attempts made by CTA	7.2.2	M	M
	A-CRC test	7.2.2	O	O
	Frame error test	7.2.2	O	O
	Result on test Detect network terminating unit	7.2.2	O	O
Result on test Check for leakage to earth	7.2.2	O	O	
Result on test Detect hazardous voltage	7.2.2	O	O	

Feature/Procedure mapping				
Feature	Procedure	Ref.	Status	
			CTA	FP
	Result on test Detect mains power at CTA	7.2.2	O	O
	Result on test Link quality	7.2.2	O	O
	Result on test RSSI	7.2.2	O	O
	Delivery of number of failed remote call attempts made by CTA	7.2.2	M	M
	Result on test A-CRC	7.2.2	O	O
	Result on test Frame error	7.2.2	O	O
N.109, Alarms		5.1.1	O	O
	Mains failure alarm	7.2.3	O	O
	Power supply failure alarm	7.2.3	O	O
	Low battery voltage alarm	7.2.3	O	O
	Opening of CTA enclosure alarm	7.2.3	O	O
N.110, On-air modification of user parameters		5.1.1	O	O
	On-air modification of user parameters	7.2.4	M	M
	Remote resynchronization	7.2.7	M	M
N.115, Remote configuration		5.1.1	O	O
	Remote configuration	7.2.5	M	M
N.119, Incoming WRS maintenance transaction		5.1.1	N/A	O
	Incoming WRS maintenance call	7.3.1	N/A	M
	Sending OA&M information	7.2	N/A	M
N.120, Outgoing WRS maintenance transaction		5.1.1	N/A	O
	Outgoing WRS maintenance call	7.3.2	N/A	M
	Sending OA&M information	7.2	N/A	M
N.121, Advanced file transfer		5.1.1	O	O
	Advanced file transfer	7.2.8	M	M
N.122, Maintenance during WRS MM operation		5.1	N/A	O
	Maintenance during WRS MM operation	7.3.3	N/A	M

7 NWK layer procedures

This clause specifies the NWK layer procedures, messages and information elements.

This profile does not prevent any CTA, PT or FT transmitting or receiving and processing any other NWK layer message or information element not specified in the profile. A PT or FT receiving an unsupported NWK layer message or information element that it does not recognize shall ignore it, as specified in clause 17 of EN 300 175-5 [5].

7.1 Maintenance calls

7.1.1 Maintenance calls within the data profiles

For the following maintenance calls the special call class "OA&M call" is required in the Information Element (IE) <<Basic service>> of the {CC-SETUP} message.

7.1.1.1 Incoming maintenance call

The incoming call procedures as defined in GAP shall be used. The FT is not required to send the <<SIGNAL>> information element during the incoming maintenance call procedure.

7.1.1.2 Outgoing maintenance call

The outgoing call procedures as defined in GAP shall be used. The CTA is not required to send the <<KEYPAD>> information element during the outgoing maintenance call procedure.

7.1.1.3 Outgoing call during maintenance call

The CTA shall release the maintenance call with partial release and shall initiate afterwards the outgoing call.

NOTE: The operator may wish to prohibit new services such as outgoing calls at the CTA by using the Claim actions as specified in clause 7.2.6.

7.1.1.4 Incoming call during maintenance call

The FT shall release the maintenance call with partial release and shall initiate afterwards the incoming call.

7.1.2 Maintenance calls within the IIP

7.1.2.1 Incoming maintenance call

On request to exchange operation and maintenance information, and if no signalling link is established, the DIFS shall set up a signalling link to the DIPS as described in clause 6.2.2 of ETS 300 822 [16].

Then, the DIFS shall forward the operation and maintenance information inside an <<IWU-TO-IWU>> information element in an {IWU-INFO} message, as defined in clause 14.2.3 of ETS 300 822 [16].

7.1.2.2 Outgoing maintenance call

On request to exchange operation and maintenance information, and if no signalling link is established, the DIPS shall set up a signalling link to the DIFS as described in clause 6.2.3 of ETS 300 822 [16].

Then, the DIPS shall forward the operation and maintenance information inside an <<IWU-TO-IWU>> information element in an {IWU-INFO} message, as defined in clause 14.2.3 of ETS 300 822 [16].

7.2 Sending OA&M information

The FT and the CTA shall be capable of exchanging "OA&M" information which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" which can be sent with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element on an established call. In the case no call is established, the CTA can setup an outgoing maintenance call, and the FT can setup an incoming maintenance call to transmit the OA&M messages.

Table 4: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Codings for OA&M information

7.2.1 Physical resources fault

If the CTA wants to inform the FT about a physical resources fault it shall send "physical resources fault" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 5: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Physical resources fault

7.2.2 Remote test

If the FT wants the CTA to perform remote controlled tests it shall send "remote test activation" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 6: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Remote test activation

Depending on the test to be performed the CTA may answer to the remote CTA test activation with a remote test information which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 7: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Remote test information

7.2.3 Alarms

If the CTA wants to inform the FT about alarms it shall send "alarms" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 8: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Alarms

7.2.4 On-air modification of user parameters

7.2.4.1 Modification of existing users parameters

The procedure shall be performed as defined in clause 13.5 of EN 300 175-5 [5].

The following text together with the associated clauses define the mandatory requirement with regard to the present document.

The procedure consists of two consecutive MM transactions: one access rights modify suggest and subsequently an obtaining access rights with its own independent transaction identifier.

An access rights **modify** suggest results in a modification (of the subscription data) of the active IPUI and PARK pair.

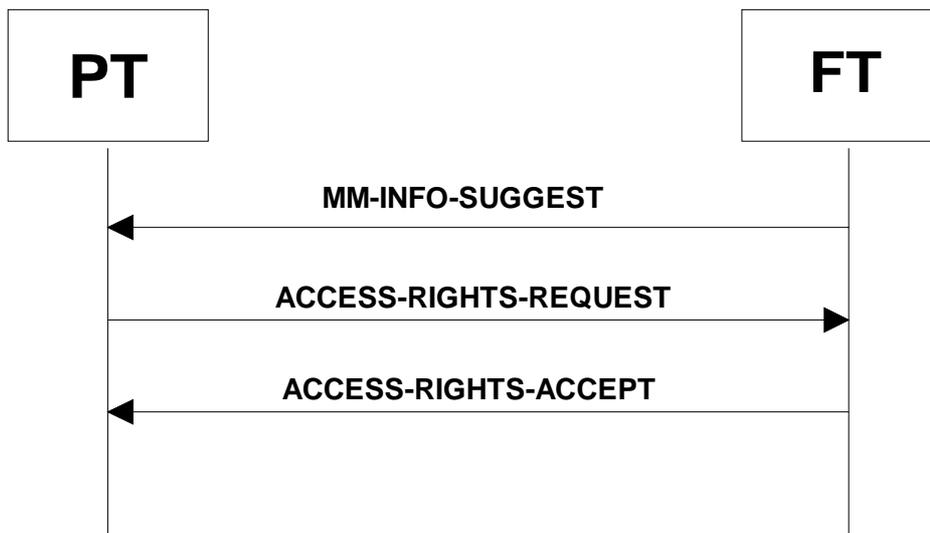


Figure 3: On-air modification of user parameters

Table 9: Values used within the {MM-INFO-SUGGEST} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<Info-type>>			
	<ext>	0/1	1 if last octet, 0 if not
	<Parameter type>	1	Access rights modify suggest

The PT shall initiate the on-air subscription procedure after the receipt of the {MM-INFO-SUGGEST} message, containing the access rights modify suggest. A PT may reject the access rights modify suggest using the {MM-INFO-REJECT}.

The values used within the {ACCESS-RIGHTS-REQUEST} and {ACCESS-RIGHTS-ACCEPT} messages shall be compatible with clause 8.30 of EN 300 444 [12].

If the FT does assign a new PARK to the PT in {ACCESS-RIGHTS-ACCEPT} message, it is necessary that the FT invokes the remote resynchronization procedure as described in clause 7.2.7, to force the PT to lock to a system whose ARI matches the new PARK.

7.2.4.2 Additional subscriptions to the same fixed part

If the FT wants a new port of a multipoint CTA to be subscribed to itself it can send "subscription suggest" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 10: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Subscription suggest (port number)

On reception of this message, the CTA shall perform the obtaining access rights procedure at the requested port given with the Subscription suggest. This obtaining access rights procedure shall be carried out only to the system that invoked the subscription suggest message. The FT shall set bit a44 of the higher layer capabilities-bits to "access_rights_supported" when sending the subscription suggest message. The CTA will assume this bit to be set when starting the obtain access rights procedure and will not check if it is set.

When there is not UAK present, the AC required for this additional subscription is the one assigned to the request port. When both, AC and UAK are available, the FP shall suggest the procedure for new subscription. In the case that no AC is available for this port, it shall be derived using the procedure as described in clause 7.2.4.3.

7.2.4.3 Derivation of AC for additional subscriptions

The CTA shall derive the needed AC for the requested port in the following way: The AC for the requested port is derived from the 4 most significant bytes of the UAK of the port at which the request for an additional subscription was received. The most significant bit of this UAK will also be the most significant bit of the new AC.

To avoid ambiguity problems in calculating the AC from the UAK, the following rule shall be used: when, as stated in clause 4.5.2 of EN 300 175-7 [7], both AC and UAK are input into the B1-process in the Form described below, then the new AC shall be derived from the UAK as shown in "rule 1" in the figure 4.

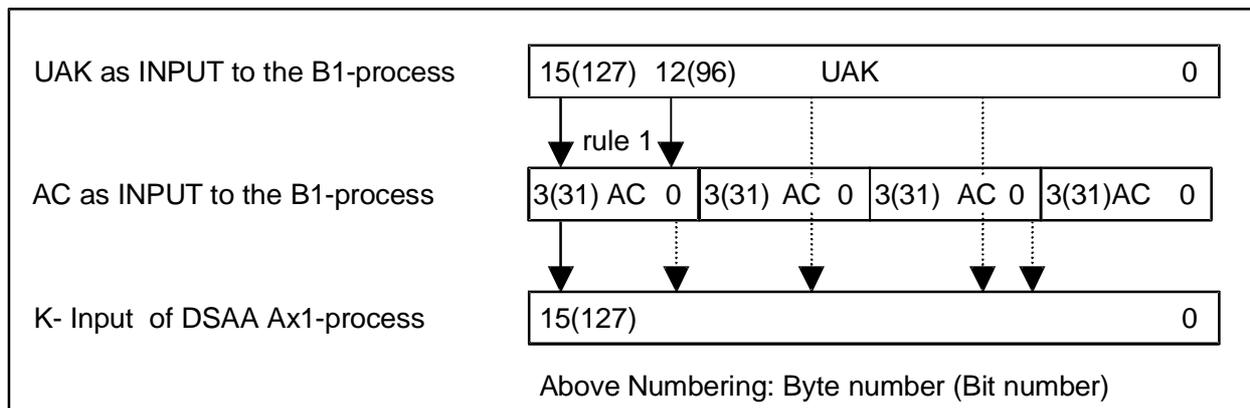


Figure 4: AC and UAK in B1 process

7.2.5 Remote configuration

If the FT wants to do a remote configuration parameter downloading in the CTA it shall send "remote configuration (request)" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" which can be sent with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element on an established call. In the case no call is established, the FT can setup an incoming maintenance call.

Table 11: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15 H	RAP indication
	<IWU-TO-IWU information>	See annex B	Remote configuration (request)

To indicate to the FT its MODEL (MANIC + MODIC) code the CTA shall answer to the remote configuration (request) with a remote configuration (confirm) which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" which can be sent with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element on an established call. In the case no call is established, the CTA can setup an outgoing maintenance call.

Table 12: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Remote configuration (confirm) with MANIC and MODIC codes

Then the FT shall transmit the parameters for the remote configuration sending the "remote configuration information" command which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" which can be sent with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element on an established call. In the case no call is established, the FT can setup an incoming maintenance call.

The <<IWU-TO-IWU>> information element shall include the remote configurations parameters as it is indicated in annex B.

7.2.6 Claim actions

Claim Actions initiated either in FT side or in CTA side implies impose restrictions on the CTAs and FT normal operation. With the claiming imposed restrictions the CTA and FT are not allowed to initiate any new procedure as part of features N.1, N.8, and N.11 listed in EN 300 444 [12].

The CTA shall always accept the Claim Actions FT Initiated (excluding the case of failure in FT authentication).

The FT shall have the responsibility to accept or to reject the Claim Actions CTA Initiated. The non-appearance of a response shall be interpreted, in CTA side, as FT reject.

When Claim Actions initiated in CTA or FT side the ongoing procedures are allowed to continue in CTA. The FT shall have the responsibility, when Claim Actions initiated in FT side, after the completion of the Claim Actions to release or to allow the ongoing procedures to continue.

The Claim Actions in CTA side are initiated for deferrable maintenance purposes and shall not apply for failure conditions that allow for affecting the ongoing procedures.

The Claim Actions in FT side are initiated either for deferrable maintenance purposes or as a serious fault result that allows for affecting the ongoing procedures.

7.2.6.1 Claim Actions FT side Initiated

If the FT wants to claim, it shall send "claim enable" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" in a {CC-INFO} message.

Upon receipt of the "Claim Enable", the CTA shall respond to the FT by sending "Claim Active" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message.

The response "Claim Active" works as Acknowledgement for value "Claim Enable".

Upon completion of the Claim Action the FT shall block all new procedure invocations. In addition the FT shall have the responsibility either to terminate the ongoing procedures initiating abnormal call release or to allow the ongoing procedures to continue.

Upon receipt of the "Claim Enable", the CTA shall block all new procedure invocations (part of the features listed above), but without termination of any ongoing procedures.

NOTE 1: The user of a CPE attached to a claimed CTA may be informed of the claimed situation by e.g. a congestion tone.

NOTE 2: The CTA is recommended to Authenticate the FT upon receipt of "Claim Enable", before it responds with "Claim Active". In case of Authentication failure the receipt of "Claim Enable" is ignored.

If the FT wants to disable a claim, it shall send "claim disable" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" in a {CC-INFO} message.

Upon receipt of the "Claim Disable", the CTA shall respond to the FT by sending "Claim Inactive" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message.

The response "Claim Inactive" works as Acknowledgement for value "Claim Disable".

Upon completion of the Claim Action the FT shall have no restrictions on the invocation of new procedures.

Upon receipt of the "Claim Disable" the CTA shall have no restrictions on the invocation of new procedures.

The {CC-INFO} message shall be send during an established call. If no call is established the FT can setup an incoming maintenance call to transmit this OA&M message.

Table 13: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Claim enable/Claim disable

Table 14: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Claim active/Claim inactive

7.2.6.2 Claim Actions CTA Initiated

If the CTA wants to enable a claim, it shall send "claim enable" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message.

The FT may accept or reject the Claim Action; if the "claim enable" is accepted the FT shall respond to CTA with "Claim Active" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message otherwise the FT shall respond to CTA with "Claim Inactive" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message. The non-appearance of a response shall be interpreted as FT reject.

For the value "Claim Enable" the response "Claim Active" means FT accept while the response "Claim Inactive" means FT reject.

If the CTA wants to disable a claim, it shall send "claim disable" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message.

The FT may accept or reject the Claim Action; if the "claim disable" is accepted the FT shall respond to CTA with "Claim Inactive" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message otherwise the FT shall respond to CTA with "Claim Active" which shall be included in the <<IWU-TO-IWU>> IE using protocol discriminator "RAP" in a {CC-INFO} message. The non-appearance of a response shall be interpreted as FT reject.

For the value "Claim Disable" the response "Claim Inactive" means FT accept while the response "Claim Active" means FT reject.

Table 15: Set of Claim Actions CTA Initiated

CTA	FT		Comment
	Accept	Reject	
Claim Enable	Claim Active	Claim Inactive Or none	When FT accept, new procedures are not allowed but without termination of ongoing procedures.
Claim Disable	Claim Inactive	Claim Active Or none	When FT accept, new procedures are allowed.

The {CC-INFO} messages shall be sent during an established call. If no call is established the CTA can set up an outgoing maintenance call to transmit this OA&M message.

Reference to tables 13 & 14 regarding the values used within the {CC-INFO} messages.

When the "Claim Enable" is accepted, the FT and CTA shall have to block all new procedure invocations (procedure part of the features listed above), but without termination of any ongoing procedures.

When the "Claim Disable" is accepted, the FT and CTA shall have no restrictions on the invocation of new procedures.

7.2.7 Remote resynchronization

If the FT wants the CTA to perform resynchronization it shall send "resynchronization request" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP".

Table 16: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Resynchronization request

The remote resynchronization is used to inform a locked CTA about new static system information or new arrangements of carriers, etc.

NOTE: The operator may wish to terminate any ongoing services, and prohibit new services at the CTA by using the Claim actions as specified in clause 7.2.6, before issuing the resynchronization request.

7.2.8 Advanced file transfer

If the FT wants to perform an advanced file transfer in the CTA it shall send "advanced file transfer (request)" which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" which can be sent with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element on an established call. If the case no call is established, the FT can setup an incoming maintenance call.

Table 17: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Advanced file transfer (request)

To indicate to the FT its MODEL (MANIC + MODIC) code the CTA shall answer to the advanced file transfer (request) with an advanced file transfer (confirm) which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP" which can be sent with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element on an established call. If the case no call is established, the CTA can setup an outgoing maintenance call.

Table 18: Values used within the {CC-INFO} message

Information element	Field within the information element	Standard values within the field/IE	Normative action/comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>	See annex B	Advanced file transfer (confirm) with MANIC and MODIC codes

NOTE: The procedure that has to be used for file transfer phase which will follow this first phase is not defined in the present document. The main application of this procedure is software download: for good performance the B-field could be used.

7.3 WRS maintenance calls

7.3.1 Incoming WRS maintenance call

For incoming maintenance calls the FT shall use <<IWU-TO-IWU>> as defined in annex B, included in the {MM-INFO-SUGGEST} message, using the procedures as defined in EN 300 175-5 [5], clause 13.7.

NOTE: A special value for the <<INFO-TYPE>> shall be used, indicating "OA&M call".

7.3.2 Outgoing WRS maintenance call

For outgoing maintenance calls the WRS shall use <<IWU-TO-IWU>> as defined in annex B, included in the {MM-INFO-REQUEST} message, using the procedures as defined in EN 300 175-5 [5], clause 13.7. The FT shall respond according to these procedures with a {MM-INFO-ACCEPT}, which may include a <<IWU-TO-IWU>> as defined in annex B.

NOTE: A special value for the <<INFO-TYPE>> shall be used, indicating "OA&M call".

7.3.3 Maintenance during WRS MM operation

If the FT or the WRS need to transfer OA&M information, and there is an MM procedure ongoing, the FT or WRS may add the <<IWU-TO-IWU>> information element containing the OA&M information as defined in annex B, to the MM-messages part of the ongoing MM procedure, if it is allowed by the coding of the relevant MM-message, as given in EN 300 175-5 [5]. Otherwise, the FT or WRS shall wait until the ongoing MM procedure is completed, and initiate an incoming or outgoing maintenance call.

Annex A (informative):
Void.

Annex B (normative): Codings for "OA&M" messages

The FT and the CTA shall be capable of exchanging RAP-OA&M information which shall be included in the <<IWU-TO-IWU>> information element using Protocol Discriminator "RAP", which can be send with every CC-message or MM-message which is allowed to carry the <<IWU-TO-IWU>> information element on an established call. If the case no call is established, the CTA can setup an outgoing maintenance call, and the FT can setup an incoming maintenance call to transmit the OA&M message.

Table B.1

Information element	Field within the information element	Standard values within the field/IE	Normative action / comment
<<IWU-TO-IWU>>			
	<Protocol Discriminator>	15H	RAP indication
	<IWU-TO-IWU information>		Codings for OA&M

B.1 General Structure for RAP <<IWU-TO-IWU>> IE

Bit	8	7	6	5	4	3	2	1	Octet
0	<<IWU-TO-IWU>>								1
	Length of Contents (L)								2
1	S/R	RAP							3
	SC			Service Type					4
									5
	RAP IWU-TO-IWU Contents								.
									L + 2

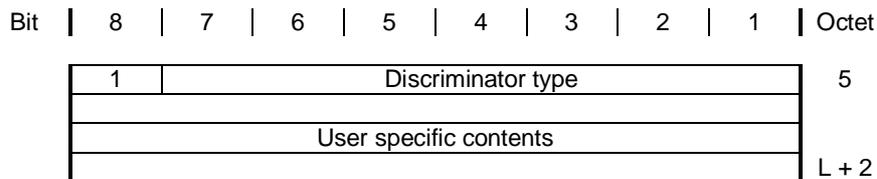
Service Category (SC)

Bits	8	7	6	Meaning
0	1	0		RAP-OA&M
All other values reserved				

Service Type

Bits	5	4	3	2	1	Meaning
0	0	0	0	0	0	Claim enable
0	0	0	0	0	1	Claim disable
0	0	0	1	0		Claim active
0	0	0	1	1		Physical resource fault
0	0	1	0	0		Remote test activation/information
0	0	1	0	1		Alarm
0	0	1	1	0		Resynchronization request
0	0	1	1	1		Remote configuration
0	1	0	0	0		Remote configuration information
0	1	0	0	1		Advanced file transfer
0	1	0	1	0		Subscription suggest
0	1	0	1	1		Claim inactive
1	1	1	1	1		Escape
All other values reserved						

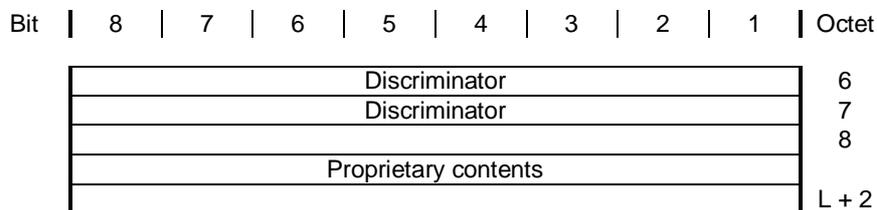
B.2 RAP-OA&M IWU-TO-IWU Contents Proprietary



Discriminator type (octet 5)

Bits	7	6	5	4	3	2	1	Meaning
	0	0	0	0	0	0	0	Unspecified
	0	0	0	0	0	0	1	EMC
All other values reserved								

User specific contents field (octets 6 to L + 2) for Discriminator type "EMC"



The discriminator consists of 2 octets (octets 6 and 7) and contains the EMC.

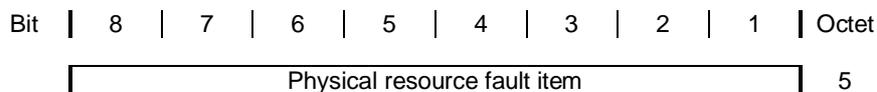
This proprietary structure of the RAP IWU-TO-IWU contents can be used for RAP-OA&M Service Type commands except for the ones listed below.

- claim enable,
- claim disable,
- claim active,
- claim inactive,
- resynchronization request.

For these RAP-OA&M commands, only the standardized structure can be used.

B.3 RAP-OA&M IWU-TO-IWU Contents Standardized

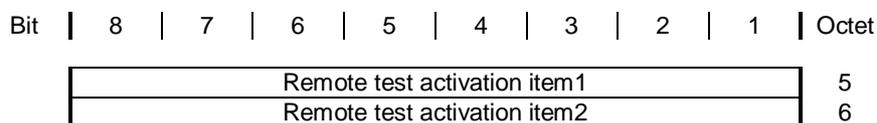
Physical resource fault



Bits	8	7	6	5	4	3	2	1	Meaning
0	X	X	X	X	X	X	X	1/0	Antenna fault present/absent
0	X	X	X	X	X	X	1/0	X	RF unit plus logic fault present/absent
0	X	X	X	X	X	1/0	X	X	Line interface unit fault present/absent
0	X	X	X	1/0	X	X	X	X	Power supply unit fault present/absent
0	X	X	1/0	X	X	X	X	X	Backup battery fault present/absent
0	X	1/0	X	X	X	X	X	X	Network terminating unit fault present/absent
0	1/0	X	X	X	X	X	X	X	General unit fault present/absent

X: do not care

Remote test activation



Remote test activation item1

Bits	8	7	6	5	4	3	2	1	Meaning
0	X	X	X	X	X	X	X	1/0	Detect network terminating unit test activated/deactivated
0	X	X	X	X	X	X	1/0	X	Reserved
0	X	X	X	X	1/0	X	X	X	Check for leakage to earth test activated/deactivated
0	X	X	X	1/0	X	X	X	X	Detect hazardous voltage test activated/deactivated
0	X	X	1/0	X	X	X	X	X	Detect mains power at CTA test activated/deactivated
0	X	1/0	X	X	X	X	X	X	Reserved
0	1/0	X	X	X	X	X	X	X	Link Quality test activated/deactivated

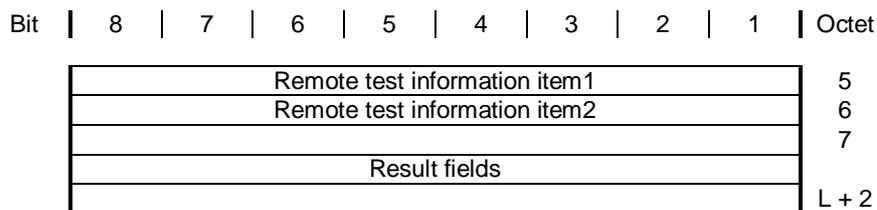
X: do not care

Remote test activation item2

Bits	8	7	6	5	4	3	2	1	Meaning
X	X	X	X	X	X	X	X	1/0	Reserved
X	X	X	X	X	X	X	1/0	X	Reserved
X	X	X	X	X	1/0	X	X	X	Deliver number of failed remote call attempts made by CTA
X	X	X	X	1/0	X	X	X	X	RSSI test activated/deactivated
X	X	X	1/0	X	X	X	X	X	A-CRC test
X	X	1/0	X	X	X	X	X	X	Frame error test
X	1/0	X	X	X	X	X	X	X	Reserved

X: do not care

Remote test information



Remote test information item1

Bits	8	7	6	5	4	3	2	1	Meaning
	0	0	0	0	0	0	0	1	Results on test Detect network terminating unit
	0	0	0	0	0	0	1	0	Reserved
	0	0	0	0	0	1	0	0	Results on test Check for leakage to earth
	0	0	0	0	1	0	0	0	Results on test Detect hazardous voltage
	0	0	0	1	0	0	0	0	Results on test Detect mains power at CTA
	0	0	1	0	0	0	0	0	Reserved
	0	1	0	0	0	0	0	0	Results on test Link Quality

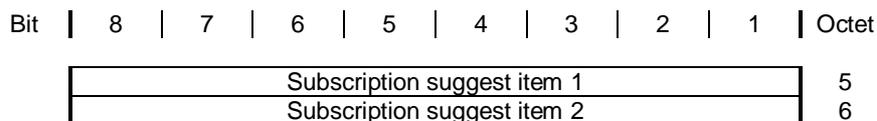
Remote test information item2

Bits	8	7	6	5	4	3	2	1	Meaning
	0	0	0	0	0	0	0	1	Reserved
	0	0	0	0	0	0	1	0	Reserved
	0	0	0	0	0	1	0	0	Delivery of number of failed remote call attempts made by CTA
	0	0	0	0	1	0	0	0	Results on test RSSI test
	0	0	0	1	0	0	0	0	Results on A-CRC test
	0	0	1	0	0	0	0	0	Results on Frame error test
	0	1	0	0	0	0	0	0	Reserved

Alarm

Bits	8	7	6	5	4	3	2	1	Meaning
	0	X	X	X	X	X	X	1/0	Mains failure alarm present/absent
	0	X	X	X	X	X	1/0	X	Power supply failure alarm present/absent
	0	X	X	X	X	1/0	X	X	Low battery voltage alarm present/absent
	0	X	X	X	1/0	X	X	X	Opening of CTA enclosure alarm present/absent
	0	X	X	1/0	X	X	X	X	Reserved
	0	X	1/0	X	X	X	X	X	Reserved
	0	1/0	X	X	X	X	X	X	Reserved

X: do not care

Subscription suggest**Subscription suggest item 1**

Bits	8	7	6	5	4	3	2	1	Meaning
	0	X	X	X	X	X	X	X	Desired port number (0-7FH)

Subscription suggest item 2

Bits	8	7	6	5	4	3	2	1	Meaning
	0	0	0	0	0	0	0	0	Derive AC from UAK/AC
	0	0	0	0	0	0	0	1	Used stored AC

Annex C (informative): CTA data port realizations

In conventional RLL configurations the Cordless Terminal Adapter (CTA) is normally configured to provide a physical interface port which, as near as possible, offers the standard PSTN/ISDN services. Therefore in order for a subscriber to access the advanced data services specified in clause 4.2.2 he or she would require certain additional equipment, for example a modem or ISDN card.

It is certainly possible for the data services profiles to provide these services based on standard PSTN/ISDN CTA ports. However the data being transported is already in digital format so it would not be efficient to convert it back into an analogue PSTN (or voiceband PCM) format. It is also not usually efficient to convert it to a 64 kbit/s isochronous data stream. In addition the data services profiles have been optimized to allow direct communications from PP/CTA to most DTE types, without the need for a "communications device". Therefore to realize the full advantages and data rate potential of DECT requires the use of a CTA Data Port, as shown in figure C.1.

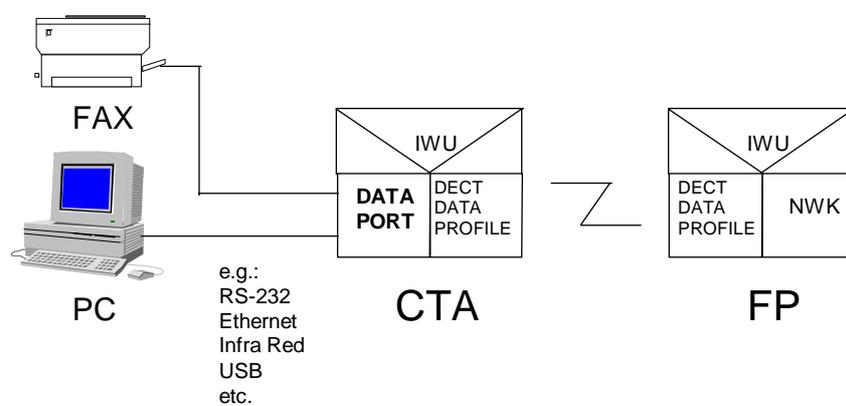


Figure C.1: The CTA Data Port concept

This type of CTA configuration takes advantage of the fact that there are industry standard data interfaces which are far more suited to data communications than either the PSTN or the ISDN. It also takes advantage of the fact that both the DECT Data Service Profiles and most common User Data Terminals (DTEs) interface easily with these industry standard interfaces.

There are many possibilities for CTA Data Port types, including RS-232, LAN (Ethernet, Token Ring), Infrared access (IrDA), Parallel Port, Universal Serial Bus (USB), etc. The choice of the physical interface used to implement a CTA Data Port is left to the implementer.

Annex D (normative): Interworking with WRSs

This annex describes:

- additional requirements for WRSs;
- additional requirements for FTs with respect to support of WRSs.

EN 300 765-2 compliance can only be obtained for the CRFP type WRS. For European approval, no more than one hop shall be allowed in a network with WRs. On a national base, multihop architectures can be allowed after agreement with the national authority. In this case, to provide a RAP compliant interface to the FT, the first WRS in the chain is of the CRFP type.

D.1 Definitions of features, services and procedures

D.1.1 NWK features

Transparency between FT and PT [N.201]: ability of the CRFP to be transparent for all DECT air interface procedures handled between the PT and FT

Encryption of relayed connections [N.202]: ability of the CRFP and the FT to support encryption of relayed connections

D.1.2 MAC services

Extended Fixed Part Capabilities [M.201]: service which indicates the extended capabilities of the FP to the PT or to the CRFP-PT

Hop Control [M.202]: service used by the FP to control the number of WRS hops

Normal relay operation [M.203]: service that only provides unencrypted relayed connections

Dual relay operation [M.204]: service that provides encryption of relayed connections

Bearer handover, intra-cell of PT within CRFP [M.205]: internal MAC process initiated by a PT communicating with a CRFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of the same CRFP while maintaining the service to the DLC layer.

Bearer handover, intra-cell of CRFP within one RFP [M.206]: internal MAC process initiated by a CRFP communicating with a RFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of the same RFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of CRFP from one RFP to a RFP [M.207]: internal MAC process initiated by a CRFP communicating with a RFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of another RFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of PT from a CRFP to a RFP [M.208]: internal MAC process initiated by a PT communicating with a CRFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of another RFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of PT from a RFP to a CRFP [M.209]: internal MAC process initiated by a PT communicating with a RFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of another CRFP while maintaining the service to the DLC layer.

Bearer handover, inter-cell of PT from a CRFP to a CRFP [M.210]: internal MAC process initiated by a PT communicating with a CRFP whereby data transfer (C channel and I channel) is switched from one duplex bearer to another in the domain of the other CRFP while maintaining the service to the DLC layer.

Connection handover, inter-cell of CRFP from one RFP to a RFP [M.211]: in the MAC layer, it is the process initiated by the CRFP communicating with a RFP enabling setting up a new connection in the domain of another RFP to support connection handover at the DLC layer.

Connection handover, inter-cell of PT from a CRFP to a RFP [M.212]: in the MAC layer, it is the process initiated by the PT communicating with a CRFP enabling setting up a new connection in the domain of another RFP to support connection handover at the DLC layer.

Connection handover, inter-cell of PT from a RFP to a CRFP [M.213]: in the MAC layer, it is the process initiated by the PT communicating with a RFP enabling setting up a new connection in the domain of another CRFP to support connection handover at the DLC layer.

Connection handover, inter-cell of PT from a CRFP to a CRFP [M.214]: in the MAC layer, it is the process initiated by the PT communicating with a CRFP enabling setting up a new connection in the domain of another CRFP to support connection handover at the DLC layer.

D.2 Interoperability requirements

D.2.1 NWK features

There are no NWK requirements for the CRFP-FT.

For the CRFP-PT a subset of the NWK features of the following profiles shall be provided:

- 1) the DECT-IIP as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18];

however only if the profile is supported.

For EN 300 765-2, additionally the following NWK features shall be supported by the CRFP-PT and the FT supporting a CRFP.

Table D.1: NWK features status

Feature supported				
Item number	Name of feature	Ref.	Status	
			CRFP-PT	FT
N.102	Incoming maintenance transaction	5.1.1	O	See 6.2.2
N.103	Outgoing maintenance transaction	5.1.1	O	See 6.2.2
N.104	Maintenance using an existing connection	5.1.1	O	See 6.2.2
N.107	Physical resources fault	5.1.1	O	See 6.2.2
N.108	Remote test	5.1.1	O	See 6.2.2
N.109	Alarms	5.1.1	O	See 6.2.2
N.110	Start remote over the air subscription	5.1.1	O	See 6.2.2
N.111	Start Quality measurement	5.1.1	O	See 6.2.2
N.112	Stop Quality measurement	5.1.1	O	See 6.2.2
N.116	Remote configuration	5.1.1	O	See 6.2.2
N.121	Incoming WRS maintenance transaction	5.1.1	O	See 6.2.2
N.122	Outgoing WRS maintenance transaction	5.1.1	O	See 6.2.2
N.123	Claim	5.1.1	O	See 6.2.2
N.201	Transparency between FT and PT	D.1.1	M	N/A
N.202	Encryption of relayed connections (procedure: Cipher key transfer to CRFP)	D.1.1	C101	O
C101: IF encryption M for PT (as result of profile supported) THEN M ELSE O.				

D.2.2 DLC services

There are no DLC requirements for the CRFP-FT.

For the CRFP-PT a subset of the DLC features of the following profiles shall be provided:

- 1) the DECT-IIP as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18];

however only if the profile is supported.

For the FT there are no additional DLC requirements for support of a CRFP.

D.2.3 MAC services

For the CRFP-PT and the CRFP-FT, the MAC services of the following profiles shall be provided:

- 1) the DECT-IIP as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18];

however only if the profile is supported.

Additionally the following MAC features shall be supported by the CRFP-PT, CRFP-FT and the FT supporting a CRFP.

The CRFP-FT shall support the Blind slot information service as described in clause 6.4.2.

The CRFP-PT shall provide the Improved Channel Selection Rules service as described in clause 6.4.3.

Table D.2: MAC services status

Service supported					
Item number	Name of service	Ref.	Status		
			CRFP-PT	CRFP-FT	FT
M.201	Extended Fixed Part Capabilities	D.1.2	M	M	O
M.202	Hop Control	D.1.2	M	M	O
M.203	Normal relay operation	D.1.2	M	N/A	O
M.204	Dual relay operation	D.1.2	O	N/A	O
M.205	Bearer handover, intra-cell of PT within CRFP	D.1.2	N/A	note 1	N/A
M.206	Bearer handover, intra-cell of CRFP within one RFP	D.1.2	O	N/A	note 1
M.207	Bearer handover, inter-cell of CRFP from one RFP to a RFP	D.1.2	O	N/A	note 1
M.208	Bearer handover, inter-cell of PT from a CRFP to a RFP	D.1.2	note 2	note 1	note 1
M.209	Bearer handover, inter-cell of PT from a RFP to a CRFP	D.1.2	note 2	note 1	note 1
M.210	Bearer handover, inter-cell of PT from a CRFP to a CRFP	D.1.2	note 2	note 1	N/A
M.211	Connection handover, inter-cell of CRFP from one RFP to a RFP	D.1.2	O	N/A	note 1
M.212	Connection handover, inter-cell of PT from a CRFP to a RFP	D.1.2	note 2	note 1	note 1
M.213	Connection handover, inter-cell of PT from a RFP to a CRFP	D.1.2	note 2	note 1	note 1
M.214	Connection handover, inter-cell of PT from a CRFP to a CRFP	D.1.2	note 2	note 1	N/A
NOTE 1: See FT MAC service status of the following profile if supported: - the DECT-IIP as defined in ETS 300 822 [16]; - the DECT data profile as defined in EN 301 649 [18]; however only if the profile is supported.					
NOTE 2: See PT MAC service status of the following profile if supported: - the DECT-IIP as defined in ETS 300 822 [16]; - the DECT data profile as defined in EN 301 649 [18]; however only if the profile is supported.					

D.2.4 PHL services

For the CRFP-PT and the CRFP-FT the PHL services of the following profiles shall be provided:

- 1) the DECT-IIP as defined in ETS 300 822 [16];
- 2) the DECT data profile as defined in EN 301 649 [18];

however only if the profile is supported.

Additionally, for the CRFP-PT and CRFP-FT the PHL requirements as specified in ETS 300 700 [14], clause 4.2.1 apply.

D.2.5 NWK feature to procedure mapping

Table D.3: NWK feature to procedure mapping

Feature/Procedure mapping				
Feature	Procedure	Ref.	Status	
			CRFP-PT	FT
N.102, Incoming maintenance transaction		5.1.1	O	See 6.6
	Incoming maintenance call	7.1.1.1	M	See 6.6
N.103, Outgoing maintenance transaction	Sending OA&M information	7.2	M	See 6.6
		5.1.1	O	See 6.6
N.104, Maintenance using an existing connection	Outgoing maintenance call	7.1.1.1	M	See 6.6
	Sending OA&M information	7.2	M	See 6.6
N.107, Physical resources fault		5.1.1	O	See 6.6
	Physical resources fault	7.2.1	M	See 6.6
N.108, Remote test		5.1.1	O	See 6.6
	Remote test	7.2.2	M	See 6.6
N.109, Alarms		5.1.1	O	See 6.6
	Alarms	7.2.3	M	See 6.6
N.110, Start remote over the air subscription		5.1.1	O	See 6.6
	Subscription to a new Fixed Part	7.2.4.1	M	See 6.6
	Resubscription to the same Fixed Part	7.2.4.2	M	See 6.6
	Additional subscriptions to the same Fixed Part	7.2.4.3	M	See 6.6
N.111, Start Quality measurement	Remote resynchronization	7.2.8	M	See 6.6
		5.1.1	O	See 6.6
N.112, Stop Quality measurement	Start Quality measurement	7.2.5	M	See 6.6
		5.1.1	O	See 6.6
N.116, Remote configuration	Stop Quality measurement	7.2.6	M	See 6.6
		5.1.1	O	See 6.6
N.121, Incoming WRS maintenance transaction	Remote configuration	7.2.7	M	See 6.6
		5.1.1	O	See 6.6
N.122, Outgoing WRS maintenance transaction	Incoming WRS maintenance call	7.3.1	M	See 6.6
	Sending OA&M information	7.3.2	M	See 6.6
N.123, Claim		5.1.1	O	See 6.6
	Claim Actions	7.2.9	M	See 6.6
N.201, Transparency between FT and PT		D.1.1	M	N/A
	Transparency between FT and PT	D.3.1	M	N/A
N.202, Encryption of relayed connections		D.1.1	C301	O
	Cipher key transfer to CRFP	D.3.2	M	M
C301: IF encryption M for PP (as result of profile supported) THEN M ELSE O.				

D.2.6 MAC service to procedure mapping

Table D.4: MAC service to procedure mapping

Service/Procedure mapping					
Service	Procedure	Ref.	Status		
			CRFP-PT	CRFP-FT	FT
M.201, Extended Fixed Part Capabilities		D.1.2	M	M	O
	Extended Fixed Part Capabilities	D.4.1	M	M	M
M.202, Hop Control		D.1.2	M	M	O
	Hop Control	D.4.2	M	M	M
M.203, Normal relay operation		D.1.2	M	N/A	O
	Normal C/O bearer set-up	D.4.3	M	N/A	M
	C/O connection release	D.4.6	M	N/A	M
M.204, Dual relay operation		D.1.2	C401	N/A	O
	Dual C/O bearer set-up	D.4.4	M	N/A	M
	CRFP connection suspend and resume	D.4.5	M	N/A	M
	C/O connection release	D.4.6	M	N/A	M
M.205, Bearer handover, intra-cell of PT within CRFP		D.1.2	N/A	note 1	N/A
	Bearer handover request	D.4.7	N/A	M	N/A
M.206, Bearer handover, intra-cell of CRFP within one RFP		D.1.2	O	N/A	note 1
	Bearer handover request	D.4.7	M	N/A	M
M.207, Bearer handover, inter-cell of CRFP from one RFP to a RFP		D.1.2	note 2	note 1	note 1
	Bearer handover request	D.4.7	M	M	M
M.208, Bearer handover, inter-cell of PT from a CRFP to a RFP		D.1.2	note 2	note 1	note 1
	Bearer handover request	D.4.7	M	M	M
M.209, Bearer handover, inter-cell of PT from a RFP to a CRFP		D.1.2	note 2	note 1	note 1
	Bearer handover request	D.4.7	M	M	M
M.210, Bearer handover, inter-cell of PT from a CRFP to a CRFP		D.1.2	note 2	note 1	N/A
	Bearer handover request	D.4.7	M	M	N/A
M.211, Connection handover, inter-cell of CRFP from one RFP to a RFP		D.1.2	O	N/A	note 1
	Connection handover request	D.4.8	M	N/A	M
M.212, Connection handover, inter-cell of PT from a CRFP to a RFP		D.1.2	note 2	note 1	note 1
	Connection handover request	D.4.8	M	M	M
M.213, Connection handover, inter-cell of PT from a RFP to a CRFP		D.1.2	note 2	note 1	note 1
	Connection handover request	D.4.8	M	M	M
M.214, Connection handover, inter-cell of PT from a CRFP to a CRFP		D.1.2	note 2	note 1	N/A
	Connection handover request	D.4.8	M	M	N/A
C401: IF encryption M for PP (as a result of profile supported) THEN M ELSE O.					
NOTE 1: See FT MAC service status of the following profile if supported: - the DECT-IIP as defined in ETS 300 822 [16]; - the DECT data profile as defined in EN 301 649 [18]; however only if the profile is supported.					
NOTE 2: See PT MAC service status of the following profile if supported: - the DECT-IIP as defined in ETS 300 822 [16]; - the DECT data profile as defined in EN 301 649 [18]; however only if the profile is supported.					

D.3 NWK layer procedures

D.3.1 NWK layer transparency between FT and PT

The CRFP shall provide full transparency for all NWK layer messages exchanged between FT and PT.

D.3.2 Cipher key transfer to CRFP

The procedure shall be performed as defined in clauses 5.3.4.1 and 5.3.4.2 of ETS 300 700 [14].

D.4 MAC layer procedures

D.4.1 Extended Fixed Part capabilities

The procedure shall be performed as defined in clause 4.4.2.1 of ETS 300 700 [14].

D.4.2 Hop control

The procedure shall be performed as defined in clause 4.4.2.2 of ETS 300 700 [14].

D.4.3 Normal C/O bearer set-up

The procedure shall be performed as defined in clause 5.3.1.1.2 of ETS 300 700 [14].

D.4.4 Dual C/O bearer set-up

The procedure shall be performed as defined in clause 5.3.1.1.3 of ETS 300 700 [14].

D.4.5 CRFP connection suspend and resume

The procedure shall be performed as defined in clause 5.3.1.2 of ETS 300 700 [14].

D.4.6 CRFP C/O release

The procedure shall be performed as defined in clause 5.3.1.4 of ETS 300 700 [14].

D.4.7 Bearer handover request

The procedures for:

- 1) Bearer handover, intra-cell of PT within CRFP;
- 2) Bearer handover, intra-cell of CRFP within one RFP;
- 3) Bearer handover, inter-cell of CRFP from one RFP to a RFP;
- 4) Bearer handover, inter-cell of PT from a CRFP to a RFP;
- 5) Bearer handover, inter-cell of PT from a RFP to a CRFP;
- 6) Bearer handover, inter-cell of PT from a CRFP to a CRFP;

shall be performed as defined in clause 5.3.1.3 of ETS 300 700 [14].

D.4.8 Connection handover request

The procedures for:

- 1) Connection handover, inter-cell of CRFP from one RFP to a RFP;
- 2) Connection handover, inter-cell of PT from a CRFP to a RFP;
- 3) Connection handover, inter-cell of PT from a RFP to a CRFP;
- 4) Connection handover, inter-cell of PT from a CRFP to a CRFP;

shall be performed as defined in clause 5.3.2.1 of ETS 300 700 [14].

Annex E (normative): Synchronization requirements for fixed parts

Public systems shall provide intrasystem cluster synchronization and shall have either GPS synchronization and a Synchronization Output Port or a complete Synchronization Port (both input and output). This will allow absolute time synchronization via GPS or wired mutual synchronization, if an operator requires local synchronization between operators.

Table E.1: Synchronization requirements

Synchronization requirements			
Item number	Name of feature	Reference (EN 300 175-2 [2])	Status FT (Public)
S.1	GPS multiframe time synchronization	B.3	O
S.2	DECT SYNC output port, Class 1	annex B.2	M
S.3	DECT SYNC input port, Class 1	annex B.2	C101
C101:	IF S1 THEN O ELSE M.		

Annex F (informative): Bibliography

ETSI I-ETS 300 176: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification".

ETSI ETR 246: "Digital Enhanced Cordless Telecommunications (DECT); Application of DECT Wireless Relay Stations (WRS)".

ETSI 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".

RFC 1661 (1994): "The Point-to-Point Protocol (PPP)".

RFC 1662 (1994): "PPP in HDLC-like Framing".

History

Document history		
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