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Technical Specification

Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 4: Light Data Services; Software Update Over The Air (SUOTA), content downloading and HTTP based applications

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Digital Enhanced Cordless Telecommunications (DECT).

The present document is based on EN 300 175, parts 1 [1] to 8 [8], EN 300 444 [14] and EN 301 649 [15]. General attachment requirements and speech attachment requirements are based on EN 301 406 [11] (replacing TBR 006 [i.2]) and EN 300 176-2 [10] (previously covered by TBR 010 [i.3]). Further details of the DECT system may be found in TR 101 178 [i.1].

The present document has been developed in accordance to the rules of documenting a profile specification as described in ISO/IEC 9646-6 [12].

The information in the present document is believed to be correct at the time of publication. However, DECT standardization is a rapidly changing area, and it is possible that some of the information contained in the present document may become outdated or incomplete within relatively short time-scales.

The present document is part 4 of a multi-part deliverable covering the New Generation DECT as identified below:

- Part 1: "Wideband speech";
- Part 2: "Support of transparent IP packet data";
- Part 3: "Extended wideband speech services";
- Part 4: "Light Data Services; Software Update Over The Air (SUOTA), content downloading and HTTP based applications".**

1 Scope

The present document specifies a set of functionalities of the New Generation DECT.

The functionalities defined in this profile are based on DECT base standard, EN 300 175, parts 1 [1] to 8 [8], DECT Generic Access Profile (GAP), EN 300 444 [14], and DECT Packet Radio Service (DPRS), EN 301 649 [15].

The New Generation DECT provides the following basic new functionalities:

- wideband voice service;
- packet-mode data service supporting Internet Protocol with efficient spectrum usage and high data rates.

All DECT devices claiming to be compliant with this Application Profile will offer at least the basic services defined as mandatory. In addition to that, optional features can be implemented to offer additional DECT services.

The aim of the present document is to guarantee a sufficient level of interoperability and to provide an easy route for development of DECT data applications, with the features of the present document being a common fall-back option available in all compliant to this profile equipment.

DECT does not standardize Internet Application protocols or other high layer data protocols, which are in the scope of other standardization organizations.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) 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 and audio coding and transmission".
- [9] ETSI EN 300 176-1: "Digital Enhanced Cordless Telecommunications (DECT); Test specification; Part 1: Radio".
- [10] ETSI EN 300 176-2: "Digital Enhanced Cordless Telecommunications (DECT); Test specification; Part 2: Audio and speech".
- [11] ETSI EN 301 406: "Digital Enhanced Cordless Telecommunications (DECT); Harmonized EN for Digital Enhanced Cordless Telecommunications (DECT) covering the essential requirements under article 3.2 of the R&TTE Directive; Generic radio".
- [12] ISO/IEC 9646-6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".
- [13] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
- [14] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [15] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".
- [16] ETSI TS 102 527-1: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 1: Wideband Speech".
- [17] ETSI TS 102 527-3: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 3: Extended Wideband Speech Services".
- [18] Void.
- [19] IETF RFC 791 (1981): "Internet Protocol" (STD 51).
- [20] IETF RFC 768 (1980): "User Datagram Protocol" (STD 6).
- [21] IETF RFC 793 (1981): "Transmission Control Protocol" (STD 7).
- [22] IETF RFC 2616: "Hypertext Transfer Protocol -- HTTP/1.1".
- [23] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax" (STD 66).
- [24] IETF RFC 2817: "Upgrading to TLS within HTTP/1.1".
- [25] IETF RFC 1034: "Domain Names - Concepts and Facilities" (STD 13).
- [26] IETF RFC 1035: "Domain Names - Implementation and Specification" (STD 13).
- [27] XHTML™ 1.1 - Module-based XHTML - World Wide Web Consortium Recommendation 31 May 2001.

NOTE: <http://www.w3.org/TR/2001/REC-xhtml11-20010531/>.

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A high Level Guide to the DECT Standardization".
- [i.2] ETSI TBR 006: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".
- [i.3] ETSI TBR 010: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements: Telephony applications".
- [i.4] ETSI TS 102 527-2: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 2: Support of transparent IP packet data".
- [i.5] The Broadband Forum's (formerly DSL-Forum) Technical Report 069 (TR-069): "Technical Reports for a Customer Premises Equipment (CPE) WAN Management Protocol".
- [i.6] Web pages of the Unicode Consortium.

NOTE: <http://www.unicode.org/>.

- [i.7] IETF RFC 3629 (2003): "UTF-8, a transformation format of ISO 10646".
- [i.8] IEEE 802.3: "IEEE Standard for Information technology - Specific requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications" (also known as ISO/IEC 8802-3).
- [i.9] IEEE 802.5: "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 5: Token Ring Access Method and Physical Layer Specification" (also known as ISO/IEC 8802-5).
- [i.10] IETF RFC 1661: "The Point-to-Point Protocol (PPP)".
- [i.11] ISO/IEC 8859-1: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 1: Latin alphabet No. 1".
- [i.12] ISO/IEC 8859-2: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 2: Latin alphabet No. 2".
- [i.13] ISO/IEC 8859-15: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 15: Latin alphabet No. 9".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 301 649 [15] and the following apply:

distributed application: application available to the user on a DECT handset, for which part of the code (behaviour) and/or data is located on the handset (local tier) and part of it is located in the network (remote tier), and more specifically on one or more HTTP servers hosted by-or on behalf of-the FP's vendor

downloading server: See Software upgrade downloading server.

Light Data Services (LDS): basic DECT data services with limited data rate and simplified implementation

Management Server (MS): See Software upgrade management server.

software package: set of files sharing the same version identifier, and needed by the PP for installing or upgrading an application or a firmware

NOTE: The software package is often simply referred to as the "software".

software upgrade Downloading Server (DS): site of a PP vendor, or operated on behalf of a PP vendor, from where the software image releases can be downloaded

software upgrade Management Server (MS): site of a PP vendor, or operated on behalf of a PP vendor, where information about new software image releases for handsets, and their locations (on the downloading server) can be found

Software Upgrade Over The Air (SUOTA): capability to upgrade the Software or the Firmware in the PP by means of downloading it from the FP via the DECT air interface

software version identifier: parameter that identifies a software package, including the software package version

NOTE: From PP to FP, this parameter identifies the currently installed software package. From FP to PP it identifies the software package to be installed as a result of the upgrade (and is shared by all the files needed for the upgrade). Details and examples are provided in clause 7.5.5.2.1.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 301 649 [15] and the following apply:

C	For conditional to support (process mandatory)
I	For irrelevant or out-of-scope (provision optional, process optional), not subject for testing
M	For mandatory to support (provision mandatory, process mandatory)
n	Current requested file number (value of the "fileNumber" parameter in the current "Handset Version indication" command)
N/A	For not-applicable (in the given context the specification makes it impossible to use this capability)
N_f	Number of files to be downloaded for a given Software upgrade ($1 \leq N_f \leq 15$).
O	For optional to support (provision optional, process mandatory)
O.x	Option comprising number of items
X	Excluded, not allowed

The symbols defined in this clause are applied for procedures, features, and services in the present document if not explicitly otherwise stated. The interpretation of status columns in all tables is as follows:

- 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 [13].

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 301 649 [15] and the following apply:

CLIP	Calling Line Identification Presentation
CLSS	ConnectionLess Supplementary Service
D-GMEP	DPRS Generic Media Encapsulation Protocol
DPRS	DECT Packet Radio Service
DS	Download(ing) Server
GAP	Generic Access Profile
GMCI	Generic Media Context Identifier
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
LDS	LightData Services
MS	Management Server
SSL	Secure Sockets Layer
SUOTA	Software Upgrade Over The Air
TLS	Transport Layer Security
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
XHTML	eXtensible HyperText Markup Language
XML	eXtensible Markup Language

4 Description of services

4.1 Services covered by the present document

4.1.1 Introduction

The present document defines a set of what has been named "Light Data Services". Light Data Services are packet mode data services for specific applications, based on DPRS [15], and designed to be implementable using simplified operation modes.

The following Light Data Services are defined by the present document:

- Software Upgrade Over The Air (SUOTA); SUOTA may be automatic, user initiated, or possibly pushed from the management server.
- Binary content download; this is used in SUOTA for the actual software download, and can also be used to define proprietary distributed applications to be used on handsets.
- HTTP based applications; this is intended to allow the design of DECT specific applications based on a limited browsing functionality.

Further Light Data Services may be created by further releases of the present document, or by other DECT specifications.

4.1.2 Application scenario

The Light Data Services defined by the present document have been designed as a complement to voice service terminals. Therefore, the expected scenario is that PPs and FPs implementing the present specification, are also implementing one of the DECT voice services. The services defined by the present document have been optimized to be a natural complement of New Generation DECT; part 1: wideband speech [16], and New Generation DECT: part 3: extended wideband speech services [17]. However, it is also possible the use the Light Data Services in combination with plain GAP [14] terminals.

The application scenario assumes that there is a data connection at the DECT FP that allows the connectivity to external application servers that participate in the service from application point of view. Such data connectivity is typically via the Internet. However, other scenarios of connectivity may exist, including the case when the FP incorporates locally the network side application server. The network side implementation of the scenario is out of the scope of DECT standardization. However, the descriptions given in the present document will assume the most expected case of data connectivity via the Internet, and remote application servers located at any internet location. Other cases, as exotic connectivity or local implementation of the network side server are adaptation of the general scenario, without impact on the DECT air interface protocols.

4.2 Light Data Services Protocol architecture

The common characteristic of all Light Data Services defined by the present document is the use of the DPRS [15], generic media encapsulation interworking mode (DPRS [15], clause B.8). The generic media encapsulation is a DPRS facility that allows the direct transportation of multiple application protocols. In the case of the Light Data Services defined in the present document, the application protocol is HTTP (as defined by RFC 2616 [22]) supporting only the modes defined by DPRS [15], clause B.8.

Another characteristic of the protocol architecture defined in the present document is that the application protocol is transported without the use of any transport layer protocol (TCP [21] or UDP [20]). This approach, that has been chosen in order to simplify implementations, relies on the request/response nature of the application protocol and requires some collaboration from it in order to perform the tasks normally done by the transport layer (TCP).

The result of the approach is that PPs do not need to implement the TCP protocol.

4.2.1 Data protocol reference configuration

Figures 1 and 2 define the U-plane and C-plane protocol stacks used in the Light Data Services defined by the present document.

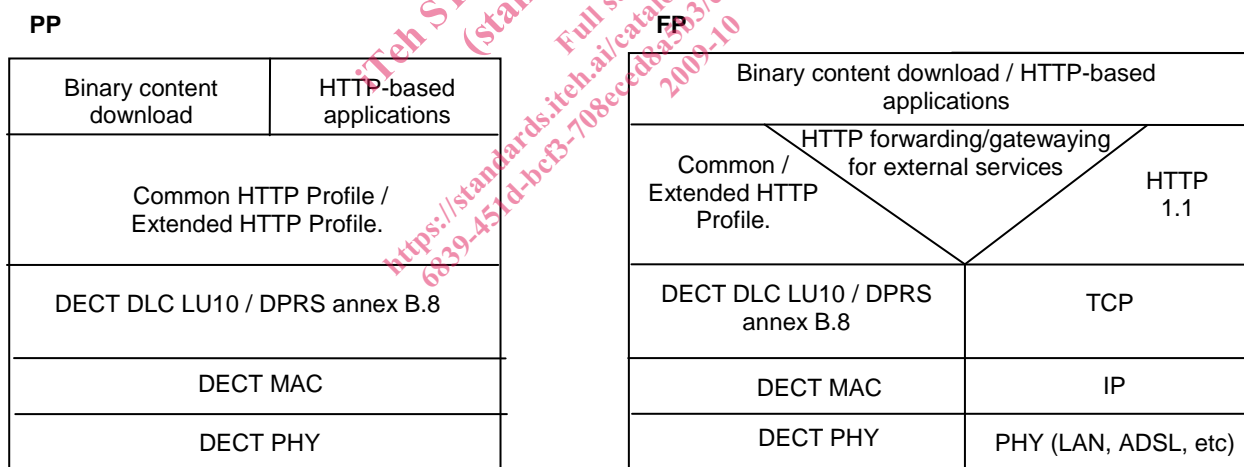


Figure 1: Reference model of the U-plane protocol stack