



Digital Enhanced Cordless Telecommunications (DECT); Study on URLLC use cases of vertical industries for DECT evolution and DECT-2020

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Foreword

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

The present document presents a study of use cases and vertical scenarios for Ultra-Reliable Low-Latency Communications (URLLC) based on different development paths evolving DECT technology.

The present document is a preparation of follow-up technical specifications within DECT, DECT ULE, DECT evolution and DECT-2020.

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Introduction

The present document has been produced by ETSI TC Digital Enhanced Cordless Telephony (DECT) Working Group (WG) Ultra-Reliable Low-Latency Communications (URLLC).

1 Scope

The present document presents a study of use cases and vertical scenarios for Ultra-Reliable Low-Latency Communications (URLLC) intended to be used as base requirements for evolving DECT.

The proposed use cases can be classified as belonging to the following three major application areas:

- Home and Building Automation, including Smart Living;
- Industry automation - Factories of the Future, Industry 4.0;
- Media and entertainment industry - Programme Making and Special Events (PMSE).

The identified scenarios are intended to be implementable under 5G technology assumptions and timeframe. However some of them may also be implementable enhancements of current DECT technology.

By 5G technology assumptions, it is meant state of the art radio interfaces based on OFDM with optional use of MIMO.

The present document also describes the methodology and sources used for the identification of use cases, and describes the required DECT standard specifications for the implementation of the different evolution paths.

The present document is a preparation of follow-up technical specifications within DECT, DECT ULE, DECT evolution and DECT-2020.

2 References

2.1 Normative references

Normative references are not applicable in the present document.

2.2 Informative references

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

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

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

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3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI EN 300 175-1 [i.1] and ETSI TR 121 905 [i.27] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in ETSI EN 300 175-1 [i.1] and ETSI TR 121 905 [i.27] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 300 175-1 [i.1], in ETSI TR 121 905 [i.27] and the following apply:

| | |
|------|---|
| AR | Augmented Reality |
| A/V | Audio/Video |
| CCI | Culture and Creative Industry |
| DL | Downlink |
| IP | Internet Protocol |
| IEEE | Institute of Electrical and Electronics Engineers |
| IEM | In-Ear Monitor |
| PA | Public Address |
| PER | Packet Error Rate |
| PLMN | Public Land Mobile Network |
| PMSE | Programme Making and Special Events |
| PTP | Precision Time Protocol |
| SLA | Service Level Agreement |
| UE | User Equipment |
| UL | Uplink |
| VR | Virtual Reality |

4 Overview, general concepts and methodology

4.1 Overall intention and initial assumptions

The present document was conceived as part of the initial studies for DECT-2020, a 5G radio technology intended to be the long-term evolution of DECT. DECT-2020 is assumed to be based on a new radio interface, with flexibility to use state of the art concepts and paradigms such as OFDM and MIMO. The only fundamental initial limitations were that:

- 1) the technology should be for license-exempt operation;
- 2) should be able to operate over existing DECT bands with minimum disturbance to existing DECT equipment and over additional frequency ranges which might show up in future; and
- 3) should have a coverage area compatible with the transmission power levels of current DECT.

Although not explicitly stated, it was found convenient targeting the technology to areas not currently served by the existing major developments of cellular and WLAN [i.23] technologies. From the very beginning the area of URLLC (Ultra Reliable Low Latency Communications) was identified as a primary target due to its foreseen importance and the fact that it is not well served by existing wireless technology standards. Although 3GPP is targeting similar area in its 3GPP-5G standardization program, it is also clear that there will be enough scenarios and use cases clearly requiring or preferring solutions based on license-exempt operation of wireless networks deployed and operated by the end user.

Three major application areas have been identified with detailed scenarios and use cases consistent with the expected range of DECT evolution and DECT-2020 radio technologies. These are:

- Home and Building Automation, including Smart Living;
- Industry automation - Factories of the Future, Industry 4.0;
- Media and entertainment industry - Programme Making and Special Events (PMSE).