Irish Standard Recommendation
S.R. CEN/TR 16671:2014

Information technology - Authorization of mobile phones when used as RFID interrogators

S.R. CEN/TR 16671:2014

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Information technology - Authorization of mobile phones when used as RFID interrogators

Technologies de l'information - Autorisation des téléphones mobiles utilisés comme lecteurs RFID

Informationstechnik - Autorisierung von Mobilfunkgeräten als RFID-Lesegeräte

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Foreword

This document (CEN/TR 16671:2014) has been prepared by Technical Committee CEN/TC 225 “AIDC technologies”, the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This Technical Report is one of a series of related deliverables, which comprise mandate 436 Phase 2. The other deliverables are:

— EN 16570, *Information technology — Notification of RFID — The information sign and additional information to be provided by operators of RFID application systems*

— EN 16571, *Information technology — RFID privacy impact assessment process*

— EN 16656, *Information technology - Radio frequency identification for item management - RFID Emblem (ISO/IEC 29160:2012, modified)*

— CEN/TR 16684, *Information technology — Notification of RFID — Additional information to be provided by operators*

— CEN/TS 16685, *Information technology — Notification of RFID — The information sign to be displayed in areas where RFID interrogators are deployed*

— CEN/TR 16669, *Information technology — Device interface to support ISO/IEC 18000-3 Mode 1*

— CEN/TR 16670, *Information technology — RFID threat and vulnerability analysis*

— CEN/TR 16672, *Information technology — Privacy capability features of current RFID technologies*

— CEN/TR 16673, *Information technology — RFID privacy impact assessment analysis for specific sectors*

— CEN/TR 16674, *Information technology — Analysis of privacy impact assessment methodologies relevant to RFID*

Introduction

In response to the growing deployment of RFID systems in Europe, the European Commission published in 2007 the Communication COM(2007) 96 'RFID in Europe: steps towards a policy framework'. This Communication proposed steps which needed to be taken to reduce barriers to adoption of RFID whilst respecting the basic legal framework safeguarding fundamental values such as health, environment, data protection, privacy and security.

In December 2008, the European Commission addressed Mandate M/436 to CEN, CENELEC and ETSI in the field of ICT as applied to RFID systems. The Mandate M/436 was accepted by the ESOs in the first months of 2009. The Mandate addresses the data protection, privacy and information aspects of RFID, and is being executed in two phases. Phase 1, completed in May 2011, identified the work needed to produce a complete framework of future RFID standards. The Phase 1 results are contained in the ETSI Technical Report TR 187 020, which was published in May 2011.

Phase 2 is concerned with the execution of the standardisation work programme identified in the first phase.

This Technical Report explores developments in the use of mobile phones as RFID interrogators. The integration of Near Field Communication (NFC) in mobile phones, many years ago, has enabled mobile phones for use as RFID interrogators. NFC is generally considered to be a close-coupled mechanism with a defined operating distance of maximum 10 cm. Recently the NFC Forum, amongst other things formed to advance the use of NFC technology by developing specifications, has started developments to extend the support for NFC tag types in the phones to also support tags that are compliant to ISO/IEC 15693 and ISO/IEC 18000-3 Mode 1.

Another recent development is the integration of Ultra High Frequency (UHF) reader chips into mobile phones. That allows using mobile phones as interrogators to read UHF tags, for example UHF tags that are compliant with ISO/IEC 18000-63 or the equivalent GS1 UHF EPC Gen2 standard. It is also realistic to expect that in the future mobile phones might appear that have combined support for both NFC and UHF technology.

These new additions have the potential to increase the read range and might enable NFC and UHF mobile phones to capture data without consent from RFID tags and ID badges compliant with these well-established standards.

By nature mobile phones are connected to the GSM network that provides an access portal to the Internet of Things (IoT). In addition modern mobile phones become equipped with strong processors that have the potential to manipulate data. The ability to use the mobile phone as RFID Interrogators to surreptitiously read data, the increased computing power and the access portal to the IoT can potentially ruin the efficacy of an RFID application.

This Technical Report describes emerging developments in the functionality of mobile phones and analyses the risks that these developments could have on the privacy and security aspects.

1 Scope

The scope of this Technical Report is to explore developments in the use of mobile phones as RFID interrogators. It uses as a datum the communication protocols developed for near field communication, which have a defined level of security. This Technical Report will explore known developments in the use of mobile phones as RFID interrogators including (but not limited to):

— extending NFC phone capabilities to read RFID tags compliant with ISO/IEC 15693 and ISO/IEC 18000-3 Mode 1;

— using mobile phones as interrogators for UHF tags based on ISO/IEC 18000-6 Type C;

— the development of multi-protocol readers capable of switching between high frequency and UHF.

The objective of the Technical Report is to identify specific characteristics associated with mobile phones being used as interrogators with tags that are primarily intended for other purposes. It will identify some potential threats associated with the technology. It will also identify gaps in the standardization process that might need to be addressed to mitigate against such threats.

To counterbalance any negative implications, the Technical Report also identifies real and potential applications that could lead to an accelerated take-up of RFID and the Internet of Things through mobile phones being used as RFID interrogators by individual citizens and organizations.

2 Normative references

Not applicable

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
anti-collision loop
algorithm used to prepare for dialogue between PCD and one or more PICCs out of the total number of PICCs responding to a request command

3.2
contactless
pertaining to the achievement of signal exchange with and supplying power to the card without the use of galvanic elements

EXAMPLE The absence of an ohmic path from the external interfacing equipment to the integrated circuit(s) contained within the card.

3.3
contactless integrated circuit(s) card
card of the card type ID-1 into which integrated circuit(s) have been placed and in which communication to such integrated circuit(s) is done in a contactless manner

[SOURCE: ISO/IEC 7810]