ETSI TR 103 582 V1.1.1 (2019-07)

TECHNICAL REPORT

EMTEL;
Study of use cases and communications involving IoT devices in provision of emergency situations

Reference

DTR/EMTEL-00041

Keywords

emergency, emergency services, IoT, public
safety, security

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Foreword

This Technical Report (TR) has been produced by ETSI Special Committee Emergency Communications (EMTEL).

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Introduction

Since the Internet has matured, society has become more interconnected, as have the devices used to enhance everyday lives. This has led to the emergence of the so-called "Internet of Things" (IoT), in which autonomous devices as well as people act as connected endpoints in a massive network of networks.

The purpose of the present document is to consider communications involving IoT devices in all types of emergency situations, such as emergency calling, mission critical communications, Public Warning System communications and a new domain identified as automated emergency response, and to prepare the potential standardization requirements enabling a safe operation of these communications.

The reader will find in clause 4 a general overview of the topic.

Clause 5 provides a comprehensive state of the art at the date of the present document, covering IoT in emergency communications, as well as emergency handling in IoT communications. It analyses existing standards, communications networks, previous studies and solutions being already deployed.

A set of eight exemplary use cases, presenting different types of communications and applications involving IoT devices for emergency services, is presented in clause 6. The use cases are analysed from the point of view of potential failures putting safety at risk. Potential means to prevent these points of failure are also identified.

Finally, the impact of these use cases on existing or future standards is assessed. A set of potential requirements is proposed in clause 7, for each emergency domain under study, leading to recommendations for the different standardization groups targeted by this study, including SC EMTEL, IoT service platform specification groups and network specification groups.

1 Scope

The present document considers communications involving IoT devices in all types of emergency situations. This includes the use of IoT devices to enhance:

- Emergency calling, e.g. between individuals and emergency authorities/organizations, between emergency authorities/organizations, and between individuals.
- Mission critical communications within emergency services/public safety organizations, e.g. between public safety officers and control centres, between the control centres of different public safety organizations, and between individual public safety officers.
- Public Warning System type communications from authorities to the general public.
- Automated emergency response (new IoT domain) between two IoT devices.

The current state of the art for IoT device communications, especially when relevant to emergency situations, is described and use cases illustrate how such communications can be used to provide additional/enhanced information for communicating parties involved in emergency situations.

The impact of the use cases on the existing emergency, public warning, and mission critical communications is then considered, and recommendations for requirements to existing specifications for each domain are provided.

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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