



**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
Service requirements
for Machine-Type Communications (MTC);
Stage 1
(3GPP TS 22.368 version 15.0.0 Release 15)**



ReferenceRTS/TSGS-0122368vf00

KeywordsGSM,LTE,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2019.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M™ logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	4
1 Scope	5
2 References	5
3 Definitions and abbreviations.....	5
3.1 Definitions	5
3.2 Abbreviations	6
4 Overview of system optimizations for machine-type communications	7
5 MTC communication aspects.....	8
5.1 MTC communication scenarios.....	8
5.1.1 Introduction.....	8
5.1.2 MTC devices communicating with one or more MTC servers	8
5.1.3 MTC devices communicating with each other.....	9
5.2 (void).....	9
6 Categories of features for Machine-Type Communications.....	10
7 Service requirements	11
7.1 Common service requirements	11
7.1.1 General.....	11
7.1.2 MTC Device triggering.....	12
7.1.3 Addressing	12
7.1.4 Identifiers	13
7.1.5 Charging requirements.....	14
7.1.6 Security requirements	14
7.1.7 Remote MTC device management.....	14
7.2. Specific service requirements – MTC Features.....	14
7.2.1 Low Mobility	14
7.2.2 Time Controlled.....	14
7.2.3 Void	15
7.2.4 Void	15
7.2.5 Small Data Transmissions	15
7.2.6 Void	16
7.2.7 Infrequent Mobile Terminated	16
7.2.8 MTC Monitoring	16
7.2.9 Void	17
7.2.10 Secure Connection	17
7.2.11 Void	17
7.2.12 Void	17
7.2.13 Void	17
7.2.14 Group Based MTC Features	17
7.2.14.1 General	17
7.2.14.2 Group Based Policing	17
7.2.14.3 Group Based Addressing.....	17
Annex A (informative): Use cases	19
Annex B (informative): Examples of MTC applications.....	23
Annex C (informative): Change history	24
History	27

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

PREVIEW
iTech STANDARD
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/0b4787e8-c223-42b4-87d6-3ef466e1491b/etsi-ts-122-368-v15.0.0-2019-07>

1 Scope

The present document specifies the service requirements for Network Improvements for Machine Type Communications. In particular it will:

- identify and specify general requirements for machine type communications;
- identify service aspects where network improvements (compared to the current human-to-human oriented services) are needed to cater for the specific nature of machine-type communications;
- specify machine type communication requirements for these service aspects where network improvements are needed for machine type communication.

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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.011: " Service accessibility"
- [3] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".
- [4] ETSI TS 102 690: "Machine-to-Machine communications (M2M); functional architecture".
- [5] ETSI TS 102 921: " Machine-to-Machine communications (M2M); mla, dla, and mld interfaces".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

MTC Device: A MTC Device is a UE equipped for Machine Type Communication, which communicates through a PLMN with MTC Server(s) and/or other MTC Device(s).

Note 1: A MTC Device might also communicate locally (wirelessly, possibly through a Personal Area Network, or hardwired) with other entities which provide the MTC Device "raw data" for processing and communication to the MTC Server(s) and/or other MTC Device(s). Local communication between MTC Device(s) and other entities is out of scope of the present document.

MTC Feature: MTC Features are network functions to optimize the network for use by M2M applications.

MTC Group: A MTC Group is a group of MTC Devices that share one or more MTC Features and that belong to the same MTC Subscriber.

MTC Server: A MTC Server is a server, which communicates to the PLMN itself, and to MTC Devices through the PLMN. The MTC Server can also have an interface which can be accessed by the MTC User. The MTC Server can:

- Provide services for other servers (e.g. The MTC Server is a Services Capability Server 3GPP TS 23.682 [3] for an Application Server [3]), and/or
- Provide services for applications and can host the application (e.g. The MTC Server is an Application Server [3]).

MTC User: A MTC User uses the service provided by the MTC Server.

MTC Subscriber: A MTC Subscriber is a legal entity having a contractual relationship with the network operator to provide service to one or more MTC Devices.

Note 2: Typically a M2M service provider is the party holding subscriptions in order to provide connectivity between MTC Devices and the MTC Server. In practise certain roles can collapse, e.g. the network operator acts as the same time as service provider.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

NIMTC	Network Improvements for Machine Type Communications
MNO	Mobile Network Operator
MTC	Machine-Type Communications

ETSI STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/0b4787e8-c229-42b4-87d6-3ef466e1491b/etsi-ts-122-368-v15.0.0-2019-07>

4 Overview of system optimizations for machine-type communications

Machine-type communication is a form of data communication which involves one or more entities that do not necessarily need human interaction.

A service optimized for machine type communications differs from a service optimized for Human to Human communications. Machine-type communications is different to current mobile network communication services as it involves:

- a) different market scenarios,
- b) data communications,
- c) lower costs and effort,
- d) a potentially very large number of communicating terminals with,
- e) to a large extent, little traffic per terminal.

For the purpose of the present document, the term MTC is used for the purpose to describe use-cases and illustrate the diverse characteristics of machine-type communication services.

The informative annex A gives an overview of MTC use-cases which also illustrate different overload scenarios which will require overload control functions to prevent overload and to differentiate between services offered to different subscribers with different service requirements. In particular, certain MTC services and MTC applications, as exemplified in annex B, are more tolerant and can accept a lower level of performance requirements for its communication services. However, some MTC services will have similar service requirements as current mobile network communication services.

ITeH STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/477e1589-42b4-87d6-3ef466e1491b/etsi-ts-122-368-v15.0.0-2019-07>

5 MTC communication aspects

5.1 MTC communication scenarios

5.1.1 Introduction

For MTC communication the following communication scenarios can be identified:

- a) MTC Devices communicating with one or more MTC Server;
- b) MTC Devices communicating with each other.

5.1.2 MTC devices communicating with one or more MTC servers

The network operator provides network connectivity to MTC Server(s). This applies to MTC Server(s) controlled by the network operator (refer to figure 5-1) or to MTC Server(s) not controlled by the network operator (refer to figure 5-2.)

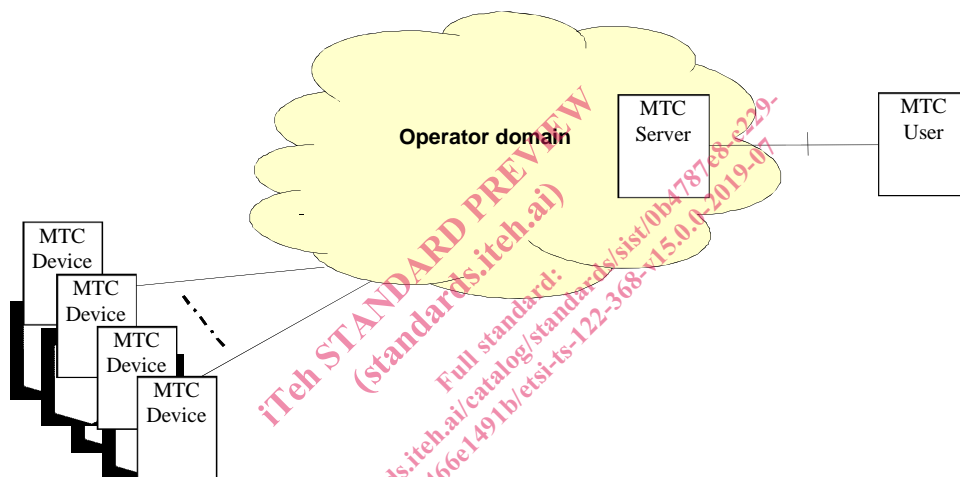


Figure 5-1: Communication scenario with MTC devices communicating with MTC server. MTC server is located in the operator domain.

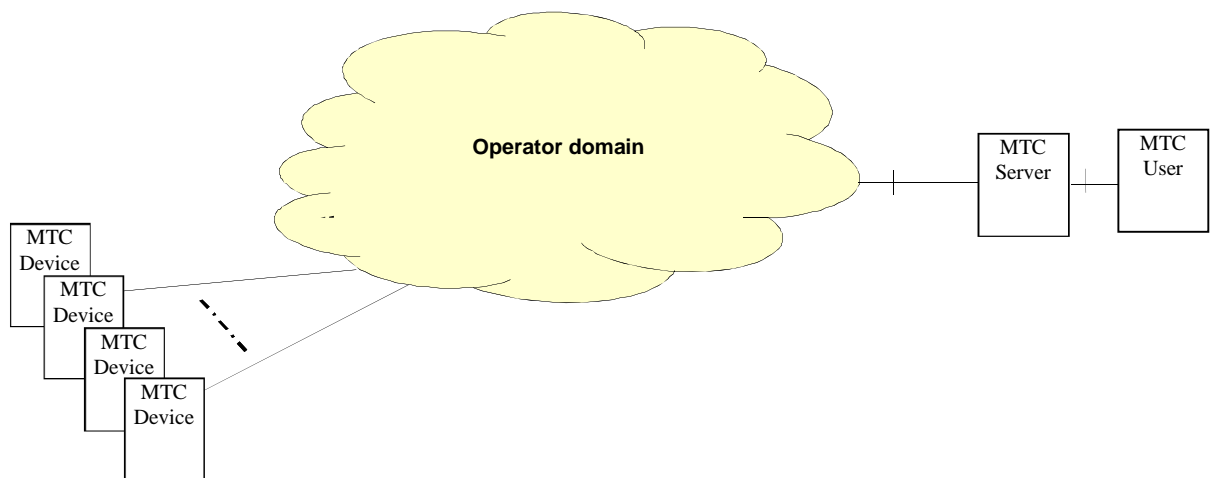


Figure 5-2: Communication scenario with MTC devices communicating with MTC server. MTC server is located outside the operator domain.

The MTC Device and the MTC Server it is communicating with may implement a service enablement framework (e.g. as specified in [4] and [5]) to provide generic functionality for applications. The MTC Device may implement multiple instances of service enablement frameworks, each communicating with a different MTC Server.

Note 1: the standardization of service enablement frameworks is out of scope of 3GPP.

Note 2: as an example, a device can have two (or more) service enablement frameworks, both compliant to the same specific standard or belonging to the same proprietary implementation. Each one has to be peered to a different MTC server.

5.1.3 MTC devices communicating with each other

The communication scenario where the MTC Devices communicate directly without intermediate MTC Server (refer to figure 5-3) is not considered in this release of the specification.

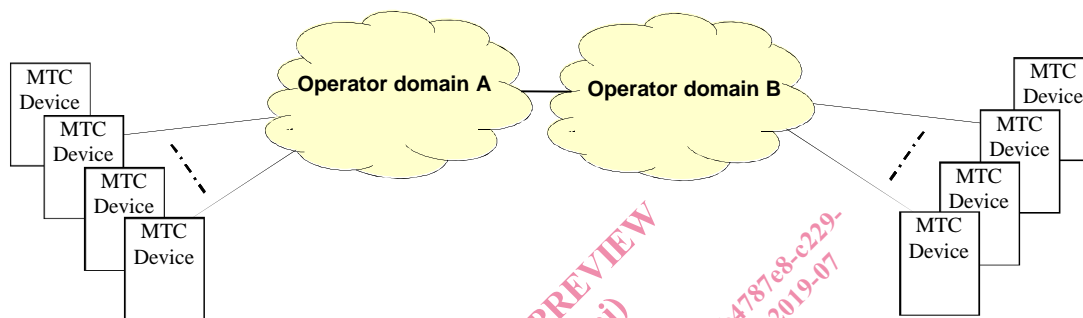


Figure 5-3: MTC Devices communicating directly with each other without intermediate MTC server

5.2 (void)