

ETSI TR 122 986 V16.0.0 (2020-08)



**Universal Mobile Telecommunications System (UMTS);
Study on Service Specific Access Control
(3GPP TR 22.986 version 16.0.0 Release 16)**



Reference

RTR/TSGS-0122986vg00

Keywords

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/CommitteeSupportStaff.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 2020.

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 Report (TR) 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 "**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
Introduction	4
1 Scope	5
2 References	5
3 Definitions, symbols and abbreviations	5
3.1 Definitions	5
3.2 Symbols.....	5
3.3 Abbreviations	5
4 Use Cases	6
5 Considerations.....	6
6 Candidate Requirements.....	6
7 Conclusion.....	7
Annex A: Change history	8
History	9

Foreword

This Technical Report 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.

Introduction

In an emergency situation, like Earthquake or Tsunami, degradation of quality of service may be experienced. Degradation in service availability and performance can be accepted in such situations, but mechanisms are desirable to minimize such degradation and maximize the efficiency of the remaining resources.

When Domain Specific Access Control (DSAC) mechanism was introduced for UMTS, the original motivation was to enable PS service continuation during congestion in CS Nodes in the case of major disaster like an Earthquake or a Tsunami.

In fact, the use case of DSAC in real UMTS deployment situation has been to apply access control separately on different types of services, such as voice and other packet-switched services.

For example, people's psychological behaviour is to make a voice call in emergency situations and it is not likely to change. Hence, a mechanism will be needed to separately restrict voice calls and other services.

As EPS is a PS-Domain only system, DSAC access control does not apply. This SSAC TR identifies specific features useful when the network is subjected to decreased capacity and functionality. Considering the characteristics of voice and non-voice calls in EPS, requirements of the SSAC could be to restrict the voice calls and non-voice calls separately.

For a normal paid service there are QoS requirements. The provider can choose to shut down the service if the requirements cannot be met. In an emergency situation the most important thing is to keep communication channels uninterrupted, therefore the provider should preferably allow for a best effort (degradation of) service in preference to shutting the service down. During an emergency situation there should be a possibility for the service provider also to grant services, give extended credit to subscribers with accounts running empty. Under some circumstances (e.g. the terrorist attack in London on the 7 of July in 2005), overload access control may be invoked giving access only to authorities or a predefined set of users. It is up to national authorities to define and implement such schemes.

1 Scope

This Technical Report (TR) presents the results of the Study on Service Specific Access Control (SSAC). The intent of this Study is to assess the ability of 3GPP specifications to meet requirements identified for Services Specific Access Control. This Study considers the following aspects:

- Study use cases and clarify issues in SSAC in EPS.
- Describe the considerations and the problems with existing access control, which are identified in the use cases
- Identify candidate requirements and aspects for providing SSAC in EPS.

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 TR 23.898: "Access Class Barring and Overload Protection (ACBOP)"

3 Definitions, symbols 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].

3.2 Symbols

For the purposes of the present document, the following symbols apply:

3.3 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].

4 Use Cases

Use case 1

Japanese operators provide 'Disaster Message Board' services whenever a major disaster has happened such as an earthquake, tsunami or typhoon. This service enables the large number of subscribers to access the message board in order to post or retrieve information concerning the safety of individuals in the affected area with their mobile phones during a major disaster.

The human psychological behaviour is to make a voice call in emergency situations. Thus increased voice traffic consumes too much bandwidth for accessing other services such as the Disaster Message Board and/or data services (e.g. SMS).

Hence, a limiting mechanism is required to differentiate bandwidth consuming real-time services (e.g. Voice) from bandwidth-efficient data service to access to e.g. a Disaster Message Board.

Use case 2

As described in the Use case 1 above, subscribers may wish to make voice calls to check on the safety of individuals and it may cause congestion. Under such a situation, prioritised subscribers (e.g. governmental, military civil authorities) and (depending on national regulation) access to emergency services should still be allowed access to EPS, while voice calls for other subscribers are restricted.

5 Considerations

In UMTS, Domain Specific Access Control (DSAC) has been introduced. According to Section 4.1.1 of TR23.898 [x], the original motivation was to enable PS service continuation during congestion in CS nodes.

Although that was the original motivation, operators have been using DSAC to restrict CS calls while permitting PS sessions. Operators want to avoid service discontinuity in the packet data services due to the congestion in the voice calls side. Consequently, the use case of DSAC in a real deployment situation has been to apply access control separately on different types of services, such as voice and other packet-switched services.

The voice services will be provided by MMTEL using IMS in EPS; however the VoIP will be used in the same way as the existing CS-domain voice services (e.g. including Emergency Calls). This means customer experience per "Service" in EPS is not different from UMTS.

It is reasonable that DSAC principles are to be applied in the PS-domain only EPS as well. However, EPS is a PS-Domain only system, so the "Domain Specific" way of access control cannot be applied as it is now. Hence, "Service Specific" Access Control (SSAC) has to be specified and introduced to EPS.

6 Candidate Requirements

The following is the principle for the Service Specific Access Control.

1. The EPS shall provide a capability to apply independent access control for telephony services (MMTEL) and other data services, for mobile originating session requests from idle-mode.
2. The EPS shall provide a capability to assign a service probability factor for each of MMTEL voice and MMTEL video:
 - assign a barring rate (percentage) commonly applicable for Access Classes 0-9;
 - assign a flag barring status (barred /unbarred) for each Access Class in the range 11-15.

SSAC shall not apply to Access Class 10.

3. The SSAC shall be provided by the VPLMN based on operator policy without accessing the HPLMN.
4. The SSAC shall provide mechanisms to minimize service availability degradation (i.e. radio resource shortage) due to the mass simultaneous mobile originating session requests and maximize the availability of the wireless access resources for non-barred services.

7 Conclusion

This Technical Report (TR) on Study on Service Specific Access Control (SSAC) identified the requirements for SSAC and considered the following aspects:

- Use cases were documented and issues clarified for SSAC in EPS.
- Considerations were described as well as problems with existing access control, which are identified in the use cases.
- Candidate requirements and aspects were identified for providing SSAC in EPS.

From this study, it is concluded the following:

- EPS is a PS-Domain only system, so the “Domain Specific” way of access control cannot be applied as it is now. Hence, “Service Specific” Access Control (SSAC) has to be specified and introduced to EPS.

SSAC shall provide mechanisms to minimize service availability degradation (i.e. radio resource shortage) due to the mass simultaneous mobile originating session requests and maximize the availability of the wireless access resources for non-barred services.

It is also concluded that the content of this TR be used as a basis for further work within 3GPP.

Annex A: Change history

Change history											
TSG SA#	SA Doc.	SA1 Doc	Spec	CR	Rev	Rel	Cat	Subject/Comment	Old	New	WI
SP-42	SP-080786	S1-084390	22.986	-	-	Rel-9	-	One-step-approved at SA#42	1.0.0	9.0.0	SSAC
2011-03	-	-	-	-	-	-	-	Update to Rel-10 version (MCC)	9.0.0	10.0.0	
2012-09	-	-	-	-	-	-	-	Updated to Rel-11 by MCC	10.0.0	11.0.0	
2014-10	-	-	-	-	-	-	-	Updated to Rel-12 by MCC	11.0.0	12.0.0	
2015-12	-	-	-	-	-	-	-	Updated to Rel-13 by MCC	12.0.0	13.0.0	
2017-03	-	-	-	-	-	-	-	Updated to Rel-14 by MCC	13.0.0	14.0.0	
2018-06	-	-	-	-	-	-	-	Updated to Rel-15 by MCC	14.0.0	15.0.0	
SA#88e	-	-	-	-	-	-	-	Updated to Rel-16 by MCC	15.0.0	16.0.0	

History

Document history		
V16.0.0	August 2020	Publication