|  |
| --- |
| 3GPP TR 33.884 V0.1.0 (2022-07) |
| Technical Report |
| 3rd Generation Partnership Project;Technical Specification Group Services and System Aspects;Study on security of application enablement aspects for subscriber-aware northbound API access (FS\_SNAAPPY)(Release 18) |
|   |
|  | 3GPP-logo_web |
|  |
| The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP.The present document has not been subject to any approval process by the 3GPPOrganizational Partners and shall not be implemented.This Specification is provided for future development work within 3GPPonly. The Organizational Partners accept no liability for any use of this Specification.Specifications and Reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices. |

|  |
| --- |
|  |
| ***3GPP***Postal address3GPP support office address650 Route des Lucioles - Sophia AntipolisValbonne - FRANCETel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16Internethttp://www.3gpp.org |
| ***Copyright Notification***No part may be reproduced except as authorized by written permission.The copyright and the foregoing restriction extend to reproduction in all media.© 2022, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).All rights reserved.UMTS™ is a Trade Mark of ETSI registered for the benefit of its members3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational PartnersLTE™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational PartnersGSM® and the GSM logo are registered and owned by the GSM Association |

Contents

Foreword 4

1 Scope 6

2 References 6

3 Definitions of terms, symbols and abbreviations 6

3.1 Terms 7

3.2 Symbols 7

3.3 Abbreviations 7

4 Assumptions 7

4.1 Architectural assumptions 7

5 Key issues 7

5.1 Key Issue #1: Authentication and authorization of UE in UE originated API invocation 7

5.1.1 Key issue details 7

5.1.2 Threats 8

5.1.3 Potential security requirements 8

5.X Key issue #X: <Title> 8

5.X.1 Key issue details 8

5.X.2 Threats 8

5.X.3 Potential security requirements 8

6 Proposed solutions 8

6.0 Mapping of solutions to key issues 8

6.Y Solution #Y: <Title> 8

6.Y.1 Introduction 8

6.Y.2 Solution details 9

6.Y.3 Evaluation 9

Annex <X>: Change history 10

For definitive guidance on drafting 3GPP TSs and TRs, see [3GPP TS 21.801](http://www.3gpp.org/DynaReport/21801.htm) supplemented by the 3GPP web page <http://www.3gpp.org/specifications-groups/delegates-corner/writing-a-new-spec>.

Ensure all blue guidance text is removed before submitting the TS/TR to the TSG for approval.

# 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.

In the present document, modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

**can** indicates that something is possible

**cannot** indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

**will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

**might not** indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

**is** (or any other verb in the indicative mood) indicates a statement of fact

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

# 1 Scope

The scope of present document is based on the requirements for SNA (TS 22.261 clause 6.10.2) [xx] and on the Study on application enablement aspects for subscriber-aware northbound API access (TR 23.700-95) [yy].

The objective of this study is to:

1. Identify potential new security requirements related to API invocation (such as user authorization) and define potential solutions to fulfil these requirements. This encompasses:

- Whether and how CAPIF functions can determine the resource owner upon CAPIF invocation

- Whether and how CAPIF can support obtaining authorization from the resource owner

- Whether and how CAPIF can support revocation of authorization by the resource owner

- Whether and how CAPIF can support security procedures with the aim to reduce authorization inquiries for a nested API invocation

 The study is not exclusively tailored to CAPIF, but should align with widely deployed authorization frameworks.

2. Identify potential security requirements for APIs used in SNAAPP and define potential solutions to fulfil these requirements.

 This objective includes UE-originated API invocation.

# 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 22.261: "Service requirements for the 5G system".

…

[x] <doctype> <#>[ ([up to and including]{yyyy[-mm]|V<a[.b[.c]]>}[onwards])]: "<Title>".

It is preferred that the reference to 21.905 be the first in the list.

# 3 Definitions of terms, symbols and abbreviations

This clause and its three subclauses are mandatory. The contents shall be shown as "void" if the TS/TR does not define any terms, symbols, or abbreviations.

## 3.1 Terms

For the purposes of the present document, the terms given in 3GPP 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 3GPP TR 21.905 [1].

Definition format (Normal)

**<defined term>:** <definition>.

**example:** text used to clarify abstract rules by applying them literally.

## 3.2 Symbols

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

Symbol format (EW)

<symbol> <Explanation>

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP 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 3GPP TR 21.905 [1].

Abbreviation format (EW)

<ABBREVIATION> <Expansion>

# 4 Assumptions

Editor's note: This clause will capture the assumptions for this work

## 4.1 Architectural assumptions

Editor's note: This clause will capture the architectural assumptions for this work

# 5 Key issues

## 5.1 Key Issue #1: Authentication and authorization of UE in UE originated API invocation

### 5.1.1 Key issue details

One of the objectives of the study on SNAAPP security is to address the security aspects of UE originated API invocation. Corresponding stage 1 requirement, in TS 22.261 [2] clause 6.10.2, states that “*provide a UE with secure access to APIs (e.g. triggered by an application that is not visible to the 5G system), by authenticating and authorizing the UE*”. From this requirement, it is understood that the applications running on the UE are not visible to 3GPP system and the UE needs to be authenticated and authorized.

In addition to authentication and authorization of the invoker UE, the communication needs to be secured.

This KI is to investigate the invoker UE authentication and authorization and communication security for the UE originated API invocation procedure.

Editor’s Note: This key issue needs to be finalized after alignment with SA6 and possibly SA1.

### 5.1.2 Threats

If the API invoker UE is not authenticated and authorized, then unauthorized entities can impersonate authorized entities to learn sensitive data about the target UE from the 3GPP network or to affect service experience of the target UE negatively.

If the communication is not secured, then sensitive information leakage to unauthorized entities can be possible or the data in transfer can be altered so that the target UE is negatively affected.

### 5.1.3 Potential security requirements

The API invoker UE shall be authenticated and authorized, and the communication shall be protected against confidentiality, integrity and replay attacks.

## 5.X Key issue #X: <Title>

### 5.X.1 Key issue details

### 5.X.2 Threats

### 5.X.3 Potential security requirements

# 6 Proposed solutions

## 6.0 Mapping of solutions to key issues

Table 6.0-1: Mapping of solutions to key issues

|  |  |  |  |
| --- | --- | --- | --- |
| Solutions | KI#1 | KI#2 | KI#3 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## 6.Y Solution #Y: <Title>

### 6.Y.1 Introduction

### 6.Y.2 Solution details

### 6.Y.3 Evaluation

Annex <X>:
Change history

|  |
| --- |
| **Change history** |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
|  |  |  |  |  |  |  |  |

Change history of this template:

|  |  |  |
| --- | --- | --- |
| 2001-07 | Copyright date changed to 2001; space character added before TTC in copyright notification; space character before first reference deleted. | 1.3.3 |
| 2002-01 | Copyright date changed to 2002. | 1.3.4 |
| 2002-07 | Extra Releases added to title area. | 1.3.5 |
| *2002-12* | *"TM" added to 3GPP logo.* | *1.3.6* |
| *2003-02* | *Copyright date changed to 2003.* | *1.3.7* |
| *2003-12* | *Copyright date changed to 2004. Chinese OP changed from CWTS to CCSA* | *14.0* |
| *2004-04* | *North American OP changed from T1 to ATIS* | *1.5.0* |
| *2005-11* | *Stock text of clause 3 includes reference to 21.905.*  | *1.6.0* |
| *2005-11* | *Caters for new TSG structure. Minor corrections.* | *1.6.1* |
| *2006-01* | *Revision marks removed.* | *1.6.2* |
| *2008-11* | *LTE logo line added, © date changed to 2008, guidance on keywords modified; acknowledgement of trade marks; sundry editorial corrections and cosmetic improvements* | *1.7.0* |
| *2010-02* | *3GPP logo changed for cleaner version, with tag line;LTE-Advanced logo line added; © date changed to 2010;editorial change to cover page footnote text;trade marks acknowledgement text modified;additional Releases added on cover page;proforma copyright release text block modified* | *1.8.0* |
| *2010-02* | *Smaller 3GPP logo file used.* | *1.8.1* |
| *2010-07* | *Guidance note concerning use of LTE-Advanced logo added.* | *1.8.2* |
| *2011-04-01* | *Guidance of use of logos on cover page modified; copyright year modified.* | *1.8.3* |
| *2013-05-15* | *Changed File Properties to MCC macro default.* *Removed R99, added Rel-12/13.**Modified Copyright year.**Guidance on annex X Change history.* | *1.8.4* |
| *2014-10-27* | *Updated Release selection on cover. In clause 3, added "3GPP" to TR 21.905.* | *1.8.5* |
| *2015-01-06* | *New Organizational Partner TSDSI added to copyright block.Old Releases removed.* | *1.9.0* |
| *2015-12-03* | *Provision for LTE Advanced Pro logo Update copyright year to 2016* | *1.10.0* |
| *2016-03-08* | *Standarization of the layout of the Change History table in the last annex.(Unreleased)* | *1.11.0* |
| *2016-06-15* | *Minor adjustment to Change History table heading* | *1.11.1* |
| *2017-03-13* | *Adds option for 5G logo on cover* | *1.12.0* |
| *2017-05-03* | *Smaller 5G logo to reduce file size* | *1.12.1* |
| *2019-02-25* | *Replacement of frames on cover pages by in-line text.**Clarification of help text on when to use 5G logo.Removal of defunct keywords frame on page 2.Add Rel-16, Rel-17 options, eliminated earlier, frozen, Releases (cover page, below title)Corrections to some guidance text, addition of guidance text concerning automatic page headers under Word 2016 ff.Use of modal auxiliary verbs added to Foreword.More explicit guidance on Bibliography and Index annexes.Converted to .docx format.* | *1.13.0* |
| *2019-09-12* | *Cover page table outline shown dotted for ease of logo selection. (Author to hide outline after logo selection.) User now needs to delete whole table rows instead of individual cells, which proved to be tricky.**Change of style for "notes" in the Foreword to normal paragraphs.**Insertion of new bookmarks, correction of location of existing bookmarks. (To improve navigation.)**Improvements to guidance text.* | *1.13.1* |
| *2021-06-18* | *Provision for 5G Advanced logo Update copyright year to 2021Additional guidance on the use of Heading 8/9 in annexes C, D and X.* | *1.14.0* |