3GPP TSG-WG3 Meeting #123 S3-252957

**Goteborg, Sweden; 25 – 29 August 2025** **(revision of S3-252640)**

**Source: KDDI, AT&T, Boost Mobile Network, Deutsche Telekom, SK Telecom, SoftBank, TOYOTA MOTOR CORPORATION, Rakuten Mobile, Verizon, vivo, Vodafone, NEC, Philips, Ericsson, Telefonica**

**Title: New SID on Security Aspects for IMS resiliency**

**Document for: Approval**

**Agenda Item: 6.1.2**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on Security Aspects for IMS resiliency

Acronym: FS\_IMSRE\_SEC

Unique identifier: TBD

Potential target Release: Rel-20

# 1 Impacts

{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  |  |  | X |  |
| No | X | X | X |  | X |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study  |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| N/A | N/A | N/A | N/A |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 1080002 | Study on IMS resiliency | Define scenario of IMS resilience |

# 3 Justification

When the network error occurs, e.g. a maintenance-induced router misconfiguration in the national transport network, SIP registration requests are dropped, triggering massive retransmissions that congested IMS and then nationwide IMS. As IMS couldn’t process, the congestion spread to the PCF as UEs’ retransmissions. The overload PCF responded with errors to SMF, prompting further UE retries and sustaining the congestion, which disrupted voice and data services.

Even if the service is provided normally, when congestion occurs and the response from IMS/5GC becomes slow, massive UEs attempts to register to the network in cycles, increasing the load in the network and leading to a cascade of failures. It goes without saying that strengthening the resiliency of IMS is necessary as MNOs continue to operate it over the coming years.

When a UE subscribes to IMS service, it sends an authentication request to 5GC first, then to the IMS in the same PLMN second.

Additionally, the IMS AKA procedures for SIP Registration involve multiple steps that further increase the load on the UDR. Simplifying these processes , if possible, can help reduce signaling and prevent congestion in the network.

As described above, when congestion occurs, a large number of UEs may attempt repeated authentication. This significantly increases the load in the network. To mitigate the impact, study is needed to decrease the signaling burden resulting from IMS registration procedures. Given the scale of millions of UEs, even a marginal reduction in signaling could significantly lighten the load, thereby helping to alleviate congestion and maintain network stability.

# 4 Objective

The study aims to investigate and identify enhancements on 5GS and/or IMS to support the network.

The main objectives of this study include:

 WT1: Identify potential IMS congestion scenarios which are related to multiple IMS registration considering TR 29.867.

WT2: Study the potential solutions taking into account existing solutions addressing the identified congestion scenarios.

NOTE 1: The potential solutions will not weaken the IMS security.

NOTE 2: It is assumed that the same PLMN has control of both the IMS system and 5GC.

## TU estimates and dependencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Task ID | TU Estimate(Study) | TU Estimate(Normative) | RAN/SA2 Dependency(Yes/No/Maybe) | Inter Work Tasks Dependency |
| **WT1** | **1** | **0.25** | **Yes** |  |
| **WT2** | **3** | **0.75** | **Yes** |  |

Total TU estimates for the normative phase: 1

Total TU estimates: 5

# 5 Expected Output and Time scale

***{If this WID covers both stage 2 and stage 3, clearly indicate the different completion dates.}***

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| Internal TR | 33.xyz | Study on Security Aspects of IMS resiliency | SA#110 (Dec 25) | SA#111 (Mar 26) |  |

# 6 Work item Rapporteur(s)

TBD

# 7 Work item leadership

SA3

# 8 Aspects that involve other WGs

SA2 for the Architecture aspects.

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| KDDI |
| AT&T |
| Boost Mobile Network |
| Deutsche Telekom |
| SK Telecom |
| SoftBank |
| TOYOTA MOTOR CORPORATION |
| Rakuten Mobile |
| Verizon |
| vivo |
| Vodafone |
| NEC |
| Philips |
| Ericsson |
| Telefonica |