3GPP TSG SA WG2 Meeting #170 S2-2506688r03

25 - 29 August, 2025, Goteborg, Sweden was SP-250857

**Source: Nokia (Moderator) [China Mobile, NEC, Deutsche Telekom, China Unicom, AT&T, Telefonica, T-Mobile USA, Orange, KPN, BT, SKT, Rakuten Mobile, LG Uplus, KDDI, Boost Mobile Network, China Broadnet, Turkcell, Huawei, vivo, ZTE, CATT, OPPO, Xiaomi, Honor, Telecom Italia]**

**Title: New SID: Study on IMS Architecture Enhancement**

**Document for: Approval**

**Agenda Item: 30.2**

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 IMS Architecture Enhancement

Acronym: FS\_ARCH\_enIMS

Unique identifier: TBC

Potential target Release: Rel-20

# 1 Impacts

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

# 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

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| FS\_6G\_REQ | SA WG1 | 1050110 | Study on 6G Use Cases and Service Requirements; Stage 1 |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 1060079 | Study on 6G Scenarios and Requirements | The architecture related requirements from RAN may need to be taken into account. |
|  | RAN WG studies (TBD) |  |

# 3 Justification

Empowered by the rapid development of advanced technologies such as Generative Artificial Intelligence (Gen AI), Large Language Models (LLMs) and AI Agent, and the emerging of new types of terminals such as AI glasses and embodied robots, operators will be able to provide various personalized and enriched communication services. 3GPP SA1 has started the FS\_6G\_REQ study item to identify use cases and service/operational requirements for new multi-media services. New use cases, e.g. intelligent communication assistant (TR 22.870 6.10), intelligent immersive calling service (S1-252487, approved), may bring new network requirements to both IP-CAN and IMS network. The approved S1-252891 also includes the requirement that IMS systems shall provide improved system capabilities for the Multimedia Telephony Service.

While looking into existing IMS architecture and mechanisms, several aspects could be enhanced to better support both existing and aforementioned new services, e.g.:

- **Service triggering efficiency**: IMS relies on iFC (initial Filter Criteria) mechanism for service triggering, which requires any AS which may potentially be used during the call shall be triggered at initial INIVTE request. This may lead to waste of network resources since the invoked AS may not be used at all during the call.

- **Service triggering flexibility**: Again due to iFC mechanism, all the ASes are triggered in a predefined order. When a new service is deployed, operators have to figure out (manually) a proper place to insert the new service on the iFC chain, then the order of the services cannot be changed, which significantly reduces the flexibility for services interaction in real time. Also, after the initial INVITE exchange, there is no way to add new AS into the call, which reduces the service flexibility further.

- **Signalling cost and latency**: In IMS network, when an AS send a SIP message executing service logic, the SIP message and relevant responses will be handled by every IMS entity stays on the signalling path. Therefore the more SIP entities in the network, the more message handling required. This not only increases the signalling cost but also increases the latency of service execution.

Editor's note: The justification text will be updated based the finally agreed objectives.

# 4 Objective

Editor's note: The objectives have been updated based on various inputs received through NWM and does not reflect consensus to study all of them. They will be further updated during SA2 meeting.

This study aims to enhance the IMS network architecture for both existing services and new service requirements identified in 6G.

All work tasks aim at supporting multi-vendor interoperable interfaces.

This study includes the following work tasks:

WT#1: Study whether and how to simplify and enhance the IMS architecture including:

WT#1.1: simplify/optimize the IMS control plane by e.g., converging P/S/I-CSCF and/or introducing service based interfaces.

WT#1.2: simplify/optimize the IMS media plane by converging MF, MRF and IMS-AGW.

WT#1.2a: introduce service based interface for replacing H.248

WT#1.3: optimise the interaction between AS(s) and CSCF for triggering of AS and simplify AS chaining.

WT#1.3a: improve AS availability, redundancy, flexibility and scalability

WT#1.4: whether and how to eliminate the need for user authentication by IMS as the core network has already authenticated the UE.

NOTE x: WT#1.4 will need close coordination with SA WG3

WT#2: Whether and how to enhance the IMS architecture and procedures to support new services. This WT includes studying the following aspects:

WT#2.1: introduce new capabilities to support new services defined by SA WG1.

WT#2.2: whether and how to support offloading of media resource and capabilities from the UE(s) to IMS network besides rendering capability supported in Rel-19.

NOTE x: WT2 will be properly scoped when the related service requirements from SA1 will reach appropriate level of maturity.

WT 3: whether and how to enhance the exposure of IMS capabilities including exposure of the IMS media layer to enhance service experience and to open up further development of IMS services by 3rd parties.

NOTE 1: This study assumes that the UNI signalling and inter PLMN IMS interfaces are supported for backward compatible consideration and IMS architecture remains access agnostic. An IMS network per the output of the study continues serving properly legacy terminals.

NOTE 2: WT#1 will be more focusing on IMS optimization based on the existing IMS architecture.

NOTE 3: The enhanced IMS will support regulatory services in backward-compatible way.

During the study, the progress and results of 3GPP TR 22.870 (SA1 study) shall be taken into account.

NOTE 4: The content of the SID will be further refined on SA2 meeting.

## TU estimates and dependencies

TBD.

# 5 Expected Output and Time scale

|  |
| --- |
| 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 |
|  |  |  |  |  |  |
| TR | 23.xxx | Study on IMS Architecture Enhancement | TSG#xx(TBD) | TSG#xx(TBD) | {<FamilyName>, <GivenName>, <Company>, <email address>. See Note 2} |

NOTE: The timeline for the study will be decided at SA#110 (Dec 2025)

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |
|  |  |  |  |

# 6 Work item Rapporteur(s)

TBD

# 7 Work item leadership

SA2

# 8 Aspects that involve other WGs

Potential security impact to be covered by SA3/SA3-LI.

Potential multimedia and codecs aspects to be covered by SA4.

Potential charging and OAM impact to be covered by SA5.

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| AT&T? |
| Boost Mobile Network? |
| BT? |
| CATT? |
| China Broadnet? |
| China Mobile? |
| China Unicom? |
| Deutsche Telekom? |
| Honor? |
| Huawei? |
| KDDI? |
| KPN? |
| LG Uplus? |
| NEC? |
| OPPO? |
| Orange? |
| Rakuten Mobile? |
| SKT? |
| Telefonica? |
| T-Mobile USA? |
| Turkcell? |
| Vivo? |
| Xiaomi? |
| ZTE? |
| Telecom Italia? |
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