3GPP TSG|SA WG2 Meeting #169 S2-2505647r01

19 - 23 May, 2025, Fukuoka, Japan (revision of S2-2504686r02)

**Source: ZTE (Moderator)**

**Title: New Study on Architecture for 6G System**

**Document for: Approval**

**Agenda Item: 30.7**

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 Architecture for 6G System

{Free text. It has to be the same as in the "Title:" section above. Studies have to start by "Study on"}

Acronym: FS\_6G\_ARCH

Unique identifier: TBC

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 | x | x | x |  |
| No |  |  |  |  |  |
| 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

|  |
| --- |
| 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

The 5G network architecture marked a significant leap forward compared to previous generations, with its adoption of a Service-Based Architecture (SBA) enabling a cloud-native deployment. These innovations enhanced flexibility and scalability, enabling more dynamic and adaptable network orchestration. While 5G is continuously introducing remarkable advancements, there is the need from operators for further CAPEX/OPEX reduction by further improvement of overall 3GPP system performance. 6G brings a good opportunity to provide solutions to meet those needs, e.g. by means of simplifying the overall system, integrating of new technologies, etc

3GPP SA1 has started the FS\_6G\_REQ study item to identify use cases and service/operational requirements for 6G system. TSG RAN has also initiated the FS\_6G\_RAN\_Scen\_Req study item to develop requirements for 6G Radio and expects to see initial input from and interaction with SA2.

The 6G architecture is to be grounded in established design principles, aligns with the IMT-2030 vision, and responds directly to the 6G requirements outlined in 3GPP TR 22.870 and TR 38.914. Therefore, this study will address critical challenges identified in 5G deployments and study the architecture aspects to support both connectivity service and beyond connectivity services in 6G era in a more efficient, sustainable, and innovative ways.

# 4 Objective

This study aims to define a system architecture for 6G mobile networks for improvement of existing services and support of new services, to meet the 6G system requirements as defined by 3GPP SA1 and TSG RAN.

The study shall follow the principles endorsed in SP-250340 at TSG#107(Mar2025) to create a lean and streamlined standards for 6G, e.g., by dimensioning an appropriate set of functionalities, minimizing the adoption of multiple options for the same functionality, avoiding excessive configurations, etc.

The study shall investigate the requirements, assumptions and high level principles for 6G architecture.

The study should consider at least the following aspects: cloud native, sustainability and energy efficiency, robustness and resiliency, architecture simplification, etc.

The study contains multiple work tasks. The scope of these work tasks and potential key issues derived from these work tasks will be refined during SA2#170-#172 before solutions for a given key issue can be studied. Some work task(s) might not result in key issue(s).

The study includes the following high level work tasks, and the conclusion will consolidate the 6G architecture among all work tasks:

**WT#1**: Define the overall standalone 6G architecture as collection of capabilities and high level functions considering the following sub work tasks and other work tasks to support 6G access network:

1.1. Void

NOTE  n: The duplication of functionality in RAN and CN will be avoided, while maintaining the existing RAN and CN functionality split.

1.2. Study support for control signalling for 6G for connectivity and beyond connectivity services, including at least the following:

a. Whether and how to enable the introduction of a new non-access stratum functionality without impacting other non-access stratum functionalities.

b. Whether and how to identify a minimal set of non-access stratum functionalities that does not get impacted by additional non-access stratum functionalities (for fixed wireless access).

c. Whether and how to develop generic mechanisms for UE-Core Network interaction that are reusable for operator services, e.g. service discovery, service authentication, service authorisation, etc.

1.3. Study whether and how to support the SBA framework

1.4. Study whether and how to support the network slicing in 6G.

1.5. Study whether and how to support the network sharing in 6G.

1.6. Study whether and how to support user plane architecture

1.7. Study whether and how to support QoS framework.

1.7a. Study whether and how to support Policy framework.

1.8. Study whether and how to support different non 3GPP access (e.g., Wi-Fi, wireline) and multi-access data connections between 3GPP access and non 3GPP access.

1.9. Study how to support essential/regulatory services (e.g. voice, Messaging, location services, Emergency services, MPS, Mission Critical services, PWS, etc.).

1.10. Study whether and how to support network exposure framework

**WT#2**: Study migration and interworking of 6GS, including

- How to support migration to 6GS

- How to support interworking with 5GS

- Whether and how to support interworking with EPS

NOTE  n: Interworking with 2G/3G are not considered in this study, but scenarios where the UE in 6G may reselect to 2G/3G and return to 6G will be analysed only if there is a need.

NOTE n: The detailed migration study scope will be coordinated and aligned with RAN

**WT#3:** Study the support of AI in 6GS

**WT#4:** Study the integration of Sensing and Communication over 3GPP access, considering the sensing modes to be supported and other sources of sensing data.

NOTE n: The scope of WT#4 will be aligned with the work of R20 FS\_Sensing\_ARC.

**WT#5:** Study common data framework for all aspects related to efficient and scalable data handling including, for example, data collection, distribution, processing, storage, data access and data exposure, with consideration of access control/user consent and privacy where relevant. The example of data may include data for AI and Sensing. This WT can also study the any potential enhancement on system and procedure user consent framework.

NOTE n: The work split with SA3, SA5 and RAN WGs will require TSG coordination

**WT#6:** Study aspects on support of computing in 6G, including at least the following:

1. Whether and how to support coordination between UE and core network for computing.

2. Whether and how to enhance the exposure framework to offer computing service to authorized (third-party) applications.

NOTE n: Application layer mechanism and exposure framework may require coordination with SA6.

NOTE n: Support of computing in RAN is not in this study.

**WT#7:** Study enhancements on IMS architecture, including at least the following:

1. Whether and how to simplify the IMS architecture, including network elements convergence and signalling optimization.

2. Whether and how to enhance the support for existing services, immersive service and Intelligent RTC services communication

NOTE n: Whether WT#7 is part of this study will be determined at TSG SA#108(Jun).

**WT#8:** Study how to support 6G RAT for NTN , based on RAN decision for 6G NTN RAT.

**WT#9:** Study how to support cellular IoT enablers in 6G, based on RAN decision for 6G IoT. Ambient IoT is not in the scope of the work.

NOTE n: The detailed scope for WT#8 and WT#9 will be coordinated and aligned with RAN

In addition to the work tasks above, this study will identify other 5G features that will be supported in 6G.

The conclusion for each work task should:

a. Identify functionalities, NFs etc. that use 5GC NFs as basis and any enhancements.

b. Identify functionalities, NFs etc. that need further study and that may be redesigned

c. Identify new functionalities, e.g. NFs to be added for supporting new features

The conclusions of this study will form the basis for the normative work and/or for any further study.

During the study, the progress and results of 3GPP TR 22.870(SA1 study) and TR 38.914(RAN study) shall be taken into account.

NOTE n: Coordination with SA1 is required.

A single TR is expected to capture the output of this study.

# 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 |
|  |  |  |  |  |  |
| TR | 23.xxx | Study on Architecture for 6G System | TSG#xx(TBD) | TSG#xx(TBD) | {<FamilyName>, <GivenName>, <Company>, <email address>. See Note 2} |

NOTE n: 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 |
| {e.g. "22.281"} | {Possible values: - either free text (e.g. “CS aspects to be removed") - or “Specification to be withdrawn”} | {e.g. "TSG#89"} | {Free text, e.g. "This TS covers Stage 2" or "This TS covers Stage 3" or "This TS covers both stages 2 and 3"} |
|  |  |  |  |

# 6 Work item Rapporteur(s)

# 7 Work item leadership

SA2

# 8 Aspects that involve other WGs

Potential RAN impact to be covered by RAN WGs.

Potential security impact to be covered by SA3.

Potential multimedia and codecs aspects to be covered by SA4.

Potential charging and OAM impact to be covered by SA5.

Potential specific exposure related aspects to be covered by SA6

# 9 Supporting Individual Members

{At least 4 supporting Individual Members are needed. There is an expectation that these companies will provide resources to progress the work. Note that having 4 supporting companies is a necessary but not sufficient condition: the usual TSG approval process by consensus is needed for the WID approval}

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| Supporting IM name |
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