**3GPP TSG-SA5 Meeting #162 *S5-253837d9***

**Goteborg, Sweden, 25 - 29 August 2025**

**Source: China Unicom (Moderator)**

**Title: Study on 6G Management and Orchestration**

**Document for: Approval**

**Agenda Item: 5.5**

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 6G Management and Orchestration

Acronym: FS\_6G\_OAM

Unique identifier:

Potential target Release: Rel-20

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  |  | X | X |  |
| No | X | 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) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 1050110 | Study on 6G Use Cases and Service Requirements; Stage 1 | Management requirements related to SA1 |
| 1060079 | Study on 6G Scenarios and Requirements | Management requirement related to RAN |
| 1080057 | Study on Architecture for 6G System | Management requirements related to SA2 |
| 1080072 | Study on 6G Radio | Management requirement related to RAN |

# 3 Justification

The development of 6G management and orchestration aims to address several critical challenges. Network infrastructure complexity grows exponentially with increasing 6G service diversity. While some intelligent capabilities have been introduced in current management system, they are fragmented and lack robust decision-making functionality. For operational 6G networks, operators urgently require further reductions in CAPEX and OPEX through enhanced intelligent approaches.

The envisioned 6G management architecture should support unified management of heterogeneous access networks and diverse service types to ensure seamless connectivity and consistent quality of service. Multi-dimensional management features require further investigation and coordination to achieve end-to-end intelligence and automation across 6G management scenarios. The introduction of additional advanced technologies is anticipated to enable higher levels of autonomy.

3GPP SA1 has initiated the "Study on 6G Use Cases and Service Requirements" to identify system use cases and service/operational requirements. 3GPP SA2 has approved the "Study on Architecture for 6G System" to define the 6G architecture. TSG RAN has also launched the study items "Study on 6G Scenarios and Requirements" and "Study on 6G Radio" to develop RAN requirements and radio access technologies.

The 6G management and orchestration will be based on established design principles and aligned with the 6G requirements specified in 3GPP TR 22.870 and TR 38.914. The management architecture and features resulting from this work will consider integration with the 6G Core and RAN architectures, ultimately aiming to build an intelligent, flexible, efficient and sustainable 3GPP management system.

# 4 Objective

The study includes the following work tasks for OAM prime features:

**WT#1**: Investigate the overall management architecture for 6G as collection of capabilities and high-level functionalities focusing strictly on architectural enablers. This WT provides the framework into which applicable features addressed under WT#2 will map. It includes the following sub work tasks and other closely related work tasks to support 6G network management:

1.1. Study high-level architectural requirements, principles and scope for 6G network management, including managed network scope (manage both 6G and 5G network or 6G network only), management layers, management functionalities and deployments.

1.2. Study how the high-level architectural requirements, principles and scope captured in WT#1.1 impact the existing SBMA framework including identification of new or existing management services, interfaces and management functions, and their applicability to specific management layers.

1.3. Study potential architectural alignment and interaction points between the 6G network management architecture (developed in WT#1.1) and the network architecture defined in other groups (e.g., SA2 and RAN3), including the identification of relevant reference points, services, and management functions needed to enable interoperability.

1.4. Study whether and how to support MnF and service orchestration, lifecycle management and FCAPS.

1.5. Study whether and how the agents are used within a part of 6G management architecture, e.g., agent management and orchestration, multi-agent collaboration and interactions, enabling agent to utilize/access 6G management services.

1.6. Study the data management framework for different types of data, and coordinate with SA2 if necessary.

Note: the scope of different types of data are to be part of the study, including access control of the data.

1.6. Study the data management framework for different types of management data.

1.6. Study the data management framework for different types of data to be used for network management and service management.

1.7. Study how to handle information and knowledge considering relation with data.

1.8. Study the architectural enablers (e.g., management services, operations and APIs) required to support network slice LCM in 6G. This includes considering enhancements to existing network slice management solutions to address 6G-specific slice aspects, in cooperation with SA2 as necessary.

**WT#2**: Investigate 6G management scenarios/use cases to derive requirements and functionalities and feature-level capabilities. This WT covers the following sub-work tasks necessary to support 6G management scenarios and features:

2.1. Investigate the use cases for 6G service in SA1 TR 22.870 and identify the management requirements for corresponding management features.

2.2. Investigate new 6G management scenarios and identify the management requirements for corresponding management features.

2.3. Investigate whether and how to support the identified management requirements (including new management capabilities if needed). New technologies (e.g. protocols) potentially used by 6G OAM can be considered to support the identified management requirements. The study should also highlight relevant potential solutions in scenarios where management features interact with each other. Management features include:

 2.3.1 **AI/ML:** Study further advanced management capabilities for lifecycle management, observability, trustworthiness and sustainability of AI/ML features in 6G system, considering cross-WG alignment on the terminology and procedures pertaining to AI/ML management.

2.3.2 **Agent:** Study definition and use of autonomous agents for 6G network management and service management to the evolution towards autonomy.

2.3.3 **Intent-driven management:** Study how to extend the intent-driven capabilities to support delivering, assurance, trouble shooting, verification, pre-evaluation and natural language intents, and investigate whether a new solution set for intent modelling, intent provisioning and intent reporting is required.

2.3.4 **Network Digital Twins:** Study NDT enhancements to support 6G new use cases and network management optimization.

2.3.5 **CCL:** Study enhancements to support new 6G use cases including automated, adaptive operations to support dynamic network topology and changing demands.

6**/Knowledge**Study the feature of semantic network management in 3GPP management system, focusing on defining semantic data (knowledge) in 3GPP management system, including its definition and how such data will be managed.

2.3.7 **Data Management:** Study management capabilities and mechanism for 6G management data.

2.3.8 **Policy Management:** Study whether and how the existing policy management needs enhancement to support 6G use cases.

2.3.9 **Energy Efficiency and Energy Saving:** Study management mechanisms to dynamically reduce network-wide energy consumption, optimize energy efficiency, enhance estimation of energy consumption and energy efficiency for 6G.

2.3.10 **Cloud aspects of Management and Orchestration:**

**NOTE:** The detailed scope will be determined considering the outcome of Rel-19 FS\_Cloud\_OAM

2.3.11 **Management Mechanism for Network Sharing:** Study management mechanism and capabilities to support network sharing scenarios for 6G.

2.3.12 **Management Exposure for management service and capabilities in 6G**

Note: the study should consider the relations among the management features.

**WT#3**: Study the overall 6G management specifications in coordination and consideration with other SDOs and forums to support the end-to-end management requirements of operators in order to create lean and streamlined standards

**TU estimates and dependencies**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Work Task ID** | **TU Estimate****(Study)** | **TU Estimate****(Normative)** | **RAN Dependency****(Yes/No/Maybe)**  | **SA Dependency****(Yes/No/Maybe)** | **Non-3GPP Dependency** |
| **WT#1** | 21 | 0 | No | No | No |
| **WT#2** | 37 | 0 | No | No | No |
| **WT#3** | 4 | 0 | No | No | Maybe |
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**Total TU estimates for the study phase: 62**

**Total TU estimates for the normative phase: 0**

**Total TU estimates: 62**

# 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 | 28.xyz | Study on 6G Management and Orchestration | TSG#114(Dec. 2026) | TSG#xx(TBD) |  |

# 6 Work item Rapporteur(s)

# 7 Work item leadership

SA5

# 8 Aspects that involve other WGs

Potential collaboration with SA1, SA2, SA5 CH and RAN WGs

# 9 Supporting Individual Members

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| Supporting IM name |
| AsiaInfo? |
| AT&T? |
| CATT? |
| China Mobile |
| China Telecom? |
| China Unicom |
| Deutsche Telekom |
| Ericsson? |
| FiberCop? |
| Huawei? |
| Lenovo? |
| NEC? |
| Nokia? |
| NTT DOCOMO? |
| Orange |
| Rakuten Mobile |
| Samsung? |
| Verizon? |
| Vodafone |
| ZTE Corporation? |
| TELECOM ITALIA |
| Qualcomm |