**3GPP TSG-SA5 Meeting #162 *S5-25xxxx***

**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 |
| N/A | 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. Current network management systems remain heavily dependent on manual operations. While some intelligent capabilities have been introduced, 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 must support unified management of heterogeneous 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 grounded in 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 high level work tasks, and the conclusion will consolidate the 6G management and orchestration among all work tasks:

**WT#1**: Investigate the overall management architecture for 6G as collection of capabilities and high-level functionalities considering the following sub work tasks and other work tasks to support 6G management.:

1.1. Study high-level architectural requirements, principles and scope for 6G 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 impact the existing SBMA framework including new or existing management services, interfaces and management functions, and their applicability at specific management layers.

1.3. Study how the 6G management architecture (captured in WT-1 and WT-3) integrates with the network architecture defined in other groups (e.g., SA2 and RAN3).

1.4. Study whether and how to support programmability to deploy and orchestrate management functions.

1.5. Study the adoption of agentic autonomous management in 6G management architecture towards Autonomous Networks, including agent discovery, agent management and orchestration, multi-agent collaboration and interactions, enabling agent to utilize/access 6G management provisions.

1.6. Study whether and how to support message bus in management architecture for 6G.

**NOTE:** WT-1.6 has dependency on the outcomes of WT-1 in the Rel-20 FS\_SBMA\_Ph4.

1.7. Study the unified data management framework for different management data types.

1.8. Study management services, operations and APIs required to support network slice LCM in 6G, considering enhancements to existing network slice management solution to cover 6G slice specific aspects, and cooperated with SA2 if needed.

**WT#2**: Study 6G management scenarios and identify the requirements and functionalities:

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

2.2. Investigate the 6G management scenarios for improving network operation efficiency and user experience and identify the management requirements for corresponding management features.

2.3. Investigate whether and how to support the identified management requirements (define new management capabilities or reuse the existing management capabilities). New technologies (e.g. protocols) potentially used by 6G OAM can be considered to support the identified management requirements. Management features include:

 2.3.1 **AI/ML:** Study further advanced management capabilities for lifecycle management, controllability, 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 how to use agents to improve operation efficiency and support new services from management and orchestration aspects.

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

2.3.4 **Semantic Network Management:** Study the feature of semantic network management in 3GPP management system, focusing on defining semantic and knowledge and how the adoption of this feature may impact 6G management architecture and how it relates to data management.

2.3.5 **Network Digital Twins:** Study NDT concepts and enhancements to support new 6G use cases supporting exposure mechanisms of digital twin services, and utilizing automation functions to analyze.

2.3.6 **CCL and Automation:** Study enhancements to support new 6G use cases including automated, adaptive, and fast CN operations to support dynamic network topology and changing demands as well as unpredictable events.

2.3.7 **Data Management:** Study management capabilities and mechanism for 6G management data (including data collection control and reporting, data processing, data analytic, data registration, data discovery, data access control, data publish, data distribution, data exposure, data cataloging, data destruction (EOL), data quality reporting and change management), including introducing new data for analytics, principles for data QoS, enhancing user consent and potentially introducing not-3GPP solutions.

2.3.8 **Energy Efficiency and Energy Saving:** Study enhanced energy management mechanisms for network functions/elements to dynamically reduce network-wide energy consumption, optimize energy efficiency evaluation methods, and improve network resiliency for increased energy savings and outage/shortage mitigation.

2.3.9 **Cloud Management and Orchestration:** Study enhancing the cloud management and orchestration LCM framework and corresponding configuration management, performance management, fault management and policy management, interactions, etc.

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

2.3.10 **Management Mechanism for Network Sharing:** Study management mechanism and capabilities to support trustworthy management for network sharing scenarios and using management exposure for communication and capability exposure of MOP and POPs.

**WT#3**: Study the overall of 6G management specifications and structure for management features:

3.1. Study the principle for 6G management specifications.

3.2. Study the structure for management features to enhance the interoperability and readability.

3.3. Study using LLM/SLM for reading and comprehending intertwined specifications.

3.4. Study creation of SA5 benchmarks for LLM fine tuning.

# 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 | 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 and RAN WGs

# 9 Supporting Individual Members

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