**3GPP TSG-SA5 Meeting #162 *S5-253837d1***

**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 impact the existing SBMA framework including identification of new or existing management services, interfaces and management functions, and their applicability at specific management layers.

1.3. Study potential architectural alignment and interaction points between the 6G network management architecture (developed in WT#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 programmability to support MnF deployment, orchestration and lifecycle management.

1.5. Study whether and how the adoption of agentic autonomous management in 6G management architecture towards Autonomous Networks, e.g., agent management and orchestration, agent integration fabric, multi-agent collaboration and interactions, enabling agent to utilize/access 6G management provisions.

1.6. Study a data management framework for different management data types, in alignment with SA2 as necessary. This includes studying the adoption of advance data framework technologies (e.g. based on message bus) and its integration with management system.

1.7. 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 that may or may not directly impact the architectural framework defined in WT#1. This WT covers the following sub-work tasks necessary to support 6G management scenarios and features:

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:

**- Intelligence and automation:**

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 definition of Autonomous Agents and their use for 6G network 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, agent interactions and natural language intents, and support a new solution set for intent modelling, intent provisioning and intent reporting.

2.3.4 **Network Digital Twins:** Study NDT enhancements to support 6G new use cases and network management optimization, focusing on autonomous capabilities, precise analysis, multi-domain & cross-domain simulations, real time NDT, data services processing and exposure.

2.3.5 **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.

**- Data, semantics and analytics:**

2.3.6 **Semantic Network Management:** 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 (e.g., data collection control and reporting, data processing, data analytic, data discovery, data access control, data publish, data distribution, data exposure, data cataloging).

**- Management mechanisms:**

2.3.8 **Policy Management:** Study how to manage the policies and investigate new use cases and potential enhancements for the existing policy management feature.

2.3.9 **Energy Efficiency and Energy Saving:** Study enhanced management mechanisms for network functions/elements, management functionalities/processes to dynamically reduce network-wide energy consumption, optimize energy efficiency, enhance estimation of energy consumption and energy efficiency, and enhancements for the collection from sources outside the 3GPP management system of energy-related information and its association to the mobile network.

2.3.10 **Cloud Management and Orchestration:** Study cloud management and orchestration framework, lifecycle, fulfilment (including provisioning) and assurance.

2.3.11 **Management Mechanism for Network Sharing:** Study management mechanism and capabilities to support trustworthy management for network sharing scenarios, using management exposure for communication and capability exposure of MOP and POPs, and temporary network sharing for different reasons, e.g., disaster, business and energy-related.

**WT#3**: Study the overall of 6G management specifications and structure for management features, to create lean and streamlined standards for 6G OAM. Also, coordination with other SDOs to support the End-to-End solution needs to be considered if needed.

Work tasks for supporting features depending on other WGs will be included after alignment with timelines and progresses of other WGs.

**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#1.1 |  |  |  |  |  |
| WT#1.2 |  |  |  |  |  |
| WT#1.3 |  |  |  |  |  |
| WT#1.4 |  |  |  |  |  |
| WT#1.5 |  |  |  |  |  |
| WT#1.6 |  |  |  |  |  |
| WT#1.7 |  |  |  |  |  |
| WT#1.8 |  |  |  |  |  |
| WT#2.1 |  |  |  |  |  |
| WT#2.2 |  |  |  |  |  |
| WT#2.3 |  |  |  |  |  |
| WT#2.3.1 |  |  |  |  |  |
| WT#2.3.2 |  |  |  |  |  |
| WT#2.3.3 |  |  |  |  |  |
| WT#2.3.4 |  |  |  |  |  |
| WT#2.3.5 |  |  |  |  |  |
| WT#2.3.6 |  |  |  |  |  |
| WT#2.3.7 |  |  |  |  |  |
| WT#2.3.8 |  |  |  |  |  |
| WT#2.3.9 |  |  |  |  |  |
| WT#2.3.10 |  |  |  |  |  |
| WT#2.3.11 |  |  |  |  |  |
| WT#3 |  |  |  |  |  |

**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 |
| 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

|  |
| --- |
| 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? |