**3GPP TSG-SA5 Meeting #148e *S5-233465rev1***

**17 Apr to 25 Apr 2023, E-meeting**

**Source: China Telecom**

**Title: Discussion paper on summarization of TR 28.864 and work plan for MANWDAF**

**Document for: Approval**

**Agenda Item: 6.7.6.2**

# 1 Decision/action requested

***The group is asked to discuss and agree on the proposal.***

# 2 References

[1] 3GPP TR 28.864-100: "Study on Enhancement of the management aspects related to NWDAF".

[2] 3GPP SP‑230181: "New WID on Management Aspects related to NWDAF".

# 3 Rationale

## 3.1 Background

The study item FS\_MANWDAF (see TR 28.864 [1]) has been progressed with completion 95% and the corresponding normative work will be started in the next meeting. In order to finish the normative work successfully, this discussion paper is to provide the summarization of TR 28.864 and the work plan for the normative work.

## 3.2 Summarization of TR 28.864

The TR 28.864 identified and documented a wide range of key issues for enhancement of the management aspects related to NWDAF, derived the corresponding potential requirements on 3GPP management system, proposed potential solutions to address the related key issues and evaluated the potential solutions.

There are seven key issues in TR 28.864, including:

**Key Issue #1:** NWDAFFunction IOC enhancement to support Multiple NWDAF Deployment.

* This issue is used to distinguish different NWDAF instances. There is one concluded solution on NRM enhancement aspect. With this NRM enhancement, the operator can distinguish the NWDAF acting as aggregator NWDAF or not.

**Key Issue #2:** NWDAFFunction IOC enhancement to support the logical decomposition of NWDAF.

* This issue is used to distinguish different NWDAF instances. There is one concluded solution on NRM enhancement aspect. With this NRM enhancement, the operator can distinguish 1) NWDAF providing analytic services but no trained model provisioning services (i.e., NWDAF containing AnLF only); 2) NWDAF providing trained model provisioning services but no analytic services (i.e., NWDAF containing MTLF only); 3) NWDAF providing both analytic services and trained model provisioning services (i.e., NWDAF containing both AnLF and MTLF).

**Observation 1:** The Key Issue #1 and #2 are used to distinguish different NWDAF instances. There are two concluded solutions which can be feasible candidates as input to the normative phase.

**Key Issue #3:** Performance Measurement of the NWDAF on the Interaction Aspect.

* This key issue is used to monitor interaction activities of NWDAF related to analytics services and trained model provisioning services. There are four concluded solutions providing the NWDAF performance related to analytics services based on counting SBA interaction activities. These performances show 1) the monitored NWDAF interacts with which NF (including other NWDAFs) for what kind of analytics, at what frequency and at what time period, 2) the service successful rate and total work load. There are two potential solutions providing the NWDAF performance related to trained model provisioning services that need to be concluded in this meeting.

**Observation 2:** The Key Issue #3 is used to monitor interaction activities of NWDAF related to analytics services and trained model provisioning services. There are four concluded solutions related to analytics services which can be feasible candidates as input to the normative phase. There are two potential solutions related to trained model provisioning services needed to be concluded.

**Key Issue #4:** Performance Measurement for NWDAF Data Collection.

* This key issue is used to monitor interaction activities of NWDAF related to data collection services. There are two concluded solutions providing performance of data collection performed by NWDAF based on counting SBA interaction activities. These performances show the monitored NWDAF collect data at what frequency from which NF.

**Key Issue #5:** Performance Measurement on Data Collection Exposed by NWDAF.

* This key issue is used to monitor interaction activities of NWDAF related to data collection services. There are two concluded solutions providing performance of the data collection exposed/provided by NWDAF to other NFs (NWDAFs) based on counting SBA interaction activities. These performances show how often the monitored NWDAF is act as a data source to provide data to other NWDAF.

**Observation 3:** The Key Issue #4 and #5 are used to monitor interaction activities of NWDAF related to data collection service. There are two concluded solutions related to data collection performed by NWDAF and two concluded solutions related to data collection exposed/provided by NWDAF to other NFs (NWDAFs). These four solutions can be feasible candidates as input to the normative phase.

**Key Issue #6:** Performance measurement of the NWDAF related to the analytics result generation.

* This key issue is used to monitor NWDAF performance on providing analytic services. There are two concluded solutions providing NWDAF performance related analytic services based on measuring the time consumed by the NWDAF to perform the requested analytics service. These performances show the average time consumed by the NWDAF to perform an analytic service (e.g., of a specified analytic type, requested from a specific NF, in a specific area of interests covered by this NWDAF).

**Observation 4:** The Key Issue #6 is used to monitor NWDAF performance on providing analytic services. There are two concluded solutions related to analytics result generation which can be feasible candidates as input to the normative phase.

**Key Issue #7:** Performance Management of the NWDAF Analytics-related Timing.

* This key issue is used to monitor NWDAF performance on fulfilling the timing requirements related to the analytic services. There are four concluded solutions providing NWDAF performance related to analytic services based on recording and counting the events which provide analytic results with unexpected timing parameters. These performances show 1) what kind of abnormal situation is happened; 2) how often the abnormal situation is happened.

**Observation 5:** The Key Issue #7 is used to monitor NWDAF performance on fulfilling the timing requirements related to the analytic services. There are four concluded solutions related to analytics services which can be feasible candidates as input to the normative phase.

Based on TR 28.864 and the observations above, we made the following table to describe the relationship between the key issues and concluded solutions.

|  |  |
| --- | --- |
| **Key Issues in TR 28.864** | **Concluded Solutions in TR 28.864** |
| Key Issue #1 | Solution #1: clause 4.1.3.1 |
| Key Issue #2 | Solution #1: clause 4.2.3.1 |
| Key Issue #3 | Solution #1: clause 4.3.3.1Solution #2: clause 4.3.3.2Solution #3: clause 4.3.3.3Solution #4: clause 4.3.3.4Solution #6: clause 4.3.3.6 (need to be concluded in SA5#148e)Solution #7: clause 4.3.3.7 (need to be concluded in SA5#148e) |
| Key Issue #4 | Solution #1: clause 4.4.3.1Solution #2: clause 4.4.3.2 |
| Key Issue #5 | Solution #1: clause 4.5.3.1Solution #2: clause 4.5.3.2 |
| Key Issue #6 | Solution #1: clause 4.6.3.1 |
| Key Issue #7 | Solution #1: clause 4.7.3.1Solution #2: clause 4.7.3.2Solution #3: clause 4.7.3.3Solution #4: clause 4.7.3.4 |

## 3.3 Work Plan for MANWDAF

The objectives of the MANWDAF in 3GPP Rel-18 are provided in SP-230181[2] as follows:

 *1. For the NWDAF applying for all deployment scenarios:*

*1.1. Specifying enhancement to support providing performance of the data collection actions initiated by NWDAF and data management services provided by NWDAF, including*

*1.1.1. the statistic information about how frequently the NWDAF collects data and service successful rate;*

*1.1.2. the statistic information about how frequently the data management services are requested and service successful rate.*

*2. For the deployment scenario supporting multiple NWDAFs and coordination between multiple NWDAFs:*

*2.1. Specifying enhancement to support providing performance of the analytic services requested by the Aggregator NWDAF for aggregating the analytics information from the other NWDAFs, including*

*2.1.1. the statistic information about how frequently a specific analytic service is requested and the service successful rate.*

*3. For the deployment scenario including NWDAF with logical decomposition:*

*3.1. Specifying enhancement to 3GPP NRMs to support management of NWDAF supporting logical decomposition, i.e. the NWDAF which is deployed with only MTLF (Model Training Logical Function) or with only AnLF (Analytics Logical Function) or both MTLF and AnLF;*

*3.2. Specifying enhancement to support providing performance of the analytic services provided by NWDAF which contains AnLF, including*

*3.2.1. the statistic information about how frequently a specific analytic service is requested and the service successful rate;*

*3.2.2. performance of NWDAF about time consumed by NWDAF to provide a specific analytic service and analytics generation failures related to timing attributes specified in the analytics subscription/request;*

*3.3 Specifying enhancement to support providing performance of the ML model provisioning services provided by NWDAF which contains MTLF, including*

*3.3.1. the statistic information about how frequently a ML model specified for an analytic is requested and the service successful rate;*

*Note: The NWDAF containing AnLF and/or MTLF is the NWDAF supporting logical decomposition.*

The relationship between the objectives (in SP-230181) and key issues concluded (in TR 28.864) is listed in the table below.

|  |  |
| --- | --- |
| **Objectives in SP-230181** | **Key issues in TR 28.864** |
| Objective 1.1: *Specifying enhancement to support providing performance of the data collection actions initiated by NWDAF and data management services provided by NWDAF.* | Key Issue #4Key Issue #5 |
| Objective 2.1: *Specifying enhancement to support providing performance of the analytic services requested by the Aggregator NWDAF for aggregating the analytics information from the other NWDAFs.* | Key Issue #3 |
| Objective 3.1: *Specifying enhancement to 3GPP NRMs to support management of NWDAF supporting logical decomposition.* | Key Issue #2 |
| Objective 3.2: *Specifying enhancement to support providing performance of the analytic services provided by NWDAF which contains AnLF.* | Key Issue #3Key Issue #6Key Issue #7 |
| Objective 3.3: *Specifying enhancement to support providing performance of the ML model provisioning services provided by NWDAF which contains MTLF* | Key Issue #3 |

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According to the observations and table above, we propose the work plan for the next four meetings in the table below for information.

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| Meetings | Work task |
| SA5#149 (May) | Try to finish the Objective 1.1, Objective 2.1, Objective 3.1 and part of Objective 3.2. |
| SA5#150 (Aug) | Try to finish the Objective 3.2 and Objective 3.3. |
| SA5#151 (Oct) | Address the questions which are not solved in the previous meetings.Prepare for completing this WI. |
| SA5#152 (Nov) |

## 3.4 Conclusions

According to the discussion above, we have the following findings and proposals:

**Observation 1:** The Key Issue #1 and #2 are used to distinguish different NWDAF instances. There are two concluded solutions which can be feasible candidates as input to the normative phase.

**Observation 2:** The Key Issue #3 is used to monitor interaction activities of NWDAF related to analytics services and trained model provisioning services. There are four concluded solutions related to analytics services which can be feasible candidates as input to the normative phase. There are two potential solutions related to trained model provisioning services needed to be concluded.

**Observation 3:** The Key Issue #4 and #5 are used to monitor interaction activities of NWDAF related to data collection service. There are two concluded solutions related to data collection performed by NWDAF and two concluded solutions related to data collection exposed/provided by NWDAF to other NFs (NWDAFs). These four solutions can be feasible candidates as input to the normative phase.

**Observation 4:** The Key Issue #6 is used to monitor NWDAF performance on providing analytic services. There are two concluded solutions related to analytics result generation which can be feasible candidates as input to the normative phase.

**Observation 5:** The Key Issue #7 is used to monitor NWDAF performance on fulfilling the timing requirements related to the analytic services. There are four concluded solutions related to analytics services which can be feasible candidates as input to the normative phase.

**Proposals:**

- In SA5#149, we try to finish the Objective 1.1, Objective 2.1, Objective 3.1 and part of Objective 3.2.

- In SA5#150, we try to finish the Objective 3.2 and Objective 3.3.

- In SA5#151 and SA5#152, we try to address the questions which are not solved in the previous meetings and prepare for completing this WI.

# 4 Detailed proposal

SA5 is asked to endorse the followings as the working assumption in the discussions of the next four meetings:

- In SA5#149, we try to finish the Objective 1.1, Objective 2.1, Objective 3.1 and part of Objective 3.2.

- In SA5#150, we try to finish the Objective 3.2 and Objective 3.3.

- In SA5#151 and SA5#152, we try to address the questions which are not solved in the previous meetings and prepare for completing this WI.