**SA WG2 Meeting #162S2-2405035**

**April 15 – 19, 2024, Changsha, China (revision of S2-2402660, S2-2404427)**

**Source: MediaTek Inc., Lenovo**

**Title: KI#3, New Sol: NWDAF assisted PDU Set assistance information**

**Document for: Approval**

**Agenda Item: 19.15**

**Work Item / Release:** **FS\_AIML\_CN / Rel-19**

*Abstract of the contribution: This paper proposes a new Solution for KI#3, Use Case#2 of FS\_AIML\_CN.*

# Discussion

SA#160-AH-E agreed on a Key Issues and a set of use cases for NWDAF-assisted policy control and QoS enhancement as captured in TR 23.700-84, i.e.:

* Key Issue #3: NWDAF-assisted policy control and QoS enhancement
* Use Case #1: NWDAF-assisted QoS recommendation
* Use Case #2: Enhancements to QoS Determination with NWDAF Assistance

This paper proposes a new Solution for KI#3 in the context of Use Case #2 to address below aspects:

- Whether and how to introduce new 5GC functionality e.g. of the NWDAF and/or PCF to enhance the policy control and QoS, considering operator's policies.

- Whether and what additional input information is needed by the NWDAF for providing an assistance to policy control and QoS, and how to gather it.

- Whether and what output information, on top of already provided, the NWDAF can provide to assist with policy control and QoS enhancements.

# Proposal

It proposed to adopt the Solution as below in TR 23.700-84.

\*\*\*\* START OF CHANGES (ALL NEW TEXT) \*\*\*\*

## 6.X Solution #X: NWDAF-assisted PDU Set assistance information

### 6.X.1 Description

As part of existing XRM procedures, PDU Set based handling is expected. A PDU Set is comprised of one or more PDUs carrying an application layer payload such as a video frame or video slice. The PDU Set based QoS Handling can be applied for GBR and non-GBR QoS Flows.

The AF should provide PDU Set related assistance information for dynamic PCC control as captured in clause 5.37.5 of TS 23.501 [2]. PDU Set related assistance information may be provided to the NEF/PCF using the AF session with required QoS procedures in clauses 4.15.6.6 and 4.15.6.6a of TS 23.502 [3]. This includes PDU Set QoS parameters (see clause 5.7.7 of TS.23.501 [1]) and Protocol Description.

Based on the PCC rules from PCF, the SMF instructs PSA UPF to perform PDU Set marking and may provide the PSA UPF the Protocol Description used by the service data flow.

As stated in Use Case #2 (clause 5.1.2), when a PDU Session is set-up for an XRM service, a default PDU session is associated with a default QoS rule which provides a default QoS treatment for the data flows. Such default PDU session may not accurately reflect PDU Set related information given that before a PDU session is established, the AF can not provide PDU Set related assistance information to the 5GC. As a result, in many practical scenarios, a follow-up PDU Session Modification is needed where such assistance information from the AF can be incorporated.

To avoid unnecessary PDU Session Modification and associated signalling at AS, NAS or 5GC levels, the AF with assistance from NWDAF may provide a new set of Application-Specific Expected UE Behaviour parameters for XRM services using the existing procedures as captured in clause 4.15.6.2 of TS 23.501 [2].

**Option 1:**

To do so, the AF as a service consumer may subscribe to existing NWDAF Analytics IDs (e.g. Network Performance or DN Performance, see clauses 6.6 and 6.14 of TS 23.288 [5]) to get e.g. average/maximum packet delay, average packet loss rate in the form of statistics or predictions. The AF validates the received data and derives new XRM Application-Specific Expected UE Behaviour parameters:

- Expected PDU Set Delay Budget

- Expected PDU Set Error Rate

 The values of the parameters as above can be different for UL and DL.

Editor's note: Other XRM Application-Specific Expected UE Behaviour parameters are FFS.

The AF may store or update the XRM Application-Specific Expected UE Behaviour parameters as above within the UDR using existing UDM services as captured in clause 4.15.6.2 of TS 23.501 [2].

The PCF (or SMF) may subscribe to UDM and the UDM performs Nudm\_SDM\_Notification (SUPI or Internal Group Identifier, Application-Specific Expected UE Behaviour parameters set, DNN/S-NSSAI, etc.) service operation.

The PCF (or SMF) stores the received parameters and associates them with a local policy of XRM service for a default PDU Session based on the DNN, S-NSSAI or other parameters included in the message from UDM.

**Option 2:**

As an alternative solution, PCF (or SMF) may directly subscribe to existing NWDAF Analytics IDs (e.g. Network Performance or DN performance, see clauses 6.6 and 6.14 of TS 23.288 [5]) to get e.g. average/maximum packet delay, average packet loss rate in the form of statistics or predictions. The PCF (or SMF) derives the XRM Application-Specific Expected UE Behaviour parameters as above and associates them with a local policy of XRM service for a default PDU Session.

Network Performance or

### 6.X.2 Procedures

Existing procedure as captured in clause 4.15.6.2 of TS 23.501 [2] with addition of

- DN Performance (see clause 6.14 of TS 23.288 [5]) in step 0 as a possible option for AF subscription.

- NF (e.g. PCF or SMF) to request XRM Application-Specific Expected UE Behaviour parameters in step 0.

- New set of XRM Application-Specific Expected UE Behaviour parameters (see Clause 6.X.1) in step 1.

- The PCF (or SMF) stores the received parameters in step 7 and associates them with a local policy of XRM service for a default PDU Session based on the DNN, S-NSSAI or other parameters included in the message from UDM.

### 6.X.3 Impacts on services, entities and interfaces

**AF:**

- Use NWDAF Analytics IDs (e.g. DN performance) and provide XRM Application-Specific Expected UE Behaviour parameters to 5GC (see clause 6.X.1)

**UDR/ UDM:**

- Maintain new set of XRM Application-Specific Expected UE Behaviour parameters

**PCF /SMF**:

- Use NWDAF Analytics IDs (e.g. DN performance) or new set of XRM Application-Specific Expected UE Behaviour parameters via UDR/UDM to derive local policy rules for future default PDU session establishment.

\*\*\*\* END OF CHANGES \*\*\*\*