**3GPP TSG-WG SA2 Meeting #160-Ad Hoc-e S2-2400097r01**

**Online, Jan 22 – 29, 2024 (revision of S2-240xxxx)**

**Source: Tencent, Tencent Cloud, Xiaomi**

**Title: KI#1, New Sol: Support of Alternative QoS Profiles for PDU Set based QoS handling**

**Document for: Approval**

**Agenda Item: 19.3**

**Work Item / Release: XRM\_Ph2 / Rel-19**

*Abstract: This pCR proposes the solution to support Alternative QoS Profiles for PDU set based QoS handling.*

# 1. Introduction/Discussion

In Key Issue#1 of XRM\_Ph2, i.e. Support of PDU set based QoS handling enhancement, the following aspects are captured:

This key issue will study PDU set based QoS handling enhancements considering both control plane and user plane perspectives. In particular, this KI will address:

- whether, what and how PDU Set based handling (e.g. new standardized 5QI, enhancements to Alternative QoS profiles, FEC, etc.) and PDU Set information (including Control Plane and/or User plane information) provided by the AF/AS are enhanced.

NOTE: This will require close coordination with SA WG4 and RAN WGs.

In XR and media services, the application data traffic may contain audio, video, haptic traffic etc. Among these data traffic, video traffic is characterized by high data rate which is caused by higher resolution of the picture and also increase FPS etc. When the network radio resource is insufficient, application layer rate adaptation can be conducted which means the resolution and FPS parameter can be adjusted. Meanwhile, packet loss rate and delay requirement may also be adapted since the application layer may be able to support FEC or other techniques to accommodate packet loss. The delay requirement may also be adapted among UL and DL directions with the total RT latency requirements still fulfilled. Therefore, QoS parameters related to XRM traffic is very likely to be range and therefore it is very suitable for XRM traffic to adopt AQP mechanism. On the other hand, different media types among the XRM traffic e.g. audio, video and haptic have quite different traffic characteristics. Among these characteristics are the required data rate. Therefore, when generate the alternative QoS profile, requirements from different media types should be considered as an important aspect.

**Observation: It is important to consider different media types within the XRM traffic for enhanced AQP mechanism for PDU set based QoS handling.**

This pCR proposes a new solution to support alternative QoS profiles (AQP) for PDU-set based QoS handling considering characteristics and QoS requirements for different media types/streams. The purpose of this solution is to extend the pre-Rel-19 AQP mechanisms specified to support PDU-set related QoS parameters and support related functionalities in both 5GC and NG-RAN.

# 2. Text Proposal

It is proposed to capture the following changes vs. TR 23.700-70.

\* \* \* \* First change, All text new \* \* \* \*

6.X Solution #X: Enhanced Alternative QoS Profiles for PDU set based QoS handling

6.X.1 Key Issue mapping

This solution mainly applies to Key Issue #1: Support of PDU set based QoS handling enhancement

6.X.2 Description

Alternative QoS Profiles mechanism has been specified in 3GPP to support flexible QoS adaptation for V2X and other services. However, in the existing 3GPP specifications, the current AQP mechanism doesn’t contain PDU-set related QoS parameters and also there is no functions specified in 5GC and NG-RAN to support AQP for PDU-set based QoS mechanisms.

This solution assumes the following:

* It is assumed that the NG-RAN and 5GC support the PDU set based QoS handling as specified in clause 5.7.7.7 and clause 5.37.5 of 3GPP TS 23.501[2].
* It is assumed that the NG-RAN and 5GC support the Alternative QoS related features as specified in clause 5.7.1.2a and clause 5.7.2.4 of 3GPP TS 23.501[2].

This solution proposes to extend the AQP mechanisms for PDU-set based QoS handling considering traffic characteristics and QoS requirements from different media types/streams.

6.x.3 Procedures

Figure 6.X-1 represents the procedure of the solution and the major steps are elaborated as follows.



Figure 6.X.-1 Procedure of Enhanced Alternative QoS profiles with PDU Set based QoS handling

1. AF may provide alternative QoS requirements which can be media type related. For audio and video media traffic from different media type, there can be different QoS requirements and alternative QoS profiles regarding to the QoS parameters including GFBR, PSDB, PSER, MDBV etc. The enhanced Alternative Service Requirements with PDU set QoS Parameters can be provide by AF in a prioritized order.
2. According to the inputs from AF, PCF may generate PCC rules to support alternative QoS profiles with PDU set based QoS handling. The generated PCC rules may include the rule regarding to whether different media type traffic is mapped into same or different QoS follows. If different media type traffic are mapped into different QoS flows, different alternative QoS profiles can be applied for different QoS flow. If different media type traffic are mapped into same QoS flow, one alternative QoS profile can be applied.
3. PCF provides the PCC rules including alternative QoS profiles related to PDU set handing to SMF.
4. SMF configures the N4 rule, QoS profile and QoS rules to UPF, NG-RAN and UE.
5. UPF perform PDU set handling according to the N4 rule for PDU set handling.
6. NG-RAN and UE performs PDU set handling according to the Alternative QoS Profiles and QoS rules for PDU set handling.
7. NG-RAN may send notification to AF via 5GS regarding to alternative QoS profiles for different media streams if they are mapped into separate QoS flows.

### 6.X.4 Impacts on services, entities and interfaces

AF

- To provide PDU-set related QoS requirements considering the media types within the XR traffic as assistance information to PCF to enable PCF to general PCC rules for alternative QoS profiles related to PDU set based handling

PCF

- To receive the provided information from AF and generate PCC rules for alternative QoS profiles for PDU-set based QoS handling and provides the PCC rules to SMF

SMF

- To configure the QoS Profile including the PDU Set QoS Parameters to NG-RAN

- To configures N4 rules to UPF related to alternative QoS profiles for PDU set-based QoS handling

NG-RAN

- According to the configured the QoS profile including PDU set QoS parameters from SMF, sends notification to SMF regarding to alternative QoS profiles for PDU-set based QoS handling when triggered.

\* \* \* \* Second change \* \* \* \*

## 6.0 Mapping of Solutions to Key Issues

Table 6.0-1: Mapping of Solutions to Key Issues

|  |  |  |
| --- | --- | --- |
| Solutions |  |  |
|  | <Key Issue #1> |  |
| #X | X |  |
|  |  |  |

\* \* \* \* End of changes \* \* \* \*