**SA WG2 Meeting #153E (e-meeting) S2-2208673r019**

**October 10 – 17, 2022, Elbonia (revision of S2-xxxxxxx)**

**Source: Tencent, Tencent Cloud, Xiaomi, China Mobile, Huawei, Samsung?, ZTE?**

**Title: KI#3, conclusion update**

**Document for: Approval**

**Agenda Item: 9.19**

**Work Item / Release: FS\_XRM /Rel-18**

*Abstract of the contribution:*

*For KI#3 "5GS information exposure for XR/media Enhancements", the conclusion part is updated to clarify which entity may be impacted for exposing the information. Two more parameters provided by AF are also added.*

*Regards to the Delay difference and round trip delay, as in sol#42 and #47, they are measured by UPF and RAN. The RAN part of UL/DL packet delay measurement is as defined in clause 5.33.3 of TS 23.501.There is no additional RAN impact compared with the requirements defined in clause 5.33.3 of TS 23.501.* *The information can be exposed as the exposure path defined in clause 6.4 of TS 23.548 [61] or via SMF/PCF/NEF.*

*Regards to data rate, it may be measured and reported by the UPF as in sol#5. It could also be measured and reported by RAN via SMF/PCF/NEF as in sol#48.*

*Furthermore, as in sol#6, the AF may provide the Alternative QoS parameter set requirements to help the network to decide the related QoS parameters; as in sol#44, the AF may also provide the Averaging window in order to help the network to decide the AW for quick QoS notification to the AF. These two parameters are considered helpful for the XR service.*

*Based on rapporteur’s suggestion, S2-2208673r01 merges the revisions from S2-2208567, S2-2208658,* *S2-2208663, S2-2208823 and S2-2208999.*

# 1. Proposal

For KI#3 "5GS information exposure for XR/media Enhancements", this contribution proposes to update the conclusion to clarify which entity may be impacted for exposing the information. Two more parameters provided by AF are also added.

**\*\*\*\*\*\*\*\*\*\*\* First Change\*\*\*\*\*\*\*\*\*\*\***

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**\*\*\*\*\*\*\*\*\*\*\* Second Change\*\*\*\*\*\*\*\*\*\*\***

## 8.1 Conclusions for Key issue#3: 5GS information exposure for XR/media Enhancements

The following bullet points summarize the principles for the way forward to support current congestion level information exposure:

- 5G System may use ECN marking for the purpose of Low Latency, Low Loss and Scalable Throughput services L4S according to [37] and [62] for uplink and/or downlink QoS Flows via one of the following two methods.

- To support L4S, NG-RAN performs ECN marking according to [37] and [62] for uplink and downlink in IP layer of the received packets.

NOTE 1: The criteria for RAN to determine (e.g. its congestion level) when to perform the marking is up to RAN implementation.

- PSA UPF performs ECN marking according to [37] and [62] for uplink and downlink QoS Flows based on current congestion level information reported from NG-RAN via GTP-U header

NOTE 2: If the network operator want to apply the ECN marking for L4S, it shall guarantee that any sender (UE or Server) requesting classic ECN congestion control will not tag its packets with the ECT(1) in order to avoid conflicted usage of ECT(1) in L4S. Otherwise, L4S is not supported in network.

NOTE 3: Supports for L4S and for exposure of congestion level (e.g. per QoS flow congestion level) is pending RAN WG's feedback on the feasibility of RAN judgment and/or exposure of the corresponding info.

- 5G System also may support API based exposure of congestion level information towards AF as following:

- The following information may be exposed by RAN:

- QNC for GBR QoS Flow: data rate cannot be guaranteed;

- Congestion level = a value denoting the level of congestion in the RAN. The lower the value, the lower the level of congestion.

 Congestion level information: congestion level, and indication of the direction(s) in which the congestion happens.

NOTE: The coding of congestion level and related range, whether congestion start/end indications can be denoted by specific level values or need separated IEs is up to Stage 3.

- AF uses Nnef\_AFSessionWithQoS to subscribe the above exposure to NEF/PCF, same as local exposure mechanism defined in TS 23.548 [61].

- Exposure path of Network Exposure defined in clause 6.4 of TS 23.548 [61] is reused with extensions of GTP-U header and UPF/L-NEF services to exposure the above information.

- Exposure path of RAN/UPF reporting congestion level information via SMF/PCF/NEF is also supported.

The following bullet points summarize the principles for the way forward to support exposure for other network information:

- Data rate, delay difference and round trip delay of QoS Flow may be exposed to AF.

- Data rate may be measured and exposed by PSA UPF. Exposure path defined in clause 6.4 of TS 23.548 [61] is reused to expose the above information. Exposure path of UPF reporting via SMF/PCF/NEF is also supported.

The RAN may support exposing the above data rate information via SMF/PCF/NEF.

- AF may request to be notified when the delay difference between two QoS Flows exceeds a threshold. The delay measurement for individual QoS Flows is based on QoS monitoring in clause 5.33.3 of TS 23.501.

- Round trip delay for multiple QoS flows of the XR service (e.g. the UL and DL are separated into two flows) can be obtained and exposed by the PSA UPF via the exposure path defined in clause 6.4 of TS 23.548 [61] or via SMF/PCF/NEF.

Editor's note: It is FFS whether to expose the Normal data transmission interruption event to AF.

- Estimated bandwidth for 5QI may be exposed by NWDAF (according to information described in clause 6.9.2 in TS 23.288[61]) to AF.

**\* \* \* \* End of Changes \* \* \* \***