**Source: Huawei (Rapporteur)**

**Title: KI#4 and KI#5, key questions for company view collection**

This document is to collect company views on key questions of KI#4 and #5 to facilitate the following conclusion discussion. Please kindly provide your company views on the following questions before EoB of Sep 16th. The rapporteur will collect the views and propose summary/way forwards/SoH for further discussion afterwards.

### Q1: How does UPF identify DL PDU Set info?

* Option 1: use existing IETF RTP/SRTP RFC and draft
* Option 2: Define/extend N6 protocols to carry related info
  + Option 2.1: extend GTP-U protocol
  + Option 2.2: extend HTTP header (S2-2205830)
  + Option 2.3: extend RTP header
* Option 3: UPF implementation based on e.g. traffic characteristics.
* Option 4: UPF interacts with NWDAF(S2-2205838)

**[Company view]**

**Position:** Option 1 when the RTP/SRTP is not transmitted in the encrypted protocol.

Whether RTP/SRTP header is always cleartext or not is related to SA4 reply for Q6. If the reply is yes, then we need to see to other solutions (e.g. option2, 3, 4) for traffic with encrypted RTP/SRTP header

“Q6: SA2 would like to ask SA4 whether there are XRM use cases where RTP/SRTP could be transferred over TLS/DTLS/QUIC and whether it implies encryption of the entire XRM media packet headers?”

**Justification**:

Option2 requires close coordination between App server and 5GS and server need to support 3GPP user plane specification.

Both Option3 and Option4 are applied to traffic with specific characteristic, so can only applied to specific XR flow. Option4 applies ML learning based on the traffic characteristic. So its detection should be more accurate than option3. But the delay of Option4 is longer than option3 when the NWDAF is not collocated with UPF.

### Q2. How to deliver PDU Set importance information to RAN:

* Option 1: use different QoS Flows with different priority level. PDU Set importance is mapped to existing QoS flow priority.
* Option 2: use one QoS flow for different PDU Set with different priority level
  + Option 2.1: use different sub-QoS Flow within one QoS Flow, and using sub-QoS flow Identifier in GTP-U header
  + Option 2.2: use PDU Set importance information in GTP-U header

**[Company view]**

**Position: Option1 is preferred.**

**Justification**:

The importance information is provided because of the importance differentiation based scheduling at RAN. The scheduling granularity is DRB based.

In Option1, although it doesn’t align the existing service data flow/QoS flow mapping, mapping one service data flow into multiple QoS flow can avoid extra RAN’s complexity. RAN can reuse the existing QoS flow/DRB mapping at most.

Option2 follows the existing mapping rule between service data flow to QoS flow. But RAN further needs identify the sub QoS flow ID or importance information per PDU and design new mapping mechanism, which is extra complexity to RAN.

Also both Option2.1 and Option2.2 need extra bits overhead in GTP-U for each PDU. The burden for N3/N9 backhaul cannot be ignored if the XR data amount is great. Option2.2 is more straightforward than Option2.1.

### Q3: Support to PDU Set dependency-based scheduling

* Option 1: Identify accurate dependency relationship between PDU Sets for scheduling.
* Option 2: In some scenario (e.g. closed GOP), the decoding of the non-I frames between two successive I frames always directly or indirectly relies on the 1st I frame of the two successive I frames. If the 1st I frame is in error, the non-I frames can be dropped until the next I frame. (proposed in S2-2205839)
* Option 3: If a PDU Set is depended by others, it can be considered as more important during scheduling. But the scheduling will not further consider the accurate dependency relationship.

**[Company view]**

**Position: Option2(pending to SA4 reply) and also OK without PDU Set dependency**

**Justification**:

The controversial point is PDU Set dependency-based data dropping, not about the scheduling.

Firstly, PDU Set dependency-based data dropping is not naturally applied but need consent from App. Based on that, for some XR traffic with AF providing consent for PDU Set dependency-based data dropping, the three options can be evaluated:

* Option1 has ideal motivation but dependency relationship cannot be exhausted.
* Option2 relies on SA4 reply on Q5. If the reply is yes, this comparably simple dependency can be considered.
* “Q5: SA2 would like to ask SA4 whether the following scenario exists for some XR service flow: The non-I frames (e.g., P frame or B frame) transmitted/decoded between two successive I frames directly or indirectly refers to the 1st I frame of the two successive I frames?”Option3 in more related to importance section, it is not clear whether the less importance packet can be dropped or not

If there is no possibility of APP consent for PDU Set dependency-based data dropping, we are also OK without PDU Set dependency.

### Q4. Support to hierarchical PDU Set:

* Option 1: introduces PDU Set group. (S2-2205938)
* Option 2: not support.

**[Company view]**

**Position: Option2 in this release**

**Justification**: RTP and SRTP transmits the NAL Unit, which is slice based. When a frame includes multiple slices, it is unclear any co-operation is needed among those slices of one frame. Note: the non-I slice is not necessary refers to the I slice within the same frame.

### Q5. On “*Whether to drop a PDU Set in case PSDB is exceeded*”, do we need further define “*PDU Set Discard Time*” (A PDU Set shall be dropped in case this time is exceeded (sol 25 etc):

* Option 1: Support
* Option 2: not support.

**[Company view]**

**Position: Option2**

**Justification**:

PDU Set discard time should be determined by RAN not in SA2.

Whether to drop a PDU Set in case PSDB is exceeded depends on whether the PDU Set is delay critical or not.