**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)

**[MediaTek view]**

**Position: Option 1 along with Option 2.1**

**Justification**:

Option 1: The IETF has issued a last call for draft-ietf-avtext-framemarking version 13 for it to become a recognised RFC. The framework described in the draft is codec agnostic.

Option 2.1: The parameters contained in the draft framework (of option 1) can be included in the extended GTP-U header.

Option 2.2: HTTP is a protocol to fetch or push (HTTP3) resources through web links provided in a manifest file and is not suited to XR.

Option 2.3: A single extension per RTP packet is allowed according to RFC 5285 without needing IETF approval.

### 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

**[MediaTek view]**

**Position:** **Option 2.2 is preferred, but Option 1 is also viable**

**Justification**:

Option 1: Is feasible without further changes to the specification.

Option 2.2: When packet losses occur, the importance information allows the RAN to opportunistically discard less important PDU Sets on the fly. In addition, complexity is lower.

### 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.
* **[MediaTek view]**
* **Position: No support for the options listed.**
* **Justification**:

Option 1: Undesirable since it requires deep packet inspection of the NAL units in each PDU Set. Also from SA4 reply LS (S2-2203658 Q4): “***For example, the handling of dependent PDU Sets once a leading PDU Set is lost is not universally defined and depends on the operation of the application***”

Option 2: The LS reply from SA4 (s2-2203658, Q2) cast doubt on this scenario: “***In particular, low-latency XR and cloud gaming video services such as Split-Rendering or Cloud Gaming typically would not use the traditional coding structure with a fixed Group of-Picture (GOP).***”

Option 3: The method by which the dependency is derived, as well as the metric used to determine its significance, are not explained, and requires coordination with SA4.

None of these options are viable for moving forward with normative work.

### Q4. Support to hierarchical PDU Set:

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

**[MediaTek view]**

**Position: Option 2**

**Justification**: The value of grouping has not been adequately demonstrated, and its application to XR media transportation requires the support of SA4. SA4 have frequently mentioned the need for coordination in their LS (S2-2203658).

### 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.

**[MediaTek view]**

**Position: Option 1**

**Justification**: When PSDB is exceeded, which is primarily due to congestion, we support enabling discarding PDU Sets if discarding PDU Sets is allowed. When such an event occurs, we support lowering the encoding bitrate as indicated in the SA4 reply LS (S2-2203658 Q4): “***typically, video applications prefer reducing the encoding bitrate in order to minimize congestion-related packet losses***”.