**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)

**[Lenovo’s view]**

**Position:** Option1 and Option 3 are preferred at this stage.

**Justification**:

Option 1 utilizing existing IETF RFC and draft, which has only 3GPP impact. Option 2 is either out of 3GPP scope or interworking with IETF is necessary, which is not feasible at this stage. Option 3 depends on UPF implementation based on traffic characteristics, which is also feasible. Option 4 is not feasible which does not provide real-time information.

### 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

**[Lenovo’s view]**

**Position:** Option1 and Option2.2 are preferred.

**Justification**:

* Option 1 simplify RAN node handling and may complicate UPF handling. As we know, RAN node schedules based on logical channel. By binding logical channel with specific frame type/importance in Option1, RAN node is able to perform differentiated QoS handling without introducing new scheduling mechanism. That is, QoS flow should first be associated with specific frame type/importance. Then 1:1 mapping of QoS flow and radio bearer (i.e., logical channel) makes logical channel to be associated with specific frame type/importance, which facilitates RAN to perform differentiated QoS handling. For slice based traffic model defined in TR 38.838, there’re I-stream and P-stream respectively. It is easily to map one stream into one QoS flow. However, if the I-frame and P-frame are in the same service data flow, then it is a bit complicated for UPF to generate I-frame specific PDU set SN and P-frame specific PDU set SN respectively.
* Option 2.2 simplifies UPF handling but complicates RAN node handling. That is, there’s different PDU set importance within a single logical channel. The logical channel based scheduling is not applicable anymore. A more complicated scheduling mechanism shall be designed by taking the PDU set importance information in GTP-U header into consideration.

In our point of view, it is hard to decide which one is better. So it is preferred to support both options.

### 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.

**[Lenovo’s view]**

**Position:** more related with RAN WG

**Justification**:

Lenovo thinks Q3 is more related with RAN WG. And from our point of view, how dependency information can be provided to RAN shall be first discussed. E.g., to introduce “dependency information” in GTP-U header or to configure dependency over control plane. However, Option2 depends on SA4’s response for Q5 in LS out S2-2207887. If it is true, it is more CP like solution. E.g., AF indicates or specification states that the decoding of non-I frames between two successive I frames always directly or indirectly relies on the 1st I frame of the two successive I frames.

Regarding Option 1 and Option 3, whether accurate dependency relationship will be further considered for scheduling depends on RAN WG’s decision.

### Q4. Support to hierarchical PDU Set:

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

**[Lenovo’s view]**

**Position:** Option2

**Justification**:

S2-2205938 introduces PDU set group concept serves as an alternative to dependency information in the GTP-U header. For slice based traffic model, the PDU set is a “slice” and the PDU set group is a “frame”. It introduces “PDU set group SN” into dependency information. It is too complex by introducing the concept of PDU set group. There may be “PDU set group SN”, “PDU set SN” and “SN within the PDU set” in one GTP-U header. In our understanding, P-slice of one frame dependents on the I-slice of the previous frame. Therefore, we can still use “PDU set SN” to infer dependency information for the slice based traffic model.

Besides, dependency information in GTP-U header is not the only option. In LS out S2-2207887, Q4 is also related with dependency, i.e., 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?

If the answer is yes, we can refer the dependency information from the frame type and the time relation without introducing the “dependency information”.

### 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**:

As stated in 23.501, PDB can be utilized to handle the “expired” packets, i.e., discard or delivered. We don’t see the necessity of introducing a new parameter for packet discarding.

* The PDB for Non-GBR and GBR resource types denotes a "soft upper bound" in the sense that an "expired" packet, e.g. a link layer SDU that has exceeded the PDB, does not need to be discarded and is not added to the PER. However, for a Delay-critical GBR resource type, packets delayed more than the PDB are added to the PER and can be discarded or delivered depending on local decision.