**Source: Huawei, Hisilicon**

**Title:** **Discussion on cases for unmarked PDU handling and PDU Set importance configuration.**

**Document for:** **Agreement**

**Agenda Item:** **10.6**

# **Introduction**

In FS\_5G\_RTP\_ph2 the handling of lone or unmarked PDU was studied in Key Issue number #2.

Originally this issue was mainly introduced based on the fact that in SA2 unmarked PDU’s are also treated using PDU Set based QoS Handling, and are seen as a separate PDU Set with one PDU or maybe be grouped in PDU sets of multiple PDU’s depending on the implementation bye network.

The original question from SA2 was if this would affect the user or service experience. Generally as similar requirements in terms of latency or error rate apply this issue was not seen as critical to SA4 but it was taken into account in the 5G RTP phase 2 study.

Further study was done, one was on the mapping of PDU Set fields from 5G RTP and unmarked PDU’s to the corresponding values in the 5GS.

Another solution proposes application based setting of PDU Set importance based on the media type and configuration in the 5G Core.

So far incorporating this last solution depends on the adoption in SA2 and an LS exchange was initiated. In this paper we go a bit deeper on the use cases as it is not so clear which use cases will benefit from this solution.

# **Use Cases**

An important case for unmarked/lone PDU exists in the multiplexing cases.

* Multiplexing cases:
	+ A) RTP/RTCP multiplex, with RTCP unmarked
	+ B) retransmission stream unmarked
	+ C) audio packet stream that is unmarked multiplexed with video
	+ D) receiving multiple streams perhaps some senders do not apply PDU Set marking as they are not in the 5G context (a Wifi sender to 5G client should still add PDU set marking information) and the AS does not add this information either.

# **SA2/RAN perspective**

* The goal, especially for control packets that are not that many may be to assign the best PDU Set importance value in order to not lose the packets due to incorrect PSI value that would harm the quality of service and experience
* In use cases with video and audio, or video with retransmission or video with RTCP the volume of the video data is more than 10x the volume of the other streams, in that case what is the use case for addressing PDU Set importance for these low volume packets instead of just assigning the best value (PSI = 1).
* The complexity added to the network can be considered significant (i.e. NEF, PCF, SMF, UPF) , different points of view exist on this in SA4 but generally some additional signaling and interpretation in network components is needed. The exchange of information follows the same path as other common signaling that is already in place.
* Some assumption exists that the unmarked PDU’s are fewer in SA2/RAN, which hold for basic cases like audio video multiplex, RTP/RTCP multiplex, and retransmission multiplex. There may be cases with many video streams and unmarked video streams but this was not the original intention or part of the discussion. Also for video there is the bitstream based deviation based on bitstream syntax of the PSI value. So what are the key use cases and setups that would benefit from the PSI congfiguration by the application, understanding that wrong configuration could reduce the service and user experience quality ? A viewpoint in SA4 is that since the application is aware of what kind of PDUs it is generating. However, another viewpoint may think the network is best to determine the importance as the application does not really understand the network impact. Networks in general want to have the best resulting quality. In that case, the UPF can only apply a preconfigured value. We discussed and documented this during the study. See TR 26.822 clause 6.15.

Based on these considerations, perhaps a bit more work is needed on SA4 side to take some of these aspects into account.

# **Proposal**

Discuss these considerations from SA2 perspective, it makes sense to design the network for best quality of service/experience and avoid added complexity from their side.

Consider updating the use cases in 26.822 to see for which use cases benefit most from such configuration.

For video there is already the UPF based deviation based on video syntax, video is most interesting to the volume typically being over 10 times higher.

* What about non 5G aware clients participating in the session sending unmarked video
* Scalable innovative codec usage with multiple layers where PDU set cannot be implicitly derived
* Other use cases with low bit-rate traffic like audio/haptic, what hampers from setting the best PDU Set importance value.

It seems these cases go a bit beyond the original intentions with this.

Consider updating 26.822 to take these aspects into account.