**3GPP TSG-WG SA2 Meeting #141E e-meeting *S2-2006844r09***

**Elbonia, October 12 – 23, 2020 (revision of S2-200xxxx)**

**Source: Huawei, HiSilicon**

**Title: KI#3: Evaluation update**

**Document for: Approval**

**Agenda Item: 8.4**

**Work Item / Release: FS\_eNS\_ph2 / Rel-17**

*Abstract: This contribution proposes to update the evaluation on solutions of KI#3.*

# 1. Introduction/Discussion

Currently, there is an EN in clause 7.3:

Editor's note: This clause will provide some interim evaluation based on solutions #13, #20, #21, #22 that will need further updates to address e.g. roaming aspects.

Solution #37 is introduced to resolve KI#3 last meeting. Solution #37 is also a kind of Distribution based solution with SMF as a central NF.

Besides, all the solutions for KI#3 are evaluated based on following aspects:

* Impact on NF Discovery and selection
* Impact on architecture
* Roaming aspects

It is proposed to also consider Solution #37 besides the above aspects during evaluation.

# 2. Text Proposal

It is proposed to capture the following changes vs. TR 23.700-40.

\* \* \* \* First change \* \* \* \*

## 7.3 Evaluation on solutions of KI#3

Solutions can be categorized as follows:

* Category A: Those enforcing the Slice-MBR in the user plane, i.e. solution #13 and solution #22,
* Category B: Those ensuring that the Slice-MBR limits the aggregated MBR and GBR for QoS flows of active PDU sessions, i.e. solution #20, #21 and #37. Enforcement is done using the existing QoS parameter.

High level aspects of the solutions:

- Solution #22 has RAN impact. It lets RAN to enforce the SMBR (Slice Maximum Bitrate). Currently, RAN is able to be aware of the S-NSSAI of the PDU Session. And RAN is able to be enforce the UE AMBR per UE and GFBR/MFBR per QoS Flow.

Editor´s note: Solution#22 needs to be validated with RAN WG2 and RAN WG3, due to RAN impacts.

- Solution #13 uses UPF to enforce the DL slice level bitrate. This solution will require to select the same SMF/PCF and UPF per UE for all the PDU Sessions within the slice. It is applicable for such scenario where the operator may deploy specific slice network or network entity for some enterprise/corporate customers.. Other solutions can also be used in these deployment type, nonetheless. So, this solution is for small scale deployments only.

- Distribution based solutions, i.e. Solution #20, #21, and #37 let a centralized NF distribute the SMBR into pieces (i.e. Session AMBR and/or MFBR). They have no RAN impact. However, solutions do not explain how to resolve the fact that since the SMBR is distributed into Session-AMBRs, the aggregated SMBR enforced may be smaller than the SMBR, as such the SLA would not be fulfilled, as the UE will be throttled while SMBR is not fully consumed. The situation could be worse when a large amount of PDU Sessions exist as the SMBR is distributed over more Session AMBR. The subscribed Session AMBR should be delivered when there is no competing traffic. In particular, no session AMBR means there is no limit to the rate the UE could enjoy (the UE should be able to enjoy up to the peak rate or the SMBR of the slice or the UE-AMBR for the UE. this solution leveraging the existing Session AMBR parameter would break the existing parameter definition and purpose.

Impact on NF Discovery and selection:

- Solution #22 has no impact on the current NF discovery and selection.

- Solution #21 needs new NF discovery and selection mechanism on NSQ.

- Solution #13, #20 and #37 have impact on current NF discovery and selection, as they require a central NF for all the PDU Sessions within a slice.

Roaming aspects:

- Solution #13, #20, #21, #22, #37 support roaming scenario.

Editor´s note: Whether introducing new interaction between V-PCF and H-PCF for SM Policy Control in roaming scenario is suitable is FFS.

Accuracy:

* For Category A solutions: They enforce the Slice-MBR in the user plane, i.e. solution #13 in UE and UPF and solution #22 in NG-RAN and the UE, provides an accurate mechanism to ensure that the aggregated MBR and GBR of those QoS flows in UE PDU sessions to a slice is not exceeded.
* For Category B solutions: The enforcement of the existing QoS parameters ensuring that the aggregated GBR and MBR for the QoS flows with a slice does not exceed the Slice-MBR assumes that all PDU sessions are active and QoS flows run traffic, and this may not be the case.

Impact on NFs:

* Solution #13 impacts the UE (optional) and the UPF, only UPF supporting this feature can be selected for a PDU session.
* Solution #22 impacts NG-RAN, UDM, SMF
* Solution #20 (method 1) impacts PCF only, (method 2) impacts UDR as well.
* Solution #21 defines a new NF(i.e. NSQ) to control SMBR..
* Solution #37 impacts SMF and PCF.

Other aspects:

* Solutions can be also categorized depending on whether the SMBR value is different per UE, i.e. the operator can define a different value per UE in a slice or per Internal-Group-Id, i.e. the operator can define a different value per subscriber group, or per Slice, i.e. the slice MBR value is the same for all UEs within the slice.
	+ Solution #13, #21, #22, #37 describes that the SMBR value can be different per slice/UE.
	+ Solution #20 describes that the SMBR value is different per Slice, but in flavour impacting UDR can also be different per UE (UDR can store per UE data) per slice/UE.

\* \* \* \* End of changes \* \* \* \*