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**Title: On enforcement of UE MBR UL/DL per S-NSSAI**

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*Abstract of the contribution: xxx*

# Discussion

This paper proposes a mechanism to allow the network to enforce a Maximum data rate per slice/UE. It addresses the KI#3

# Proposal

The following is proposed to be added to TR 23.700-40.

## 6.X Solution #<X>: enforcement of UE- NetworkSlice-MBR(UL/DL)

### 6.X.1 Introduction

The solution applies to Key Issue #3 limitation of data rate per network slice in UL and DL per UE

This solution is based on these principles that the UE Maximum Data Rate(s) (for UL/DL) per network/slice UE is enforced in the RAN in UL and DL.

The RAN both schedules data and performs admission control for QoS flows belonging to the Network Slice.

### 6.X.2 High-level Description

* UE Maximum Data Rate(s) (for UL/DL) per Slice (**UE- NetworkSlice-MBR(UL/DL)** is provisioned in the UDM for those S-NSSAIs that are subject to it
* AMF gets **UE- NetworkSlice-MBR(UL/DL)** from the UDM for S-NSSAIs that are subject to it during the Initial UE registration procedure as part of subscription information retrieval.
* During the N2 Initial context set up procedure the AMF provides the NG-RAN with **UE- NetworkSlice-MBR(UL/DL)** per S-NSSAI for all the S-NSSAIs which are subject to it for the UE.
* NG-RAN enforces the data rate limitation per UE per network slice based on **UE- NetworkSlice-MBR(UL/DL)** considering both the GBR and no- GBR QoS flows for the UE per slice.
* The NG- RAN associates all the QoS flows of a S-NSSAI to a Logical channel group and it provides grants in UL to the logical channel group not to exceed the **UE- NetworkSlice-MBR(UL/DL).** For DL, all the Data related to QoS flows for the Network Slice are rate limited to the **UE- NetworkSlice-MBR(UL/DL).**
* During admission control (at PDU Session establishment or modification) the RAN makes sure that the accepted guaranteed rates for the aggregate of all GBR Qos flows does not exceed in UL and DL the **UE- NetworkSlice-MBR(UL/DL).**

### 6.X.3 Procedures:

#### 6.x.3.1 Registration



In step 14b the AMF obtains for the S-NSSAIs that are subject to that, the subscription data including UE- NetworkSlice-MBR(UL/DL).

#### 6.X.3.2 PDU session establishment



Step 12. In N2 SM information the GBR is evaluated against any UE- NetworkSlice-MBR(UL/DL) for the S-NSSAI in the UE context. The RAN keeps a total GBR allowed in the slice for the UE across all the GBR QoS flows and it stops admitting more GBR QoS flows when they would overflow the UE- NetworkSlice-MBR(UL/DL). If the GBR cannot allowed, then the RAN rejects the PDU session establishment in step 14.

#### 6.X.3.3 PDU session modification



Step 4. In N2 SM information the GBR is evaluated against any UE- NetworkSlice-MBR(UL/DL) for the S-NSSAI in the UE context. The RAN keeps a total GBR allowed in the slice for the UE across all the GBR Qos flows and it stops admitting more GBR QoS flows when they would overflow the UE- NetworkSlice-MBR(UL/DL). If the GBR cannot be allowed, then the RAN rejects the PDU session modification in step 6.

#### 6.X.3.4 Service Request



In Step 12, in addition to the allowed NSSAI, the AMF provides to the RAN for each s-NSSAI for which it is applicable, the UE- NetworkSlice-MBR(UL/DL).

### 6.X.4 Impacts on services, entities and interfaces

UDM: Store per S-NSSAI the **UE- NetworkSlice-MBR(UL/DL).** If applicable.

AMF: Receive from UDM the **UE- NetworkSlice-MBR(UL/DL)** in the UE subscription information per S-NSSAIsif applicable and provides it to the RAN

RAN: receives the **UE- NetworkSlice-MBR(UL/DL)** from AMF if applicable for a S-NSSAI and enforces the **UE- NetworkSlice-MBR(UL/DL)** in UL and DL and limits in admission control accepted GBR aggregate per S-NSSAI to the **UE- NetworkSlice-MBR(UL/DL)** as described above.