Source: Samsung Electronics Co. Ltd

**Title: [FS\_MS\_NS\_Ph2] Key Issue on impact of Network Slice data rate limitations on media streaming procedures**

**Agenda Item: 8.9**

**Document for: Discussion and Agreement**

# **Introduction**

3GPP SA2 has defined a procedure for data rate limitation for Network Slice for a UE in clause 5.15.13 of TS 23.501. The data rate limitation signifies the aggregate bit rate that can be expected to be provided across all GBR and Non-GBR QoS Flows corresponding to the PDU Sessions of the UE for the same Network Slice. We believe there may be an impact of this limitation on the 5G media streaming procedures specified in TS 26501 and TS 26512. In this contribution, we discuss two procedures (the dynamic policy procedure and the network assistance procedure) that may have an impact because of the above data rate limitation. We further propose a key issue for inclusion in TR 26941 to study more on this topic.

# **Impact of Network Slice data rate limitations on media streaming procedures**

Clause 5.15.13 of TS 23.501 describes the aspect of data rate limitation per Network Slice for a UE. According to this limitation, UE subscription information may include an optional Network Slice Maximum Bit Rate for the UE (Subscribed UE-Slice-MBR) for an S-NSSAI. The Subscribed UE-Slice-MBR includes a UL and a DL value. This information dictates the aggregate bit rate that can be expected to be provided across all GBR and Non-GBR QoS Flows corresponding to PDU Sessions of the UE for the same Network Slice (S-NSSAI).

## 2.1 Impact on Dynamic Policy procedure

Clause 7.9 of TS 26.512 specifies Policy Templates Provisioning API using which an 5GMS Application Provider configures a set of Policy Templates within the scope of the Provisioning Session that can be subsequently applied to downlink or uplink media streaming sessions. The dynamic policy invocation configuration information is fetched by the Media Session Handler from the 5GMS AF using the M5 Service Access Information API specified in clause 11.2 of TS 26512. When the UE wants a different network QoS policy for 5G Media Streaming, the Media Session Handler in the 5GMS Client creates a dynamic policy request to the 5GMS AF. Clause 11.5 of TS 26.512 describes the M5 Dynamic Policies API that allows the Media Session Handler to request a specific policy and charging treatment to be applied to a particular application data flow of a downlink or uplink media streaming session.

When the Media Session Handler intends to activate a QoS-related Dynamic Policy Template, it includes an object of type M5QoSSpecification specified in clause 6.4.3.3 of TS 26512. Included in the M5QoSSpecification information element are two mandatory sub-properties – Maximum requested bit rate for the Downlink and Maximum requested bit rate for the Uplink. Six other sub-properties – Minimum requested/desired bit rate for Downlink/Uplink, desired Latency and desired Loss Rate are optional parameters.

It is not clear from TS 26512 as to how the six sub-properties of M5QoSSpecification related to bit rate are governed/managed with respect to the data rate limitation per Network Slice for a UE procedure specified in clause 5.15.13 of TS 23.501. At the minimum, it may be prudent to introduce guard conditions to specify that the recommended QoS parameters by the 5GMS AF do not exceed the data rate limitations for the Network Slice for the UE.

## 2.2 Impact on Network Assistance procedure

Clause 11.6 of TS 26512 describes the API for Network Assistance, a facility provided by the network to the 5GMS Client to offer bit rate recommendation (or throughput estimation) and/or delivery boost. The data model for NetworkAssistanceSession resource described in clause 11.6.3 specifies two important properties – the requestedQoS (requested QoS parameters by the 5GMSd Client for an array of ServiceDataFlowDescriptions) and the recommendedQoS (the QoS parameters recommended by the 5GMS AF). Both the requestedQoS and *recommendedQoS* properties are of the type M5QoSSpecification specified in clause 6.4.3.3 of TS 26.512. The sub-properties of M5QoSSpecification are discussed in clause 2.1 of this contribution.

Similar to clause 2.1 of this contribution, it is not clear how the sub-properties of requestedQoS and recommendedQoS are governed/managed with respect to the data rate limitation per Network Slice for the UE procedure specified in clause 5.15.13 of TS 23.501.

# **Proposal**

We propose following change be adopted into TR 26.941.

**===== 1. CHANGE =====**

## 6.X Key Issue #x: Support of data rate limitation per Network Slice for a UE

### 6.X.1 Description

#### 6.X.1.1 Impact on 5G Media Streaming procedures

Clause 5.15.13 of TS 23.501 [7] defines an optional Maximum Bit Rate (MBR) that a UE is permitted to use in a given Network Slice (the "Subscribed UE-Slice-MBR"). If provisioned, this bit rate budget is applied in aggregate to all of a UE's PDU Sessions in that Network Slice. Requests to establish or modify a particular QoS Flow are admitted or rejected by the network on the basis of whether they can be accommodated within this ceiling according to the provisions laid out in clause 5.7.1.10 of [7], which take into account the Guaranteed Bit Rate (if any) and priority of the modified QoS Flow in relation to that of other QoS Flows already established for that UE in the same Network Slice.

TS 26.501 [20] defines two features for 5G Media Streaming that either interrogate or modify the network Quality of Service of an application data flow within an established PDU Session. Network APIs for these between the Media Session Handler and the 5GMS AF are specified in TS 26.512 [21]:

- *Dynamic Policies.* Clause 11.5 of [21] describes the Dynamic Policies API that allows the Media Session Handler to request activation of a QoS-related Policy Template previously provisioned in the 5GMS AF.

- *Network Assistance.* Clause 11.6 of [21] describes the Network Assistance API that allows the Media Session Handler to request bit rate recommendation and/or delivery boost.

It is not clear from [21] how the per-UE data rate limitation for a Network Slice defined in clause 5.15.13 of TS 23.501 [7] impacts the response of the 5GMS AF to the above API requests from the Media Session Handler.

Open issues:

- How QoS-related dynamic policy activation and Network Assistance requests from the Media Session Handler to the 5GMS AF are impacted by the per-UE data rate limitation for a Network Slice defined in clause 5.15.13 of TS 23.501 [7].