Source: Samsung Electronics Co. Ltd

**Title: [FS\_MS\_NS\_Ph2] Key Issue #2: Realizing dynamic policies using different slices**

**Agenda Item: 8.10**

**Document for: Discussion and Agreement**

# **Introduction**

During the MBS SWG Ad-hoc Post 120-e meeting on October 06, 2022, a contribution S4aI221389 was discussed that covered the aspect of slice selection for M5 dynamic policy requests. Contribution S4aI221389 proposed a key issue description (clause 6.2.1.1 in First change in this document) and a candidate solution (clause 6.2.2.x in First change in this document) for this topic. The MBS SWG discussed on this contribution and was in agreement on the key issue and candidate solution, but decided to wait on another candidate solution based on USRP so a merged contribution could be agreed as a whole for inclusion in TR 26941. The meeting minutes for the above contribution are included in Chairman report available at <https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/3GPP_SA4_AHOC_MTGs/SA4_MBS/Docs/S4aI221399.zip>.

This contribution provides a candidate solution that uses USRP for this key issue. A use case basis for this candidate solution in described in clause 2 of this contribution.

# **Use case**

Clause 5.12.6 of TR 26804 describes a use case for using multiple network slices for media streaming for different operation points. An excerpt from this clause is below:

“*The 5GMS Application Provider may use the M1 provisioning interface to define a set of network slices that can be used for the media streaming sessions that it offers. This is done when the 5GMS Application Provider would like to request that its media traffic is isolated from other traffic. This may facilitate features such charging and QoS accounting.*

*It may associate each operation point (e.g. 4K HDR, HD, SD) with a dedicated network slice. Access to each network slice at reference point M4 is restricted to UEs with a valid subscription to that service level. The list or groups of users that are to be authorized to use a certain slice is provided by the 5GMS Application Provider during the provisioning step and can be updated subsequently*”

The above clause provides a detailed call flow for realizing the above use case. As part of the solution, the service access information from the 5GMS AF to the MSH may include mapping information between the operation points and the S-NSSAIs that should be used during the session. Once the 5GMS-Aware Application retrieves the allowed operation points through M8, it selects one of the operation points and communicates with the MSH which will then establish a PDU session through that slice so M4 media streaming can proceed.

A minor variation of this use case is that the 5GMS-Aware Application intends to receive more than one operation point at the same time. For example, a user with HD level subscription is allowed to receive both the HD and SD quality media streams.

Note: It is also very likely that media services are only provisioned and to be used in only one network slice.

Given the above, following are some options for determining the slice to use for outbound M5 dynamic policy requests without an explicit preference communicated by the 5GMS AF to the UE. The options are based on reachability of the 5GMS AF in the slice described for each option.

* Option 1: Use the current slice that is carrying the media flow for which dynamic policy application is sought. If the 5GMS AF is reachable to the MSH in this slice, the MSH and 5GMS AF can follow the dynamic policy procedures described in TS 26512.
* Option 2: Use any of the slices provisioned for the media service. The MSH can try to reach the 5GMS AF through each of the slices, one after the other, until it finds a slice that it can use for dynamic policy operations
* Option 3: Use USRP to determine the slice for dynamic policy requests. The Route Selection Descriptor of the USRP rule that matched the application traffic contains a list of S-NSSAIs as described in clause 6.6.2 of TS 23.503. Each of the slices in the Route Selection Descriptor can be checked to see if 5GMS AF is reachable and available for dynamic policy operations.

This contribution proposes a candidate solution based on above 3 options with priority for option 1, then option 2, and finally option 3.

# **Proposal**

We propose that the following change be adopted into TR 26.941 for key issue #2.

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

## 6.2 Key Issue #2: Realising dynamic policies using different slices

### 6.2.1 Description

#### 6.2.1.1 Slice Selection for M5 dynamic policy requests

Editor’s Note: Key issue to cover study objective of identifying the appropriate network slice for outbound M5 dynamic policy requests from UE to AF.

Clause 5.3 of TS 26.501 [20] describes a domain model for a provisioning session for media streaming and provides a high-level procedure for provisioning the 5GMS System for downlink media streaming sessions. One of the features offered to the 5GMSd Application Provider as part of the provisioning session is dynamic policy. With this feature, the 5GMSd Application Provider specifies a set of policies (in the form of policy templates) that can be invoked for downlink media streaming. The Media Session Handler in the UE becomes aware of the current set of valid policies in the form of a list of valid Policy Template Ids.

Clause 4.7.3 of TS 26.512 [21] describes the detailed procedures for dynamic policy invocation that are invoked by the Media Session Handler using the M5 interface at the 5GMS AF. The information required by the Media Session Handler to invoke dynamic policy requests is present in the Service Access Information obtained by the Media Session Handler either from the 5GMS-Aware Application (via M6) or from the 5GMS AF (via M5) as described in clause 4.7.2 of [21].

Clause 5.8 of [20] describes a procedure for dynamic policy for downlink media streaming. As part of this procedure, the 5GMS Application Provider may request distribution of the service via one or more network slices for the, and the 5GMS AF returns back with a list of allowed S-NSSAIs. The procedure further details how the Media Session Handler and UE Policy Management in the UE determine the network slice(s) to be used for the provisioning session so that media streaming can happen at M4. However, it is not clear from the above procedures how a specific slice is selected by the Media Session Handler for performing M5 procedures with the 5GMS AF.

Open issues:

- How the Media Session Handler in the UE determines which slice, among a set of slices, to be used for M5 dynamic policy procedures.

### 6.2.2 Candidate solutions

#### 6.2.2.x Candidate solution #x: Service Access Information for inferring slice to use for M5 dynamic policy requests

Clause 11.2.3 of TS 26.512 [21] specifies the data model for the ServiceAccessInformation resource type that includes information to be used subsequently by the Media Session Handler to populate the Dynamic‌Policy‌Invocation‌Configuration information element. This information element is enhanced with slice information using which the Media Session Handler selects the slice to use for outbound M5 dynamic policy requests.

| Property name | Type | Cardinality | Usage | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| dynamicPolicyInvocation‌Configuration | Object | 0..1 | RO |  | downlink,uplink |
| sliceInfo | S-NSSAI | 0..1 | RO | Slice identifier to use for outbound M5 dynamic policy requests |

Figure 6.2.2.x-1 illustrates the procedure for using ServiceAccessInformation to determine the slice to use for M5 dynamic policy requests.



Figure 6.2.2.x-1: Procedure for using ServiceAccessInformation to extract S-NSSAI to use for outbound M5 dynamic policy requests

The steps are as follows:

1. The 5GMS Application Provider configures a provisioning session at the 5GMS AF at reference point M1 as described in clauses 5 and 6 of TS 26.501 [20].

2. The Media Session Handler obtains Service Access Information from either the 5GMS-Aware Application or 5GMS AF as described in steps 4 and 6 of clause 5.1 in [20] for download streaming, or steps 4 and 7 of clause 6.1 in [20] for upload streaming. The Service Access Information includes information about the S-NSSAI to use for outbound M5 dynamic policy requests.

3. The Media Session Handler invokes outbound M5 dynamic policy requests at the 5GMS AF using the S-NSSAI obtained in step 2.

#### 6.2.2.y Candidate solution #y: Slice selection based on 5GMS AF reachability

The following options, presented in in order of decreasing preference, may be used to determine the slice to use for outbound M5 dynamic policy requests to the 5GMS AF:

1. Use the same slice that is currently carrying the media flow for which dynamic policy application is sought.

2. Use any of the network slices provisioned for the media service. The list of slices for the media service is available to the Media Session Handler through Service Access Information acquired as described in clause 5.1 of TS 26.501 [20].

3. Use Route Selection Descriptor information of USRP rules that match the application traffic described in clause 6.6.2 of TS 23.503 [?] to obtain a list of all network slices currently accessible by the UE. Each slice in this list is tested by the Media Session Handler to determine whether the 5GMS AF is reachable. The Media Session Handler then selects one of these slices for use when invoking M5 dynamic policy operations described in clause 11.5 of TS 26.512 [20].

**===== END CHANGES =====**