Source: Samsung Electronics Co. Ltd

**Title: [FS\_MS\_NS\_Ph2] Candidate Solution for Key Issue #1: Service Provisioning**

**Agenda Item: 8.9**

**Document for: Discussion and Agreement**

# **Introduction**

Clause 6.1 of TR 26941 describes a key issue on service provisioning referencing the premium gaming use case described in clause 5.3.2 where in there is more than one Slice for the service. An extract from the key issue description is the following:

“*Clauses 7 and 11 of TS 26.512 [21] describe 5G Media Streaming APIs for (respectively) M1 Provisioning and M5 Media Session Handling. However, the present APIs support only one Network Slice per Provisioning Session. Furthermore, it is not clear from [21] whether the same Service Operation Points and Policy Templates are available in different slices when they are provisioned in this way.”*

This key issue needs to be looked into from the perspective of another key issue in TR 26941– Key Issue#3: Moving media flows to other Network Slices – which described the aspect of migrating PDU Sessions to an alternative Network Slice. Such migration may require the availability of the same policy treatment in multiple Network Slices.

In case the application provider intends to configure the same policy template for different Network Slices as described above, with the existing procedure, the policy template provisioning has to be done multiple times – once per each Network Slice and DNN combination. This contribution proposes a simple enhancement to the data model for M1 Policy Template Provisioning API so all the Network Slices can be configured with a single M1 transaction between the Application Provider and the 5GMS AF.

# **Aspects related to Service Provisioning**

Clause 7.9.3 of TS 26.512 describes data model for policy template resource as part of the M1 policy template provisioning API. Some of the information elements in the resource definition are the following:

| Property | Type | Cardinality | Description |
| --- | --- | --- | --- |
| policyTemplateId | ResourceId | 1..1 | Unique identifier of this Policy Template within the scope of the Provisioning Session. |
| externalReference | String | 1..1 | Additional identifier for this Policy Template, unique within the scope of its Provisioning Session, that can be cross-referenced with external metadata about the media streaming session. |
| qoSSpecification | M1‌QoS‌Specification | 0..1 | Specifies the network quality of service to be applied to media streaming sessions at this Policy Template. |
| ApplicationSession‌Context | Object | 1..1 | Specifies information about the application session context to which this Policy Template can be applied. |
|  afAppId | AfAppId | 0..1 | As defined in clause 5.6.2.3 of TS 29.514 [34] and clause 5.3.2 of TS 29.571 [12]. |
|  sliceInfo | Snssai | 0..1 |
|  dnn | Dnn | 0..1 |
|  aspId | AspId | 1..1 |

From the above, it is clear that there is a 1:1 correspondence between the policyTemplate parent and the ApplicationSessionContext child. With this correspondence, multiple M1 API requests from the application provider to the 5GMS AF are required to provision a policy with identical externalReference tag and M1QoSSpecification but that differ in the members of ApplicationSessionContext (e.g., with differing sliceInfo and dnn combinations).

To address the open issue described in clause 1, i.e. to allow for policy template provisioning for multiple Network Slice and DNN combinations at the same time, we propose enhancement of data model of policy template resource in clause 7.9.3 of TS 26.512 to be modified as follows:

1. Add an array of NetworkContexts as a child under the applicationSessionContext parent
2. Each NetworkContext object specifies the sliceInfo and dnn fields. The semantics of sliceInfo and dnn fields will remain the same as in the current specification.

# **Proposal**

We propose following changes be adopted into TR 26.941 for key issue #1.

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

## 6.1 Key Issue #1: Service Provisioning

### 6.1.1 Description

6.1.1.1 Provisioning multiple Network Slices for media streaming

Clause 5.3.2 of the present document describes a use case for premium gaming where two network slices are provisioned by the 5GMS Application Provider for users with different subscription levels. Clauses 7 and 11 of TS 26.512 [21] describe 5G Media Streaming APIs for (respectively) M1 Provisioning and M5 Media Session Handling. However, the present APIs support only one Network Slice per Provisioning Session. Furthermore, it is not clear from [21] whether the same Service Operation Points and Policy Templates are available in different slices when they are provisioned in this way.

Open issues:

- Whether and how the 5GMS Provisioning (M1) APIs and corresponding data model definitions in [21] need to be enhanced to support the use case referenced by this Key Issue.

- Whether and how the Media Session Handline (M5) APIs and corresponding data model definitions in [21] need to be enhanced to support the use case referenced by this Key Issue.

NOTE: Migration of media flows to different Network Slice is studied separately in clause 6.3

Assumptions:

- Slice creation and activation are out of scope of this Key Issue. The 5GMS Application Provider may perform offline negotiation with MNO OAM for slice creation and activation as described in clause 4.3.

### 6.1.2 Candidate solutions

#### 6.1.2.1 Candidate solution #1: Policy template provisioning for a plurality of Network Slices and/or DNNs

Pre-requisites and assumptions:

- A single 5GMS Application Provider (with identity aspId) intends to provision a Policy Template for a plurality of Network Slices.

- The one or more Network Slices are already provisioned and activated. Appropriate Slice and DNN identifiers are known to the 5GMS Application Provider.

To enable a Policy Template to be valid for more than one Network Slice and/or DNN, in this candidate solution the Policy Template resource specified in clause 7.9.3.1 of TS 26.512 [21] is modified as follows:

1. Add an array of networkContexts as a child under the applicationSessionContext parent. For backwards compatibility with the existing syntax, this array may be omitted, or present but empty.

2. Each Network Context object includes the existing sliceInfo and dnn properties. Both properties remain optional, so it is syntactically valid for the networkContexts array to contain empty objects (although this is meaningless semantically).

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| 7.9.3 Data model7.9.3.1 PolicyTemplate resourceThe data model for the PolicyTemplate resource is specified in table 7.9.3‑1 below:Table 7.9.3-1: Definition of PolicyTemplate resource

| Property | Type | Cardinality | Usage | Visibility | Description |
| --- | --- | --- | --- | --- | --- |
| policyTemplateId | ResourceId | 1..1 | C: ROR: ROU: RO |  | Unique identifier of this Policy Template within the scope of the Provisioning Session. |
| state | Enumeration of Strings | 1..1 | C: ROR: ROU: RO |  | A Policy Template may be in the PENDING, INVALID, READY, or SUSPENDED state.Only a Policy Template in the READY state may be instantiated as a Dynamic Policy Instance and applied to media streaming sessions. |
| apiEndPoint | String | 1..1 | C: RWR: ROU: RW | MNO Admin | The API endpoint that should be invoked when activating a Dynamic Policy Instance based on this Policy Template. |
| apiType | Enumeration of Strings | 1..1 | C: RWR: ROU: RW | MNO Admin | N5: Npcf\_PolicyAuthorization Service.N33: AsSessionWithQoS or ChargableParty. |
| externalReference | String | 1..1 | C: RWR: ROU: RW |  | Additional identifier for this Policy Template, unique within the scope of its Provisioning Session, that can be cross-referenced with external metadata about the media streaming session. |
| qoSSpecification | M1QoS‌Specification | 0..1 | C: RWR: ROU: RW |  | Specifies the network quality of service to be applied to media streaming sessions at this Policy Template. |
| applicationSession‌Context | Object | 1..1 |  |  | Specifies information about the application session context to which this Policy Template can be applied. |
|  afAppId | AfAppId | 0..1 | C: RWR: RWU: RW  |  | As defined in clause 5.6.2.3 of TS 29.514 [34] and clause 5.3.2 of TS 29.571 [12]. |
|  networkContexts | Array(Object) | 0..1 |  |  |
|  |  sliceInfo | Snssai | 0..1 | C: RWR: RWU: RW |  |
|  |  dnn | Dnn | 0..1 | C: RWR: RWU: RW |  |
|  aspId | AspId | 1..1 | C: RWR: RWU: RW |  |
| chargingSpecification | Charging‌Specification | 0..1 | C: RWR: RWU: RW  |  | Provides information about the charging policy to be used for this Policy Template. |

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NOTE: The cardinality relationship between aspId and sliceInfo is for future study.

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