Source: Samsung Electronics Co. Ltd

**Title: Requirements for EAS Relocation Support in EMSA Architecture**

**Agenda Item: 9.7**

**Document for: Discussion and Agreement**

# **Introduction**

In 3GPP SA4#114-e meeting, the SA4 group agreed for a new WID in S4-210974 titled “WID on Extensions to Support Media Processing in the Edge”. As part of the agreed work item description, below objectives were agreed to that dealt with aspects related to EAS relocation using the EMSA architecture specified in TR 26.803.

*The work item has the following objectives:*

*1. Extend the 5GMS architecture to support edge media processing according to the recommended architecture in TR 26.803 clause 6.2.*

*2. Enhance the procedures and services that are offered by the 5GMS AF and the 5GMS Client to enable establishment and management of media streaming sessions with edge processing. Specifically:*

*a. Extend the M1 interface to support the provisioning of edge media processing.*

*b. Extend the 5GMS AF to support discovery and request of edge media processing resources using the EDGE-6 and EDGE-1 interfaces.*

*c. Incorporate the EDGE-3 interface between the 5GMS AF and 5GMS AS to manage edge processing resources and sessions.*

*d. Incorporate the EDGE-4 and EDGE-5 interfaces into the Media Session Handler to facilitate discovery and offer edge functionality to 5GMS-Aware applications.*

*3. Define application context for media applications and specify relocation scenarios, conditions, triggers, information, and procedures for session continuity in edge media processing based on the EDGE-9 interface, including:*

*a. Relocation of the 5GMS AF.*

*b. Relocation of the 5GMS AS.*

In this contribution, a set of architectural requirements for supporting EAS relocation in EMSA architecture are specified. Any specification on defining the edge extensions to the 5G Media Streaming Architecture is requested to consider the EAS relocation architecture requirements presented in this contribution.

# **EAS Relocation Architecture Requirements**

The edge extensions for 5G Media Streaming in 3GPP SA4 are being defined using the 3GPP SA6 defined Architecture for enabling Edge Applications in TS 23558. While SA6 defines the network architecture components, 3GPP SA4 defines the media aspects for realizing media use cases using the SA6 architecture.

As part of the work item 5GMS\_EDGE in SA4 described earlier, one of the aspects for specification is the process of EAS relocation. TR 26.803 tackles one architectural requirement of transferring application context during relocation. In addition, clause 6.3.4 of TR 26.803 discusses a scenario for EAS relocation decided by EEC. However, the TR does not describe any network or ASP initiated relocation scenarios.

In addition to the application context transfer aspect, there are few other aspects that need to be considered for specifying a complete edge solution capable of application service relocation. Following are some requirements that the EMSA architecture has to consider while specifying EAS relocation aspects:

* Requirement # 1: If the entities that are responsible for the relocation identify the necessity for relocation during mid-session, then those entities shall provide all requisite functionalities so the performance shall not drop for the underlying service, unless explicitly notified by the application service provider that such requirement is not mandatory
* Requirement # 2: All entities that are responsible for relocation shall guarantee the KPIs of the service during and after the relocation, unless explicitly notified by the application service provider that such requirement is not mandatory
* Requirement #3: The target environment has to support the resource requirements (physical, virtual) of the EAS that is targeted for relocation. For relocation to happen, the entity responsible for EAS relocation needs guarantees from the target environment that all resources for the EAS shall be available unless otherwise specified by the application service provider
* Requirement # 4: It may be possible that the target environment cannot provide the required resources to run the EAS. In this case, the the relocation architecture shall have capabilities for the target environment to inform the source environment that the target environment cannot provide the required resources.
* Requirement # 5: If the EAS cannot be relocated as is to the target environment, then it may be possible that the entities responsible for the relocation be able to divide the functionality of the EAS in the source environment into multiple sub EAS functions that can be deployed in the target environment. The effect of combining these multiple sub functions shall be identical to the EAS that is being relocated
* Requirement # 6: If there are multiple EAS functions being relocated and they cannot be relocated as is, then it may be possible that the entities responsible for the relocation be able to combine the functionality of two or more EAS functions into one or few EAS functions that get deployed in the target environment. The effect of combined one or few EAS functions shall be identical to the multiple EAS functions that are being relocated from source environment.
* Requirement # 7: In case of multi-AS deployments, if the entities responsible for the relocation decide to relocate one or more of those AS functions, then the relocation architecture may provide capabilities for relocation even in cases where there is a functional dependency between AS functions that were decided to be relocated and the other AS functions that were deemed not relocatable.
* Requirement # 8: The relocation architecture shall support the provisioning of all the above aspects for a 5G Media Streaming session using the M1d interface in case edge is used for realizing the session

Note: If there are any changes required to the architecture or primitives specified by other 3GPP groups for satisfying the above requirements, then those groups shall be approached for appropriate improvements.

# **Proposal**

We propose that the architecture specified as part of 5GMS\_EDGE work item support the requirements specified in clause 2 above.