3GPP TSG-SA WG4 Meeting #130 S4-242014

Orlando, USA, 18th November–22nd November 2024

Title: [FS-AMD WT 3b]: Further details on application layer considerations with multi-access media delivery

Agenda Item: 8.6

Source: Samsung Electronics Co Ltd.

Introduction

Document S4aI240193 on the topic of application layer considerations with multi-access media delivery was submitted to Post-SA4#129e meeting and discussed. There were some comments during the presentation of that document. This contribution addresses those comments, and provides an update. This contribution also proposes a summary and conclusions of the study topic.

Background and motivation

Document S4aI240177, and subsequently clause 5.15.6.2 in endorsed candidate baseline CR#13 in S4aI240192, proposed to extend the media stream handling client API exposed by the Media Stream Handler to the 5GMS-Aware Application at reference point M7 and to the Media Session Handler at reference point M11 as follows:

1. For the 5GMS-Aware Application to configure the following multipath delivery parameters:

- Enable/disable multipath media delivery.

- The number of MPQUIC paths or MPTCP subflows in the multipath delivery connection.

- Add new or remove existing MPQUIC path or MPTCP subflows to/from the multipath delivery connection.

- Which media application flows are mapped onto which MPQUIC path or MPTCP subflow.

 These objectives may be achieved by modifying the Configurations and settings API specified in clause 13.2.4 of TS 26.512 [16].

2. For the 5GMS-Aware Application to be informed of the following:

- Connection endpoint information to each of the MPQUIC path or MPTCP subflow.

- Status information of multipath delivery connection.

 These objectives may be achieved by modifying the Dynamic Status Information specified in clause 13.2.6 of TS 26.512 [16].

Document S4aI240193 described the modifications to the Configurations and settings API specified in clause 13.2.4 and Dynamic Status Information specified in clause 13.2.6 of TS 26512 as indicated above to support application configuration. However, there were some comments during the presentation of S4aI240193 (meeting minutes link: https://docs.google.com/document/d/149-Zl8YpuhH-Np\_XwznANd73gkz\_hlbcN49Ecn1Ft0c/edit?tab=t.0 )

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| [**S4aI240193**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/3GPP_SA4_AHOC_MTGs/SA4_MBS/Docs/S4aI240193.zip) | [FS-AMD WT 3b]: Further details on application layer considerations with multi-access media delivery | Samsung Research America | Prakash Kolan |

**E-mail Discussion**:**Revisions**: none**Presenter**: Prakash Kolan**Online Discussion**:* Prakash presents.
* Prakash: I don’t think we are modifying the entry point here, related to Thomas’ comment on 192.
* Richard: I prefer to express the possible changes to the spec as a bullet list and not as a spec diff. It feels that it goes too far for a FS.
* Richard: On the first table, you are suggesting enabling multipath delivery as a static information but maybe it could per client. This goes probably too fast to the solution. On the second table, it seems like a stage 3 proposal but the element is just a string what should be an object but then you are limited because this is only stage 2 right now.
* Prakash: It’s ok with me to just have a bullet list of possible changes.
* Thomas: I am lost of what this is about. What would a player do with this? I would like to check with player developers how useful this information is.
* Prakash: Both MSH and media player terminate M7. You need to inform the MSH and maybe yes the media player might not do much with this information.

**Decision**:[S4aI240193](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/3GPP_SA4_AHOC_MTGs/SA4_MBS/Docs/S4aI240193.zip) is **noted**. |

Here are the responses to the above comments:

1. Richard: I prefer to express the possible changes to the spec as a bullet list and not as a spec diff. It feels that it goes too far for a FS.

[Prakash] 🡺 Understand, and agree to the proposal. This contribution proposes the update as a simple bulleted list as suggested.

2. Richard: On the first table, you are suggesting enabling multipath delivery as a static information but maybe it could per client. This goes probably too fast to the solution. On the second table, it seems like a stage 3 proposal but the element is just a string what should be an object but then you are limited because this is only stage 2 right now.

[Prakash] 🡺 Yes, I am open to defining a detailed structure for the response object, but would like to go with a simple string to start with.

3. Thomas: I am lost of what this is about. What would a player do with this? I would like to check with player developers how useful this information is.

[Prakash] 🡺 As responded to during the presentation of the contribution, we need application configuration of transport parameters, and there is only one place in our spec where the configuration happens – over M7 and M11. Hence this proposal of updating the existing API to configure some transport parameters. It is understandable that a Media Player may not know how to use these parameters, but the M7 API terminates at the Media Access Function / Media Stream Handler as well. Hence, it may be prudent to enhance the M7 and M11 API, and have those functions use the configuration as appropriate.

Text proposal

The following textual changes to TR 26.804 **CR0013** are proposed based on above discussion. In addition, summary and conclusion text for this study topic is proposed.

\* \* \* \* First change \* \* \* \*
Candidate solutions

#### 5.15.6.2 Multi-Access media delivery using ATSSS

To address the gaps identified in clause 5.15.5.2, it is proposed to extend the media stream handling client API exposed by the Media Stream Handler to the 5GMS-Aware Application at reference point M6 and to the Media Session Handler at reference point M11 as follows:

1. For the 5GMS-Aware Application to configure the following multipath delivery parameters:

- Enable/disable multipath media delivery.

- The number of MPQUIC paths or MPTCP subflows in the multipath delivery connection.

- Add new or remove existing MPQUIC path or MPTCP subflows to/from the multipath delivery connection.

- Which media application flows are mapped onto which MPQUIC path or MPTCP subflow.

 These objectives are achieved by enhancing the parameters to the Configurations and settings API specified in clause 13.2.4 of TS 26.512 [16] as follows:

a. Add a new property (e.g., enableMultipathDelivery of type Boolean) to configure whether the use of multipath delivery using multiple access network connection endpoints is required of the Media Player.

b. Add a new property (e.g., pathsForMultipathDelivery of type integer) to configure the number of paths to be used by the Media Player for the multipath delivery connection. A maximum and minimum values for this property may be configured. If the 5GMS-Aware Application intends to configure a fixed value for the number of paths, it may set the maximum and minimum values to be equal to the intended fixed value.

- In the case of MPQUIC-based multipath delivery, this property represents the number of MPQUIC paths.

- In the case of MPTCP-based multipath delivery, this property represents the number of MPTCP subflows.

c. Add a new property (e.g., accessNetworkEndpoints of type array) to configure the set of access network endpoints over which the multipath delivery connection is to be used.

2. For the 5GMS-Aware Application to be informed of the following:

- Connection endpoint information to each of the MPQUIC path or MPTCP subflow.

- Status information of multipath delivery connection.

 These objectives are achieved by enhancing the Dynamic Status Information specified in clause 13.2.6 of TS 26.512 [16] as follows:

- Add a new property (e.g., multipathDeliveryStatus of type string) to expose status information about the multipath delivery connection to the 5GMS-Aware Application.NOTE: Detailed formats of the above information are to be developed in conjunction with study progress documented in clause 5.24 of the present document.

\* \* \* \*Second change \* \* \* \*

### 5.15.7 Summary and conclusions

Multi-access media delivery enables media streaming applications to efficiently access content over multiple access networks. This Key Issue has examined existing specification relating to the ATSSS (Access Trafffic Steering Switching and Splitting) architecture in TS 23.501 [23501] and TS 23.502 [23502] to identify its impact on 5GMS. Topics relating to application awareness and influence on multi-access delivery, potential enhancements to dynamic policy feature of 5GMS to support multiple access paths, and network assistance with multi-access delivery have been studied. The Key Issue has documented collaboration scenarios and the mapping of the ATSSS architecture into the 5GMS architecture.

The MPTCP and MPQUIC link-specific multipath IP addresses are not routable via N6 as of current release, and therefore identification of specific paths for any 5G Media Streaming procedures is not supported. Further, traffic splitting for GBR QoS Flows is not supported. If M4 media flows are transported as GBR QoS Flows, then traffic splitting of M4 media flows using ATSSS is not supported in this release, and the study is to be revisited in a future release.

It is recommended that:

1. An informative annex is added to TS 26.501 [15] documenting:

a. A brief description of multi-access media delivery, based on clause 5.15.1 of the present document.

b. The mapping of the ATSSS architecture into the 5GMS architecture, as described in clause 5.15.3.2 of the present document.

2. Changes to the *Configuration Settings API* and to the *Dynamic Status Information API* as described in clause 5.15.6.2 of the present document are implemented in TS 26.510 [26510] to allow for application configuration and status information exchange for multi-access media delivery.

\* \* \* \* End of changes \* \* \* \*