**3GPP TSG-S4 Meeting # 128S4-240938**

Jeju Island, KR, 20-24 May 2024 revision of S4-240835

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| *CR-Form-v12.2* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
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|  | **26.510** | **CR** | pseudo | **rev** |  | **Current version:** | 1.2.3 |  |
|  | | | | | | | | |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Improving M6 general parts | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Tencent Cloud | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GMS\_Pro\_Ph2 | | | | |  | ***Date:*** | | | 2024-04-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Updating clause 10 because it lacks functionality described in clause 5.4.2 due to the following additions in R18:   1. Multiple media entry points in Service Access Information 2. New 3GPP service URL to start the service 3. New media delivery session identifier which is issued by Media Session Handler.   Some of the above changes are reflected in 5.4.2 but clause 10 lacks the support for the above features.  References:   1. In 5.4.2, it is stated:   “Media session handling of a new media delivery session may be explicitly initiated by a Media-aware Application invoking an appropriate API method on the Media Session Handler at reference point M6. An *external service identifier* shall be provided as input parameter to the API method.  In response, the Media Session Handler shall allocate a globally unique *media delivery session identifier* for use by the Media Client in its subsequent interactions with the Media AF and Media AS.  The Media Session Handler shall attempt to acquire full Service Access Information for the specified external service identifier from the Media AF using the operation defined in clause 5.3.2.3 and, if successful, shall return the media delivery session identifier to the invoker of the API method.  Subsequent interactions by the Media-aware Application with the Media Session Handler at reference point M6 shall cite the relevant media delivery session identifier.  a) If it initiates media delivery, the Media-aware Application shall also pass this media delivery session identifier to the Media Access Function at reference point M7 for subsequent use in interactions between the Media Access Function and the Media Session Handler at reference point M11.  b) Alternatively, if media delivery is initiated by the Media Session Handler on behalf of the Media-aware Application, the media delivery session identifier shall instead be passed to the Media Access Function at reference point M11 for use in subsequent interactions between them at this reference point.  Subsequent interactions by the Media Access Client with the Media AS at reference point M4 shall cite the relevant media delivery session identifier to enable media access logged by the Media AS to be correlated with media session handling operations logged by the Media AF.  The Media-aware Application may explicitly terminate media session handling of the media delivery session by invoking an appropriate API method on the Media Session Handler at reference point M6, citing the target media delivery session identifier as input parameter.”   1. In 26.512 clause 13:     Table 13.2.3.3-1: Parameters for attachMPD()   |  |  |  | | --- | --- | --- | | Name | Type | Description | | urlOrMPD | string | Object | A URL to a valid MPD or a valid MPD as defined in ISO/IEC 23009-1 [32] or TS 26.247 [4].  The URL may be augmented by MPD Anchors as defined in ISO/IEC 23009-1 [32], clause C.4. |   Discussion:   1. Note that Application may have only the 3GPP service URL or external service ID or none. 2. Application or Media Access Function (MAF) may need to decide among multiple media entry points. 3. MSH is the entity that assigns the media delivery session id. 4. According the 26.512 clause 13, M7, the App is requesting MAF to start playing by passing URL or the MPD.   Therefore, we need to make a high level decision. Either:   * 1. The App starts the delivery session when requesting the SAI, even before MAF is actually requesting the media streaming starts. It could be a time interval between the two actions.   2. Or, we define that the delivery session starts when the MAF actually starts requesting/uploading the media data.   We believe b makes more sense since:   1. The App getting the SAI from the MSH doesn’t necessarily mean the UE will start the actual media delivery session right away. For instance, the MAF may not find a media entry point that it supports for downlink or uplink streaming formats. Approach b also requires minimal changes in 26.512 clause 13. 2. The App may receive the entry point(s) and other SAI information through M8. So the App may need to retrieve the SAI through MSH.   Therefore, we argue that the start of media delivery sessions seems to not need to be tied to retrieval of SAI through MSH. However, MSH still should be the entity issuing the media session identifier.  In either case, clause 10 is completely inadequate.  If we go with b, then the process would be:   1. App either has SAI from M8 or use an external service id or 3GPP Service URL to acquire and subscribe to SAI through M6. 2. Then the App chooses a media entry point and call MAF using initialize(). 3. When MAF receives attach(MPD) or Preload(MPD) (or more general, an entry point), it calls MSH to assign the media delivery session identifier. 4. When MAF receives reset() or destroy() from the App, it requests the MSH to release the media delivery session identifier. 5. MSH needs to maintain the latest of SAI. 6. When MSH receives an updated SAI (through request or notification + request), needs to notify the application and/or MAF.   Furthermore: The Media Access Function (player) maintains the state of streaming/playback. But now in addition to the above, the MSH assigns the media delivery session identifier to a specific service URL and maintains its status in its internal logic. So MHS also has one of the following states: 1) assigned a identifier and keep the latest SAI 2) release the identifier 3) error.  The change request is proposed using the approach b. If we decide to go with approach a, the proposed changes are provided as alternative changes in change 1a and change 2b. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. 5.4.2.1:updating the process of assigning the media delivery session identifier. 2. 10.2.1: new entry in the table 3. 10.2.2: updating the methods 4. 10.2.3: updating the events | | | | | | | | |
| ***:*** | |  | | | | | | | | |
| ***Consequences if not approved:*** | | M6 is underdefined and not clear. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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### 5 Media delivery session life-cycle

#### 5.4.2.1 Explicit media session handling initiation/termination

Prior to or during a media delivery session, the Media-aware Application or Media Access Function, may request the Service Access Information Function by invoking an appropriate API method on the Media Session Handler at reference points M6 or M11, respectively and providing the external service id.

Media session handling of a new media delivery session may be explicitly initiated by a Media-aware Application or Media Access Function by invoking an appropriate API method on the Media Session Handler at reference points M6 or M11, respectively. A media entry point document or URL, for instance obtained from the Service Access Information, shall be provided as input parameter to the API method.

In response, the Media Session Handler shall allocate a globally unique *media delivery session identifier* for use by the Media Client in its subsequent interactions with the Media AF and Media AS.

The Media Session Handler shall attempt to acquire full Service Access Information for the specified external service identifier from the Media AF using the operation defined in clause 5.3.2.3 and, if successful, shall return the media delivery session identifier to the invoker of the API method.

Subsequent interactions by the Media-aware Application with the Media Session Handler at reference point M6 shall cite the relevant media delivery session identifier.

a) If it initiates media delivery, the Media-aware Application shall also pass this media delivery session identifier to the Media Access Function at reference point M7 for subsequent use in interactions between the Media Access Function and the Media Session Handler at reference point M11.

b) Alternatively, if media delivery is initiated by the Media Access Function on behalf of the Media-aware Application, the media delivery session identifier shall instead be passed to the Media Access Function at reference point M11 for use in subsequent interactions between them at this reference point.

Subsequent interactions by the Media Access Client with the Media AS at reference point M4 shall cite the relevant media delivery session identifier to enable media access logged by the Media AS to be correlated with media session handling operations logged by the Media AF.

The Media-aware Application or Media Access Function may explicitly terminate media session handling of the media delivery session by invoking an appropriate API method on the Media Session Handler at reference point M6 or M11, respectively, citing the target media delivery session identifier as input parameter.

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# 10 UE media session handling APIs

## 10.1 Introduction

This clause defines the abstract client APIs exposed by the Media Session Handler to the Media-aware Application at reference point M6 and to the Media Access Function at reference point M11. The APIs may be used to query a subset of information from Service Access Information and its updates as well as to receive the notifications of various events during the media delivery session.

NOTE: Client-driven management of edge processing resources via reference point M6 is not specified in this release.

## 10.2 Media Session Handler client API

### 10.2.1 Media Session Handler internal properties

The Media Session Handler maintains internal properties as defined table 10.2.1-1. Note that the parameters are conceptual. They serve only for the purpose of defining the media session handling APIs.

Table 10.2.1-1: Parameters of Media Session Handler

|  |  |  |
| --- | --- | --- |
| States and Parameters | | Definition |
| \_Configuration[externalServiceId] | | The Media Session Handler maintains a separate configuration for each set of Service Access Information it has knowledge of, indexed by its external service identifier or 3GPP Service URL. |
|  | ~~\_serviceAccessInformation~~ | ~~The Service Access Information resource~~ |
|  | \_mediaDeliverySessionIdentifier | The media delivery session identifier, if assigned. |
|  | \_mediaAccess | Media access information including the provisioning session type and streaming access information. |
|  | \_networkAssistance | Network Assistance configuration. |
|  | \_policyTemplate | Policy Template configuration. |
|  | \_consumptionReporting | Consumption reporting configuration. |
|  | \_metricsReporting | Metrics reporting configuration. |
| \_status[mediaDeliverySessionId] | | The Media Session Handler maintains a separate status record for each currently active media delivery session, indexed by media delivery session identifier. |
|  | \_generalStatus | General status information. (See table 10.2.3‑1.) |
|  | \_dynamicPolicyStatus | Dynamic Policy status information. (See table 10.3.2-1) |
|  | \_networkAssistanceStatus | Network Assistance status information. (See table 10.4.2-1) |
|  | \_consumptionReportingStatus | Consumption Reporting status information. (See table 10.5.2‑1.) |
|  | \_metricsReportingStatus | Metrics Reporting status information. (See table 10.6.2‑1.) |

#### 10.2.2 General Media Session Handler methods10.2.2.1 Get Service Access Information

Prior to the start of a media delivery session, the 5GMS-Aware Application or Media Access Function usually requests the Service Access Information at reference point M6 or M11, respectfully. Furthermore, the latest Service Access information along with the media delivery session identifier can be retrieved using these APIs.

The getServiceAccessInformation() method is used to request the Media Session Handler to retrieve the latest Service Access Information from the Media AF. The input and return parameters of the method are defined in tables 10.2.2.1-1 and 10.2.2.1-2. Alternatively, the Media-aware Application or Media Access Function may subscribe to notifications of Service Access Information updates.

Table 10.2.2.1-1: Input parameters for getServiceAccessInformation() method

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| serviceId | string | The external service identifier. |

Table 10.2.2.1-2: Return value for getServiceAccessInformation() method

|  |  |
| --- | --- |
| Type | Description |
| object | Service Access Information and media session delivery identifier, if it is assigned. |

#### 10.2.2.2 Subscribe to Service Access Information

The subscrribeMediaAccessInformation()method is used for subscribing the service access information. Whenever an update to the Service Access Information is available then a notification event is issued. The input and return parameters of the method are defined in tables 10.2.2.3-1 and 10.2.2.3-2.

Table 10.2.2.2-1: Input parameters for subscribeMediaAccessInformation() method

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| serviceId | string | The external service identifier. |

Table 10.2.2.2-2: Return value for subscribeMediaAccessInformation() method

|  |  |
| --- | --- |
| Type | Description |
| boolean | true if subscription is successful, otherwise false. |

#### 10.2.2.3 Request media delivery session identifier

The requestDeliveryIdentifier() method is used to request to start a media delivery session in the Media Session Handler and to obtain the associated media delivery session identifier. The input and return parameters of the method are specified in tables 10.2.2.3-1 and 10.2.2. 3-2.

Table 10.2.2.3-1: Input parameters for requestDeliveryIdentifier() method

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| serviceId | string | The external service identifier. |

Table 10.2.2.3-2: Return value for requestDeliveryIdentifier() method

|  |  |
| --- | --- |
| Type | Description |
| string | The media delivery session identifier. |

The Media Session Handler shall:

- Return the value of the mediaDeliverySessionIdentifier of Configuration[ExtServiceId] if exists and has an assigned value.

- Assign a new value to the mediaDeliverySessionIdentifier of Configuration[ExtServiceId] if this configuration exists, but does not have a media delivery session identifier value, and then return the new value.

#### 10.2.2.4 Release media delivery identifier

The releaseDeliveryIdentifier() method is used to release the allocated resources in the Media Session Handler for an assigned media delivery session identifier. With this method, the Media Session Handler does not maintain the internal properties corresponding to the media delivery session identifier. The input and return parameters of the method are specified in tables 10.2.2.4-1 and 10.2.2.4-2.

Table 10.2.2.4-1: Input parameters for releaseDeliveryIdentifier() method

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| mediaDeliverySessionIdentifier | String | The media delivery session identifier. |

Table 10.2.2.4-2: Return value for releaseDeliveryIdentifier() method

|  |  |
| --- | --- |
| Type | Description |
| string | Status as described in 10.2.3. |

### 10.2.3 General Media Session Handler information

Table 10.2.3-1 specifies the status information that can be obtained from the Media Session Handler through reference points M6 and M11.

Table 10.2.3-1: General Media Session Handler Status Information

|  |  |  |  |
| --- | --- | --- | --- |
| Status | Type | Parameter | Definition |
| SESSION\_HANDLING\_STATUS | Enumeration:  ACTIVATED  STOPPED  ERRORED | Media delivery session identifier | The status of media delivery session:  ACTIVATED: The Media Delivery Session is assigned.  STOPPED: The Media Delivery Session is released, and the identifier is not in use.  ERRORED: There is an error in media session handling. |

Table 10.2.3-2 provides a list of general notification events exposed by the Media Session Handler through reference points M6 and M11.

Table 10.2.3-2: General Media Session Handler Notification Events

|  |  |  |
| --- | --- | --- |
| Event | Definition | Payload |
| SESSION\_HANDLING\_ACTIVATED | Triggered when media session handling was activated for a specific Media Entry Point. | Media delivery session identifier, Media Entry Point URL. |
| SESSION\_HANDLING\_STOPPED | Triggered when media session handling stopped for a specific Media Entry Point. | Media delivery session identifier, Media Entry Point URL. |
| SERVICE\_ACCESS\_INFORMATION\_UPDATE | Triggered when an update to the Service Access Information is available. | Media delivery session identifier, Service Access Information. |

Table 10.3.3-3 provides a list of general error events exposed by the Media Session Handler through reference points M6 and M11.

Table 10.2.3-3: General Media Session Handler Error Events

|  |  |  |
| --- | --- | --- |
| Status | Definition | Payload |
| ERROR\_SESSION\_HANDLING | Triggered when there is an error in the media session handling. | Media delivery session identifier. |

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### 5 Media delivery session life-cycle

#### 5.4.2.1 Explicit media session handling initiation/termination

Media session handling of a new media delivery session may be explicitly initiated by a Media-aware Application or Media Access Function by invoking an appropriate API method on the Media Session Handler at reference points M6 or M11, respectively. An *external service identifier* shall be provided as input parameter to the API method.

In response, the Media Session Handler shall allocate a globally unique *media delivery session identifier* for use by the Media Client in its subsequent interactions with the Media AF and Media AS.

The Media Session Handler shall attempt to acquire full Service Access Information for the specified external service identifier from the Media AF using the operation defined in clause 5.3.2.3 and, if successful, shall return the media delivery session identifier to the invoker of the API method. Additionally, the Media Session Handler shall provide event notifications at reference points M6 and M11 whenever it receives an update to the Service Access Information.

Subsequent interactions by the Media-aware Application with the Media Session Handler at reference points M6 and M11 shall cite the relevant media delivery session identifier.

a) If it initiates media delivery, the Media-aware Application shall also pass this media delivery session identifier to the Media Access Function at reference point M7 for subsequent use in interactions between the Media Access Function and the Media Session Handler at reference point M11.

b) Alternatively, if media delivery is initiated by the Media Access Function on behalf of the Media-aware Application, the media delivery session identifier shall instead be passed to the Media Access Function at reference point M11 for use in subsequent interactions between them at this reference point.

Subsequent interactions by the Media Access Client with the Media AS at reference point M4 shall cite the relevant media delivery session identifier to enable media access logged by the Media AS to be correlated with media session handling operations logged by the Media AF.

The Media-aware Application or Media Access Function may explicitly terminate media session handling of the media delivery session by invoking an appropriate API method on the Media Session Handler at reference point M6 or M11, respectively, citing the target media delivery session identifier as input parameter.

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# 10 UE media session handling APIs

## 10.1 Introduction

This clause defines the abstract client APIs exposed by the Media Session Handler to the Media-aware Application at reference point M6 and to the Media Access Function at reference point M11. The APIs may be used to query a subset of information from Service Access Information and its updates as well as to receive notifications of various events during the media delivery session.

NOTE: Client-driven management of edge processing resources via reference point M6 is not specified in this release.

## 10.2 Media Session Handler client API

### 10.2.1 Media Session Handler internal properties

The Media Session Handler maintains internal properties as defined table 10.2.1-1. Note that the parameters are conceptual. They serve only for the purpose of defining the media session handling APIs.

Table 10.2.1-1: Parameters of Media Session Handler

|  |  |  |
| --- | --- | --- |
| States and Parameters | | Definition |
| \_Configuration[externalServiceId] | | The Media Session Handler maintains a separate configuration for each set of Service Access Information it has knowledge of, indexed by its external service identifier. |
|  | \_serviceAccessInformation | The Service Access Information resource |
|  | \_mediaDeliverySessionIdentifier | The media delivery session identifier, if assigned. |
| \_status[mediaDeliverySessionId] | | The Media Session Handler maintains a separate status record for each currently active media delivery session, indexed by media delivery session identifier. |
|  | \_generalStatus | General status information. (See table 10.2.3‑1.) |
|  | \_dynamicPolicyStatus | Dynamic Policy status information. (See table 10.3.2-1) |
|  | \_networkAssistanceStatus | Network Assistance status information. (See table 10.4.2-1) |
|  | \_consumptionReportingStatus | Consumption Reporting status information. (See table 10.5.2‑1.) |
|  | \_metricsReportingStatus | Metrics Reporting status information. (See table 10.6.2‑1.) |

#### 10.2.2 General Media Session Handler methods10.2.2.1 Create media delivery session

The requestMediaDeliverySessionIdentifier() method is used to start a media delivery session in the Media Session Handler and to obtain the associated media delivery session identifier. The input and return parameters of the method are specified in tables 10.2.2.3-1 and 10.2.2. 3-2.

NOTE: The Media-aware Application or Media Access Function may also subscribe to receive notifications of updates to the Service Access Information for the media delivery session in question.

Table 10.2.2.3-1: Input parameters for requestMediaDeliverySessionIdentifier() method

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | O | Description |
| serviceId | string | M | An external service identifier that uniquely identified a Provisioning Session in the Media Delivery System. |
| sessionId | string | O | A media delivery session identifier nominated by the method invoker.  If omitted, the Media Session Handler shall assign a media delivery session identifier. |

Table 10.2.2.3-2: Return value for requestMediaDeliverySessionIdentifier() method

|  |  |
| --- | --- |
| Type | Description |
| string | The media delivery session identifier. |

The Media Session Handler shall:

- Return the value of the *mediaDeliverySessionIdentifier* of Configuration[ExtServiceId] if exists and has an assigned value.

- Assign a new value to the *mediaDeliverySessionIdentifier* of Configuration[ExtServiceId] if this configuration exists, but does not have a media delivery session identifier value, and then return the new value.







#### 10.2.2.3 Destroy media delivery session

The releaseDeliveryIdentifier() method is used to release the allocated resources in the Media Session Handler for an assigned media delivery session identifier. With this call, the Media Session Handler does not maintain the internal properties corresponding to the media delivery session identifier. The input and return parameters of the method are specified in tables 10.2.2.3-1 and 10.2.2.3-2.

Table 10.2.2.3-1: Input parameters for releaseDeliveryIdentifier() method

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| mediaDeliverySessionIdentifier | String | The media delivery session identifier. |

Table 10.2.2.3-2: Return value for releaseDeliveryIdentifier() method

|  |  |
| --- | --- |
| Type | Description |
| string | Status as described in 10.2.3. |

### 10.2.3 General Media Session Handler information

Table 10.2.3-1 specifies the status information that can be obtained from the Media Session Handler through reference points M6 and M11.

Table 10.2.3-1: General Media Session Handler Status Information

|  |  |  |  |
| --- | --- | --- | --- |
| Status | Type | Parameter | Definition |
| SESSION\_HANDLING\_STATUS | Enumeration:  ACTIVATED  STOPPED  ERRORED | Media delivery session identifier | The status of media delivery session:  ACTIVATED: The Media Delivery Session is assigned.  STOPPED: The Media Delivery Session is released, and the identifier is not in use.  ERRORED: There is an error in media session handling. |

Table 10.2.3-2 provides a list of general notification events exposed by the Media Session Handler through reference points M6 and M11.

Table 10.2.3-2: General Media Session Handler Notification Events

|  |  |  |
| --- | --- | --- |
| Event | Definition | Payload |
| SESSION\_HANDLING\_ACTIVATED | Triggered when media session handling was activated for a specific Media Entry Point. | Media delivery session identifier, Media Entry Point URL. |
| SESSION\_HANDLING\_STOPPED | Triggered when media session handling stopped for a specific Media Entry Point. | Media delivery session identifier, Media Entry Point URL. |

Table 10.3.3-3 provides a list of general error events exposed by the Media Session Handler through reference points M6 and M11.

Table 10.2.3-3: General Media Session Handler Error Events

|  |  |  |
| --- | --- | --- |
| Status | Definition | Payload |
| ERROR\_SESSION\_HANDLING | Triggered when there is an error in the media session handling. | Media delivery session identifier. |