**3GPP TSG-SA WG4 Meeting** #**132 S4-250966**

**Fukuoka, Japan, 19-23 May 2025**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **26.512** | **pCR** | **0088** | **rev** |  | **Current version:** | **18.5.0** |  |
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| *For* [***HE******LP***](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:*** |  | | | | | | | | | |
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| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | AMD\_PRO-MED | | | | |  | ***Date:*** | | | 2025-05-13 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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)* | |
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| ***Reason for change:*** | | [S4-250585](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131-bis-e/Docs/S4-250585.zip) contribution implements recommendations on topic of multi-access media delivery. It is endorsed. Following this, in the CR, we propose new modifications to be added to TS 26.512. | | | | | | | | |
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| ***Summary of change:*** | | This CR proposes new text Configurations and settings API for Multi-Access media delivery using ATSSS. | | | | | | | | |
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| ***Consequences if not approved:*** | | Proposed objectives will not be met. | | | | | | | | |
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| ***Clauses affected:*** | |  | | | | | | | | |
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|  | | **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:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | | [S4-250585](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131-bis-e/Docs/S4-250585.zip) proposed initial contents in SA4#131-bis-e.  [S4-250698](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131-bis-e/Docs/S4-250698.zip) was endorsed as basis of further work which was merged from [S4-250585](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131-bis-e/Docs/S4-250585.zip) and [S4-250505](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131-bis-e/Docs/S4-250505.zip). | | | | | | | | |

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| 1st Change |

### 4.6.2 Procedures for Progressive Download Session

This procedure is used by a 5GMSd client to establish a Progressive Download session via the M4d interface. In order to establish such a session, the 5GMSd AS shall host an 3GP/MP4 file as defined in TS 26.247 [4]. The 3GP/MP4 URL is known to the Media Player (in this case a progressive download player), typically by using M8d.

The Media Player receives a URL from the 5GMSd-Aware Application through M7d by methods defined in clause 13. The Media Player shall send an HTTP GET message to the 5GMSd AS including the URL of the 3GP/MP4 resource. On success, the 5GMSd AS shall respond with a 200 (OK) message that includes the requested 3GP/MP4 resource.

Additional procedures for reactions to different HTTP status codes are provided in TS 26.247 [4].

The Media Player may use multiple access networks available on the UE to connect to a service location on the 5GMSd AS via reference point M4d.

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| 2nd Change |

## 4.14 Procedures for downlink media streaming via MBS

This procedure is used by a 5GMSd Client to establish a downlink media streaming session either completely, or at least partially, through MBS.

- For downlink media streaming exclusively via MBS and for hybrid 5GMSd/MBS services, as defined in clauses 5.12.2 and 5.12.4 respectively of TS 26.501 [2]:

- The 5GMSd Application Provider shall provision a supplementary distribution network of type DISTRIBUTION\_‌NETWORK\_MBS in the Content Hosting Configuration at reference point M1d, as specified in clause 8.8.3.1 of TS 26.510 [56], with either MODE\_EXCLUSIVE or MODE\_HYBRID (as appropriate).

- The 5GMSd Application Provider may additionally provision access reporting in the Consumption Reporting Configuration at M1d, as specified in clause 8.12.3.1 of TS 26.510 [56].

- The MBSTF Client shall host an MPD as defined in ISO/IEC 23009‑1 [32] or in TS 26.247 [4], or any other presentation manifest such as an HLS Variant Playlist, as the 5GMSd Media Entry Point.

- The URL of this presentation manifest shall be signalled to the 5GMSd Client through the 5GMSd session establishment procedure. The MBSTF Client may use multiple access networks available on the UE to connect to a service location on the 5GMSd AS reference point MBS-4.

- The MBSTF Client shall be invoked by the Media Session Handler via reference point MBS-7 using the procedures defined in TS 26.517 [64].

- For dynamically provisioned downlink media streaming via MBS as defined in clause 5.12.5 TS 26.501 [2]:

- The 5GMSd Application Provider shall provision a supplementary distribution network of type DISTRIBUTION\_‌NETWORK\_MBS in the Content Hosting configuration at reference point M1d, as specified in clause 8.8.3.1 of TS 26.510 [56], with MODE\_DYNAMIC.

- The 5GMSd Application Provider shall additionally provision access reporting in the Consumption Reporting Configuration at M1d, as specified in clause 8.12.3.1 of TS 26.510 [56].

- The 5GMSd AS shall host an MPD as defined in ISO/IEC 23009‑1 [32] or in TS 26.247 [4], or any other presentation manifest such as an HLS Variant Playlist as the 5GMSd Media Entry Point.

- The URL of this presentation manifest shall be signalled to the 5GMSd Client through the 5GMSd session establishment procedure. If the 5GMSd service is currently available as an MBS User Service, the 5GMSd Client forwards the manifest request to the Media Server in the MBSTF Client via reference point MBS-7; otherwise, it forwards the request to the 5GMSd AS via reference point M4d. The 5GMSd Client may use multiple access networks available on the UE to connect to a service location on the 5GMSd AS via reference point MBS-4.

NOTE: The detailed execution of dynamically handling this decision is left to implementation.

- The MBS Client shall be invoked dynamically, paused or destroyed by the Media Session Handler via reference point MBS-7 using the procedures defined in TS 26.517 [64].

Additional procedures for reactions to different HTTP status codes are provided in clause A.7 of TS 26.247 [4] and clause A.7 of ISO/IEC 23009‑1 [32].

Additional procedures for handling partial file responses are provided in clause A.9 of TS 26.247 [4].

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| 3rd Change |

### 13.2.5 Notifications and error events

Table 13.2.5-1 provides a list of notification events that are provided by the Media Player to 5GMSd-Aware Applications at reference point M7d and to the Media Session Handler at reference point M11d. Every notification and error event is disambiguated by a media delivery session identifier.

Table 13.2.5-1: Media Player Notification events

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| Status | Definition | Payload |
| AST\_IN\_FUTURE | Triggered when playback will not start yet as the MPD's availabilityStartTime is in the future. | Media delivery session identifier, Time before playback will start. |
| AVAILABLE\_MEDIA\_CHANGED | The list of available media has changed. | Media delivery session identifier, Media type:  - video  - audio  - subtitle  - all |
| BUFFER\_EMPTY | Triggered when the media playback platform's buffer state changes to stalled. | Media delivery session identifier, Media Type |
| BUFFER\_LOADED | Triggered when the media playback platform's buffer state changes to loaded. | Media delivery session identifier, Media Type |
| CAN\_PLAY | Sent when enough data is available that the media can be played. | Media delivery session identifier |
| MANIFEST\_LOADED | Triggered when the manifest load is complete | Media delivery session identifier |
| METRIC\_ADDED | Triggered every time a new metric is added. | Media delivery session identifier |
| METRIC\_CHANGED | Triggered every time a metric value changes. | Media delivery session identifier,  Metric identifier |
| METRIC\_UPDATED | Triggered when the configuration of a metric is updated. | Media delivery session identifier,  Metric identifier |
| METRICS\_CHANGED | Triggered whenever there is a change to the overall metrics. | Media delivery session identifier |
| OPERATION\_POINT\_CHANGED | Triggered whenever there is a change of a Service Operation Point parameter. | Media delivery session identifier,  External reference identifier of currently selected Service Operation Point. |
| PLAYBACK\_ENDED | Sent when media playback completes normally. | Media delivery session identifier |
| PLAYBACK\_ERROR | Sent when an error occurs during media playback. The element's error attribute contains more information. | Media delivery session identifier,  Error reason (see table 13.2.5‑2). |
| PLAYBACK\_PAUSED | Sent when media playback is paused. | Media delivery session identifier |
| PLAYBACK\_PLAYING | Sent when the media begins to play (either for the first time, after having been paused, or after ending and then restarting). | Media delivery session identifier |
| PLAYBACK\_SEEKED | Sent when a media playback seek operation completes. | Media delivery session identifier |
| PLAYBACK\_SEEKING | Sent when a media playback seek operation begins. | Media delivery session identifier |
| PLAYBACK\_STALLED | Sent when the media playback platform reports stalled. | Media delivery session identifier |
| PLAYBACK\_STARTED | Sent when playback of the media starts after having been paused; that is, when playback is resumed after a prior pause event. | Media delivery session identifier |
| PLAYBACK\_WAITING | Sent when the media playback has stopped because of a temporary lack of data. | Media delivery session identifier |
| SERVICE\_DESCRIPTION\_SELECTED | sent when the DASH client has selected a service description. | Media delivery session identifier |
| SERVICE\_DESCRIPTION\_CHANGED | Sent when the DASH client has changed a service description. | Media delivery session identifier |
| SERVICE\_DESCRIPTION\_VIOLATED | Provides notification that the service description parameters are currently not met. | Media delivery session identifier,  Parameters of service description that are not met |
| SOURCE\_INITIALIZED | Triggered when the source is set up and ready. | Media delivery session identifier |
| DOWNLOAD\_STARTED | Sent when a non-real-time content download begins. | Media delivery session identifier |
| DOWNLOAD\_COMPLETED | Sent when a non-real-time content download is complete. | Media delivery session identifier |
| DOWNLOAD\_ERROR | Send when an error occurs during non-real-time content download. | Media delivery session identifier,  Error reason (see table 13.2.5‑2). |
| MULTI-ACCESS\_DELIVERY\_ESTABLISHED | Triggered when the multi-access media delivery connection is set up and ready. | Media delivery session identifier,  Multi-access connection status |
| MULTI-ACCESS\_DELIVERY\_CHANGED | Triggered when the multi-access media delivery connection status changes. | Media delivery session identifier, Multi-access connection status |
| MULTI-PATH\_DELIVERY\_ESTABLISHED | Triggered when the multi-path media delivery connection is set up and ready. | Media delivery session identifier,  Multi-path connection status |
| MULTI-PATH\_DELIVERY\_CHANGED | Triggered when the multi-path media delivery connection status changes. | Media delivery session identifier, Multi-path connection status |

Table 13.2.5-2 provides a list of error reasons that are indicated for notifications of type PLAYBACK\_ERROR and DOWNLOAD\_ERROR.

Table 13.2.5-2: Media Player Error reasons

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| Error reason | Definition |
| ERROR\_MEDIA\_ENTRY\_NOT\_FOUND | The Media Entry Point resource requested by the Media Player could not be located. |
| ERROR\_CONTENT\_NOT\_FOUND | Other content requested by the Media Player could not be located. |
| ERROR\_MEDIA\_PLAYBACK | There is an error from the media playback platform buffer. |
| ERROR\_INVALID\_MEDIA\_ENTRY | The Media Entry Point resource supplied is not syntactically valid. |
| ERROR\_INACCESSIBLE\_MEDIA\_TIME | The media time requested in a seek operation is not accessible in the current media presentation. |
| ERROR\_UNSUPPORTED\_PROFILE | The profile of the media presentation described by the Media Entry Point resource is not supported by the media playback platform. |
| ERROR\_DOWNLOAD\_DEADLINE\_MISSED | The download of content did not complete before the requested deadline and the incomplete download has been discarded. |
| ERROR\_MULTI-ACCESS\_DELIVERY\_UNAVAILABLE | The configured multi-access media delivery (see clause 13.2.4) is not supported by the Media Player or is not supported by the Media AS. |
| ERROR\_MULTI-PATH\_DELIVERY\_UNAVAILABLE | The configured multi-path media delivery (see clause 13.2.4) is not supported by the Media Player or is not supported by the Media AS. |

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| End of change |