**3GPP TSG-S4 Meeting #118-e *S4-220348***

**Online, , 6th–14th April 2022** revision of S4aI221311

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| *CR-Form-v12.0* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *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:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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). | | | | | | | |  | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Provide additional detail of the data types to be conveyed by Nmbsf and Nmbstf service operations. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Summary of distribution modes for Object Distribution Method and Packet Distribution Method. * Formally bringing RTP streaming into the scope of Packet Distribution Method. * Nmb8 User Plane ingest example for RTP streaming. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The data model will not be clearly defined for stage 3 realisation. | | | | | | | | |
| ***Q*** | |  | | | | | | | | |
| ***Clauses affected:*** | | 6, B.3.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | S4aI221308 -> S4aI221311 -> S4-221348 | | | | | | | | |

FIRST CHANGE

# 6 MBS User Services distribution methods

## 6.1 Object Distribution Method

The Object Distribution Method is used to deliver binary objects to the MBS Client over an MBS Session that have been received from the MBS Application Provider over reference point Nmb8.

The following Use Cases are supported:

- Single file delivery.

- Delivering a root object and its dependent objects as a collection, e.g. a web page and all the assets needed to render it.

- Object carouselling for file delivery, including updates of files.

- Real-time object streaming, for example for regular-latency or low-latency streaming delivery. In the latter case, the objects distributed may be CMAF segments as defined by the 5G Media Streaming DASH Interoperability Point specified in clause 7.3.11 of TS 26.247 [10].

The distribution modes for the Object Distribution Method are summarised in table 6.1‑1 below.

Table 6.1‑1: Summary of distribution modes for Object Distribution Method

|  |  |  |
| --- | --- | --- |
| Distribution method | Distribution mode | Description |
| OBJECT | OBJECT\_SINGLE | A single object is ingested by the MBSTF and distributed once. |
| OBJECT\_COLLECTION | A set of objects described by a manifest is ingested by the MBSTF and distributed once. |
| OBJECT\_CAROUSEL | A set of objects described by a manifest is ingested by the MBSTF and distributed multiple times. |
| OBJECT\_STREAMING | A sequence of objects is ingested by the MBSTF and streamed in real time according to a schedule described in a presentation manifest (e.g. DASH MPD). |

Based on the configuration received from the MBSF via reference point Nmb2, the objects are ingested by the MBSTF from the MBS Application Provider via pull-based or push-based method.

NOTE: Pull-based object ingest may occur once shortly before the start of each active period of the associated MBS User Data Ingest Session, or the pulled objects may be revalidated (and possibly re-ingested) periodically, for example once per rotation of an object carousel.

As defined in clause 4, the MBSTF segments the objects into appropriate payloads, adds the FEC redundancy and schedule packet transmission to the MBS Client.

File repair functionality may be utilized to repair object fragments transmitted by the MBSTF using the Object Distribution Method but lost or corrupted in transit. In such cases, the MBS Client may request the missing object fragments from the MBS AS. File repair may be done during an ongoing MBS User Services Session or after an MBS User Services Session.

## 6.2 Packet Distribution Method

The Packet Distribution Method is used to deliver ***p***acket streams to the MBS Client over an MBS Session that have been received from the MBS Application Provider over reference point Nmb8. This distribution method is particularly useful for multicast and broadcast of IP-based services for which the content delivery protocols are defined outside the scope of the MBS specification.

The MBSTF receives packet streams from the MBS Application Provider, typically in the form of UDP/IP packets, and sends them to the configured MBS Session. Optionally, packet sequence numbering and/or FEC redundancy may be added by the MBSTF.

The Packet Distribution Session may be operated in one of three different modes:

- In *Forward-only mode*, the transport protocol on top of IP is opaque to the MBS System, as described in clause B.3.1. The User Service Announcement may be handled by the MBS Application Provider via external means at reference point MBS-8.

- In *Proxy mode*, the UDP packet payload of the UDP streams is opaque to the MBS Session, as described in clause B.3.2. An MBS Client is expected to make the UDP Payloads available directly to the MBS-Aware Application, without further knowledge of the content carried.

- In *Streaming mode*, RTP packets are encapsulated in UDP packets, as described in clause B.3.3. The MBSTF may act on metadata in the RTP packets, for example to schedule their onward distribution. The MBSTF may modify the RTP packet headers, for example the synchronisation source identifier.

The distribution modes for the Packet Distribution Method are summarised in table 6.2‑1 below.

Table 6.2‑1: Summary of distribution modes for Packet Distribution Method

|  |  |  |
| --- | --- | --- |
| Distribution method | Distribution mode | Description |
| PACKET | PACKET\_FORWARD\_ONLY | The payloads of IP packets ingested by the MBSTF are forwarded to the MB-UPF in new IP packets (Layer 3 proxying). |
| PACKET\_PROXY | The payloads of UDP packets ingested by the MBSTF are forwarded to the MB-UPF in new UDP packets (Layer 4 proxying). |
| PACKET\_STREAMING | RTP packet payloads ingested by the MBSTF are forwarded to the MB-UPF in new RTP packets in real time according to the RTP packet timestamp. |

NEXT CHANGE

## B.3.3 RTP Streaming mode

Figure B.3.3-1 illustrates a setup in which the MBS Application Provider (AF/AS) pushes RTP/UDP packets directly into the MBSTF at reference point Nmb8. The MBSTF handles all MBS-related complexity, e.g. restamping RTP headers, adding AL-FEC, etc.



Figure B.3.3-1: Packet Distribution Method using RTP Streaming mode

The following MBS Distribution Session properties are used by the MBS Application Provider (AF/AS) at reference point Nmb10 to provision this setup:

*- Distribution method* is set to *Packet.*

*- Distribution operating mode* is set to *Packet streaming.*

*- Session Description Parameters for User Plane* (property specific to the distribution method) indicates UDP flow mapping descriptions. The MBSTF provides the *MBSTF tunnel endpoint address* (property specific to the distribution method) to the MBS Application Provider (AF/AS) and joins the multicast group indicated in the *MBSTF traffic flow information* (property specific to the distribution method) to receive the RTP stream.

END OF CHANGES