**3GPP TSG-SA4 Meeting #124 *S4-230974***

**Berlin, Germany, 22nd May 2023- 26th May 2023** revision of S4-230869

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0007** | **rev** | **5** | **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:*** | Manifest format for Object Collection and Carousel | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, BBC, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5MBP3 | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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). | | | | | | | | *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:*** | | Table 6.1-1 of TS 26.502 describes two operating modes for the Object Distribution method that rely on a manifest file format: OBJECT\_COLLECTION and OBJECT\_CAROUSEL. There is a NOTE that states that the manifest format is specified in TS 26.517. However, this is still missing in TS 26.517. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Update the clause 5.3 and 6 to specify the manifest format and reference a YAML-based syntax in an annex. The manifest is able to optionally indicate an update interval for itself. * Reference this clause from clauses 6.2.3.3 and 6.2.3.4. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage-3 of MBS User Services is incomplete with respect to stage-2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3, 6.1.2 (new), 6.2.3, Annex C (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | S4aI230081 -> S4-230548 -> S4-230659 -> S4aI230095 -> S4-230869 -> S4-230974 | | | | | | | | |

1st CHANGE

## 5.3 Delivery of User Service Description

Editor’s Note: Specify delivery envelope for User Service Bundles.

### 5.3.1 General

An MBS User Service Description may be delivered to the MBS Client via MBS Distribution Sessions at reference point MBS‑4‑MC (see clause 5.3.2) and/or via a regular unicast PDU Session at reference point MBS‑5 (see clause 5.3.3) and/or via application-private means at reference point MBS-8.

### 5.3.2 Delivery of User Service Description in object carousel

In this case, the MBS User Service Announcement is delivered repeatedly by the MBSTF to the MBSTF Client via a suitable MBS Distribution Session at reference point MBS‑4‑MC using the Object Distribution Method, as defined in clause 4.2.4 of TS 26.502 [6]. The operating mode of this MBS Distribution Session shall be set to OBJECT\_CAROUSEL and relies on an object manifest to characterize the repetition and the update pattern of the MBS User Service Announcement information. The object manifest is specified in clause 6.1.2.

NOTE: The use of the object carousel operating mode for the MBS Distribution Session carrying the MBS User Service Announcement precludes the use of the same MBS Distribution Session for carrying application service content requiring different operating modes.

### 5.3.3 Delivery of User Service Description via unicast PDU Session

Editor’s Note: To be specified.

2nd CHANGE

# 6 Object Distribution Method

## 6.1 General

### 6.1.1 Overview

The Object Distribution Method supports the transmission of media segments, e.g. CMAF media segments [7] and also non-real-time objects.

The MBS Distribution Session shall be provisioned to accommodate the bit rate of the aggregated object flow, accounting for in-band carriage of metadata units, protocol header overheads, and FEC redundancy (if configured).

### 6.1.2 Object manifest

An object manifest document describes a list of objects to be distributed in an MBS Distribution Session. The syntax of the object manifest is specified in clause C.1. The semantics of the document are specified in table 6.1.2‑1 below.

For each object to be delivered in the MBS Distribution session, the attributes under the objects property in table 6.1.2‑1 shall be maintained by the MBSTF.

Table 6.1.2‑1: Properties of object manifest

|  |  |  |
| --- | --- | --- |
| Property name | Cardinality | Description |
| updateInterval | Optional | The time interval, expressed in seconds, according to which the MBSTF attempts to re-acquire the object manifest when pull-based object acquisition is provisioned.  Ignored by the MBSTF for push-based object acquisition. |
| objects | Mandatory | The list of objects to be carouselled from the MBSTF to the MBSTF Client. |
| locator | Mandatory | The URL from which the object is to be ingested by the MBSTF. |
| repetitionInterval | Optional | The time interval, expressed in milliseconds, according to which the MBSTF will periodically send the object to the MBSTF Client.  If omitted, the MBSTF determines the repetition interval for the object.  Ignored by the MBSTF in Object Collection operating mode. |
| keepUpdatedInterval | Optional | The time interval, expressed in seconds, according to which the MBSTF is expected to check for updates made to the object at its origin (as indicated by locator or a redirect from there to another location).  In case of conflicting information, the MBSTF should give precedence in determining the update interval to the HTTP cache control metadata included in the HTTP response from the object origin.  Any changes to the origin object that are detected by the MBSTF shall be reflected in the MBS Distribution Session at the earliest opportunity and the replacement of one object with another shall be signalled to the MBSTF Client by means of the object transport protocol provisioned at reference point MBS‑4‑MC.  If omitted, the MBSTF shall not attempt to check for updates to the object.  Ignored by the MBSTF in Object Collection operating mode. |
| earliestFetchTime | Optional | The MBSTF shall fetch the object no sooner than this UTC timestamp. If absent, then the object shall be present at its origin (as indicated by locator or a redirect from there to another location) and the MBSTF may fetch it at a time of its choosing. |
| latestFetchTime | Optional | The MBSTF shall fetch the object no later than this UTC timestamp. If absent, then the object shall be present at its origin (as indicated by locator or a redirect from there to another location)and the MBSTF may fetch it at a time of its choosing. |

(SNIPPED – No further changes to this clause)

3rd CHANGE

### 6.2.3 Operating modes for Object Distribution Method

#### 6.2.3.1 Introduction

The operating modes for the Object Distribution Method are defined in clause 6.1 of TS 26.502 [6]. Operating modes primarily describe the operation of the MBSTF to convert ingest data into an MBS Distribution Session. The following clauses specify how FLUTE is used for each operating mode.

(SNIPPED)

#### 6.2.3.3 Object collection operating mode

Object collection operating mode (OBJECT\_COLLECTION) refers to the case in which multiple objects are distributed via the Object Distribution Method. The list of objects to be distributed is described by an object manifest document as specified in clause 6.1.2. The objects listed in the manifest are distributed only once. Each object listed in the manifest is pulled by the MBSTF from the location indicated prior to inclusion in the FLUTE Session corresponding to the MBS Distribution Session.

In this operating mode, the FDT Instance should describe all objects that are part of the collection.

#### 6.2.3.4 Object carousel operating mode

Object carousel operating mode (OBJECT\_CAROUSEL) refers to the case in which one or multiple objects are distributed via the Object Distribution Method in a repeated fashion. The list of objects to be distributed is described by an object manifest document as specified in clause 6.1.2. Each object listed in the manifest is pulled by the MBSTF from the location indicated prior to inclusion in the FLUTE Session corresponding to the MBS Distribution Session.

The list of objects described in the manifest may be updated over time by providing a replacement object manifest.

In this operating mode, the FDT Instance should describe all objects that are currently available in the FLUTE Session, considering the potential object update interval.

(SNIPPED – No further changes to this clause)

4th CHANGE (New clause)

Annex C (normative):  
Syntax for object manifest

# C.1 Object manifest schema

Below is the formal syntax of the object manifest for use with the Object Collection or Object Carousel operating mode. The schema shall have the filename "TS26517\_MBSObjectManifest.yaml".

|  |
| --- |
| openapi: 3.0.0  info:  title: MBS User Services Object Manifest  version: 1.0.0  description: |  MBS User Services Object Manifest syntax  © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).  All rights reserved.  tags:  - name: MBS User Services Object Manifest  description: '5G Media Streaming: Common Data Types'  externalDocs:  description: 'TS 26.517 V17.3.0; 5G Multicast-Broadcast User Services; Protocols and Formats'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.517/'  paths: {}  components:  schemas:  ObjectManifest:  type: object  required:  - objects  properties:  updateInterval:  type: integer  format: int32  description: The time period (in seconds) after which the MBSTF attempts to re-acquire the object manfiest when pull-based object acquisition is provisioned.  objects:  type: array  description: The list of objects to be carouselled from the MBSTF to the MBSTF Client.  items:  $ref: '#/components/schemas/Object'  Object:  type: object  required:  - locator  properties:  locator:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'  description: The URL from which the MBSTF will fetch the object content.  repetitionInterval:  type: integer  format: int32  description: The MBSTF sends the object repeatedly to the MBSTF Client with the given interval (in milliseconds). This parameter is ignored in the case of Object Collection operating mode.  keepUpdatedInterval:  type: integer  format: int32  description: The MBSTF checks for changes to the object with the given interval (in seconds). This parameter is ignored in the case of Object Collection operating mode.  earliestFetchTime:  type: string  format: date-time  description: The MBSTF shall pull each object from its origin location no sooner than this time or, if this parameter is omitted, at a time of its choosing.  latestFetchTime:  type: string  format: date-time  description: The MBSTF shall pull each object from its origin location no later than this time, or, if this parameter is omitted, at a time of its choosing. |

END OF CHANGES