**3GPP TSG-SA4 Meeting #127-bis-e *S4-240637***

**Online, 8th – 12th Apr 2024**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.517** | **CR** | **0013** | **rev** | **-** | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *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:*** | Alignment on support of MBS data reception for UEs using power saving functions | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5MBP3 | | | | |  | ***Date:*** | | | 2024-04-03 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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:*** | | In Rel-18, SA2 5MBS\_Ph2 introduced the support of MBS data reception for UEs using power saving functions. The MBS User Service Announcement needs to be enhanced to further include a start time and/or a sequence of scheduled activation times (e.g. a first time and a periodicity) for corresponding MBS distribution session, considering the unreachable times for the UEs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add support of MBS data reception for UEs using power saving functions to align with other WGs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incomplete and misaligned designs among WGs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.7, 6.2.2.1, 6.2.2.3, 7.2.3.1, 7.2.3.2, A.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

\* \* \* \* First change \* \* \* \*

### 5.2.7 Service Schedule Description data type

A Service Schedule Description object describes the distribution schedule of a single instance of the MBS User Service and the availability of content via unicast delivery in terms of:

- Start/stop time point; or

- Start time point, time duration and periodicity.

The MBS Client can expect to receive MBS data during the described time period(s).

The Schedule Description object may be delivered to the MBS Client prior to the MBS Distribution Session as part of the User Service Description document (see clause 5.2.2) and may be updated subsequently along with that document.

The Service Schedule Description object with the highest version number shall take priority, such that schedule parameters received prior to the MBS Distribution Session are regarded as "initial defaults", and schedule parameters received during the MBS Distribution Session overwrite the earlier received schedule parameters.

The MBS Distribution Session shall be available to the MBS Client during the time interval(s) announced by the session schedule. The MBS Client shall not activate reception of that MBS Distribution Session outside this time window.

Schedule information received in the Schedule Description object shall take precedence over timing information that may have been received in the Session Description object (t and/or r lines in the SDP).

Table 5.2.7-1 provides the detailed semantics for the ServiceScheduleDescription data type which describes a single scheduled instance of the MBS User Service Session.

Table 5.2.7-1: Semantics of ServiceScheduleDescription data type

| Property name | Type | P | Cardinality | Description |
| --- | --- | --- | --- | --- |
| id | string | M | 1 | An identifier for the MBS User Service Session instance described by this object, unique within the scope of the MBS System.  This value is invariant across all versions of the object. |
| version | integer | M | 1 | The version number of this scheduled MBS User Service Session instance. The value increases monotonically whenever a change to the remaining properties needs to be signalled to the MBS Client.  Minimum value: 1. |
| start | DateTime | C | 1 | The start date–time of this MBS User Service Session instance.  If present, start shall also be present.  This property is mutually exclusive with repetitionRule. |
| stop | DateTime | C | 1 | The stop date–time of this MBS User Service Session instance.  If present, start shall also be present.  This property is mutually exclusive with repetitionRule. |
| repetition‌Rule | Repetition‌Rule | C | 1 | A rule describing the periodic active time(s) of this MBS User Service Session instance.  This property shall be mutually exclusive with start and stop. |
| cancelled | boolean | O | 0..1 | When set to true, indicates that this MBS User Service Session instance is cancelled and the MBS Client shall terminate all ongoing MBS User Service procedures, including object reception, object repair and reporting.  The MBS Client shall not attempt to join an MBS User Service Session that is marked as cancelled.  If omitted the value is false. |

Table 5.2.7-2: Semantics of RepetitionRule data type

| Property name | Type | P | Cardinality | Description |
| --- | --- | --- | --- | --- |
| startTime | DateTime | M | 1 | The absolute start date–time of the first occurrence of this period. |
| duration | DurationSec | M | 1 | The duration of each occurrence of this period. |
| repetition‌Interval | DurationSec | M | 1 | The time between occurrences of the period. |

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

#### 6.2.2.1 General

The Session Description document for FLUTE contains the information needed to activate the reception of an MBS Distribution Session using the FLUTE protocol [12] when this is used to realise the Object Distribution Method. The Session Description document is formatted according to the Session Description Protocol [8] and its content is based on the Session Description parameters specified in clause 7.3 of TS 26.346 [7] with the following restrictions and extensions.

Restrictions:

- The *Mode of MBMS bearer per media* parameter (clause 7.3.2.7 of [7]) shall not be used.

- The *QoE Metrics* (as defined in clauses 7.3.2.0 of [7]) shall not be used

- The *Service-language(s) per media* (clause 7.3.2.9 of [7]) shall not be used. It is assumed that the service languages are described within an application manifest.

- The *Alternative TMGI* (clause 7.3.2.12 of [7]) shall not be used.

- The *Start time* and *End time* of the session (SDP t-line) shall indicate a superset of the active times, if present in the service schedule (see clause 5.2.7). If there is no service schedule specified, both values of the SDP t-line should be set to zero indicating undefined times.

Extensions:

- When an MBS Session is of MBS Service Type *Broadcast* or when the Multicast MBS Session Type uses a TMGI as MBS Session ID, the *MBS service type of MBS Session* declaration attribute as defined in clause 6.2.2.2 shall be present in the Session Description.

- The *Repeat interval, Active duration* and *Offset from start time* of each active period present in the service schedule (see clause 5.2.7), shall be mapped to a separate SDP *r*-line of the session. The *Offset from start time* is expressed relative to the *Start time* in the SDP t-line.

\* \* \* \* Third change \* \* \* \*

#### 6.2.2.3 SDP examples for FLUTE Session

Listing 6.2.2.3‑1 provides a full example of an SDP description describing a FLUTE-based MBS Distribution Session using the Object Distribution Method with a TMGI as MBS Session Id. This MBS Distribution Session is repeatedly active for one hour per day during the active time of this session from Tue 03-Feb-1970 06:09:57 UTC to Sat 14-Feb-970 19:56:44 UTC.

Listing 6.2.2.3‑1: Session Description metadata unit for  
FLUTE-based MBS Distribution Session with TMGI

|  |
| --- |
| v=0  o=user123 2890844526 2890842807 IN IP6 2201:056D::112E:144A:1E24  s=Object Distribution session example  i=More information  t=2873397496 3873404696  r=86400 3600 0  a=mbs-servicetype:broadcast 123869108302929  a=FEC-declaration:0 encoding-id=1  a=source-filter: incl IN IP6 \* 2001:210:1:2:240:96FF:FE25:8EC9  a=flute-tsi:3  m=application 12345 FLUTE/UDP 0  c=IN IP6 FF1E:03AD::7F2E:172A:1E24/1  b=1000  a=lang:EN  a=FEC:0 |

Listing 6.2.2.3‑2 provides a second example of an SDP description describing a FLUTE-based MBS Distribution Session using the Object Distribution Method and which indicates that 25% redundant FEC protection is applied to the FEC encoding of the video Segments of the associated DASH-formatted content.

Listing 6.2.2.3‑2: Session Description metadata unit for  
FLUTE-based MBS Distribution Session with TMGI and 25% FEC redundancy

|  |
| --- |
| v=0  o=user123 2890844526 2890842807 IN IP6 2201:056D::112E:144A:1E24  s=Object Distribution session carrying 2-hour DASH-packaged programme  i=More information  t=3615124600 3615131800  a=mbs-servicetype:broadcast 123869108302929  a=FEC-declaration:0 encoding-id=1  a=FEC-redundancy-level:0 redundancy-level=25  a=source-filter: incl IN IP6 \* 2001:210:1:2:240:96FF:FE25:8EC9  a=flute-tsi:5  m=video 10111 FLUTE/UDP 0  c=IN IP6 FF1E:03AD::7F2E:172A:1E24/1  b=2048  a=lang:EN |

\* \* \* \* Forth change \* \* \* \*

#### 7.2.3.1 General

The Session Description document contains the needed information to activate the reception of a Packet Distribution Method. The Session Description document is formatted according to the Session Description Protocol [8]. The Session Description document for the Packet Distribution Method is based on the Session Description parameters as defined in clauses 8.3, 8A.3 and 8B.3 of TS 26.346 [7] with the following restrictions and extensions.

Restrictions:

- The *Mode of MBMS bearer per media* parameter (clauses 8.3.1.5 and 8B.3.2 of [7]) shall not be used.

- The *QoE Metrics* (as defined in clauses 8.3.2.1 and 8.4 of [7]) shall not be used.

- ROHC header compression (as defined in clauses 8A.4 and 8B.4 of [7]) shall not be used.

NOTE: ROHC is handled by RAN in 5MBS.

- The *Alternative TMGI* (clause 7.3.2.12 of [7]) shall not be used.

- The *Start time* and *End time* of the session (SDP t line) shall indicate a superset of the active times, if present in the service schedule (see clause 5.2.7). If there is no service schedule specified, both values of the SDP t-line should be set to zero indicating undefined times.

Extensions:

- When the MBS User Service is of MBS Service Type *Broadcast* or when an MBS User Service of type *Multicast* uses a TMGI as its MBS Session ID, the *MBS service type of MBS Session* declaration attribute as defined in clause 6.2.2.2 shall be present in the Session Description.

- The *Repeat interval, Active duration* and *Offset from start time* of each active period present in the service schedule (see clause 5.2.7), shall be mapped to a separate SDP *r*-line of the session. The *Offset from start time* is expressed relative to the *Start time* in the SDP t-line.

\* \* \* \* Fifth change \* \* \* \*

#### 7.2.3.2 SDP examples for Packet Distribution Method

Below is a full example of SDP description describing the media streams part of an MBS Packet Distribution session for RTP streaming where the RTP streaming can be repeatedly active for one hour per week:

Listing 7.2.3.2‑1: Session description for RTP streaming

|  |
| --- |
| v=0 o=ghost 2890844526 2890842807 IN IP4 192.168.10.10 s=3GPP MBS Packet Distribution SDP Example i=Example of MBS Packet Distribution SDP file u=http://www.infoserver.example.com/ae600 e=ghost@mailserver.example.com *c=IN IP6 FF1E:03AD::7F2E:172A:1E24* t=0 0  r=604800 3600 0  b=AS:77  a=mbs-mode:broadcast 123869108302929  a=source-filter: incl IN IP6 \* 2001:210:1:2:240:96FF:FE25:8EC9  m=video 4002 RTP/AVP 96  b=TIAS:62000  b=RR:0  b=RS:600  a=maxprate:17  a=rtpmap:96 H264/90000 a=fmtp:96 profile-level-id=42A01E; packetization-mode=1; sprop-parameter-sets=Z0IACpZTBYmI,aMljiA== |

The following is a full example of SDP description for transparent streaming with two MPEG-2 Transport Streams:

Listing 7.2.3.2‑2: Session description for MPEG‑2 Transport Stream

|  |
| --- |
| v=0 o=ghost 2890844526 2890842807 IN IP4 192.168.10.10 s=3GPP MBS Transport-only SDP Example i=Example of MBS transport-only SDP file u=http://www.infoserver.example.com/ae600 e=ghost@mailserver.example.com *c=IN IP6 FF1E:03AD::7F2E:172A:1E24* t=3034423619 3042462419  b=AS:8000000  a=mbs-mode:broadcast 123869108302929  a=source-filter: incl IN IP6 \* 2001:210:1:2:240:96FF:FE25:8EC9  m=video 4002 UDP/RTP/AVP 96  b=TIAS:4000000  a=mms-framing-header:0 2  a=rtpmap:100 MP2T/90000  m=video 4002 RTP/AVP 98  b=TIAS:4000000  a=rtpmap:100 MP2T/90000  a=MBS-framing-trailer:0 2 |

\* \* \* \* Sixth change \* \* \* \*

## A.2.1 MBS User Service Announcement schema

Below is the schema specifying the format of User Service Descriptions instance documents using a JSON-based representation. Documents following this schema shall be identified with the MIME type application/mbs-user-service-descriptions+json as registered in clause E.2.1. The schema filename is TS26517\_MBSUserServiceAnnouncement.yaml.

|  |
| --- |
| openapi: 3.0.0  info:  title: 'MBS User Service Announcement'  version: 2.0.0  description: |  MBS User Service Announcement Element units.  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).  All rights reserved.  externalDocs:  description: 3GPP TS 26.517 V18.0.0; 5G Multicast-Broadcast User Services; Protocols and Formats  url: http://www.3gpp.org/ftp/Specs/archive/26\_series/26.517/  paths:  /user-service-descriptions:  get:  operationId: discoverUserServiceDescriptions  summary: 'Discover User Service Descriptions'  description: 'Discover User Service Descriptions that match the supplied query filter(s). At least one filter query parameter must be included in the request URL.'  parameters:  - in: query  name: service-class  schema:  type: string  required: true  description: 'Filter for User Service Descriptions tagged with the supplied service class term identifier expressed as a fully-qualified URI string from a controlled vocabulary'  responses:  '200':  # OK  description: "Success"  content:  multipart/related:  schema:  type: string  '204':  # No Content (no matching User Service Descriptions)  description: "No Matches Found"  '500':  # Internal Server Error  $ref: 'TS29571\_CommonData.yaml#/components/responses/500'  '503':  # Service Unavailable  $ref: 'TS29571\_CommonData.yaml#/components/responses/503'  default:  $ref: 'TS29571\_CommonData.yaml#/components/responses/default'  /user-service-descriptions/{externalServiceId}:  get:  operationId: retrieveUserServiceDescription  summary: 'Retrieve User Service Description'  description: 'Retrieve the User Service Description of a single service by supplying its external service identifier.'  parameters:  - name: externalServiceId  in: path  required: true  schema:  type: string  description: 'The external service identifier of a User Service provisioned in the MBSF.'  responses:  '200':  # OK  description: "Success"  content:  multipart/related:  schema:  type: string  '404':  # Not Found  $ref: 'TS29571\_CommonData.yaml#/components/responses/404'  '500':  # Internal Server Error  $ref: 'TS29571\_CommonData.yaml#/components/responses/500'  '503':  # Service Unavailable  $ref: 'TS29571\_CommonData.yaml#/components/responses/503'  default:  $ref: 'TS29571\_CommonData.yaml#/components/responses/default'  components:  schemas:  UserServiceDescriptions:  description: 'A document announcing one or more MBS User Services.'  type: object  properties:  version:  type: integer  minimum: 1  userServiceDescriptions:  type: array  items:  $ref: '#/components/schemas/UserServiceDescription'  minItems: 1  required:  - userServiceDescriptions  UserServiceDescription:  description: 'A description of a single MBS User Service.'  type: object  properties:  serviceIds:  type: array  items:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  minItems: 1  class:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  names:  type: array  items:  type: object  properties:  name:  type: string  lang:  type: string  pattern: '^[a-zA-Z]{3}$'  example: 'eng'  required:  - name  - lang  minItems: 1  descriptions:  type: array  items:  type: object  properties:  description:  type: string  lang:  type: string  pattern: '^[a-zA-Z]{3}$'  example: 'eng'  required:  - description  - lang  minItems: 1  serviceLanguage:  type: string  pattern: '^[a-zA-Z]{3}$'  example: 'eng'  distributionSessionDescriptions:  type: array  items:  $ref: '#/components/schemas/DistributionSessionDescription'  minItems: 1  serviceScheduleDescriptions:  type: array  items:  $ref: '#/components/schemas/ServiceScheduleDescription'  minItems: 1  required:  - serviceIds  - class  - distributionSessionDescriptions  DistributionSessionDescription:  type: object  properties:  distributionMethod:  $ref: '#/components/schemas/DistributionMethod'  conformanceProfiles:  type: array  items:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  minItems: 1  sessionDescriptionLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  applicationServiceDescriptions:  type: array  items:  $ref: '#/components/schemas/ApplicationServiceDescription'  minItems: 1  postSessionObjectRepairParameters:  $ref: '#/components/schemas/ObjectRepairParameters'  availabilityInfos:  type: array  items:  $ref: '#/components/schemas/AvailabilityInformation'  minItems: 1  securityDescription:  $ref: '#/components/schemas/SecurityDescription'  required:  - distributionMethod  - sessionDescriptionLocator  DistributionMethod:  anyOf:  - type: string  enum:  - OBJECT  - PACKET  - type: string  description: >  This string provides forward-compatibility with future  extensions to the enumeration but is not used to encode  content defined in the present version of this API.  ApplicationServiceDescription:  type: object  properties:  entryPointLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  contentType:  type: string  pattern: '^[a-zA-Z]+\/[a-zA-Z]+$'  example: 'application/dash+xml'  required:  - entryPointLocator  - contentType  AvailabilityInformation:  type: object  properties:  mbsServiceArea:  type: array  items:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/MbsServiceArea'  minItems: 1  mbsFSAId:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/MbsFsaId'  radioFrequency:  type: array  items:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  minItems: 1  required:  - radioFrequency  ObjectRepairParameters:  type: object  properties:  backOffParameters:  $ref: '#/components/schemas/BackOffParameters'  objectDistributionBaseLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  objectRepairBaseLocator:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'  BackOffParameters:  type: object  properties:  offsetTime:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'  randomTimePeriod:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'  anyOf:  - required: [offsetTime]  - required: [randomTimePeriod]  ServiceScheduleDescription:  type: object  properties:  id:  type: string  version:  type: integer  minimum: 1  start:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  stop:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  repetitionRule:  $ref: '#/components/schemas/RepetitionRule'  required:  - id  - version  oneOf:  - required: [start, stop]  - required: [repetitionRule]  RepetitionRule:  type: object  properties:  startTime:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  duration:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'  repetitionInterval:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'  required:  - startTime  - duration  - repetitionInterval  SecurityDescription:  type: object  properties:  mBSSFAddresses:  type: array  items:  $ref: 'TS26512\_CommonData.yaml#/components/AbsoluteUrl'  minItems: 1  mBSServiceKeyInfo:  type: object  properties:  mBSId:  type: string  mBSDomainId:  type: string  required:  - mBSId  - mBSDomainId  uICCKeyManagement:  type: boolean  2GGBAallowed:  type: boolean  backOffParameters:  $ref: '#/components/schemas/BackOffParameters'  required:  - mBSSFAddresses  - mBSSessionKeyInfo |

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