**3GPP TSG- Meeting #**

**, , - revision of S4-241157**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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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 |  | Radio Access Network |  | Core Network |  |

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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). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Support for RedCap UEs in MBS Broadcast   * In order for RedCap UEs to be able to receive 5MBS service in broadcast mode, NG-RAN needs to be able to determine the specific broadcast MBS service identified by the MBS Session ID and it should be received by RedCap UEs.In order for NG-RAN to know that the MBS Service is to be received by RedCap UEs, information needs to be provided by the AF to the NEF/MBSF at the MBS Session Creation. * With respect to how to communicate the information about the support for RedCap UEs to NG-RAN, it is proposed to use explicit optional information in N2 SM Information from MB-SMF to AMF and from AMF to NG-RAN to indicate whether the broadcast MBS session is intended only for NR RedCap UEs, both for NR RedCap UEs and non-RedCap UEs, or only by non-RedCap UEs * SA2 has agreed 23247-CR0341 to address the issue. * A stage-2 CR for TS 26.502 has been prepared in 26502-0029. * Stage-3 extensions are needed.   Alignment on support of MBS data reception for UEs using power saving functions   * 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.   [5MBP3] Correction of Frequency Parameters   * RAN2 sent an LS to 3GPP SA4 in November 2022 in 3gpp.org/ftp/TSG\_SA/WG4\_CODEC/TSGS4\_121\_Toulouse/Docs/S4-221229.zip asking that the following two parameters are to be added: "In NR, the frequency parameter is coded as combination of FreqBandIndicatorNR and ARFCN-ValueNR as defined in 3GPP TS 38.331 and TS 38.101." Recently 26.517 was significantly updated in CR 0001 in order to address the removal of XML and only use JSON. * There was an oversight to address the request from RAN2 and only one of the requested parameters is added. * This issue was also raised by 5G-MAG here: <https://github.com/5G-MAG/Standards/issues/127>   [5GMS\_Pro\_Ph2] MBS User Service Announcement schema correction   * Syntax error in OpenAPI schema for MBS User Service Announcenent. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Addition of NR RedCap UE Information to MBS User Service Announcement * Add support of MBS data reception for UEs using power saving functions to align with other WGs. * The radio frequency parameter is changed to address the RAN2 format * Replacement OpenAPI schema with (i) Syntax correction and (ii) Repointed from TS 26.512 common data types to TS 26.510. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | * “NR RedCap UE Information” is not available to MBS UEs * Incomplete and misaligned designs among WGs. * The information required for RAN configuration cannot be signaled. * Paper specification is out of step with schema committed to 3GPP Forge. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.2.1, 5.2.7, 5.2.9, 6.2.2.1, 7.2.3.1, A.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23247 CR 0341  TS 26502 CR 0029  TS 26.510 V2.0.0  TS 26.512 CR0057 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | CR0014rev2: Merge of CR0014rev1 and CR0013rev4 and CR0019 and CR0017rev1 | | | | | | | | |

FIRST CHANGE

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System architecture for the 5G System (5GS)".

[3] 3GPP TS 23.502: "Procedures for the 5G System (5GS)".

[4] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[5] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[6] 3GPP TS 26.502: "5G multicast–broadcast services; User Service architecture".

[7] 3GPP TS 26.346: "MBMS; Protocols and Codecs".

[8] IETF RFC 8866: "Session Description Protocol".

[9] Void.

[10] 3GPP TS 23.003: "Numbering, addressing and identification".

[11] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[12] IETF RFC 3926: "FLUTE - File Delivery over Unidirectional Transport".

[13] Void.

[14] OpenAPI: "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.

[15] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[16] 3GPP TS 29.501: "5G System: Principles and Guidelines for Services Definition; Stage 3".

[17] 3GPP TS 29.580: "5G System; Multicast/Broadcast Service Function services; Stage 3".

[18] 3GPP TS 29.581: "5G System; Multicast/Broadcast Service transport services; Stage 3".

[19] IETF RFC 9110: "HTTP Semantics", June 2022.

[20] IETF RFC 9111: "HTTP Caching", June 2022.

[21] IETF RFC 9112: "HTTP/1.1", June 2022.

[22] IETF RFC 9113: "HTTP/2", June 2022.

[23] Reserved for future use.

[24] IETF RFC 8446: "The Transport Layer Security (TLS) Protocol Version 1.3", August 2018.

[25] Open Mobile Alliance: "OMNA BCAST Service Class Registry", https://technical.openmobilealliance.org/OMNA/bcast/bcast-service-class-registry.html.

[26] IETF RFC 3629: "UTF-8, a transformation format of ISO 10646".

[27] IETF RFC 8141: "Uniform Resource Names (URNs)".

[28] ISO 639-2: "Codes for the representation of names of languages - Part 2: Alpha-3 code".

[29] IETF RFC 6381: "The 'Codecs' and 'Profiles' Parameters for "Bucket" Media Types".

[30] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[31] 3GPP TS 26.512: "5G Media Streaming (5GMS); Protocols".

[32] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[33] 3GPP TS 33.246: "3G Security; Security of Multimedia Broadcast/Multicast Service (MBMS)".

[34] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".

[35] 3GPP TR 26.946: "Multimedia Broadcast/Multicast Service (MBMS) user service guidelines".

[36] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[37] IETF RFC 2046, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types".

[38] IETF RFC 2387: "The MIME Multipart/Related Content-type".

[39] IETF RFC 2557: "MIME Encapsulation of Aggregate Documents, such as HTML (MHTML)".

[40] IETF RFC 2017: "Definition of the URL MIME External-Body Access-Type".

[41] IETF RFC 1952: "GZIP file format specification version 4.3".

[42] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

NEXT CHANGE

### 5.2.1 General

The following description in this clause presumes a JSON encoding of the information comprising the MBS User Service Announcement as specified in clause 5.1A.

The data types in table 5.2.1-1 from other 3GPP specifications are reused in the remainder of the present document.

Table 5.2.1 1: Externally defined data types used by User Service Description schema

|  |  |  |
| --- | --- | --- |
| Data type | Comments | Reference |
| Uri | A Uniform Resource Locator | TS 29.571 [30] |
| DateTime | A date–time value. |  |
| MbsServiceArea | An MBS Service Area. |  |
| MbsFsaId | An MBS Frequency Selection Area identifier. |  |
| DurationSec | A time duration expressed in seconds. |  |
| AbsoluteUrl | An absolute URL | TS 29 512 [31] |

The data types in table 5.2.1-2 are defined in the present document.

Table 5.2.1 2: User Service Description schema data types defined in the present document

|  |  |
| --- | --- |
| Data type | Clause |
| User‌Service‌Descriptions | 5.2.2 |
| User‌Service‌Description | 5.2.3 |
| Distribution‌Session‌Description | 5.2.4 |
| Application‌Service‌Description | 5.2.6 |
| Service‌Schedule‌Description | 5.2.7 |
| Object‌Repair‌Parameters | 5.2.8 |
| Availability‌Information | 5.2.9 |
| NrParameterSet | 5.2.9 |
| Security‌Description | 5.2.10 |

NEXT 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, stop shall also be present.  This property shall be 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 shall be 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. |

NEXT CHANGE

### 5.2.9 Availability Information data type

The AvailabilityInformation data type provides additional information pertaining to the availability of the MBS Distribution Session within the 5G Network:

- The serviceArea property declares the one or more service areas in which the MBS Session corresponding to this MBS Distribution Session is currently available.

- In the case of a broadcast MBS Session corresponding to this MBS Distribution Session:

- The mbsFSAId property identifies a preconfigured area within which, and in proximity to, the cell(s) announce the MBS Frequency Selection Area (FSA) ID and its associated frequency.

- The nrRedCapUEInfo property indicates which classes of UE the MBS Distribution Session is suitable for consumption by.

NOTE: This is used to guide frequency selection by the UE for a broadcast MBS Session.

- The radioFrequencyproperty indicates the one or more radio frequencies in the NG-RAN downlink which transmit the MBS Session corresponding to this MBS Distribution Session in the service area(s) identified by the serviceArea property.

Table 5.2.9-1 provides the detailed semantics for the AvailabilityInformation data type.

Table 5.2.9-1: Semantics of AvailabilityInformation data type

| Property name | Type | P | Cardinality | Description |
| --- | --- | --- | --- | --- |
| mbsService‌Area | array(Mbs‌Service‌Area) | O | 1..N | The *Target service areas* of this MBS Distribution Session, as defined in table 4.5.8‑1 of TS 26.502 [6]. |
| mbs‌FSA‌Id | MbsFsaId | O | 0..1 | The *MBS Frequency Selection Area (FSA) Identifier* of the (broadcast) MBS Distribution Session in the parent service area, as defined in table 4.5.8‑1 of TS 26.502 [6]. |
| nrParameters | array(Nr‌ParameterSet) | M | 1..N | The New Radio transmission parameters associated with mbsFSAId in the parent service area, expressed using the data type specified in table 5.2.9-2. |
| nrRedCapUEInfo | NrRedCapUeInfo | O | 0..1 | Indicates whether the MBS session is suitable for consumption by NR RedCap UEs and/or non-RedCap UEs as defined by *Target UE classes* in TS 26.502 [6]. The data type and its enumerated values are specified in TS 29.571 [30].  If omitted, no information is known and the value NON\_REDCAP\_UE\_ONLY may be assumed. |

Table 5.2.9-2 provides the detailed semantics for the NrParameterSet data type.

Table 5.2.9-2: Semantics of NrParameterSet data type

| Property name | Type | P | Cardinality | Description |
| --- | --- | --- | --- | --- |
| freqBandIndicator | Uinteger | M | 1 | NR frequency band number, corresponding to the FreqBandIndicatorNR parameter in clause 6.3.2 of TS 38.331 [42]. |
| aRFCNValue | Uinteger | M | 1 | ARFCN applicable to a downlink NR global frequency raster, corresponding to the ARFCN-ValueNR parameter specified in clause 6.3.2 of TS 38.331 [42]. |

NEXT 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 specified in the MBS Schedule Description metadata unit in the service schedule descriptions of the MBS Distribution Session (see clause 5.2.7), if present. 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.

NEXT 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 specified in the MBS Schedule Description metadata unit, if present in the service schedule descriptions of the MBS Distribution Session (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.

NEXT 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 V18.1.0; 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'  nrParameters:  type: array  items:  $ref: ' #/components/schemas/NrParameterSet'  minItems: 1  required:  - nrParameters  NrParameterSet:  type: object  properties:  freqBandIndicator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  aRFCNValue:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  required:  - freqBandIndicator  - aRFCNValue  nrRedCapUEInfo:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/NrRedCapUeInfo'  ObjectRepairParameters:  type: object  properties:  backOffParameters:  $ref: '#/components/schemas/BackOffParameters'  objectDistributionBaseLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  objectRepairBaseLocator:  $ref: 'TS26510\_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: 'TS26510\_CommonData.yaml#/components/schemas/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