**3GPP TSG- Meeting #125 *S4-231160***

**, Sweden, 21st–25th August 2023** revision of S4aI230124

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **1** | **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 | **X** | Radio Access Network |  | Core Network |  |

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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | | 2023-07-31 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Protocol at reference point MBS‑5 is unspecified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Add general clause 8 on HTTP handling. 2. Add specific clause 9 specifying API for unicast retrieval of MBS User Service Announcement from MBS AF and/or MBSTF Client. 3. Add annex registering MIME type for MBS User Service Description. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Lack of interoperability between MBS Client implementations and MBS System. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.3, 5.3.1, 5.3.2, 5.3.3, 8 (new), 9 (new), A.2.1, E (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:*** | | CR0010r1 [S4-231160]:   * Addition of YAML service operations at annex A.2.1. * Addition of annex E to satisfy cross-references. | | | | | | | | |

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".

…

[OpenAPI3] OpenAPI: "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.

[29500] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[29501] 3GPP TS 29.501: "5G System: Principles and Guidelines for Services Definition; Stage 3".

[29580] 3GPP TS 29.580: "5G System; Multicast/Broadcast Service Function services; Stage 3".

[29581] 3GPP TS 29.581: "5G System; Multicast/Broadcast Service transport services; Stage 3".

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

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

[H1.1] IETF RFC 9112: "HTTP/1.1", June 2022.

[H2] IETF RFC 9113: "HTTP/2", June 2022.

[H3] Reserved for future use.

[TLS1.3] IETF RFC 8446: "The Transport Layer Security (TLS) Protocol Version 1.3", August 2018.

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

NEXT CHANGE

## 5.3 Delivery of User Service Description

### 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.

The syntax of the User Service Description is specified in clause A.2.

The MIME content type of the MBS User Service Description bundle is specified in clause E.2.

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

In this case, a bundle of MBS User Service Descriptions 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.

As defined in clause 5.4 of TS 26.502 [6], the MBSTF Client announces the arrival of an MBS User Service Description to the MBSF Client using a suitable notification at internal reference point MBS‑7′, and the MBSF Client may subsequently retrieve the MBS User Service Description from the MBSTF Client via internal reference point MBS‑6′. It may do so using procedures equivalent to those specified for unicast retrieval at reference point MBS‑5 (see clause 5.3.3). In this case, the MBSTF Client acts as a proxy for the MBS AF.

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

In this case, a bundle of one or more MBS User Service Descriptions is retrieved by the MBSF Client from the MBS AF at reference point MBS‑5 via a regular unicast PDU Session.

The API at this reference point is specified in clause 9.2. The OpenAPI [OpenAPI3] specification of the User Service Description retrieval API can be found in clause A.2.

NEXT CHANGE

# 8 General aspects of APIs for MBS User Services

## 8.1 HTTP resource URIs and paths

The resource URI used in each HTTP request to the API provider shall have the structure defined in subclause 4.4.1 of TS 29.501 [29501], i.e.:

{apiRoot}/{apiName}/{apiVersion}/{apiSpecificResourceUriPart}

with the following components:

- {apiRoot} shall be set as described in TS 29.501 [29501].

- {apiName}shall be set as defined by the following clauses.

- {apiVersion} shall be set to "v1" in this release.

- {apiSpecificResourceUriPart} shall be set as described in the following clauses.

## 8.2 Usage of HTTP

### 8.2.1 HTTP protocol version

#### 8.2.1.1 General

Content interfaces at reference points specified in the present document shall expose an HTTP/1.1 [H1.1] endpoint to API clients. They may additionally expose an HTTP/2 [H2] endpoint, including support for the HTTP/2 starting mechanisms specified in section 3 of [H2]. The API client may choose any supported HTTP protocol version. TLS [TLS1.3] shall be supported on these interfaces and, where the option to use cleartext HTTP is available in the version of HTTP selected by the API client, it should opt for HTTPS interactions in preference.

#### 8.2.1.2 MBSF

The HTTP protocol version used to invoke Nmbsf service operations on the MBSF at reference point Nbm10 is specified in clauses 6.1.2.1 and 6.2.2.1 of TS 29.580 [29580].

#### 8.2.1.3 MBSTF

The HTTP protocol version used to invoke Nmbstf service operations on the MBSTF at reference point Nmb2 is specified in clause 6.1.2.1 of TS 29.581 [29581].

The endpoint exposed to the MBSF at reference point Nmb2 for the purpose of pushing object manifests into the MBSTF shall comply with the general provisions specified in clause 8.2.1.1.

The endpoint exposed to the MBS Application Provider (AF/AS) at reference point Nmb8 for the purpose of pushing objects into the MBSTF shall comply with the general provisions specified in clause 8.2.1.1.

#### 8.2.1.4 MBS AF

The endpoint exposed to the MBSF Client at reference point MBS‑5 for the purpose of retrieving User Service Descriptions using the API specified in clause 9.2 shall comply with the general provisions specified in clause 8.2.1.1.

Editor's Note: Possibly add MBS‑10 here to specify the use of HTTP in the User Plane security procedure, or else specify the use of this reference point in a new clause 8.2.1.6 specifically for the MBSSF.

The endpoint exposed to the MBSTF at reference point MBS‑11 for the purpose of retrieving object manifests and User Service Descriptions shall comply with the general provisions specified in clause 8.2.1.1.

All responses from the MBS AF that carry a message body shall include a strong entity tag in the form of an ETag response header field and a modification timestamp in the form of a Last-Modified response header per section 8.8 of RFC 9110 [HTTPSem].

All endpoints exposed by the MBS AF shall support conditional HTTP requests using the header fields If-none-Match and If-Modified-Since per section 13 of RFC 9110 [HTTPSem].

#### 8.2.1.5 MBS AS

The endpoint exposed to the MBSTF Client at reference point MBS‑4‑UC for the purpose of unicast object repair shall comply with the general provisions specified in clause 8.2.1.1.

Byte range requests per section 14 of RFC 9110 [HTTPSem] shall be supported by the MBS AS at reference point MBS‑4‑UC for the purpose of efficient unicast object repair by the MBSTF Client.

### 8.2.2 HTTP message bodies for API resources

Individual APIs in the present document specify the syntax and encoding of HTTP request and response message bodies. MIME content types for a subset of these are registered in annex E.

### 8.2.3 Usage of HTTP headers

#### 8.2.3.1 General

Standard HTTP headers shall be used in accordance with clause 5.2.2 of TS 29.500 [29500], encoded appropriately for the version of HTTP in use.

#### 8.2.3.2 User Agent identification

##### 8.2.3.2.1 General

When one of the MBS User Services functions defined in TS 26.502 [6] makes requests to an HTTP endpoint specified in the present document, it shall identify itself to the HTTP server using a User-Agent request header field (see section 10.1.5 of RFC 9110 [HTTPSem]) that includes a product identifier indicating the type of client function making the request in its token element.

The optional product-version suffix shall be present and should indicate the version number of the present document (without the leading "V") with which the client implementation complies and shall, at minimum, indicate the 3GPP release number with which the implementation complies.

The User-Agent request header field may also include comment elements (see section 5.6.5 of RFC 9110 [HTTPSem]) following the above specified product identifier, as well as additional vendor-specific product identifiers and comment elements compliant with the syntax and guidance provided in section 10.1.5 of RFC 9110 [HTTPSem].

EXAMPLE 1: MBSTF/17.4.0 (build2114) libhttp/1.23.2

EXAMPLE 2: MBSFClient/17

##### 8.2.3.2.2 MBSF identification

When invoking the Nmbstf service at reference point Nmb2, the MBSF identifies itself to the MBSTF using a User-Agent request header as specified in clauses 6.1.2.2.1 and 6.2.2.2.1 of TS 29.580 [29580].

##### 8.2.3.2.3 MBSTF identification

When ingesting content using the pull-based object acquisition method (see table 4.5.6‑2 of TS 26.502 [6]), the MBSTF shall identify itself to the MBS Application Provider (AF/AS) at reference point Nmb8 and to the MBS AF at reference point MBS‑11 using a User-Agent request header field that complies with the general provisions specified in clause 8.2.3.2.1. The product identifier token shall be set to the value MBSTF.

##### 8.2.3.2.4 MBSF Client identification

The MBSF Client shall identify itself to the MBS AF at reference point MBS‑5 and to the MBSSF at reference point MBS‑10 using a User-Agent request header field that complies with the general provisions specified in clause 8.2.3.2.1. The product identifier token shall be set to the value MBSF‌Client.

##### 8.2.3.2.5 MBSTF Client identification

The MBSTF Client shall identify itself to the MBS AS at reference point MBS‑4‑UC using a User-Agent request header field that complies with the general provisions specified in clause 8.2.3.2.1. The product identifier token shall be set to the value MBSTF‌Client.

#### 8.2.3.3 Server identification

##### 8.2.3.3.1 General

When one of the MBS User Services functions defined in TS 26.502 [6] responds to an HTTP request, it shall identify itself to the requesting client using a Server response header (see section 10.2.4 of RFC 9110 [HTTPSem]) that includes a product identifier indicating the type and host name of the responding server in its token element. The server type and host name shall be separated by a single hyphen ('-') character.

The optional product-version suffix shall be present and should indicate the version number of the present document (without the leading "V") with which the server implementation complies and shall, at minimum, indicate the 3GPP release number with which the implementation complies.

The Server response header field may also include comment elements (see section 5.6.5 of RFC 9110 [HTTPSem]) following the above specified product identifier, as well as additional vendor-specific product identifiers and comment elements compliant with the syntax and guidance provided in section 10.2.4 of RFC 9110 [HTTPSem].

EXAMPLE 1: MBSTF-vm10665.mno.net/17.4.0 (api=1.0.0) libsbi/2.1 libnf/1.2

EXAMPLE 2: MBSAF-vm10240.mno.net/17 (api=1.0.0) libsbi/2.1 libnf/1.2

##### 8.2.3.3.2 MBSF identification

When responding to Nmbsf service operations made by the MBS Application Provider (AF/AS) at reference point Nmb10, the MBSF's Server response header is set as specified in clauses 6.1.2.2.1 and 6.2.2.2.1 of TS 29.580 [29580].

##### 8.2.3.3.3 MBSTF identification

When responding to Nmbstf service operations made by the MBSF at reference point Nmb2, the MBSTF's Server response header is set as specified in clause 6.1.2.2.1 of TS 29.581 [29581].

When acknowledging objects published using the push-based object acquisition method by the MBSF at reference point Nmb2 or by the MBS Application Provider (AF/AS) at reference point Nmb10, the MBSTF shall identify itself using a Server response header field that complies with the general provisions specified in clause 8.2.3.3.1. The product identifier token shall be set to the value MBSTF.

##### 8.2.3.3.4 MBS AF identification

The MBS AF shall identify itself to the MBSF Client at reference point MBS‑5 and to the MBSTF at reference point MBS‑11 using a Server response header field that complies with the general provisions specified in clause 8.2.3.3.1. The product identifier token shall be set to the value MBSAF.

##### 8.2.3.3.5 MBS AS identification

The MBS AS shall identify itself to the MBSTF Client at reference points MBS‑4‑UC using a Server response header field that complies with the general provisions specified in clause 8.2.3.3.1. The product identifier token shall be set to the value MBSAS.

#### 8.2.3.4 Support for conditional HTTP GET requests

The provisions in clause 5.2.2 of TS 29.500 [TS29500] relating to conditional GET requests using the If-None-Match and If-Modified-Since request headers apply to all Network Functions in the MBS System. In particular:

- This is specified for invocations of the Nmbsf service at reference point Nmb10 in clauses 6.1.2.2.1 and 6.2.2.2.1 of TS 29.580 [29580].

- This is specified for invocations of the Nmbstf service at reference point Nmb2 in clause 6.1.2.2.1 of TS 29.581 [29581].

All responses from the MBS AF at reference points MBS‑5 and MBS‑11 that carry a resource message body shall include:

- a strong entity tag for the resource, conveyed in an ETag response header per section 8.8.3 of RFC 9110 [HTTPSem],

- a resource modification timestamp, conveyed in a Last-Modified response header per section 8.8.2 of RFC 9110 [HTTPSem], and

- a predicted time-to-live period for the resource, conveyed in a Cache-Control: max-age response header per section 5.2 of RFC 9111 [HTTPCache].

All API endpoints on the MBS AF that expose the HTTP GET method shall support conditional requests using the If-None-Match and If-Modified-Since request headers per section 13.1.2 and 13.1.3 respectively of RFC 9110 [HTTPSem]. API clients should not attempt to revalidate their cached copy of a resource using a conditional GET request before the indicated time-to-live period has elapsed.

#### 8.2.3.5 Support for conditional HTTP POST, PUT, PATCH and DELETE requests

The provisions in clause 5.2.2 of TS 29.500 [TS29500] relating to conditional POST, PUT, PATCH and DELETE requests using the If-Match request header apply to all Network Functions in the MBS System. In particular:

- This is specified for invocations of the Nmbsf service at reference point Nmb10 in clauses 6.1.2.2.1 and 6.2.2.2.1 of TS 29.580 [29580].

- This is specified for invocations of the Nmbstf service at reference point Nmb2 in clause 6.1.2.2.1 of TS 29.581 [29581].

## 8.3 HTTP response codes

Guidelines for error responses to the invocation of APIs of NF services are specified in clause 4.8 of TS 29.501 [29501]. API-specific error responses are specified in the respective technical specifications.

NEXT CHANGE

# 9 MBS AF APIs

## 9.1 General

This clause specifies the network APIs exposed by the MBS AF with reference to the general provisions of clause 8 as they apply to the reference point in question.

## 9.2 User Service Description retrieval API

### 9.2.1 General

In the case where *Service announcement modes* (see table 4.5.3‑1 of TS 26.502 [6]) indicates that the MBS User Service Announcement for an MBS User Service is advertised at reference point MBS‑5, the User Service Description retrieval API is used by the MBSF Client to retrieve a User Service Description document (or a set of User Service Description documents) from the MBS AF that enable reception of the MBS User Service(s) to be initiated by the MBSF Client*.*

In the case where *Service announcement modes* (see table 4.5.3‑1 of TS 26.502 [6]) indicates that the MBS User Service Announcement for an MBS User Service is advertised via the User Service Announcement Channel at reference point MBS‑4‑MC, the User Service Description retrieval API is used by the MBSF Client at reference point MBS‑7′ to retrieve a User Service Description document (or a set of User Service Description documents) from the MBSTF Client that enable reception of the MBS User Service(s) to be initiated by the MBSF Client.

In the absence of prior knowledge about which Service announcement mode(s) are configured for currently provisioned MBS User Services, an MBSF Client may use either or both of the above procedures to proactively discover MBS User Service Announcements.

### 9.2.2 Resource structure

The User Service Description retrieval API is accessible from the MBS AF at reference point MBS‑5 and from the MBSTF Client at reference point MBS‑7′ through the following URL base path:

{apiRoot}/3gpp-mbs-user-service-discovery/{apiVersion}/

The operations and the corresponding HTTP methods in table 9.2.2-1 are supported through the above API base path. In each case, the sub-resource path specified in the second column shall be appended to the URL base path.

Table 9.2.2‑1: Operations supported by the User Service Description retrieval API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub-resource path | Allowed HTTP method(s) | Description |
| Discover User Service Descriptions | user-service-descriptions?‌{queryParameters} | GET | Used to discover a set of User Service Descriptions that match a set of filtering criteria corresponding to at least one of the query parameters specified in table 9.2.2‑2.  Multiple query parameters may be concatenated using the ampersand ('&') character as a separator with the resulting semantics of logical conjunction (i.e., Boolean AND).  It is an error to invoke this operation with no query parameters.  A UserServiceDescriptions bundle resource (see clause 9.2.3.1) is returned containing User Service Descriptions matching all of the specified filtering criteria, which may be empty if none match all of the criteria. |
| Retrieve User Service Descritption | user-service-descriptions/‌{externalServiceId} | GET | The {externalServiceId} uniquely identifies a single User Service Description resource in the MBS AF.  If the requested User Service is known to the MBS AF, a User‌Service‌Description resource (see clause 9.2.3.2) is returned. Otherwise, a suitable HTTP error response code is returned. |

Table 9.2.2‑2 specifies the query parameters that may be combined with the operations specified in table 9.2.2‑1.

Table 9.2.2‑2: Query parameters supported by the User Service Description retrieval API

|  |  |  |  |
| --- | --- | --- | --- |
| Applicable operation | Filter name | Query parameter | Description |
| Discover User Service Descritptions | Service class | service-class=‌{serviceClassTermId} | Used to select User Service Descriptions that are tagged with the supplied service class term identifier (see table 4.5.3‑1 of TS 26.502 [6]), which is expressed as a fully-qualified URI string from a controlled vocabulary (e.g., OMNA BCAST Service Class [OMNA-BCAST]) with appropriate URL encoding applied. |

### 9.2.3 Data model

#### 9.2.3.1 UserServiceDescriptions resource type

The data model for the UserServiceDescriptions bundle resource is specified in clause 5.2.2 and clause A.2.

#### 9.2.3.2 UserServiceDescription resource type

The data model for the UserServiceDescription resource is specified in clause 5.2.3 and clause A.2.

NEXT CHANGE

## A.2.1 MBS User Service Announcement schema

The following schema shall have the filename "TS26517\_MBSUserServiceAnnouncement.yaml".

|  |
| --- |
| openapi: 3.0.0  info:  title: 'MBS User Service Announcement'  version: 1.2.0  description: |  MBS User Service Announcement Element units.  © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).  All rights reserved.  externalDocs:  description: 3GPP TS 26.517 V17.4.0; 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:  application/json:  schema:  $ref: '#/components/schemas/UserServiceDescriptions'  '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:  application/json:  schema:  $ref: '#/components/schemas/UserServiceDescription'  '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:  type: array  items:  $ref: '#/components/schemas/UserServiceDescription'  minItems: 1  UserServiceDescription:  type: object  properties:  name:  type: array  items:  type: string  serviceLanguage:  type: array  items:  type: string  serviceId:  type: string  distributionSessionDescription:  $ref: '#/components/schemas/DistributionSessionDescription'  appServiceDescription:  $ref: '#/components/schemas/AppServiceDescription'  scheduleDescription:  $ref: '#/components/schemas/ScheduleDescription'  availabilityInfo:  $ref: '#/components/schemas/AvailabilityInformation'  required:  - serviceId  DistributionSessionDescription:  type: object  properties:  distributionMethod:  $ref: '#/components/schemas/DistributionMethod'  conformanceProfile:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  sessionDescriptionLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  objectRepairParameters:  $ref: '#/components/schemas/AssociatedProcedureDescription'  dataNetworkName:  type: string  mbsAppService:  type: array  items:  $ref: '#/components/schemas/ApplicationService'  unicastAppServices:  type: array  items:  type: object  properties:  unicastAppService:  type: array  items:  $ref: '#/components/schemas/ApplicationService'  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.  AppServiceDescription:  type: object  properties:  mediaEntryPointLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  mimeType:  type: string  identicalContents:  type: array  items:  type: object  properties:  unicastAppService:  type: array  items:  $ref: '#/components/schemas/ApplicationService'  minItems: 2  alternativeContents:  type: array  items:  type: array  items:  $ref: '#/components/schemas/ApplicationService'  ApplicationService:  type: object  properties:  basePattern:  type: string  required:  - basePattern  AvailabilityInformation:  type: array  items:  $ref: '#/components/schemas/AvailabilityInformationBinding'  AvailabilityInformationBinding:  type: object  properties:  mbsServiceArea:  type: array  items:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/MbsServiceArea'  mbsFSAId:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/MbsFsaId'  radioFrequency:  type: array  items:  type: integer  minimum: 0  AssociatedProcedureDescription:  type: object  properties:  postObjectRepair:  $ref: '#/components/schemas/PostObjectRepair'  mbsObjectRepair:  $ref: '#/components/schemas/MbsObjectRepair'  PostObjectRepair:  type: object  properties:  serviceLocators:  type: array  items:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  offsetTime:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'  randomTimePeriod:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'  MbsObjectRepair:  type: object  properties:  sessionDescriptionURI:  type: string  ScheduleDescription:  type: array  items:  $ref: '#/components/schemas/ServiceSchedule'  ServiceSchedule:  type: object  properties:  sessionSchedule:  $ref: '#/components/schemas/SessionSchedule'  sessionScheduleOverride:  $ref: '#/components/schemas/SessionScheduleOverride'  objectSchedule:  $ref: '#/components/schemas/ObjectSchedule'  serviceId:  type: string  serviceClass:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  required:  - sessionSchedule  - serviceId  - serviceClass  SessionSchedule:  type: array  items:  type: object  properties:  start:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  stop:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  reoccurencePattern:  type: string  numberOfTimes:  type: integer  minimum: 1  reoccurenceStopTime:  type: string  index:  type: integer  fDTInstanceLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  required:  - start  - stop  SessionScheduleOverride:  type: array  items:  type: object  properties:  start:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  stop:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  index:  type: integer  cancelled:  type: boolean  sessionDescriptionLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  ObjectSchedule:  type: array  items:  type: object  properties:  objectLocator:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'  sessionId:  type: string  objectEtag:  type: string  unicastOnly:  type: boolean  deliveryInfo:  type: array  items:  type: object  properties:  start:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  stop:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime' |

NEXT CHANGE

Annex E (normative):  
IANA registration

# E.1 General

This annex provides the formal registrations of MIME media types for different resources specified in the present document. It is referenced from the IANA registry at <http://www.iana.org/>.

# E.2 Registration of MIME media type "application/mbs-user-service-description+json"

## E.2.1 General

The MIME media type application/mbs-user-service-description+json denotes that the message body is an MBS User Service Description instance document compliant with the YAML schema specified in clause A.2.1.

Table E.2.1-1 provides the MIME media type registration for application/mbs-user-service-description+json.

Table E.2.1‑1: MIME media type registration for application/mbs-user-service-description+json

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| MIME media type name | application |
| MIME subtype name | mbs-user-service-description+json |
| Required parameters | None |
| Optional parameters | The 'profiles' parameter as specified in clause E.2.2. |
| Encoding considerations | This is a JSON document, and the encoding considerations are the same as for media type application/json defined in IETF RFC 8259. |
| Security considerations | This media format is used to configure the receiver on how to participate in a service. This format is highly susceptible to manipulation or spoofing for attacks desiring to mislead a receiver about a session. Both integrity protection and source authentication are recommended to prevent misleading of the receiver. |
| Interoperability considerations | The specification defines a platform-independent expression of an entry point document, and it is intended that wide interoperability can be achieved. |
| Published specification | 3GPP TS 26.517 |
| Applications which use this media type | 3GPP MBS-based applications and services |
| Additional information | File extension(s): json  Intended usage: COMMON |
| Other information/general comment | None |
| Person & email address to contact for further information | Thomas Stockhammer (tsto@qti.qualcomm.com)  3GPP TSG SA WG4 |
| Restrictions on usage | None |
| Author/Change controller | 3GPP TSG SA WG4 |

## E.2.2 Profiles parameter

Table D.2.2-1 provides the definition of the profiles parameter to be used with the MBS User Service Description instance document as defined in clause D.5.1.

Table E.2.2‑1: Definition of profiles parameter

|  |  |
| --- | --- |
| Parameter | Value |
| Parameter name | profiles |
| Parameter value | Optional attribute indicating one or more profiles to which the resource representation claims conformance. The contents of this attribute shall conform to either the pro‑simple or pro‑fancy productions specified in section 4.5 of IETF RFC 6381.  The set of profile identifiers indicated in this parameter should match the set indicated in the profiles attribute of the corresponding MPEG‑DASH MPD (see clause 8). |

EXAMPLE:

application/mbs-user-service-description+json;profiles="1,2"

END OF CHANGES