**3GPP TSG-CT WG1 Meeting #137-eC1-22xxxx**

**E-Meeting, 18th – 26th August 2022**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.548** | **CR** | **0027** | **rev** | **1** | **Current version:** | **17.1.0** |  |
|  | | | | | | | | |
| *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:*** | Addition of resource representation and API annex | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eSEAL | | | | |  | ***Date:*** | | | 2022-08-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 24.548 needs to be updated to support CoAP following stage 2 requirements, and a CoAP MBMS resource representation and API annex is proposed to be added. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | CoAP MBMS resource representation and API annex is added | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | CoAP is not supported following stage 2 requirements | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Annex A.X (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:*** | |  | | | | | | | | |

**\*\*\*\*\*\*\***

\* \* \* First Change \* \* \* \*

# A.X Resource representation and APIs for MBMS resource configuration and monitoring

## A.X.1 SU\_MbmsResourceManagement API provided by SNRM-C

### A.X.1.1 API URI

The CoAP URIs used in CoAP requests from SNRM-S towards the SNRM-C shall have the Resource URI structure as defined in Annex C.1.1 of 3GPP TS 24.546 [31] with the following clarifications:

- the <apiName>shall be "su-nmb-c";

- the <apiVersion> shall be "v1"; and

- the <apiSpecificSuffixes> shall be set as described in clause A.X.1.2.

### A.X.1.2 Resources

#### A.X.1.2.1 Overview



Figure A.X.1.2.1-1: Resource URI structure of the SU\_MbmsResourceManagement API provided by SNRM-C

Table A.X.1.2.1-1 provides an overview of the resources and applicable CoAP methods.

Table A.X.1.2.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | CoAP method | Description |
| MBMS Resource Configuration | /val-services/{valServiceId}/mbms-resources/{tmgi}/configuration | GET | Retrieve MBMS Resource Configuration of the SNRM-C for a given VAL service and TMGI. |
| PUT | Create or update MBMS Resource Configuration of the SNRM-C for a given VAL service and TMGI. |
| DELETE | Delete MBMS Resource Configuration of the SNRM-C for a given VAL service and TMGI. |
| MBMS Resource State | /val-services/{valServiceId}/mbms-resources/{tmgi}/state | GET  (NOTE) | Retrieve MBMS Resource State information for a given VAL service and TMGI. |
| NOTE: The GET method can also be used to observe this resource. | | | |

#### A.X.1.2.2 Resource: MBMS Resource Configuration

##### A.X.1.2.2.1 Description

The MBMS Resource Configuration resource allows a SNRM-S to manage the MBMS Resource Configuration of a SNRM-C.

##### A.X.1.2.2.2 Resource Definition

Resource URI: **{apiRoot}/su-nmb-c/<apiVersion>/val-services/{valServiceId}/mbms-resources/{tmgi}/configuration**

This resource shall support the resource URI variables defined in the table A.X.1.2.2.2-1.

Table A.X.1.2.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See Annex C.1.1 of 3GPP TS 24.546 [31]. |
| apiVersion | string | See clause A.X.1.1. |
| valServiceId | string | Identifier of a VAL service. |
| tmgi | bytes | Identifier of the MBMS resource (Temporary Mobile Group Identity). |

##### A.X.1.2.2.3 Resource Standard Methods

A.X.1.2.2.3.1 GET

This operation retrieves the MBMS Resource Configuration.

This method shall support the response data structures and response codes specified in table A.X.1.2.2.3.1-1.

Table A.X.1.2.2.3.1-1: Data structures supported by the GET Response payload on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MbmsResourceConfig | M | 1 | 2.05 Content | The MBMS Resource Configuration information. |
| NOTE: The mandatory CoAP error status codes for the PUT method listed in table C.1.3-1 of 3GPP TS 24.546 [31] shall also apply. | | | | |

A.X.1.2.2.3.2 PUT

This operation creates and updates the MBMS Resource Configuration.

This method shall support the request data structures specified in table A.X.1.2.2.3.2-1 and the response data structures and response codes specified in table A.X.1.2.2.3.2-2.

Table A.X.1.2.2.3.2-1: Data structures supported by the PUT Request payload on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MbmsResourceConfig | M | 1 | Updated details of the MBMS Resource Configuration. |

Table A.X.1.2.2.3.2-2: Data structures supported by the PUT Response payload on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MbmsResourceConfig | M | 1 | 2.01 Created | MBMS Resource Configuration created successfully. |
| MbmsResourceConfig | O | 1 | 2.04 Changed | MBMS Resource Configuration updated successfully and the updated MBMS Resource Configuration may be returned in the response. |
| NOTE: The mandatory CoAP error status codes for the PUT method listed in table C.1.3-1 of 3GPP TS 24.546 [31] shall also apply. | | | | |

A.X.1.2.2.3.3 DELETE

This operation deletes the MBMS Resource Configuration.

This method shall support the response data structures and response codes specified in table A.X.1.2.2.3.3-1.

Table A.X.1.2.2.3.3-1: Data structures supported by the DELETE Response payload on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 2.02 Deleted | MBMS Resource Configuration is deleted. |
| NOTE: The mandatory CoAP error status codes for the DELETE method listed in table C.1.3-1 of 3GPP TS 24.546 [31] shall also apply. | | | | |

#### A.X.1.2.3 Resource: MBMS Resource State

##### A.X.1.2.3.1 Description

The MBMS Resource State resource allows the SNRM-S to retrieve and monitor the state of the MBMS Resource as seen by the SNRM-C.

##### A.X.1.2.3.2 Resource Definition

Resource URI: **{apiRoot}/su-nmb-c/<apiVersion>/val-services/{valServiceId}/mbms-resources/{tmgi}/state**

This resource shall support the resource URI variables defined in the table A.X.1.2.3.2-1.

Table A.X.1.2.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See Annex C.1.1 of 3GPP TS 24.546 [31]. |
| apiVersion | string | See clause A.X.1.1. |
| valServiceId | string | Identifier of a VAL service. |
| tmgi | bytes | Identifier of the MBMS resource (Temporary Mobile Group Identity). |

##### A.X.1.2.3.3 Resource Standard Methods

A.X.1.2.3.3.1 GET

This operation retrieves the MBMS resource state information as seen by the SNRM-C.

This method shall support the request options specified in table A.X.1.2.3.3-1, the response data structures and response codes specified in table A.X.1.2.3.3-2, and the response options specified in table A.X.1.2.3.3-3.

Table A.X.1.2.3.3-1: Options supported by the GET Request on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Observe | Uinteger | O | 0..1 | When set to 0 (Register) it extends the GET request to subscribe to the changes of this resource.  When set to 1 (Deregister) it cancels the subscription. |
| NOTE: Other request options also apply in accordance with normal CoAP procedures. | | | | |

Table A.X.1.2.3.3-2: Data structures supported by the GET Response payload on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MbmsResourceState | M | 1 | 2.05 Content | MBMS resource state information at the SNRM-C. |
| NOTE: The mandatory CoAP error status codes for the GET method listed in table C.1.3-1 of 3GPP TS 24.546 [31] also apply. | | | | |

Table A.X.1.2.3.3-3: Options supported by the 2.05 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Observe | Uinteger | O | 0..1 | Sequence number of the notification. |
| NOTE: Other response options also apply in accordance with normal CoAP procedures. | | | | |

### A.X.1.3 Data Model

#### A.X.1.3.1 General

This clause specifies the application data model supported by the API. Data types listed in clause C.1.X of TS 24.546 [31] apply to this API.

Table A.X.1.3.1-1 specifies the data types defined specifically for the SU\_MbmsResourceManagement API service.

Table A.2.1.3.1-1: SU\_MbmsResourceManagement API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| MbmsResourceConfig | A.X.1.3.2.1 | Represents the MBMS Resource configuration of the SNRM-C. |  |
| MbmsResourceMonitoringConfig | A.X.1.3.2.2 | Represents the MBMS Resource monitoring configuration of the SNRM-C, i.e. instructions for the SNRM-C what to monitor in relation to the MBMS resource. |  |
| MbmsResourceState | A.X.1.3.2.3 | Represents the current state of the MBMS Resource as monitored by the SNRM-C. |  |

Table A.X.1.3.1-2 specifies data types re-used by the SU\_MbmsResourceManagement API service.

Table A.X.1.3.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| MbmsSaId | 3GPP TS 24.546 [31] | String containing a unique identifier of a MBMS serving area. |  |
| Tmgi | 3GPP TS 24.546 [31] | Byte string containing an identifier of Temporary Mobile Group Identity used by the MBMS resource. |  |
| Uinteger | 3GPP TS 24.546 [31] | Unsigned integer. |  |

#### A.X.1.3.2 Structured data types

##### A.X.1.3.2.1 Type: MbmsResourceConfig

Table A.X.1.3.2.1-1: Definition of type MbmsResourceConfig

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| tmgi | Tmgi | M | 1 | TMGI for identifying the MBMS Resource. |  |
| alternativeTmgis | Array(Tmgi) | O | 0..1 | A list of additional alternative TMGI used in roaming scenarios. |  |
| qci | Uinteger | O | 0..1 | QCI information used by the ProSe UE-Network Relay to determine the ProSe Per-Packet Priority value to be applied for the multicast packets relayed to Remote UE over PC5. QCI values are defined in 3GPP TS 23.203 [4]. |  |
| frequency | Uinteger | O | 0..1 | Identification of frequency in case of multi carrier support. It is coded as specified in 3GPP TS 29.468 [13]. |  |
| serviceAreas | array(MbmsSaId) | O | 0..N | List of MBMS service area identifiers. |  |
| sdp | string | O | 0..1 | SDP with media and application control information applicable to groups that can use this MBMS bearer. |  |
| rohcEnabled | boolean | O | 0..1 | Indicates if the flows delivered by the MBMS bearer are header compressed with ROHC as specified in IETF RFC 5795 [20] and IETF RFC 3095 [16]. |  |
| monitorConfig | MbmsResourceMonitoringConfig | O | 0..1 | Monitoring configuration for the SNRM-C. |  |

##### A.X.1.3.2.2 Type: MbmsResourceMonitoringConfig

Table A.X.1.3.2.2-1: Definition of type MbmsResourceMonitoringConfig

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| receptionQuality | boolean | O | 0..1 | Indicates if reception quality of the MBMS bearer is to be monitored. |  |
| unicastResource | boolean | O | 0..1 | Indicates if the unicast resource related to the MBMS berare is to be monitored. |  |
| suspension | boolean | O | 0..1 | Indicates if suspension state of the MBMS bearer is to be monitored. |  |

##### A.X.1.3.2.3 Type: MbmsResourceState

Table A.X.1.3.2.3-3: Definition of type MbmsResourceState

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| tmgi | Tmgi | M | 1 | Temprorary Mobile Group Identity for identifying the MBMS Resource. |  |
| monitorConfig | MbmsResourceMonitoringConfig | M | 1 | MBMS Resource monitoring configuration of the SNRM-C. |  |
| receptionQualityLevel | integer | O | 0..1 | Reception quality level measured for the MBMS bearer. |  |
| suspendingState | boolean | O | 0..1 | Indicates if the MBMS bearer’s intended suspension state:  - "true" indicates that the RAN has decided to suspend the referenced MBMS bearer(s) at the beginning of the next MCCH modification period;  - "false" indicates that the RAN has decided to revoke its decision to suspend the referenced MBMS bearer(s) before the beginning of the next MCCH modification period; |  |
| unicastListeningState | boolean | O | 0..1 | Indicate the unicast listening status:  - "true" indicates that the VAL UE is listening;  - "false" indicates that the VAL UE is not listening; |  |

### A.X.1.4 Error Handling

General error responses are defined in clause C.1.3 of 3GPP TS 24.546 [31].

### A.X.1.5 CDDL Specification

#### A.X.1.5.1 Introduction

The data model described in clause A.X.1.3 shall be binary encoded in the CBOR format as described in IETF RFC 8949 [26].

Clause A.X.1.5.2 uses the Concise Data Definition Language described in IETF RFC 8610 [28] and provides corresponding representation of the SU\_MbmsResourceManagement API provided by SNRM-C data model.

#### A.X.1.5.2 CDDL document

;;; MbmsResourceConfig

;;+ Represents MBMS resource configuration.

MbmsResourceConfig = {

tmgi: Tmgi

? alternativeTmgis: [+ Tmgi]

? qci: Uinteger

? frequency: Uinteger

? serviceAreas: [+ MbmsSaId]

? sdp: text

? rohcEnabled: bool

? monitorConfig: MbmsResourceMonitoringConfig

}

;;; MbmsResourceMonitoringConfig

;;+ Represents MBMS resource monitoring configuration, i.e. instructions for the VAL UE what to monitor in relation to the MBMS resource.

MbmsResourceMonitoringConfig = {

? receptionQuality: bool

? unicastResource: bool

? suspension: bool

}

;;; MbmsResourceState

;;+ Represents MBMS Resource state information as observed by the VAL UE.

MbmsResourceState = {

tmgi: Tmgi

monitoringConfig: MbmsResourceMonitoringConfig

? receptionQualityLevel: int

? suspendingState: bool

? unicastListeningState: bool

}

;;; MbmsSaId

;;+ Unique identifier of a MBMS serving area.

MbmsSaId = text

;;; Tmgi

;;+ Temprorary Mobile Group Identity for use by MBMS.

Tmgi = bytes

;;; Uinteger

;;+ Unsigned Integer, i.e. only value 0 and integers above 0 are permissible.

Uinteger = int .ge 0

### A.2.1.6 Media Types

The media type for a MBMS Resource Configuration shall be "application/vnd.3gpp.seal-mbms-config+cbor".

The media type for a MBMS Resource State shall be "application/vnd.3gpp.seal-mbms-state+cbor".

Editor's Note: It is possible to specify other payload format for CoAP than CBOR, and the details about other payload format is FFS.

### A.2.1.7 Media Type registration for application/vnd.3gpp.seal-mbms-config+cbor

Type name: application

Subtype name: vnd.3gpp.seal-mbms-config+cbor

Required parameters: none

Optional parameters: none

Encoding considerations: Must be encoded as using IETF RFC 8949 [17]. See "MbmsResourceConfig" data type in 3GPP TS 24.548 clause A.X.1.3.2.1 for details.

Security considerations: See Section 10 of IETF RFC 8949 [17] and Section 11 of IETF RFC 7252 [23].

Interoperability considerations: Applications must ignore any key-value pairs that they do not understand. This allows backwards-compatible extensions to this specification.

Published specification: 3GPP TS 24.548 "Network Resource Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification", available via http://www.3gpp.org/specs/numbering.htm.

Applications that use this media type: Applications supporting the SEAL network resource management procedures as described in the published specification.

Fragment identifier considerations: Fragment identification is the same as specified for "application/cbor" media type in IETF RFC 8949 [17]. Note that currently that RFC does not define fragmentation identification syntax for "application/cbor".

Additional information:

Deprecated alias names for this type: N/A

Magic number(s): N/A

File extension(s): none

Macintosh file type code(s): none

Person & email address to contact for further information: <MCC name>, <MCC email address>

Intended usage: COMMON

Restrictions on usage: None

Author: 3GPP CT1 Working Group/3GPP\_TSG\_CT\_WG1@LIST.ETSI.ORG

Change controller: <MCC name>/<MCC email address>

### A.2.1.8 Media Type registration for application/vnd.3gpp.seal-mbms-state+cbor

Type name: application

Subtype name: vnd.3gpp.seal-mbms-state+cbor

Required parameters: none

Optional parameters: none

Encoding considerations: Must be encoded as using IETF RFC 8949 [17]. See "MbmsResourceState" data type in 3GPP TS 24.548 clause A.X.1.3.2.3 for details.

Security considerations: See Section 10 of IETF RFC 8949 [17] and Section 11 of IETF RFC 7252 [23].

Interoperability considerations: Applications must ignore any key-value pairs that they do not understand. This allows backwards-compatible extensions to this specification.

Published specification: 3GPP TS 24.548 "Network Resource Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification", available via http://www.3gpp.org/specs/numbering.htm.

Applications that use this media type: Applications supporting the SEAL network resource management procedures as described in the published specification.

Fragment identifier considerations: Fragment identification is the same as specified for "application/cbor" media type in IETF RFC 8949 [17]. Note that currently that RFC does not define fragmentation identification syntax for "application/cbor".

Additional information:

Deprecated alias names for this type: N/A

Magic number(s): N/A

File extension(s): none

Macintosh file type code(s): none

Person & email address to contact for further information: <MCC name>, <MCC email address>

Intended usage: COMMON

Restrictions on usage: None

Author: 3GPP CT1 Working Group/3GPP\_TSG\_CT\_WG1@LIST.ETSI.ORG

Change controller: <MCC name>/<MCC email address>

\* \* \* End of Changes \* \* \* \*