**3GPP TSG-CT WG4 Meeting #110-eC4-223xxx**

**E-Meeting, 12th – 20th May 2022** *Revision of C4-223109, C4-222371*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **3** | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | MBS application service requirements in MbsSession | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | QoS information in MbsSession is not specified yet. It shall describe the MBS QoS service requirements / media related information from the AF. Stage 2 requirements for MBS QoS flows are specified in clause 6.6 of TS 23.247. Clause 9.2.3.2 of TS 23.247 also specifies: 9.2.3.2 Npcf\_MBSPolicyAuthorization\_Create service operation **Service operation name:** Npcf\_MBSPolicyAuthorization\_Create  **Description:** Authorize the request, and optionally determines and installs MBS Policy Control Data according to the information provided by the NF Consumer.  **Inputs, Required:** MBS session ID, identification of the application session context.  **Inputs, Optional:** DNN if available, S-NSSAI if available, Media type, Media format, bandwidth requirements, flow description, Application Identifier, AF Communication Service Identifier, Flow status, Priority indicator, emergency indicator Application service provider.  **Outputs, Required:** Success (application session context) or Failure (reason for failure).  **Outputs, Optional:** The service information that can be accepted by the PCF.  Clause 7.1.1.3 (MBS Session Creation with PCC) of TS 23.247 also specifies:  There are two alternatives to initiate the policy Authorization service operation.  In the Alt-A, the MB-SMF is the Npcf\_MBSPolicy Authorization\_Create service operation consumer. The step 17 to step 19 are performed after step 16.  In the Alt-B, the NEF/MBSF is the Npcf\_MBSPolicy Authorization\_Create service operation consumer. The step 20 to step 25 are performed.  Accordingly, the MBS application service requirements need to be defined consistently between the Nmbsmf\_MBSession, Nnef\_MBSSession and Nmbpcf\_MBSPolicyAuthorization APIs to enable the MB-SMF and NEF to provide the necessary parameters when invoking the Npcf\_MBSPolicyAuthorization\_Create service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | A new mbsAppContext attribute and data type are defined to enable the AF to indicate its service requirements, i.e. flow descriptions and requested QoS profile. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incomplete specification, QoS support is not defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.9.3.a (new), 5.9.4.6, 5.9.4.x (new), 5.9.4.y (new), 5.9.4.z (new), A.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 introduces new backward compatible features to the the following APIs:  - TS29522\_MBSSession  - TS29532\_Nmbsmf\_MBSSession  - TS29537\_ MBSPolicyAuthorization | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev. 1:  - Huawei is added as co-source (merge with CR 29.571 #0339)  - Data type names and descriptions are updated to no longer refer to "MBS QoS flows" for the MBS QoS service requirements provided towards the MB-SMF. A new FlowQoSData type is also defined, with relaxed condition of presence of the QoS parameters, e.g. not to require an AF to provide an 5QI.  Rev. 2: A new MbsAppContext common data type is defined. It provides consistency between the MBS service requirements provided by the AF to the NEF and MB-SMF, and by the NEF or MB-SMF to the PCF. It is defined along the AppSessionContextReqData data type defined in TS 29.514, but retaining only the attributes required for MBS.  Rev. 3: Several data types from TS 29.514 and 29.512 are reused. A few attributes are renamed and a few new ones added. | | | | | | | | |

\* \* \* 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 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[3] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[4] IETF RFC 1166: "Internet Numbers".

[5] IETF RFC 5952: "A recommendation for IPv6 address text representation".

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

[7] 3GPP TS 23.003: "Numbering, addressing and identification".

[8] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[9] IETF RFC 7807: "Problem Details for HTTP APIs".

[10] IETF RFC 3339: "Date and Time on the Internet: Timestamps".

[11] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP) ".

[12] IETF RFC 6901: "JavaScript Object Notation (JSON) Pointer".

[13] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[14] IETF RFC 6902: "JavaScript Object Notation (JSON) Patch".

[15] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[16] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".

[17] IETF RFC 7042: "IANA Considerations and IETF Protocol and Documentation Usage for IEEE 802 Parameters".

[18] IETF RFC 6733: "Diameter Base Protocol".

[19] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[20] 3GPP TS 24.501: "Non-Access-Stratum (NAS) Protocol for 5G System (5GS); Stage 3".

[21] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[22] Void.

[23] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[24] ITU-T Recommendation Q.763 (1999): "Specifications of Signalling System No.7; Formats and codes".

[25] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[26] 3GPP TS 23.015: "Technical Realization of Operator Determined Barring".

[27] 3GPP TR 21.900: "Technical Specification Group working methods".

[28] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[29] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[30] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[31] IEEE Std 802.11-2012: "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[32] CableLabs WR-TR-5WWC-ARCH: "5G Wireless Wireline Converged Core Architecture".

[33] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access; Stage 2".

[34] BBF TR-069: "CPE WAN Management Protocol".

[35] BBF TR-369: "User Services Platform (USP)".

[36] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".

[37] BBF TR-470: "5G Wireless Wireline Convergence Architecture".

[38] IEEE "Guidelines for Use of Extended Unique Identifier (EUI), Organizationally Unique Identifier (OUI), and Company ID (CID)", <https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/tutorials/eui.pdf>

[39] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[40] IETF RFC 5580: "Carrying Location Objects in RADIUS and Diameter".

[41] BBF TR-456: "AGF Functional Requirements".

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

[43] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[x] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[y] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point".

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

\* \* \* Next Change \* \* \* \*

#### 5.9.3.a Enumeration: FlowStatus

The enumeration "FlowStatus" represents whether the service data flow(s) are enabled or disabled.

Table 5.9.3.a-1: Enumeration FlowStatus

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| ENABLED | Indicates to enable all associated service data flow(s) in downlink direction. |  |
| DISABLED | Indicates to disable all associated service data flow(s) in downlink direction. |  |
| REMOVED | Indicates to remove all associated service data flow(s). The IP Filters for the associated service data flow(s) shall be removed. The associated service data flows shall not be taken into account when deriving the authorized QoS. |  |

\* \* \* Next Change \* \* \* \*

#### 5.9.4.6 Type: MbsSession

Table 5.9.4.6-1: Definition of type MbsSession

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| mbsSessionId | MbsSessionId | C | 0..1 | MBS session identifier (TMGI and/or SSM, and NID for an SNPN)  (NOTE) |
| tmgiAllocReq | boolean | C | 0..1 | TMGI allocation request indication.  This IE shall be present if the mbsSessionId IE is absent. This IE may also be present if the mbsSessionId IE is present and it does not contain a TMGI.  When present, it shall be set as follows:  - true: a TMGI is requested to be allocated  - false (default): no TMGI is requested to be allocated  Write-Only: true  (NOTE) |
| tmgi | Tmgi | C | 0..1 | This IE shall be present in an MBS session creation response if the tmgiAllocReq IE was present and set to "true" in the MBS session creation request.  When present, it shall indicate the TMGI allocated to the MBS session.  Read-Only: true |
| expirationTime | DateTime | C | 0..1 | This IE shall be present in an MBS session creation response if the tmgiAllocReq IE was present and set to "true" in the in the MBS session creation request.  When present, it shall indicate the expiration time for the TMGI allocated to the MBS session.  Read-Only: true |
| serviceType | MbsServiceType | M | 1 | Service Type (either multicast or broadcast service)  Write-Only: true |
| locationDependent | boolean | C | 0..1 | Location dependent MBS session indication.  This IE shall be present and set to true for a Location dependent MBS session. It may be present otherwise.  When present, it shall be set as follows:  - true: this is a Location dependent MBS session  - false (default): this is not a Location dependent MBS session |
| areaSessionId | AreaSessionId | C | 0..1 | This IE shall be present in a successful response to a request to create a Location dependent MBS session.  When present, it shall contain the Area Session ID assigned by the MB-SMF to the location dependent MBS session in the MBS Service Area.  Read-Only: true |
| ingressTunAddrReq | boolean | O | 0..1 | Ingress transport address request indication (for unicast transport over N6mb/Nmb9).  When present, it shall be set as follows:  - true: an ingress transport address is requested  - false (default): no request  Write-Only: true |
| ingressTunAddr | TunnelAddress | C | 0..1 | Ingress tunnel address (UDP/IP tunnel).  This IE shall be present in an MBS session creation response if the ingressTunAddrReq IE was present and set to "true" in the in the MBS session creation request.  When present, it shall indicate the allocated ingress tunnel address.  Read-Only: true |
| ssm | Ssm | C | 0..1 | Source specific IP multicast address  This IE shall be present if multicast transport applies over N6mb/Nmb9 and the MBS session is not identified by the SSM, e.g. for a location-dependent MBS session with multicast transport over N6mb/Nmb9.  Write-Only: true |
| mbsServiceArea | MbsServiceArea | O | 0..1 | MBS Service Area  Write-Only: true |
| extMbsServiceArea | ExternalMbsServiceArea | O | 0..1 | This IE may be present only over the N33 and Nmb10 interfaces; it shall not be present over other interfaces.  When present, it shall indicate the MBS Service Area information which shall either be geographical area information or civic address information.  Write-Only: true |
| dnn | Dnn | O | 0..1 | DNN  Write-Only: true |
| snssai | Snssai | O | 0..1 | S-NSSAI  Write-Only: true |
| activationTime | DateTime | O | 0..1 | MBS session activation time |
| terminationTime | DateTime | O | 0..1 | MBS session termination time |
| mbsAppContext | MbsAppContext | O | 0..1 | Identifies the service requirements (i.e. flow descriptions and requested QoS) of the MBS Application |
| mbsSessionSubsc | MbsSessionSubscription | O | 0..1 | Subscription to one or more MBS session events |
| activityStatus | MbsSessionActivityStatus | O | 0..1 | Session activity status (active or inactive)  This IE may be provided if the serviceType indicates a multicast MBS session. |
| anyUeInd | Boolean | O | 0..1 | Indication that any UE may join the MBS session.  This IE may be provided if the serviceType indicates a multicast MBS session.  When present, it shall be set as follows:  - true: any UE may join the MBS session  - false (default): the MBS session is not open to any UE  Write-Only: true |
| NOTE: At least one of the mbsSessionId IE and tmgiAllocReq IE shall be present. Both may be present if the mbsSessionId IE does not contain a TMGI (i.e. if it only contains a SSM). | | | | |

\* \* \* Next Change \* \* \* \*

#### 5.9.4.x Type MbsAppContext

Table 5.9.4.x-1: Definition of type MbsAppContext

| Attribute name | Data type | P | Cardinality | Description |
| --- | --- | --- | --- | --- |
| afAppId | string | O | 0..1 | Contains information that identifies the service the AF session belongs to. |
| aspId | string | O | 0..1 | Application service provider identity. |
| medComps | map(MediaComp) | O | 1..N | Media Component information. The key of the map is the attribute "medCompN". |
| resPrio | ReservPriority | O | 0..1 | Indicates the reservation priority. |

\* \* \* Next Change \* \* \* \*

#### 5.9.4.y Type: MediaComp

Table 5.9.4.y-1: Definition of type MediaComp

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| afAppId | string | O | 0..1 | Contains information that identifies the service the AF session belongs to. |
| qosReference | string | O | 0..1 | Identifies a pre-defined QoS information. |
| medCompN | integer | M | 1 | Identifies the media component number, and it contains the ordinal number of the media component. |
| medSubComps | map(MediaSubComp) | O | 1..N | Contains the requested bitrate and filters for the set of service data flows identified by their common flow identifier. The key of the map is the attribute "fNum". |
| medType | MediaType | O | 0..1 | Indicates the media type of the service. |
| maxReqBwDl | BitRate | O | 0..1 | Maximum requested bandwidth for the Downlink. |
| minReqBwDl | BitRate | O | 0..1 | Minimum requested bandwidth for the Downlink. |
| mbsFlowStatus | FlowStatus | O | 0..1 | Indicates whether the status of the service data flows is enabled or disabled. |
| codecs | array(CodecData) | O | 1..2 | Indicates the Codec Data. |
| resPrio | ReservPriority | O | 0..1 | Indicates the reservation priority. |

\* \* \* Next Change \* \* \* \*

#### 5.9.4.z Type MediaSubComp

Table 5.9.4.z-1: Definition of type MediaSubComp

| Attribute name | Data type | P | Cardinality | Description |
| --- | --- | --- | --- | --- |
| fNum | integer | M | 1 | Identifies the ordinal number of the service data flow. |
| flowInfos | array(FlowInformation) | O | 1..N | Contains the flow description for the Downlink IP flows. |
| maxReqBwDl | BitRate | O | 0..1 | Maximum requested bandwidth for the Downlink. |
| tosTrCl | TosTrafficClass | O | 0..1 | Type of Service or Traffic Class. |
| mbsFlowStatus | FlowStatus | O | 0..1 | Indicates whether the status of the service data flows is enabled or disabled. |

\* \* \* Next Change \* \* \* \*

## A.2 Data related to Common Data Types

openapi: 3.0.0

info:

version: '1.3.0-alpha.5'

title: 'Common Data Types'

description: |

Common Data Types for Service Based Interfaces.

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[…]

#

# Enumerations

#

#

MbsServiceType:

description: Indicates the type of an MBS session

anyOf:

- type: string

enum:

- MULTICAST

- BROADCAST

- type: string

MbsSessionActivityStatus:

description: Indicates the MBS session's activity status

anyOf:

- type: string

enum:

- ACTIVE

- INACTIVE

- type: string

MbsSessionEventType:

description: MBS Session Event Type

anyOf:

- type: string

enum:

- MBS\_REL\_TMGI\_EXPIRY

- BROADCAST\_DELIVERY\_STATUS

- type: string

FlowStatus:

description: Describes whether the IP flow(s) are enabled or disabled.

anyOf:

- type: string

enum:

- ENABLED

- DISABLED

- REMOVED

- type: string

#

# STRUCTURED DATA TYPES

#

MbsSession:

description: Individual MBS session

type: object

properties:

mbsSessionId:

$ref: '#/components/schemas/MbsSessionId'

tmgiAllocReq:

type: boolean

default: false

writeOnly: true

tmgi:

$ref: '#/components/schemas/Tmgi'

readOnly: true

expirationTime:

$ref: '#/components/schemas/DateTime'

readOnly: true

serviceType:

$ref: '#/components/schemas/MbsServiceType'

writeOnly: true

locationDependent:

type: boolean

default: false

areaSessionId:

$ref: '#/components/schemas/AreaSessionId'

readOnly: true

ingressTunAddrReq:

type: boolean

default: false

writeOnly: true

ingressTunAddr:

$ref: '#/components/schemas/TunnelAddress'

readOnly: true

ssm:

$ref: '#/components/schemas/Ssm'

writeOnly: true

mbsServiceArea:

$ref: '#/components/schemas/MbsServiceArea'

writeOnly: true

extMbsServiceArea:

$ref: '#/components/schemas/ExternalMbsServiceArea'

writeOnly: true

dnn:

$ref: '#/components/schemas/Dnn'

writeOnly: true

snssai:

$ref: '#/components/schemas/Snssai'

writeOnly: true

activationTime:

$ref: '#/components/schemas/DateTime'

terminationTime:

$ref: '#/components/schemas/DateTime'

mbsAppContext:

$ref: '#/components/schemas/MbsAppContext'

mbsSessionSubsc:

$ref: '#/components/schemas/MbsSessionSubscription'

activityStatus:

$ref: '#/components/schemas/MbsSessionActivityStatus'

anyUeInd:

type: boolean

default: false

writeOnly: true

required:

- serviceType

anyOf:

- required: [ mbsSessionId ]

- required: [ tmgiAllocReq ]

[…]

ExternalMbsServiceArea:

description: List of geographic area or list of civic address info for MBS Service Area

type: object

properties:

geographicAreaList:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

minItems: 1

civicAddressList:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/CivicAddress'

minItems: 1

oneOf:

- required: [ geographicAreaList ]

- required: [ civicAddressList ]

MbsAppContext:

description: >

Identifies the service requirements of the MBS Application

type: object

properties:

afAppId:

type: string

aspId:

type: string

medComps:

type: object

additionalProperties:

$ref: '#/components/schemas/MediaComp'

minProperties: 1

description: >

Contains media component information. The key of the map is the medCompN attribute.

resPrio:

$ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/ReservPriority'

MediaComp:

description: Identifies a media component

type: object

required:

- medCompN

properties:

afAppId:

type: string

qosReference:

type: string

medCompN:

type: integer

medSubComps:

type: object

additionalProperties:

$ref: '#/components/schemas/MediaSubComp'

minProperties: 1

description: >

Contains the requested bitrate and filters for the set of service data flows identified

by their common flow identifier. The key of the map is the fNum attribute.

medType:

$ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/MediaType'

maxReqBwDl:

$ref: '#/components/schemas/BitRate'

minReqBwDl:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'

mbsFlowStatus:

$ref: '#/components/schemas/FlowStatus'

codecs:

type: array

items:

$ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/CodecData'

minItems: 1

maxItems: 2

resPrio:

$ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/ReservPriority'

MediaSubComp:

description: Identifies a media subcomponent

type: object

required:

- fNum

properties:

fNum:

type: integer

flowInfos:

type: array

items:

$ref: 'TS29512\_Npcf\_SMPolicyControl.yaml#/components/schemas/FlowInformation'

minItems: 1

maxReqBwDl:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'

tosTrCl:

$ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/TosTrafficClass'

mbsFlowStatus:

$ref: '#/components/schemas/FlowStatus'

[…]

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