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

**E-Meeting, 12th – 20th May 2022** *Revision of C4-223106*

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** | **1** | **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)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Signaling of NG-RAN Node ID from AMF to MB-SMF |
|  |  |
| ***Source to WG:*** | , Ericsson |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | MBS |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | F |  | ***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 canbe 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:*** | CR 23.527 #0048 requires the AMF to insert the NG-RAN ID in the N2MbsSmInfo attribute included in the MBSBroadcast\_ContextCreate Response message. The NG-RAN ID is useful information to insert in other scenarios as well where the AMF forwards an N2 MBS Session Management container towards the MB-SMF. For instance, when (per existing requirements) the AMF forwards the MBS Session Information Failure Transfer IE in the MBSBroadcast\_ContextCreate Response, MBSBroadcast\_ContextUpdate Response or MBSBroadcast\_ContextStatusNotify Response, the container (which is only defined in NGAP with a Cause IE) is useless for the MB-SMF without the RAN Node ID information. |
|  |  |
| ***Summary of change:*** | A new attribute is defined in the N2MbsSmInfo data type to enable the AMF to report the identifier of the NG-RAN node that generated the container. The AMF inserts the NG-RAN Node ID for each N2 MBS Session Management container it forwards to the MB-SMF. |
|  |  |
| ***Consequences if not approved:*** | The MB-SMF (and operator) cannot make any use of some N2 MBS Session Management container it receives from the AMF, e.g. when the container contains an MBS Session Information Failure Transfer IE. Stage 2 requirements for restoration procedures cannot be implemented. |
|  |  |
| ***Clauses affected:*** | 5.6.2.2, 5.6.2.3, 5.6.2.5, 6.5.6.1, 6.5.6.2.7, A.6 |
|  |  |
|  | **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 backward compatible corrections to the Namf\_MBSBroadcast API. |
|  |  |
| ***This CR's revision history:*** | Rev. 1: adds Ericsson as co-source |

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

#### 5.6.2.2 ContextCreate

The ContextCreate service operation shall be used by the NF Service Consumer (e.g. MB-SMF) to request the AMF to create a broadcast MBS session context.

It is used in the following procedures:

- MBS Session Start for Broadcast (see clause 7.3.1 of 3GPP TS 23.247 [55]);

- Support for Local Broadcast Service (see clause 7.3.4 of 3GPP TS 23.247 [55]).

There shall be only one broadcast MBS session context per MBS session, or per MBS session and Area Session ID for an MBS session with Location dependent Broadcast service.

The NF Service Consumer (e.g. MB-SMF) shall create a broadcast MBS session context by using the HTTP POST method as shown in Figure 5.6.2.2-1.



Figure 5.6.2.2-1: Broadcast MBS session context creation

1. The NF Service Consumer shall send a POST request targeting the Broadcast MBS session contexts collection resource of the AMF. The payload body of the POST request shall contain the following information:

- MBS Session ID (i.e. TMGI, or TMGI and NID for an MBS session in an SNPN);

- Area Session ID, if this is a Location dependent broadcast MBS service;

- MBS service area;

- N2 MBS Session Management container (see MBS Session Information Setup Request Transfer IE in 3GPP TS 38.413 [12]); and

- Notification URI where to be notified about the status change of the broadcast MBS session context.

 The NF Service Consumer may also include the maxResponseTime IE in the request to indicate the maximum response time to receive information about the completion of the Broadcast MBS session establishment.

2a. On success, "201 Created" shall be returned. The AMF should respond success when it receives the first successful response from the NG-RAN(s). The 201 Created response may contain one or more N2 MBS Session Management containers, if additional information (e.g. MBS Session Information Response Transfer IE or MBS Session Information Failure Transfer IE in 3GPP TS 38.413 [12]) needs to be transferred to the MB-SMF. If the AMF received the NG-RAN responses from all involved NG-RAN(s), e.g. if the broadccast MBS session involves only one NG-RAN, the AMF shall include an indication of completion of the operation in all NG-RANs in the 201 Created response.

Upon receipt of subsequent responses from other NG-RANs after sending the 201 Created response, if additional information (e.g. MBS Session Information Response Transfer IE or MBS Session Information Failure Transfer IE in 3GPP TS 38.413 [12]) needs to be transferred to the MB-SMF, the AMF shall transfer such information by sending one or more Namf\_MBSBroadcast\_ContextStatusNotify requests to the MB-SMF. A Namf\_MBSBroadcast\_ContextStatusNotify request may include a list of N2 MBS Session Management containers received from different NG-RANs. When the AMF receives the response from all NG-RANs, the AMF shall include an indication of the completion of the operation in the Namf\_MBSBroadcast\_ContextStatusNotify request.

If the AMF does not receive responses from all NG-RAN nodes before the maximum response time elapses since the reception of the Namf\_MBSBroadcast\_ContextCreate Request, then the AMF should send one Namf\_MBSBroadcast\_ContextStatusNotify request indicating the incompletion of the Broadcast MBS session establishment.

For each N2 MBS Session Management container sent towards the MB-SMF, the AMF shall insert the identifier of the NG-RAN node that generated it in the corresponding entry of the n2MbsSmInfoList attribute.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.5.3.2.3.1-3 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in Table 6.5.3.2.3.1-3.

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

#### 5.6.2.3 ContextUpdate

The ContextUpdate service operation shall be used by the NF Service Consumer (e.g. MB-SMF) to request the AMF to update a broadcast MBS session context.

It is used in the following procedures:

- MBS Session Update for Broadcast (see clause 7.3.3 of 3GPP TS 23.247 [55]).

The NF Service Consumer (e.g. MB-SMF) shall update a broadcast MBS session context by using the HTTP POST method as shown in Figure 5.6.2.3-1.



Figure 5.6.2.3-1: Broadcast MBS session context update

1. The NF Service Consumer shall send a POST request targeting the individual Broadcast MBS session context resource to be updated in the AMF. The payload body of the POST request may contain the following information:

- N2 MBS Session Management container (see MBS Session Information Modify Request Transfer IE in 3GPP TS 38.413 [12]);

- Notification URI, if the NF Service Consumer wishes to modify the notification URI where to be notified about the status change of the broadcast MBS session context;

- updated MBS service area.

 The NF Service Consumer may also include the maxResponseTime IE in the request to indicate the maximum response time to receive information about the completion of the Broadcast MBS session update.

2a. On success, "200 OK" shall be returned if additional information needs to be returned in the response. The 200 OK response may contain one or more N2 MBS Session Management containers, if such information (e.g. MBS Session Information Response Transfer IE or MBS Session Information Failure Transfer IE in 3GPP TS 38.413 [12]) needs to be transferred to the MB-SMF. If the AMF received the NG-RAN responses from all involved NG-RAN(s), the AMF shall include an indication of completion of the operation in all NG-RANs.

2b. On success, "204 No Content" shall be returned if no additional information needs to be returned in the response.

In both 2a and 2b cases, upon receipt of subsequent responses from other NG-RANs after sending the 200 OK response or the 204 No Content response, if additional information (e.g. MBS Session Information Response Transfer IE or MBS Session Information Failure Transfer IE in 3GPP TS 38.413 [12]) needs to be transferred to the MB-SMF, the AMF shall transfer such information by sending one or more Namf\_MBSBroadcast\_ContextStatusNotify requests to the MB-SMF. A Namf\_MBSBroadcast\_ContextStatusNotify request may include a list of N2 MBS Session Management containers received from different NG-RANs. When the AMF receives the response from all NG-RANs, the AMF shall include an indication of the completion of the operation in the Namf\_MBSBroadcast\_ContextStatusNotify request.

If the AMF does not receive responses from all NG-RAN nodes before the maximum response time elapses since the reception of the Namf\_MBSBroadcast\_ContextUpdate Request, then the AMF should send one Namf\_MBSBroadcast\_ContextStatusNotify request indicating the incompletion of the Broadcast MBS session update.

For each N2 MBS Session Management container sent towards the MB-SMF, the AMF shall insert the identifier of the NG-RAN node that generated it in the corresponding entry of the n2MbsSmInfoList attribute.

2c. On failure or redirection, one of the HTTP status code listed in Table 6.5.3.2.4.2.2-2 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in Table 6.5.3.2.4.2.2-2.

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

#### 5.6.2.5 ContextStatusNotify

The ContextStatusNotify service operation shall be used by the AMF to notify status change of a broadcast MBS session context to the NF Service Consumer (e.g. MB-SMF).

It is used in the following procedures:

- MBS Session Start for Broadcast (see clause 7.3.1 of 3GPP TS 23.247 [55]);

- MBS Session Update for Broadcast (see clause 7.3.3 of 3GPP TS 23.247 [55]).

The AMF shall notify status change of a broadcast MBS session context to the NF Service Consumer (e.g. MB-SMF) by using the HTTP POST method as shown in Figure 5.6.2.5-1.



Figure 5.6.2.5-1: Broadcast MBS session context status change notification

1. The AMF shall send a POST request targeting the notification URI received from the NF Service Consumer. The payload body of the POST request shall contain the following information:

- MBS Session ID (i.e. TMGI, or TMGI and NID for an MBS session in an SNPN);

- Area Session ID, if this is a Location dependent broadcast MBS service;

- one or more N2 MBS Session Management containers, if N2 MBS Session Management information has been received from one or more NG-RANs that needs to be transferred to the NF Service Consumer; for each N2 MBS Session Management container sent towards the MB-SMF, the AMF shall insert the identifier of the NG-RAN node that generated it in the corresponding entry of the n2MbsSmInfoList attribute.

- the operationStatus IE indicating the completion of the Broadcast MBS session establishment or update, if the NF Service Consumer has requested to establish or update the Broadcast MBS session context and a response has been received from all NG-RANs; and

- the operationStatus IE indicating the incompletion of the Broadcast MBS session establishment or update, if the NF Service Consumer has requested to establish or update the Broadcast MBS session context including a maximum response time and the AMF has not received responses from all NG-RANs before the maximum response time elapses.

2a. On success, the NF Service Consumer shall return a "204 No Content" response.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.5.5.2.3.1-3 shall be returned and appropriate additional error information should be returned.

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

### 6.5.6 Data Model

#### 6.5.6.1 General

This clause specifies the application data model supported by the API.

Table 6.5.6.1-1 specifies the data types defined for the Namf\_MBSBroadcast service based interface protocol.

Table 6.5.6.1-1: Namf\_MBSBroadcast specific Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Clause defined | Description |
| ContextCreateReqData | 6.5.6.2.2 | Data within ContextCreate Request |
| ContextCreateRspData | 6.5.6.2.3 | Data within ContextCreate Response |
| ContextStatusNotification | 6.5.6.2.4 | Data within ContextStatusNotify Request |
| ContextUpdateReqData | 6.5.6.2.5 | Data within ContextUpdate Request |
| ContextUpdateRspData | 6.5.6.2.6 | Data within ContextUpdate Response |
| N2MbsSmInfo | 6.5.6.2.7 | N2 MBS Session Management Information |
| OperationStatus | 6.5.6.3.3 | Operation Status |
| NgapIeType | 6.5.6.3.4 | NGAP Information Element Type |

Table 6.5.6.1-2 specifies data types re-used by the Namf service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Namf service based interface.

Table 6.5.6.1-2: Namf re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| MbsSessionId | 3GPP TS 29.571 [6] | MBS Session Id |
| AreaSessionId | 3GPP TS 29.571 [6] | Area Session Id |
| MbsServiceArea | 3GPP TS 29.571 [6] | MBS Service Area |
| RefToBinaryData | 3GPP TS 29.571 [6] | Reference to binary body part |
| Uri | 3GPP TS 29.571 [6] | URI |
| DurationSec | 3GPP TS 29.571 [6] | Duration in seconds |
| GlobalRanNodeId | 3GPP TS 29.571 [6] | Global RAN Node Identifier |

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

##### 6.5.6.2.7 Type: N2MbsSmInfo

Table 6.5.6.2.7-1: Definition of type N2MbsSmInfo

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| ngapIeType | NgapIeType | M | 1 | This IE shall indicate the NGAP IE type of the ngapData as specified in clause 6.5.6.3.x. |
| ngapData | RefToBinaryData | M | 1 | This IE shall contain the reference to the binary data part carrying the NGAP data. |
| ranId | GlobalRanNodeId | M | 1 | This IE shall indicate the Global RAN ID of the gNB that generated the N2 MBS Session Management related information. |

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

## A.6 Namf\_MBSBroadcast API

openapi: 3.0.0

info:

 version: 1.0.0-alpha.2

 title: Namf\_MBSBroadcast

 description: |

 AMF MBSBroadcast Service

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[…]

 N2MbsSmInfo:

 description: N2 MBS Session Management information

 type: object

 properties:

 ngapIeType:

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

 ngapData:

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

 randId:

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

 required:

 - ngapIeType

 - ngapData

 - randId

[…]

\* \* \* For Information \* \* \* \*

##### 6.5.6.2.3 Type: ContextCreateRspData

Table 6.5.6.2.3-1: Definition of type ContextCreateRspData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| n2MbsSmInfoList | array(N2MbsSmInfo) | O | 1..10 | When present, this IE shall contain N2 MBS Session Management related information.(see clause 6.5.6.4). |
| operationStatus | OperationStatus | C | 0..1 | This IE shall be present and indicate the completion of the MBS session start operation, if the AMF received the NG-RAN responses from all involved NG-RAN(s). |

##### 6.5.6.2.4 Type: ContextStatusNotification

Table 6.5.6.2.4-1: Definition of type ContextStatusNotification

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| mbsSessionId | MbsSessionId | M | 1 | MBS Session ID |
| areaSessionId | AreaSessionId | C | 0..1 | Area Session IDThis IE shall be present if this is a Location dependent broadcast MBS service. |
| n2MbsSmInfoList | array(N2MbsSmInfo) | O | 1..10 | When present, this IE shall contain N2 MBS Session Management related information.(see clause 6.5.6.4). |
| operationStatus | OperationStatus | C | 0..1 | This IE shall be present and indicate the completion of the MBS session start or update operation, if the NF Service Consumer has requested to establish or update the Broadcast MBS session context and a response has been received from all NG-RANs.This IE shall be present and indicate the incompletion of the MBS session start or update operation, if the NF Service Consumer has requested to establish or update the Broadcast MBS session context within a maximum response time and the AMF has not received responses from all NG-RANs before the maximum response time elapses. |

##### 6.5.6.2.6 Type: ContextUpdateRspData

Table 6.5.6.2.6-1: Definition of type ContextUpdateRspData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| n2MbsSmInfoList | array(N2MbsSmInfo) | O | 1..10 | When present, this IE shall contain N2 MBS Session Management related information.(see clause 6.5.6.4). |
| operationStatus | OperationStatus | C | 0..1 | This IE shall be present and indicate the completion of the MBS session start operation, if the AMF received the NG-RAN responses from all involved NG-RAN(s). |

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