**3GPP TSG-CT3 Meeting #118e C3-215300\_r1**

**E-Meeting, 11th – 15th October 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.522** | **CR** | **0438** | **rev** | **-** | **Current version:** | **17.3.0** |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | New Nnef\_MBSTMGI service definition – Procedures part | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5MBS | | | | |  | ***Date:*** | | | 2021-09-30 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | SA2 has further progressed the Stage 2 normative work on 5MBS WI and specified in 3GPP TS 23.247 (clause 9.4) the new NEF services that need to be supported. The new Nnef\_MBSTMGI service exposed by the NEF needs hence to be defined in TS 29.522. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | This CR proposes to:   * Define the procedures part of the new Nnef\_MBSTMGI service exposed by the NEF. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | * 5MBS requirements from Stage 2 not implemented in Stage 3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.2, 4.1, 4.4.1, 4.4.x (new subclause) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 does not impact OpenAPI specification files. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* Start of changes \* \* \* \*

# 2 References

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

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

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

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

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

[2] 3GPP TS 23.502: "Procedures for the 5G system".

[3] 3GPP TS 23.501: "System Architecture for the 5G".

[4] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

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

[6] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

[7] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[8] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[9] 3GPP TS 29.521: "5G System; Binding Support Management Service; Stage 3".

[10] Void.

[11] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".

[12] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".

[13] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[14] 3GPP TS 33.122: "Security Aspects of Common API Framework for 3GPP Northbound APIs".

[15] Void.

[16] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

[17] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[18] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[19] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[20] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[21] 3GPP TR 21.900: "Technical Specification Group working methods".

[22] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".

[23] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data, Application Data and Structured Data for Exposure; Stage 3".

[24] 3GPP TS 29.541: "5G System; Network Exposure (NE) function services for Non-IP Data Delivery (NIDD); Stage 3".

[25] 3GPP TS 29.542: "5G System, Session management services for Non-IP Data Delivery (NIDD); Stage 3".

[26] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[27] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[28] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G system (5GS)".

[29] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[30] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[31] Void

[32] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[33] 3GPP TS 24.588: "Vehicle-to-Everything (V2X) services in 5G System (5GS); User Equipment (UE) policies; Stage 3".

[34] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[35] 3GPP TS 29.515: "5G System; Gateway Mobile Location Services; Stage 3".

[36] 3GPP TS 23.273: "5G System Location Services (LCS)".

[37] 3GPP TS 33.535: "Authentication and Key Management for Applications (AKMA) based on 3GPP credentials in the 5G System (5GS)".

[38] 3GPP TS 29.535: "5G System; AKMA Anchor Services; Stage 3".

[39] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture (GBA)".

[40] IETF RFC 7542: "The Network Access Identifier".

[41] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[42] 3GPP TS 23.548: "5G System Enhancements for Edge Computing; Stage 2".

[43] 3GPP TS 29.534: "5G System; Access and Mobility Policy Authorization Service; Stage 3".

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

[45] IEEE Std 1588-2019: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control".

[46] IEEE Std 802.1AS-2020: "IEEE Standard for Local and metropolitan area networks--Timing and Synchronization for Time-Sensitive Applications".

[47] 3GPP TS 29.536: "5G System; Network Slice Admission Control Services; Stage 3".

[48] 3GPP TS 24.526: "User Equipment (UE) policies for 5G System (5GS); Stage 3".

[49] 3GPP TS 24.555: "Proximity based services (ProSe) in 5G system (5GS); User Equipment (UE) policies; Stage 3".

[50] 3GPP TS 29.565: "5G System; Time Sensitive Communication and Time Synchronization Function Services; Stage 3".

[51] IEEE 802.1Q: "Virtual Bridged Local Area Networks".

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

\* \* \* Next changes \* \* \* \*

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5MBS 5G Multicast/Broadcast Services

A-KID AKMA Key IDentifier

A-TID AKMA Temporary UE IDentifier

AAnF AKMA Anchor Function

ACS Auto-Configuration Server

AF Application Function

AKMA Authentication and Key Management for Applications

AM Access and Mobility management

BDT Background Data Transfer

CAPIF Common API Framework

CP Communication Pattern

DN Data Network

DNAI DN Access Identifier

DNN Data Network Name

ECS Edge Configuration Server

GMLC Global Mobile Location Centre

GPSI Generic Public Subscription Identifier

IPTV Internet Protocol Television

KAF AKMA Application Key

MBS Multicast/Broadcast Service.

MB-SMF Multicast/Broadcast Session Management Function.

MO-LR Mobile Originated Location Request

NEF Network Exposure Function

NSAC Network Slice Admission Control

NSACF Network Slice Admission Control Function

PCF Policy Control Function

PCRF Policy and Charging Rule Function

PFD Packet Flow Description

PFDF Packet Flow Description Function

REST Representational State Transfer

SCEF Service Capability Exposure Function

S-NSSAI Single Network Slice Selection Assistance Information

TMGI Temporary Mobile Group Identity

TSC Time Sensitive Communication

TSCAI Time Sensitive Communication Assistance Information

TSCTSF Time Sensitive Communication and Time Synchronization Function

UDR Unified Data Repository

UP User Plane

URSP UE Route Selection Policy

WB Wide Band

\* \* \* Next changes \* \* \* \*

## 4.1 Overview

The NEF Northbound interface is between the NEF and the AF. It specifies RESTful/RPC APIs that allow the AF to access the services and capabilities provided by 3GPP network entities and securely exposed by the NEF.

This document also specifies the procedures triggered at the NEF by API requests from the AF and by event notifications received from 3GPP network entities.

The stage 2 level requirements and signalling flows for the NEF Northbound interface are defined in 3GPP TS 23.502 [2] and 3GPP TS 23.247 [aa].

The NEF Northbound interface supports the following procedures:

1) Procedures for Monitoring

2) Procedures for Device Triggering

3) Procedures for resource management of Background Data Transfer

4) Procedures for CP Parameters, Network Configuration Parameters Provisioning, 5G LAN Parameters Provisioning, ACS Configuration Parameter Provisioning, Location Privacy Indication Parameters Provisioning, Time Synchronization Exposure and ECS address provisioning

5) Procedures for PFD Management

6) Procedures for Traffic Influence

7) Procedures for changing the chargeable party at session set up or during the session

8) Procedures for setting up an AF session with required QoS

9) Procedures for MSISDN-less Mobile Originated SMS

10) Procedures for non-IP data delivery

11) Procedures for analytics information exposure

12) Procedure for applying BDT policy

13) Procedures for Enhanced Coverage Restriction Control

14) Procedures for IPTV Configuration

15) Procedures for Service Parameter Provisioning

16) Procedures for RACS Parameter Provisioning

17) Procedures for Mobile Originated Location Request

18) Procedures for AKMA

19) Procedures for AF triggered Access and Mobility Influence

20) Procedures for AF triggered Access and Mobility Policy Authorization

yy) Procedures for TMGI allocation, deallocation, expiry timer refresh and timer expiry notification

Which correspond to the following services respectively, supported by the NEF as defined in 3GPP TS 23.502 [2]:

1) Nnef\_EventExposure service and Nnef\_APISupportCapability service

2) Nnef\_Trigger service

3) Nnef\_BDTPNegotiation service

4) Nnef\_ParameterProvision service

5) Nnef\_PFDManagement service

6) Nnef\_TrafficInfluence service

7) Nnef\_ChargeableParty service

8) Nnef\_AFsessionWithQoS service

9) Nnef\_MSISDN-less\_MO\_SMS service

10) Nnef\_NIDDConfiguration and Nnef\_NIDD services

11) Nnef\_AnalyticsExposure service

12) Nnef\_ApplyPolicy service

13) Nnef\_ECRestriction service

14) Nnef\_IPTVConfiguration service

15) Nnef\_ServiceParameter service

16) Nnef\_UCMFProvisioning service

17) Nnef\_Location service

18) Nnef\_AKMA service

19) Nnef\_AMInfluence service

20) Nnef\_AMPolicyAuthorization service

bb) Nnef\_MBSTMGI service

NOTE 1: For Nnef\_PFDManagement service, only the Nnef\_PFDManagement\_Create/Update/Delete service operations are applicable for the NEF Northbound interface.

NOTE 2: For Nnef\_NIDD service, NF consumer other than the AF does not use the NEF Northbound interface.

NOTE 3: For Nnef\_NIDDConfiguration service, the Nnef\_NIDDConfiguration\_Trigger service operation is only applicable for the NEF Northbound interface.

NOTE 4: The Nnef\_APISupportCapability service is only applicable in the MonitoringEvent API when the monitoring type sets to "API\_SUPPORT\_CAPABILITY".

\*\*\* Next Changes \*\*\*

### 4.4.1 Introduction

All procedures that operate across the NEF Northbound interface, as specified in 3GPP TS 23.502 [2] and 3GPP TS 23.247 [aa], are specified in the following subclauses.

\* \* \* Next changes \* \* \* \*

### 4.4.x Procedures for MBS Session Management for 5MBS

#### 4.4.x.1 General

The procedures described in the subclauses below are used by an AF to interact with the 5GC for 5G MBS session(s) management as defined in 3GPP TS 23.247 [aa].

#### 4.4.x.2 Procedures for TMGI management for 5MBS

#### 4.4.x.2.1 General

The procedures described in the subclauses below are used by an AF to request and manage TMGI(s) for 5G MBS session(s) as defined in subclause 7.1 of 3GPP TS 23.247 [aa].

#### 4.4.x.2.2 Procedures for TMGI(s) allocation or TMGI(s) expiry time refresh

This procedure is used by an AF to request the allocation of TMGI(s) for new 5G MBS session(s) or the refresh of the expiry time of already allocated TMGI(s).

In order to request the allocation of TMGI(s) for new 5G MBS session(s) or the refresh of the expiry time of already allocated TMGI(s), an AF sends a Nnef\_MBSTMGI\_Allocation Request message to the NEF. The request body shall include the TmgiAllocRequest data structure which shall contain:

- within the "afId" attribute, the identifier of the AF that is sending the request;

- within the "tmgiParams" attribute, the parameters (e.g. number of TMGI(s) to be allocated, etc.) to request the allocation of TMGI(s) for new 5G MBS session(s) or the refresh of the expiry time of already allocated TMGI(s);

and may contain:

- within the "notificationUri" attribute, the notification URI via which the AF desires to receive notifications on timer expiry for TMGI(s);

- within the "requestTestNotification" attribute, an indication on whether the NEF should send a test notification;

- within the "websockNotifConfig" attribute, the configuration parameters to set up notification delivery over Websocket protocol; and/or

- within the "suppFeat" attribute, the features supported by the AF.

The NEF checks whether the AF is authorized or not as defined in subclause 6.1.1 of 3GPP TS 23.247 [aa]. If the AF is authorized, the NEF may query the NRF to discover and select an MB-SMF (service) instance that can handle this request. Then, the NEF conveys this TMGI(s) allocation or expiry time refresh request to the MB-SMF using the Nmbsmf\_TMGI service.

Editor's Note: The Nmbsmf\_TMGI service will be defined by CT4.

Upon reception of a reply from the MB-SMF, the NEF forwards the received information (e.g. allocated TMGI(s), expiry time or updated expiry time, etc.) in a Nnef\_MBSTMGI\_Allocation Response message with a "200 OK" status code to the AF. The response body shall include the TmgiAllocResponse data structure which shall contain:

- within the "tmgiInfo" attribute, the TMGI(s) allocation information or the refreshed expiry time for already allocated TMGI(s);

and may contain:

- within the "suppFeat" attribute, the features supported by both the AF and the NEF.

Editor's note: Error cases and the related responses are FFS.

#### 4.4.x.2.3 Procedures for TMGI(s) deallocation

This procedure is used by an AF to request the deallocation of previously allocated TMGI(s).

In order to request the deallocation of previously allocated TMGI(s), an AF sends a Nnef\_MBSTMGI\_Deallocation Request message to the NEF. The request body shall include:

- within the "afId" attribute, the identifier of the AF that is sending the request; and

- within the "tmgis" attribute, the the list of TMGI(s) for which deallocation is requested;

The NEF checks whether the AF is authorized or not as defined in subclause 6.1.1 of 3GPP TS 23.247 [aa]. If the AF is authorized, the NEF may query the NRF to discover and select an MB-SMF (service) instance that can handle this request. Then, the NEF conveys this TMGI(s) deallocation request to the MB-SMF using the Nmbsmf\_TMGI service.

Editor's Note: The Nmbsmf\_TMGI service will be defined by CT4.

Upon reception of a reply from the MB-SMF confirming the deallocation of the TMGI(s), the NEF forwards this confirmation in a Nnef\_MBSTMGI\_Deallocation Response message with a "204 No Content" status code to the AF.

Editor's note: Error cases and the related responses are FFS.

#### 4.4.x.2.4 Procedures for TMGI(s) timer expiry notification

This procedure is used by the NEF to notify an AF of timer expiry for previously allocated TMGI(s).

In order to notify an AF of timer expiry for previously allocated TMGI(s), the NEF sends a Nnef\_MBSTMGI\_ExpiryNotify Request message to the AF. The request body shall include the list of TMGI(s) whose timer expired within the "tmgis" attribute of the ExipryNotify data structure.

Upon reception of this notification request, the AF acknowledges its successful reception by sending a Nnef\_MBSTMGI\_ExpiryNotify Response message with an HTTP "204 No Content" status code.

Editor's note: Error cases and the related responses are FFS.

\* \* \* End of changes \* \* \* \*