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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

1 Scope

The present document specifies the stage 3 protocol and data model for the Nmbsf Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the MBSF.

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3]. The stage 2 architecture and procedures for 5G Multicast/Broadcast Services are specified in 3GPP TS 23.247 [14] and 3GPP TS 26.502 [15].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in 3GPP TS 29.500 [4] and 3GPP TS 29.501 [5].

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 23.501: "System Architecture for the 5G System; Stage 2".

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

[4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

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

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

[7] 3GPP TR 21.900: "Technical Specification Group working methods".

[8] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

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

[10] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[11] IETF RFC 9113: "HTTP/2".

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

[13] IETF RFC 9457: "Problem Details for HTTP APIs".

[14] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[15] 3GPP TS 26.502: "5G Multicast-Broadcast User Service Architecture".

[16] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[17] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[18] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

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

[20] 3GPP TS 29.581: "5G System; Multicast/Broadcast Service Transport Services; Stage 3".

[21] IANA: "Reliable Multicast Transport (RMT) FEC Encoding IDs and FEC Instance IDs", https://www.iana.org/assignments/rmt-fec-parameters/rmt-fec-parameters.xhtml#rmt-fec-parameters-1

[22] IETF RFC 7396: "JSON Merge Patch".

[23] 3GPP TS 26.517: "5G Multicast-Broadcast User Services; Protocols and Formats".

[24] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

For the purpose of the present document, the terms and definitions given in clause 3 of 3GPP TS 23.247 [14] and clause 3 of 3GPP TS 26.502 [15] also apply, including the ones referencing other specifications.

3.2 Symbols

Void.

3.3 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].

FEC	Forward Erasure Correction
MBS	Multicast/Broadcast Service.
MBSF	Multicast/Broadcast Service Function
MBSTF	Multicast/Broadcast Service Transport Function
TMGI	Temporary Mobile Group Identity
URI	Uniform Resource Identifier

4 Overview

In the frame of Multicast/Broadcast Services (MBS), the Multicast/Broadcast Service Function (MBSF) provides services to NF service consumers (e.g. AF, NEF) via the Nmbsf service based interface. The MBSF supports for this purpose the functionalities defined in 3GPP TS 26.502 [15] and 3GPP TS 23.247 [14], i.e. service level functionalities to support MBS and the control of the MBSTF, when used.

Figures°4-1 and 4.2 depict the Multicast/Broadcast related reference architecture of the MBSF respectively in SBI representation and reference point representation.

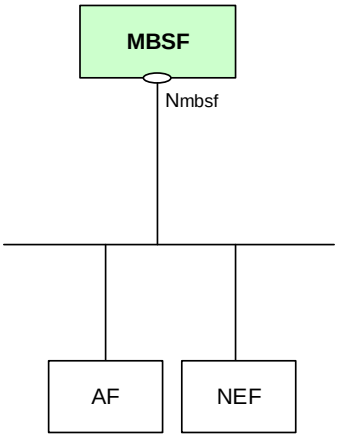

Figure 4-1: Reference model for the MBSF Services – SBI representation

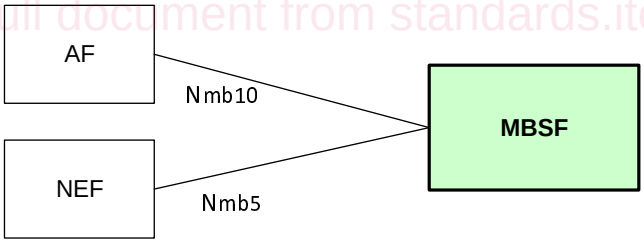

Figure 4-2: Reference Model for the MBSF Services – Reference point representation

5 Services offered by the MBSF

5.1 Introduction

The MBSF provides the following services:

- Nmbsf_MBSUserService
- Nmbsf_MBSUserDataIngestSession

Table 5.1-1 summarizes the corresponding APIs defined for this specification.

Table 5.1-1: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Nmbsf_MBSUserService	5.2	MBS User Management Service	TS29580_Nmbsf_MBSUserService.yaml	nmbsf-mbs-us	A.2
Nmbsf_MBSUserDataIngestSession	5.3	MBS User Data Ingest Session Management Service	TS29580_Nmbsf_MBSUserDataIngestSession.yaml	nmbsf-mbs-ud-ingest	A.3

5.2 Nmbsf_MBSUserService Service

5.2.1 Service Description

The Nmbsf_MBSUserService service exposed by the MBSF enables an NF service consumer to:

- request the creation of a new MBS User Service;
- retrieve the properties of an existing MBS User Service;
- request the update/modification of the properties of an existing MBS User Service; and
- request the deletion of an existing MBS User Service.

5.2.2 Service Operations

5.2.2.1 Introduction

The service operations defined for the Nmbsf_MBSUserService service are shown in table 5.2.2.1-1.

Table 5.2.2.1-1: Nmbsf_MBSUserService Service Operations

Service Operation Name	Description	Initiated by
Nmbsf_MBSUserService_Create	This service operation enables the NF service consumer to request the creation of a new MBS User Service.	AF, NEF (NOTE 2)
Nmbsf_MBSUserService_Retrieve	This service operation enables the NF service consumer to retrieve the properties of an existing MBS User Service.	AF, NEF (NOTE 2)
Nmbsf_MBSUserService_Update	This service operation enables the NF service consumer to request the update/modification of an existing MBS User Service.	AF, NEF (NOTE 2)
Nmbsf_MBSUserService_Delete (NOTE 1)	This service operation enables the NF service consumer to request the deletion of an existing MBS User Service.	AF, NEF (NOTE 2)
NOTE 1: This service operation corresponds to the Nmbsf_MBSUserService_Destroy service operation defined in 3GPP TS 26.502 [15]. NOTE 2: For MBS group message delivery, the NEF shall play the role of an AF as specified in clauses 6.15 and 7.5 of 3GPP TS 23.247 [14].		

5.2.2.2 Nmbsf_MBSUserService_Create service operation

5.2.2.2.1 General

This service operation is used by an NF service consumer to request the creation of a new MBS User Service at the MBSF.

The following procedures are supported by the "Nmbsf_MBSUserServie_Create" service operation:

- MBS User Service Creation.

5.2.2.2.2 MBS User Service Creation

Figure 5.2.2.2.2-1 depicts a scenario where an NF service consumer requests the creation of a new MBS User Service at the MBSF.

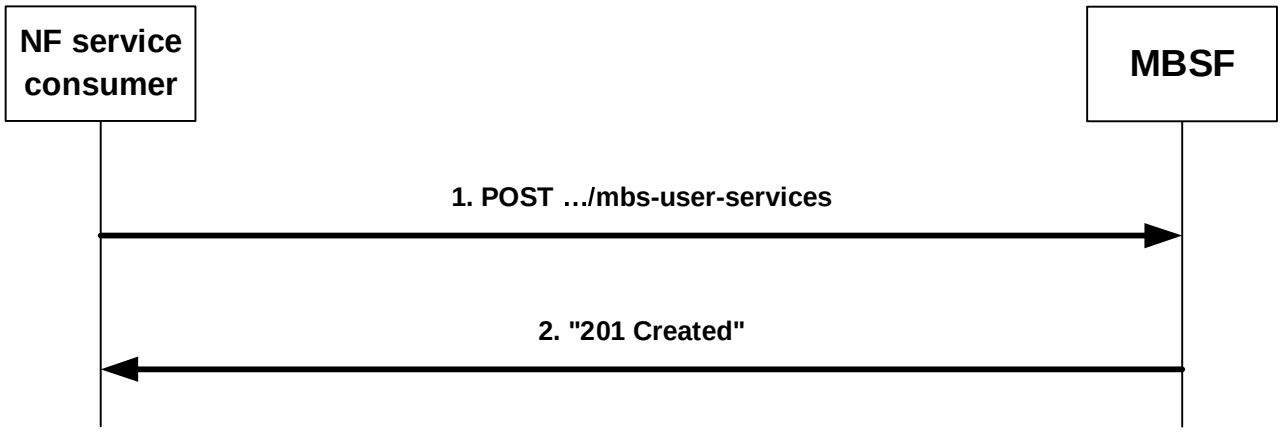

Figure 5.2.2.2.2-1: MBS User Service Creation procedure

1. In order to request the creation of a new MBS User Service, the NF service consumer (e.g. AF, NEF) shall send an HTTP POST request message to the MBSF targeting the "MBS User Services" collection resource, with the request body containing the MBSUserService data structure which shall include:

   - a list of external service identifier(s), within the "extServiceIds" attribute;
   - the service type, within the the "servType" attribute;
   - the service class, within the "servClass" attribute;

- the supported MBS User Service Announcement mode(s), within the "servAnnModes" attribute;
- one or several set(s) of per language service name and/or service description, within the "servNameDescs" attribute; and
- the list of supported features, if feature negotiation needs to take place, within the "suppFeat" attribute;

and may include:

- the main service language, within the "mainServLang" attribute.

2. Upon success, the MBSF shall create a new "Individual MBS User Service" resource and respond to the NF service consumer with a "201 Created" status code, including an HTTP Location header field containing the URI of the created resource, and the response body containing a representation of the created "Individual MBS User Service" resource within the MBSUserService data structure.

   On failure, the MBSF shall take proper error handling actions, as specified in clause 6.1.7, and respond to the NF service consumer with an appropriate error status code.

5.2.2.3 Nmbsf_MBSUserService_Retrieve service operation

5.2.2.3.1 General

This service operation is used by an NF service consumer to retrieve the properties of an existing MBS User Service at the MBSF.

The following procedures are supported by the "Nmbsf_MBSUserServie_Retrieve" service operation:

- MBS User Service Retrieval.

5.2.2.3.2 MBS User Service Retrieval

Figure 5.2.2.3.2-1 depicts a scenario where an NF service consumer requests the retrieval of the properties of an existing "Individual MBS User Service" resource from the MBSF.

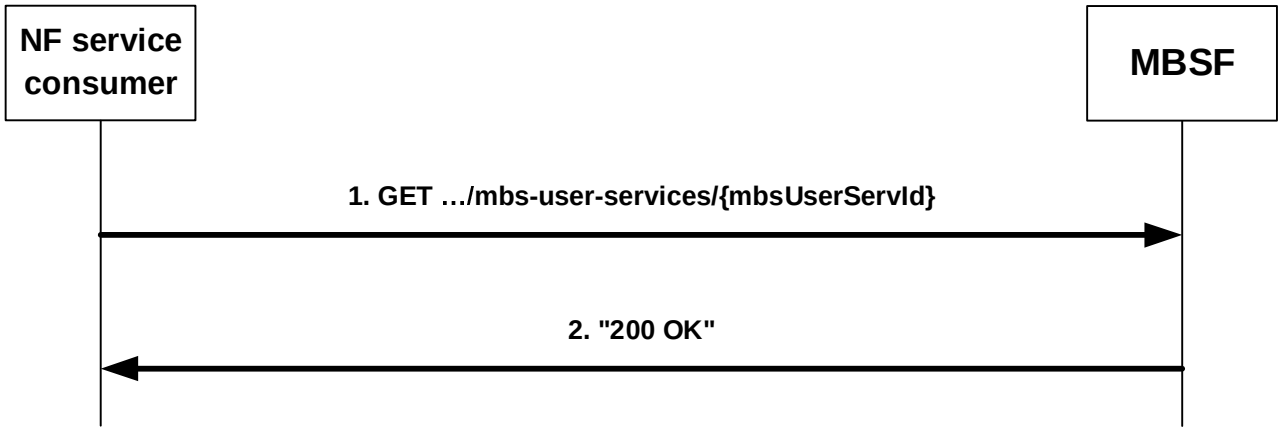

Figure 5.2.2.3.2-1: MBS User Service Retrieval procedure

1. In order to retrieve the properties of an existing MBS User Service, the NF service consumer (e.g. AF, NEF) shall send an HTTP GET request message targeting the corresponding "Individual MBS User Service" resource, using the URI "{apiRoot}/nmbsf-mbs-us/<apiVersion>/mbs-user-services/{mbsUserServId}", as shown in step 1 of figure 5.2.2.3.2-1.

   If the MBSF determines that the received HTTP GET request needs to be redirected, the MBSF shall respond with an HTTP redirect response, as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

2. Upon success, the MBSF shall respond to the NF service consumer with an HTTP "200 OK" status code with the response body containing a representation of the requested "Individual MBS User Service" resource within the MBSUserService data structure.