ETSI TS 129 581 V17.7.0 (2026-04)

TECHNICAL SPECIFICATION

5G;
5G System;
Multicast/Broadcast Service Transport Services;
Stage 3
(3GPP TS 29.581 version 17.7.0 Release 17)

Reference
RTS/TSGC-0429581vh70

Keywords
5G

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI IPR online database.

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

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

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found at 3GPP to ETSI numbering cross-referencing.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- 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 Nmbstf Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the MBSTF.

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3]. The 5G Multicast-Broadcast Session Management Services for 5G System is specified in 3GPP TS 23.247 [15] and the User Service Architecture for 5G Multicast-Broadcast Services is specified in 3GPP TS 26.502 [17].

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 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

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

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

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

[15] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[16] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[17] 3GPP TS 26.502: "5G multicast–broadcast services; User Service architecture; Stage 2".

[18] 3GPP TS 29.580: "5G System; Multicast/Broadcast Service Function services; Stage 3".

[19] IETF RFC 5775: "Asynchronous Layered Coding (ALC) Protocol Instantiation".

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 definitions of the basic SBI notions (e.g. apiRoot, API URI, Callback URI, etc.), SBI specific abbreviations (e.g. CRUD, YAML, etc.), special characters, operators and delimiters that are used by SBI specifications, see clause 3 in 3GPP TS 29.501 [5].

3.2 Symbols

For the purposes of the present document, the following symbols apply:

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].

5MBS	5G Multicast-Broadcast Services
AF	Application Function
ALC	Asynchronous Layered Coding
AS	Application server
DNN	Data Network Name
MBSF	Multicast/Broadcast Service Function
MBSTF	Multicast/Broadcast Service Transport Function
MB-SMF	Multicast/Broadcast Session Management Function
MB-UPF	Multicast/Broadcast User Plane Function
NEF	Network Exposure Function
NF	Network Function
S-NSSAI	Single Network Slice Selection Assistance Information
TSI	Transmission Session Identifier
URI	Uniform Resource Identifier

4 Overview

4.1 General

Within the 5GC, the MBSTF offers services to the MBSF via the Nmbstf service based interface (see 3GPP TS 23.501 [2] and 3GPP TS 26.502 [17]).

Figures 4.1 provides the reference model (in service based interface representation and in reference point representation), with focus on the MBSTF and the scope of the present specification.

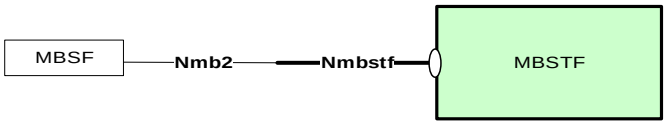

Figure 4-1: Reference model – MBSTF

Nmb2 is the reference point between MBSF and MBSTF.

The functionalities supported by the MBSTF are listed in clause 5.3.2.12 of 3GPP TS 23.247 [15].

The services and service operations provided by the Nmbstf interface are listed in clause 7.3 of 3GPP TS 26.502 [17].

5 Services offered by the MBSTF

5.1 Introduction

Table 5.1-1 summarizes the SBI services produced by the MBSTF.

Table 5.1-1: NF Services provided by MBSTF

Service Name	Description	Example Consumers
Nmbstf_MBSDistributionSession	Manage (e.g. Create, Modify, Delete) a new MBS Distribution Session within the MBSTF.	MBSF

Table 5.1-2 summarizes the corresponding APIs defined for this specification.

Table 5.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Nmbstf_MBSDistributionSession	5.2	MBSTF Distribution Session Service	TS29581_ Nmbstf_DistSession.yaml	nmbstf-distsession	A.2

5.2 Nmbstf_MBSDistributionSession Service

5.2.1 Service Description

The Nmbstf_MBSDistributionSession service operates on MBS distribution sessions. The following are the key functionalities of this NF service:

- Creation, modification, retrieval and deletion of MBS Distribution Sessions

Table 5.2.1-1 lists the service operations that are supported by the Nmbstf_MBSDistributionSession service.

Table 5.2.1-1: Service operations supported by the Nmbstf_MBSDistributionSession service

Service Operations	Description	Operation Semantics	Example Consumers
Create	Create a new MBS Distribution Session within the MBSTF	Request / Response	MBSF
Update	Update an existing MBS Distribution Session	Request / Response	MBSF
Destroy	Delete an existing MBS Distribution Session	Request / Response	MBSF
Retrieve	Retrieve the parameters of an existing MBS Distribution Session	Request / Response	MBSF
StatusSubscribe	Subscribe to notifications related to an MBS Distribution Session	Subscribe/ Notify	MBSF
StatusUnsubscribe	Unsubscribe from notifications related to an MBS Distribution Session		MBSF
StatusNotify	Notify event(s) related to an MBS Distribution Session		MBSF

5.2.2 Service Operations

5.2.2.1 Introduction

See Table 5.2.1-1 for an overview of the service operations supported by the Nmbstf_MBSDistributionSession service.

5.2.2.2 Create

5.2.2.2.1 General

The Create service operation shall be used to create a new MBS Distribution Session within the MBSTF (see clauses 5.2, 4.5.2 of 3GPP TS 26.502 [17]).

The NF Service Consumer (e.g. MBSF) shall create an MBS Distribution session in the MBSTF by using the HTTP POST method as shown in Figure 5.2.2.2.1-1.

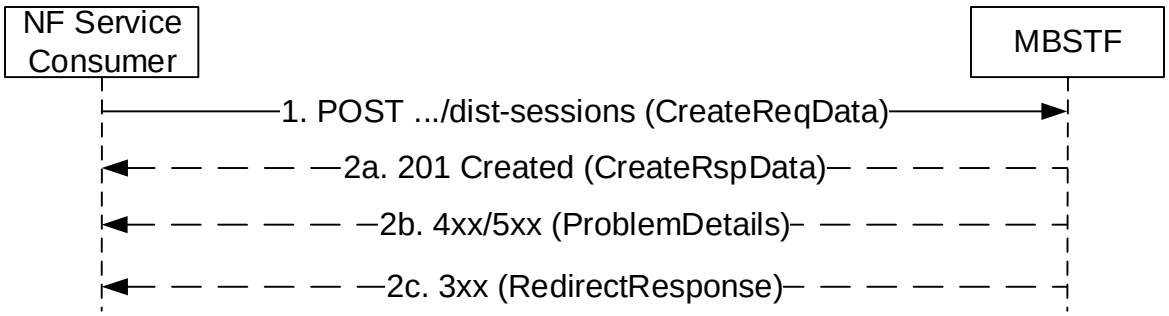

Figure 5.2.2.2.1-1: MBS Distribution session creation

1. The NF Service Consumer shall send a POST request (CreateReqData) targeting the MBS Distribution Sessions collection resource of the MBSTF. The payload body of the POST request shall contain the following information:

   - The baseline parameters for an MBS Distribution Session including Distribution Session Identifier, and;
   - Additional MBS Distribution Session parameters for Object Distribution Method, or;
   - Additional MBS Distribution Session parameters for Packet Distribution Method;

2a. On success, the MBSTF shall return a "201 Created" response. The "Location" header shall be present and shall contain the URI of the created resource. The payload body of the POST response (CreateRspData) shall contain a representation of the created MBS session.

2b. On failure, one of the HTTP status code listed in Table 6.1.3.2.3.1-3 shall be returned. The message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in Table 6.1.3.2.3.1-3.

2c. On redirection, "307 Temporary Redirect" or "308 Permanent Redirect" shall be returned. A RedirectResponse IE shall be included in the payload body of POST response.

5.2.2.3 Update

5.2.2.3.1 General

The Update service operation shall be used to update an existing MBS Distribution Session within the MBSTF (see clauses 5.2, 4.5.2 of 3GPP TS 26.502 [17]).

The NF Service Consumer (e.g. MBSF) shall update an MBS Distribution session in the MBSTF by using the HTTP PATCH method as shown in Figure 5.2.2.3.1-1.

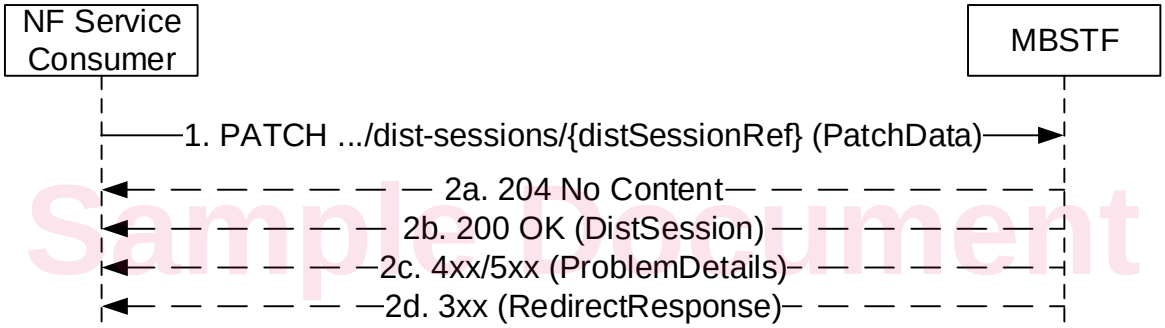

Figure 5.2.2.3.1-1: MBS Distribution session update

1. The NF Service Consumer shall send a PATCH request (PatchData) to update the MBS distribution session.

2a. On success, the MBSTF shall return "204 No Content";

2b. On success, the MBSTF shall return "200 OK" containing new resource representation of MBS distribution session;

2c. On failure, one of the HTTP status code listed in Table 6.1.3.3.3.1-3 shall be returned. The message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in Table 6.1.3.3.3.1-3.

2d. On redirection, "307 Temporary Redirect" or "308 Permanent Redirect" shall be returned. A RedirectResponse IE shall be included in the payload body of PATCH response.

5.2.2.4 Destroy

5.2.2.4.1 General

The Destroy service operation shall be used to delete an existing MBS Distribution Session within the MBSTF (see clauses 5.2, 4.5.2 of 3GPP TS 26.502 [17]).

The NF Service Consumer (e.g. MBSF) shall delete an MBS Distribution session in the MBSTF by using the HTTP DELETE method as shown in Figure 5.2.2.4.1-1.

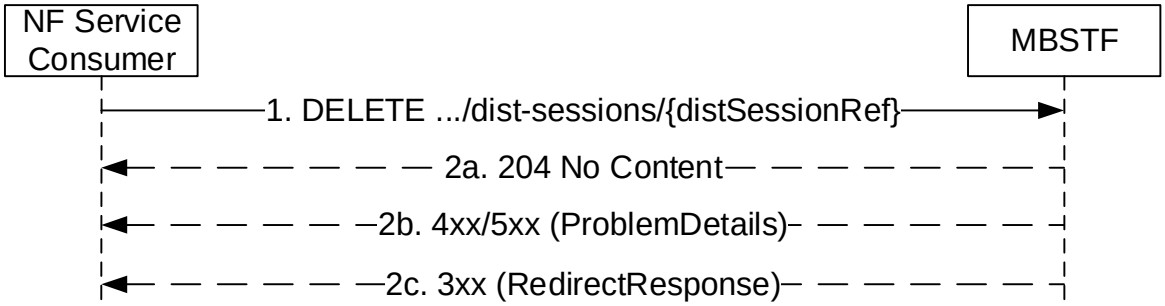

Figure 5.2.2.4.1-1: MBS Distribution session deletion

1. The NF Service Consumer shall send a DELETE request (distSessionRef) to release the MBS distribution session.

2a. On success, the MBSTF shall delete the MBS distribution session and return a "204 No Content" response.

2b. On failure, one of the HTTP status code listed in Table 6.1.3.3.3.2-3 shall be returned. The message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in Table 6.1.3.3.3.2-3.

2c. On redirection, "307 Temporary Redirect" or "308 Permanent Redirect" shall be returned. A RedirectResponse IE shall be included in the payload body of DELETE response.

5.2.2.5 Retrieve

5.2.2.5.1 General

The Retrieve service operation shall be used to retrieve the parameters of an existing MBS Distribution Session within the MBSTF (see clauses 5.2, 4.5.2 of 3GPP TS 26.502 [17]).

The NF Service Consumer (e.g. MBSF) shall retrieve an MBS Distribution session in the MBSTF by using the HTTP GET method as shown in Figure 5.2.2.5.1-1.

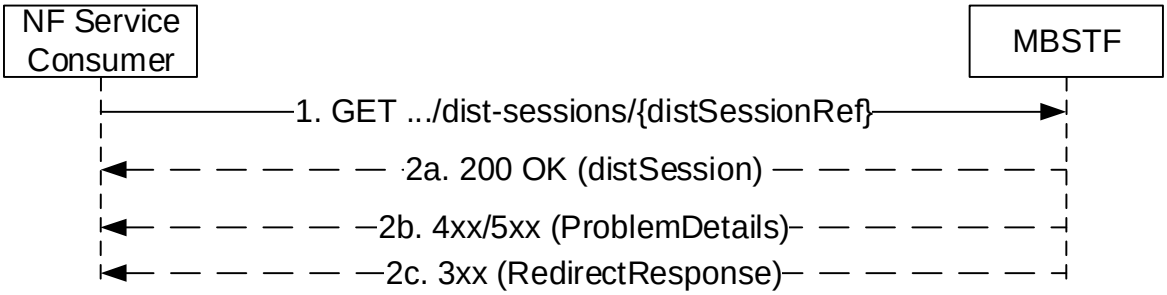

Figure 5.2.2.5.1-1: MBS Distribution session retrieval

1. The NF Service Consumer shall send a GET request to the resource representing the MBS distribution session (distSessionRef).

2a. On success, the MBSTF shall respond with "200 OK" with the message body containing parameters of the distribution session (distSession).

2b. On failure, one of the HTTP status code listed in Table 6.1.3.3.3.3-3 shall be returned. The message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in Table 6.1.3.3.3.3-3.

2c. On redirection, "307 Temporary Redirect" or "308 Permanent Redirect" shall be returned. A RedirectResponse IE shall be included in the payload body of GET response.

5.2.2.6 StatusSubscribe service operation

5.2.2.6.1 General

The StatusSubscribe service operation shall be used by an NF Service Consumer (e.g. MBSF) to create a subscription to the MBSTF notifications related to the event(s) of an MBS distribution session.

5.2.2.6.2 Subscription creation

The NF Service Consumer (e.g. MBSF) shall subscribe to MBSTF service notifications by using the HTTP POST method as shown in Figure 5.2.2.6.2-1.

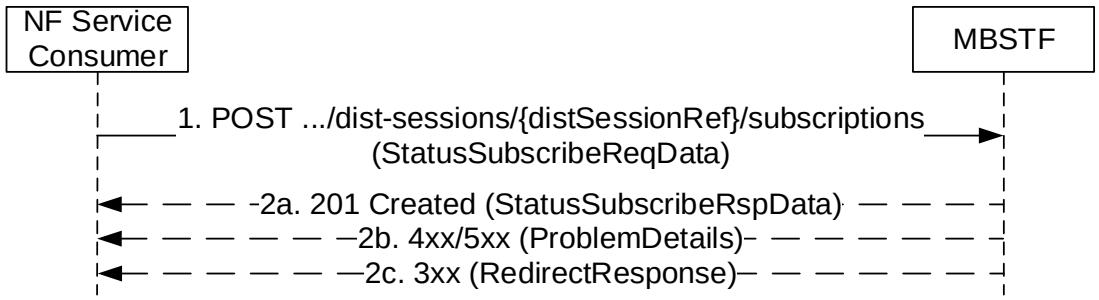

Figure 5.2.2.6.2-1: Subscribing to MBSTF notifications

1. The NF Service Consumer shall send a POST request (StatusSubscribeReqData) to the resource URI representing the subscriptions collection resource in the MBSTF. The payload body of the POST request shall contain:

   - the list of MBS distribution session events requested to be subscribed.
   - the Notification URI , indicating the address where the MBSTF shall send the notifications;

   The request body may also contain:

   - an expiry time suggested by the NF Service Consumer, representing the time span during which the subscription is desired to be kept active; and
   - Notification Correlation ID;

2a. On success, the MBSTF shall return a "201 Created" response. The "Location" header shall be present and shall contain the URI of the created resource. The payload body of the POST response (StatusSubscribeRspData) shall include:

   - the Distribution Session Identifier;
   - the list of events successfully subscribed;
   - the expiry time after which the subscription becomes invalid.

2b. On failure, one of the HTTP status code listed in the data structures supported by the POST Response Body (see Table 6.1.3.4.3.1-3) shall be returned. The message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in the same Table 6.1.3.4.3.1-3).

2c. On redirection, "307 Temporary Redirect" or "308 Permanent Redirect" shall be returned. A RedirectResponse IE shall be included in the payload body of POST response.