

ETSI TS 129 581 V17.2.0 (2023-01)



**5G;
5G System;
Multicast/Broadcast Service Transport Services;
Stage 3
(3GPP TS 29.581 version 17.2.0 Release 17)**



Reference

RTS/TSGC-0429581vh20

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

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our
Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2023.
All rights reserved.

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 Web server (<https://ipr.etsi.org/>).

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™** and **LTE™** 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 under <http://webapp.etsi.org/key/queryform.asp>.

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

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	6
1 Scope	8
2 References	8
3 Definitions, symbols and abbreviations	9
3.1 Definitions	9
3.2 Symbols.....	9
3.3 Abbreviations	9
4 Overview	9
4.1 General	9
5 Services offered by the MBSTF.....	10
5.1 Introduction	10
5.2 Nmbstf_MBSDistributionSession Service	10
5.2.1 Service Description.....	10
5.2.2 Service Operations.....	11
5.2.2.1 Introduction.....	11
5.2.2.2 Create	11
5.2.2.2.1 General	11
5.2.2.3 Update	12
5.2.2.3.1 General	12
5.2.2.4 Destroy	12
5.2.2.4.1 General	12
5.2.2.5 Retrieve	13
5.2.2.5.1 General	13
5.2.2.6 StatusSubscribe service operation.....	14
5.2.2.6.1 General	14
5.2.2.6.2 Subscription creation	14
5.2.2.6.3 Subscription update	15
5.2.2.7 StatusUnsubscribe.....	15
5.2.2.7.1 General	15
5.2.2.8 StatusNotify	16
5.2.2.8.1 General	16
6 API Definitions	17
6.1 Nmbstf_MBSDistributionSession Service API.....	17
6.1.1 Introduction.....	17
6.1.2 Usage of HTTP	17
6.1.2.1 General	17
6.1.2.2 HTTP standard headers	17
6.1.2.2.1 General	17
6.1.2.2.2 Content type	17
6.1.2.3 HTTP custom headers	18
6.1.3 Resources.....	18
6.1.3.1 Overview.....	18
6.1.3.2 Resource: MBS Distribution sessions collection (Collection)	18
6.1.3.2.1 Description	18
6.1.3.2.2 Resource Definition.....	19
6.1.3.2.3 Resource Standard Methods	19
6.1.3.2.3.1 POST.....	19
6.1.3.2.4 Resource Custom Operations	20
6.1.3.3 Resource: Individual MBS distribution session (Document).....	20

6.1.3.3.1	Description	20
6.1.3.3.2	Resource Definition	20
6.1.3.3.3	Resource Standard Methods	21
6.1.3.3.3.1	PATCH	21
6.1.3.3.3.2	DELETE	22
6.1.3.3.3.3	GET	23
6.1.3.3.4	Resource Custom Operations	24
6.1.3.4	Resource: Subscriptions collection for MBS distribution session (Collection)	25
6.1.3.4.1	Description	25
6.1.3.4.2	Resource Definition	25
6.1.3.4.3	Resource Standard Methods	25
6.1.3.4.3.1	POST	25
6.1.3.4.4	Resource Custom Operations	27
6.1.3.5	Resource: Individual subscription for an MBS distribution session (Document)	27
6.1.3.5.1	Description	27
6.1.3.5.2	Resource Definition	27
6.1.3.5.3	Resource Standard Methods	27
6.1.3.5.3.1	DELETE	27
6.1.3.5.3.2	PATCH	28
6.1.3.5.4	Resource Custom Operations	30
6.1.4	Custom Operations without associated resources	30
6.1.5	Notifications	30
6.1.5.1	General	30
6.1.5.2	StatusNotify	30
6.1.5.2.1	Description	30
6.1.5.2.2	Target URI	30
6.1.5.2.3	Standard Methods	31
6.1.6	Data Model	32
6.1.6.1	General	32
6.1.6.2	Structured data types	33
6.1.6.2.1	Introduction	33
6.1.6.2.2	Type: CreateReqData	33
6.1.6.2.3	Type: CreateRspData	33
6.1.6.2.4	Type: DistSession	34
6.1.6.2.5	Type: ObjDistributionData	36
6.1.6.2.6	Type: PktDistributionData	37
6.1.6.2.7	Type: StatusSubscribeReqData	37
6.1.6.2.8	Type: StatusSubscribeRspData	37
6.1.6.2.9	Type: StatusNotifyReqData	37
6.1.6.2.10	Type: DistSessionSubscription	37
6.1.6.2.11	Type: DistSessionEventReportList	38
6.1.6.2.12	Type: DistSessionEventReport	38
6.1.6.2.13	Type: UpTrafficFlowInfo	39
6.1.6.2.14	Type: MbStfIngestAddr	40
6.1.6.2.15	Type: ExtSsm	41
6.1.6.3	Simple data types and enumerations	41
6.1.6.3.1	Introduction	41
6.1.6.3.2	Simple data types	41
6.1.6.3.3	Enumeration: DistSessionState	41
6.1.6.3.4	Enumeration: ObjDistributionOperatingMode	41
6.1.6.3.5	Enumeration: ObjAcquisitionMethod	41
6.1.6.3.6	Enumeration: PktDistributionOperatingMode	42
6.1.6.3.7	Enumeration: DistSessionEventType	42
6.1.6.3.8	Enumeration: PktIngestMethod	42
6.1.6.4	Data types describing alternative data types or combinations of data types	42
6.1.6.5	Binary data	42
6.1.7	Error Handling	43
6.1.7.1	General	43
6.1.7.2	Protocol Errors	43
6.1.7.3	Application Errors	43
6.1.8	Feature negotiation	43
6.1.9	Security	43

Annex A (normative): **OpenAPI specification**.....44
A.1 General44
A.2 Nmbstf_DistSession API.....44
Annex B (informative): **Change history**55
History56

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".

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
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
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]).

Figure 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.

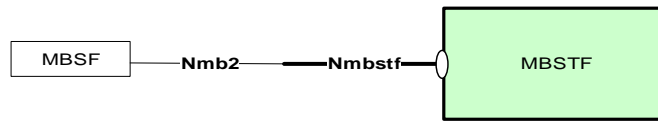


Figure 4-1: Reference model – MBSTF

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.

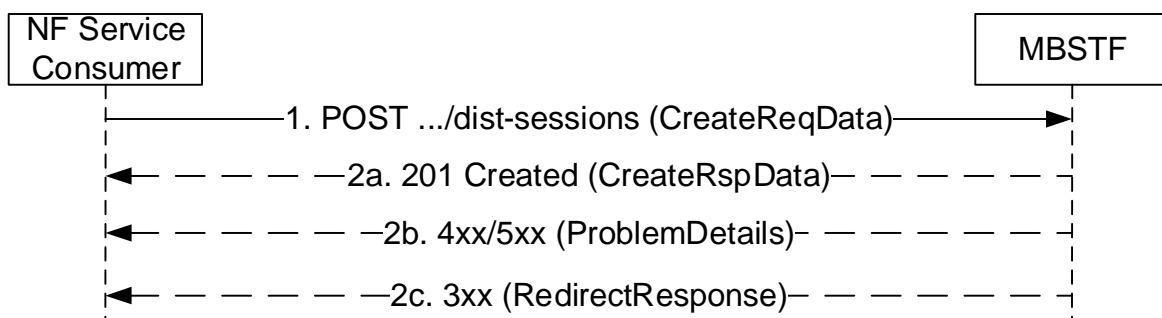


Figure 5.2.2.2.1-1: MBS Distribution session creation

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; if security protection is applied, the multicast session security context containing MBS Session Key (MSK), MSK lifetime and the corresponding key ID(s), 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.

If MBSTF received MBS Session Key (MSK) and the corresponding key IDs in Create request, the response may include the multicast session security context containing MBS Session Key (MSK), MBS Traffic Key (MTK) and the corresponding key IDs,

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.

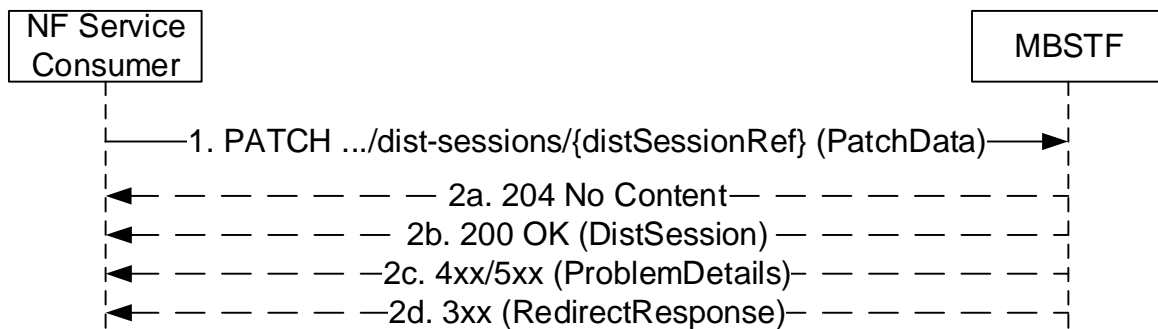


Figure 5.2.2.3.1-1: MBS Distribution session update

1. The NF Service Consumer shall send a PATCH request (PatchData) to update the MBS distribution session. The request may include an updated multicast session security context containing MBS Session Key (MSK), MSK lifetime and the corresponding key IDs if MBSF generated a new MSK.

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, if MBSTF received an updated multicast session security context, and/or if the MBSTF generated a new MBS Traffic Key (MTK);

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.

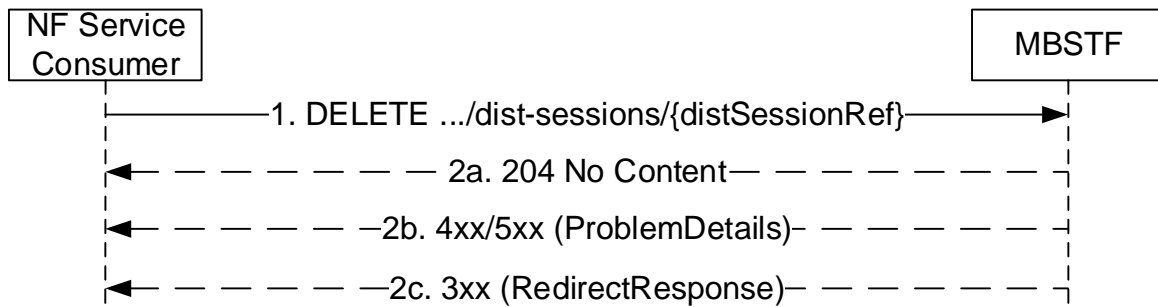


Figure 5.2.2.4.1-1: MBS Distribution session deletion

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.

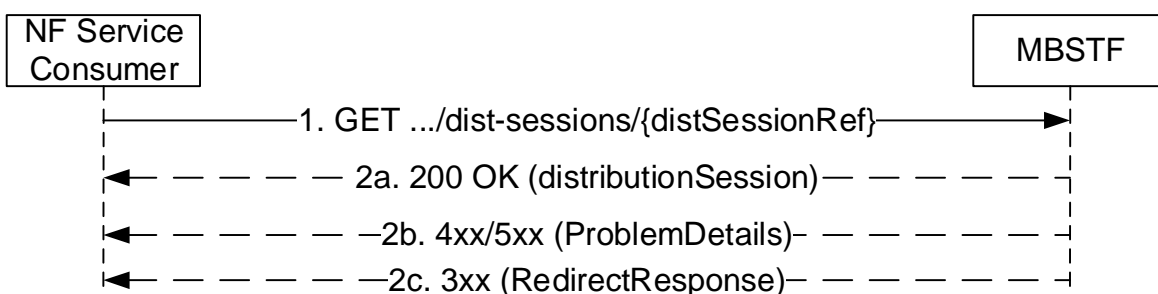


Figure 5.2.2.5.1-1: MBS Distribution session retrieval

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.

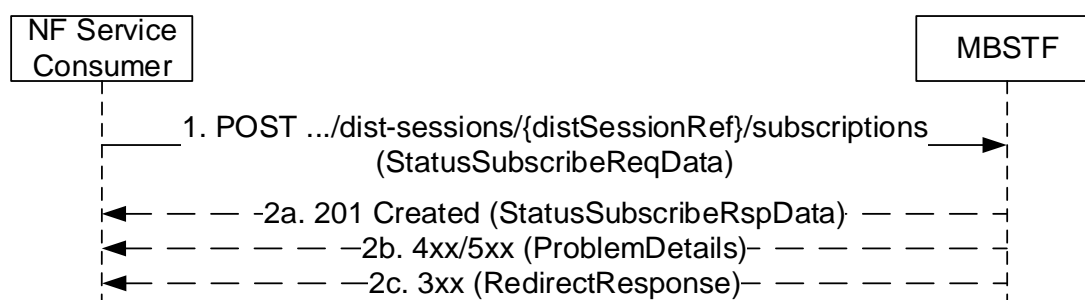


Figure 5.2.2.6.2-1: Subscribing to MBSTF notifications

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.

5.2.2.6.3 Subscription update

When the StatusSubscribe service operation is used for updating a subscription, the NF Service Consumer (e.g. MBSF) shall update its subscription to MBSTF notifications by using the HTTP PATCH method as shown in Figure 5.2.2.6.3-1.

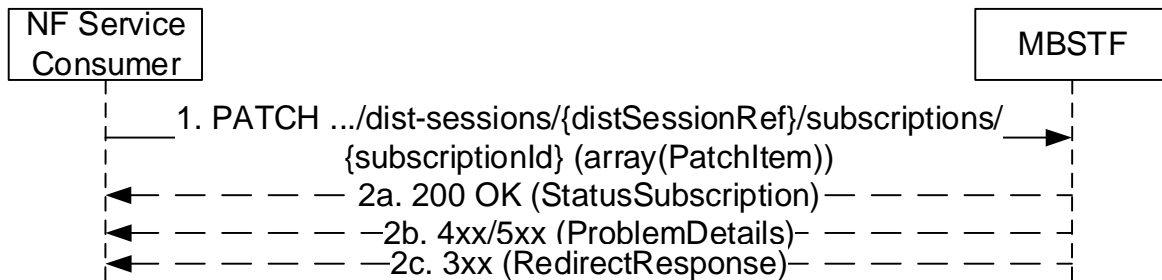


Figure 5.2.2.6.3-1: Updating a subscription to MBSTF notifications

1. The NF Service Consumer shall send a PATCH request to update the individual subscription resource in the MBSTF (/dist-sessions/{distSessionRef}/subscriptions/{subscriptionId}). The message body contains an array(PatchItem), where each PatchItem type indicates a requested change to the DistSessionSubscription data structure (see clause 6.1.6.2.10). The following information may be requested to be modified with array(PatchItem) structure (see Table 6.1.3.5.3.2-2):
 - Notification URI (callback URI), indicating the address where the MBSTF shall send the notifications;
 - New expiration time;
- 2a. On success, the MBSTF shall return a "200 Ok" response with a representation of the modified subscription (DistSessionSubscription data structure (see clause 6.1.6.2.10)).
- 2b. On failure, one of the HTTP status code listed in Table 6.1.3.5.3.2-3 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 6.1.3.5.3.2-3.
- 2c. On redirection, "307 Temporary Redirect" or "308 Permanent Redirect" shall be returned. A RedirectResponse IE shall be included in the payload body of PATCH response.

5.2.2.7 StatusUnsubscribe

5.2.2.7.1 General

The StatusUnsubscribe service operation shall be used by an NF Service Consumer (e.g. MBSF) to unsubscribe from the MBSTF notifications related to an MBS distribution session.

The NF Service Consumer (e.g. MBSF) shall unsubscribe from MBSTF notifications by using the HTTP DELETE method as shown in Figure 5.2.2.7.1-1.

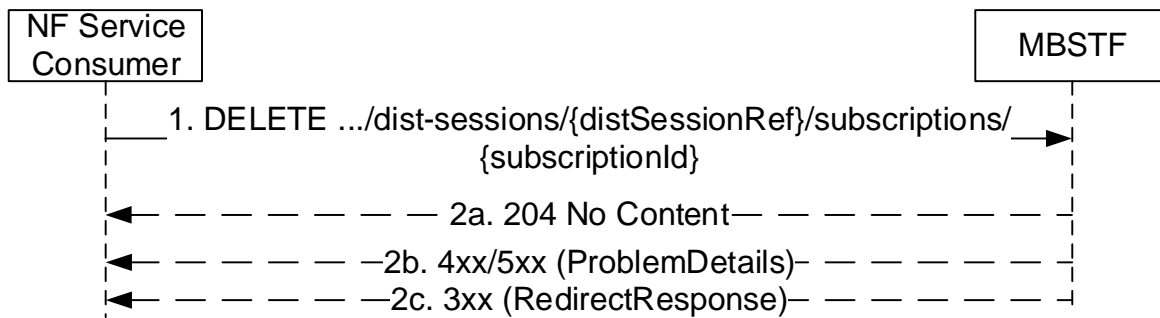


Figure 5.2.2.7.1-1: Unsubscribing from MBSTF notifications

1. The NF Service Consumer shall send a DELETE request to the resource URI representing the individual subscription document resource in the MBSTF.
2. On success, the MBSTF shall return a "204 No Content" response.
- 2b. On failure, one of the HTTP status code listed in the data structures supported by the DELETE Response Body (see Table 6.1.3.5.3.1-3) 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 6.1.3.5.3.1-3.
- 2c. On redirection, "307 Temporary Redirect" or "308 Permanent Redirect" shall be returned. A RedirectResponse IE shall be included in the payload body of DELETE response.

5.2.2.8 StatusNotify

5.2.2.8.1 General

The StatusNotify service operation shall be used by the MBSTF to notify a subscribed NF Service Consumer (e.g. MBSF) about the events related to an MBS distribution session.

The MBSTF shall notify the NF Service Consumer (e.g. MBSF) by using the HTTP POST method to the callback URI received earlier in the subscription as shown in Figure 5.2.2.8.1-1.

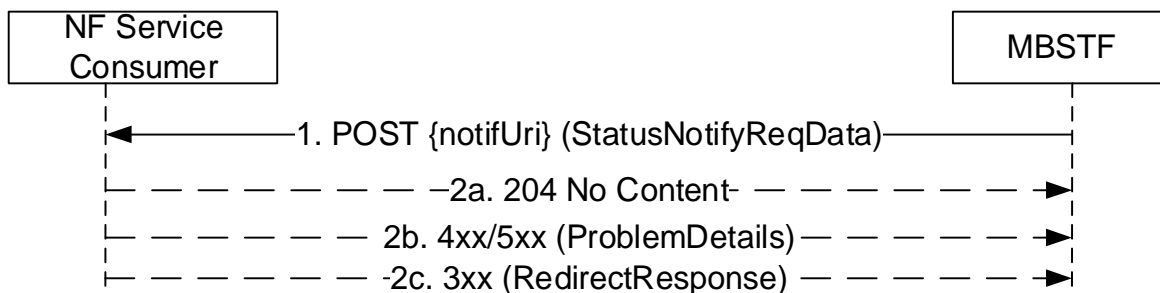


Figure 5.2.2.8.1-1: MBTSMF notifications

1. The MBSTF shall send a POST request (StatusNotifyReqData) to the callback URI ({notifUri}) of the subscribed NF Service Consumer. The payload body of the POST request shall contain:
 - Notification Correlation ID, if this information was provided during subscription;
 - the list of MBS distribution session events to be reported:
 - report a DATA_INGEST_FAILURE event when the MBSTF failed to ingest data from the AF/AS;
 - report a SESSION_DEACTIVATED event when the MBS distribution session is released in the MBSTF;
 - report a SESSION_ACTIVATED event when the delivery started toward the MB-UPF.
- 2a. On success, the MBSF shall return a "204 No Content" response.

- 2b. On failure, one of the HTTP status code listed in the data structures supported by the POST Response Body (see Table 6.1.5.2.3.1-2) 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 6.1.5.2.3.1-2).
- 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.

6 API Definitions

6.1 Nmbstf_MBSDistributionSession Service API

6.1.1 Introduction

The Nmbstf_MBSDistributionSession service shall use the Nmbstf-distsession API.

The API URI of the Nmbstf_MBSDistributionSession API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests from the NF service consumer towards the NF service producer shall have the Resource URI structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nmbstf-distsession".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.1.3.

6.1.2 Usage of HTTP

6.1.2.1 General

HTTP/2, IETF RFC 7540 [11], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

The OpenAPI [6] specification of HTTP messages and content bodies for the Nmbstf-distsession API is contained in Annex A.

6.1.2.2 HTTP standard headers

6.1.2.2.1 General

See clause 5.2.2 of 3GPP TS 29.500 [4] for the usage of HTTP standard headers.

6.1.2.2.2 Content type

JSON, IETF RFC 8259 [12], shall be used as content type of the HTTP bodies specified in the present specification as specified in clause 5.4 of 3GPP TS 29.500 [4]. The use of the JSON format shall be signalled by the content type "application/json".

"Problem Details" JSON object shall be used to indicate additional details of the error in a HTTP response body and shall be signalled by the content type "application/problem+json", as defined in IETF RFC 7807 [13].

6.1.2.3 HTTP custom headers

The mandatory HTTP custom header fields specified in clause 5.2.3.2 of 3GPP TS 29.500 [4] shall be supported, and the optional HTTP custom header fields specified in clause 5.2.3.3 of 3GPP TS 29.500 [4] may be supported.

6.1.3 Resources

6.1.3.1 Overview

Figure 6.1.3.1-1 describes the resource URI structure of the Nmbstf_MBSDistributionSession API.

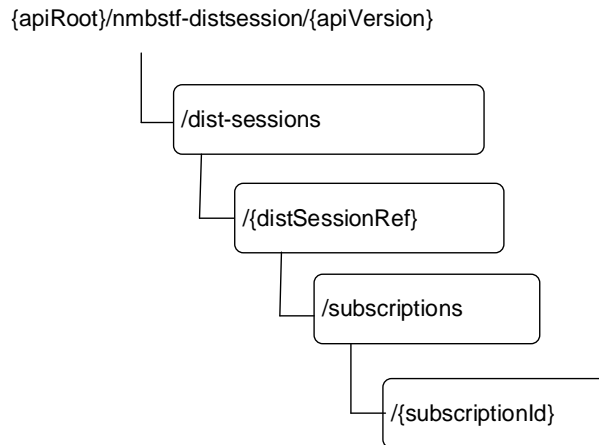


Figure 6.1.3.1-1: Resource URI structure of the Nmbstf_MBSDistributionSession API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

Resource purpose/name	Resource URI (relative path after API URI)	HTTP method or custom operation	Description (service operation)
MBS Distribution sessions collection	/dist-sessions	POST	Create
Individual MBS Distribution session	/dist-sessions/{distSessionRef}	PATCH	Update
		GET	Retrieve
		DELETE	Destroy
Subscriptions collection for MBS Distribution sessions	/dist-sessions/{distSessionRef}/subscriptions	POST	StatusSubscribe (to create a subscription)
Individual subscription for an MBS Distribution session	/dist-sessions/{distSessionRef}/subscriptions/{subscriptionId}	DELETE	StatusUnsubscribe
		PATCH	StatusSubscribe (to update or renew a subscription)

6.1.3.2 Resource: MBS Distribution sessions collection (Collection)

6.1.3.2.1 Description

This resource represents the collection of the MBS Distribution sessions created in the MBSTF.

This resource is modelled with the Collection resource archetype (see clause C.2 of 3GPP TS 29.501 [5]).

6.1.3.2.2 Resource Definition

Resource URI: {apiRoot}/nmbstf-distSession/<apiVersion>/dist-sessions

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

Table 6.1.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
apiVersion	string	See clause 6.1.1

6.1.3.2.3 Resource Standard Methods

6.1.3.2.3.1 POST

This method creates an individual MBS distribution session resource in the MBSTF.

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
CreateReqData	M	1	Representation of the MBS distribution session to be created in the MBSTF

Table 6.1.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
CreateRspData	M	1	201 Created	Successful creation of an MBS session
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)

NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.

NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].

Table 6.1.3.2.3.1-4: Headers supported by the POST method on this resource

Name	Data type	P	Cardinality	Description

Table 6.1.3.2.3.1-5: Headers supported by the 201 response code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains the URI of the newly created resource, according to the structure: {apiRoot}/nmbstf-distSession/<apiVersion>/dist-sessions/{distSessionRef}

Table 6.1.3.2.3.1-6: Headers supported by the 307 response code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

Table 6.1.3.2.3.1-7: Headers supported by the 308 response code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

6.1.3.2.4 Resource Custom Operations

None

6.1.3.3 Resource: Individual MBS distribution session (Document)

6.1.3.3.1 Description

This resource represents an individual MBS distribution session created in the MBSTF.

This resource is modelled with the Document resource archetype (see clause C.1 of 3GPP TS 29.501 [5]).

6.1.3.3.2 Resource Definition

Resource URI: {apiRoot}/nmbstf-distSession/<apiVersion>/dist-sessions/{distSessionRef}

This resource shall support the resource URI variables defined in table 6.1.3.3.2-1.

Table 6.1.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	String	See clause 6.1.1
apiVersion	String	See clause 6.1.1
distSessionRef	String	MBS distribution session reference assigned by the MBSTF during the Create service operation

6.1.3.3.3 Resource Standard Methods

6.1.3.3.3.1 PATCH

This method updates an individual MBS distribution session resource in the MBSTF.

This method shall support the URI query parameters specified in table 6.1.3.3.3.1-1.

Table 6.1.3.3.3.1-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.3.3.1-2 and the response data structures and response codes specified in table 6.1.3.3.3.1-3.

Table 6.1.3.3.3.1-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
array(PatchItem)	M	1	List of changes to be made to the MBS session resource, according to the JSON PATCH format specified in IETF RFC 6902 [16].

Table 6.1.3.3.3.1-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful response
DistSession	M	1	200 OK	Upon success, a response body containing the updated representation of Distribution Session shall be returned
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)

NOTE 1: The mandatory HTTP error status code for the PATCH method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.

NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].

Table 6.1.3.3.1-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	String	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	String	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

Table 6.1.3.3.1-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

6.1.3.3.2 DELETE

This method deletes an individual MBS distribution session resource in the MBSTF.

This method shall support the URI query parameters specified in table 6.1.3.3.2-1.

Table 6.1.3.3.2-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.3.2-2 and the response data structures and response codes specified in table 6.1.3.3.2-3.

Table 6.1.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.1.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful response
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
NOTE 1: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				
NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.1.3.3.2-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

Table 6.1.3.3.2-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MB-STF (service) instance ID towards which the request is redirected

6.1.3.3.3.3 GET

This method retrieves an individual MBS distribution session resource in the MBSTF.

This method shall support the URI query parameters specified in table 6.1.3.3.3-1.

Table 6.1.3.3.3-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.3.3-2 and the response data structures and response codes specified in table 6.1.3.3.3-3.

Table 6.1.3.3.3-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.1.3.3.3-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
DistSession	M	1	200 OK	Successful response containing representation of the MBS Distribution Session
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
NOTE 1: The mandatory HTTP error status code for the GET method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				
NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.1.3.3.3-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

Table 6.1.3.3.3-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

6.1.3.3.4 Resource Custom Operations

None.

6.1.3.4 Resource: Subscriptions collection for MBS distribution session (Collection)

6.1.3.4.1 Description

This resource represents the collection of the individual subscriptions for an MBS distribution session created in the MBSTF with StatusSubscribe service operation.

This resource is modelled with the Collection resource archetype (see clause C.2 of 3GPP TS 29.501 [5]).

6.1.3.4.2 Resource Definition

Resource URI: **{apiRoot}/nmbstf-distSession/<apiVersion>/dist-sessions/{distSessionRef}/subscriptions**

This resource shall support the resource URI variables defined in table 6.1.3.4.2-1.

Table 6.1.3.4.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
apiVersion	string	See clause 6.1.1
distSessionRef	string	MBS distribution session reference assigned by the MBSTF during the Create service operation

6.1.3.4.3 Resource Standard Methods

6.1.3.4.3.1 POST

This method creates an individual subscription resource for an MBS distribution session in the MBSTF with StatusSubscribe service operation.

This method shall support the URI query parameters specified in table 6.1.3.4.3.1-1.

Table 6.1.3.4.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.4.3.1-2 and the response data structures and response codes specified in table 6.1.3.4.3.1-3.

Table 6.1.3.4.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
StatusSubscribeReqData	M	1	Data within the StatusSubscribe Request

Table 6.1.3.4.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
StatusSubscribeRspData	M	1	201 Created	Data within the StatusSubscribe Response
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				
NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.1.3.4.3.1-4: Headers supported by the POST method on this resource

Name	Data type	P	Cardinality	Description

Table 6.1.3.4.3.1-5: Headers supported by the 201 response code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains the URI of the newly created resource, according to the structure: {apiRoot}/nmbstf-distSession/<apiVersion>/dist-sessions/{distSessionRef}/subscriptions/{subscriptionId}

Table 6.1.3.4.3.1-6: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

Table 6.1.3.4.3.1-7: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

6.1.3.4.4 Resource Custom Operations

None.

6.1.3.5 Resource: Individual subscription for an MBS distribution session (Document)

6.1.3.5.1 Description

This resource represents an individual subscription for an MBS distribution session in the MBSTF, which can be deleted with StatusUnsubscribe service operation or updated with StatusSubscribe service operation.

This resource is modelled with the Document resource archetype (see clause C.1 of 3GPP TS 29.501 [5]).

6.1.3.5.2 Resource Definition

Resource URI: {apiRoot}/nmbstf-distsession/<apiVersion>/dist-sessions/{distSessionRef}/subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in table 6.1.3.5.2-1.

Table 6.1.3.5.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
apiVersion	string	See clause 6.1.1
distSessionRef	string	MBS distribution session reference assigned by the MBSTF during the Create service operation
subscriptionId	string	Subscription identifier assigned by the MBSTF during the creation of the subscription

6.1.3.5.3 Resource Standard Methods

6.1.3.5.3.1 DELETE

This method deletes an individual subscription resource for an MBS distribution session in the MBSTF with StatusUnsubscribe service operation.

This method shall support the URI query parameters specified in table 6.1.3.5.3.1-1.

Table 6.1.3.5.3.1-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.5.3.1-2 and the response data structures and response codes specified in table 6.1.3.5.3.1-3.

Table 6.1.3.5.3.1-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.1.3.5.3.1-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response Codes	Description
n/a			204 No Content	Successful deletion
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				
NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.1.3.5.3.1-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

Table 6.1.3.5.3.1-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

6.1.3.5.3.2 PATCH

This method updates an individual subscription resource for an MBS distribution session in the MBSTF with StatusSubscribe service operation for the subscription update (see clause 5.2.2.6.3).

This method shall support the URI query parameters specified in table 6.1.3.5.3.2-1.

Table 6.1.3.5.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.5.3.2-2 and the response data structures and response codes specified in table 6.1.3.5.3.2-3.

Table 6.1.3.5.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
array(PatchItem)	M	1	It shall contain the list of changes to be made to the Status Subscription (i.e. DistSessionSubscription data type), according to the JSON PATCH format specified in IETF RFC 6902 [16].

Table 6.1.3.5.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
DistSessionSubscription	M	1	200 OK	Upon success, a response body shall be returned containing the updated Status Subscription.
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if a request is redirected to the same target resource via a different SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. (NOTE 2)
NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				
NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.1.3.5.3.2-4: Headers supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description

Table 6.1.3.5.3.2-5: Headers supported by the 200 response code on this resource

Name	Data type	P	Cardinality	Description

Table 6.1.3.5.3.2-6: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

Table 6.1.3.5.3.2-7: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same MBSTF or MBSTF (service) set. Or the same URI, if a request is redirected to the same target resource via a different SCP.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target MBSTF (service) instance ID towards which the request is redirected

6.1.3.5.4 Resource Custom Operations

None.

6.1.4 Custom Operations without associated resources

None

6.1.5 Notifications

6.1.5.1 General

Notifications shall comply to clause 6.2 of 3GPP TS 29.500 [4] and clause 4.6.2.3 of 3GPP TS 29.501 [5].

Table 6.1.5.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
Event Notification	NotifUri	POST	StatusNotify

6.1.5.2 StatusNotify

6.1.5.2.1 Description

The Event Notification is used by the NF service producer to report one or several observed Events to a NF service consumer that has subscribed to such Notifications.

6.1.5.2.2 Target URI

The Callback URI "{notifUri}" shall be used with the callback URI variables defined in table 6.1.5.2.2-1.

Table 6.1.5.2.2-1: Callback URI variables

Name	Definition
notifUri	String formatted as URI with the Callback Uri

6.1.5.2.3 Standard Methods

6.1.5.2.3.1 POST

This method shall support the request data structures specified in table 6.1.5.2.3.1-1 and the response data structures and response codes specified in table 6.1.5.2.3.1-2.

Table 6.1.5.2.3.1-1: Data structures supported by the POST Request Body

Data type	P	Cardinality	Description
StatusNotifyReqData	M	1	Data within the StatusNotify Request

Table 6.1.5.2.3.1-2: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful response
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. The NF service consumer shall generate a Location header field containing a URI pointing to the endpoint of another NF service consumer to which the notification should be sent. If an SCP redirects the message to another SCP then the location header field shall contain the same URI or a different URI pointing to the endpoint of the NF service consumer to which the notification should be sent.
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. The NF service consumer shall generate a Location header field containing a URI pointing to the endpoint of another NF service consumer to which the notification should be sent. If an SCP redirects the message to another SCP then the location header field shall contain the same URI or a different URI pointing to the endpoint of the NF service consumer to which the notification should be sent.
NOTE: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				

Table 6.1.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	A URI pointing to the endpoint of the NF service consumer to which the notification should be sent
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

Table 6.1.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	A URI pointing to the endpoint of the NF service consumer to which the notification should be sent.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

6.1.6 Data Model

6.1.6.1 General

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

Table 6.1.6.1-1 specifies the data types defined for the Nmbstf_MBSDistributionSession service based interface protocol.

Table 6.1.6.1-1: Nmbstf_MBSDistributionSession specific Data Types

Data type	Clause defined	Description	Applicability
CreateReqData	6.1.6.2.2	Data within the Create Request	
CreateRspData	6.1.6.2.3	Data within the Create Response	
DistSession	6.1.6.2.4	Data specific to distribution session	
ObjDistributionData	6.1.6.2.5	Data specific to Object Distribution Method	
PktDistributionData	6.1.6.2.6	Data specific to Packet Distribution Method	
StatusSubscribeReqData	6.1.6.2.7	Data within Subscription creation request	
StatusSubscribeRspData	6.1.6.2.8	Data within Subscription creation response	
StatusNotifyReqData	6.1.6.2.9	Data within Notification request	
DistSessionSubscription	6.1.6.2.10	Data specific to subscription request	
DistSessionEventReportList	6.1.6.2.11	MBS distribution session event report list	
DistSessionEventReport	6.1.6.2.12	MBS distribution session event report	
UpTrafficFlowInfo	6.1.6.2.13	IP Multicast Address and Port Number	
MbStfIngestAddr	6.1.6.2.14	MBSTF Ingest Addresses	
ExtSsm	6.1.6.2.15	SSM and Port Number	
DistSessionState	6.1.6.3.3	MBS distribution session state	
ObjDistributionOperatingMode	6.1.6.3.4	Operating Mode for Object distribution method	
ObjAcquisitionMethod	6.1.6.3.5	Object acquisition method	
PktDistributionOperatingMode	6.1.6.3.6	Operating Mode for Packet distribution method	
DistSessionEventType	6.1.6.3.7	MBS distribution session event type	
PktIngestMethod	6.1.6.3.8	Packet Ingest Method	

Table 6.1.6.1-2 specifies data types re-used by the Nmbstf_MBSDistributionSession 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 Nmbstf_MBSDistributionSession service based interface.

Table 6.1.6.1-2: Nmbstf_MBSDistributionSession re-used Data Types

Data type	Reference	Comments	Applicability
TunnelAddress	3GPP TS 29.571 [16]	Tunnel Address (UDP/IP)	
BitRate	3GPP TS 29.571 [16]	Bit Rate	
PacketDelBudget	3GPP TS 29.571 [16]	Maximum Delay	
Uri	3GPP TS 29.571 [16]	Uniform resource identifier	
DateTime	3GPP TS 29.571 [16]	Data and Time	
NfInstanceId	3GPP TS 29.571 [16]	NF Instance Identifier	
UInteger	3GPP TS 29.571 [16]	Unsigned Integer	
IpAddr	3GPP TS 29.571 [16]	IP Address	
Ssm	3GPP TS 29.571 [16]	Source Specific Multicast Address	
MbsSecurityContext	3GPP TS 29.571 [16]	MBS Security Context	
FECConfig	3GPP TS 29.580 [18]	FEC Configuration	

6.1.6.2 Structured data types

6.1.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

6.1.6.2.2 Type: CreateReqData

Table 6.1.6.2.2-1: Definition of type CreateReqData

Attribute name	Data type	P	Cardinality	Description	Applicability
distSession	DistSession	M	1	MBS Distribution Session to be created.	

6.1.6.2.3 Type: CreateRspData

Table 6.1.6.2.3-1: Definition of type CreateRspData

Attribute name	Data type	P	Cardinality	Description	Applicability
distSession	DistSession	M	1	Representation of the created MBS session	

6.1.6.2.4 Type: DistSession

Table 6.1.6.2.4-1: Definition of type DistSession

Attribute name	Data type	P	Cardinality	Description	Applicability
distSessionId	string	M	1	An identifier for this MBS Distribution Session assigned by the MBSF that is unique within the scope of the MBS User Service (see clause 4.5.3 of 3GPP TS 26.502)	
distSessionState	DistSessionState	M	1	The current state of the MBS Distribution Session (see clause 4.6.1 of 3GPP TS 26.502)	
mbUpfTunAddr	TunnelAddress	M	1	The tunnel endpoint address of the MB-UPF that supports this MBS Distribution Session at reference point Nmb9 or the tunnel endpoint address of the MBMS-GW at reference point SGi-mb. Write-Only: true	
mbmsGwTunAddr	TunnelAddress	O	0..1	This IE may be present to contain the tunnel endpoint address of the MBMS-GW at reference point SGi-mb when the mbUpfTunAddr is also present which contains the tunnel endpoint address of the MB-UPF that supports this MBS Distribution Session at reference point Nmb9. Write-Only: true	
upTrafficFlowInfo	UpTrafficFlowInfo	C	0..1	Details of the traffic flow to be used by the MBSTF for this MBS Distribution Session, including the multicast group destination address and port number. Shall be present in case of Object Distribution Method and Packet Distribution Method in Packet Proxy Mode. Write-Only: true	
mbr	BitRate	M	1	The maximum bit rate for this MBS Distribution Session Write-Only: true	
maxDelay	PacketDelBudget	O	0..1	The maximum end-to-end distribution delay that is tolerated for this MBS Distribution Session by the MBS Application Provider Write-Only: true	
objDistributionData	ObjDistributionData	C	0..1	Additional MBS Distribution Session parameters for Object Distribution Method (NOTE 1)	
pktDistributionData	PktDistributionData	C	0..1	Additional MBS Distribution Session parameters for Packet Distribution Method (NOTE 1)	
fecInformation	FECConfig	O	0..1	Configuration for FEC information added by the MBSTF to protect this MBS Distribution Session.	
dscpMarking	string	O	0..1	DSCP Marking to be applied to outgoing traffic. It shall be encoded as two octet string in hexadecimal representation. The first octet shall contain the DSCP value in the IPv4 Type-of-Service or the IPv6 Traffic-Class field and the second octet shall contain the ToS/Traffic Class mask field, which shall be set to "0xFC". Write-Only: true	

mbsSecurityContext	MbsSecurityContext	O	0..1	<p>This IE may be present if security protection is applied to the MBS Session.</p> <p>When present, it shall contain:</p> <ul style="list-style-type: none"> - the security context containing MBS Service Key (MSK), MSK lifetime and the corresponding key IDs in request from MBSF. - the security context containing MBS Service Key (MSK), MBS Traffic Key (MTK) and the corresponding key IDs in response or notification from MBSTF. 	
NOTE 1: Either the objDistributionData IE or the pktDistributionData IE shall be present in a request/response.					

Editor's Note: Inclusion of Security Context is FFS and depends on alignment between SA3 and SA4.

6.1.6.2.5 Type: ObjDistributionData

Table 6.1.6.2.5-1: Definition of type ObjDistributionData

Attribute name	Data type	P	Cardinality	Description	Applicability
objDistributionOperatingMode	ObjDistributionOperatingMode	M	1	Operating Mode for the Object distribution method	
objAcquisitionMethod	ObjAcquisitionMethod	M	1	Indicates whether the object(s) are to be pushed into the MBSTF by the MBS Application Provider or whether they are to be pulled from the MBS Application Provider by the MBSTF	
objAcquisitionIdsPull	array(Uri)	C	0..1	In case of PULL method, it identifies the object(s) to be ingested and distributed by the MBSTF during this MBS Distribution Session.	
objAcquisitionIdPush	Uri	C	0..1	In case of PUSH method, it identifies the URL endpoint on the MBSTF used to ingest objects by the application provider. This may be present only in the response to the Create or Retrieve request Read-Only: true	
objIngestBaseUrl	Uri	C	0..1	A URL prefix substituted by the MBSTF with the Object distribution base URL prior to distribution of ingested objects. Shall be present if Object Distribution base URL is present. Shall be present only in case of PUSH Method.	
objDistributionBaseUrl	Uri	O	0..1	A URL prefix substituted by the MBSTF in place of the Object ingest base URL prior to distribution of ingested objects. Shall be present only in case of PUSH Method.	
objRepairBaseUrl	Uri	O	0..1	A URL prefix substituted by the MBSTF in place of the Object Distribution base URL when repairing objects not received completely intact from this MBS Distribution Session. Present only when object repair is provisioned for this MBS Distribution Session. Shall be present only in case of PUSH Method.	

6.1.6.2.6 Type: PktDistributionData

Table 6.1.6.2.6-1: Definition of type PktDistributionData

Attribute name	Data type	P	Cardinality	Description	Applicability
pktDistributionOperatingMode	PktDistributionOperatingMode	M	1	Operating Mode for the Packet distribution method	
pktIngestMethod	PktIngestMethod	C	1	Indicates whether packets are ingested using multicast or unicast ingest. It shall be present if operating mode of the packet distribution method is set to "PACKET_PROXY".	
mbStfIngestAddr	MbStfIngestAddr	M	1	The endpoint addresses used by the MBS Application Provider and MBSTF to establish a connection at reference point Nmb8 prior to the commencement of MBS User Data Ingest Session.	

6.1.6.2.7 Type: StatusSubscribeReqData

Table 6.1.6.2.7-1: Definition of type StatusSubscribeReqData

Attribute name	Data type	P	Cardinality	Description	Applicability
subscription	DistSessionSubscription	M	1	Subscription to be created	

6.1.6.2.8 Type: StatusSubscribeRspData

Table 6.1.6.2.8-1: Definition of type StatusSubscribeReqData

Attribute name	Data type	P	Cardinality	Description	Applicability
subscription	DistSessionSubscription	M	1	Subscription created	
reportList	DistSessionEventReportList	C	0..1	Immediate event reports, if requested in the request and if corresponding information is available.	

6.1.6.2.9 Type: StatusNotifyReqData

Table 6.1.6.2.9-1: Definition of type StatusSubscribeReqData

Attribute name	Data type	P	Cardinality	Description	Applicability
reportList	DistSessionEventReportList	M	1	Reported MBS session events	

6.1.6.2.10 Type: DistSessionSubscription

Table 6.1.6.2.10-1: Definition of type DistSessionSubscription

Attribute name	Data type	P	Cardinality	Description
eventList	array(DistSessionEventType)	M	1..N	List of MBS distribution session events subscribed
notifyUri	Uri	M	1	URI where the NF service consumer requests to receive notifications. Write-Only: true
notifyCorrelationId	string	O	0..1	Notification Correlation ID Write-Only: true
expiryTime	DateTime	O	0..1	When present in the subscription creation request, it shall indicate the time up to which the subscription is desired to be kept active and after which the subscribed events shall stop generating notifications. When present in a subscription response, it shall indicate the expiry time after which the subscription becomes invalid.
nfInstanceId	NfInstanceId	C	0..1	NF Instance ID of the NF Service Consumer This IE shall be present if available. Write-Only: true
distSessionSubscUri	Uri	C	0..1	This IE shall be present in the response to an MBS distribution session creation request that includes a subscription to events about the MBS session and the subscription was created successfully. When present, it shall contain the URI of the individual subscription resource. Read-Only: true (NOTE)
NOTE: When an MBS distribution session status subscription is created separately (i.e. after) an MBS distribution session creation, the Location header returned in the MBS distribution session status subscription creation response contains the URI of the created subscription.				

6.1.6.2.11 Type: DistSessionEventReportList

Table 6.1.6.2.11-1: Definition of type DistSessionEventReportList

Attribute name	Data type	P	Cardinality	Description	Applicability
eventReportList	array(DistSessionEventReport)	M	1..N	List of MBS distribution session events to report	
notifyCorrelationId	string	C	0..1	Notification Correlation ID. This IE shall be present if a Notification Correlation ID is available in the subscription.	

6.1.6.2.12 Type: DistSessionEventReport

Table 6.1.6.2.12-1: Definition of type DistSessionEventReport

Attribute name	Data type	P	Cardinality	Description	Applicability
eventType	DistSessionEventType	M	1	MBS distribution session event type	
timeStamp	DateTime	C	0..1	This IE shall contain the time at which the event is generated. This IE should be present, if available.	
mbsSecurityContext	MbsSecurityContext	C	0..1	This IE shall be present if the eventType IE indicates "MTK_UPDATE" or "MSK_REQUEST".	

Editor's Note: Inclusion of Security Context is FFS and depends on alignment between SA3 and SA4.

6.1.6.2.13 Type: UpTrafficFlowInfo

Table 6.1.6.2.13-1: Definition of type UpTrafficFlowInfo

Attribute name	Data type	P	Cardinality	Description	Applica bility
destIpAddr	IpAddr	M	1	Multicast group destination Address	
portNumber	UInteger	M	1	Port Number	

6.1.6.2.14 Type: MbStfIngestAddr

Table 6.1.6.2.14-1: Definition of type MbStfIngestAddr

Attribute name	Data type	P	Cardinality	Description	Applicability
afEgressTunAddr	TunnelAddress	C	0..1	<p>AF side endpoint address and port for establishment of unicast tunnel at reference point Nmb8 prior to the commencement of MBS User Data Ingest Session.</p> <p>The MBSTF shall use this information to validate the source IP address and port of incoming packets pertaining to the MBS User Data Ingest Session from the MBS Application Provider.</p> <p>This IE shall be included if the packet distribution method is used and when the operating mode is set to "PACKET_FORWARD_ONLY", or when the operating mode is set to "PACKET_PROXY" while the packet ingest method is set to unicast.</p> <p>This shall be present only in the Create request.</p> <p>Write-Only: true</p>	
mbStfIngressTunAddr	TunnelAddress	C	0..1	<p>MBSTF side endpoint address and port for establishment of unicast tunnel at reference point Nmb8 prior to the commencement of MBS User Data Ingest Session.</p> <p>It is applicable only if operating mode of the packet distribution method is set to "PACKET_FORWARD_ONLY".</p> <p>This shall be present only in the response to the Create (or Retrieve) request.</p> <p>Read-Only: true</p>	
afSsm	ExtSsm	C	0..1	<p>AF side Source specific multicast address and port to which MBSTF issues an IGMP Join to ingest multicast UDP/IP datagrams.</p> <p>It is applicable only if operating mode of the packet distribution method is set to "PACKET_PROXY" and packet ingest method is set to "MULTICAST".</p> <p>This shall be present only in the Create request.</p> <p>Write-Only: true</p>	
mbStfListenAddr	TunnelAddress	C	0..1	<p>MBSTF side endpoint address and port for to receive unicast-addressed UDP/IP datagrams.</p> <p>It is applicable only if operating mode of the packet distribution method is set to "PACKET_PROXY" and packet ingest method is set to "UNICAST".</p> <p>This shall be present only in the response to the Create (or Retrieve) request.</p> <p>Read-Only: true</p>	

6.1.6.2.15 Type: ExtSsm

Table 6.1.6.2.15-1: Definition of type ExtSsm

Attribute name	Data type	P	Cardinality	Description	Applicability
ssm	Ssm	M	1	Source Specific Multicast Address consisting of multicast source IP address and the destination multicast address	
portNumber	UInteger	M	1	Source Port	

6.1.6.3 Simple data types and enumerations

6.1.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

6.1.6.3.2 Simple data types

None

6.1.6.3.3 Enumeration: DistSessionState

The enumeration DistSessionState represents the current state of the MBS Distribution Session. It shall comply with the values defined in table 6.1.6.3.3-1.

Table 6.1.6.3.3-1: Enumeration DistSessionState

Enumeration value	Description	Applicability
"INACTIVE"	Distribution Session in Inactive	
"ESTABLISHED"	Distribution Session in Established	
"ACTIVE"	Distribution Session in Active	
"DEACTIVATING"	Distribution Session in Released	

6.1.6.3.4 Enumeration: ObjDistributionOperatingMode

The enumeration ObjDistributionOperatingMode defines the mode of data ingestion for Object distribution method. It shall comply with the values defined in table 6.1.6.3.4-1.

Table 6.1.6.3.4-1: Enumeration ObjDistributionOperatingMode

Enumeration value	Description	Applicability
"SINGLE"	Each object ingested by the MBSTF is distributed once	
"COLLECTION"	A set of objects described by a manifest is ingested by the MBSTF and distributed once Not used with Push-based ingest	
"CAROUSEL"	A set of one or more objects described by a manifest is ingested by the MBSTF and distributed according to a repetition pattern specified in the manifest Not used with Push-based ingest	
"STREAMING"	A sequence of objects is ingested by the MBSTF and streamed in real time	

6.1.6.3.5 Enumeration: ObjAcquisitionMethod

The enumeration ObjAcquisitionMethod indicates whether the object(s) are to be pushed into the MBSTF by the MBS Application Provider or whether they are to be pulled from the MBS Application Provider by the MBSTF. It shall comply with the values defined in table 6.1.6.3.5-1.

Table 6.1.6.3.5-1: Enumeration ObjAcquisitionMethod

Enumeration value	Description	Applicability
"PULL"	MBSTF Pulls objects from AF/AS	
"PUSH"	AF/AS Pushes objects into MBSTF	

6.1.6.3.6 Enumeration: PktDistributionOperatingMode

The enumeration PktDistributionOperatingMode defines the mode of data ingestion for Packet distribution method. It shall comply with the values defined in table 6.1.6.3.6-1.

Table 6.1.6.3.6-1: Enumeration PktDistributionOperatingMode

Enumeration value	Description	Applicability
"PACKET_PROXY"	The payloads of UDP packets ingested by the MBSTF are forwarded to the MB-UPF in new UDP packets (Layer 4 proxying)	
"PACKET_FORWARD_ONLY"	The payloads of IP packets ingested by the MBSTF are forwarded to the MB-UPF in new IP packets (Layer 3 proxying)	

6.1.6.3.7 Enumeration: DistSessionEventType

The enumeration DistSessionEventType defines the status of the MBS distribution session that NF consumer wants to subscribe to. It shall comply with the values defined in table 6.1.6.3.7-1.

Table 6.1.6.3.7-1: Enumeration DistSessionEventType

Enumeration value	Description	Applicability
"DATA_INGEST_FAILURE"	MBSTF failed to ingest data from AF/AS	
"SESSION_DEACTIVATED"	Session released in MBSTF	
"SESSION_ACTIVATED"	Delivery started towards MB-UPF	

Editor's Note: Inclusion of Security Context Events is FFS and depends on alignment between SA3 and SA4.

6.1.6.3.8 Enumeration: PktIngestMethod

The enumeration PktIngestMethod defines the mode of data ingestion for Packet distribution method. It shall comply with the values defined in table 6.1.6.3.8-1.

Table 6.1.6.3.8-1: Enumeration PktIngestMethod

Enumeration value	Description	Applicability
"MULTICAST"	Multicast Ingest Mode	
"UNICAST"	Unicast Ingest Mode	

6.1.6.4 Data types describing alternative data types or combinations of data types

None

6.1.6.5 Binary data

None

6.1.7 Error Handling

6.1.7.1 General

For the Nmbstf-distsession API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [5]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [4] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [4].

In addition, the requirements in the following clauses are applicable for the Nmbstf-distsession API.

6.1.7.2 Protocol Errors

No specific procedures for the Nmbstf-distsession service are specified.

6.1.7.3 Application Errors

The application errors defined for the Nmbstf-distsession service are listed in Table 6.1.7.3-1.

Table 6.1.7.3-1: Application errors

Application Error	HTTP status code	Description

6.1.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the Nmbstf-distsession API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.1.8-1: Supported Features

Feature number	Feature Name	Description

6.1.9 Security

As indicated in 3GPP TS 33.501 [8] and 3GPP TS 29.500 [4], the access to the Nmbstf-distsession API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [9]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [10]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nmbstf-distsession API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [10], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nmbstf-distsession service.

The Nmbstf-distsession API defines a single scope "nmbstf-distsession " for the entire service, and it does not define any additional scopes at resource or operation level.

Annex A (normative): OpenAPI specification

A.1 General

This Annex specifies the formal definition of the API(s) defined in the present specification. It consists of OpenAPI specifications in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE 1: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see 3GPP TS 29.501 [5] clause 5.3.1 and 3GPP TR 21.900 [7] clause 5B).

A.2 Nmbstf_DistSession API

```
openapi: 3.0.0

info:
  title: Nmbstf-distsession
  version: 1.0.2
  description: |
    MBSTF Distribution Session Service.
    © 2022, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: 3GPP TS 29.581 V17.2.0; 5G System; MBSDistribution Service.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.581/

servers:
  - url: '{apiRoot}/nmbstf-distsession/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:
  - {}
  - oAuth2ClientCredentials:
      - nmbstf-distsession

paths:
  /dist-sessions:
    post:
      summary: Create
      tags:
        - MBS distribution sessions collection
      operationId: Create
      requestBody:
        description: >
          Representation of the MBS distribution session to be created in the MBSTF
          Creates an individual MBS distribution session resource in the MBSTF.
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/CreateReqData'
      responses:
        '201':
          description: >
            Successful creation of an MBS session
```

```

    content:
      application/json:
        schema:
          $ref: '#/components/schemas/CreateRspData'
    headers:
      Location:
        description: >
          'Contains the URI of the newly created resource, according to the structure:
          {apiRoot}/nmbstf-distsession/<apiVersion>/dist-sessions/{distSessionRef}'
        required: true
        schema:
          type: string
  '307':
    $ref: 'TS29571_CommonData.yaml#/components/responses/307'
  '308':
    $ref: 'TS29571_CommonData.yaml#/components/responses/308'
  '400':
    $ref: 'TS29571_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29571_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29571_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29571_CommonData.yaml#/components/responses/404'
  '411':
    $ref: 'TS29571_CommonData.yaml#/components/responses/411'
  '413':
    $ref: 'TS29571_CommonData.yaml#/components/responses/413'
  '415':
    $ref: 'TS29571_CommonData.yaml#/components/responses/415'
  '429':
    $ref: 'TS29571_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29571_CommonData.yaml#/components/responses/500'
  '502':
    $ref: 'TS29571_CommonData.yaml#/components/responses/502'
  '503':
    $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/dist-sessions/{distSessionRef}:
  patch:
    summary: Updates an individual MBS distribution session resource in the MBSTF.
    tags:
      - Individual MBS distribution session
    operationId: Update
    parameters:
      - name: distSessionRef
        in: path
        required: true
        description: Unique ID of the MBS distribution session
        schema:
          type: string
    requestBody:
      description: Data within the Update Request
      required: true
      content:
        application/json-patch+json:
          schema:
            type: array
            items:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchItem'
            minItems: 1
    responses:
      '204':
        description: >
          Successful modification of the MBS distribution session without content in the response.
      '200':
        description: >
          Successful response containing the updated representation of Distribution Session.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DistSession'
      '307':
        $ref: 'TS29571_CommonData.yaml#/components/responses/307'
      '308':

```

```

    $ref: 'TS29571_CommonData.yaml#/components/responses/308'
  '400':
    $ref: 'TS29571_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29571_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29571_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29571_CommonData.yaml#/components/responses/404'
  '411':
    $ref: 'TS29571_CommonData.yaml#/components/responses/411'
  '413':
    $ref: 'TS29571_CommonData.yaml#/components/responses/413'
  '415':
    $ref: 'TS29571_CommonData.yaml#/components/responses/415'
  '429':
    $ref: 'TS29571_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29571_CommonData.yaml#/components/responses/500'
  '502':
    $ref: 'TS29571_CommonData.yaml#/components/responses/502'
  '503':
    $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

```

delete:

```

summary: Deletes an individual MBS distribution session resource in the MBSTF.
tags:
  - Individual MBS distribution session
operationId: Destroy
parameters:
  - name: distSessionRef
    in: path
    required: true
    description: Unique ID of the MBS distribution session
    schema:
      type: string
responses:
  '204':
    description: >
      Successful release of the MBS distribution session without content in the response.
  '307':
    $ref: 'TS29571_CommonData.yaml#/components/responses/307'
  '308':
    $ref: 'TS29571_CommonData.yaml#/components/responses/308'
  '400':
    $ref: 'TS29571_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29571_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29571_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29571_CommonData.yaml#/components/responses/404'
  '429':
    $ref: 'TS29571_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29571_CommonData.yaml#/components/responses/500'
  '502':
    $ref: 'TS29571_CommonData.yaml#/components/responses/502'
  '503':
    $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

```

get:

```

summary: Retrieves an individual MBS distribution session resource in the MBSTF.
tags:
  - Individual MBS distribution session
operationId: Retrieve
parameters:
  - name: distSessionRef
    in: path
    required: true
    description: Unique ID of the MBS distribution session
    schema:
      type: string
responses:

```

```

'200':
  description: successful retrieval of MBS distribution session parameters
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/DistSession'
'307':
  $ref: 'TS29571_CommonData.yaml#/components/responses/307'
'308':
  $ref: 'TS29571_CommonData.yaml#/components/responses/308'
'400':
  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
'401':
  $ref: 'TS29571_CommonData.yaml#/components/responses/401'
'403':
  $ref: 'TS29571_CommonData.yaml#/components/responses/403'
'404':
  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
'429':
  $ref: 'TS29571_CommonData.yaml#/components/responses/429'
'500':
  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
'502':
  $ref: 'TS29571_CommonData.yaml#/components/responses/502'
'503':
  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/dist-sessions/{distSessionRef}/subscriptions:
  post:
    summary: StatusSubscribe creating a subscription
    tags:
      - Subscriptions collection for MBS distribution session
    operationId: StatusSubscribe
    parameters:
      - name: distSessionRef
        in: path
        required: true
        description: Unique ID of the MBS distribution session
        schema:
          type: string
    requestBody:
      description: Data within the StatusSubscribe Request
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/StatusSubscribeReqData'
    responses:
      '201':
        description: Data within a successful StatusSubscribe Response
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/StatusSubscribeRspData'
      '307':
        $ref: 'TS29571_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29571_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        $ref: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        $ref: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        $ref: 'TS29571_CommonData.yaml#/components/responses/415'
      '429':
        $ref: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        $ref: 'TS29571_CommonData.yaml#/components/responses/500'

```



```

'502':
  $ref: 'TS29571_CommonData.yaml#/components/responses/502'
'503':
  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29571_CommonData.yaml#/components/responses/default'

callbacks:
  statusNotification:
    '{$request.body#/notifUri}':
      post:
        parameters:
          - name: Content-Encoding
            in: header
            description: Content-Encoding, described in IETF RFC 7231
            schema:
              type: string
        requestBody:
          description: Notification Payload
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/StatusNotifyReqData'
        responses:
          '204':
            description: Expected response to a successful callback processing
            headers:
              Accept-Encoding:
                description: Accept-Encoding, described in IETF RFC 7694
                schema:
                  type: string
          '307':
            $ref: 'TS29571_CommonData.yaml#/components/responses/307'
          '308':
            $ref: 'TS29571_CommonData.yaml#/components/responses/308'
          '400':
            $ref: 'TS29571_CommonData.yaml#/components/responses/400'
          '401':
            $ref: 'TS29571_CommonData.yaml#/components/responses/401'
          '403':
            $ref: 'TS29571_CommonData.yaml#/components/responses/403'
          '404':
            $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          '411':
            $ref: 'TS29571_CommonData.yaml#/components/responses/411'
          '413':
            $ref: 'TS29571_CommonData.yaml#/components/responses/413'
          '415':
            $ref: 'TS29571_CommonData.yaml#/components/responses/415'
          '429':
            $ref: 'TS29571_CommonData.yaml#/components/responses/429'
          '500':
            $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          '501':
            $ref: 'TS29571_CommonData.yaml#/components/responses/501'
          '503':
            $ref: 'TS29571_CommonData.yaml#/components/responses/503'
          default:
            $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/dist-sessions/{distSessionRef}/subscriptions/{subscriptionId}:
  delete:
    summary: StatusUnSubscribe to unsubscribe from the Status Subscription
    tags:
      - Individual Subscription for an MBS session
    operationId: StatusUnSubscribe
    parameters:
      - name: subscriptionId
        in: path
        required: true
        description: Unique ID of the subscription
        schema:
          type: string
      - name: distSessionRef
        in: path
        required: true
        description: Unique ID of the MBS distribution session
        schema:

```

```

    type: string
  responses:
    '204':
      description: Successful deletion of the subscription
    '307':
      $ref: 'TS29571_CommonData.yaml#/components/responses/307'
    '308':
      $ref: 'TS29571_CommonData.yaml#/components/responses/308'
    '400':
      $ref: 'TS29571_CommonData.yaml#/components/responses/400'
    '401':
      $ref: 'TS29571_CommonData.yaml#/components/responses/401'
    '403':
      $ref: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29571_CommonData.yaml#/components/responses/404'
    '429':
      $ref: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      $ref: 'TS29571_CommonData.yaml#/components/responses/500'
    '502':
      $ref: 'TS29571_CommonData.yaml#/components/responses/502'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
    default:
      $ref: 'TS29571_CommonData.yaml#/components/responses/default'

  patch:
    summary: StatusSubscribe to modify (update or renew) an individual subscription
    tags:
      - Individual Subscription for an MBS distribution session
    operationId: StatusSubscribeMod
    parameters:
      - name: subscriptionId
        in: path
        required: true
        description: Unique ID of the individual subscription to be modified
        schema:
          type: string
      - name: distSessionRef
        in: path
        required: true
        description: Unique ID of the MBS distribution session
        schema:
          type: string
    requestBody:
      description: Data to be modified in the DistSessionSubscription
      required: true
      content:
        application/json-patch+json:
          schema:
            type: array
            items:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchItem'
            minItems: 1
    responses:
      '200':
        description: Successful modification of the individual Status Subscription
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DistSessionSubscription'
      '307':
        $ref: 'TS29571_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29571_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        $ref: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        $ref: 'TS29571_CommonData.yaml#/components/responses/413'

```

```

    '415':
      $ref: 'TS29571_CommonData.yaml#/components/responses/415'
    '429':
      $ref: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      $ref: 'TS29571_CommonData.yaml#/components/responses/500'
    '502':
      $ref: 'TS29571_CommonData.yaml#/components/responses/502'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            nmbstf-distsession: Access to the nmbstf-distsession API

  schemas:
    #
    # STRUCTURED DATA TYPES
    #
    CreateReqData:
      description: Data within Create Request
      type: object
      properties:
        distSession:
          $ref: '#/components/schemas/DistSession'
      required:
        - distSession

    CreateRspData:
      description: Data within Create Response
      type: object
      properties:
        distSession:
          $ref: '#/components/schemas/DistSession'
      required:
        - distSession

    DistSession:
      description: Mbs Distribution Session Information
      type: object
      properties:
        distSessionId:
          type: string
        distSessionState:
          $ref: '#/components/schemas/DistSessionState'
        mbUpfTunAddr:
          writeOnly: true
          allOf:
            - $ref: 'TS29571_CommonData.yaml#/components/schemas/TunnelAddress'
        mbmsGwTunAddr:
          writeOnly: true
          allOf:
            - $ref: 'TS29571_CommonData.yaml#/components/schemas/TunnelAddress'
        upTrafficFlowInfo:
          writeOnly: true
          allOf:
            - $ref: '#/components/schemas/UpTrafficFlowInfo'
        mbr:
          writeOnly: true
          allOf:
            - $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
        maxDelay:
          writeOnly: true
          allOf:
            - $ref: 'TS29571_CommonData.yaml#/components/schemas/PacketDelBudget'
        objDistributionData:
          $ref: '#/components/schemas/ObjDistributionData'
        pktDistributionData:
          $ref: '#/components/schemas/PktDistributionData'
        fecInformation:

```

```

    $ref: 'TS29580_Nmbssf_MBSUserDataIngestSession.yaml#/components/schemas/FECCConfig'
  dscpMarking:
    type: string
    writeOnly: true
  mbsSecurityContext:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/MbsSecurityContext'
  required:
    - distSessionId
    - distSessionState
    - mbUpfTunAddr
    - mbr
  oneOf:
    - required: [ objDistributionData ]
    - required: [ pktDistributionData ]

```

Editor's Note: the encoding of the fecInformation IE is FFS

```

ObjDistributionData:
  description: Info for Object Distribution Method
  type: object
  properties:
    objDistributionOperatingMode:
      $ref: '#/components/schemas/ObjDistributionOperatingMode'
    objAcquisitionMethod:
      $ref: '#/components/schemas/ObjAcquisitionMethod'
    objAcquisitionIdsPull:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      minItems: 1
    objAcquisitionIdPush:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    objIngestBaseUrl:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    objDistributionBaseUrl:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    objRepairBaseUrl:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
  required:
    - objDistributionOperatingMode
    - objAcquisitionMethod

```

```

PktDistributionData:
  description: Info for Packet Distribution Method
  type: object
  properties:
    pktDistributionOperatingMode:
      $ref: '#/components/schemas/PktDistributionOperatingMode'
    pktIngestMethod:
      $ref: '#/components/schemas/PktIngestMethod'
    mbStfIngestAddr:
      $ref: '#/components/schemas/MbStfIngestAddr'
  required:
    - pktDistributionOperatingMode
    - mbStfIngestAddr

```

```

StatusSubscribeReqData:
  description: Data within the StatusSubscribe Request
  type: object
  properties:
    subscription:
      $ref: '#/components/schemas/DistSessionSubscription'
  required:
    - subscription

```

```

StatusSubscribeRspData:
  description: Data within StatusSubscribe Response
  type: object
  properties:
    subscription:
      $ref: '#/components/schemas/DistSessionSubscription'
    reportList:
      $ref: '#/components/schemas/DistSessionEventReportList'
  required:
    - subscription

```

```
StatusNotifyReqData:
  description: Status Notification
  type: object
  properties:
    reportList:
      $ref: '#/components/schemas/DistSessionEventReportList'
  required:
    - reportList

DistSessionSubscription:
  description: Data within the Status Subscription
  type: object
  properties:
    nfcInstanceId:
      writeOnly: true
      allOf:
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    eventList:
      type: array
      items:
        $ref: '#/components/schemas/DistSessionEventType'
      minItems: 1
    notifyUri:
      writeOnly: true
      allOf:
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    notifyCorrelationId:
      type: string
      writeOnly: true
    expiryTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    distSessionSubscUri:
      readOnly: true
      allOf:
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
  required:
    - eventList
    - notifyUri

DistSessionEventReportList:
  description: List of Event Reports
  type: object
  properties:
    eventReportList:
      type: array
      items:
        $ref: '#/components/schemas/DistSessionEventReport'
      minItems: 1
    notifyCorrelationId:
      type: string
  required:
    - eventReportList

DistSessionEventReport:
  description: Data related to a specific event
  type: object
  properties:
    eventType:
      $ref: '#/components/schemas/DistSessionEventType'
    timeStamp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    mbsSecurityContext:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/MbsSecurityContext'
  required:
    - eventType

UpTrafficFlowInfo:
  description: IP Multicast Address and Port Number
  type: object
  properties:
    destIpAddr:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/IpAddr'
    portNumber:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
  required:
    - destIpAddr
    - portNumber
```

```
MbStfIngestAddr:
  description: MBSTF Ingest Addresses
  type: object
  properties:
    afEgressTunAddr:
      writeOnly: true
      allOf:
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/TunnelAddress'
    mbStfIngressTunAddr:
      readOnly: true
      allOf:
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/TunnelAddress'
    afSsm:
      writeOnly: true
      allOf:
        - $ref: '#/components/schemas/ExtSsm'
    mbStfListenAddr:
      readOnly: true
      allOf:
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/TunnelAddress'
```

```
ExtSsm:
  description: SSM and Port Number
  type: object
  properties:
    ssm:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ssm'
    portNumber:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
  required:
    - ssm
    - portNumber
```

```
#
# SIMPLE DATA TYPES
#
```

```
#
# ENUMERATIONS
#
```

```
DistSessionState:
  description: Current State of MBS distribution session
  anyOf:
    - type: string
      enum:
        - INACTIVE
        - ESTABLISHED
        - ACTIVE
        - DEACTIVATING
    - type: string

ObjDistributionOperatingMode:
  description: Mode of data ingestion for Object distribution method
  anyOf:
    - type: string
      enum:
        - SINGLE
        - COLLECTION
        - CAROUSEL
        - STREAMING
    - type: string

ObjAcquisitionMethod:
  description: Object Acquisition Method
  anyOf:
    - type: string
      enum:
        - PULL
        - PUSH
    - type: string

PktDistributionOperatingMode:
  description: Mode of data ingestion for Packet distribution method
  anyOf:
    - type: string
```

```
enum:  
  - PACKET_PROXY  
  - PACKET_FORWARD_ONLY  
- type: string  
  
DistSessionEventType:  
description: Status Event Type  
anyOf:  
- type: string  
enum:  
  - DATA_INGEST_FAILURE  
  - SESSION_DEACTIVATED  
  - SESSION_ACTIVATED  
- type: string  
  
PktIngestMethod:  
description: Packet Ingest Method  
anyOf:  
- type: string  
enum:  
  - MULTICAST  
  - UNICAST  
- type: string
```

Annex B (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2022-03	CT4 #109e	C4-222344				Implementation of following pCRs: C4-222320, C4-222321, C4-222322, C4-222323, C4-222324, C4-222325, C4-222326	0.1.0
2022-05	CT4 #110e	C4-223453				Implementation of following pCRs: C4-223027, C4-223044, C4-223047, C4-223325, C4-223326, C4-223330, C4-223423, C4-223511	0.2.0
2022-06	CT#96	CP-221081				TS presented for information and approval	1.0.0
2022-06	CT#96	CP-221081				TS approved at CT#96	17.0.0
2022-09	CT#97e	CP-222031	0003		F	Corrections to MBS Distribution Session parameters	17.1.0
2022-09	CT#97e	CP-222031	0004		F	Updates to Operating Mode Descriptions	17.1.0
2022-09	CT#97e	CP-222031	0005		F	Editor's Note on Security Requirements	17.1.0
2022-09	CT#97e	CP-222031	0006	1	F	Description of notification events in Nmbstf_DistSession	17.1.0
2022-09	CT#97e	CP-222031	0007		F	Clarification on the use of afEgressTunAddr	17.1.0
2022-09	CT#97e	CP-222031	0008		F	Align terminology of operating mode PACKET_PROXY and PACKET_FORWARD_ONLY	17.1.0
2022-09	CT#97e	CP-222031	0009		D	Editorial errors for the headings	17.1.0
2022-09	CT#97e	CP-222031	0010		F	Corrections for the StatusSubscribe service operation	17.1.0
2022-09	CT#97e	CP-222031	0011		F	Corrections for the Nmbstf_DistSession API	17.1.0
2022-09	CT#97e	CP-222031	0012	1	F	Clarification for the attributes in the data type distSession	17.1.0
2022-09	CT#97e	CP-222031	0013	1	F	Miscellaneous updates and corrections to the data model of the Nmbstf_DistSession API	17.1.0
2022-09	CT#97e	CP-222058	0014		F	29.581 Rel-17 API version and External doc update	17.1.0
2022-12	CT#98	CP-223036	0017		F	Clarification on Object Distribution Method	17.2.0
2022-12	CT#98	CP-223036	0018		F	Miscellaneous corrections	17.2.0
2022-12	CT#98	CP-223097	0015	2	F	Add mbmsGwTunAddr attribute in DistSession data type	17.2.0
2022-12	CT#98	CP-223036	0016	1	F	Corrections on data type of the user plane traffic flow information	17.2.0
2022-12	CT#98	CP-223066	0029		F	29.581 Rel-17 API version and External doc update	17.2.0

History

Document history		
V17.0.0	July 2022	Publication
V17.1.0	October 2022	Publication
V17.2.0	January 2023	Publication