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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 Application Programming Interface (API) for enabling the MSGin5G Service over MSGin5G-2/3/4/7/8 interfaces. The application layer architecture, functional requirements, procedures and information flows necessary for MSGin5G Service are contained in 3GPP TS 23.554 [2]. The requirements for MSGin5G are specified in 3GPP TS 22.262 [3].

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 23.554: "Application architecture for MSGin5G Service".
- [3] 3GPP TS 22.262: "Message Service within the 5G System".
- [4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".
- [5] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".
- [6] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.
- [7] 3GPP TS 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs; Stage 2".
- [8] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".
- [9] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".
- [10] IETF RFC 9112: "HTTP/1.1".
- [11] IETF RFC 9110: "HTTP Semantics"
- [12] Void.
- [13] Void.
- [14] IETF RFC 9111: "Caching".
- [15] Void
- [16] IETF RFC 9113: "HTTP/2".
- [17] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
- [18] 3GPP TR 21.900: "Technical Specification Group working methods".
- [19] 3GPP TR 33.862: "Study on security aspects of the Message Service for MIIoT over the 5G System (MSGin5G)".
- [20] 3GPP TS 33.501: "Security architecture and procedures for 5G system".
- [21] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

- [22] 3GPP TS 33.122: "Security Aspects of Common API Framework for 3GPP Northbound APIs".
- [23] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".
- [24] 3GPP TS 29.122: "T8 reference point for northbound APIs".

3 Definitions of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms 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 purposes of the present document, the following terms and its definitions given in 3GPP TS 23.554 [2] shall apply:

MSGin5G Service
MSGin5G message
MSGin5G UE
MSGin5G Group
MSGin5G Client
MSGin5G Server
Legacy 3GPP Message Gateway
Non-3GPP Message Gateway
Broadcast Message Gateway
Legacy 3GPP UE
Non-3GPP UE
Point-to-Point messaging
Point-to-Application messaging
Application-to-Point messaging
Group messaging
Broadcast messaging
Messaging Topic
Message Gateway
Broadcast Area

3.2 Symbols

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

<symbol> <Explanation>

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].

AS Application Server
BC Broadcast
BMG Broadcast Message Gateway
CAPIF Common API Framework
L3G Legacy 3GPP Message Gateway
N3G Non-3GPP Message Gateway

4 Overview

The MSGin5G Service is designed and optimized for massive IoT device communication including thing-to-thing communication and person-to-thing communication and provides messaging capability in 5GS with messaging communication models including Point-to-Point, Application-to-Point/Point-to-Application, Group and Broadcast messaging.

3GPP TS 23.554 [2] has specified the application layer architecture, architectural requirements, procedures, information flows and some APIs, in order to support the MSGin5G Service. Various features are defined to ensure the efficient use and deployment of MSGin5G Service, including configuration, registration, message delivery, message aggregation, segmentation and reassembly, topic messaging.

The present document specifies MSGin5G Services offered by MSGin5G Servers and MSGin5G Gateway, and APIs in detail, needed over MSGin5G-2/3/4/7/8 interfaces for interworking between MSGin5G Server and Legacy 3GPP UE, Non-3GPP UE, Broadcast Message Gateway or Application Server, with following functionalities need to be supported:

1. Server-side functionality with the sending and receiving of messages to/from Application Servers and/or other MSGin5G Service endpoints on other UEs, provided by MSGin5G Server.
2. Interconnecting two different messaging delivery mechanisms and assure the message integrity between different message delivery mechanisms, provided by Message Gateway.

And the definition of APIs specified in TS 23.554 [2] clause 9 is introduced in present document.

5 Services offered by the MSGin5G Servers

5.1 Introduction

The Table 5.1-1 lists the services provided by the MSGin5G Server and corresponding service operations. A service description clause for each API gives a general description of the related API.

Table 5.1-1 List of services provided by the MSGin5G Servers

Service Name	Service Operations	Operation Semantics	Example Consumer(s)
MSGs_ASRegistration	MSGs_ASRegistration_Request	Request/Response	AS
	MSGs_ASRegistration_Deregister		
MSGs_MSGDelivery	MSGs_MSGDelivery_ASODelivery	Request/ Response	AS, Legacy 3GPP Message Gateway, Non-3GPP Message Gateway
	MSGs_MSGDelivery_ASODeliveryReport		
	MSGs_MSGDelivery_UEODelivery		
	MSGs_MSGDelivery_UEODeliveryReport		
MSGs_TopiclistEvent	MSGs_TopiclistEvent_SubscribeMSGTopiclist	Subscribe/Notify	MSGin5G Server
	MSGs_TopiclistEvent_UnsubscribeMSGTopiclist		
	MSGs_TopiclistEvent_NotifyMSGTopiclist		
	MSGs_TopiclistEvent_SubscribeMSGTopic	Request/ Response	MSGin5G Server
	MSGs_TopiclistEvent_UnsubscribeMSGTopic		

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

Table 5.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
MSGs_ASRegistration	8.1	AS Registration Service	TS29538_MSGS_ASRegistration.yaml	Msgs-asregistration	A.2
MSGs_MSGDelivery	8.2	Message Delivery Service	TS29538_MSGS_MSGDelivery.yaml	Msgs-msgdelivery	A.3
MSGs_TopiclistEvent	8.3	Topic Messaging Service	TS29538_MSGS_TopiclistEvent.yaml	Msgs-topiclistevent	A.7

5.2 MSGS_ASRegistration Service

5.2.1 Service Description

The MSGS_ASRegistration API, as defined in 3GPP TS 23.554 [2], allows an AS via Mm5s interface to register, and deregister at a given MSGin5G Server.

5.2.2 Service Operations

5.2.2.1 Introduction

The service operation defined for MSGS_ASRegistration API is shown in the Table 5.2.2.1-1.

Table 5.2.2.1-1: Operations of the MSGS_ASRegistration API

Service operation name	Description	Initiated by
MSGs_ASRegistration_Request	This service operation is used by the AS to register itself to MSGin5G Server.	AS
MSGs_ASRegistration_Deregister	This service operation is used by the AS to deregister itself from a MSGin5G Server.	AS

5.2.2.2 MSGS_ASRegistration_Request

5.2.2.2.1 General

This service operation is used by the AS to register itself to MSGin5G Server.

5.2.2.2.2 Application Server registering to MSGin5G Server using MSGS_ASRegistration_Request operation

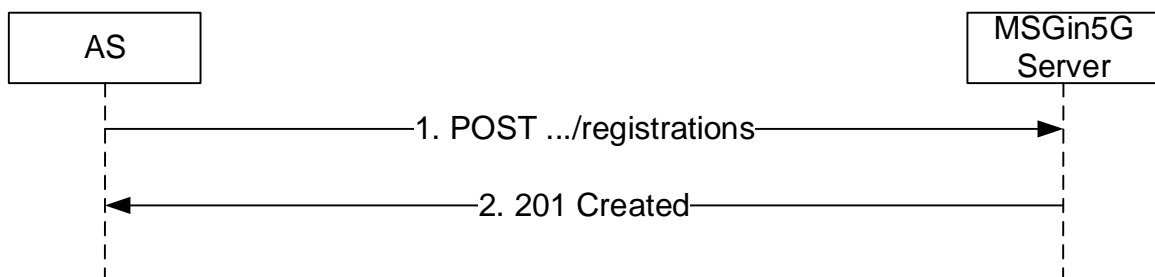


Figure 5.2.2.2.2-1: AS Registering to MSGin5G Server

To register itself at the MSGin5G Server, the AS shall send an HTTP POST message to the MSGin5G Server on the "AS Registrations" collection resource. The body of the HTTP POST message shall include ASRegistration data structure that shall include:

- the Application Server Identifier within the "asSvcId" attribute; and
- may include:
- the Application Identifier within the "appId" attribute;
 - the notification target URI within the "targetUri" attribute; and
 - the Application Server Profile Information within the "asProf" attribute, that may include:
 - the Application Server name within the "appName" attribute;
 - the list of Application Providers name within the "appProviders" attribute;
 - the list of Application scenarios within the "appScenarios" attribute;
 - the list of Application Server category within the "appCategory" attribute; and
 - the list of Application Server status within the "asStatus" attribute.

Upon receiving the HTTP POST message from the AS, the MSGin5G Server shall:

1. process the AS registration request information;
2. verify the identity of the AS and check if the AS is authorized to register itself at MSGin5G Server; and
3. if the AS is authorized to register to MSGin5G Server, then the MSGin5G Server shall:
 - a. store the AS registration information and create a new resource with the AS registration information as specified in clause 8.1.2.1; and
 - b. If the registration is successful, the MSGin5G Server shall respond to the AS with an HTTP "201 Created" status code, including an HTTP Location header field containing the URI of the created "AS Registration" resource and the response body containing ASRegistrationAck data structure that shall contain:
 - the Application Server Identifier within the "asSvcId" attribute; and
 - the registration result within the "result" attribute.

If errors occur when processing the HTTP POST request, the MSGin5G Server shall apply error handling procedures as specified in clause 8.1.6.

5.2.2.3 MSGS_ASRegistration_Deregister

5.2.2.3.1 General

This service operation is used by the AS to deregister itself from a MSGin5G Server.

5.2.2.3.2 Application Server deregistering from MSGin5G Server using MSGS_ASRegistration_Deregister operation

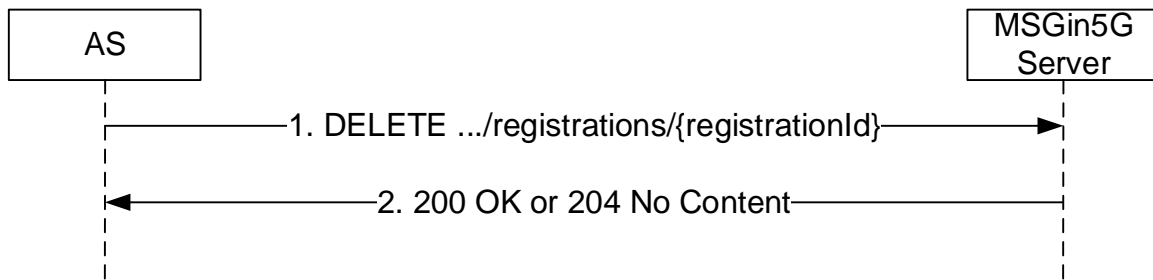


Figure 5.2.2.3.2-1: AS Deregistering from MSGin5G Server

To deregister itself from the MSGin5G Server, the AS shall send HTTP DELETE message to the MSGin5G Server on the "AS DeRegistration" collection resource, as specified in clause 8.1.2.3.3.2.

Upon receiving the HTTP DELETE request, the MSGin5G Server shall:

1. verify the identity of the AS and check if the AS is authorized to deregister the AS registration information;
2. if the AS is authorized to deregister the AS registration information, then the MSGin5G Server shall deregister the AS profile from the MSGin5G Server and delete the resource representing AS registration information; and
3. return the HTTP "200 OK" status code to the AS, indicating the successful deregistration of the AS information and shall include ASRegistrationAck data structure within the response body or HTTP "204 No Content" status code to the AS.

If errors occur when processing the HTTP DELETE request, the MSGin5G Server shall apply error handling procedures as specified in clause 8.1.6.

5.3 MSGS_MSGDelivery Service

5.3.1 Service Description

The MSGS_MSGDelivery Service corresponding to Mm5s as defined in 3GPP TS 23.554 [2], is provided by the MSGin5G Server.

This service:

- allows AS invokes services provided by MSGin5G Server to send MSGin5G Messages and MSGin5G message delivery status reports to MSGin5G Server; and
- allows L3G/N3G invokes services provided by MSGin5G Server to send MSGin5G Messages and MSGin5G message delivery status reports to MSGin5G Server on behalf of Legacy 3GPP UE or Non-3GPP UE.
- allows BMG invokes services provided by MSGin5G Server to send MSGin5G message delivery status reports to MSGin5G Server.
- allows other MSGin5G Server invokes services provided by MSGin5G Server to send MSGin5G Messages and MSGin5G message delivery status reports to MSGin5G Server.

5.3.2 Service Operations

5.3.2.1 Introduction

The service operation defined for MSGS_MSGDelivery Service is shown in the Table 5.3.2.1-1.

Table 5.3.2.1-1: Operations of the MSGS_MSGDelivery Service

Service operation name	Description	Initiated by
MSGS_MSGDelivery_ASODelivery	This service operation is used by AS to deliver MSGin5G message to the MSGin5G Server. This service operation corresponds to clause 9.1.1.1.2 as defined in 3GPP TS 23.554 [2].	AS
MSGS_MSGDelivery_ASODeliveryReport	This service operation is used by AS to deliver the delivery status report to the MSGin5G Server. This service operation corresponds to clause 9.1.1.3.2 as defined in 3GPP TS 23.554 [2].	AS
MSGS_MSGDelivery_UEODelivery	This service operation is used by Legacy 3GPP Message Gateway or Non-3GPP Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) to deliver MSGin5G message to the MSGin5G Server. This service operation corresponds to clause 9.1.1.2.2 as defined in 3GPP TS 23.554 [2].	Legacy 3GPP Message Gateway Non-3GPP Message Gateway MSGin5G Server
MSGS_MSGDelivery_UEODeliveryReport	This service operation is used by Message Gateway (on behalf Legacy 3GPP UE or Non-3GPP UE) to deliver the delivery status report to the MSGin5G Server. This service operation corresponds to clause 9.1.1.4.2 as defined in 3GPP TS 23.554 [2].	Legacy 3GPP Message Gateway Non-3GPP Message Gateway Broadcast Message Gateway MSGin5G Server

5.3.2.2 MSGS_MSGDelivery_ASODelivery

5.3.2.2.1 General

This service operation corresponding to clause 9.1.1.1.2 as defined in 3GPP TS 23.554 [2], is used by AS to deliver MSGin5G message to the MSGin5G Server.

5.3.2.2.2 AS Originating MSGin5G Message Delivery

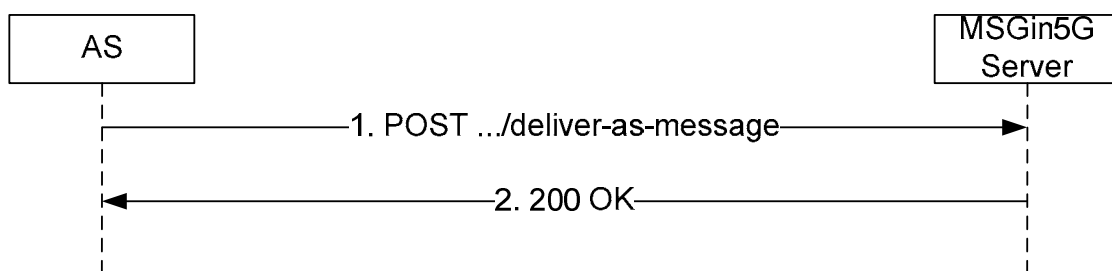


Figure 5.3.2.2.2-1: AS Originating MSGin5G Message Delivery

When the AS needs to send the message to the MSGin5G Server, the AS shall send the HTTP POST method as step 1 of the Figure 5.3.2.2.2-1.

The AS shall include ASMessageDelivery data structure in the content of the HTTP POST request.

The ASMessageDelivery data structure shall include:

- the AS Service ID within the "oriAddr" attribute;
- the Recipient Address within the "destAddr" attribute;

- the Message ID within the "msgId" attribute;
 - the store and forward flag within the "stoAndFwInd" attribute; and
- may include:
- the Application ID within the "appId" attribute;
 - the indication whether the message delivery status report is required within the "delivStReqInd" attribute;
 - the Payload within the "payload" attribute;
 - the priority type within the "priority" attribute;
 - the message segment flag within the "segInd" attribute;
 - the message segment parameters within the "segParams" attribute, this attribute may include:
 - the segmentation set identifier within the "segId" attribute;
 - the total number of message segments within the "totalSegCount" attribute;
 - the message segment number within the "segNumb" attribute; and
 - the last segment flag within the "lastSegFlag" attribute;
 - the store and forward parameters within the "stoAndFwParams" attribute, this attribute may include:
 - the message expiration time within the "exprTime" attribute;
 - The latency within the "latency" attribute.

When the MSGin5G Server receives the HTTP POST request from the AS, the MSGin5G Server shall make an authorization based on the information received from the AS. If the authorization is successful, the MSGin5G Server shall respond to the AS with a 200 OK message.

If errors occur when processing the HTTP POST request, the MSGin5G Server shall apply error handling procedures as specified in clause 8.2.6.

5.3.2.3 MSGS_MSGDelivery_ASODeliveryReport

5.3.2.3.1 General

This service operation corresponds to clause 9.1.1.3.2 as defined in 3GPP TS 23.554 [2], is used by AS to deliver the delivery status report to the MSGin5G Server.

5.3.2.3.2 AS Originating Message Delivery Status Report

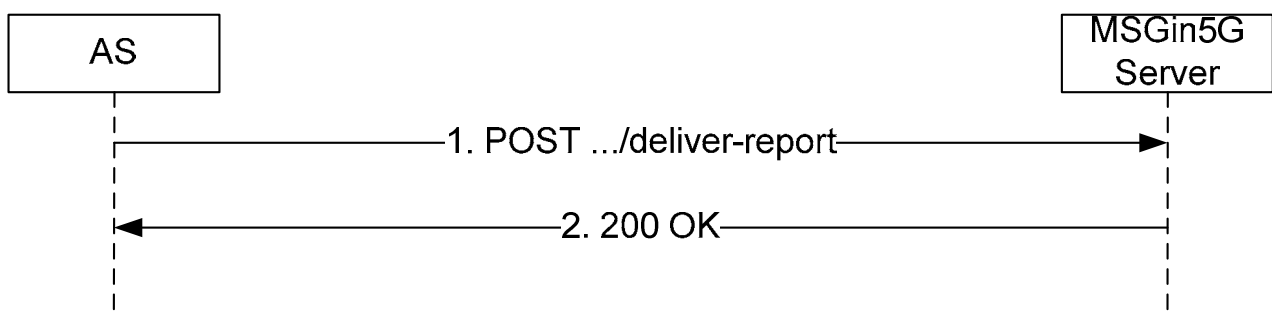


Figure 5.3.2.3.2-1: AS Originating MSGin5G Delivery Report

When the AS needs to send the delivery report to the MSGin5G Server, the AS shall send the HTTP POST method as step 1 of the Figure 5.3.2.3.2-1.

The AS shall include DeliveryStatusReport data structure in the content of the HTTP POST request.

The DeliveryStatusReport data structure shall include:

- the AS Service ID within the "oriAddr" attribute;
 - the Recipient Address within the "destAddr" attribute;
 - the Message ID within the "msgId" attribute;
 - the delivery status within the "delivSt" attribute; and
- may include:

- the failure cause within the "failureCause" attribute;

When the MSGin5G Server receives the HTTP POST request from the AS, the MSGin5G Server shall make an authorization based on the information received from the AS. If the authorization is successful, the MSGin5G Server shall respond to the AS with a 200 OK message.

If errors occur when processing the HTTP POST request, the MSGin5G Server shall apply error handling procedures as specified in clause 8.2.6.

5.3.2.4 MSGS_MSGDelivery_UEODelivery

5.3.2.4.1 General

This service operation corresponds to clause 9.1.1.2.2 as defined in 3GPP TS 23.554 [2], is used by Legacy 3GPP Message Gateway (on behalf of Legacy 3GPP UE), Non-3GPP Message Gateway (on behalf of Non-3GPP UE) or other MSGin5G Server to deliver MSGin5G message to the MSGin5G Server.

5.3.2.4.2 UE Originating Message Delivery

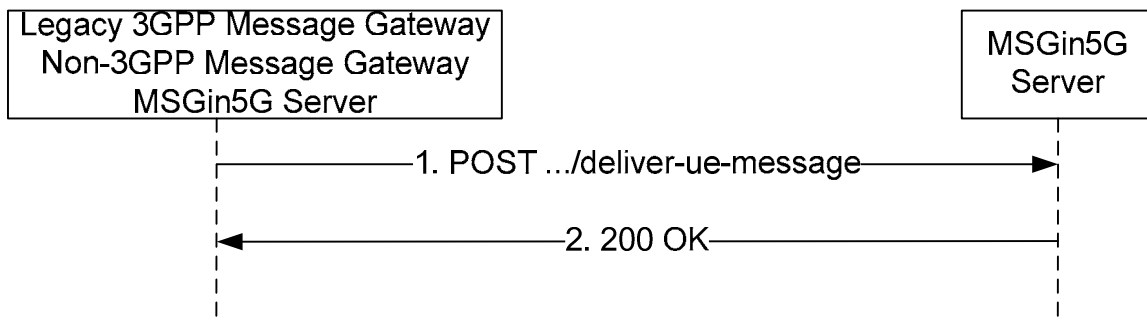


Figure 5.3.2.4.2-1: Legacy 3GPP UE or Non-3GPP UE Originating MSGin5G Message Delivery

When the Legacy 3GPP Message Gateway (on behalf of Legacy 3GPP UE), Non-3GPP Message Gateway (on behalf of Non-3GPP UE) or other MSGin5G Server needs to send the message to the MSGin5G Server, the Legacy 3GPP Message Gateway, Non-3GPP Message Gateway or other MSGin5G Server shall send the HTTP POST method as step 1 of the Figure 5.3.2.4.2-1.

The Legacy 3GPP Message Gateway, Non-3GPP Message Gateway or other MSGin5G Server shall include UEMessageDelivery data structure in the content of the HTTP POST request.

The UEMessageDelivery data structure shall include:

- the Originating UE Service ID within the "oriAddr" attribute;
- the Recipient Address within the "destAddr" attribute;
- the Message ID within the "msgId" attribute; and

- the store and forward flag within the "stoAndFwInd" attribute;
- and may include:
- the Application ID within the "appId" attribute;
 - the Payload within the "payload" attribute;
 - the indication whether the message delivery status report is required within the "delivStReqInd" attribute; and
 - the message segment flag within the "segInd" attribute;
 - the message segment parameters within the "segParams" attribute, this attribute may include:
 - the segmentation set identifier within the "segId" attribute;
 - the total number of message segments within the "totalSegCount" attribute;
 - the message segment number within the "segNumb" attribute;
 - the last segment flag within the "lastSegFlag" attribute;
 - the store and forward parameters within the "stoAndFwParams" attribute, this attribute may include:
 - the message expiration time within the "exprTime" attribute;

When the MSGin5G Server receives the HTTP POST request from the Legacy 3GPP Message Gateway, Non-3GPP Message Gateway or other MSGin5G Server, the MSGin5G Server shall make an authorization based on the information received from the Legacy 3GPP Message Gateway, Non-3GPP Message Gateway or other MSGin5G Server. If the authorization is successful, the MSGin5G Server shall respond to the Legacy 3GPP Message Gateway, Non-3GPP Message Gateway or other MSGin5G Server with a 200 OK message.

If errors occur when processing the HTTP POST request, the MSGin5G Server shall apply error handling procedures as specified in clause 8.2.6.

5.3.2.5 MSGS_MSGDelivery_UEODeliveryReport

5.3.2.5.1 General

This service operation corresponds to clause 9.1.1.4.2 as defined in 3GPP TS 23.554 [2], is used by Message Gateway (on behalf Legacy 3GPP UE or Non-3GPP UE) or other MSGin5G Server to deliver the delivery status report to the MSGin5G Server.

5.3.2.5.2 UE Originating Message Delivery Status Report

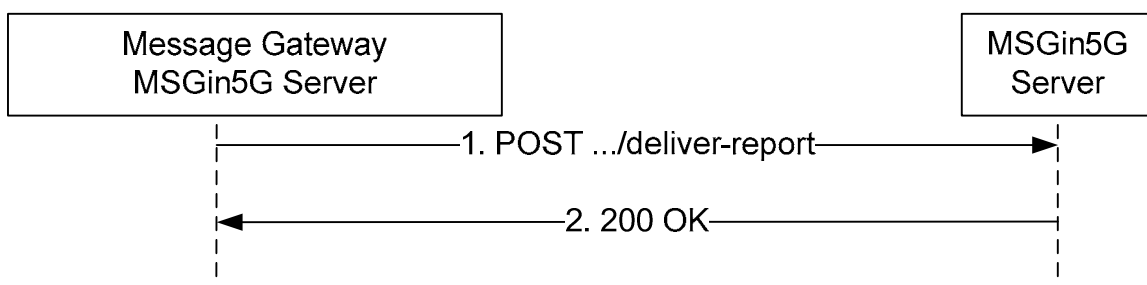


Figure 5.3.2.5.2-1: Legacy 3GPP UE or Non-3GPP UE Originating MSGin5G Delivery Report

When the Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) or other MSGin5G Server needs to send the delivery report to the MSGin5G Server, the Message Gateway or other MSGin5G Server shall send the HTTP POST method as step 1 of the Figure 5.3.2.5.2-1.

The Message Gateway or other MSGin5G Server shall include DeliveryStatusReport data structure in the content of the HTTP POST request.

The DeliveryStatusReport data structure shall include:

- the Originating UE Service ID within the "oriAddr" attribute;
- the Recipient Address within the "destAddr" attribute;
- the Message ID within the "msgId" attribute; and
- the delivery status within the "delivSt" attribute;

and may include:

- The failure cause within the "failureCause" attribute;

When the MSGin5G Server receives the HTTP POST request from the Message Gateway or other MSGin5G Server, the MSGin5G Server shall make an authorization based on the information received from the Message Gateway or other MSGin5G Server. If the authorization is successful, the MSGin5G Server shall respond to the Message Gateway or other MSGin5G Server with a 200 OK message.

If errors occur when processing the HTTP POST request, the MSGin5G Server shall apply error handling procedures as specified in clause 8.2.6.

5.4 MSGS_TopiclistEvent

5.4.1 Service Description

The MSGS_TopiclistEvent API Service corresponding to Mm5s as defined in 3GPP TS 23.554 [2], is provided by the MSGin5G Server.

This service:

- allows another MSGin5G Server invokes services provided by MSGin5G Server to subscribe or unsubscribe to MSGin5G Messaging Topic;
- allows another MSGin5G Server invokes services provided by MSGin5G Server to subscribe or unsubscribe to MSGin5G Messaging Topic list;
- allows another MSGin5G Server invokes services provided by MSGin5G Server to notify changes of MSGin5G Messaging Topic list;

5.4.2 Service Operations

5.4.2.1 Introduction

The service operation defined for MSGS_TopiclistEvent service is shown in the Table 5.4.2.1-1, corresponds to clause 9.1.1.6 as defined in 3GPP TS 23.554 [2].

Table 5.4.2.1-1: Operations of the MSGS_TopiclistEvent Service

Service operation name	Description	Initiated by
MSGS_TopiclistEvent_SubscribeMSGTopiclist	This service operation is used by MSGin5G Server to subscribe to Messaging Topic list on another MSGin5G Server.	MSGin5G Server
MSGS_TopiclistEvent_UnsubscribeMSGTopiclist	This service operation is used by MSGin5G Server to unsubscribe to Messaging Topic list on another MSGin5G Server.	MSGin5G Server
MSGS_TopiclistEvent_NotifyMSGTopiclist	This service operation is used by MSGin5G Server, to deliver the notification of Messaging Topic list changes.	MSGin5G Server
MSGS_TopiclistEvent_SubscribeMSGTopic	This service operation is used by MSGin5G Server (on behalf of Application Server or MSGin5G Client) to subscribe to Messaging Topic on the MSGin5G Server.	MSGin5G Server
MSGS_TopiclistEvent_UnsubscribeMSGTopic	This service operation is used by MSGin5G Server (on behalf of Application Server or MSGin5G Client) to unsubscribe to Messaging Topic on the MSGin5G Server.	MSGin5G Server

5.4.2.2 **MSGS_TopiclistEvent_SubscribeMSGTopiclist**

5.4.2.2.1 **General**

This service operation is used by MSGin5G Server to subscribe to Messaging Topic list on another MSGin5G Server, corresponds to clause 9.1.1.6.2 as defined in 3GPP TS 23.554 [2].

5.4.2.2.2 **MSGin5G Server subscribing to MSGin5G Messaging Topic List**

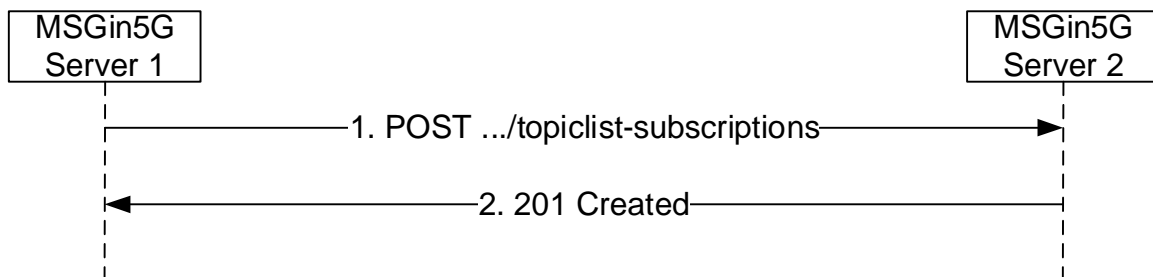


Figure 5.4.2.2.2-1: MSGin5G Server Subscribing to Messaging Topic List

To subscribe MSGin5G Messaging Topic list on another MSGin5G Server 2, the MSGin5G Server 1 shall send an HTTP POST message to the MSGin5G Server 2 on the "Topic List Subscription" collection resource. The body of the HTTP POST message shall include TopicListSubscription data structure that shall include:

- the Originating MSGin5G Server ID within the "oriAddr" attribute;
- the Recipient MSGin5G Server ID within the "destAddr" attribute;
- a notification target address within the "notificationURI" attribute;
- a supported features attribute if at least one feature defined is supported; and

may include:

- the Expiration within the "exprTime" attribute;
- the security credentials within the "secCred" attribute.

Upon receiving the HTTP POST message from the MSGin5G Server 1, the MSGin5G Server 2 shall:

1. make an authorization based on the information received from from MSGin5G Server 1;

2. checks the locally stored Messaging Topic list subscription(s):
 - a. If the MSGin5G Server 1's subscription has already been created, the MSGin5G Server 2 updates the validity time of this subscription;
 - b. If the MSGin5G Server 1's subscription has not been created, the MSGin5G Server 2 creates new subscription; and

If the subscription request is successfully processed, the MSGin5G Server 2 shall respond to the MSGin5G Server 1 with an HTTP "201 Created" status code, including an HTTP Location header field containing the URI of the created "Topic List Subscription" resource and the response body containing TopicListSubscriptionAck data structure that shall contain:

- the Subscription Status within the "subStat" attribute;
- a supported features attribute if at least one feature defined is supported; and may contain
- the Expiration within the "exprTime" attribute.

If errors occur when processing the HTTP POST request, the MSGin5G Server 2 shall apply error handling procedures as specified in clause 8.3.6.

5.4.2.3 MSGS_TopiclistEvent_UnsubscribeMSGTopiclist

5.4.2.3.1 General

This service operation is used by MSGin5G Server to subscribe to Messaging Topic list on another MSGin5G Server, corresponds to clause 9.1.1.6.2 as defined in 3GPP TS 23.554 [2].

5.4.2.3.2 MSGin5G Server Unsubscribing to MSGin5G Messaging Topic List

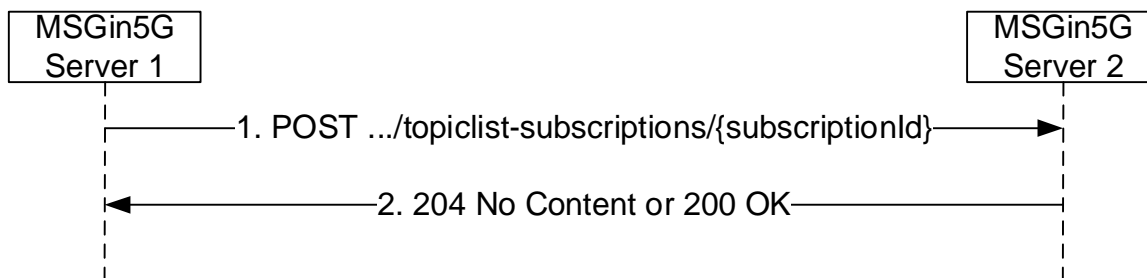


Figure 5.4.2.3.2-1: MSGin5G Server Unsubscribing to Messaging Topic List

As shown in Figure 5.4.2.3.2-1, to unsubscribe MSGin5G Messaging Topic list on the MSGin5G Server 2, the MSGin5G Server 1 shall send HTTP POST message to the MSGin5G Server 2 on the "Individual Topic List Subscription" collection resource, where "{subscriptionId}" is the identifier of the existing Messaging Topic list subscription that is to be deleted. The body of the HTTP POST message shall include TopicListUnsubscription data structure that shall include:

- the Originating MSGin5G Server ID within the "oriAddr" attribute;
 - the Recipient MSGin5G Server ID within the "destAddr" attribute;and
- may include:
- the security credentials within the "secCred" attribute.

Upon receiving the HTTP POST message from the MSGin5G Server 1, the MSGin5G Server 2 shall make an authorization based on the information received. If the authorization is successful, the MSGin5G Server 2 shall remove the corresponding subscription. If the unsubscription request is successfully processed, the MSGin5G Server 2 shall

respond to the MSGin5G Server 1 with an HTTP "204 No Content" status code. If the subscription is not successfully deleted, the MSGin5G Server 2 shall respond to the MSGin5G Server 1 with an HTTP "200 OK" status code, and the response body containing TopicListUnsubscriptionAck data structure that shall contain:

- the Unsubscriptoin Status within the "subStat" attribute.

If errors occur when processing the HTTP POST request, the MSGin5G Server 2 shall apply error handling procedures as specified in clause 8.3.6.

5.4.2.4 MSGS_TopiclistEvent_NotifyMSGTopiclist

5.4.2.4.1 General

This service operation is used by MSGin5G Server 1 to notify another MSGin5G Server 2 about changes of Messaging Topic list, corresponds to clause 9.1.1.6.3 as defined in 3GPP TS 23.554 [2].

5.4.2.4.2 Notification about MSGin5G Messaging Topic List

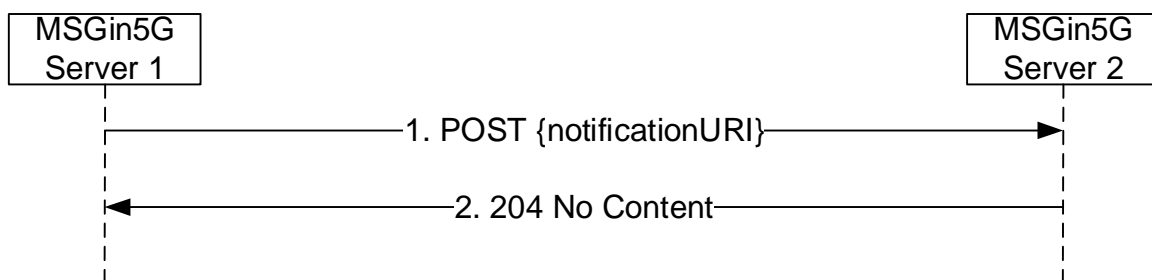


Figure 5.4.2.4.2-1:MSGin5G Server Notification about Messaging Topic List

As shown in Figure 5.4.2.4.2-1, the MSGin5G Server 1 shall invoke the MSGS_TopiclistEvent_NotifyMSGTopiclist service operation to notify about subscribed Messaging Topic list events. The MSGin5G Server 1 shall send HTTP POST request to the MSGin5G Server 2 with "{notificationURI}" previously received in the subscription. The TopicListNotification data structure provided in the request body shall include:

- The Messaging Topic list exists in MSGin5G Server 1 within the "msgTopicList" attribute, this attribute may include:
 - the unique topic identifier within the "msgTopics" attribute;
 - the topic update status indicating if such topic is newly created or deleted within the "updateStat" attribute;

may include:

- the Expiration within the "exprTime" attribute;

Upon receiving the HTTP POST message from the MSGin5G Server 1, the MSGin5G Server 2 shall make an authorization based on the information received. If the authorization is successful, the MSGin5G Server 2 shall update locally stored Messaging Topic list, and respond to the MSGin5G Server 1 with an HTTP "204 No Content" status code.

If errors occur when processing the HTTP POST request, the MSGin5G Server 2 shall apply error handling procedures as specified in clause 8.3.6.

5.4.2.5 MSGS_TopiclistEvent_SubscribeMSGTopic

5.4.2.5.1 General

This service operation is used by MSGin5G Server 1 to subscribe to Messaging Topic on another MSGin5G Server 2, corresponding to clause 9.1.1.6.4 as defined in 3GPP TS 23.554 [2].

5.4.2.5.2 MSGin5G Server Subscribing to MSGin5G Messaging Topic

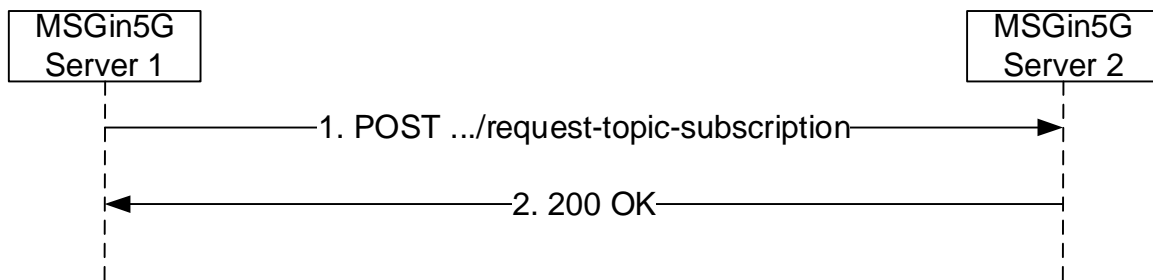


Figure 5.4.2.5.2-1: Subscribing to Messaging Topic List

As shown in Figure 5.4.2.5.2-1, to subscribe MSGin5G Messaging Topic on the MSGin5G Server 2, the MSGin5G Server 1 shall send the HTTP POST method. The body of the HTTP POST message shall include TopicSubscription data structure that shall include:

- the originating UE Service ID/AS Service ID if the MSGin5G Server forwards the request, or the Service ID of MSGin5G Server subscribing topic on behalf of all MSGin5G Clients and Application Servers served by it within the "oriAddr" attribute
- the requested list of Messaging Topic(s) within the "msgTopics" attribute;
- the security credentials within the "secCred" attribute; and

may include:

- the Expiration within the "exprTime" attribute;

Upon receiving the HTTP POST message, the MSGin5G Server 2 shall:

1. make an authorization based on the information received;
2. checks the locally stored Messaging Topic subscription(s):
 - a. If the requested subscription has already been created, the MSGin5G Server 2 updates the validity time of this subscription;
 - b. If the requested subscription has not been created, the MSGin5G Server 2 creates new subscription; and

If the subscription request is successfully processed, the MSGin5G Server 2 shall respond with an HTTP "200 OK" status code. The response body containing TopicSubscriptionAck data structure that shall contain:

- the Subscriptoin Status within the "subStat" attribute; and may contain
- the Expiration within the "exprTime" attribute.

If errors occur when processing the HTTP POST request, the MSGin5G Server 2 shall apply error handling procedures as specified in clause 8.3.6.

5.4.2.6 MSGS_TopiclistEvent_UnsubscribeMSGTopic

5.4.2.6.1 General

This service operation is used by MSGin5G Server to unsubscribe to Messaging Topic(s) on another MSGin5G Server, corresponding to clause 9.1.1.6.4 as defined in 3GPP TS 23.554 [2].

5.4.2.6.2 MSGin5G Server Unsubscribing to MSGin5G Messaging Topic

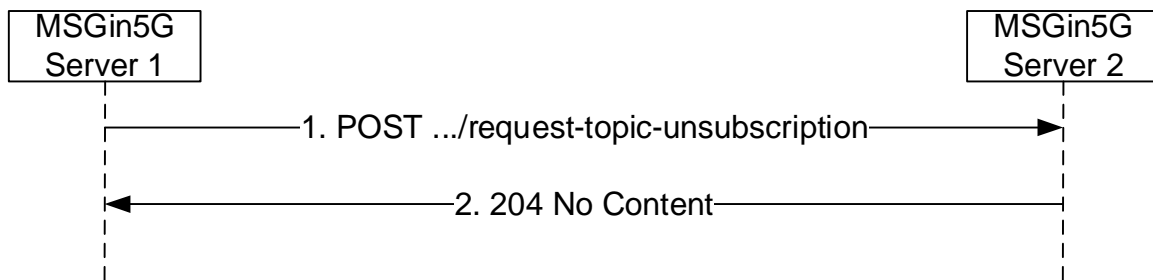


Figure 5.4.2.6.2-1: Unsubscribing to Messaging Topic(s)

As shown in Figure 5.4.2.6.2-1, to unsubscribe one or more MSGin5G Messaging Topic(s) on the MSGin5G Server 2, the MSGin5G Server 1 shall send HTTP POST message to the MSGin5G Server 2. The body of the HTTP POST message shall include TopicUnsubscription data structure that shall include:

- the originating UE Service ID/AS Service ID if the MSGin5G Server forwards the request, or the Service ID of MSGin5G Server unsubscribing topic on behalf of all MSGin5G Clients and Application Servers served by it within the "oriAddr" attribute;
- the requested list of Messaging Topic(s) within the "msgTopics" attribute;
- the security credentials within the "secCred" attribute; and

may include:

- the Expiration within the "exprTime" attribute;

Upon receiving the HTTP POST message, the MSGin5G Server 2 shall make an authorization based on the information received. If the authorization is successful, the MSGin5G Server 2 shall remove the corresponding subscription and respond with an HTTP "204 No Content" status code.

If errors occur when processing the HTTP POST request, the MSGin5G Server 2 shall apply error handling procedures as specified in clause 8.3.6.

6 Services offered by the Message Gateway

6.1 Introduction

The Table 6.1-1 lists the services provided by the MSGin5G Message Gateway and corresponding service operations. A service description clause for each API gives a general description of the related API.

Table 6.1-1 List of services provided by the MSGin5G Message Gateway

Service Name	Service Operations	Operation Semantics	Example Consumer(s)
MSGG_L3GDelivery	MSGG_L3GDelivery_GTDelivery	Request/Response	MSGin5G Server
	MSGG_L3GDelivery_GTDeliveryReport		
MSGG_N3GDelivery	MSGG_N3GDelivery_GTDelivery	Request/Response	MSGin5G Server
	MSGG_N3GDelivery_GTDeliveryReport		
MSGG_BGDelivery	MSGG_BGDelivery_GTDelivery	Request/Response	MSGin5G Server

Table 6.1-2 summarizes the corresponding APIs defined in this specification.

Table 6.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
MSGG_L3GDelivery	9.1	L3G Message Delivery Service	TS29538_MSGG_L3GDelivery.yaml	msgg-l3gdelivery	A.4
MSGG_N3GDelivery	9.2	N3G Message Delivery Service	TS29538_MSGG_N3GDelivery.yaml	msgg-n3gdelivery	A.5
MSGG_BGDelivery	9.3	BMG Message Delivery Service	TS29538_MSGG_BGDelivery.yaml	msgg-bgdelivery	A.6

6.2 MSGG_L3GDelivery Service

6.2.1 Service Description

The MSGG_L3GDelivery Service corresponding to M13g as defined in 3GPP TS 23.554 [2], is provided by the Legacy 3GPP Message Gateway.

This service:

- allows MSGin5G Server invokes services provided by Legacy 3GPP Message Gateway to send MSGin5G Messages to Legacy 3GPP Message Gateway.

6.2.2 Service Operations

6.2.2.1 Introduction

The service operation defined for MSGG_L3GDelivery Service is shown in the table 6.2.2.1-1.

Table 6.2.2.1-1: Operations of the MSGG_L3GDelivery Service

Service operation name	Description	Initiated by
MSGG_L3GDelivery_GTDelivery	This service operation is used by MSGin5G Server to deliver MSGin5G message to Legacy 3GPP Message Gateway. This service operation corresponds to clause 9.2.1.1.2 as defined in 3GPP TS 23.554 [2].	MSGin5G Server
MSGG_L3GDelivery_GTDeliveryReport	This service operation is used by MSGin5G Server to deliver the delivery status report to Legacy 3GPP Message Gateway. This service operation corresponds to clause 9.2.1.3.2 as defined in 3GPP TS 23.554 [2].	MSGin5G Server

6.2.2.2 MSGG_L3GDelivery_GTDelivery

6.2.2.2.1 General

This service operation corresponds to clause 9.2.1.1.2 as defined in 3GPP TS 23.554 [2], is used by MSGin5G Server to deliver MSGin5G message to the Legacy 3GPP Message Gateway.

6.2.2.2.2 Legacy 3GPP Message Gateway Terminating Message Delivery



Figure 6.2.2.2-1: Legacy 3GPP Message Gateway Terminating Message Delivery

When the MSGin5G Server needs to send the message to the Legacy 3GPP Message Gateway, the MSGin5G Server shall send the HTTP POST request towards the "deliver-message" resource as shown in Figure 6.2.2.2-1.

The MSGin5G Server shall send a POST request to the resource with an L3gMessageDelivery object in the request body.

The L3gMessageDelivery data type shall include:

- the Originating UE Service ID/AS Service ID within the "oriAddr" attribute;
- the Recipient UE Service ID within the "destAddr" attribute;
- the Message ID within the "msgId" attribute; and

may include:

- the Application ID within the "appId" attribute;
- the indication whether the message delivery status report is required within the "delivStReqInd" attribute;
- the Payload within the "payload" attribute;
- the Message is segmented within the "segInd" attribute; and
- the message segment parameters within the "segParams" attribute, this attribute may include:
 - the segmentation set identifier within the "segId" attribute;
 - the total number of message segments within the "totalSegCount" attribute;
 - the message segment number within the "segNumb" attribute; and
 - the last segment flag within the "lastSegFlag" attribute.

When the Legacy 3GPP Message Gateway receives the HTTP POST request from the MSGin5G Server, the Legacy 3GPP Message Gateway shall respond to the MSGin5G Server with a 204 No Content message.

If errors occur when processing the HTTP POST request, the Legacy 3GPP Message Gateway shall apply error handling procedures as specified in clause 9.1.6.

6.2.2.3 MSGG_L3GDelivery_GTDeliveryReport

6.2.2.3.1 General

This service operation corresponds to clause 9.2.1.3.2 as defined in 3GPP TS 23.554 [2], is used by MSGin5G Server to deliver the delivery status report to the Legacy 3GPP Message Gateway.

6.2.2.3.2 Legacy 3GPP Message Gateway Terminating Message Delivery Status Report

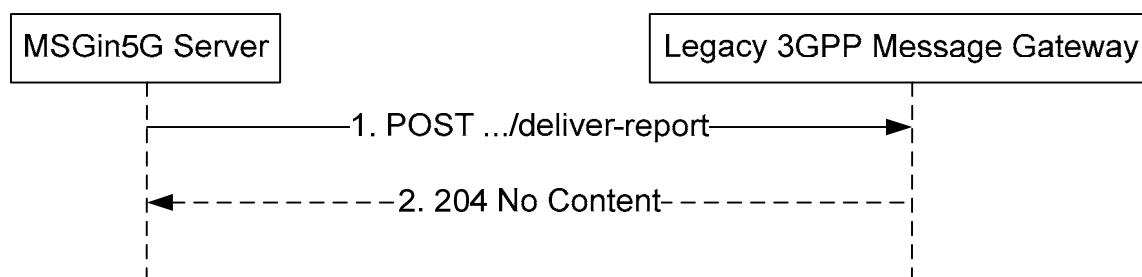


Figure 6.2.2.3.2-1: Legacy 3GPP Message Gateway Terminating Delivery Status Report

When the MSGin5G Server needs to send the delivery status report to the Legacy 3GPP Message Gateway, the MSGin5G Server shall send the HTTP POST request towards the "deliver-report" resource as shown in Figure 6.2.2.3.2-1.

The MSGin5G Server shall send a POST request to the resource with a DeliveryStatusReport object in the request body.

The DeliveryStatusReport data type shall include:

- the Originating UE Service ID/AS Service ID within the "oriAddr" attribute;
- the Recipient UE Service ID within the "destAddr" attribute;
- the Message ID within the "msgId" attribute;
- the delivery status within the "delivSt" attribute; and

may include:

- the failure cause within the "failureCause" attribute.

When the Legacy 3GPP Message Gateway receives the HTTP POST request from the MSGin5G Server, the Legacy 3GPP Message Gateway shall respond to the MSGin5G Server with a 204 No Content message.

If errors occur when processing the HTTP POST request, the Legacy 3GPP Message Gateway shall apply error handling procedures as specified in clause 9.1.6.

6.3 MSGG_N3GDelivery Service

6.3.1 Service Description

The MSGG_N3GDelivery Service corresponding to Mn3g as defined in 3GPP TS 23.554 [2], is provided by the Non-3GPP Message Gateway.

This service:

- allows MSGin5G Server invokes services provided by Non-3GPP Message Gateway to send MSGin5G Messages to Non-3GPP Message Gateway.

6.3.2 Service Operations

6.3.2.1 Introduction

The service operation defined for MSGG_N3GDelivery Service is shown in the table 6.3.2.1-1.

Table 6.3.2.1-1: Operations of the MSGG_N3GDelivery Service

Service operation name	Description	Initiated by
MSGG_N3GDelivery_GTDelivery	This service operation is used by MSGin5G Server to deliver MSGin5G message to Non-3GPP Message Gateway. This service operation corresponds to clause 9.2.2.1.2 as defined in 3GPP TS 23.554 [2].	MSGin5G Server
MSGG_N3GDelivery_GTDeliveryReport	This service operation is used by MSGin5G Server to deliver the delivery status report to Non-3GPP Message Gateway. This service operation corresponds to clause 9.2.2.2.2 as defined in 3GPP TS 23.554 [2].	MSGin5G Server

6.3.2.2 MSGG_N3GDelivery_GTDelivery

6.3.2.2.1 General

This service operation corresponds to clause 9.2.2.1.2 as defined in 3GPP TS 23.554 [2], is used by MSGin5G Server to deliver MSGin5G message to the Non-3GPP Message Gateway.

6.3.2.2.2 Non-3GPP Message Gateway Terminating Message Delivery

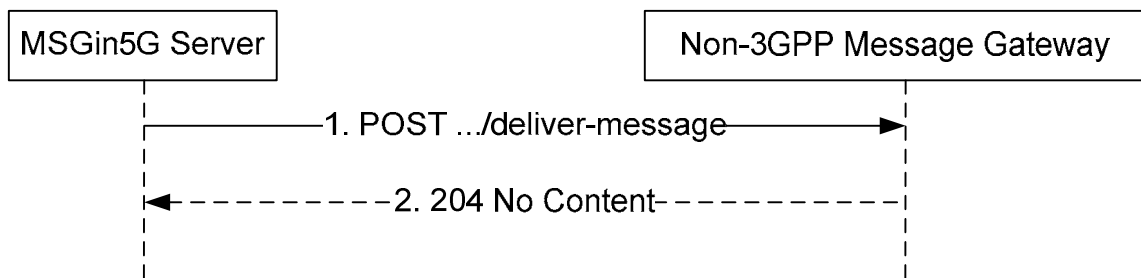


Figure 6.3.2.2.2-1: Non-3GPP Message Gateway Terminating Message Delivery

When the MSGin5G Server needs to send the message to the Non-3GPP Message Gateway, the MSGin5G Server shall send the HTTP POST request towards the "deliver-message" resource as shown in figure 6.3.2.2.2-1.

The MSGin5G Server shall send a POST request to the resource with an N3gMessageDelivery object in the request body.

The N3gMessageDelivery data type shall include:

- the Originating UE Service ID/AS Service ID within the "oriAddr" attribute;
- the Recipient UE Service ID within the "destAddr" attribute;
- the Message ID within the "msgId" attribute; and

may include:

- the Application ID within the "appId" attribute;
- the indication whether the message delivery status report is required within the "delivStReqInd" attribute;
- the Payload within the "payload" attribute;
- the Message is segmented within the "segInd" attribute; and
- the message segment parameters within the "segParams" attribute, this attribute may include:
 - the segmentation set identifier within the "segId" attribute;

- the total number of message segments within the "totalSegCount" attribute;
- the message segment number within the "segNumb" attribute; and
- the last segment flag within the "lastSegFlag" attribute.

When the Non-3GPP Message Gateway receives the HTTP POST request from the MSGin5G Server, the Non-3GPP Message Gateway shall respond to the MSGin5G Server with a 204 No Content message.

If errors occur when processing the HTTP POST request, the Non-3GPP Message Gateway shall apply error handling procedures as specified in clause 9.2.6.

6.3.2.3 MSGG_N3GDelivery_GTDeliveryReport

6.3.2.3.1 General

This service operation corresponds to clause 9.2.2.2.2 as defined in 3GPP TS 23.554 [2], is used by MSGin5G Server to deliver the delivery status report to the Non-3GPP Message Gateway.

6.3.2.3.2 Non-3GPP Message Gateway Terminating Message Delivery Status Report

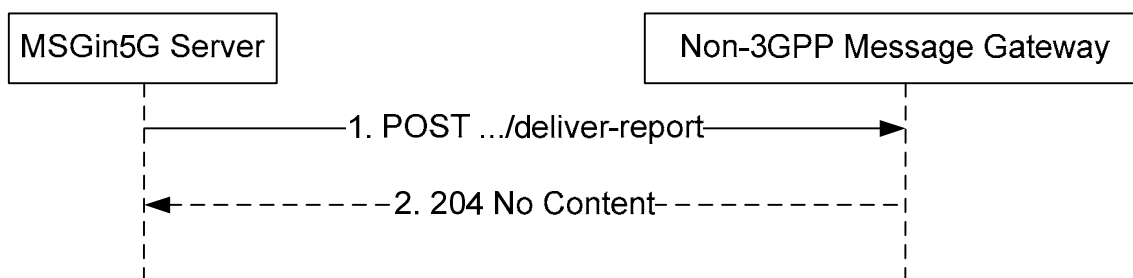


Figure 6.3.2.3.2-1: Non-3GPP Message Gateway Terminating Delivery Status Report

When the MSGin5G Server needs to send the delivery status report to the Non-3GPP Message Gateway, the MSGin5G Server shall send the HTTP POST request towards the "deliver-report" resource as shown in figure 6.3.2.3.2-1.

The MSGin5G Server shall send a POST request to the resource with a DeliveryStatusReport object in the request body.

The DeliveryStatusReport data type shall include:

- the Originating UE Service ID/AS Service ID within the "oriAddr" attribute;
- the Recipient UE Service ID within the "destAddr" attribute;
- the Message ID within the "msgId" attribute;
- the delivery status within the "delivSt" attribute; and

may include:

- the failure cause within the "failureCause" attribute.

When the Non-3GPP Message Gateway receives the HTTP POST request from the MSGin5G Server, the Non-3GPP Message Gateway shall respond to the MSGin5G Server with a 204 No Content message.

If errors occur when processing the HTTP POST request, the Non-3GPP Message Gateway shall apply error handling procedures as specified in clause 9.2.6.

6.4 MSGG_BGDelivery Service

6.4.1 Service Description

The MSGG_BGDelivery Service corresponding to Mbg as defined in 3GPP TS 23.554 [2], is provided by the Broadcast Message Gateway.

This service:

- allows MSGin5G Server invokes services provided by Broadcast Message Gateway to deliver MSGin5G messages to Broadcast Message Gateway.

6.4.2 Service Operations

6.4.2.1 Introduction

The service operation defined for MSGG_BGDelivery Service is shown in the table 6.4.2.1-1.

Table 6.4.2.1-1: Operations of the MSGG_BGDelivery Service

Service operation name	Description	Initiated by
MSGG_BGDelivery_GTDelivery	This service operation is used by MSGin5G Server to deliver MSGin5G message to Broadcast Message Gateway. This service operation corresponds to clause 9.2.3.1.2 as defined in 3GPP TS 23.554 [2].	MSGin5G Server

6.4.2.2 MSGG_BGDelivery_GTDelivery

6.4.2.2.1 General

This service operation corresponds to clause 9.2.3.1.2 as defined in 3GPP TS 23.554 [2], is used by MSGin5G Server to deliver MSGin5G message to the Broadcast Message Gateway.

6.4.2.2.2 Broadcast Message Gateway Terminating Message Delivery

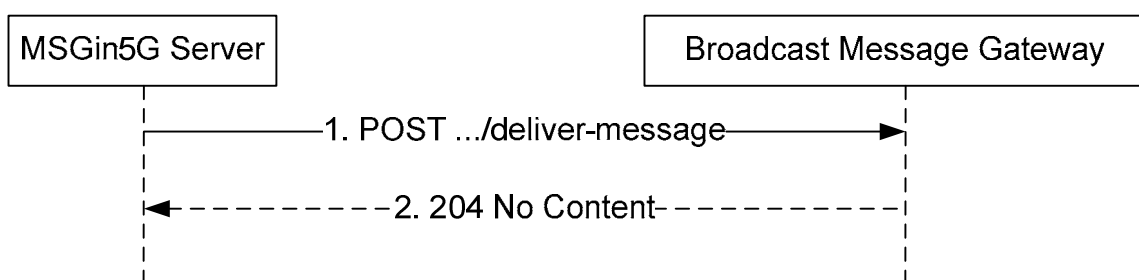


Figure 6.4.2.2.2-1: Broadcast Message Gateway Terminating Message Delivery

When the MSGin5G Server needs to send the message to the Broadcast Message Gateway, the MSGin5G Server shall send the HTTP POST request towards the "deliver-message" resource as shown in Figure 6.4.2.2.2-1.

The MSGin5G Server shall send a POST request to the resource with an BGMessageDelivery object in the request body.

The BGMessageDelivery data type shall include:

- the Originating UE Service ID/AS Service ID within the "oriAddr" attribute;
- the Recipient ID within the "destAddr" attribute;

- the Message ID within the "msgId" attribute;
- may include:
- the Payload within the "payload" attribute; and
 - the Application ID within the "appId" attribute; and
 - the indication whether the message delivery status report is required within the "delivStReqInd" attribute;
 - the priority type within the "priority" attribute;
 - the message segment flag within the "segInd" attribute; and
 - the message segment parameters within the "segParams" attribute, this attribute may include:
 - the segmentation set identifier within the "segId" attribute;
 - the total number of message segments within the "totalSegCount" attribute;
 - the message segment number within the "segNumb" attribute; and
 - the last segment flag within the "lastSegFlag" attribute;

When the Broadcast Message Gateway receives the HTTP POST request from the MSGin5G Server, the Broadcast Message Gateway shall respond to the MSGin5G Server with a 204 No Content message.

If errors occur when processing the HTTP POST request, the Broadcast Message Gateway shall apply error handling procedures as specified in clause 9.3.6.

7 Common information applicable to several APIs

7.1 General

MSGin5G APIs allow secure access to the capabilities provided by the MSGin5G.

This document specifies the procedures triggered at different functional entities as a result of API invocation requests and event notifications. The stage-2 level requirements and signalling flows are defined in 3GPP TS 23.554 [2].

Several design aspects, as mentioned in the following clauses, are specified in 3GPP TS 29.500 [4] and referenced by this specification.

7.2 Data Types

7.2.1 General

This clause defines structured data types, simple data types and enumerations that are applicable to several APIs defined in the present specification and can be referenced from data structures defined in the subsequent clauses.

In addition, data types that are defined in OpenAPI Specification [6] can also be referenced from data structures defined in the subsequent clauses.

NOTE: As a convention, data types in the present specification are written with an upper-case letter in the beginning. Parameters are written with a lower-case letter in the beginning. As an exception, data types that are also defined in OpenAPI Specification [6] can use a lower-case case letter in the beginning for consistency.

Table 7.2.1-1 specifies data types re-used by the MSGin5G from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the APIs of this specification.

Table 7.2.1-1: Re-used Data Types

Data type	Reference	Comments

7.2.2 Referenced structured data types

Table 7.2.2-1 lists structured data types defined in this specification referenced by multiple services.

Table 7.2.2-1: Referenced Structured Data Types

Data type	Reference	Description
Address	Clause 9.1.5.2.3	Represent an address
DeliveryStatusReport	Clause 8.2.5.2.7	The message delivery status report request information.
MessageSegmentParameters	Clause 8.2.5.2.5	Parameters for message segmentation

7.2.3 Referenced Simple data types and enumerations

Following simple data types defined in Table 7.2.3.1-1 are applicable to several APIs in this document:

Table 7.2.3.1-1: Simple data types applicable to several APIs

Type name	Reference	Description

7.3 Usage of HTTP

For MSGin5G APIs, support of HTTP/1.1 (IETF RFC 9110 [11], IETF RFC 9111 [14] and IETF RFC 9912 [10]) over TLS is mandatory and support of HTTP/2 (IETF RFC 9113 [16]) over TLS is recommended.

A functional entity desiring to use HTTP/2 shall use the HTTP upgrade mechanism to negotiate applicable HTTP version as described in IETF RFC 9113 [16].

7.4 Content type

JSON, IETF RFC 8259 [17], 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".

7.5 URI structure

7.5.1 Resource URI structure

The resource URI structure of all the APIs specified in this document shall be as specified in clause 5.2.4 of 3GPP TS 29.501 [9].

7.5.2 Custom operations URI structure

The custom operation definition is in Annex C of 3GPP TS 29.501 [9].

The URI of a custom operation which is associated with a resource shall have the following structure:

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

Custom operations can also be associated with the service instead of a resource. The URI of a custom operation which is not associated with a resource shall have the following structure:

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

In the above URI structures, "apiRoot", "apiName", "apiVersion" and "apiSpecificResourceUriPart" are as defined in clause 7.5.1 and "custOpName" represents the name of the custom operation as defined in clause 5.1.3.2 of 3GPP TS 29.501 [9].

7.6 Notifications

None.

7.7 Error Handling

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [4].

7.8 Feature negotiation

The procedures in clause 6.6.2 of 3GPP TS 29.500 [4] shall be applicable for the APIs defined in the present specification. For each of the APIs defined, the applicable list of features is contained in the related API definition.

7.9 HTTP headers

The MSGin5G API shall support mandatory HTTP custom header fields specified in clause 5.2.3.2 of 3GPP TS 29.500 [4] and may support HTTP custom header fields specified in clause 5.2.3.3 of 3GPP TS 29.500 [4]. No specific custom headers are defined for the MSGin5G API in the present specification.

7.10 Conventions for Open API specification files

The conventions for Open API specification files as specified in clause 5.3 of 3GPP TS 29.501 [9] shall be applicable for all APIs in this document.

8 Message Server API definition

8.1 MSGS_ASRegistration API

8.1.1 API URI

The MSGS_ASRegistration service shall use the MSGS_ASRegistration API.

The request URIs used in HTTP requests from the AS towards the MSGin5G Server shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName> shall be "msg-asregistration".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.1.2.

8.1.2 Resources

8.1.2.1 Overview

{apiRoot}/msgs-asregistration/<apiVersion>

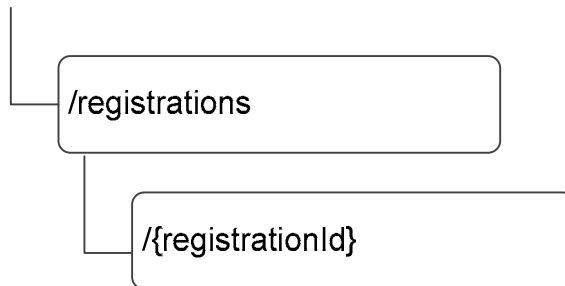


Figure 8.1.2.1-1: Resource URI structure of the MSGS_ASRegistration API

Table 8.1.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.1.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
AS Registrations	/registrations	POST	Registers a new AS at the MSGin5G Server.
AS DeRegistration	/registrations/{registrationId}	DELETE	Removes an AS registration resource.

8.1.2.2 Resource: AS Registrations

8.1.2.2.1 Description

This resource represents all the Application Servers that are registered at a given MSGin5G Server.

8.1.2.2.2 Resource Definition

Resource URI: {apiRoot}/msgs-asregistration/<apiVersion>/registrations

This resource shall support the resource URI variables defined in the table 8.1.2.2.2-1.

Table 8.1.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
apiVersion	string	See clause 8.1.1

8.1.2.2.3 Resource Standard Methods

8.1.2.2.3.1 POST

This method shall support the URI query parameters specified in table 8.1.2.2.3.1-1.

Table 8.1.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.1.2.2.3.1-2 and the response data structures and response codes specified in table 8.1.2.2.3.1-3.

Table 8.1.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ASRegistration	M	1	AS registration request information.

Table 8.1.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ASRegistrationAck	M	1	201 Created	AS information is registered successfully at MSGin5G Server. The URI of the created resource shall be returned in the "Location" HTTP header.
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] shall also apply.				

Table 8.1.2.2.3.1-4: Headers supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

Table 8.1.2.2.3.1-5: 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}/msg-asregistration/<apiVersion>/registrations/{registrationId}

Table 8.1.2.2.3.1-6: Links supported by the 200 Response Code on this endpoint

Name	Resource name	HTTP method or custom operation	Link parameter(s)	Description
n/a				

8.1.2.3 Resource: AS DeRegistration

8.1.2.3.1 Description

This resource represents all the Application Servers that are deregistered at a given MSGin5G Server.

8.1.2.3.2 Resource Definition

Resource URI: {apiRoot}/msg-asregistration/<apiVersion>/registrations/{registrationId}

This resource shall support the resource URI variables defined in the table 8.1.2.3.2-1.

Table 8.1.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
apiVersion	string	See clause 8.1.1
registrationId	string	The AS registration resource id

8.1.2.3.3 Resource Standard Methods

8.1.2.3.3.1 DELETE

This method deregisters an AS registration from the MSGin5G Server. This method shall support the URI query parameters specified in the table 8.1.2.3.3.1-1.

Table 8.1.2.3.3.1-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.1.2.3.3.1-2 and the response data structures and response codes specified in table 8.1.2.3.3.1-3.

Table 8.1.2.3.3.1-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.1.2.3.3.1-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ASRegistrationAck	M	1	200 OK	The AS DeRegistration information matching the registrationId is deleted.
n/a			204 No Content	Successful response. The individual AS registration matching the registrationId is successfully deleted.
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] shall also apply.				

Table 8.1.2.3.3.1-4: Headers supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

Table 8.1.2.3.3.1-5: Headers supported by the 204 response code on this resource

Name	Data type	P	Cardinality	Description
n/a				

Table 8.1.2.3.3.1-6: Links supported by the 200 Response Code on this endpoint

Name	Resource name	HTTP method or custom operation	Link parameter(s)	Description
n/a				

8.1.3 Custom Operations without associated resources

None.

8.1.4 Notifications

None.

8.1.5 Data Model

8.1.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API. Table 8.1.5.1-1 specifies the data types defined specifically for the MSGS_ASRegistration API service.

Table 8.1.5.1-1: MSGS_ASRegistration API specific Data Types

Data type	Section defined	Description	Applicability
ASRegistration	8.1.5.2.2	The AS registration request information.	
ASRegistrationAck	8.1.5.2.3	The AS registration response information.	
ASProfile	8.1.5.2.4	The profile information related to the AS in the ASRegistration data type.	

Table 8.1.5.1-2 specifies data types re-used by the MSGS_ASRegistration API service.

Table 8.1.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
ProblemDetails	3GPP TS 29.571 [5]		
Uri	3GPP TS 29.571 [5]		

8.1.5.2 Structured data types

8.1.5.2.1 Introduction

8.1.5.2.2 Type: ASRegistration

Table 8.1.5.2.2-1: Definition of type ASRegistration

Attribute name	Data type	P	Cardinality	Description	Applicability
asSvcId	string	M	1	The MSGin5G identifier of the Application Server.	
appld	string	O	0..1	The identifier of the application specified by the application provider	
targetUri	Uri	O	0..1	The URL for receiving message, message delivery status report, etc. The MSGin5G Server uses this URL to interact to AS.	
asProf	ASProfile	O	0..1	The profile information of the AS.	

8.1.5.2.3 Type: ASRegistrationAck

Table 8.1.5.2.3-1: Definition of type ASRegistrationAck

Attribute name	Data type	P	Cardinality	Description	Applicability
asSvcId	string	M	1	The MSGin5G identifier of the Application Server.	
result	ProblemDetails	M	1	The result of the registration.	

8.1.5.2.4 Type: ASProfile

Table 8.1.5.2.4-1: Definition of type ASProfile

Attribute name	Data type	P	Cardinality	Description	Applicability
appName	string	O	1	The name of the Application Server	
appProviders	array(string)	O	1..N	The provider of the Application Server	
appScenarios	array(string)	O	1..N	The application scenario description.	
appCategory	string	O	0..1	The category or type of Application Server.	
asStatus	string	O	0..1	AS status (e.g. Enabled, Disabled etc.)	

8.1.5.3 Simple data types and enumerations

None.

8.1.6 Error Handling

8.1.6.1 General

HTTP error handling shall be supported as specified in clause 7.7.

In addition, the requirements in the following clauses shall apply.

8.1.6.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the MSGS_ASRegistration API.

8.1.6.3 Application Errors

The application errors defined for the MSGS_ASRegistration API are listed in table 8.1.6.3-1.

Table 8.1.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.1.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.1.7-1 lists the supported features for MSGS_ASRegistration API.

Table 8.1.7-1: Supported Features

Feature number	Feature Name	Description

8.2 MSGS_MSGDelivery API

8.2.1 API URI

The MSGS_MSGDelivery service shall use the MSGS_MSGDelivery API, The MSGS_MSGDelivery API corresponding to Mm5s APIs as defined in in 3GPP TS 23.554 [2].

The request URIs used in HTTP requests from the Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) or the Application Server towards the MSGIn5G Server shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName> shall be "msgsg-delivery".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.2.2.

8.2.2 Resources

None.

8.2.3 Custom Operations without associated resources

8.2.3.1 Overview

The structure of the custom operation URIs of the MSGS_MSGDelivery service is shown in Figure 8.2.3.1-1.

{apiRoot}/msgs-msgdelivery/<apiVersion>

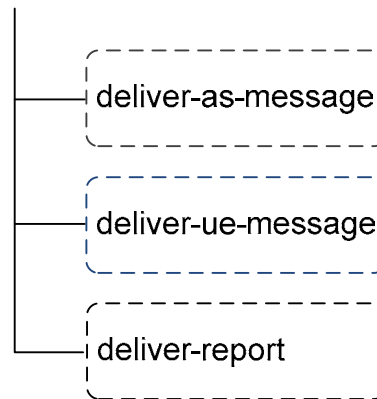


Figure 8.2.3.1-1: Custom operation URI structure of the MSGS_MSGDelivery API

Table 8.2.3.1-1 provides an overview of the custom operations and applicable HTTP methods.

Table 8.2.3.1-1: Custom operations without associated resources

Custom operation URI	Mapped HTTP method	Description
{apiRoot}/msgs-msgdelivery/<apiVersion>/deliver-as-message	POST	Request of AS to deliver message to a given MSGin5G Server.
{apiRoot}/msgs-msgdelivery/<apiVersion>/deliver-ue-message	POST	Request of Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) to deliver message to a given MSGin5G Server.
{apiRoot}/msgs-msgdelivery/<apiVersion>/deliver-report	POST	Request of Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) to deliver status report to a given MSGin5G Server.

8.2.3.2 Operation: deliver-as-message

8.2.3.2.1 Description

This operation is used by the Application Server to deliver message to a given MSGin5G Server.

8.2.3.2.2 Operation Definition

This operation shall support the response data structures and response codes specified in Table 8.2.3.2.2-1 and Table 8.2.3.2.2-2.

Table 8.2.3.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ASMessageDelivery	M	1	Represents the data to be used for AS to deliver message.

Table 8.2.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
MessageDeliveryAck	M	1	200 OK	AS Message is delivered successfully.
NOTE: 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.				

8.2.3.3 Operation: deliver-ue-message

8.2.3.3.1 Description

This operation is used by the Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) to deliver message to a given MSGin5G Server.

8.2.3.3.2 Operation Definition

This operation shall support the response data structures and response codes specified in Table 8.2.3.3.2-1 and Table 8.2.3.3.2-2.

Table 8.2.3.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
UEMessageDelivery	M	1	Represents the data to be used for Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) to deliver message.

Table 8.2.3.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
MessageDeliveryAck	M	1	200 OK	UE Message is delivered successfully.
NOTE: 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.				

8.2.3.4 Operation: deliver-report

8.2.3.4.1 Description

This operation is used by the Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) or the Application Server to deliver status report to a given MSGin5G Server.

8.2.3.4.2 Operation Definition

This operation shall support the response data structures and response codes specified in Table 8.2.3.4.2-1 and Table 8.2.3.4.2-2.

Table 8.2.3.4.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
DeliveryStatusReport	M	1	Represents the data to be used for Message Gateway (on behalf of Legacy 3GPP UE or Non-3GPP UE) or the Application Server to deliver status report.

Table 8.2.3.4.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
MessageDeliveryAck	M	1	200 OK	The status report is delivered successfully.
NOTE: 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.				

8.2.4 Notifications

None.

8.2.5 Data Model

8.2.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API. Table 8.2.5.1-1 specifies the data types defined specifically for the MSGS_MSGDelivery API service.

Table 8.2.5.1-1: API specific Data Types

Data type	Section defined	Description	Applicability
ASMessageDelivery	8.2.5.2.2	The AS message delivery request information.	
DeliveryStatus	8.2.5.3.3	Indicates if delivery is a failure, or if the message is stored for deferred delivery.	
DeliveryStatusReport	8.2.5.2.7	The message delivery status report request information.	
MessageDeliveryAck	8.2.5.2.4	The message delivery response information.	
MessageSegmentParameters	8.2.5.2.5	Contains the message segment information of the message.	
Priority	8.2.5.3.5	Application priority level requested for this message.	
ReportDeliveryStatus	8.2.5.3.4	The delivery status description, including success or failure in delivery.	
StoreAndForwardParameters	8.2.5.2.6	Contains the store forward information of the message.	
UEMessageDelivery	8.2.5.2.3	The UE message delivery request information.	

Table 8.2.5.1-2 specifies data types re-used by the MSGS_MSGDelivery API service.

Table 8.2.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
Address	9.1.5.2.3	The data type of the oriAddr and destAddr.	
DateTime	3GPP TS 29.571 [5]	String with format "date-time" as defined in OpenAPI Specification [6].	

8.2.5.2 Structured data types

8.2.5.2.1 Introduction

8.2.5.2.2 Type: ASMessageDelivery

Table 8.2.5.2.2-1: Definition of type ASMessageDelivery

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the sending Application Server (NOTE).	
destAddr	Address	M	1	The service identity of the receiving Legacy 3GPP UE, Non-3GPP UE or MSGin5G UE. The service identifier of the target MSGin5G Group. The service identifier of the Broadcast Service Area where the message needs to be broadcast. Indicates which Messaging Topic this message is related to.	
appld	string	O	0..1	Identifies the application(s) for which the content is intended. This list of Application IDs IE is required when the message is sent to one or multiple Application Clients served by same MSGin5G Client.	
msgld	string	M	1	Unique identifier of this message.	
delivStReqInd	boolean	O	0..1	Indicates if delivery acknowledgement from the recipient is requested. Set to "true" if delivery acknowledgement from the recipient is requested. otherwise set to "false". Default value is "false".	
payload	string	O	0..1	Payload of the message.	
priority	Priority	O	0..1	Application priority level requested for this message.	
segInd	boolean	O	0..1	Indicates this message is part of a segmented message. Set to "true" if the message is part of a segmented message. otherwise set to "false". Default value is "false".	
segParams	MessageSegmentParameters	O	0..1	The message segment parameters. This IE shall be included only if the value of the message Segment Flag IE indicates that message Segment services are requested.	
stoAndFwInd	boolean	M	1	An indicator of whether store and forward services are requested for this message. Set to "true" if it is required to store and forward services for this message. otherwise set to "false".	
stoAndFwParams	StoreAndForwardParameters	O	0..1	Parameters used by MSGin5G Server for providing store and forward services, This IE shall be included only if the value of the Store and forward flag IE indicates that store and forward services are requested.	
latency	integer	O	0..1	The latency requirement for the message which only applies to AS Originating MSGin5G Message. Unit: millisecond.	
NOTE: Only "AS" is applicable to the addrType attribute in the Address data type to represent the originating type of message request.					

8.2.5.2.3 Type:UEMessageDelivery

Table 8.2.5.2.3-1: Definition of type UEMessageDelivery

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the sending Legacy 3GPP UE or Non-3GPP UE (NOTE).	
destAddr	Address	M	1	The service identity of the receiving Application Server or MSGin5G UE.	
appld	string	O	0..1	Identifies the application(s) for which the content is intended. This list of Application IDs IE is required when the message is sent to one or multiple Application Clients served by same MSGin5G Client.	
msgld	string	M	1	Unique identifier of this message.	
delivStReqInd	boolean	O	0..1	Indicates if delivery acknowledgement from the recipient is requested. Set to "true" if delivery acknowledgement from the recipient is requested. otherwise set to "false". Default value is "false".	
payload	string	O	0..1	Payload of the message.	
segInd	boolean	O	0..1	Indicates this message is part of a segmented message. Set to "true" if the message is part of a segmented message. otherwise set to "false". Default value is "false".	
segParams	MessageSegmentParameters	O	0..1	The message segment parameters. This IE shall be included only if the value of the message Segment Flag IE indicates that message Segment services are requested.	
stoAndFwInd	boolean	M	1	An indicator of whether store and forward services are requested for this message. Set to "true" if it is required to store and forward services for this message. otherwise set to "false".	
stoAndFwParams	StoreAndForwardParameters	O	0..1	Parameters used by MSGin5G Server for providing store and forward services, This IE shall be included only if the value of the Store and forward flag IE indicates that store and forward services are requested.	
NOTE: Only "UE" is applicable to the addrType attribute in the Address data type to represent the originating type of message request.					

8.2.5.2.4 Type: MessageDeliveryAck

Table 8.2.5.2.4-1: Definition of type MessageDeliveryAck

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the sending Legacy 3GPP UE, Non-3GPP UE or the sending Application Server (NOTE).	
msgld	string	M	1	Unique identifier of this message.	
status	DeliveryStatus	O	0..1	Indicates if delivery is a failure, or if the message is stored for deferred delivery.	
failureCause	string	C	0..1	The reason for failure. May only be present if the "status" attribute is set to "DELY_FAILED".	
NOTE: Either "UE" or "AS" shall be included in the "addrType" attribute within the Address data type to represent the originating type of message request.					

8.2.5.2.5 Type:MessageSegmentParameters

Table 8.2.5.2.5-1: Definition of type MessageSegmentParameters

Attribute name	Data type	P	Cardinality	Description	Applicability
segId	string	O	0..1	All segmented messages associated within the same set of segmented messages (i.e. associated with the same MSGin5G message) are assigned the same unique identifier.	
totalSegCount	integer	O	0..1	Indicates the total number of segments for the message.	
segNumb	integer	O	0..1	Indicates segmented message number of each segmented message within a set of segmented messages.	
lastSegFlag	boolean	O	0..1	An indicator of whether this segmented message is the last segment in the set of segmented messages or not. Set to "true" if the segmented message is the last segment in the set of segmented messages. otherwise set to "false". Default value is "false".	

8.2.5.2.6 Type:StoreAndForwardParameters

Table 8.2.5.2.6-1: Definition of type StoreAndForwardParameters

Attribute name	Data type	P	Cardinality	Description	Applicability
exprTime	DateTime	O	0..1	Indicates message expiration time.	

8.2.5.2.7 Type:DeliveryStatusReport

Table 8.2.5.2.7-1: Definition of type DeliveryStatusReport

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the sending Legacy 3GPP UE, Non-3GPP UE or the sending Application Server (NOTE).	
destAddr	Address	M	1	The service identity of the receiving Legacy 3GPP UE, Non-3GPP UE or the receiving Application Server (NOTE).	
msgId	string	M	1	Unique identifier of this message.	
failureCause	string	C	0..1	The Failure Cause indicates the failure reason, if applicable. May only be present if the ReportDeliveryStatus sets to "REPT_DELY_FAILED".	
delivSt	ReportDeliveryStatus	M	1	The delivery status description, including success or failure in delivery.	
NOTE: Either "UE" or "AS" shall be included in the addrType attribute in Address data type to represent the originating type of message request.					

8.2.5.3 Simple data types and enumerations

8.2.5.3.1 Introduction

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

8.2.5.3.2 Simple data types

None.

8.2.5.3.3 Enumeration: DeliveryStatus

Table 8.2.5.3.3-1: Enumeration DeliveryStatus

Enumeration value	Description	Applicability
DELY_FAILED	Indicates that the message delivery is failed.	
DELY_STORED	Indicates that the message is stored for deferred delivery.	

8.2.5.3.4 Enumeration: ReportDeliveryStatus

Table 8.2.5.3.4-1: Enumeration ReportDeliveryStatus

Enumeration value	Description	Applicability
REPT_DELY_SUCCESS	Indicates that the report delivery is successful.	
REPT_DELY_FAILED	Indicates that the report delivery is failed.	

8.2.5.3.5 Enumeration:Priority

Table 8.2.5.3.5-1: Enumeration Priority

Enumeration value	Description	Applicability
HIGH	Indicates the messages should be sent in high priority.	
MIDDLE	Indicates the messages should be sent in middle priority.	
LOW	Indicates the messages should be sent in low priority.	

8.2.6 Error Handling

8.2.6.1 General

HTTP error handling shall be supported as specified in clause 7.7.

In addition, the requirements in the following clauses shall apply.

8.2.6.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the MSGS_MSGDelivery API.

8.2.6.3 Application Errors

The application errors defined for the MSGS_MSGDelivery API are listed in table 8.2.6.3-1.

Table 8.2.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.2.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.2.7-1 lists the supported features for MSGS_MSGDelivery API.

Table 8.2.7-1: Supported Features

Feature number	Feature Name	Description

8.3 MSGS_TopiclistEvent API

8.3.1 API URI

The MSGS_TopiclistEvent service shall use the MSGS_TopiclistEvent API.

The request URIs used in HTTP requests from the MSGin5G Server 1 towards the MSGin5G Server 2 shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName> shall be "msgsg-topiclistevent".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.3.2.

8.3.2 Resources

8.3.2.1 Overview

{apiRoot}/msgsg-topiclistevent/<apiVersion>

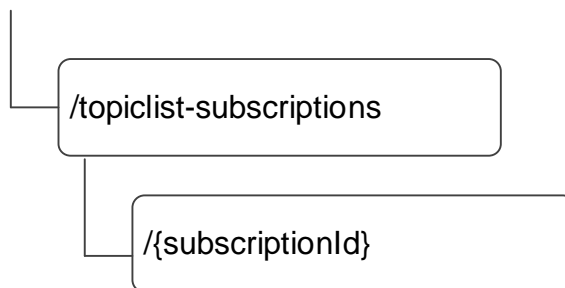


Figure 8.3.2.1-1: Resource URI structure of the MSGS_TopiclistEvent API

Table 8.3.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.3.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Topic List Subscriptions	/topiclist-subscriptions	POST	Subscribe to a Messaging Topic list on a MSGin5G Server.
Individual Topic List Subscription	/topiclist-subscriptions/{subscriptionId}	POST	Individual Messaging Topic list subscription resource.

8.3.2.2 Resource: Topic List Subscriptions

8.3.2.2.1 Description

This resource represents all the MSGin5G Servers that are subscribed at a given Messaging Topic on a MSGin5G Server.

8.3.2.2.2 Resource Definition

Resource URI: {apiRoot}/msgs-topiclistevent/<apiVersion>/topiclist-subscriptions

This resource shall support the resource URI variables defined in the table 8.3.2.2.2-1.

Table 8.3.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
apiVersion	string	See clause 8.3.1

8.3.2.2.3 Resource Standard Methods

8.3.2.2.3.1 POST

This method shall support the URI query parameters specified in table 8.3.2.2.3.1-1.

Table 8.3.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.3.2.2.3.1-2 and the response data structures and response codes specified in table 8.3.2.2.3.1-3.

Table 8.3.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
TopicListSubscription	M	1	Messaging Topic list subscription request information.

Table 8.3.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
TopicListSubscriptionAck	M	1	201 Created	The creation of an Messaging Topic list subscription resource is confirmed. The URI of the created resource shall be returned in the "Location" HTTP header.
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] shall also apply.				

Table 8.3.2.2.3.1-4: Headers supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

Table 8.3.2.2.3.1-5: 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}/msgstopiclistevent/<apiVersion>/topiclist-subscriptions/{subscriptionId}

8.3.2.3 Resource: Individual Topic List Subscription

8.3.2.3.1 Description

The Individual Topic List Subscription resource represents single Messaging Topic list subscription at a given MSGin5G Server. The resource allows an MSGin5G Server to delete Individual Topic List Subscription resource.

8.3.2.3.2 Resource Definition

Resource URI: {apiRoot}/msgstopiclistevent/<apiVersion>/topiclist-subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in the table 8.3.2.3.2-1.

Table 8.3.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
apiVersion	string	See clause 8.3.1
subscriptionId	string	The MSGin5G Server Messaging Topic list subscription resource id

8.3.2.3.3 Resource Standard Methods

8.3.2.3.3.1 POST

This method shall support the URI query parameters specified in table 8.3.2.3.3.1-1.

Table 8.3.2.3.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.3.2.3.3.1-2 and the response data structures and response codes specified in table 8.3.2.3.3.1-3.

Table 8.3.2.3.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
TopicListUnsubscription	M	1	Messaging Topic list unsubscription request information.

Table 8.3.2.3.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful response. The individual MSGin5G Server Messaging Topic list subscription matching the subscriptionId is successfully deleted.
TopicListUnsubscriptionAck	M	1	200 OK	Response of successfully handled Topic list unsubscription request with status information if subscription is not deleted.

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] shall also apply.

Table 8.3.2.3.3.1-4: Headers supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

Table 8.3.2.3.3.1-5: Headers supported by the 204 response code on this resource

Name	Data type	P	Cardinality	Description
n/a				

8.3.3 Custom Operations without associated resources

8.3.3.1 Overview

The structure of the custom operation URIs of the MSGS_MSGTopiclistEvent service is shown in Figure 8.3.3.1-1.

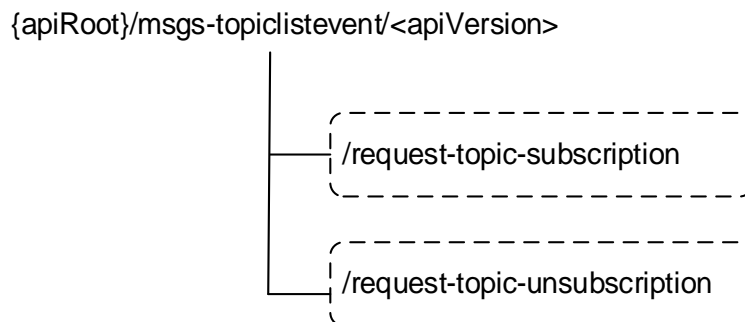


Figure 8.3.3.1-1: Custom operation URI structure of the MSGS_TopiclistEvent API

Table 8.3.3.1-1 provides an overview of the custom operations and applicable HTTP methods.

Table 8.3.3.1-1: Custom operations without associated resources

Custom operation URI	Mapped HTTP method	Description
{apiRoot}/msgstopiclistevent/<apiVersion>/request-topic-subscription	POST	Request of MSGin5G Server to deliver Messaging Topic subscription to another given MSGin5G Server.
{apiRoot}/msgstopiclistevent/<apiVersion>/request-topic-unsubscription	POST	Request of MSGin5G Server to deliver Messaging Topic unsubscription to another given MSGin5G Server.

8.3.3.2 Operation: request-topic-subscription

8.3.3.2.1 Description

The operation is used by the MSGin5G Server to request the other MSGin5G Server to create a subscription for one or more Messaging Topic(s).

8.3.3.2.2 Operation Definition

This operation shall support the request data structures shown in Table 8.3.3.2.2-1 and the response data structures and error codes specified in Tables 8.3.3.2.2-2.

Table 8.3.3.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
TopicSubscription	M	1	Information about the Messaging Topic subscription that the MSGin5G Server shall create.

Table 8.3.3.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
TopicSubscription Ack	M	1	200 OK	Successful request to trigger the creation of a subscription for Messaging Topic at the MSGin5G Server.
NOTE: 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.				

8.3.3.3 Operation: request-topic-unsubscription

8.3.3.3.1 Description

The operation is used by the MSGin5G Server to request the other MSGin5G Server to remove a subscription for one or more Messaging Topic(s).

8.3.3.3.2 Operation Definition

This operation shall support the request data structures shown in Table 8.3.3.3.2-1 and the response data structures and error codes specified in Tables 8.3.3.3.2-2.

Table 8.3.3.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
TopicUnsubscription	M	1	Reference used to identify the Messaging Topic subscription that the MSGin5G Server shall remove.

Table 8.3.3.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful request to trigger the removal of a subscription for Messaging Topic(s) on the MSGin5G Server.
NOTE: 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.				

8.3.4 Notifications

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 8.3.4.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
TopicList Notification	{notificationURI}	POST	Notify about Messaging Topic list changes from MSGin5G Server.

8.3.4.2 Topiclist Notification

8.3.4.2.1 Description

The Topiclist Notification is used by the MSGin5G Server to notify Messaging Topic list change events to another MSGin5G Server that has subscribed to such Messaging Topic list.

8.3.4.2.2 Target URI

The Callback URI "{notificationURI}" shall be used with the callback URI variables defined in table 8.3.4.2.2-1.

Table 8.3.4.2.2-1: Callback URI variables

Name	Definition
notificationURI	String formatted as URI with the Callback Uri

8.3.4.2.3 Standard Methods

8.3.4.2.3.1 POST

This method shall support the request data structures specified in table 8.3.4.2.3.1-1 and the response data structures and response codes specified in table 8.3.4.2.3.1-2.

Table 8.3.4.2.3.1-1: Data structures supported by the POST Request Body

Data type	P	Cardinality	Description
TopicListNotification	M	1	Provides information about subscribed Messaging Topic list.

Table 8.3.4.2.3.1-2: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The receipt of the Notification is acknowledged.
NOTE 1: 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.				

8.3.5 Data Model

8.3.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API. Table 8.3.5.1-1 specifies the data types defined specifically for the MSGS_TopiclistEvent API service.

Table 8.3.5.1-1: TopiclistEvent API specific Data Types

Data type	Section defined	Description	Applicability
TopicListSubscription	8.3.5.2.2	The Messaging Topic list subscription request information.	
TopicListUnsubscription	8.3.5.2.3	The Messaging Topic list unsubscription request information	
TopicListSubscriptionAck	8.3.5.2.4	The Messaging Topic list subscription response information, indicating the subscription result.	
TopicListUnsubscriptionAck	8.3.5.2.5	The Messaging Topic list unsubscription response information, indicating the subscription result.	
TopicSubscription	8.3.5.2.6	The Messaging Topic subscription request information.	
TopicSubscriptionAck	8.3.5.2.7	The Messaging Topic subscription response information.	
TopicUnsubscription	8.3.5.2.8	The Messaging Topic list unsubscription request information.	
TopicListNotification	8.3.5.2.9	The Messaging Topic list notification information, indicating changed Messaging Topics.	
MessagingTopic	8.3.5.2.10	The individual Messaging Topic information	

Table 8.3.5.1-2 specifies data types re-used by the MSGS_TopiclistEvent API service.

Table 8.3.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
Uri	3GPP TS 29.571 [5]		
SupportedFeatures	3GPP TS 29.571 [5]	Used to negotiate the optional features defined in table 8.3.7-1.	

8.3.5.2 Structured data types

8.3.5.2.1 Introduction

8.3.5.2.2 Type: TopicListSubscription

Table 8.3.5.2.2-1: Definition of type TopicListSubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the MSGin5G Server which requests the Messaging Topic list subscription.	
destAddr	Address	M	1	The service identity of the receiving MSGin5G Server.	
notificationURI	Uri	M	1	Notification target address.	
secCred	string	O	0..1	Security information required by the MSGin5G Server.	
exprTime	DateTime	O	0..1	The expiration time of this subscription requested, and should be larger than 0 if included. If not included, the expiration time subjects to operator policy.	
suppFeat	Supported Features	C	0..1	This IE represents a list of Supported features as described in clause 8.3.7. It shall be present if at least one feature defined in clause 8.3.7 is supported.	

8.3.5.2.3 Type: TopicListUnsubscription

Table 8.3.5.2.3-1: Definition of type TopicListSubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the MSGin5G Server which requests the Messaging Topic list unsubscription.	
destAddr	Address	M	1	The service identity of the receiving MSGin5G Server.	
secCred	string	O	0..1	Security information required by the MSGin5G Server.	

8.3.5.2.4 Type: TopicListSubscriptionAck

Table 8.3.5.2.4-1: Definition of type TopicListSubscriptionAck

Attribute name	Data type	P	Cardinality	Description	Applicability
subStat	string	M	1	The result of the subscription.	
exprTime	DateTime	O	0..1	Indicates the expiration time of the subscription.	
suppFeat	Supported Features	C	0..1	This IE represents a list of Supported features as described in clause 8.3.7. It shall be present if at least one feature defined in clause 8.3.7 is supported.	

8.3.5.2.5 Type: TopicListUnsubscriptionAck

Table 8.3.5.2.5-1: Definition of type TopicListSubscriptionAck

Attribute name	Data type	P	Cardinality	Description	Applicability
subStat	string	M	1	The result of the subscription.	

8.3.5.2.6 Type: TopicSubscription

Table 8.3.5.2.6-1: Definition of type TopicSubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	string	M	1	The Service identifier of the originating MSGin5G Client or Application Server, or MSGin5G Server	
msgTopics	array(string)	M	1..N	Information of Messaging Topic(s) to be subscribed	
secCred	string	O	0..1	Security information required by the MSGin5G Server.	
exprTime	DateTime	O	0..1	The expiration time of this subscription requested, and should be larger than 0 if included. If not included, the expiration time subjects to operator policy.	

8.3.5.2.7 Type: TopicSubscriptionAck

Table 8.3.5.2.7-1: Definition of type TopicSubscriptionAck

Attribute name	Data type	P	Cardinality	Description	Applicability
subStat	string	M	1	Indicating update status of the Messaging Topic if newly created or deleted.	
exprTime	DateTime	O	0..1	The expiration time of this subscription set by MSGin5G Server.	

8.3.5.2.8 Type: TopicUnsubscription

Table 8.3.5.2.8-1: Definition of type TopicUnsubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	string	M	0..1	The Service identifier of the originating MSGin5G Client or Application Server, or MSGin5G Server.	
secCred	string	O	0..1	Security information required by the MSGin5G Server.	
msgTopics	array(string)	M	1..N	Information of Messaging Topic(s) to be unsubscribed.	

8.3.5.2.9 Type: TopicListNotification

Table 8.3.5.2.9-1: Definition of type TopicListNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
exprTime	DateTime	O	0..1	The expiration time of this subscription set by MSGin5G Server.	
msgTopics	array(MessagingTopic)	M	1..N	List of Messaging Topic(s) information notified by MSGin5G Server.	

8.3.5.2.10 Type: MessagingTopic

Table 8.3.5.2.10-1: Definition of type MessagingTopic

Attribute name	Data type	P	Cardinality	Description	Applicability
msgTopic	string	M	1	The identifier of the Messaging Topic.	
updateStat	UpdateStatus	M	1	Indicating update status of the Messaging Topic if newly created or deleted.	

8.3.5.3 Simple data types and enumerations

8.3.5.3.1 Introduction

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

8.3.5.3.2 Enumeration: UpdateStatus

Table 8.3.5.3.2-1: Enumeration UpdateStatus

Enumeration value	Description	Applicability
CREATED	The Messaging Topic is newly created.	
DELETED	The Messaging Topic is newly deleted.	

8.3.6 Error Handling

8.3.6.1 General

HTTP error handling shall be supported as specified in clause 7.7.

In addition, the requirements in the following clauses shall apply.

8.3.6.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the MSGS_TopiclistEvent API.

8.3.6.3 Application Errors

The application errors defined for the MSGS_TopiclistEvent API are listed in table 8.3.6.3-1.

Table 8.3.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.3.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.3.7-1 lists the supported features for MSGS_TopiclistEvent API.

Table 8.3.7-1: Supported Features

Feature number	Feature Name	Description

9 Message Gateway API definition

9.1 MSGG_L3GDelivery API

9.1.1 API URI

The MSGG_L3GDelivery service shall use the MSGG_L3GDelivery API, The MSGG_L3GDelivery API corresponding to M13g APIs as defined in in 3GPP TS 23.554 [2].

The request URIs used in HTTP requests from the MSGin5G Server towards the Legacy 3GPP Message Gateway shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName> shall be "msgg-l3gdelivery".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 9.1.3.

9.1.2 Resources

None.

9.1.3 Custom Operations without associated resources

9.1.3.1 Overview

The structure of the custom operation URIs of the MSGG_L3GDelivery service is shown in Figure 9.1.3.1-1.

{apiRoot}/msgg-l3gdelivery/<apiVersion>

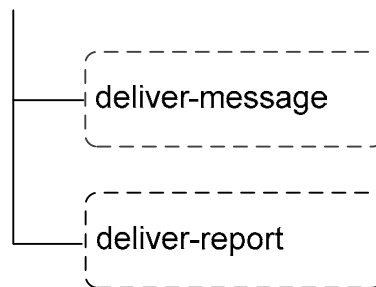


Figure 9.1.3.1-1: Custom operation URI structure of the MSGG_L3GDelivery API

Table 9.1.3.1-1 provides an overview of the custom operations and applicable HTTP methods.

Table 9.1.3.1-1: Custom operations without associated resources

Custom operation URI	Mapped HTTP method	Description
{apiRoot}/msgg-l3gdelivery/<apiVersion>/deliver-message	POST	Request of MSGin5G Server to deliver message to a given Legacy 3GPP Message Gateway.
{apiRoot}/msgg-l3gdelivery/<apiVersion>/deliver-report	POST	Request of MSGin5G Server to deliver status report to a given Legacy 3GPP Message Gateway.

9.1.3.2 Operation: deliver-message

9.1.3.2.1 Description

This operation is used by the MSGin5G Server to deliver message to a given Legacy 3GPP Message Gateway.

9.1.3.2.2 Operation Definition

This operation shall support the response data structures and response codes specified in table 9.1.3.2.2-1 and table 9.1.3.2.2-2.

Table 9.1.3.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
L3gMessageDelivery	M	1	Represents the data to be used for MSGin5G Server to deliver message.

Table 9.1.3.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The Message is Delivered successfully.
NOTE: 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.				

9.1.3.3 Operation: deliver-report

9.1.3.3.1 Description

This operation is used by the MSGin5G Server to deliver status report to a given Legacy 3GPP Message Gateway.

9.1.3.3.2 Operation Definition

This operation shall support the response data structures and response codes specified in Table 9.1.3.3.2-1 and Table 9.1.3.3.2-2.

Table 9.1.3.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
DeliveryStatusReport	M	1	Represents the data to be used for MSGin5G Server to deliver status report.

Table 9.1.3.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The status report is Delivered successfully.
NOTE: 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.				

9.1.4 Notifications

None.

9.1.5 Data Model

9.1.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API. Table 9.1.5.1-1 specifies the data types defined specifically for the MSGG_L3GDelivery API service.

Table 9.1.5.1-1: MSGG_L3GDelivery API specific Data Types

Data type	Section defined	Description	Applicability
L3gMessageDelivery	9.1.5.2.2	Information within message delivery request.	

Table 9.1.5.1-2 specifies data types re-used by the MSGG_L3GDelivery API service.

Table 9.1.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
DeliveryStatusReport	8.2.5.2.7	The message delivery status report request information.	
MessageSegmentParameters	8.2.5.2.5	Contains the message segment information of the message.	

9.1.5.2 Structured data types

9.1.5.2.1 Introduction

9.1.5.2.2 Type: L3gMessageDelivery

Table 9.1.5.2.2-1: Definition of type L3gMessageDelivery

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the originating MSGin5G Client or the originating Application Server. This IE is copied from the associated inbound message (NOTE).	
destAddr	Address	M	1	The service identity of the receiving entity. The receiving entity can only be Legacy 3GPP UE Service ID in MSGG_L3GDelivery API.	
appld	string	O	0..1	Identifies the application(s) for which the content is intended. This list of Application IDs IE is required when the message is sent to one or multiple Application Clients served by same MSGin5G Client.	
msgld	string	M	1	Unique identifier of this message. This IE is copied from the associated inbound message request	
delivStReqInd	boolean	O	0..1	Indicates if delivery acknowledgement from the recipient is requested. This IE is copied from the associated inbound message. Set to "true" if delivery acknowledgement from the recipient is requested. otherwise set to "false". Default value is "false".	
payload	string	O	0..1	Payload of the message. This IE is copied from the associated inbound message.	
segInd	boolean	O	0..1	Indicates this message is part of a segmented message. Set to "true" if the message is part of a segmented message. otherwise set to "false". Default value is "false".	
segParams	MessageSegmentParameters	O	0..1	The message segment parameters. This IE shall be included only if the value of segInd is true to indicate that message Segment services are requested.	
NOTE: The addrType in Address data type shall only include AS or UE to represent the originating of message request.					

9.1.5.2.3 Type: Address

Table 9.1.5.2.3-1: Definition of type Address

Attribute name	Data type	P	Cardinality	Description	Applicability
addrType	AddressType	M	1	Represent the type of message request.	
addr	string	M	1	Refer to UE Service ID or AS Service ID or Group Service ID or Broadcast Area ID or Messaging Topic.	

9.1.5.3 Simple data types and enumerations

9.1.5.3.1 Introduction

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

9.1.5.3.2 Enumeration: AddressType

Table 9.1.5.3.2-1: Enumeration AddressType

Enumeration value	Description	Applicability
UE	The address type is UE.	
AS	The address type is AS.	
GROUP	The address type is GROUP.	
BC	The address type is BC.	
TOPIC	The address type is TOPIC.	

9.1.6 Error Handling

9.1.6.1 General

HTTP error handling shall be supported as specified in clause 7.7.

In addition, the requirements in the following clauses shall apply.

9.1.6.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the MSGG_L3GDelivery API.

9.1.6.3 Application Errors

The application errors defined for the MSGG_L3GDelivery API are listed in table 9.1.6.3-1.

Table 9.1.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

9.1.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 9.1.7-1 lists the supported features for MSGG_L3GDelivery API.

Table 9.1.7-1: Supported Features

Feature number	Feature Name	Description

9.2 MSGG_N3GDelivery API

9.2.1 API URI

The MSGG_N3GDelivery service shall use the MSGG_N3GDelivery API, The MSGG_N3GDelivery API corresponding to Mn3g APIs as defined in in 3GPP TS 23.554 [2].

The request URIs used in HTTP requests from the MSGin5G Server towards the Non-3GPP Message Gateway shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName> shall be "msgg-n3gdelivery".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 9.2.3.

9.2.2 Resources

None.

9.2.3 Custom Operations without associated resources

9.2.3.1 Overview

The structure of the custom operation URIs of the MSGG_N3GDelivery service is shown in Figure 9.2.3.1-1.

{apiRoot}/msgg-n3gdelivery/<apiVersion>

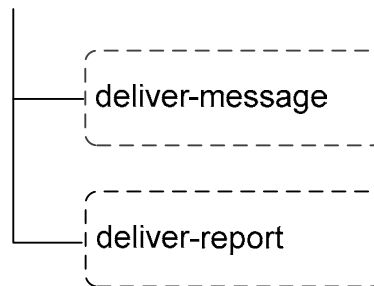


Figure 9.2.3.1-1: Custom operation URI structure of the MSGG_N3GDelivery API

Table 9.2.3.1-1 provides an overview of the custom operations and applicable HTTP methods.

Table 9.2.3.1-1: Custom operations without associated resources

Custom operation URI	Mapped HTTP method	Description
{apiRoot}/msgg-n3gdelivery/<apiVersion>/deliver-message	POST	Request of MSGin5G Server to deliver message to a given Non-3GPP Message Gateway
{apiRoot}/msgg-n3gdelivery/<apiVersion>/deliver-report	POST	Request of MSGin5G Server to deliver status report to a given Non-3GPP Message Gateway

9.2.3.2 Operation: deliver-message

9.2.3.2.1 Description

This operation is used by the MSGin5G Server to deliver message to a given Non-3GPP Message Gateway.

9.2.3.2.2 Operation Definition

This operation shall support the response data structures and response codes specified in table 9.2.3.2.2-1 and table 9.2.3.2.2-2.

Table 9.2.3.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
N3gMessageDelivery	M	1	Represents the data to be used for MSGin5G Server to deliver message.

Table 9.2.3.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The Message is Delivered successfully.
NOTE: 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.				

9.2.3.3 Operation: deliver-report

9.2.3.3.1 Description

This operation is used by the MSGin5G Server to deliver status report to a given Non-3GPP Message Gateway.

9.2.3.3.2 Operation Definition

This operation shall support the response data structures and response codes specified in table 9.2.3.3.2-1 and table 9.2.3.3.2-2.

Table 9.2.3.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
DeliveryStatusReport	M	1	Represents the data to be used for MSGin5G Server to deliver status report.

Table 9.2.3.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The status report is Delivered successfully.
NOTE: 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.				

9.2.4 Notifications

None.

9.2.5 Data Model

9.2.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API. Table 9.2.5.1-1 specifies the data types defined specifically for the MSGG_N3GDelivery API service.

Table 9.2.5.1-1: MSGG_N3GDelivery API specific Data Types

Data type	Section defined	Description	Applicability
N3gMessageDelivery	9.2.5.2.2	Information within message delivery request.	

Table 9.2.5.1-2 specifies data types re-used by the MSGG_N3GDelivery API service.

Table 9.2.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
DeliveryStatusReport	8.2.5.2.7	The message delivery status report request information.	
MessageSegmentParameters	8.2.5.2.5	Contains the message segment information of the message.	
Address	9.1.5.2.3	The data type of the oriAddr and destAddr.	

9.2.5.2 Structured data types

9.2.5.2.1 Introduction

9.2.5.2.2 Type: N3gMessageDelivery

Table 9.2.5.2.2-1: Definition of type N3gMessageDelivery

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The oriAddr is the service identity of the originating MSGin5G Client or the originating Application Server. This IE is copied from the associated inbound message (NOTE).	
destAddr	Address	M	1	The destAddr is the service identity of the receiving entity. The receiving entity can only be Non-3GPP UE Service ID in MSGG_N3GDelivery API.	
appld	string	O	0..1	Identifies the application(s) for which the content is intended. This list of Application IDs IE is required when the message is sent to one or multiple Application Clients served by same MSGin5G Client.	
msgld	string	M	1	Unique identifier of this message. This IE is copied from the associated inbound message request.	
delivStReqInd	boolean	O	0..1	Indicates if delivery acknowledgement from the recipient is requested. This IE is copied from the associated inbound message. Set to "true" if delivery acknowledgement from the recipient is requested. otherwise set to "false". Default value is "false".	
payload	string	O	0..1	Payload of the message. This IE is copied from the associated inbound message.	
segInd	boolean	O	0..1	Indicates this message is part of a segmented message. Set to "true" if the message is part of a segmented message. otherwise set to "false". Default value is "false".	
segParams	MessageSegmentParameters	O	0..1	The message segment parameters. This IE shall be included only if the value of segInd is true to indicate that message Segment services are requested.	
NOTE: The addrType in Address data type shall only include AS or UE to represent the originating of message request.					

9.2.6 Error Handling

9.2.6.1 General

HTTP error handling shall be supported as specified in clause 7.7.

In addition, the requirements in the following clauses shall apply.

9.2.6.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the MSGG_N3GDelivery API.

9.2.6.3 Application Errors

The application errors defined for the MSGG_N3GDelivery API are listed in table 9.2.6.3-1.

Table 9.2.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

9.2.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 9.2.7-1 lists the supported features for MSGG_N3GDelivery API.

Table 9.2.7-1: Supported Features

Feature number	Feature Name	Description

9.3 MSGG_BGDelivery API

9.3.1 API URI

The MSGG_BGDelivery service shall use the MSGG_BGDelivery API, The MSGG_BGDelivery API corresponding to Mbg APIs as defined in in 3GPP TS 23.554 [2].

The request URIs used in HTTP requests from the MSGin5G Server towards the Broadcast Message Gateway shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName> shall be "msgg-bgdelivery".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 9.3.3.

9.3.2 Resources

None.

9.3.3 Custom Operations without associated resources

9.3.3.1 Overview

The structure of the custom operation URIs of the MSGG_BGDelivery service is shown in Figure 9.3.3.1-1.

{apiRoot}/msgg-bgdelivery/<apiVersion>

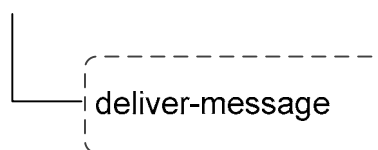


Figure 9.3.3.1-1: Custom operation URI structure of the MSGG_BGDelivery API

Table 9.3.3.1-1 provides an overview of the custom operations and applicable HTTP methods.

Table 9.3.3.1-1: Custom operations without associated resources

Custom operation URI	Mapped HTTP method	Description
{apiRoot}/msgg-bgdelivery/<apiVersion>/deliver-message	POST	Request of MSGin5G Server to deliver message to a given Broadcast Message Gateway.

9.3.3.2 Operation: deliver-message

9.3.3.2.1 Description

This operation is used by the MSGin5G Server to deliver message to a given Broadcast Message Gateway.

9.3.3.2.2 Operation Definition

This operation shall support the response data structures and response codes specified in table 9.3.3.2.2-1 and table 9.3.3.2.2-2.

Table 9.3.3.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
BgMessageDelivery	M	1	Represents the data to be used for MSGin5G Server to deliver message.

Table 9.3.3.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The Message is delivered successfully.
NOTE: 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.				

9.3.4 Notifications

None.

9.3.5 Data Model

9.3.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API. Table 9.3.5.1-1 specifies the data types defined specifically for the MSGG_BGDelivery API service.

Table 9.3.5.1-1: MSGG_BGDelivery API specific Data Types

Data type	Section defined	Description	Applicability
BgMessageDelivery	9.3.5.2.2	Information within broadcast message delivery request.	

Table 9.3.5.1-2 specifies data types re-used by the MSGG_BGDelivery API service.

Table 9.3.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
Address	9.1.5.2.3	The data type of the oriAddr and destAddr.	
MessageSegmentParameters	8.2.5.2.5	The data type of the segParams	
Priority	8.2.5.3.5	The data type of the priority	

9.3.5.2 Structured data types

9.3.5.2.1 Introduction

9.3.5.2.2 Type: BgMessageDelivery

Table 9.3.5.2.2-1: Definition of type BgMessageDelivery

Attribute name	Data type	P	Cardinality	Description	Applicability
oriAddr	Address	M	1	The service identity of the originating MSGin5G Client or the originating Application Server. This IE is copied from the associated inbound message (NOTE).	
destAddr	Address	O	0..1	The service identity of the Broadcast Service Area where the message needs to be broadcast.	
appld	string	O	0..1	Identifies the application(s) for which the content is intended. This list of Application IDs IE is required when the message is sent to one or multiple Application Clients served by same MSGin5G Client.	
msgld	string	M	1	Unique identifier of this message. This IE is copied from the associated inbound message request	
delivStReqInd	boolean	O	0..1	Indicates if delivery acknowledgement from the recipient is requested. This IE is copied from the associated inbound message. Set to "true" if delivery acknowledgement from the recipient is requested. otherwise set to "false". Default value is "false".	
payload	string	O	1	Payload of the message. This IE is copied from the associated inbound message.	
segInd	boolean	O	0..1	Indicates this message is part of a segmented message. Set to "true" if the message is part of a segmented message. otherwise set to "false". Default value is "false".	
segParams	MessageSegmentParameters	C	0..1	The message segment parameters. This IE shall be included only if the value of the attribute segInd is set to "true".	
priority	Priority	O	0..1	Application priority level requested for this message.	
NOTE: The addrType in Address data type shall only include AS or UE to represent the originating of message request.					

Editor's Note: Definition of all the attributes in BgMessageDelivery data type as defined in 3GPP TS 23.554 [2] clause 8.3.3 is FFS.

9.3.5.3 Simple data types and enumerations

None.

9.3.6 Error Handling

9.3.6.1 General

HTTP error handling shall be supported as specified in clause 7.7.

In addition, the requirements in the following clauses shall apply.

9.3.6.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the MSGG_BGDelivery API.

9.3.6.3 Application Errors

The application errors defined for the MSGG_BGDelivery API are listed in table 9.3.6.3-1.

Table 9.3.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

9.3.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 9.3.7-1 lists the supported features for MSGG_BGDelivery API.

Table 9.3.7-1: Supported Features

Feature number	Feature Name	Description

10 Security

TLS shall be used to support the security communication between the MSGin5G Server and the Application Server over MSGin5G-3 interface, and also between MSGin5G Server and the Message Gateway over MSGin5G-2 or MSGin5G-4 interface as specified in 3GPP TS 33.862 [19] and 3GPP TS 33.501 [20]. The access to the MSGin5G Service APIs shall be authorized by means of OAuth2 protocol (see IETF RFC 6749 [21]), based on local configuration, using the "Client Credentials" authorization grant. If OAuth2 is used, a client, prior to consuming services offered by the MSGin5G Service APIs, shall obtain a "token" from the authorization server.

11 Using Common API Framework

11.1 General

When CAPIF is used with a MSGin5G service, the MSGin5G Server shall support the following as defined in 3GPP TS 29.222 [8]:

- the API exposing function and related APIs over CAPIF-2/2e and CAPIF-3/3e reference points;

- the API publishing function and related APIs over CAPIF-4/4e reference point;
- the API management function and related APIs over CAPIF-5/5e reference point; and
- at least one of the security methods for authentication and authorization, and related security mechanisms.

In a centralized deployment as defined in 3GPP TS 23.222 [7], where the CAPIF core function and API provider domain functions are co-located, the interactions between the CAPIF core function and API provider domain functions may be independent of CAPIF-3/3e, CAPIF-4/4e and CAPIF-5/5e reference points.

When CAPIF is used with a MSGin5G service, the MSGin5G Server shall register all the features for northbound APIs in the CAPIF Core Function.

11.2 Security

When CAPIF is used for external exposure, before invoking the API exposed by the MSGin5G Server, the NF service consumer (e.g. the Application Server) as API invoker shall negotiate the security method (PKI, TLS-PSK or OAuth2) with CAPIF core function and ensure the MSGin5G Server has enough credential to authenticate the NF service consumer (e.g. the Application Server), see 3GPP TS 29.222 [8], clause 5.6.2.2 and clause 6.2.2.2.

If PKI or TLS-PSK is used as the selected security method between the NF service consumer (e.g. the Application Server) and the MSGin5G Server, upon API invocation, the MSGin5G Server shall retrieve the authorization information from the CAPIF core function as described in 3GPP TS 29.222 [8], clause 5.6.2.4.

As indicated in 3GPP TS 33.122 [22], the access to the MSGin5G APIs may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [21]), using the "Client Credentials" authorization grant, where the CAPIF core function (see 3GPP TS 29.222 [8]) plays the role of the authorization server.

NOTE 1: In this release, only "Client Credentials" authorization grant is supported.

If OAuth2 is used as the selected security method between the NF service consumer (e.g. the Application Server) and the MSGin5G Server, the the NF service consumer (e.g. the Application Server), prior to consuming services offered by the MSGin5G APIs, shall obtain a "token" from the authorization server, by invoking the Obtain_Authorization service, as described in 3GPP TS 29.222 [8], clause 5.6.2.3.2.

The MSGin5G APIs do not define any scopes for OAuth2 authorization. It is the MSGin5G Server responsibility to check whether the NF service consumer (e.g. the Application Server) is authorized to use an API based on the "token". Once the MSGin5G Server verifies the "token", it shall check whether the MSGin5G Server identifier in the "token" matches its own published identifier, and whether the API name in the "token" matches its own published API name. If those checks are passed, the NF service consumer (e.g. the Application Server) has full authority to access any resource or operation for the invoked API.

NOTE 2: For aforementioned security methods, the MSGin5G Server needs to apply admission control according to access control policies after performing the authorization checks.

12 Usage of Network Capabilities

As specified in 3GPP TS 23.554 [2], MSGin5G Server may perform procedures of UE reachability monitoring and device triggering by consuming the 3GPP core network capabilities from SCEF/NEF as specified in 3GPP TS 29.522 [23], with description of the AF applies to the MSGin5G Server. With usage of network capabilities, the following procedure for UE reachability monitoring and device triggering procedure could be supported. Upon the MSGin5G Server receiving a request to send MSGin5G message to a MSGin5G UE, the MSGin5G Server may determine whether the recipient MSGin5G Client is not reachable:

- by using the recipient's information received when performing the procedures specified in clause 8.9.2.2 of 3GPP TS 23.554 [2]; or
- by using the recipient's availability information provided by MSGin5G Client at registration as specified in clause 8.2.1 of 3GPP TS 23.554 [2].

If the recipient MSGin5G Client is not reachable, the MSGin5G Server may send a request for device triggering to SCEF/NEF as specified in clause 4.4.3 of 3GPP TS 29.522 [23]. The request uses the information provided by the

MSGin5G Client at registration in the MSGin5G Client Triggering Information IE. And the MSGin5G Server may use the MSGin5G Client communication availability and/or pre-configured information to determine the timing of the device triggering request, e.g. the trigger request may be sent to ensure that the target UE is reachable prior to resuming MSGin5G communications.

As specified in clause 4.4.6 of 3GPP TS 29.122 [24], upon the MSGin5G Server receiving an HTTP POST request from SCEF/NEF indicating the result of the triggering delivery, the MSGin5G Server shall respond with an HTTP 200 OK or 204 No Content response.

Annex A (normative): OpenAPI specification

A.1 General

This Annex is based on the OpenAPI Specification [6] and provides corresponding representations of all APIs defined in the present specification.

NOTE 1: An OpenAPIs representation embeds JSON Schema representations of HTTP message bodies.

This Annex shall take 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 2: 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 clause 5B of the 3GPP TR 21.900 [18] and clause 5.3.1 of the 3GPP TS 29.501 [9] for further information).

A.2 MSGS_ASRegistration API

```
openapi: 3.0.0
info:
  title: MSGS_ASRegistration
  version: 1.1.0-alpha.2
  description: |
    API for MSGS AS Registration Service.
    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.538 V18.4.0; Enabling MSGin5G Service; Application Programming Interfaces (API)
    specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.538/

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

security:
  - {}
  - oAuth2ClientCredentials: []

paths:
  /registrations:
    post:
      summary: Registers a new AS at a MSGin5G Server
      tags:
        - AS registration
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ASRegistration'
      responses:
        '201':
          description: AS information is registered successfully at MSGin5G Server
          content:
            application/json:
              schema:
```

```

    $ref: '#/components/schemas/ASRegistrationAck'
  headers:
    Location:
      description: 'Contains the URI of the newly created resource'
      required: true
      schema:
        type: string
  '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'
  '503':
    $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

```

/registrations/{registrationId}:

```

delete:
  summary: Delete an existing AS registration at MSGin5G Server
  tags:
    - AS DeRegistration
  parameters:
    - name: registrationId
      in: path
      description: AS registration Id
      required: true
      schema:
        type: string
  responses:
    '200':
      description: The individual AS registration is deleted successfully.
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ASRegistrationAck'
    '204':
      description: >
        No Content. The individual AS registration resource is deleted successfully.
    '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'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

```

```

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

```

```

schemas:
#
# STRUCTURED DATA TYPES
#
ASRegistration:
  description: AS registration data
  type: object
  required:
    - asSvcId
  properties:
    asSvcId:
      type: string
    appId:
      type: string
    targetUri:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    asProf:
      $ref: '#/components/schemas/ASProfile'

ASRegistrationAck:
  description: AS registration response data
  type: object
  required:
    - asSvcId
    - result
  properties:
    asSvcId:
      type: string
    result:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'

ASProfile:
  description: AS profile information
  type: object
  properties:
    appName:
      type: string
    appProviders:
      type: array
      items:
        type: string
      minItems: 1
      description: The provider of the AS.
    appScenarios:
      type: array
      items:
        type: string
      minItems: 1
      description: The application scenario.
    appCategory:
      type: string
    asStatus:
      type: string

```

A.3 MSGS_MSGSDelivery API

```

openapi: 3.0.0
info:
  title: MSGS_MSGSDelivery
  version: 1.1.0-alpha.3
  description: |
    API for MSGG MSGIn5G Server Message Delivery Service.
    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.538 V18.4.0; Enabling MSGIn5G Service; Application Programming Interfaces (API)
    specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.538/

servers:
  - url: '{apiRoot}/msgsg-msgsdelivery/v1'

```

```
variables:
  apiRoot:
    default: https://example.com
    description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:
- {}
- oAuth2ClientCredentials: []

paths:
  /deliver-as-message:
    post:
      summary: AS deliver message to MSGin5G Server
      tags:
        - AS Message delivery
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ASMessageDelivery'
      responses:
        '200':
          description: OK, AS Message delivery successful
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/MessageDeliveryAck'
        '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'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'

  /deliver-ue-message:
    post:
      summary: UE deliver message to MSGin5G Server
      tags:
        - UE Message delivery
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/UEMessageDelivery'
      responses:
        '200':
          description: OK, UE Message delivery successful
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/MessageDeliveryAck'
        '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'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/deliver-report:
  post:
    summary: AS or UE deliver status report to MSGin5G Server
    tags:
      - AS/UE status report delivery
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/DeliveryStatusReport'
    responses:
      '200':
        description: OK, status report delivery successfully
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/MessageDeliveryAck'
      '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'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:
#
# STRUCTURED DATA TYPES
#
  ASMessageDelivery:
    description: Contains the AS message delivery data
    type: object
    required:
      - oriAddr
      - destAddr
      - msgId

```

```

- stoAndFwInd
properties:
  oriAddr:
    $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
  destAddr:
    $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
  appId:
    type: string
  msgId:
    type: string
  delivStReqInd:
    type: boolean
  payload:
    type: string
  priority:
    $ref: '#/components/schemas/Priority'
  segInd:
    type: boolean
  segParams:
    $ref: '#/components/schemas/MessageSegmentParameters'
  stoAndFwInd:
    type: boolean
  stoAndFwParams:
    $ref: '#/components/schemas/StoreAndForwardParameters'
  latency:
    type: integer

UEMessageDelivery:
  description: Contains the UE message delivery data
  type: object
  required:
  - oriAddr
  - destAddr
  - msgId
  - stoAndFwInd
  properties:
    oriAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    destAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    appId:
      type: string
    msgId:
      type: string
    delivStReqInd:
      type: boolean
    payload:
      type: string
    segInd:
      type: boolean
    segParams:
      $ref: '#/components/schemas/MessageSegmentParameters'
    stoAndFwInd:
      type: boolean
    stoAndFwParams:
      $ref: '#/components/schemas/StoreAndForwardParameters'

MessageDeliveryAck:
  description: Contains the message delivery ack data
  type: object
  required:
  - oriAddr
  - msgId
  properties:
    oriAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    msgId:
      type: string
    status:
      $ref: '#/components/schemas/DeliveryStatus'
    failureCause:
      type: string

MessageSegmentParameters:
  description: Contains the message segment parameters data
  type: object
  properties:
    segId:

```



```
    type: string
  totalSegCount:
    type: integer
  segNumb:
    type: integer
  lastSegFlag:
    type: boolean
```

```
StoreAndForwardParameters:
  description: Contains the store and forward parameters data
  type: object
  properties:
    exprTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
```

```
DeliveryStatusReport:
  description: Contains the delivery status report data
  type: object
  required:
    - oriAddr
    - destAddr
    - msgId
    - delivSt
  properties:
    oriAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    destAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    msgId:
      type: string
    failureCause:
      type: string
    delivSt:
      $ref: '#/components/schemas/ReportDeliveryStatus'
```

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

```
#
# ENUMERATIONS
#
```

```
DeliveryStatus:
  anyOf:
    - type: string
      enum:
        - DELY_FAILED
        - DELY_STORED
    - type: string
      description: >
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
      description: |
        Indicates if delivery is a failure, or if the message is stored for deferred delivery.
        Possible values are:
        - DELY_FAILED: Indicates that the message delivery is failed.
        - DELY_STORED: Indicates that the message is stored for deferred delivery.
```

```
ReportDeliveryStatus:
  anyOf:
    - type: string
      enum:
        - REPT_DELY_SUCCESS
        - REPT_DELY_FAILED
    - type: string
      description: >
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
      description: |
        The delivery status description, including success or failure in delivery.
        Possible values are:
        - REPT_DELY_SUCCESS: Indicates that the report delivery is successful.
        - REPT_DELY_FAILED: Indicates that the report delivery is failed.
```

```
Priority:
```

```

anyOf:
- type: string
  enum:
    - HIGH
    - MIDDLE
    - LOW
- type: string
  description: >
    This string provides forward-compatibility with future
    extensions to the enumeration but is not used to encode
    content defined in the present version of this API.
description: |
  Application priority level requested for this message.
  Possible values are:
  - HIGH: Indicates the messages should be sent in high priority.
  - MIDDLE: Indicates the messages should be sent in middle priority.
  - LOW: Indicates the messages should be sent in low priority.

```

A.4 MSGG_L3GDelivery API

```

openapi: 3.0.0
info:
  title: MSGG_L3GDelivery
  version: 1.1.0-alpha.2
  description: |
    API for MSGG L3G Message Delivery Service.
    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.538 V18.4.0; Enabling MSGin5G Service; Application Programming Interfaces (API)
  specification: Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.538/

servers:
- url: '{apiRoot}/msgg-l3gdelivery/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:
- {}
- oAuth2ClientCredentials: []

paths:
  /deliver-message:
    post:
      summary: deliver message to Legacy 3GPP Message Gateway
      tags:
        - L3G Message delivery
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/L3gMessageDelivery'
      responses:
        '204':
          description: No Content, Message delivery successful
        '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'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/deliver-report:
  post:
    summary: deliver status report to Legacy 3GPP Message Gateway
    tags:
      - L3G status report delivery
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: 'TS29538_MSGS_MSGDelivery.yaml#/components/schemas/DeliveryStatusReport'
    responses:
      '204':
        description: No Content, status report delivery successfully
      '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'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:
    #
    # STRUCTURED DATA TYPES
    #
    L3gMessageDelivery:
      description: Contains the L3G message delivery data
      type: object
      required:
        - oriAddr
        - destAddr
        - msgId
      properties:
        oriAddr:
          $ref: '#/components/schemas/Address'
        destAddr:
          $ref: '#/components/schemas/Address'
        appId:
          type: string
        msgId:
          type: string

```

```

delivStReqInd:
  type: boolean
payload:
  type: string
segInd:
  type: boolean
segParams:
  $ref: 'TS29538_MSGS_MSGDelivery.yaml#/components/schemas/MessageSegmentParameters'

```

```

Address:
  description: Contains the Message type data
  type: object
  required:
    - addrType
    - addr
  properties:
    addrType:
      $ref: '#/components/schemas/AddressType'
    addr:
      type: string

```

```

#
# SIMPLE DATA TYPES
#

```

```

#
# ENUMERATIONS
#

```

```

AddressType:
  anyOf:
    - type: string
    enum:
      - UE
      - AS
      - GROUP
      - BC
      - TOPIC
    - type: string
  description: >
    This string provides forward-compatibility with future
    extensions to the enumeration but is not used to encode
    content defined in the present version of this API.
  description: |
    Represent the type of message request.
    Possible values are:
    - UE: The address type is UE.
    - AS: The address type is AS.
    - GROUP: The address type is GROUP.
    - BC: The address type is BC.
    - TOPIC: The address type is TOPIC.

```

A.5 MSGG_N3GDelivery API

```

openapi: 3.0.0
info:
  title: MSGG_N3GDelivery
  version: 1.1.0-alpha.1
  description: |
    API for MSGG N3G Message Delivery Service.
    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
externalDocs:
  description: >
    3GPP TS 29.538 V18.4.0; Enabling MSGin5G Service; Application Programming Interfaces (API)
    specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.538/
servers:
  - url: '{apiRoot}/msgg-n3gdelivery/v1'
    variables:
      apiRoot:
        default: https://example.com

```

```
description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:
- {}
- oAuth2ClientCredentials: []

paths:
/deliver-message:
  post:
    summary: deliver message to NON-3GPP Message Gateway
    tags:
      - N3G Message delivery
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/N3gMessageDelivery'
    responses:
      '204':
        description: No Content, Message delivery successful
      '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'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/deliver-report:
  post:
    summary: deliver status report to NON-3GPP Message Gateway
    tags:
      - N3G status report delivery
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: 'TS29538_MSGS_MSGDelivery.yaml#/components/schemas/DeliveryStatusReport'
    responses:
      '204':
        description: No Content, status report delivery successfully
      '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'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
```

```

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

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:
    #
    # STRUCTURED DATA TYPES
    #
    N3gMessageDelivery:
      description: N3G message delivery data
      type: object
      required:
        - oriAddr
        - destAddr
        - msgId
      properties:
        oriAddr:
          $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
        destAddr:
          $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
        appId:
          type: string
        msgId:
          type: string
        delivStReqInd:
          type: boolean
        payload:
          type: string
        segInd:
          type: boolean
        segParams:
          $ref: 'TS29538_MSGS_MSGDelivery.yaml#/components/schemas/MessageSegmentParameters'

```

A.6 MSGG_BGDelivery API

openapi: 3.0.0

```

info:
  title: MSGG_BGDelivery
  version: 1.0.0-alpha.3
  description: |
    API for Broadcast Message Delivery Service.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

```

```

externalDocs:
  description: >
    3GPP TS 29.538 V18.5.0; Enabling MSGin5G Service; Application Programming Interfaces (API)
    specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.538/

```

```

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

```

```

security:
  - {}
  - oAuth2ClientCredentials: []

```

paths:

```

/deliver-message:
  post:
    summary: deliver message to Broadcast Message Gateway
    tags:
      - Broadcast Message delivery
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/BgMessageDelivery'
    responses:
      '204':
        description: No Content, Message delivery successful
      '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'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29571_CommonData.yaml#/components/responses/default'

```

```

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

```

```

schemas:
#
# STRUCTURED DATA TYPES
#
BgMessageDelivery:
  description: Broadcast message delivery data
  type: object
  required:
    - oriAddr
    - msgId
  properties:
    oriAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    destAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    appId:
      type: string
    msgId:
      type: string
    delivStReqInd:
      type: boolean
    payload:
      type: string
    segInd:
      type: boolean
    segParams:
      $ref: 'TS29538_MSGS_MSGDelivery.yaml#/components/schemas/MessageSegmentParameters'
    priority:
      $ref: 'TS29538_MSGS_MSGDelivery.yaml#/components/schemas/Priority'

```

A.7 MSGS_TopiclistEvent API

openapi: 3.0.0

info:

```
title: MSGS_TopiclistEvent
version: 1.0.0-alpha.1
description: |
  API for Topic Messaging Event Service.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.538 V18.4.0; Enabling MSGin5G Service; Application Programming Interfaces (API)
  specification: Stage 3
url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.538/
```

servers:

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

security:

```
- {}
- oAuth2ClientCredentials:
  - msgs-topiclistevent
```

paths:

```
/topiclist-subscriptions:
  post:
    summary: subscribe to Messaging Topic list on a MSGin5G Server
    tags:
      - Topic List Subscription
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/TopicListSubscription'
    callbacks:
      MessagingTopicListNotification:
        '{request.body#/notificationURI}':
          post:
            requestBody:
              required: true
              content:
                application/json:
                  schema:
                    $ref: '#/components/schemas/TopicListNotification'
            responses:
              '204':
                description: No Content (successful notification)
              '307':
                $ref: 'TS29122_CommonData.yaml#/components/responses/307'
              '308':
                $ref: 'TS29122_CommonData.yaml#/components/responses/308'
              '400':
                $ref: 'TS29122_CommonData.yaml#/components/responses/400'
              '401':
                $ref: 'TS29122_CommonData.yaml#/components/responses/401'
              '403':
                $ref: 'TS29122_CommonData.yaml#/components/responses/403'
              '404':
                $ref: 'TS29122_CommonData.yaml#/components/responses/404'
              '411':
                $ref: 'TS29122_CommonData.yaml#/components/responses/411'
              '413':
                $ref: 'TS29122_CommonData.yaml#/components/responses/413'
              '415':
                $ref: 'TS29122_CommonData.yaml#/components/responses/415'
              '429':
                $ref: 'TS29122_CommonData.yaml#/components/responses/429'
              '500':
                $ref: 'TS29122_CommonData.yaml#/components/responses/500'
```



```

    '503':
      $ref: 'TS29122_CommonData.yaml#/components/responses/503'
    default:
      $ref: 'TS29122_CommonData.yaml#/components/responses/default'
  responses:
    '201':
      description: Topic list on the MSGin5G Server is successfully subscribed
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/TopicListSubscriptionAck'
      headers:
        Location:
          description: 'Contains the URI of the newly created resource'
          required: true
          schema:
            type: string
    '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'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
    default:
      $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/topiclist-subscriptions/{subscriptionId}:
  post:
    summary: Unsubscribe to Messaging Topic list on a MSGin5G Server
    tags:
      - Topic List Unsubscriptionn
    parameters:
      - name: subscriptionId
        in: path
        description: Topic list subscription Id
        required: true
        schema:
          type: string
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/TopicListUnsubscription'
    responses:
      '200':
        description: The individual Topic list unsubscription is successfully handled with the
        subscription not deleted.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/TopicListUnsubscriptionAck'
      '204':
        description: >
        No Content. The individual MSGin5G Server Messaging Topic list subscription matching the
        subscription Id is successfully deleted.
      '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'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
    default:
      $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/request-topic-subscription:
  post:
    summary: subscribe to Messaging Topic on a MSGin5G Server
    tags:
      - Messaging Topic Subscription
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/TopicSubscription'
    responses:
      '200':
        description: The Messaging Topic subscription is created successfully.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/TopicSubscriptionAck'
      '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'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29571_CommonData.yaml#/components/responses/default'

/request-topic-unsubscription:
  post:
    summary: unsubscribe to Messaging Topic on a MSGin5G Server
    tags:
      - Messaging Topic Unsubscription
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/TopicUnsubscription'
    responses:
      '204':
        description: >
          No Content. The Messaging Topic subscription is removed successfully.
      '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'
  '503':
    $ref: 'TS29571_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'

```

```

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:
#
# STRUCTURED DATA TYPES
#
  TopicListSubscription:
    description: Messaging Topic list subscription data
    type: object
    required:
      - oriAddr
      - destAddr
      - notificationURI
    properties:
      oriAddr:
        $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
      destAddr:
        $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
      notificationURI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      secCred:
        type: string
      exprTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

  TopicListUnsubscription:
    description: Messaging Topic list unsubscription data
    type: object
    required:
      - oriAddr
      - destAddr
    properties:
      oriAddr:
        $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
      destAddr:
        $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
      secCred:
        type: string

  TopicListSubscriptionAck:
    description: Response of Messaging Topic list subscription
    type: object
    required:
      - subStat
    properties:
      subStat:
        type: string
      exprTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

  TopicListUnsubscriptionAck:
    description: Response of Messaging Topic list unsubscription
    type: object
    required:
      - subStat
    properties:

```

```
    subStat:
      type: string

TopicSubscription:
  description: Messaging Topic subscription data
  type: object
  required:
    - oriAddr
    - msgTopics
  properties:
    oriAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    msgTopics:
      type: array
      items:
        type: string
      minItems: 1
      description: A list of Messaging Topics to be subscribed.
    secCred:
      type: string
    exprTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'

TopicSubscriptionAck:
  description: Response of Messaging Topic subscription
  type: object
  required:
    - subStat
  properties:
    subStat:
      type: string
    exprTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'

TopicUnsubscription:
  description: Messaging Topic unsubscription data
  type: object
  required:
    - oriAddr
    - msgTopics
  properties:
    oriAddr:
      $ref: 'TS29538_MSGG_L3GDelivery.yaml#/components/schemas/Address'
    secCred:
      type: string
    msgTopics:
      type: array
      items:
        type: string
      minItems: 1
      description: A list of Messaging Topics to be unsubscribed.

TopicListNotification:
  description: Messaging Topic list changes notification data
  type: object
  required:
    - msgTopics
  properties:
    exprTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    msgTopics:
      type: array
      items:
        $ref: '#/components/schemas/MessagingTopic'
      minItems: 1
      description: list of Messaging Topics for notification.

MessagingTopic:
  description: Represent Messaging Topic information
  type: object
  required:
    - msgTopic
    - updateStat
  properties:
    msgTopic:
      type: string
    updateStat:
      $ref: '#/components/schemas/UpdateStatus'
```

```
#
# ENUMERATIONS DATA TYPES
#

UpdateStatus:
  anyOf:
  - type: string
    enum:
      - CREATED
      - DELETED
  - type: string
    description: >
      This string provides forward-compatibility with future extensions to the enumeration
      and is not used to encode content defined in the present version of this API.
  description: |
    Represents the Messaging Topic Update status.
    Possible values are:
    - CREATED: Indicates Topic newly created.
    - DELETED: Indicates Topic newly deleted.
```

Annex B (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2021-10	CT3#118-e	C3-215030				Draft skeleton provided by the rapporteur	0.0.0
2021-10	CT3#118-e	C3-215479				Inclusion of documents agreed in CT3#118e C3-215116, C3-215165, C3-215206, C3-215432, C3-215441, C3-215462. Editorial change from the rapporteur. Correction from the rapporteur.	0.1.0
2021-11	CT3#119-e	C3-216552				Inclusion of documents agreed in CT3#119e C3-216175, C3-216525, C3-216528, C3-216529, C3-216545, C3-216546, C3-216581. Correction from the rapporteur.	0.2.0
2022-01	CT3#119bis-e	C3-220458				Inclusion of documents agreed in CT3#119bis-e C3-220384, C3-220385, C3-220386, C3-220387, C3-220389, C3-220391, C3-220410, C3-220411, C3-220412 and C3-220413. Correction from the rapporteur.	0.3.0
2022-02	CT3#120e	C3-221559				Inclusion of documents agreed in CT3#120e C3-221245, C3-221246, C3-221247, C3-221248, C3-221249, C3-221529, C3-221530, C3-221531, C3-221532, C3-221533, C3-222534, C3-221535, C3-221536, C3-221537, C3-221538, C3-221541, C3-221542, C3-221543, C3-221544, C3-221545, C3-221546, C3-221547, C3-221548 and C3-221549. Correction from the rapporteur.	0.4.0
2022-03	CT#95e	CP-220163				Presentation to TSG CT for approval	1.0.0
2022-03	CT#95e	CP-220163				Approved by TSG CT	17.0.0
2022-06	CT#96	CP-221118	0001	1	B	Add Usage of Network Capabilities in MSGin5G Server	17.1.0
2022-06	CT#96	CP-221118	0002	1	F	Update of abbreviations and terms	17.1.0
2022-06	CT#96	CP-221118	0003	1	F	Update the Presence condition of appld in Table 8.1.5.2.2-1	17.1.0
2022-06	CT#96	CP-221151	0004		F	Update of info and externalDocs fields	17.1.0
2022-09	CT#97e	CP-222092	0005	2	F	Update the Presence condition of Store and forward flag	17.2.0
2022-12	CT#98-e	CP-223199	0007	1	F	MSGs_ASRegistration_Deregister operation related corrections in the description clause	18.0.0
2022-12	CT#98-e	CP-223199	0008	1	F	MSGs_ASRegistration_Request operation related corrections in the description clause	18.0.0
2022-12	CT#98-e	CP-223185	0009		F	"Error handling" clause: alignment with other NBI and 5GS APIs	18.0.0
2022-12	CT#98-e	CP-223200	0010	1	F	Rewording some description of data structure in clause 5.3.2	18.0.0
2022-12	CT#98-e	CP-223200	0011	1	F	Change the underline to hyphen of the apiname in clause 5.1	18.0.0
2022-12	CT#98-e	CP-223189	0012		F	Update of info and externalDocs fields	18.0.0
2023-03	CT#99	CP-230156	0013	1	F	Correction of the description fields in enumerations	18.1.0
2023-03	CT#99	CP-230161	0014		F	Update of info and externalDocs fields	18.1.0
2023-06	CT#100	CP-231150	0015	1	B	Update of Scope for Broadcast Messaging	18.2.0
2023-06	CT#100	CP-231150	0016	1	D	Editorial Fixes of Words and Numbers	18.2.0
2023-06	CT#100	CP-231150	0017	1	B	Update the terms and overview	18.2.0
2023-06	CT#100	CP-231150	0018	1	B	MSGG_BGDelivery Service introduction	18.2.0
2023-06	CT#100	CP-231150	0019	1	B	MSGG_BGDelivery service description and operations	18.2.0
2023-06	CT#100	CP-231150	0020	1	B	MSGG_BGDelivery API	18.2.0
2023-06	CT#100	CP-231337	0021	1	B	New OpenAPI file for MSGG_BGDelivery API	18.2.0
2023-06	CT#100	CP-231150	0022	1	B	Update Scope for Topic Messaging	18.2.0
2023-06	CT#100	CP-231150	0023	1	B	Add service of Topic Messaging	18.2.0
2023-06	CT#100	CP-231150	0024	1	D	Reference Clause Number Correction	18.2.0
2023-08	CT#101	CP-232111	0026	1	F	Remove the IE of security credentials in message delivery procedures	18.3.0
2023-08	CT#101	CP-232111	0027		F	Corrections on MSGS_BGDelivery API	18.3.0
2023-08	CT#101	CP-232111	0028	1	F	Update the service operations of message delivery status report	18.3.0
2023-08	CT#101	CP-232085	0029		F	Update of info and externalDocs fields	18.3.0
2023-12	CT#102	CP-233251	0030	1	F	Correction on the openAPI files	18.4.0
2023-12	CT#102	CP-233251	0032	1	F	Corrections to BgMessageDelivery data type	18.4.0
2023-12	CT#102	CP-233251	0033	1	B	Introduction update for Messaging Topic Events	18.4.0
2023-12	CT#102	CP-233251	0034	1	B	Service Description of Messaging Topic Events	18.4.0
2023-12	CT#102	CP-233251	0035	1	B	Service Operation for Messaging Topic List Subscription	18.4.0
2023-12	CT#102	CP-233251	0036	1	B	Service Operation for Messaging Topic Subscription	18.4.0
2023-12	CT#102	CP-233251	0037	2	B	Messaging Topic Events API	18.4.0
2023-12	CT#102	CP-233251	0039	2	F	Correction on Terms and Abbreviations	18.4.0
2023-12	CT#102	CP-233251	0040	1	F	Corrections to BgMessageDelivery data type	18.4.0
2023-12	CT#102	CP-233251	0041		F	Correction on Messaging Topic Events API	18.4.0
2023-12	CT#102	CP-233229	0042	1	F	IETF HTTP RFCs obsoleted by RFCs 9110, 9111, 9112 and 9113	18.4.0
2023-12	CT#102	CP-233237	0044		F	Update of info and externalDocs fields	18.4.0
2024-03	CT#103	CP-240196	0045	1	F	Corrections in MSGG_BGDelivery API	18.5.0
2024-03	CT#103	CP-240196	0046		F	Updates API provided by MSGin5G Server	18.5.0
2024-03	CT#103	CP-240196	0047	1	B	OpenAPI and Corrections for TopicListEvent	18.5.0

2024-03	CT#103	CP-240166	0048		F	Update of info and externalDocs fields	18.5.0
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History

Document history		
V18.5.0	May 2024	Publication