

ETSI TS 129 538 V17.1.0 (2022-07)



**5G;
Enabling MSGin5G Service;
Application Programming Interfaces (API) specification;
Stage 3
(3GPP TS 29.538 version 17.1.0 Release 17)**



Reference

RTS/TSGC-0329538vh10

Keywords

5G

ETSI

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

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

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

Important notice

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

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

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our Coordinated Vulnerability Disclosure Program:
<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

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

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

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

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

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

Copyright Notification

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

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2022.
All rights reserved.

Intellectual Property Rights

Essential patents

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

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

Trademarks

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

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

Legal Notice

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

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

The cross reference between 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

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

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

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	7
1 Scope	9
2 References	9
3 Definitions of terms, symbols and abbreviations	10
3.1 Terms.....	10
3.2 Symbols.....	10
3.3 Abbreviations	10
4 Overview	10
5 Services offered by the MSGin5G Servers	11
5.1 Introduction	11
5.2 MSGS_ASRegistration Service.....	11
5.2.1 Service Description.....	11
5.2.2 Service Operations.....	12
5.2.2.1 Introduction.....	12
5.2.2.2 MSGS_ASRegistration_Request	12
5.2.2.2.1 General	12
5.2.2.2.2 Application Server registering to MSGin5G Server using MSGS_ASRegistration_Request operation.....	12
5.2.2.3 MSGS_ASRegistration_Deregister.....	12
5.2.2.3.1 General	12
5.2.2.3.2 Application Server deregistering from MSGin5G Server using MSGS_ASRegistration_Deregister operation	12
5.3 MSGS_MSGDelivery Service.....	13
5.3.1 Service Description.....	13
5.3.2 Service Operations.....	13
5.3.2.1 Introduction.....	13
5.3.2.2 MSGS_MSGDelivery_ASODelivery	13
5.3.2.2.1 General	13
5.3.2.2.2 AS Originating MSGin5G Message Delivery	14
5.3.2.3 MSGS_MSGDelivery_ASODeliveryReport.....	15
5.3.2.3.1 General	15
5.3.2.3.2 AS Originating Message Delivery Status Report	15
5.3.2.4 MSGS_MSGDelivery_UEODelivery	15
5.3.2.4.1 General	15
5.3.2.4.2 UE Originating Message Delivery.....	16
5.3.2.5 MSGS_MSGDelivery_UEODeliveryReport	17
5.3.2.5.1 General	17
5.3.2.5.2 UE Originating Message Delivery Status Report.....	17
6 Services offered by the Message Gateway	17
6.1 Introduction	17
6.2 MSGG_L3GDelivery Service	18
6.2.1 Service Description.....	18
6.2.2 Service Operations.....	18
6.2.2.1 Introduction.....	18
6.2.2.2 MSGG_L3GDelivery_GTDelivery.....	19
6.2.2.2.1 General	19
6.2.2.2.2 Legacy 3GPP Message Gateway Terminating Message Delivery.....	19
6.2.2.3 MSGG_L3GDelivery_GTDeliveryReport.....	20
6.2.2.3.1 General	20

6.2.2.3.2	Legacy 3GPP Message Gateway Terminating Message Delivery Status Report	20
6.3	MSGG_N3GDelivery Service	20
6.3.1	Service Description	20
6.3.2	Service Operations	21
6.3.2.1	Introduction	21
6.3.2.2	MSGG_N3GDelivery_GTDelivery	21
6.3.2.2.1	General	21
6.3.2.2.2	Non-3GPP Message Gateway Terminating Message Delivery	21
6.3.2.3	MSGG_N3GDelivery_GTDeliveryReport	22
6.3.2.3.1	General	22
6.3.2.3.2	Non-3GPP Message Gateway Terminating Message Delivery Status Report	22
7	Common information applicable to several APIs	23
7.1	General	23
7.2	Data Types	23
7.2.1	General	23
7.2.2	Referenced structured data types	23
7.2.3	Referenced Simple data types and enumerations	23
7.3	Usage of HTTP	24
7.4	Content type	24
7.5	URI structure	24
7.5.1	Resource URI structure	24
7.5.2	Custom operations URI structure	24
7.6	Notifications	24
7.7	Error Handling	24
7.8	Feature negotiation	24
7.9	HTTP headers	25
7.10	Conventions for Open API specification files	25
8	Message Server API definition	25
8.1	MSGG_ASRegistration API	25
8.1.1	API URI	25
8.1.2	Resources	25
8.1.2.1	Overview	25
8.1.2.2	Resource: AS Registrations	26
8.1.2.2.1	Description	26
8.1.2.2.2	Resource Definition	26
8.1.2.2.3	Resource Standard Methods	26
8.1.2.2.3.1	POST	26
8.1.2.3	Resource: AS DeRegistration	27
8.1.2.3.1	Description	27
8.1.2.3.2	Resource Definition	27
8.1.2.3.3	Resource Standard Methods	27
8.1.2.3.3.1	DELETE	27
8.1.3	Custom Operations without associated resources	28
8.1.4	Notifications	28
8.1.5	Data Model	28
8.1.5.1	General	28
8.1.5.2	Structured data types	29
8.1.5.2.1	Introduction	29
8.1.5.2.2	Type: ASRegistration	29
8.1.5.2.3	Type: ASRegistrationAck	29
8.1.5.2.4	Type: ASProfile	30
8.1.5.3	Simple data types and enumerations	30
8.1.6	Error Handling	30
8.1.7	Feature negotiation	30
8.2	MSGG_MSGDelivery API	30
8.2.1	API URI	30
8.2.2	Resources	30
8.2.3	Custom Operations without associated resources	30
8.2.3.1	Overview	30
8.2.3.2	Operation: deliver-as-message	31

8.2.3.2.1	Description	31
8.2.3.2.2	Operation Definition.....	31
8.2.3.3	Operation: deliver-ue-message.....	32
8.2.3.3.1	Description	32
8.2.3.3.2	Operation Definition.....	32
8.2.3.4	Operation: deliver-report.....	32
8.2.3.4.1	Description	32
8.2.3.4.2	Operation Definition.....	32
8.2.4	Notifications	33
8.2.5	Data Model	33
8.2.5.1	General	33
8.2.5.2	Structured data types	34
8.2.5.2.1	Introduction	34
8.2.5.2.2	Type: ASMessageDelivery	34
8.2.5.2.3	Type: UEMessageDelivery.....	36
8.2.5.2.4	Type: MessageDeliveryAck	37
8.2.5.2.5	Type: MessageSegmentParameters	37
8.2.5.2.6	Type: StoreAndForwardParameters	37
8.2.5.2.7	Type: DeliveryStatusReport	38
8.2.5.3	Simple data types and enumerations	38
8.2.5.3.1	Introduction	38
8.2.5.3.2	Simple data types.....	38
8.2.5.3.3	Enumeration: DeliveryStatus.....	38
8.2.5.3.4	Enumeration: ReportDeliveryStatus.....	38
8.2.5.3.5	Enumeration: Priority	39
8.2.6	Error Handling	39
8.2.7	Feature negotiation	39
9	Message Gateway API definition.....	39
9.1	MSGG_L3GDelivery API.....	39
9.1.1	API URI.....	39
9.1.2	Resources	39
9.1.3	Custom Operations without associated resources	39
9.1.3.1	Overview	39
9.1.3.2	Operation: deliver-message.....	40
9.1.3.2.1	Description	40
9.1.3.2.2	Operation Definition.....	40
9.1.3.3	Operation: deliver-report.....	41
9.1.3.3.1	Description	41
9.1.3.3.2	Operation Definition.....	41
9.1.4	Notifications	41
9.1.5	Data Model	41
9.1.5.1	General	41
9.1.5.2	Structured data types	42
9.1.5.2.1	Introduction	42
9.1.5.2.2	Type: L3gMessageDelivery	42
9.1.5.2.3	Type: Address.....	42
9.1.5.3	Simple data types and enumerations	43
9.1.5.3.1	Introduction	43
9.1.5.3.2	Enumeration: AddressType	43
9.1.6	Error Handling	43
9.1.7	Feature negotiation	43
9.2	MSGG_N3GDelivery API	43
9.2.1	API URI.....	43
9.2.2	Resources	43
9.2.3	Custom Operations without associated resources	44
9.2.3.1	Overview	44
9.2.3.2	Operation: deliver-message.....	44
9.2.3.2.1	Description	44
9.2.3.2.2	Operation Definition.....	44
9.2.3.3	Operation: deliver-report.....	45
9.2.3.3.1	Description	45

9.2.3.3.2	Operation Definition.....	45
9.2.4	Notifications	45
9.2.5	Data Model	45
9.2.5.1	General	45
9.2.5.2	Structured data types	46
9.2.5.2.1	Introduction	46
9.2.5.2.2	Type: N3gMessageDelivery	46
9.2.6	Error Handling	46
9.2.7	Feature negotiation	47
10	Security.....	47
11	Using Common API Framework.....	47
11.1	General	47
11.2	Security	47
12	Usage of Network Capabilities.....	48
Annex A (normative): OpenAPI specification.....		49
A.1	General	49
A.2	MSGs_ASRegistration API.....	49
A.3	MSGs_MSGDelivery API.....	51
A.4	MSGG_L3GDelivery API.....	56
A.5	MSGG_N3GDelivery API	58
Annex B (informative): Change history		61
History		62

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 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 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".
- [11] IETF RFC 7231: "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content".
- [12] IETF RFC 7232: "Hypertext Transfer Protocol (HTTP/1.1): Conditional Requests".
- [13] IETF RFC 7233: "Hypertext Transfer Protocol (HTTP/1.1): Range Requests".
- [14] IETF RFC 7234: "Hypertext Transfer Protocol (HTTP/1.1): Caching".
- [15] IETF RFC 7235: "Hypertext Transfer Protocol (HTTP/1.1): Authentication".
- [16] IETF RFC 7240: "Hypertext Transfer Protocol Version 2 (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 MIoT 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
Legacy 3GPP UE
Non-3GPP UE
Point-to-Point messaging
Point-to-Application messaging
Application-to-Point messaging
Group messaging
Broadcast messaging
Messaging Topic

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
CAPIF Common API Framework

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.

The present document specifies MSGin5G Services offered by MSGin5G Servers and MSGin5G Gateway, and APIs in detail, needed over MSGin5G-2/3/4 interfaces for interworking between MSGin5G Server and Legacy 3GPP UE, Non-3GPP UE 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		

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	msg_s_as_registration	A.2
MSGs_MSGDelivery	8.2	Message Delivery Service	TS29538_MSGs_MSGDelivery.yaml	msg_s_msg_delivery	A.3

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

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 the AS profile information, may include notification target URI for the registration, as specified in clause 8.1.2.2.3.1.

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. return the AS registration information, the resource URI of the AS registration information, in the response message.

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

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 "200 OK" message to the AS, indicating the successful deregistration of the AS information.

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 to MSGin5G Server; and
- allows L3G/N3G invokes services provided by MSGin5G Server to send MSGin5G Messages to MSGin5G Server on behalf of Legacy 3GPP UE or Non-3GPP UE.

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 9.1.1.2.2 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 9.1.1.3.2 as defined in 3GPP TS 23.554 [2].	Legacy 3GPP Message Gateway Non-3GPP Message Gateway
MSGS_MSGDelivery_UEODeliveryReport	This service operation is used by Legacy 3GPP Message Gateway or Non-3GPP 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 9.2.1.4.2 as defined in 3GPP TS 23.554 [2].	Legacy 3GPP Message Gateway Non-3GPP Message Gateway

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

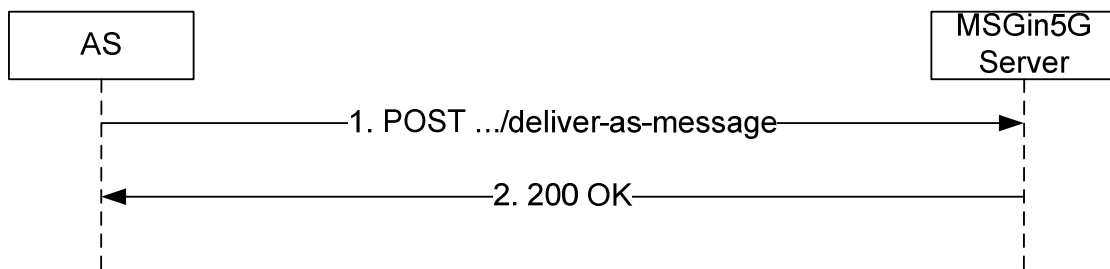


Figure 5.3.2.2.2-1: AS Originating MSGin5G Message Delivery

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 payload body of the HTTP POST request.

The ASMessageDelivery data structure shall include:

- the Originating UE Service ID/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 security credentials within the "secCred" 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 9.1.1.2.2 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

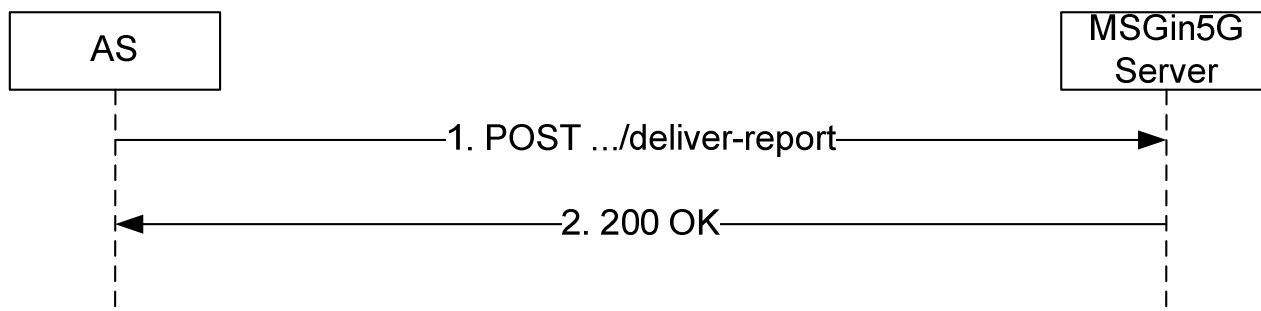


Figure 5.3.2.3.2-1: AS Originating MSGin5G Delivery Report

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 payload body of the HTTP POST request.

The DeliveryStatusReport data structure shall include:

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

may include:

- the security credentials within the "secCred" attribute; and
- 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 9.1.1.3.2 as defined in 3GPP TS 23.554 [2], 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.

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

The Legacy 3GPP Message Gateway or Non-3GPP Message Gateway shall include UEMessageDelivery data structure in the payload body of the HTTP POST request.

The UEMessageDelivery data structure shall include:

- the Originating UE Service ID/AS 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 security credentials within the "secCred" 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 or Non-3GPP Message Gateway, the MSGin5G server shall make an authorization based on the information received from the Legacy 3GPP Message Gateway or Non-3GPP Message Gateway. If the authorization is successful, the MSGin5G Server shall respond to the Legacy 3GPP Message Gateway or Non-3GPP Message Gateway 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 9.2.1.4.2 as defined in 3GPP TS 23.554 [2], is used by Legacy 3GPP Message Gateway or Non-3GPP Message Gateway (on behalf Legacy 3GPP UE or Non-3GPP UE) to deliver the delivery status report to the MSGin5G Server.

5.3.2.5.2 UE Originating Message Delivery Status Report

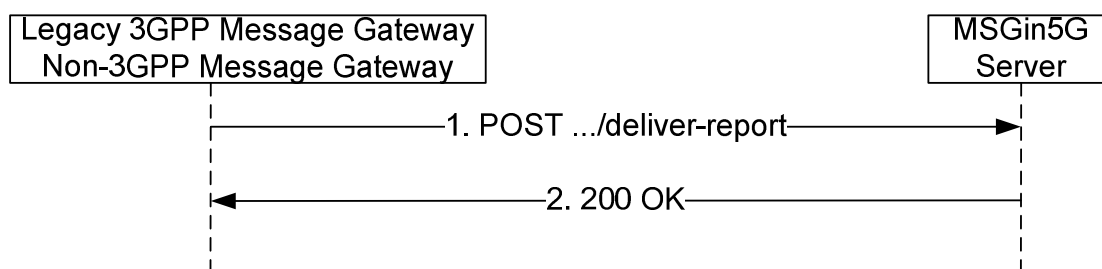


Figure 5.3.2.5.2-1: Legacy 3GPP UE or Non-3GPP UE Originating MSGin5G Delivery Report

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

The Legacy 3GPP Message Gateway or Non-3GPP Message Gateway shall include DeliveryStatusReport data structure in the payload body of the HTTP POST request.

The DeliveryStatusReport data structure shall include:

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

and may include:

- the security credentials within the "secCred" attribute;
- The failure cause within the "failureCause" attribute;

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

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		

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

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 6.2.2.2.2-1: 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 6.2.2.2.2-1.

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/AS 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 "segNum" 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

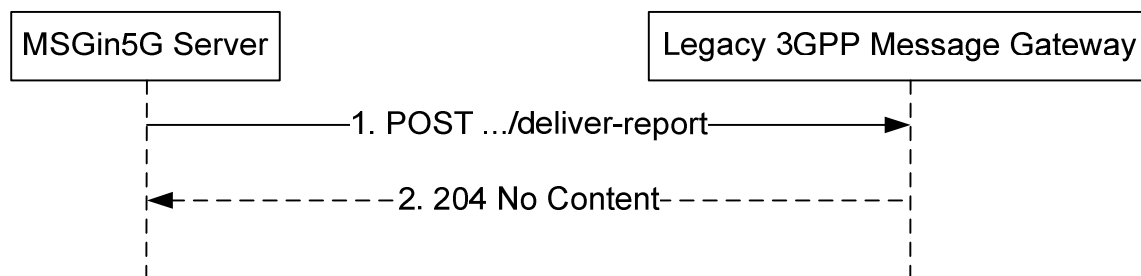


Figure 6.2.2.3.2-1: Legacy 3GPP Message Gateway Terminating Delivery Status Report

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/AS 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

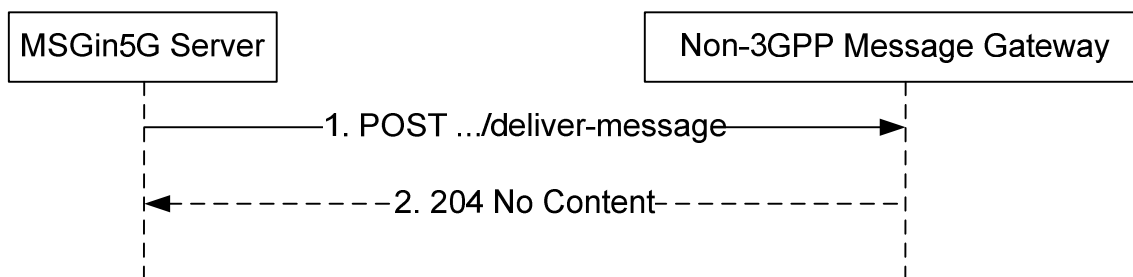


Figure 6.3.2.2.2-1: Non-3GPP Message Gateway Terminating Message Delivery

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/AS 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 "segNum" 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_N3GDDelivery_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

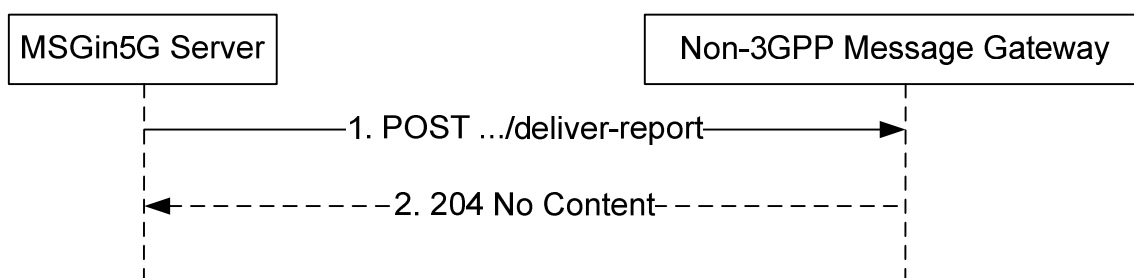


Figure 6.3.2.3.2-1: Non-3GPP Message Gateway Terminating Delivery Status Report

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.

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
MessageSegmentParameters	Clause 8.2.5.2.5	Parameters for message segmentation
Address	Clause 9.1.5.2.3	Represent an address

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 7230 [10], IETF RFC 7231 [11], IETF RFC 7232 [12], IETF RFC 7233 [13], IETF RFC 7234 [14] and IETF RFC 7235 [15]) over TLS is mandatory and support of HTTP/2 (IETF RFC 7540 [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 7540 [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

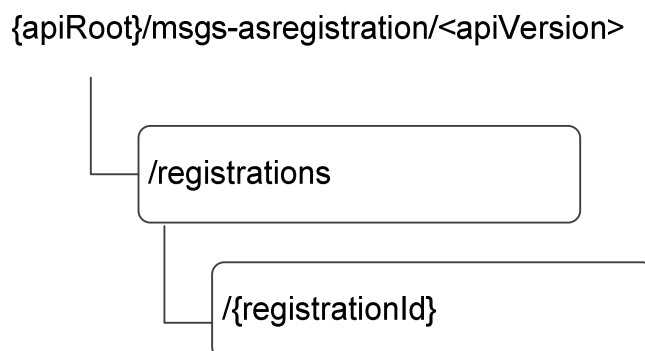


Figure 8.1.2.1-1: Resource URI structure of the MSGS_ASRegistration API

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 8.1.2.3.1-4: Headers supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

Table 8.1.2.3.1-5: 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 8.1.2.3.1-6: 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.
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	
appSenarios	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

General error responses will be defined in clause 7.7.

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 AS_Registration 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}/msgsmsgdelivery/<apiVersion>

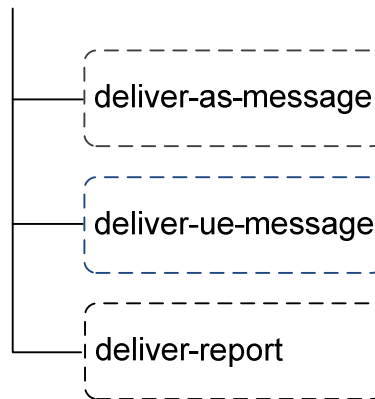


Figure 8.2.3.1-1: Custom operation URI structure of the MSGS_MSGDelivery API

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}/msgsmsgdelivery/<apiVersion>/deliver-as-message	POST	Request of AS to deliver message to a given MSGIn5G Server.
{apiRoot}/msgsmsgdelivery/<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}/msgsmsgdelivery/<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 payload 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.	
secCred	string	O	0..1	Security information required by the MSGin5G Server. This is a placeholder for SA3 security information.	
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". Default value is "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 payload 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.	
secCred	string	O	0..1	Security information required by the MSGin5G Server. This is a placeholder for SA3 security information.	
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". Default value is "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).	
msgId	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 DeliveryStatus sets to "DELY_FAILED".	
NOTE: Either "UE" or "AS" shall be included in the addrType attribute in 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 8.2.5.2.5-1: 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.	
secCred	string	O	0..1	Security information required by the MSGin5G Server. This is a placeholder for SA3 security information.	
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

General error responses will be defined in clause 7.7.

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

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>

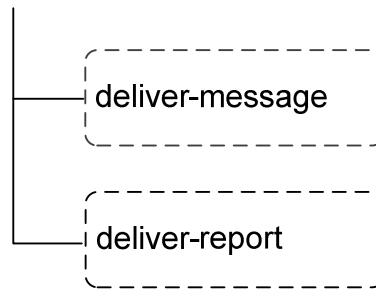


Figure 9.1.3.1-1: Custom operation URI structure of the MSGG_L3GDelivery API

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
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 payload 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

General error responses will be defined in clause 7.7.

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>

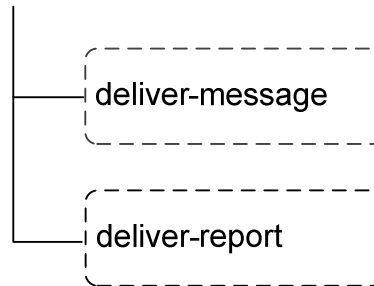


Figure 9.2.3.1-1: Custom operation URI structure of the MSGG_N3GDelivery API

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: 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
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 payload 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.	
msgId	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

General error responses will be defined in clause 7.7.

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

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: 1.0.0
  description: |
    API for MSGS AS Registration Service.
    © 2022, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.538 V17.1.0; 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:
  - msg-asregistration

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'
      '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: '{nrfApiRoot}/oauth2/token'
          scopes:
            msg5-as-registration: Access to the as registration API

```

```

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_MSGDelivery API

```

openapi: 3.0.0
info:
  title: MSGS_MSGDelivery
  version: 1.0.0
  description: |
    API for MSGS MSGin5G Server Message Delivery Service.
    © 2022, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.538 V17.1.0; 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-msgdelivery/v1'
    variables:

```

```

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

security:
  - {}
  - oAuth2ClientCredentials:
    - msgs-msgdelivery

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: '{nrfApiRoot}/oauth2/token'
          scopes:
            msgsg-delivery: Access to the MSGS_MSGDelivery API

```

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
  secCred:
    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
    secCred:
      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
  secCred:
    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: |
  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: |
  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: |
      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: 1.0.0
  description: |
    API for MSGG L3G Message Delivery Service.
    © 2022, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.538 V17.1.0; 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:
    - msgg-l3gdelivery

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: '{nrfApiRoot}/oauth2/token'
          scopes:
            msgg-l3gdelivery: Access to the MSGG_L3GDelivery API

```

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: |
    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: 1.0.0
  description: |
    API for MSGG N3G Message Delivery Service.
    © 2022, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.538 V17.1.0; 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:
    - msgg-n3gdelivery

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: '{nrfApiRoot}/oauth2/token'
          scopes:
            msgg-n3gdelivery: Access to the MSGG_N3GDelivery API

  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'
```

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

History

Document history		
V17.0.0	May 2022	Publication
V17.1.0	July 2022	Publication