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Contents

Foreword

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

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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.

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should indicates a recommendation to do something

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can indicates that something is possible

cannot indicates that something is impossible

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

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

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

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

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

In addition:

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

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

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

1 Scope

The present document specifies the stage 3 protocol and data model for the Nipsmgw and Nrouter Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the IP-SM-GW and SMS Router.

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3].

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

The Stage 2 architecture, procedures and services to support service based short message service (SMS) in 5G system (5GS) is specified in 3GPP TS 23.540 [14].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

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

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

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

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

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

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

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

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

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

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

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

[14] 3GPP TS 23.540: "5G System; Technical realization of Service Based Short Message Service; Stage 2".

[15] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[16] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[17] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[18] IETF RFC 2387: "The MIME Multipart/Related Content-type".

[19] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

3 Definitions and abbreviations

3.1 Definitions

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

Gateway MSC For Short Message Service (SMS-GMSC): function of an MSC capable of receiving a short message from an SC, interrogating an HLR/HSS/UDM for routing information and SMS info, and delivering the short message to the VMSC/SGSN/MME/SMSF of the recipient MS/UE.

IP-Short-Message-Gateway (IP-SM-GW): function responsible for protocol interworking between the IP-based UE and the SC.

3.2 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].

IP-SM-GW	IP Short Message Gateway
SM MO	Short Message Mobile Originated
SM MT	Short Message Mobile Terminated
SMSF	Short Message Service Function

4 Overview

4.1 Introduction

Within the 5GC, the IP-SM-GW offers services to the UDM or SMS-GMSC via the Nipsmgw service based interface, the SMS Router offers services to the UDM or SMS-GMSC via the Nrouter service based interface (see 3GPP TS 23.540 [14], 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3]).

Figure 4.1-1 and Figure 4.1-2 provide the reference model (in service based interface representation and in reference point representation), with focus on the IP-SM-GW and SMS Router and the scope of the present specification.

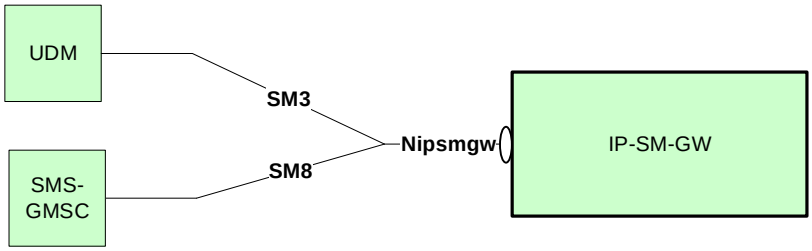

Figure 4.1-1: Reference model – IP-SM-GW

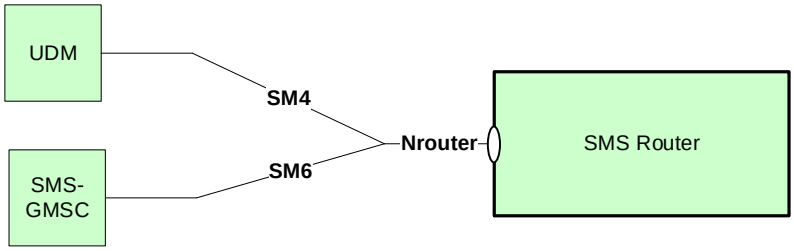

Figure 4.1-2: Reference model – SMS Router

The functionalities supported by the IP-SM-GW and SMS Router are listed in 3GPP TS 23.540 [14].

5 Services offered by the IP-SM-GW and SMS Router

5.1 Introduction

The IP-SM-GW offers to other NFs the following service:

- Nipsmgw_SMService

The SMS Router offers to other NFs the following service:

- Nrouter_SMService

The Nipsmgw_SMService service and Nrouter_SMService service are specified in 3GPP TS 23.540 [14].

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

Table 5.1-1: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Nipsmgw_SMService	6.1	IP-SM-GW SMService Service	TS29577_Nipsmgw_SMService.yaml	nipsmgw-smservice	A.2
Nrouter_SMService	6.2	SMS Router SMService Service	TS29577_Nrouter_SMService.yaml	nrouter-smservice	A.3

5.2 Nipsmgw_SMService Service

5.2.1 Service Description

The Nipsmgw_SMService service provides SBI-based MT SM transmit through IP-SM-GW. The IP-SM-GW is acting as NF Service Producer, while the UDM or SMS-GMSC is the NF Service Consumer.

Following functionalities are provided by the Nipsmgw_SMService service:

- Provide Routing Information;
- Transmit downlink SMS message.

The Nipsmgw_SMService service supports the following service operations.

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

Service Operations	Description	Operation Semantics	Example Consumer(s)
RoutingInfo	Provide Routing Information.	Request/Response	UDM
MtForwardSm	Transmit downlink SMS message.	Request/Response	SMS-GMSC

5.2.2 Service Operations

5.2.2.1 Introduction

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

5.2.2.2 RoutingInfo

5.2.2.2.1 General

The RoutingInfo service operation shall be used to provide the SMSF Instance Id to the IP-SM-GW.

It is used in the following procedures:

- Successful Mobile Terminated short message transfer via IP-SM-GW (see clause 5.1.4 of 3GPP TS 23.540 [14]).
- Unsuccessful Mobile Terminated short message transfer via IP-SM-GW (see clause 5.1.6 of 3GPP TS 23.540 [14]).

The NF Service Consumer (e.g. UDM) shall provide the SMSF Instance Id to the IP-SM-GW by using the HTTP PUT method as shown in Figure 5.2.2.2.1-1.

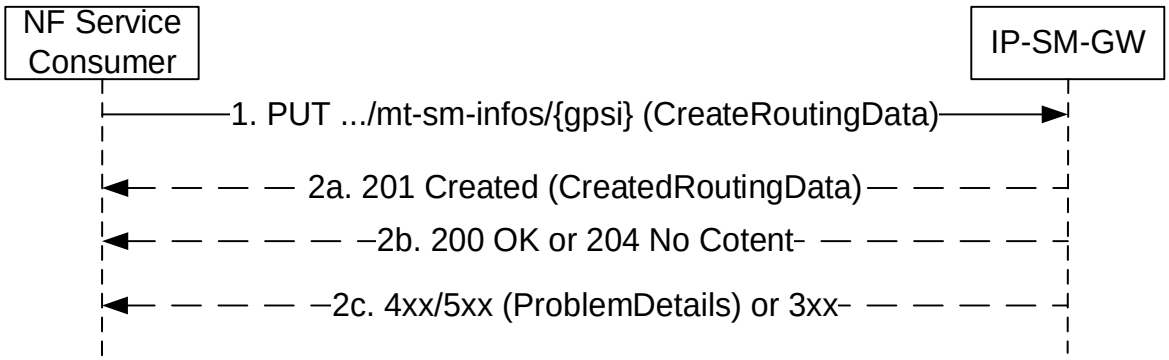

Figure 5.2.2.2.1-1: Routing Information creation

1. The NF Service Consumer shall send a PUT request to the resource representing the UE's Mobile Terminated Short Message Information resource (i.e. …/mt-sms/{gpsi}) of the IP-SM-GW to update or create the routing information for a given UE. The content of the PUT request shall contain:

   - SMSF Instance Id
   - SMSF Registration information (for each access type)

   NOTE: SMSF Instance Id is kept for backwards-compatibility reasons, but its content is included in the SMSF Registration information parameters.

2a. If the resource does not exist (there is no previous routing information stored in IP-SM-GW for that user), IP-SM-GW stores the received routing data and returns a "201 Created" response with the "Location" header containing the URI of the created resource.

   The PUT response body shall include:

- the IP address of the IP-SM-GW (to be sent by the UDM to the SMS-GMSC); and/or
- the FQDN of the IP-SM-GW (to be sent by the UDM to the SMS-GMSC); and/or
- the NF Instance ID of the IP-SM-GW

2b. If the resource exists (there is previous routing information stored in IP-SM-GW for that user), the IP-SM-GW updates the routing data by replacing it with the received information, and responds with "200 OK" or "204 No Content".

2c. On failure, or redirection, one of the HTTP status code listed in Table 6.1.3.3.3.1-3 shall be returned.

5.2.2.3 MtForwardSm

5.2.2.3.1 General

The MtForwardSm service operation shall be used to transmit downlink SMS message via IP-SM-GW.

It is used in the following procedures:

- Successful Mobile Terminated short message transfer via IP-SM-GW (see clause 5.1.4 of 3GPP TS 23.540 [14]).
- Unsuccessful Mobile Terminated short message transfer via IP-SM-GW (see clause 5.1.6 of 3GPP TS 23.540 [14]).

The NF Service Consumer (e.g. SMS-GMSC) shall transmit downlink SMS message to the IP-SM-GW by using the HTTP POST method as shown in Figure 5.2.2.3.1-1.

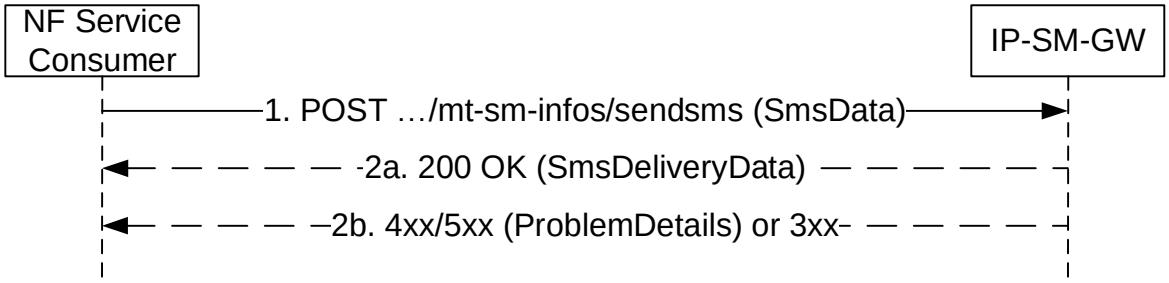

Figure 5.2.2.3.1-1: Transmit downlink SMS message

1. The NF Service Consumer shall send a POST request to the resource representing the UE's Mobile Terminated Short Message Information resource (i.e. …/mt-sms/{gpsi}/sendsms) of the IP-SM-GW. The content of the POST request shall contain the SMS message to be sent.

2a. On success, "200 OK" shall be returned with "SmsDeliveryData" object contains the MT SMS Delivery Report in the response body.

2b. On failure, or redirection, one of the HTTP status code listed in Table 6.1.3.3.4.2.2-2 shall be returned.

5.3 Nrouter_SMService Service

5.3.1 Service Description

The Nrouter_SMService service provides SBI-based MT SM transmit through SMS Router. The SMS Router is acting as NF Service Producer, while the UDM or SMS-GMSC is the NF Service Consumer.

Following functionalities are provided by the Nrouter_SMService service:

- Provide Routing Information;

- Transmit downlink SMS message.

The Nrouter_SMService service supports the following service operations.

Table 5.3.1-1: Service operations supported by the Nrouter_SMService service

Service Operations	Description	Operation Semantics	Example Consumer(s)
RoutingInfo	Provide Routing Information.	Request/Response	UDM
MtForwardSm	Transmit downlink SMS message.	Request/Response	SMS-GMSC

5.3.2 Service Operations

5.3.2.1 Introduction

See Table 5.3.1-1 for an overview of the service operations supported by the Nrouter_SMService service.

5.3.2.2 RoutingInfo

5.3.2.2.1 General

The RoutingInfo service operation shall be used to provide the SMSF Instance Id to the SMS Router.

It is used in the following procedures:

- Successful Mobile Terminated short message transfer via SMS Router (see clause 5.1.3 of 3GPP TS 23.540 [14]).
- Unsuccessful Mobile Terminated short message transfer via SMS Router (see clause 5.1.9 of 3GPP TS 23.540 [14]).

The NF Service Consumer (e.g. UDM) shall provide the SMSF Instance Id to the SMS Router by using the HTTP PUT method as shown in Figure 5.3.2.2.1-1.

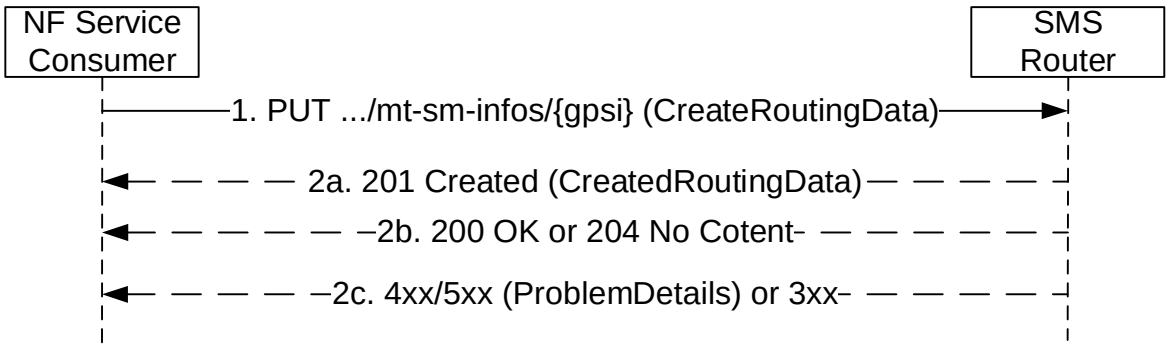

Figure 5.3.2.2.1-1: Routing Information creation

1. The NF Service Consumer shall send a PUT request to the resource representing the UE's Mobile Terminated Short Message Information resource (i.e. …/mt-sms/{gpsi}) of the SMS Router to update or create the routing information for a given UE. The content of the PUT request shall contain:
   - SMSF Instance Id
   - SMSF Registration information (for each access type)

   NOTE: SMSF Instance Id is kept for backwards-compatibility reasons, but its content is included in the SMSF Registration information parameters.

2a. If the resource does not exist (there is no previous routing information stored in SMS Router for that user), SMS Router stores the received routing data and returns a "201 Created" response with the "Location" header containing the URI of the created resource.

The PUT response body shall include:

- the IP address of the SMS Router (to be sent by the UDM to the SMS-GMSC); and/or
- the FQDN of the SMS Router (to be sent by the UDM to the SMS-GMSC); and/or
- the NF Instance ID of the SMS Router

2b. If the resource exists (there is previous routing information stored in SMS Router for that user), the SMS Router updates the routing data by replacing it with the received information, and responds with "200 OK" or "204 No Content".

2c. On failure, or redirection, one of the HTTP status code listed in Table 6.2.3.3.3.1-3 shall be returned.

5.3.2.3 MtForwardSm

5.3.2.3.1 General

The MtForwardSm service operation shall be used to transmit downlink SMS message via SMS Router.

It is used in the following procedures:

- Successful Mobile Terminated short message transfer via SMS Router (see clause 5.1.3 of 3GPP TS 23.540 [14]).
- Unsuccessful Mobile Terminated short message transfer via SMS Router (see clause 5.1.9 of 3GPP TS 23.540 [14]).

The NF Service Consumer (e.g. SMS-GMSC) shall transmit downlink SMS message to the SMS Router by using the HTTP POST method as shown in Figure 5.3.2.3.1-1.

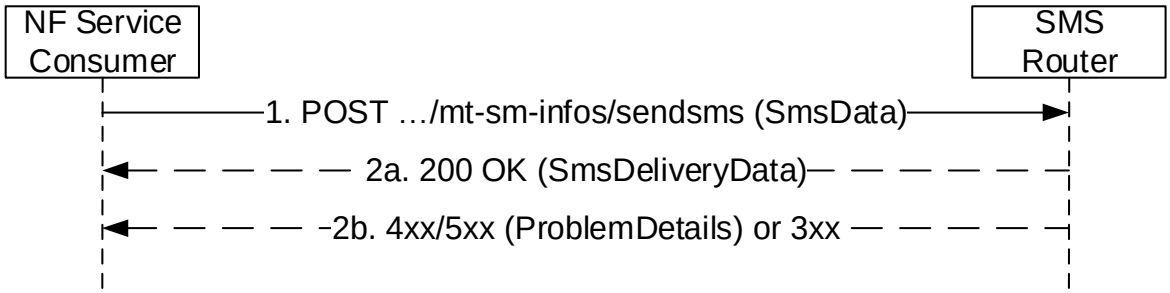

Figure 5.3.2.3.1-1: Transmit downlink SMS message

1. The NF Service Consumer shall send a POST request to the resource representing the UE's Mobile Terminated Short Message Information resource (i.e. …/mt-sms/{gpsi}/sendsms) of the SMS Router. The content of the POST request shall contain the SMS message to be sent.

2a. On success, "200 OK" shall be returned with "SmsDeliveryData" object contains the MT SMS Delivery Report in the response body.

2b. On failure, or redirection, one of the HTTP status code listed in Table 6.2.3.3.4.2.2-2 shall be returned.

6 API Definitions

6.1 Nipsmgw_SMService Service API

6.1.1 Introduction

The Nipsmgw_SMService shall use the Nipsmgw_SMService API.

The API URI of the Nipsmgw_SMService API shall be:

{apiRoot}/<apiName>/<apiVersion>

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

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

with the following components:

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

6.1.2 Usage of HTTP

6.1.2.1 General

HTTP/2, IETF RFC 9113 [11], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

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

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

6.1.2.2 HTTP standard headers

6.1.2.2.1 General

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

6.1.2.2.2 Content type

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

"Problem Details" JSON object shall be used to indicate additional details of the error in a HTTP response body and shall be signalled by the content type "application/problem+json", as defined in IETF RFC 9457 [13].

Multipart messages shall also be supported (see clause 6.1.2.4) using the content type "multipart/related", comprising:

- one JSON body part with the "application/json" content type; and
- one binary body part with 3gpp vendor specific content subtypes.

The 3gpp vendor specific content subtypes defined in Table 6.1.2.2.2-1 shall be supported.

Table 6.1.2.2.2-1: 3GPP vendor specific content subtypes

content subtype	Description
vnd.3gpp.sms	Binary encoded payload, encoding SMS payload, as specified in 3GPP TS 23.040 [16] and 3GPP TS 24.011 [17].
NOTE: Using 3GPP vendor content subtypes allows to describe the nature of the opaque payload (e.g. SMS payload) without having to rely on metadata in the JSON payload.	

See clause 6.1.2.4 for the binary payloads supported in the binary body part of multipart messages.

6.1.2.3 HTTP custom headers

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

6.1.2.4 HTTP multipart messages

HTTP multipart messages shall be supported, to transfer opaque SMS payload (e.g. SMS message, CP Ack, etc.), in the following service operations (and HTTP messages):

- MtForwardSm service operation;

HTTP multipart messages shall include one JSON body part and one binary body part comprising content of SMS payload content (see clause 6.1.6.5).

The JSON body part shall be the "root" body part of the multipart message. It shall be encoded as the first body part of the multipart message. The "Start" parameter does not need to be included.

The multipart message shall include a "type" parameter (see IETF RFC 2387 [18]) specifying the media type of the root body part, i.e. "application/json".

NOTE: The "root" body part (or "root" object) is the first body part the application processes when receiving a multipart/related message, see IETF RFC 2387 [18]. The default root is the first body within the multipart/related message. The "Start" parameter indicates the root body part, e.g. when this is not the first body part in the message.

A binary body part shall include a Content-ID header (see IETF RFC 2045 [19]), and the JSON body part shall make a reference to the binary body part using the Content-ID header field.

Examples of multipart/related messages can be found in Annex B.

6.1.3 Resources

6.1.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.1.3.1-1 depicts the resource URIs structure for the Nipsmgw_SMService API.

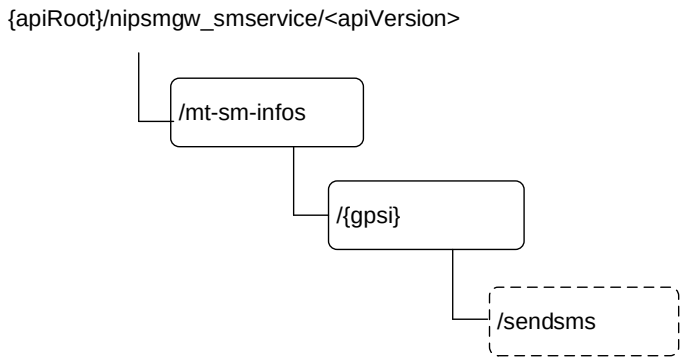

Figure 6.1.3.1-1: Resource URI structure of the Nipsmgw_SMService API

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

Table 6.1.3.1-1: Resources and methods overview

Resource purpose/name	Resource URI (relative path after API URI)	HTTP method or custom operation	Description (service operation)
MtSmInfos (Collection)	/mt-sm-infos		
MtSmInfo (Document)	/mt-sm-infos/{gpsi}	PUT	Create Routing Information for MT SMS.
	/mt-sm-infos/{gpsi}/sendsms	sendsms (POST)	It is used for the MtForwardSm service operation, to allow NF Service Consumer to send SMS payload in downlink direction.

6.1.3.2 Resource: MtSmInfos (Collection)

6.1.3.2.1 Description

This resource represents the collection of Mobile Terminated Short Message Information in IP-SM-GW.

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

No HTTP method has been defined for this resource.

6.1.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nipsmgw-smsevice/<apiVersion>/mt-sm-infos**

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

Table 6.1.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1

6.1.3.2.3 Resource Standard Methods

No HTTP method has been defined for the Mobile Terminated Short Message Information collection resource.

6.1.3.3 Resource: MtSmInfo (Document)

6.1.3.3.1 Description

This resource represents an individual Mobile Terminated Short Message Information in IP-SM-GW.

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

6.1.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nipsmgw-smsevice/<apiVersion>/mt-sm-infos/{gpsi}**

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

Table 6.1.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
gpsi	gpsi	Represents the Generic Public Subscription Identifier with MSISDN (see 3GPP TS 23.501 [2] clause 5.9.8) pattern: See pattern of type Gpsi in 3GPP TS 29.571 [15]

6.1.3.3.3 Resource Standard Methods

6.1.3.3.3.1 PUT

This method creates an individual resource of Mobile Terminated Short Message Information in the IP-SM-GW, or updates the indicated resource of Mobile Terminated Short Message Information in the IP-SM-GW.

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

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

Name	Data type	P	Cardinality	Description	Applicability
n/a					

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

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

Data type	P	Cardinality	Description
CreateRoutingData	M	1	Representation of the UE's Mobile Terminated Short Message Information to be created in the IP-SM-GW, or to be updated in the IP-SM-GW.

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

Data type	P	Cardinality	Response codes	Description
CreatedRoutingData	M	1	201 Created	This case represents the successful creation of an UE's Mobile Terminated Short Message Information. The HTTP response shall include a "Location" HTTP header that contains the resource URI of the created resource.
CreatedRoutingData	M	1	200 OK	Upon success, a response body containing a representation of the updated UE's Mobile Terminated Short Message Information shall be returned.
n/a			204 No Content	Upon success, an empty response body shall be returned
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. (NOTE 2)
NOTE 1: The manadatory HTTP error status code for the PUT method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.1.3.3.3.1-4: 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}/nipsmgw-smsevice/<apiVersion>/mt-sm-infos/{gpsi}

Table 6.1.3.3.3.1-5: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same IP-SM-GW or IP-SM-GW (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

Table 6.1.3.3.3.1-6: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same IP-SM-GW or IP-SM-GW (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

6.1.3.3.4 Resource Custom Operations

6.1.3.3.4.1 Overview

Table 6.1.3.3.4.1-1: Custom operations

Operation name	Custom operaration URI	Mapped HTTP method	Description
sendsms	/mt-sm-infos/{gpsii}/sendsms	POST	Send MT SMS message or the related Delivery Report.

6.1.3.3.4.2 Operation: sendsms

6.1.3.3.4.2.1 Description

This custom operation is used for NF Service Consumers to send SMS message in downlink direction.

6.1.3.3.4.2.2 Operation Definition

This custom operation is used to send a SMS payload to an UE's Mobile Terminated Short Message Information resource in the IP-SM-GW.

This operation shall support the request data structures specified in table 6.1.3.3.4.2.2-1 and the response data structure and response codes specified in table 6.1.3.3.4.2.2-2.

Table 6.1.3.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
SmsData	M	1	Representation of the MT SMS message to be sent.

Table 6.1.3.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SmsDeliveryData	M	1	200 OK	This case represents the successful of sending SMS message in downlink direction, with necessary response data on the received delivery report.
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. (NOTE 2)
ProblemDetails	O	0..1	400 Bad Request	This case represents an unsuccessful delivery of SMS message. The "cause" attribute may be used to indicate one of the following application errors: - SMS_PAYLOAD_MISSING, if the expected SMS payload content is missing; - SMS_PAYLOAD_ERROR, if error exists in the SMS payload content.
ProblemDetails	O	0..1	404 Not Found	This case represents an unsuccessful delivery of SMS payload. The "cause" attribute may be used to indicate one of the following application errors: - ROUTING_INFO_NOT_FOUND, if the routing information for SMS to be operated is invalid or not found in IP-SM-GW. - USER_NOT_FOUND, if the UE identified by the GPSI is not found in the IP-SM-GW.
NOTE 1: The manadatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.1.3.3.4.2.2-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same IP-SM-GW or IP-SM-GW (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

Table 6.1.3.3.4.2.2-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same IP-SM-GW or IP-SM-GW (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

6.1.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined.

6.1.5 Notifications

In this release of this specification, no notification procedures are defined.

6.1.6 Data Model

6.1.6.1 General

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

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

Table 6.1.6.1-1: Nipsmgw_SMService specific Data Types

Data type	Clause defined	Description	Applicability
CreateRoutingData	6.1.6.2.2	Information used for creating or updating the routing information of the user.	
CreatedRoutingData	6.1.6.2.3	Information used for receiving the MT SMS.	
SmsData	6.1.6.2.4	Information within request message for delivering SMS.	
SmsDeliveryData	6.1.6.2.5	Information within response message invoking MtForwardSm service operation, for delivering MT SMS Delivery Report.	

Table 6.1.6.1-2 specifies data types re-used by the Nipsmgw_SMService service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nipsmgw_SMService service based interface.

Table 6.1.6.1-2: Nipsmgw_SMService re-used Data Types

Data type	Reference	Comments	Applicability
ProblemDetails	3GPP TS 29.571 [15]	Common Data Type used in response bodies	
RedirectResponse	3GPP TS 29.571 [15]	Redirect Response	
Gpsi	3GPP TS 29.571 [15]	General Public Subscription Identifier	
NfInstanceId	3GPP TS 29.571 [15]	NF Instance ID	
RefToBinaryData	3GPP TS 29.571 [15]	Information for indicating the binary content of SMS payload.	
Ipv4Addr	3GPP TS 29.571 [15]	IPv4 address	
Ipv6Addr	3GPP TS 29.571 [15]	IPv6 address	
SupportedFeatures	3GPP TS 29.571 [15]	Supported Features	
Fqdn	3GPP TS 29.571 [15]	Fully Qualified Domain Name	
Supi	3GPP TS 29.571 [15]	Subscription Permanent Identifier	

6.1.6.2 Structured data types

6.1.6.2.1 Introduction

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

6.1.6.2.2 Type: CreateRoutingData

Table 6.1.6.2.2-1: Definition of type CreateRoutingData

Attribute name	Data type	P	Cardinality	Description	Applicability
smsfId	NfInstanceId	M	1	This IE shall be present, and it shall contain the NF instance ID of the SMSF to receive the downlink MT SM. (NOTE 1)	
smsf3Gpp	SmsfRegistration	O	0..1	This IE shall contain the 3GPP Access Registration of the SMSF. (NOTE 1)	
smsfNon3Gpp	SmsfRegistration	O	0..1	This IE shall contain the Non-3GPP Access Registration of the SMSF. (NOTE 1)	
supi	Supi	O	0..1	SUPI	
ipSmGwGuidanceInd	boolean	C	0..1	This IE indicates whether the SMS-GMSC is prepared to receive IP-SM-GW guidance information in the response; it shall be set by the consumer (UDM) to the same value as received from the SMS-GMSC. Default value: false.	
supportedFeatures	SupportedFeatures	C	0..1	This IE shall be present if at least one optional feature defined in clause 6.1.8 is supported.	
NOTE 1: The full SMSF addressing information (including SMSF access type, PLMN IDs, Diameter and MAP addresses…) are included in "smsf3Gpp" and "smsfNon3Gpp" attributes; API versions not supporting these attributes are limited to the SMSF information provided by the "smsfId" attribute.					

6.1.6.2.3 Type: CreatedRoutingData

Table 6.1.6.2.3-1: Definition of type CreatedRoutingData

Attribute name	Data type	P	Cardinality	Description	Applicability
ipsmgwIpv4	Ipv4Addr	C	0..1	This IE shall be present if available. When present, this IE indicates the IPv4 address of the IP-SM-GW to receive the downlink short message. See NOTE	
ipsmgwIpv6	Ipv6Addr	C	0..1	This IE shall be present if available. When present, this IE indicates the IPv6 address of the IP-SM-GW to receive the downlink short message. See NOTE	
ipsmgwFqdn	Fqdn	C	0..1	This IE shall be present if available. When present, this IE indicates the FQDN of the IP-SM-GW to receive the downlink short message. See NOTE	
ipSmGwNfInstanceId	NfInstanceId	C	0..1	This IE shall be present if available. When present, this IE indicates the NF Instance ID of the IP-SM-GW to receive the downlink short message. See NOTE	
correlationId	string	O	0..1	Correlation ID	
ipSmGwGuidance	IpSmGwGuidance	C	0..1	Contains the recommended and the minimum timer values for supervision of MT SMS response.	
supportedFeatures	SupportedFeatures	C	0..1	This IE shall be present if at least one optional feature defined in clause 6.1.8 is supported.	
NOTE: At least, one of IP-SM-GW addresses shall be included.					

6.1.6.2.4 Type: SmsData

Table 6.1.6.2.4-1: Definition of type SmsData

Attribute name	Data type	P	Cardinality	Description	Applicability
smsPayload	RefToBinaryData	M	1	This IE shall be present, and it shall contain the reference to the SMS Payload Information binary data (see clause 6.1.6.5)	

6.1.6.2.5 Type: SmsDeliveryData

Table 6.1.6.2.5-1: Definition of type SmsDeliveryData

Attribute name	Data type	P	Cardinality	Description	Applicability
smsPayload	RefToBinaryData	M	1	This IE shall be present, and it shall contain the reference to the SMS Payload Information binary data (see clause 6.1.6.5)	

6.1.6.3 Simple data types and enumerations

6.1.6.3.1 Introduction

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

6.1.6.3.2 Simple data types

The simple data types defined in table 6.1.6.3.2-1 shall be supported.

Table 6.1.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

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

In this release of this specification, no alternative data types or combinations of data types are defined.

6.1.6.5 Binary data

6.1.6.5.1 Binary Data Types

Table 6.1.6.5.1-1: Binary Data Types

Name	Clause defined	Content type
SMS Payload Information	6.1.6.5.2	vnd.3gpp.sms

6.1.6.5.2 SMS Payload Information

SMS Payload Information shall encode a SMS payload as specified in 3GPP TS 23.040 [16] and 3GPP TS 24.011 [17], using the vnd.3gpp.sms content-type.

SMS Payload Information may encode e.g. the following content:

- CP-DATA, CP-ACK, CP-ERROR as specified in 3GPP TS 23.040 [16] and 3GPP TS 24.011 [17].

6.1.7 Error Handling

6.1.7.1 General

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

In addition, the requirements in the following clauses are applicable for the Nipsmgw_SMService API.

6.1.7.2 Protocol Errors

No specific procedures for the Nipsmgw_SMService service are specified.

6.1.7.3 Application Errors

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

Table 6.1.7.3-1: Application errors

Application Error	HTTP status code	Description
SMS_PAYLOAD_MISSING	400 Bad Request	The expected SMS payload content is missing.
SMS_PAYLOAD_ERROR	400 Bad Request	Errors exist in the format of SMS payload.
USER_NOT_FOUND	404 Not Found	The provided subscriber identifier is not found.
ROUTING_INFO_NOT_FOUND	404 Not Found	The routing information for SMS to be operated is invalid or not found in IP-SM-GW

6.1.8 Feature negotiation

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

Table 6.1.8-1: Supported Features

Feature number	Feature Name	Description

6.1.9 Security

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

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

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

The Nipsmgw_SMService API defines the following scopes for Oauth2 authorization as specified in 3GPP TS 33.501 [8]:

Table 6.1.9-1: OAuth2 scopes defined in Nipsmgw_SMService API

Scope	Description
"nipsmgw_smservice"	Access to the Nipsmgw_SMService API.
"nipsmgw_smservice:mtsminfos:write"	Access to write MT SM Infos
"nipsmgw_smservice:sendsms:invoke"	Access to invoke Send SMS

6.1.10 HTTP redirection

An HTTP request may be redirected to a different IP-SM-GW service instance, within the same IP-SM-GW or a different IP-SM-GW of an IP-SM-GW set, e.g. when an IP-SM-GW service instance is part of an IP-SM-GW (service) set or when using indirect communications (see 3GPP TS 29.500 [4]).

An SCP that reselects a different IP-SM-GW producer instance will return the NF Instance ID of the new IP-SM-GW producer instance in the 3gpp-Sbi-Producer-Id header, as specified in clause 6.10.3.4 of 3GPP TS 29.500 [4].

If an IP-SM-GW within an IP-SM-GW set redirects a service request to a different IP-SM-GW of the set using a 307 Temporary Redirect or 308 Permanent Redirect status code, the identity of the new IP-SM-GW towards which the service request is redirected shall be indicated in the 3gpp-Sbi-Target-Nf-Id header of the 307 Temporary Redirect or 308 Permanent Redirect response as specified in clause 6.10.9.1 of 3GPP TS 29.500 [4].

6.2 Nrouter_SMService Service API

6.2.1 Introduction

The Nrouter_SMService shall use the Nrouter_SMService API.

The API URI of the Nrouter_SMService API shall be:

{apiRoot}/<apiName>/<apiVersion>

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

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

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nrouter-smservice".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.2.3.

6.2.2 Usage of HTTP

6.2.2.1 General

HTTP/2, IETF RFC 9113 [11], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

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

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

6.2.2.2 HTTP standard headers

6.2.2.2.1 General

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

6.2.2.2.2 Content type

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

"Problem Details" JSON object shall be used to indicate additional details of the error in a HTTP response body and shall be signalled by the content type "application/problem+json", as defined in IETF RFC 9457 [13].

Multipart messages shall also be supported (see clause 6.2.2.4) using the content type "multipart/related", comprising:

- one JSON body part with the "application/json" content type; and
- one binary body part with 3gpp vendor specific content subtypes.

The 3gpp vendor specific content subtypes defined in Table 6.2.2.2.2-1 shall be supported.

Table 6.2.2.2.2-1: 3GPP vendor specific content subtypes

content subtype	Description
vnd.3gpp.sms	Binary encoded payload, encoding SMS payload, as specified in 3GPP TS 23.040 [16] and 3GPP TS 24.011 [17].
NOTE: Using 3GPP vendor content subtypes allows to describe the nature of the opaque payload (e.g. SMS payload) without having to rely on metadata in the JSON payload.	

See clause 6.2.2.4 for the binary payloads supported in the binary body part of multipart messages.

6.2.2.3 HTTP custom headers

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

6.2.2.4 HTTP multipart messages

HTTP multipart messages shall be supported, to transfer opaque SMS payload (e.g. SMS message, CP Ack, etc.), in the following service operations (and HTTP messages):

- MtForwardSm service operation;

HTTP multipart messages shall include one JSON body part and one binary body part comprising content of SMS payload content (see clause 6.2.6.4).

The JSON body part shall be the "root" body part of the multipart message. It shall be encoded as the first body part of the multipart message. The "Start" parameter does not need to be included.

The multipart message shall include a "type" parameter (see IETF RFC 2387 [18]) specifying the media type of the root body part, i.e. "application/json".

NOTE: The "root" body part (or "root" object) is the first body part the application processes when receiving a multipart/related message, see IETF RFC 2387 [18]. The default root is the first body within the multipart/related message. The "Start" parameter indicates the root body part, e.g. when this is not the first body part in the message.

A binary body part shall include a Content-ID header (see IETF RFC 2045 [19]), and the JSON body part shall make a reference to the binary body part using the Content-ID header field.

Examples of multipart/related messages can be found in Annex B.

6.2.3 Resources

6.2.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.2.3.1-1 depicts the resource URIs structure for the Nrouter_SMService API.

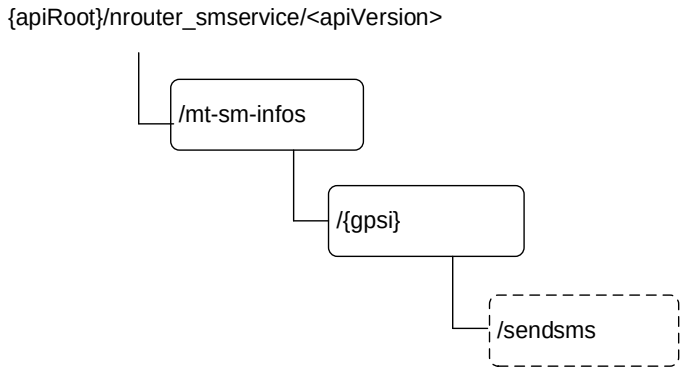

Figure 6.2.3.1-1: Resource URI structure of the Nrouter_SMService API

Table 6.2.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.2.3.1-1: Resources and methods overview

Resource purpose/name	Resource URI (relative path after API URI)	HTTP method or custom operation	Description (service operation)
MtSmInfo (Document)	/mt-sm-infos/{gpsi}	PUT	Create Routing Information for MT SMS.
	/mt-sm-infos/{gpsi}/sendsms	sendsms (POST)	It is used for the MtForwardSm service operation, to allow NF Service Consumer to send SMS payload in downlink direction.

6.2.3.2 Resource: MtSmInfos (Store)

6.2.3.2.1 Description

This resource represents the collection of Mobile Terminated Short Message Information in SMS Router.

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

No HTTP method has been defined for this resource.

6.2.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nrouter-smsevice/<apiVersion>/mt-sm-infos**

This resource shall support the resource URI variables defined in table 6.2.3.2.2-1.

Table 6.2.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.2.1

6.2.3.2.3 Resource Standard Methods

No HTTP method has been defined for the Mobile Terminated Short Message Information collection resource.

6.2.3.3 Resource: MtSmInfo (Document)

6.2.3.3.1 Description

This resource represents an individual Mobile Terminated Short Message Information in SMS Router.

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

6.2.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nrouter-smsevice/<apiVersion>/mt-sm-infos/{gpsi}**

This resource shall support the resource URI variables defined in table 6.2.3.3.2-1.

Table 6.2.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.2.1
gpsi	gpsi	Represents the Generic Public Subscription Identifier with MSISDN (see 3GPP TS 23.501 [2] clause 5.9.8) pattern: See pattern of type Gpsi in 3GPP TS 29.571 [15]

6.2.3.3.3 Resource Standard Methods

6.2.3.3.3.1 PUT

This method creates an individual resource of Mobile Terminated Short Message Information in the SMS Router, or updates the indicated resource of Mobile Terminated Short Message Information in the SMS Router.

This method shall support the URI query parameters specified in table 6.2.3.3.3.1-1.

Table 6.2.3.3.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.2.3.3.3.1-2 and the response data structures and response codes specified in table 6.2.3.3.3.1-3.

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

Data type	P	Cardinality	Description
CreateRoutingData	M	1	Representation of the UE's Mobile Terminated Short Message Information to be created in the SMS Router, or to be updated in the SMS Router.

Table 6.2.3.3.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
CreatedRoutingData	M	1	201 Created	This case represents the successful creation of an UE's Mobile Terminated Short Message Information. The HTTP response shall include a "Location" HTTP header that contains the resource URI of the created resource.
CreatedRoutingData	M	1	200 OK	Upon success, a response body containing a representation of the updated UE's Mobile Terminated Short Message Information shall be returned.
n/a			204 No Content	Upon success, an empty response body shall be returned
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. (NOTE 2)
NOTE 1: The manadatory HTTP error status code for the PUT method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.2.3.3.3.1-4: 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}/nrouter-smsevice/<apiVersion>/mt-sm-infos/{gpsi}

Table 6.2.3.3.3.1-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same SMS Router or SMS Router (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

Table 6.2.3.3.3.1-6: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same SMS Router or SMS Router (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

6.2.3.3.4 Resource Custom Operations

6.2.3.3.4.1 Overview

Table 6.2.3.3.4.1-1: Custom operations

Operation name	Custom operaration URI	Mapped HTTP method	Description
sendsms	/mt-sm-infos/{gpsii}/sendsms	POST	Send MT SMS message or the related Delivery Report.

6.2.3.3.4.2 Operation: sendsms

6.2.3.3.4.2.1 Description

This custom operation is used for NF Service Consumers to send SMS message in downlink direction.

6.2.3.3.4.2.2 Operation Definition

This custom operation is used to send a SMS payload to an UE's Mobile Terminated Short Message Information resource in the SMS Router.

This operation shall support the request data structures specified in table 6.2.3.3.4.2.2-1 and the response data structure and response codes specified in table 6.2.3.3.4.2.2-2.

Table 6.2.3.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
SmsData	M	1	Representation of the MT SMS message to be sent.

Table 6.2.3.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SmsDeliveryData	M	1	200 OK	This case represents the successful of sending SMS message in downlink direction, with necessary response data on the received delivery report.
RedirectResponse	O	0..1	307 Temporary Redirect	Temporary redirection. (NOTE 2)
RedirectResponse	O	0..1	308 Permanent Redirect	Permanent redirection. (NOTE 2)
ProblemDetails	O	0..1	400 Bad Request	This case represents an unsuccessful delivery of SMS message. The "cause" attribute may be used to indicate one of the following application errors: - SMS_PAYLOAD_MISSING, if the expected SMS payload content is missing; - SMS_PAYLOAD_ERROR, if error exists in the SMS payload content.
ProblemDetails	O	0..1	404 Not Found	This case represents an unsuccessful delivery of SMS payload. The "cause" attribute may be used to indicate one of the following application errors: - ROUTING_INFO_NOT_FOUND, if the routing information for SMS to be operated is invalid or not found in SMS Router. - USER_NOT_FOUND, if the UE identified by the GPSI is not found in the SMS Router.
NOTE 1: The manadatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. NOTE 2: RedirectResponse may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4].				

Table 6.2.3.3.4.2.2-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same SMS Router or SMS Router (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

Table 6.2.3.3.4.2.2-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located on an alternative service instance within the same SMS Router or SMS Router (service) set. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.10.9.1 in 3GPP TS 29.500 [4].
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance ID towards which the request is redirected

6.2.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined.

6.2.5 Notifications

In this release of this specification, no notification procedures are defined.

6.2.6 Data Model

6.2.6.1 General

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

Table 6.2.6.1-1 specifies the data types defined for the Nrouter_SMService service based interface protocol.

Table 6.2.6.1-1: Nrouter_SMService specific Data Types

Data type	Clause defined	Description	Applicability
CreatedRoutingData	6.2.6.2.2	Information used for receiving the MT SMS.	

Table 6.2.6.1-2 specifies data types re-used by the Nrouter_SMService service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nrouter_SMService service based interface.

Table 6.2.6.1-2: Nrouter_SMService re-used Data Types

Data type	Reference	Comments	Applicability
CreateRoutingData	6.1.6.2.2	Information used for creating or updating the routing information of the user.	
SmsData	6.1.6.2.4	Information within request message invoking MtForwardSm service operation, for delivering MT SMS.	
SmsDeliveryData	6.1.6.2.5	Information within response message invoking MtForwardSm service operation, for delivering MT SMS Delivery Report.	
ProblemDetails	3GPP TS 29.571 [15]	Common Data Type used in response bodies	
RedirectResponse	3GPP TS 29.571 [15]	Redirect Response	
Gpsi	3GPP TS 29.571 [15]	General Public Subscription Identifier	
NfInstanceId	3GPP TS 29.571 [15]	NF Instance ID	
RefToBinaryData	3GPP TS 29.571 [15]	Information for indicating the binary content of SMS payload.	
Ipv4Addr	3GPP TS 29.571 [15]	IPv4 address	
Ipv6Addr	3GPP TS 29.571 [15]	IPv6 address	
SupportedFeatures	3GPP TS 29.571 [15]	Supported Features	
Fqdn	3GPP TS 29.571 [15]	Fully Qualified Domain Name	

6.2.6.2 Structured data types

6.2.6.2.1 Introduction

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

6.2.6.2.2 Type: CreatedRoutingData

Table 6.2.6.2.2-1: Definition of type CreatedRoutingData

Attribute name	Data type	P	Cardinality	Description	Applicability
routerIpv4	Ipv4Addr	C	0..1	This IE shall be present if available. When present, this IE indicates the IPv4 address of the SMS Router to receive the downlink short message. See NOTE	
routerIpv6	Ipv6Addr	C	0..1	This IE shall be present if available. When present, this IE indicates the IPv6 address of the SMS Router to receive the downlink short message. See NOTE	
routerFqdn	Fqdn	C	0..1	This IE shall be present if available. When present, this IE indicates the FQDN of the SMS Router to receive the downlink short message. See NOTE	
routerNfInstanceId	NfInstanceId	C	0..1	This IE shall be present if available. When present, this IE indicates the NF Instance ID of the SMS Router to receive the downlink short message. See NOTE	
supportedFeatures	SupportedFeatures	C	0..1	This IE shall be present if at least one optional feature defined in clause 6.1.8 is supported.	
NOTE: At least, one of SMS Router addresses shall be included.					

6.2.6.3 Simple data types and enumerations

6.2.6.3.1 Introduction

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

6.2.6.3.2 Simple data types

The simple data types defined in table 6.2.6.3.2-1 shall be supported.

Table 6.2.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

6.2.6.3.3 Enumeration: <EnumType1>

The enumeration <EnumType1> represents <something>. It shall comply with the provisions defined in table 6.1.6.3.3-1.

Table 6.2.6.3.3-1: Enumeration < EnumType1>

Enumeration value	Description	Applicability

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

In this release of this specification, no alternative data types or combinations of data types are defined.

6.2.6.5 Binary data

See clause 6.1.6.5.

6.2.7 Error Handling

6.2.7.1 General

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

In addition, the requirements in the following clauses are applicable for the Nrouter_SMService API.

6.2.7.2 Protocol Errors

No specific procedures for the Nrouter_SMService service are specified.

6.2.7.3 Application Errors

The application errors defined for the Nrouter_SMService service are listed in Table 6.2.7.3-1.

Table 6.2.7.3-1: Application errors

Application Error	HTTP status code	Description
SMS_PAYLOAD_MISSING	400 Bad Request	The expected SMS payload content is missing.
SMS_PAYLOAD_ERROR	400 Bad Request	Errors exist in the format of SMS payload.
USER_NOT_FOUND	404 Not Found	The provided subscriber identifier is not found.
ROUTING_INFO_NOT_FOUND	404 Not Found	The routing information for SMS to be operated is invalid or not found in SMS Router

6.2.8 Feature negotiation

The optional features in table 6.2.8-1 are defined for the Nrouter_SMService API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.2.8-1: Supported Features

Feature number	Feature Name	Description

6.2.9 Security

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

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

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

The Nrouter_SMService API defines the following scopes for Oauth2 authorization as specified in 3GPP TS 33.501 [8]:

Table 6.2.9-1: OAuth2 scopes defined in Nrouter_SMService API

Scope	Description
"nrouter_smservice"	Access to the Nrouter_SMService API.
"nrouter_smservice:mtsminfos:write"	Access to write MT SM Infos
"nrouter_smservice:sendsms:invoke"	Access to invoke Send SMS

6.2.10 HTTP redirection

An HTTP request may be redirected to a different SMS Router service instance, within the same SMS Router or a different SMS Router of an SMS Router set, e.g. when an SMS Router service instance is part of an SMS Router (service) set or when using indirect communications (see 3GPP TS 29.500 [4]).

An SCP that reselects a different SMS Router producer instance will return the NF Instance ID of the new SMS Router producer instance in the 3gpp-Sbi-Producer-Id header, as specified in clause 6.10.3.4 of 3GPP TS 29.500 [4].

If an SMS Router within an SMS Router set redirects a service request to a different SMS Router of the set using a 307 Temporary Redirect or 308 Permanent Redirect status code, the identity of the new SMS Router towards which the service request is redirected shall be indicated in the 3gpp-Sbi-Target-Nf-Id header of the 307 Temporary Redirect or 308 Permanent Redirect response as specified in clause 6.10.9.1 of 3GPP TS 29.500 [4].

Annex A (normative): OpenAPI specification

A.1 General

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

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

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

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

A.2 Nipsmgw_SMService API

```
openapi: 3.0.0

info:
  version: '1.1.0-alpha.3'
  title: 'Nipsmgw_SMService Service API'
  description: |
    IP-SM-GW SMService.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: 3GPP TS 29.577 V18.3.0; 5G System; IP Short Message Gateway and SMS Router For Short
Message Services; Stage 3
  url: 'https://www.3gpp.org/ftp/Specs/archive/29_series/29.577/'

security:
  - oAuth2ClientCredentials:
    - nipsmgw-smservice
  - {}

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

paths:
  /mt-sm-infos/{gpsi}:
    put:
      summary: Create the routing information for a given UE
      operationId: RoutingInfo
      tags:
        - Creation of Routing Info
      security:
        - {}
        - oAuth2ClientCredentials:
          - nipsmgw_smservice
        - oAuth2ClientCredentials:
          - nipsmgw_smservice
          - nipsmgw_smservice:mtsminfos:write
      parameters:
        - name: gpsi
          in: path
          required: true
          description: Generic Public Subscription Identifier (GPSI)
```

```
        schema:
          type: string
    requestBody:
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/CreateRoutingData'
      required: true
    responses:
      '201':
        description: Routing Information is created in IP-SM-GW
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/CreatedRoutingData'
        headers:
          Location:
            description: >
              'Contains the URI of the newly created resource, according to the structure:
              {apiRoot}/nipsmgw-smservice/<apiVersion>/mt-sm-infos/{gpsi}'
            required: true
            schema:
              type: string
      '200':
        description: Routing Information is updated in IP-SM-GW
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/CreatedRoutingData'
      '204':
        description: Routing Information is updated in IP-SM-GW
      '307':
        $ref: 'TS29571_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29571_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        $ref: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        $ref: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        $ref: 'TS29571_CommonData.yaml#/components/responses/415'
      '429':
        $ref: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '502':
        $ref: 'TS29571_CommonData.yaml#/components/responses/502'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29571_CommonData.yaml#/components/responses/default'

  /mt-sm-infos/{gpsi}/sendsms:
    post:
      summary: Send SMS payload for a given UE
      operationId: SendSMS
      tags:
        - Send MT SMS message and the delivery report
      security:
        - {}
        - oAuth2ClientCredentials:
          - nipsmgw_smservice
        - oAuth2ClientCredentials:
          - nipsmgw_smservice
          - nipsmgw_smservice:sendsms:invoke
      parameters:
        - name: gpsi
          in: path
          required: true
          description: Generic Public Subscription Identifier (GPSI)
```

```
          schema:
            type: string
      requestBody:
        content:
          multipart/related:  # message with a binary body part
            schema:
              type: object
              properties:
                jsonData:
                  $ref: '#/components/schemas/SmsData'
                binaryPayload:
                  type: string
                  format: binary
            encoding:
              jsonData:
                contentType: application/json
              binaryPayload:
                contentType: application/vnd.3gpp.sms
                headers:
                  Content-Id:
                    schema:
                      type: string
        required: true
      responses:
        '200':
          description: sending delivery report
          content:
            multipart/related:  # message with a binary body part
              schema:
                type: object
                properties:
                  jsonData:
                    $ref: '#/components/schemas/SmsDeliveryData'
                  binaryPayload:
                    type: string
                    format: binary
              encoding:
                jsonData:
                  contentType: application/json
                binaryPayload:
                  contentType: application/vnd.3gpp.sms
                  headers:
                    Content-Id:
                      schema:
                        type: string
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '502':
          $ref: 'TS29571_CommonData.yaml#/components/responses/502'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:

  securitySchemes:
    oAuth2ClientCredentials:
```

```
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            nipsmgw-smservice: Access to the nipsmgw-smservice API
            nipsmgw-smservice:mtsminfos:write: Access to write MT SM Infos
            nipsmgw-smservice:sendsms:invoke: Access to invoke Send SMS

  schemas:

    CreateRoutingData:
      description: Information used for creating or updating the routing information of the user.
      type: object
      required:
        - smsfId
      properties:
        smsfId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        smsf3Gpp:
          $ref: 'TS29503_Nudm_UECM.yaml#/components/schemas/SmsfRegistration'
        smsfNon3Gpp:
          $ref: 'TS29503_Nudm_UECM.yaml#/components/schemas/SmsfRegistration'
        supi:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        ipSmGwGuidanceInd:
          type: boolean
          default: false
        supportedFeatures:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

    CreatedRoutingData:
      description: Information used for receiving the MT SMS.
      type: object
      properties:
        ipsmgwIpv4:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        ipsmgwIpv6:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
        ipsmgwFqdn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Fqdn'
        ipSmGwNfInstanceId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        correlationId:
          type: string
        ipSmGwGuidance:
          $ref: 'TS29503_Nudm_UECM.yaml#/components/schemas/IpSmGwGuidance'
        supportedFeatures:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

    SmsData:
      description: Information within request message for delivering SMS.
      type: object
      required:
        - smsPayload
      properties:
        smsPayload:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RefToBinaryData'

    SmsDeliveryData:
      description: >
        Information within response message invoking MtForwardSm service operation, for delivering
        MT SMS Delivery Report.
      type: object
      required:
        - smsPayload
      properties:
        smsPayload:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RefToBinaryData'
```

A.3 Nrouter_SMService API

```
openapi: 3.0.0
```

```
info:
  version: '1.1.0-alpha.3'
  title: 'Nrouter_SMService Service API'
  description: |
    SMS Router SMService.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: 3GPP TS 29.577 V18.3.0; 5G System; IP Short Message Gateway and SMS Router For Short
Message Services; Stage 3
  url: 'https://www.3gpp.org/ftp/Specs/archive/29_series/29.577/'

security:
  - oAuth2ClientCredentials:
    - nrouter-smservice
  - {}

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

paths:
  /mt-sm-infos/{gpsi}:
    put:
      summary: Create the routing information for a given UE
      operationId: RoutingInfo
      tags:
        - Creation of Routing Info
      security:
        - {}
        - oAuth2ClientCredentials:
          - nrouter_smservice
        - oAuth2ClientCredentials:
          - nrouter_smservice
          - nrouter_smservice:mtsminfos:write
      parameters:
        - name: gpsi
          in: path
          required: true
          description: Generic Public Subscription Identifier (GPSI)
          schema:
            type: string
      requestBody:
        content:
          application/json:
            schema:
              $ref: 'TS29577_Nipsmgw_SMService.yaml#/components/schemas/CreateRoutingData'
        required: true
      responses:
        '201':
          description: Routing Information is created in SMS Router
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/CreatedRoutingData'
          headers:
            Location:
              description: >
               'Contains the URI of the newly created resource, according to the structure:
               {apiRoot}/nrouter-smservice/<apiVersion>/mt-sm-infos/{gpsi}'
              required: true
              schema:
                type: string
        '200':
          description: Routing Information is updated in SMS Router
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/CreatedRoutingData'
        '204':
          description: Routing Information is updated in SMS Router
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
```

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

/mt-sm-infos/{gpsi}/sendsms:
  post:
    summary: Send SMS payload for a given UE
    operationId: SendSMS
    tags:
      - Send MT SMS message and the delivery report
    security:
      - {}
      - oAuth2ClientCredentials:
        - nrouter_smservice
      - oAuth2ClientCredentials:
        - nrouter_smservice
        - nrouter_smservice:sendsms:invoke
    parameters:
      - name: gpsi
        in: path
        required: true
        description: Generic Public Subscription Identifier (GPSI)
        schema:
          type: string
    requestBody:
      content:
        multipart/related:  # message with a binary body part
          schema:
            type: object
            properties:
              jsonData:
                $ref: 'TS29577_Nipsmgw_SMService.yaml#/components/schemas/SmsData'
              binaryPayload:
                type: string
                format: binary
          encoding:
            jsonData:
              contentType: application/json
            binaryPayload:
              contentType: application/vnd.3gpp.sms
              headers:
                Content-Id:
                  schema:
                    type: string
      required: true
    responses:
      '200':
        description: sending delivery report
        content:
          multipart/related:  # message with a binary body part
            schema:
              type: object
              properties:
                jsonData:
                  $ref: 'TS29577_Nipsmgw_SMService.yaml#/components/schemas/SmsDeliveryData'
                binaryPayload:
```

```
                  type: string
                  format: binary
              encoding:
                jsonData:
                  contentType: application/json
                binaryPayload:
                  contentType: application/vnd.3gpp.sms
                  headers:
                    Content-Id:
                      schema:
                        type: string
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '502':
          $ref: 'TS29571_CommonData.yaml#/components/responses/502'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:

  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            nrouter-smservice: Access to the nrouter-smservice API
            nrouter-smservice:mtsminfos:write: Access to write MT SM Infos
            nrouter-smservice:sendsms:invoke: Access to invoke Send SMS

  schemas:

    CreatedRoutingData:
      description: Information used for receiving the MT SMS.
      type: object
      properties:
        routerIpv4:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        routerIpv6:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
        routerFqdn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Fqdn'
        routerNfInstanceId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        supportedFeatures:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
```

Annex B (Informative): HTTP Multipart Messages

B.1 Example of HTTP multipart message

This Annex provides a (partial) example of HTTP multipart message. The example does not aim to be a complete representation of the HTTP message, e.g. additional information or headers can be included.

This Annex is informative and the normative descriptions in this specification prevail over the description in this Annex if there is any difference.

B.2 Example HTTP multipart message with SMS binary data

Example HTTP multipart message with SMS binary data:

```
POST /example.com/nipsmgw-smservice/v1/mt-sm-infos/{gpsi}/sendsms HTTP/2
Content-Type: multipart/related; boundary=----Boundary
Content-Length: xyz

------Boundary
Content-Type: application/json

{
    "smsPayload": {
      "contentId": "sms"
      },
}
------Boundary
Content-Type: application/vnd.3gpp.sms
Content-Id: sms

{ … SMS Message binary data …}
------Boundary
```

The JSON part of the HTTP POST message includes an attribute named "smsPayload" which refers to RefToBinaryData structure. The "contentId" of RefToBinaryData is encoded as a string and used to reference the value of the Content-ID header field of the binary body part.

Annex C (informative): Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2022-04	CT4#109e	C4-222401				TS skeleton	0.0.0
2022-04	CT4#109e	C4-222341				Implementation of pCRs agreed at CT4#109e: C4-222279, C4-222280, C4-222283, C4-222398, C4-222399, C4-222402, C4-222403	0.1.0
2022-05	CT4#110e	C4-223450				Implementation of pCRs agreed at CT4#110e: C4-223220, C4-223222, C4-223353	0.2.0
2022-06	CT#96	CP-221078				TS presented for information and approval	1.0.0
2022-06	CT#96	CP-221078				TS approved at CT#96	17.0.0
2022-09	CT#97e	CP-222027	0001	-	F	Alignment on the service name used with template	17.1.0
2022-09	CT#97e	CP-222027	0002	-	F	Editorial corrections	17.1.0
2022-09	CT#97e	CP-222027	0003	-	F	Update on the content type for OpenAPI	17.1.0
2022-09	CT#97e	CP-222058	0004	-	F	29.577 Rel-17 API version and External doc update	17.1.0
2022-12	CT#98e	CP-223028	0005	1	F	Missing Mandatory Status Codes in OpenAPI	18.0.0
2022-12	CT#98e	CP-223033	0006	-	F	29.577 Rel-18 API version and External doc update	18.0.0
2023-06	CT#100	CP-231026	0007	3	F	Location header description	18.1.0
2023-06	CT#100	CP-231026	0009	-	B	OAuth2 scopes in the Nipsmgw_SMService API	18.1.0
2023-06	CT#100	CP-231028	0010	1	B	OAuth2 scopes in the Nrouter_SMService API	18.1.0
2023-06	CT#100	CP-231070	0011	-	F	29.577 Rel-18 API version and External doc update	18.1.0
2023-12	CT#102	CP-233027	0012	-	F	HTTP RFCs obsoleted by IETF RFC 9113	18.2.0
2023-12	CT#102	CP-233030	0013	-	F	ProblemDetails RFC 7807 obsoleted by 9457	18.2.0
2024-03	CT#103	CP-240058	0015	-	A	SMSF Registration Information	18.3.0
2024-03	CT#103	CP-240056	0016	-	F	29.577 Rel-18 API version and External doc update	18.3.0

History

Document history		
V18.3.0	May 2024	Publication