Netsize Implementation Guide

REST API - SMS

Legal Information

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Change History

This document is updated periodically to maintain consistency with the software releases.

Revision	Changes from previous release
A	New document.
B	Logo change

Content

1 Introduction

Netsize provides a service for message delivery, micro payments and location based services. The platform acts as a transparent, white-label content acquirer and transaction router between Service Providers and Operators.

Netsize provides a RESTful API that can be used to access Netsize services such as sending SMS. This API is designed to be easy to use and compatible with all modern languages and frameworks. Using the language of your choice your application can use the Netsize REST API to implement powerful messaging and payment capabilities.

Scope of document

This document describes how the Service Provider uses the Netsize REST API for SMS. It is intended for technical architects and designers who implement the services of the Service Provider.

2 Basic usage

It's very easy to send an SMS. You send an HTTP request to Netsize which can be accomplished using just a web browser.

3 Functional overview

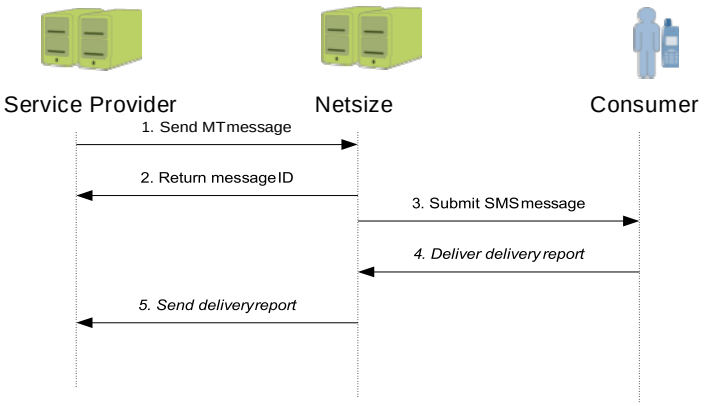
The Netsize system provides the following basic functionality for SMS messages:

- Sending Mobile Terminated (MT) SMS messages, such as text or binary (e.g. WAP Push) premium and standard rate messages.
- Receiving delivery reports for submitted MT messages.
- Receiving Mobile Originated (MO) SMS messages, premium and standard rate.

The SMS REST API is dedicated to sending standard rate MT SMS messages. The API sends all SMS messages asynchronously, enabling features such as:

- "Fire-and-forget" – the Service Provider wants to have more predictable response times and does not want to wait for the result from the Operator.
- Retry functionality – Netsize will resend the message if the Operator has temporary problems.

3.1 Sending an SMS message



The basic flow for sending an SMS messages is described as follows:

1. The Service Provider makes a request to send an SMS message to a recipient via the Netsize system.
2. A message ID is returned to the Service Provider. This ID can be used for e.g. correlate the message with the correct delivery report.
3. Netsize handles routing and delivers the SMS message to the addressed Consumer.
4. A delivery report is triggered, e.g. when the SMS message is delivered to the Consumer's device.
5. The delivery report is sent to the Service Provider. The report contains the same message ID as returned in step 2.

Alternative flow: Invalid request

If the supplied parameters or user credentials in the request are invalid an error is returned to the Service Provider. The error indicates the reason for the rejection and the flow ends. No message IDs are returned.

4 Endpoint

The SMS resource is accessed using the path:

`/restapi/v1/sms`

Example URL

https://europe.ipx.com/restapi/v1/sms

For connection security the Netsize REST API is only accessible over HTTPS. The Netsize server certificate is signed by Thawte Server CA.

5 Operations

The SMS service provides the following operations:

Name	Path
Send	/restapi/v1/sms/send

5.1 Send

The send operation is used to send an SMS to a single recipient.

This operation is intended for both basic and advanced users. In the simplest case, only destination address and the message text are required to deliver an SMS. Netsize will detect

the Data Coding Scheme and perform automatic concatenation of a message into multiple message parts if necessary.

For advanced usage the Service Provider can use optional parameters for total control of the message formatting including the user data header. The Service Provider can send concatenated messages but the preparation of the user data and user data header must be made by the Service Provider and the message must be sent by means of multiple send requests towards Netsize.

6 Authentication

Username and password are submitted in every request using HTTP Basic Authentication Scheme.

https://www.w3.org/Protocols/HTTP/1.0/spec.html#BasicAA

Credentials are sent in an Authorization header in the HTTP request. The client constructs the header field as described here:

https://en.wikipedia.org/wiki/Basic_access_authentication#Client_side

For example, if the username is `john` and `changeme` is the password then the resulting Authorization header is:

```
Authorization: Basic am9objpjaGFuZ2VtZSA=
```

As a fall-back the username and password can be submitted as request parameters. This is only recommended for clients that do not support Basic Auth.

7 Submitting a request

7.1 Query string

Request parameters are submitted as a query string containing name/value pairs.

The query string is encoded using Percent Encoding (URL encoding).

http://www.w3schools.com/tags/ref_urlencode.asp

For example, `Hello World!` is encoded as `Hello+World%21`.

7.2 Mandatory request parameters

Name	Max length	Description
destinationAddress	40	The MSISDN that the SMS message should be sent to, starting with country code. Example: 46123456789. For some markets (where the Consumer MSISDN must be obfuscated) this value can also be an alphanumeric alias, prefixed with "#".
messageText	1600	The SMS message content.

7.3 Optional request parameters (for advanced usage)

Name	Max length	Description

originatingAddress	16	The originating address for the outgoing SMS message. Type of originating address is defined by the originatorTON parameter. Short number max length is 16. Alpha numeric sender is limited to GSM default Alphabet with max length 11 characters. MSISDN sender max length is 15 (using same format as the destinationAddress element). Can be omitted when originatingAddress and originatingTON are selected by the system. This function is market and configuration dependent. Behaviour may vary with Operator integrations.
originatorTON	1	The originating address' type of number (TON): 0 – Short number 1 – Alpha numeric (max length 11) 2 – MSISDN Can be omitted when originatingAddress and originatingTON will be selected by the system. This function is market and configuration dependant. Behaviour may vary with Operator integrations.
userDataHeader	280	User Data Header together with the User Data can contain up to 140, i.e. 280 when hex-encoded, octets. This parameter is always hex-encoded.
DCS	3	Data coding scheme. Behaviour may vary with Operator integrations.
PID	3	Protocol ID. Behaviour may vary with Operator integrations.
relativeValidityTime	6	Relative validity time in seconds (relative to the time for the submission to Netsize). Max value is 604800 (7 days) and the default is 48 hours. Behaviour may vary with Operator integrations.
deliveryTime	20	Timestamp when SMS message should be delivered (delayed delivery time). See section on date time format.
statusReportFlags	1	Deliver report request: 0 – No delivery report (default) 1 – Delivery report requested 9 – Server delivery report requested (Netsize do not forward the report to the Service Provider but makes it available in reports etc.)
campaignName	50	The Netsize transactions are tagged with this name. It is used to group transactions in Netsize reports.
maxConcatenatedMessages	1	A value between 1 and 10 which defines how many concatenated messages that are allowed. Default is 3.

correlationId	100	ID provided by Service Provider that will be echoed in Delivery Report.
username	100	Provided as an alternative to HTTP Basic Authentication.
password	100	Provided as an alternative to HTTP Basic Authentication.

7.4 HTTP Request Methods

For maximum interoperability the API supports both HTTP GET and POST request methods. No other HTTP methods are allowed.

7.4.1 GET

The encoded query string is appended to the URL.

```
GET
https://europe.ipx.com/restapi/v1/sms/send?destinationAddress=46123456
789&messageText=Hello+World%21
Authorization: Basic am9objpjaGFuZ2VtZSA=
```

7.4.2 POST

The encoded query string is submitted in the HTTP request message body. Content-Type is application/x-www-form-urlencoded.

```
POST https://europe.ipx.com/restapi/v1/sms/send
Host: europe.ipx.com
Content-Type: application/x-www-form-urlencoded
Authorization: Basic am9objpjaGFuZ2VtZSA=
Content-Length: 57

destinationAddress=46123456789&messageText=Hello+World%21
```

7.5 Date and time

Parameters in the REST API representing date and time are always in UTC time zone (Coordinated Universal Time). Timestamps are represented as a string with this exact format:

`2017-04-25T23:20:50Z`

This represents 20 minutes and 50 seconds after the 23rd hour of April 25th, 2017 in UTC.

8 Response message

After receiving and interpreting a request message the API responds with a HTTP response message.

8.1 HTTP status code

The REST API always returns HTTP status code `200 OK` for processed requests. The message body contains a parameter `responseCode` that is used to determine the exact outcome.

8.2 Message body

The message body consists of JSON describing the outcome of the request.

http://json.org/

Netsize JSON complies with the *Google JSON Style Guide*.

https://google.github.io/styleguide/jsoncstyleguide.xml

8.3 Response parameters

Name	Max length	Description
responseCode	3	0 indicates successful transaction.
responseMessage	255	Response textual description, e.g. error text.
timestamp	20	Date & time when Netsize processed the request. (Refer to date/time format section).
traceId	36	Netsize internal identifier. Used for support and troubleshooting.
messageIds	10 x 36	Array of Netsize unique message IDs for each successful message (multiple message IDs are returned if the message is concatenated). Omitted in case of failure.

8.4 Example responses

Success

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 144
Date: Thu, 15 Sep 2016 13:20:31 GMT
{"responseCode":0,"responseMessage":"Success","timestamp":"2016-09-
15T13:20:31Z","traceId":"f678d30879fd4adc25f2","messageIds":["1-
4850879008"]}
```

Here is the same JSON formatted for readability:

```
{
  "responseCode":0,
  "responseMessage":"Success",
  "timestamp":"2016-0915T13:20:31Z",
  "traceId":"f678d30879fd4adc25f2",
  "messageIds":["1-4850879008"]
}
```

Failure

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 148
Date: Thu, 15 Sep 2016 13:20:31 GMT
{"responseCode":1,"responseMessage":" Invalid login or un-authorized
API usage","timestamp":"2016-09-
15T13:20:31Z","traceId":"f678d30879fd4adc25f2"}
```

8.5 Response codes

The following response codes can be returned in the send response:

Code	Text	Description
0	Success	Successfully executed.

1	Invalid login or un-authorized API usage	Incorrect username or password or Service Provider is barred by Netsize.
2	Consumer is blocked by Netsize	The Consumer is blocked by Netsize.
3	Operation is not provisioned by Netsize	The operation is blocked for the Service Provider.
4	The consumer is unknown to Netsize	The Consumer is unknown to Netsize. Or if alias was used in the request; alias not found.
5	Consumer has blocked this service in Netsize	The Consumer has blocked this service in Netsize.
6	The originating address is not supported	The originating address is not supported.
7	Alpha originating address not supported by account	The alpha originating address is not supported by account.
8	MSISDN originating address not supported	The MSISDN originating address not supported.
9	GSM extended not supported	GSM extended not supported.
10	Unicode not supported	Unicode not supported.
11	Status report not supported	Status report not supported.
12	Required capability not supported	The required capability (other than the above) for sending the message is not supported.
13	The content provider max throttling rate is exceeded	The Service Provider is sending the SMS messages to Netsize too fast.
14	Protocol ID not supported by account	Protocol ID not supported.
15	Message concatenation limit exceeded	The number of concatenated messages exceeds the max number requested.
16	Unable to route message.	Netsize was unable to route the message.
17	Prohibited time period	Not allowed to send message during time period
18	Too low balance on service provider account	Service provider is blocked due to Too low balance
50	Partial success	Partial success when sending an SMS message to multiple recipients.
99	Internal server error	Other Netsize error, contact Netsize support for more information.
100	Invalid destination address	The destination address (MSISDN, or alias) is invalid.
102	Invalid referenced (linked) ID	The reference ID is invalid, maybe the reference ID is already used, too old or unknown.
103	Invalid account name	The account name is invalid.

105	Invalid service meta data	The service meta data is invalid.
106	Invalid originating address	The originating address is invalid.
107	Invalid alphanumeric originating address	The alphanumeric originating address is invalid.
108	Invalid validity time	The validity time is invalid.
109	Invalid delivery time	The delivery time is invalid.
110	Invalid message content/user data	The user data, i.e. the SMS message, is invalid.
111	Invalid message length	The SMS message length is invalid.
112	Invalid user data header	The user data header is invalid.
113	Invalid data coding scheme	The DCS is invalid.
114	Invalid protocol ID	The PID is invalid.
115	Invalid status report flags	The status report flags are invalid.
116	Invalid TON	The originator TON is invalid.
117	Invalid campaign name	The campaign name is invalid.
120	Invalid limit for maximum number of concatenated messages	The maximum number of concatenated messages is invalid.
121	Invalid msisdn originating address	The MSISDN originating address is invalid.
122	Invalid correlation ID	The correlation ID is invalid.

9 Optional features

9.1 MSISDN Correction

MSISDN correction is an optional feature that can be enabled by Netsize support if requested.

This feature will correct destination addresses and align them to the required E.164 format. In addition of format correction the system may also perform market specific functionality such as translating international French numbers to correct DOM-TOM (départements et territoires d'outre-mer) numbers when applicable. Below are a number of examples of corrections:

Submitted Destination Address	Corrected Destination Address
+46(0)702233445	46702233445
(0046)72233445	46702233445
+460702233445	46702233445
46(0)702233445	46702233445
46070-2233445	46702233445
0046702233445	46702233445
+46(0)702233445aaa	46702233445

336005199999	2626005199999 (French number translated to a DOM-TOM number)

Additionally, it is possible to allow national phone numbers for a selected market. When this feature is enabled any international numbers for other markets must be sent with an initial '+' sign to distinguish them from the selected market.

Below are a number of examples of corrections done when using Sweden (country code 46) as default market for national numbers.

Submitted Destination Address	Corrected Destination Address
0702233445	46702233445
070-2233 445	46702233445
070.2233.4455	46702233445
460702233445	46702233445
+460702233445	46702233445
+458022334455	458022334455
45802233445	Invalid since the '+' sign is missing

Note that the corrected MSISDN will be used by Netsize and it will be returned in the delivery reports.

Please contact Netsize support for more information.

9.2 Character Replacement

Character replacement is an optional feature that can be enabled by Netsize support if requested.

This feature will translate non-GSM alphabet characters in the user data (SMS text) to equivalent GSM alphabet characters when the DCS is set to "GSM" (17). For example *"Seqüência de teste em Português"* will be translated to *"Seqüencia de teste em Portugues"*.

10Delivery reports

The Service Provider can, if provisioned, request SMS message delivery reports or delivery notifications for the MT messages sent. These reports are triggered in the Operator SMSC when the MT message is either delivered to the targeted Consumer or deleted, e.g. expired or, for some reason, not routable.

Only final status of the SMS message is reported to the Service Provider, i.e. delivered or deleted. Only one report per MT message is generated. With the deleted status, a reason code may apply. This reason code specifies the reason for the SMS message not being delivered.

The reports are routed through Netsize and sent to the Service Provider using the HTTP protocol.

To receive reports, the Service Provider needs to implement for example a Java Servlet or an ASP.NET page. Both of these receive HTTP GET or POST requests.

Parameters

The request includes the following parameters:

Parameter	Type	M/O /I*	Default Value	Max length	Description
MessageId	string	M	–	22	The message ID of the MT message that this report corresponds to.
DestinationAddress	string	M	–	40	The Consumer's MSISDN, i.e. the destination address of the original MT message.
StatusCode	integer	M		1	Status code indicates the status of the MT message. Applicable status codes are: 0 – Delivered 2 - Deleted (reason code applies)
TimeStamp	string	M	–	20	Time indicating when the delivery report was received by Netsize. The time zone of the timestamp is CET or CEST (with summer time as defined for the EU). Format: yyyyMMdd HH:mm:ss.
Operator	string	M	–	100	The name of the Operator used when sending the SMS message or the account name used when sending the SMS message. A list of available Operators is provided by Netsize support.
ReasonCode	integer	O	–	3	Reason code indicates why the message ended up in the status deleted. Applicable reason codes are: 100 – Expired 101 – Rejected 102 – Format error 103 – Other error 110 – Subscriber unknown 111 – Subscriber barred 112 – Subscriber not provisioned 113 – Subscriber unavailable 120 – SMSC failure 121 – SMSC congestion 122 – SMSC roaming 130 – Handset error 131 – Handset memory exceeded

					Behavior may vary with Operator integrations.
OperatorTimeStamp	string	O	–	20	Time indicating when the report was triggered in the SMSC of the Operator (if provided by the Operator). The time zone of the timestamp is CET or CEST (with summer time as defined for the EU). Format: yyyyMMdd HH:mm:ss.
StatusText	string	O	–	255	Placeholder for additional information from the Operator, e.g. clear text description of the status/reason. Behavior may vary with Operator integrations.
CorrelationId	string	O	–	100	The correlation ID provided in the SendRequest or SendTextRequest.
OperatorNetworkCode	integer	O	–	6	The Mobile Network Code (MCC + MNC) of the Operator.

* M = Mandatory, O = Optional, I = Ignored.

The Service Provider has to provide Netsize with the target URL for delivery reports (optionally including credentials for HTTP basic authentication). The Service Provider can choose which preferred HTTP method to use:

- HTTP POST (recommended)
- HTTP GET.

Example using HTTP GET (successfully delivered):

https://user:password@www.serviceprovider.com/receivereport?MessageId=122&DestinationAddress=46762050312&Operator=Vodafone&TimeStamp=20100401%2007%3A47%3A44&StatusCode=0

Example using HTTP GET (not delivered, the Operator has supplied timestamp for the event):

https://user:password@www.serviceprovider.com/receivereport?MessageId=123&DestinationAddress=46762050312&Operator=Vodafone&OperatorTimeStamp=20100401%2007%3A47%3A59&TimeStamp=20100401%2007%3A47%3A51&StatusCode=2&StatusText=Delivery%20failed&ReasonCode=10

The parameters are URL encoded[i].

Character encoding:

The Service Provider can choose which preferred character encoding to use:

- UTF-8 (recommended)
- ISO-8859-1.

10.1 Service Provider acknowledgement

The Service Provider should acknowledge each delivery report. The acknowledgement can be positive, i.e. delivery report successfully received, or negative, i.e. failure.

Please note: Netsize has a read timeout for acknowledgments of 30 seconds for delivery reports. A timeout will trigger a delivery retry (if retry enabled) or a cancellation of the delivery

(if retry disabled). This means that the Service Provider application must ensure quick response times, especially during high load.

It is highly recommended to acknowledge the delivery report towards Netsize before processing it.

The rule for positive and negative acknowledgement is described as follows:

Positive acknowledgement, ACK, delivery report delivered:

HTTP 200 range response code in combination with the following XML formatted content: *<DeliveryResponse ack="true"/>*

Negative acknowledgement, NAK, delivery report not delivered:

Any reply other than positive acknowledgement, for example, a negative acknowledgement is triggered by any HTTP error code or the following XML content: *<DeliveryResponse ack="false"/>*

The XML content can be used for controlling the Netsize retry mechanism. A NAK will cause retry attempt, if enabled. For Service Providers not configured for the retry mechanism, the XML content is optional.

Below is an HTTP POST request and response example of a delivery report delivered to a Service Provider:

HTTP Request:

```
POST /context/app HTTP/1.1
Content-Type: application/x-www-form-urlencoded;charset=utf-8
Host: server:port
Content-Length: xx

MessageId=213123213&DestinationAddress=46762050312&Operator=Telia&
OperatorTimeStamp=20130607%2010%3A45%3A00&TimeStamp=20130607%2010%3A45
%3A02&StatusCode=0
```

HTTP Response:

```
HTTP/1.1 200 OK
Content-Type: text/plain

<DeliveryResponse ack="true"/>
```

10.2 Retry

The Netsize system can perform retry attempts for failed, i.e. not acknowledged, delivery report deliveries. The Service Provider can choose the preferred retry behavior:

- **No retry** (default) - the message will be discarded if connection attempt fails, read time-out or for any HTTP error code.
- **Retry** - the message will be resent for every type of connection problem, read time-out, or negative acknowledgement.

When retry for NAK is enabled, it is important to understand which scenarios that will generate a retry attempt from Netsize and how the retry works. Each Service Provider has its own retry queue, where messages are ordered according to the message timestamp. Netsize always tries to deliver older messages first, even though the individual order of messages delivered to the Service Provider is not guaranteed. The main reason for messages being discarded from the retry queue is one of two reasons: either the message TTL expires or (theoretically) the retry queue becomes full. The TTL is Operator and account dependent, i.e. can vary depending on Operator and or message type, e.g. premium SMS or standard rate SMS message.

A Service Providers with retry enabled must check the unique ID of the MT message to secure that the message has not already been received.

It is important for the Service Provider to comply with these simple rules when an error occurs during the processing of a delivery report if the reason for the error is:

1. Temporary, e.g. database not available, an NAK should be returned. Netsize will resend the message.
2. Permanent and a retry attempt are likely to cause the same kind of problem, an ACK should be returned. For example, when the message could not be parsed correctly or caused an unexpected runtime error.

Acting accordingly will ensure that no blocking or throughput degradation is caused due to a delivery report being resent over and over again.

11 Implementation tips

1. It is possible to use your web browser to submit requests to the API. This makes it very easy to explore and evaluate the services without any development tools.
2. Chrome or Firefox are recommended together with an extension such as JSONView to display pretty-formatted JSON.
3. We have used SoapUI for testing POST, Basic Authentication and for inspecting the raw HTTP request and response messages.
   https://www.soapui.org/
4. The cURL tool is useful for submitting POST requests with Basic Authentication. See example below.
   https://curl.haxx.se/

```
curl POST \
-H "Content-Type: application/x-www-form-urlencoded" \
-H "Authorization: Basic am9objpjaGFuZ2VtZSA=" \
https://europe.ipx.com/restapi/v1/sms/send \
--data "destinationAddress=46123456789&messageText=Hello+World%21"
```