SMS via JMS

This section is for issuer banks that have already implemented their own SMS sender module and require ActiveAccess to be integrated to support that module via JMS.

An Overview of SMPP

The Short Message Peer-to-Peer (SMPP) in telecommunications terms, refers to an open, industry standard protocol designed to provide a flexible data communication interface for the transfer of short message data between External Short Messaging Entities (ESME), Routing Entities (RE) and Message Centres.

SMPP Operation

The protocol is based on pairs of request/response PDUs (Protocol Data Units, or packets) exchanged over TCP connections. PDUs are binary encoded for efficiency. Data exchange may be synchronous, where each peer waits for a response for each PDU being sent, or asynchronous, where multiple requests can be issued without waiting and acknowledged in a skew order by the other peer. The number of unacknowledged requests is called a window; for the best performance both communicating sides must be configured with the same window size.

SMPP Versions

The SMPP standard has evolved during its time. The most commonly used versions of SMPP are:

- SMPP 3.3 the oldest used version; supports GSM only
- SMPP 3.4 adds Tag-Length-Value (TLV) parameters, support of non-GSM SMS technologies and the transceiver support (single connections that can send and receive messages)
- SMPP 5.0 is the latest version of SMPP; adds support for cell broadcasting

The applicable version is passed in the interface_version parameter of a bind command.

ActiveAccess supports SMPP-API-0.3.9.1 for communication with SMSC.

PDU Format

SMPP PDU starts with a header, followed by the body:

SMPP PDU				
PDU Header (mandatory)				PDU Body (Optional)
Command length	Command Id	Command Status	Sequence Id	PDU Body
4 octets		Length = (Command Length value - 4) octets		

PDU Header

Each PDU starts with a header. The header consists of 4 fields, each with a length of 4 octets:

command_length: Is the overall length of the PDU in octets (including command_length field itself); must be ≥ 16 as each PDU must contain the 16 octet header

command_id: Identifies the SMPP operation (or command)

command_status: Has always value of 0 in requests; in responses it carries information about the result of the operation

sequence_number: Is used to correlate requests and responses within an SMPP session; allows asynchronous communication (using a sliding window method)

All numeric fields in SMPP use the big endian order, which means that the first octet is the Most Significant Byte (MSB).

Example

This is an example of the binary encoding of a 60-octet submit_sm PDU. The data is shown in Hex octet values as a single dump and followed by a header and body break-down of that PDU.

This is best compared with the definition of the submit_sm PDU from the SMPP specification, in order to understand how the encoding matches the field by field definition.

The value break-down is shown with decimals in parentheses followed by the corresponding Hex values. When you see one or several hex octets appended, this represents the given field size that uses one or more octets encoding.

Again, reading the definition of the submit_sm PDU from the specification will make this clearer.

PDU Header

```
'command_length', (60) ... 00 00 00 3C

'command_id', (4) ... 00 00 00 04

'command_status', (0) ... 00 00 00 00

'sequence_number', (5) ... 00 00 00 05
```

PDU Body

```
'service_type', () ... 00

'source_addr_ton', (2) ... 02

'source_addr\_[npi](http://en.wikipedia.org/wiki/Numbering_plan)', (8) ... 08

'source_addr', (555) ... 35 35 35 00

'dest_addr_ton', (1) ... 01

'dest_addr\_[npi](http://en.wikipedia.org/wiki/Numbering_plan)', (1) ... 01

'dest_addr', (555555555) ... 35 35 35 35 35 35 35 35 35 00

'esm_class', (0) ... 00

'protocol_id', (0) ... 00

'priority_flag', (0) ... 00

'schedule_delivery_time', (0) ... 00

'validity_period', (0) ... 00

'registered_delivery', (0) ... 00

'replace_if_present_flag', (0) ... 00

'data_coding', (0) ... 00
```

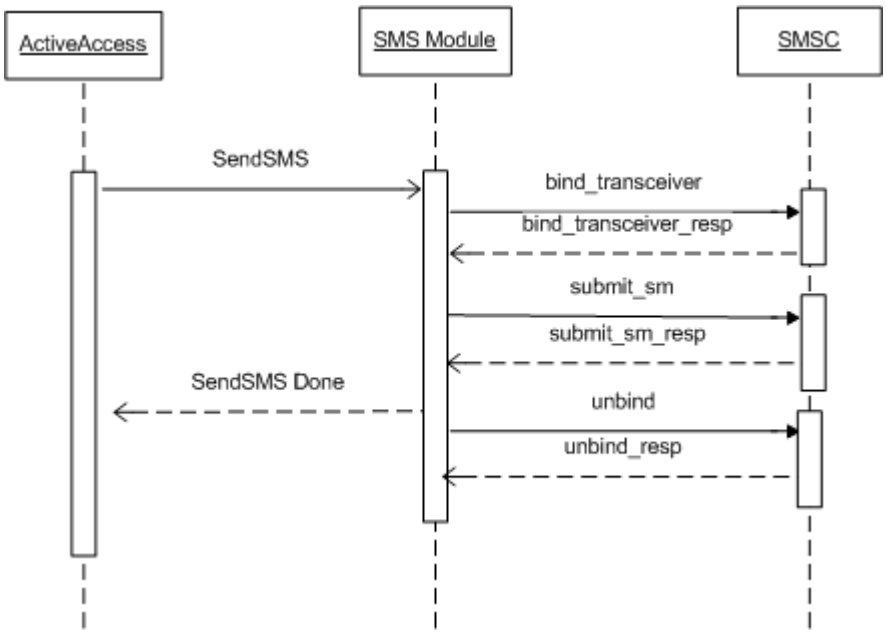
```
'sm_default_msg_id', (0) ... 00

'sm_length', (15) ... 0F

'short_message', (Hello wikipedia) ... 48 65 6C 6C 6F 20 77 69 6B 69 70 65 64 69
61'
```

An overview of the ActiveAccess SMS module

ActiveAccess has implemented an SMS module that provides the ability to send OTP SMS's to cardholders during the authentication process. This module uses SMPP v3.9 for its communication to SMSC. The following diagram illustrates a typical SMPP request/response sequence between an SMSC and ActiveAccess, bound as a Transceiver.



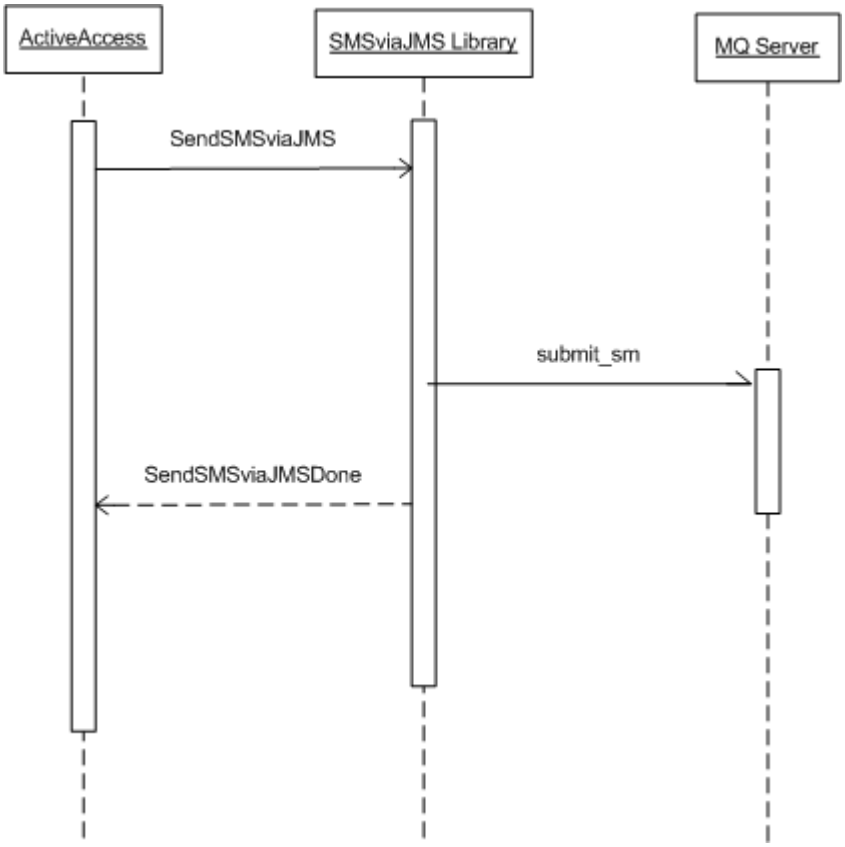
SMS via JMS (MQ Server) Solution

SMPP is an interactive messaging process, which is based on a pair of requests/responses. As MQ only accepts messages as a datagram, no response will be sent back to the sender. To integrate ActiveAccess with MQ Server for sending OTP SMS, GPayments has developed an **SMS via JMS library**.

The **SMS via JMS library** acts as a real SMPP client but it only sends **submit_sm** requests to MQ Server without any bind/unbind/enqlink commands before and after the submit_sm.

As MQ server will not be a real SMSC, as well, it only needs to implement a service that picks up the submit_sm PDUs and parses the required/optional parameters and then consumes them.

The following diagram illustrates an SMS via JMS request/response sequence between ActiveAccess, **SMS via JMS library** and MQ Server.



> sms-smpp-jms - lib.png

Format of submit_sm Message Request

MQ Server, as the server side of the SMS service, receives and queues submit_sm request. This request is a byte array. The following table provides specific details of a submit_sm request:

> **Note**
>
> ActiveAccess sets values for parameters highlighted in blue. So the MQ Service Provider only needs to refer to the highlighted parameters.

> **Note**
>
> Optional parameters which will be used for SMSs longer than 254 bytes have been highlighted in green.

Field Name	Size (octets)	Type	Description
HEADER			
command_length	4	Integer	Set to overall length of PDU.
command_id	4	Integer	submit_sm (0x00000004)
command_status	4	Integer	Set to NULL
sequence_number	4	Integer	Set to a Unique sequence number. The associated submit_sm_resp PDU will echo this sequence number.

|

Field Name	Size (octets)	Type	Description
MANDATORY PARAMETERS			
service_type	Var. Max 6	C-Octet String	The service_type parameter can be used to indicate the SMS Application service associated with the message. Specifying the service_type allows the ESME to: enhance messaging service, such as "replace by service" type control the teleservice used on the air interface. Set to NULL for default SMSC settings.
source_addr_ton	1	Integer	Type of Number for source address. It's set to Alphanumeric (5) by ActiveAccess
source_addr_npi	1	Integer	Numbering Plan Indicator for source address. It's set to Unknown (0) by ActiveAccess
source_addr	Var. Max 21	C-Octet String	Address of the sender that originates this message. If this is not known, it is set to NULL (Unknown). If there is no input, it will be set to default (NULL)

Field Name	Size (octets)	Type	Description
dest_addr_ton	1	Integer	Number Type for destination address. It's set to Unknown (0) by ActiveAccess
dest_addr_npi	1	Integer	Numbering Plan Indicator for destination. It's set to Unknown (0) by ActiveAccess
destination_addr	Var. Max 21	C-Octet String	Destination address of this short message. For mobile terminated messages, this is the directory number of the recipient MS.
esm_class	1	Integer	Indicates the Message Mode & Message Type.
protocol_id	1	Integer	Protocol Identifier. Network specific field.
priority_flag	1	Integer	Designates the priority level of the message.
schedule_delivery_time	1 or 17	C-Octet String	The short message is to be scheduled by the SMSC for delivery. Set to NULL for immediate message delivery.
validity_period	1 or 17	C-Octet String	The validity period of this message. Set to NULL to request the SMSC default validity period.
registered_delivery	1	Integer	Indicator to signify if an SMSC delivery receipt or an SME acknowledgement is required.
replace_if_present_flag	1	Integer	Flag, to indicate if submitted message should replace an existing message.
data_coding	1	Integer	Defines the encoding scheme of the short message user data. If message contains alphanumeric characters and no Unicode characters, data_coding is set to Default GSM Alphabet with extension (0) If message contains Unicode characters, data_coding is set to UCS2 (8)
sm_default_msg_id	1	Integer	Indicates the short message to be sent from a list of pre-defined ('canned') short messages stored on the SMSC. If a SMSC canned message is not in use, default value is set to NULL.
sm_length	1	Integer	Length in octets of the short_message user data.

Field Name	Size (octets)	Type	Description
short_message	Var. 0-254	Octet String	Up to 254 octets of short message user data. The exact physical limit for short_message size may vary according to the underlying network. Applications which need to send messages longer than 254 octets should use the message_payload parameter. In this case the sm_length field should be set to zero. Note: The short message data should be inserted in either the short_message or message_payload fields. Both fields must not be used simultaneously.

Field Name	Type	Description
OPTIONAL PARAMETERS		
user_message_reference	TLV	ESME assigned message reference number.
source_port	TLV	Indicates the application port number associated with the source address of the message. This parameter should be present for WAP applications.
source_addr_subunit	TLV	Indicates the subcomponent in the destination device which created the user data.
destination_port	TLV	Indicates the application port number associated with the destination address of the message. This parameter should be present for WAP applications.
dest_addr_subunit	TLV	The subcomponent in the destination device for which the user data is intended.
sar_msg_ref_num	TLV	The reference number for a particular concatenated short message.
sar_total_segments	TLV	Indicates the total number of short messages within the concatenated short message.
sar_segment_seqnum	TLV	Indicates the sequence number of a particular short message fragment within the concatenated short message.

Field Name	Type	Description
more_messages_to_send	TLV	Indicates that there are more messages to follow for the destination SME.
payload_type	TLV	Defines the type of payload (e.g. WDP, WCMP, etc.).
message_payload	TLV	Contains the extended short message user data. Up to 64K octets can be transmitted. Note: The short message data should be inserted in either the short_message or message_payload fields. Both fields should not be used simultaneously. The sm_lengthfield should be set to zero if using the message_payload parameter s
privacy_indicator	TLV	Indicates the level of privacy associated with the message.
callback_num	TLV	A callback number associated with the short message. This parameter can be included as a number of the times for multiple callback addresses.
callback_num_pres_ind	TLV	Defines the callback number presentation and screening. If this parameter is present and there are multiple instances of the callback_num parameter, then this parameter must occur an equal number of instances and the order of occurrence determines the particular callback_num_pres_ind which corresponds to a particular callback_num.
callback_num_atag	TLV	Associated to a displayable alphanumeric tag with the callback number. If this parameter is present and there are multiple instances of the callback_num parameter then this parameter must occur an equal number of instances and the order of occurrence determines the particular callback_num_atag which corresponds to a particular callback_num.
source_subaddress	TLV	The subaddress of the message originator.
dest_subaddress	TLV	The subaddress of the message destination.
user_response_code	TLV	A user response code. The actual response codes are implementation specific.
display_time	TLV	Provides the receiving MS with a display time associated with the message

Field Name	Type	Description
sms_signal	TLV	Indicates the alerting mechanism when the message is received by an MS.
ms_validity	TLV	Indicates validity information for this message to the recipient MS.
ms_msg_wait_facilities	TLV	This parameter controls the indication and specifies the message type (of the message associated with the MWI) at the mobile station.
number_of_messages	TLV	Indicates the number of messages stored in a mail box
alert_on_msg_delivery	TLV	Request for an MS alert signal to be invoked on message delivery.
language_indicator	TLV	Indicates the language of an alphanumeric text message.
its_reply_type	TLV	The MS user's reply method to an SMS delivery message received from the network is indicated and controlled by this parameter.
Its_session_info	TLV	Session control information for Interactive Teleservice
ussd_service_op	TLV	This parameter is used to identify the required USSD Service type when interfacing to a USSD system.

Configuration

The **SMS via JMS library** reads the required parameters from a config file (sms_jms_config.properties) at start up. This config file will be loaded from TOMCAT_HOME/bin/ config directory where ActiveAccess configuration files have been installed.

It is possible to configure as many different SMSviaJMS clients as required for ActiveAccess. For each client, admin needs to add a unique prefix as JMS Client name to its configuration parameters in sms_jms_config.properties file: For Example, JMSClient1.

Then it is required to add a new SMS Centre in MIA >> System Management >> Device Management >> Edit Default Device Parameter-SMS >> SMS Centre >> New SMS Centre with the following parameters:

Name: "JMSClient1"

Domain/IP: "SMSviaJMS"

"SMSviaJMS" determines for ActiceAccess to use JMS channel and load JMSClient1 properties for connecting to MQ Server.

JMSClient1.MQ_SERVER_SECURE_CHANNEL

This parameter specifies the type of channel (PLAIN or SSL) between **SMS via JMS library** and MQ Server.

Default: FALSE (PLAIN)

Example: JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE

JMSClient1.MQ_SERVER_CLIENT_AUTH

If JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE, this parameter specifies that the MQ Server requires client authentication on secure channel or not.

Default: FALSE

Example: JMSClient1.MQ_SERVER_CLIENT_AUTH=TRUE

JMSClient1.MQ_CLIENT_TRUSTSTORE

If JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE, this parameter specifies the path of the truststore with trusted root certificates of the queue manager.

Example: JMSClient1.MQ_SERVER_TRUSTSTORE=conf/trustcertificates.jks

JMSClient1.MQ_CLIENT_TRUSTSTORE_PASSWORD

If JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE, this parameter specifies the password of the truststore.

Example: JMSClient1.MQ_SERVER_TRUSTSTORE_PASSWORD=123456

JMSClient1.MQ_CLIENT_KEYSTORE

If JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE and JMSClient1.MQ_SERVER_CLIENT_AUTH=TRUE, this parameter specifies the path of the keystore that must contain required client certificate which is trusted by the queue manager.

Example: JMSClient1.MQ_KEYSTORE=

JMSClient1.MQ_CLIENT_KEYSTORE_PASSWORD

If JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE, this parameter specifies the password of the client keystore.

Example: JMSClient1.MQ_KEYSTORE_PASSWORD=123456

JMSClient1.MQ_CLIENT_KEYTYPE

If JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE, this parameter specifies one of the following as the client's keystore type:

- JKS
- JCEKS
- P12
- PKCS12

Example: JMSClient1.MQ_KEYSTORE_TYPE=JKS

JMSClient1.MQ_SSL_CIPHER_SUITE

If JMSClient1.MQ_SERVER_SECURE_CHANNEL=TRUE, this parameter restricts the type of cipher algorithm which is accepted for securing the SSL channel. Any other algorithm except this one which is specified by this parameter is rejected during the handshake. It is strongly recommended that TLSv1.1 or TLSv1.2 is used because CipherSpecs and CipherSuites, such as SSLv3, have known security vulnerabilities.

> **Note**
>
> For the complete list of supported CipherSpecs and CipherSuites, please see http://www.ibm.com/support/knowledgecenter/en/SSFKSJ_7.5.0/com.ibm.mq.sec.doc/q014260_.htm.

Example: MQ_SSL_CIPHER_SUITE=TLS_RSA_WITH_AES_256_CBC_SHA256

> **Note**
>
> This parameter is case sensitive.

JMSClient1.MQ_CHANNEL_NAME

Specifies the name of the channel, in which it will be used in order to connect to Queue Manager.

Example: JMSClient1.MQ_CHANNEL_NAME=CHANNEL1

> **Note**
>
> This parameter is case sensitive.

JMSClient1.MQ_QUEUE_MGR_NAME

Specifies the name of the Queue Manager.

Example: JMSClient1.MQ_QUEUE_MGR_NAME=QM1

> **Note**
>
> This parameter is case sensitive.

JMSClient1.MQ_QUEUE_NAME

Specifies the name of the Queue to put messages on.

Example: JMSClient1.QUEUE_NAME=LQ1

> **Note**
>
> This parameter is case sensitive.

JMSClient1.MQ_USE_USERID

Specifies whether JMSClient1.MQ_USERID is used for channel authentication or not.

Default: FALSE;

Example: JMSClient1.MQ_USE_USERID=TRUE

JMSClient1.MQ_USERID

If JMSClient1.MQ_USE_USERID=TRUE, the parameter specifies the JMSClient1.MQ_USERID which is required for channel authentication.

Example: JMSClient1.MQ_USERID=userId

> **Note**
>
> This parameter is case sensitive.

JMSClient1.MQ_USERID_PASSWORD

When MQ_USE_USERID=TRUE, this parameter specifies the password which is required for channel authentication.

Example: JMSClient1.MQ_USERID_PASSWORD= password

> **Note**
>
> This parameter is case sensitive.

JMSClient1.MQ_MAX_CONNECTION

Specifies the maximum allowed connections to MQ Server. If a limit is set and the library reaches that limit, incoming requests might encounter an MQException, with reason code of JMSClient1.MQRC_MAX_CONNS_LIMIT_REACHED

Default: 5

Example: JMSClient1.MQ_MAX_CONNECTION =10

JMSClient1.MQ_TIMEOUT

Specifies the amount of time that an idle connection is kept in pool after the specified time, the library ends the connection.

Default: 3600000

Example: JMSClient1.MQ_TIMEOUT=180000

JMSClient1.MQ_MAX_UNUSED_CONNECTION

Specifies the maximum number of idle connections

Default: 3

Example: JMSClient1.MQ_MAX_UNUSED_CONNECTION=6

JMSClient1.MQ_MSG_EXPIRY

Specifies the number of seconds that messages are kept in the queue before it expires. Default is set to **Never**, which ensures that the message is delivered and waits in the queue until it is retrieved, no matter how long it may take. To use the default value set it to zero.

Default: 0

Example: JMSClient1.MQ_MSG_EXPIRY=10

JMSClient1.MQ_MSG_PRIORITY

Specifies the priority of the message. By default, the message priority defaults to the default priority for the queue. If the queue uses priorities to order messages and this message should have a specific priority, specify the priority. Priorities can range from 1 (lowest) up to 9 (highest). To use the default priority of queue set the value to 0

Default: 0

Example: JMSClient1.MQ_MSG_PRIORITY=8

JMSClient1.MQ_MSG_DELIVERY

Specifies the delivery mode if the message (PERSISTENT or NOT PERSISTENT). Persistent messages are written to logs and queue data files. If a queue manager is restarted after a failure, it recovers these persistent messages as necessary from the logged data. Messages that are not persistent are discarded if a queue manager stops.

YES Use Persistent

NO Do not use persistent

DEF Use queue property as default

Default: DEF

Example: JMSClient1.MQ_MSG_DELIVERY=YES

JMSClient1.MQ_CONNECTION_NAME_LIST

This parameter is a comma-separated list that contains the host name and port information to be used to connect to a queue manager in client mode. SMS via JMS application attempts to

connect to each host in list order. If the end of the connection name list is reached without establishing a successful connection, it throws the MQRC_QMGR_NOT_AVAILABLE with WebSphere MQ Reason Code in log file.

Example: JMSClient1.MQ_CONNECTION_NAME_LIST=127.0.0.1(1414), 192.168.1.133(1414),192.168.1.100(1415)

_____JMSClient1.MQ_CCSID _____

This parameter specifies the code page for the SMS text. The list of codes is available at:

http://www-01.ibm.com/software/globalization/ccsid/ccsid_registered.html

If JMSClient1.MQ_CCSID is not set, code page of queue will be used as default value.

Some possible values are:

850 Commonly used ASCII codeset

819 The ISO standard ASCII codeset

37 The American EBCDIC codeset

1200 Unicode

1208 UTF-8

Example: JMSClient1.MQ_CCSID=1208

Submit_SM Processing

Following sections describe how Header and Body of the submit_sm message should be processed by MQ Service provider:

Header Processing

As mentioned in 1.1.3, PDU Header contains 4 parameters with octet length. To process the PDU message, the header should be decoded first:

- Get the Integer value of each part:

0 – 4 Specifies the cmd_len, which shows the length of received message.

4 – 8 Specifies the cmd_id, which will check to determine whether the received message is a submit_sm or not.

8 – 12 Specifies the cmd_status, which expects to be null for submit_sm

12 – 16 Specifies the seq_no, the sequence number of received message which will be used to find by ACS Session ID

Body processing

PDU Body:

16 – 22 -> **service_type**: which is null for default SMSC settings, so it is actually 16-17

22 – 23 -> **source_addr_ton:** If service-type has the max length it will be 22-23.

23 – 24 -> source_addr_npi

24 – 45 -> **source_addr:** Max length is 21, it will actually be 24 – source_addr length plus 1.

45 – 46 -> dest_addr_ton

46 – 47 -> dest_addr_npi

47 – 68 -> **destination_addr:** Max length is 21, it will actually be 47 – **destination_addr** length plus 1.

68 – 69 -> **esm_class**

69 - 70 -> **protocol_ID**

70- 71 -> priority_flag

71 – 88 -> schedule_delivery_time

88 – 105 -> validity_period

105 – 106 -> registered_delivery_flag

106 – 107 -> **data_coding**

107 – 108 -> sm_default_msg_id

108 - 109 -> **sm_length**

109 – 363 -> short_message

Optional parameter processing

Only processing message_payload is needed: **Field**	Size (Octets)	Type	Description
Parameter Tag	2	Integer	message_payload
Length	2	Integer	Length of value part in octets
Value	variable	Octet String	Short message user data. The maximum size is SMSC and network implementation specific.

363 – 365 -> tag (message_payload = 1060 or 0x424)

365 – 367 -> len

367 – 64367 -> value

Examples

Example of submit_sm in form of byte array:

```
[0, 0, 0, -76, 0, 0, 0, 4, 0, 0, 0, 0, 0, 0, 0, 3, 0, 5, 0, 49, 48, 48, 50, 48,
0, 0, 0, 54, 49, 52, 50, 50, 52, 53, 50, 48, 53, 49, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, -125, 65, 99, 116, 105, 118, 97, 116, 105, 111, 110, 47, 82, 101, 103, 105,
115, 116, 114, 97, 116, 105, 111, 110, 32, 118, 105, 97, 32, 77, 73, 65, 58, 10,
49, 48, 32, 116, 111, 107, 101, 110, 10, 65, 58, 50, 54, 50, 55, 53, 57, 10, 66,
58, 56, 49, 55, 51, 57, 49, 10, 67, 58, 57, 54, 50, 49, 49, 56, 10, 68, 58, 49,
54, 54, 51, 56, 57, 10, 69, 58, 52, 49, 54, 50, 49, 54, 10, 70, 58, 50, 50, 51,
48, 52, 55, 10, 71, 58, 55, 55, 48, 57, 53, 52, 10, 72, 58, 54, 53, 52, 53, 50,
57, 10, 73, 58, 54, 52, 53, 55, 51, 56, 10, 74, 58, 54, 49, 56, 50, 50, 50]
```

Note

When retrieving String from byte array, it will be processed for **not null (≠ 0)** values

< PDU HEADER START >

0, 0, 0, -76, -> **cmd_len :** 180

0, 0, 0, 4, -> **cmd_id :** 4

0, 0, 0, 0, -> **cmd_status :** 0

0, 0, 0, 3, -> **seq_no :** 3

< PDU HEADER END >

0,5, 0, 49, 48, 48, -> **service_type :** "" (The length is 0 - **because the first element is null** - so from 5 to 48 will be processed again for the next element)

5, -> source_addr_ton : 5

0, -> source_addr_npi : 0

49, 48, 48, 50, 48, 0, 0, 0, 54, 49, 52, 50, 50, 52, 53, 50, 48, 53, 49, 0, 0, -> **destination_addr :** 10020 (The length is 5 so from 0 to 0 will be processed again for the next element)

0, -> dest_addr_ton : 0

0, -> dest_addr_npi : 0

54, 49, 52, 50, 50, 52, 53, 50, 48, 53, 49, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -> **destination_addr :** 61422452051

0, -> **esm_class** : 0

0, -> protocol_ID : 0

0, -> priority_flag : 0

0, 0, 0, 0, 0, 0, -125, 65, 99, 116, 105, 118, 97, 116, 105, 111, 110 -> **schedule_delivery_time :** ""

0, 0, 0, 0, 0, -125, 65, 99, 116, 105, 118, 97, 116, 105, 111, 110, 47, -> **validity_period** : ""

0, -> registered_delivery_flag : 0

0, -> replace_if_present_flag : 0

0, -> data_coding : 0

0, -> sm_default_msg_id : 0

-125, -> **sm_length :** 131

65, 99, 116, 105, 118, 97, 116, 105, 111, 110, 47, 82, 101, 103, 105, 115, 116, 114, 97, 116, 105, 111, 110, 32, 118, 105, 97, 32, 77, 73, 65, 58, 10, 49, 48, 32, 116, 111, 107, 101, 110, 10, 65, 58, 50, 54, 50, 55, 53, 57, 10, 66, 58, 56, 49, 55, 51, 57, 49, 10, 67, 58, 57, 54, 50, 49, 49, 56, 10, 68, 58, 49, 54, 54, 51, 56, 57, 10, 69, 58, 52, 49, 54, 50, 49, 54, 10, 70, 58, 50, 50, 51, 48, 52, 55, 10, 71, 58, 55,

55, 48, 57, 53, 52, 10, 72, 58, 54, 53, 52, 53, 50, 57, 10, 73, 58, 54, 52, 53, 55, 51, 56, 10, 74, 58, 54, 49, 56, 50, 50, 50 **short_message** : Activation/Registration via MIA:

10 token

A:262759

B:817391

C:962118

D:166389

E:416216

F:223047

G:770954

H:654529

I:645738

J:618222

< PDU BODY END >

Example of submit_sm in form of HEX dump:

```
000000B4:00000004:00000000:00000003:
00050031:30303230:00000036:31343232:
34353230:35310000:00000000:00000000:
83416374:69766174:696F6E2F:52656769:
73747261:74696F6E:20766961:204D4941:
3A0A3130:20746F6B:656E0A41:3A323632:
3735390A:423A3831:37333931:0A433A39:
36323131:380A443A:31363633:38390A45:
3A343136:3231360A:463A3232:33303437:
```

```
0A473A37:37303935:340A483A:36353435:

32390A49:3A363435:3733380A:4A3A3631:

38323232:
```

< PDU HEADER >

000000B4: -> **cmd_len :** 173 (hex to int)

00000004: -> **cmd_id :** 4 (hex to int)

00000000: -> **cmd_status :** 0 (hex to int)

00000003: -> **seq_no :** 3 (hex to int)

< PDU HEADER END >

< PDU BODY >

- 00050031: ->

  00 => **service_type:** 0 (hex to String)

  05 => **source_addr_ton :** 5 (hex to int)

  00 => **source_addr_npi :** 0 (hex to int)

  31 => **source_addr starts** (hex to String)

  1
- 30303230: -> rest of **source_addr** (hex to String)

  0020
- 00000036: ->

  00 => **source_addr ends** (hex to String)

  00 => **dest_addr_ton :** 0 (hex to int)

  00 => **dest_addr_npi :** 0 (hex to int)

  36 => **destination_addr :** 6 (hex to String)
- 33353200: ->

  31343232 => rest of **destination_addr :** 1422 (hex to String)
- 34353230: ->

34353230 => rest of **destination_addr :** 4520 (hex to String)

- 35310000: ->

  3531 => rest of **destination_addr :** 51 (hex to String)

  00 => end of **destination_addr** (hex to String)

- Complete destination_addr: 61422452051

  00 => **esm_class :** 0 (hex to int)

- 00000000: ->

  00 => **protocol_ID :** 0 (hex to int)

  00 => **priority_flag :** 0 (hex to int)

  00 => **schedule_delivery_time :** 0 (hex to String)

  00 => **validity_period :** 0 (hex to String)

- 00000000: ->

  00 => registered_delivery_flag : 0 (hex to int)

  00 => replace_if_present_flag : 0 (hex to int)

  00 => **data_coding :** 0 (hex to int)

  00 => **sm_default_msg_id :** 0 (hex to int)

- 83416374: ->

  83 => **sm_length** : 131 (hex to int)

  416374 => **short_message starts** (hex to String)

69766174:696F6E2F:52656769: (hex to String)

73747261:74696F6E:20766961:204D4941: (hex to String)

3A0A3130:20746F6B:656E0A41:3A323632: (hex to String)

3735390A:423A3831:37333931:0A433A39: (hex to String)

36323131:380A443A:31363633:38390A45: (hex to String)

3A343136:3231360A:463A3232:33303437: (hex to String)

0A473A37:37303935:340A483A:36353435: (hex to String)

32390A49:3A363435:3733380A:4A3A3631: (hex to String)

38323232: -> **short_message ends** (hex to String)

Short_message : Activation/Registration via MIA:

10 token

A:262759

B:817391

C:962118

D:166389

E:416216

F:223047

G:770954

H:654529

I:645738

J:618222

Example of submit_sm in form of byte array for UCS-2 or Unicode SMS:

```
0, 0, 0, 87, 0, 0, 0, 4, 0, 0, 0, 0, 0, 0, 0, 3, 0, 5, 0, 49, 50, 51, 52, 53,
54, 55, 0, 0, 0, 54, 49, 52, 52, 50, 48, 50, 49, 52, 53, 50, 49, 52, 0,0 ,0, 0,0
, 0, 0, 0, 8, 0, 34, 0, 65, 0, 68, 0, 83, 0, 58, 0, 32, 4, 63, 0, 32, 4, 54, 0,
10, 0, 65, 0, 58, 0, 54, 0, 57, 0, 52, 0, 48, 0, 54, 0, 48
```

< PDU HEADER>

0, 0, 0, 87 -> **cmd_len** : 104

0, 0, 0, 4 -> **cmd_id** : 4

0, 0, 0, 0 -> **cmd_status** : 0

0, 0, 0, 3 -> **seq_no** : 3

< PDU HEADER END>

0, 5, 0, 49, 50, 51, -> **service_type** : "" (The length is 0 - **because the first element is null** – the rest will be processed again) :

< byte to String>

5, -> **source_addr_ton** : 5 < byte to Integer>

0, -> **source_addr_npi** : 0 < byte to Integer>

49, 50, 51, 52, 53, 54, 55, 0, 0, 0, 54, 49, 52, 52, 50, 48, 50, 49, 52, 53, 50, -> **source_addr** : 1234567 (The length is 7 so the rest will be processed again for the next element) < byte to String>

0, -> **dest_addr_ton** : 0 < byte to Integer>

0, -> **dest_addr_npi** : 0 < byte to Integer>

54, 49, 52, 52, 50, 48, 50, 49, 52, 53, 50, 49, 52, 0, 0 , 0, 0, 0, 0, 0 -> **destination_addr** : 6144202145214 < byte to String>

0, -> **esm_class** : 0 < byte to Integer>

0, -> **protocol_ID** : 0 < byte to Integer>

0, -> **priority_flag** : 0 < byte to Integer>

0, 0, 0, 0, 8, 0, 34, 0, 65, 0, 68, 0, 83, 0, 58, 0, 32, -> schedule **_delivery_time** : "" < byte to String>

0, 0, 0, 8, 0, 34, 0, 65, 0, 68, 0, 83, 0, 58, 0, 32, 4 -> **validity_period** : "" < byte to String>

0, -> **registered_delivery_flag** : 0 < byte to Integer>

0, -> **replace_if_present_flag** : 0 < byte to Integer>

8, -> **data_coding** : 8 < byte to Integer>

0, -> **sm_default_msg_id** : 0 < byte to Integer>

34, -> **sm_length** : 34 < byte to Integer>

0, 65, 0, 68, 0, 83, 0, 58, 0, 32, 4, 63, 0, 32, 4, 54, 0, 10, 0, 65, 0, 58, 0, 54, 0, 57, 0, 52, 0, 48, 0, 54, 0, 48 **short_message** : ADS: п ж

A:694060

< byte to String with fix length>

< PDU BODY END>

Example of submit_sm in form of HEX dump for UCS-2 or Unicode SMS:

```
00000057:00000004:00000000:00000003:
00050031:32333435:36370000:00363134:
34323032:31343532:31340000:00000000:
00000800:22004100:44005300:3A002004:
3F002004:36000A00:41003A00:36003900:
34003000:360030
```

< PDU HEADER >

00000057: -> **cmd_len** : 87 (hex to int)

00000004: -> **cmd_id** : 4 (hex to int)

00000000: -> **cmd_status** : 0 (hex to int)

00000003: -> **seq_no** : 3 (hex to int)

< PDU HEADER END >

- 00050031: ->

  00 => **service_type**:0 (hex to String)

  05 => **source_addr_ton** : 5 (hex to int)

  00 => **source_addr_npi** : 0 (hex to int)

  31 => **source_addr starts** : 1 (hex to String)
- 32333435: -> rest of **source_addr** : 2345 (hex to String)
- 36370000: ->

  363700 =>rest of **source_addr and it ends** : 67 (hex to String)

  00 => **dest_addr_ton** : 0 (hex to int)
- 00363134: ->

  00 => **dest_addr_npi** : 0 (hex to int)

363134 => **destination_addr** : 614 (hex to String)

- 34323032: ->

  34323032=> rest of **destination_addr** : 4202 (hex to String)

- 31343532: ->

  31343532=> rest of **destination_addr** : 1452 (hex to String)

- 31340000 ->

  313400 => rest of **destination_addr** and its **end** (hex to String)

  Complete destination_addr: 6144202145214

  00 => **esm_class** : 0 (hex to int)

- 00000000: ->

  00 => **protocol_ID** : 0 (hex to int)

  00 => **priority_flag** : 0 (hex to int)

  00 => **schedule_delivery_time** : 0 (hex to String)

  00 => **validity_period** : 0 hex to String)

- 00000800: ->

  00 => **registered_delivery_flag** : 0 (hex to int)

  00 => **replace_if_present_flag** : 0 (hex to int)

  08 => **data_coding** : 8 (hex to int)

  00 => **sm_default_msg_id** : 0 (hex to int)

- 22004100: ->

  22 => **sm_length** : 34 (hex to int)

  004100=> **short_message starts** (hex to String)

44005300:3A002004:

3F002004:36000A00:41003A00:36003900:

34003000:360030 **short_message ends** (hex to String)

Short_message : ADS: п ж

A:694060

< PDU BODY END>

Example of submit_sm in form of byte array for long SMS:

```
0, 0, 1, 127, 0, 0, 0, 4, 0, 0, 0, 0, 109, -63, 106, -6, 0, 5, 0, 77, 81, 83,
109, 115, 83, 101, 110, 100, 101, 114, 0, 0, 0, 54, 49, 52, 52, 54, 53, 50, 49,
52, 53, 50, 49, 52, 53, 50, 0, 0, 0, 0, 0, 0, 0, 0, 8, 0, 0, 4, 36, 1, 64, 0,
65, 0, 99, 0, 116, 0, 105, 0, 118, 0, 97, 0, 116, 0, 105, 0, 111, 0, 110, 0, 47,
0, 82, 0, 101, 0, 103, 0, 105, 0, 115, 0, 116, 0, 114, 0, 97, 0, 116, 0, 105, 0,
111, 0, 110, 0, 32, 0, 118, 0, 105, 0, 97, 0, 32, 0, 77, 0, 73, 0, 65, 0, 58, 0,
13, 0, 10, 0, 49, 0, 48, 0, 32, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 115,
0, 32, 0, 115, 0, 101, 0, 110, 0, 116, 0, 13, 0, 10, 0, 65, 0, 58, 0, 56, 0, 49,
0, 56, 0, 48, 0, 57, 0, 56, 0, 13, 0, 10, 0, 66, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 66, 0, 13, 0, 10, 0, 67, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 67, 0, 13, 0, 10, 0, 68, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 68, 0, 13, 0, 10, 0, 69, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 69, 0, 13, 0, 10, 0, 70, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 70, 0, 13, 0, 10, 0, 71, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 71, 0, 13, 0, 10, 0, 72, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 72, 0, 13, 0, 10, 0, 73, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 73, 0, 13, 0, 10, 0, 74, 0, 58, 0, 36, 0, 84, 0, 111, 0,
107, 0, 101, 0, 110, 0, 74, 0, 13, 0, 10, 6, 127
```

< PDU HEADER>

0, 0, 1, 127 -> cmd_len : 383

0, 0, 0, 4 -> cmd_id : 4

0, 0, 0, 0 -> cmd_status : 0 < PDU BODY END>

109, -63, 106, -6 -> seq_no : 1841392378

< PDU HEADER END>

0, 5, 0, 77, 81, 83, -> **service_type** : "" (The length is 0 - **because the first element is null** – the rest will be processed again) :

< byte to String>

5, -> **source_addr_ton** : 5 < byte to Integer>

0, -> **source_addr_npi** : 0 < byte to Integer>

77, 81, 83, 109, 115, 83, 101, 110, 100, 101, 114, 0, 0, 0, 54, 49, 52, 52, 54, 53, 50, -> **source_addr** : MQSMSSender (The length is 7 so the rest will be processed again for the next element) < byte to String>

0, -> **dest_addr_ton** : 0 < byte to Integer>

0, -> **dest_addr_npi** : 0 < byte to Integer>

54, 49, 52, 52, 54, 53, 50, 49, 52, 53, 50, 49, 52, 53, 50, 0, 0, 0, 0, 0, 0, -> **destination_addr** : 614465214521452 < byte to String>

0, -> **esm_class** : 0 < byte to Integer>

0, -> **protocol_ID** : 0 < byte to Integer>

0, -> **priority_flag** : 0 < byte to Integer>

0, 0, 0, 0, 8, 0, 0, 4, 36, 1, 64, 0, 65, 0, 99, 0, 116, -> **schedule_delivery_time** : "" v < byte to String>

0, 0, 0 , 8, 0, 0, 4, 36, 1, 64, 0, 65, 0, 99, 0, 116, 0, -> **validity_period** : "" < byte to String>

0, **registered_delivery_flag** : 0

0, **replace_if_present_flag** : 0

8, **data_coding** : 8

0, **sm_default_msg_id** : 0

0, **sm_length** : 0

short_message : "" because sm_length is 0

4, 36 **tag** : 1060

1, 64, **len**: 320

0, 65, 0, 99, 0, 116, 0, 105, 0, 118, 0, 97, 0, 116, 0, 105, 0, 111, 0, 110, 0, 47, 0, 82, 0, 101, 0, 103, 0, 105, 0, 115, 0, 116, 0, 114, 0, 97, 0, 116, 0, 105, 0, 111, 0, 110, 0, 32, 0, 118, 0, 105, 0, 97, 0, 32, 0, 77, 0, 73, 0, 65, 0, 58, 0, 13, 0, 10, 0, 49, 0, 48, 0, 32, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 115, 0, 32, 0, 115, 0, 101, 0, 110, 0, 116, 0, 13, 0, 10, 0, 65, 0, 58, 0, 56, 0, 49, 0, 56, 0, 48, 0, 57, 0, 56, 0, 13, 0, 10, 0, 66, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 66, 0, 13, 0, 10, 0, 67, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 67, 0, 13, 0, 10, 0, 68, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 68, 0, 13, 0, 10, 0, 69, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 69, 0, 13, 0, 10, 0, 70, 0,

58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 70, 0, 13, 0, 10, 0, 71, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 71, 0, 13, 0, 10, 0, 72, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 72, 0, 13, 0, 10, 0, 73, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 73, 0, 13, 0, 10, 0, 74, 0, 58, 0, 36, 0, 84, 0, 111, 0, 107, 0, 101, 0, 110, 0, 74, 0, 13, 0, 10, 6, 127 value:

Activation/Registration via MIA:

10 Tokens sent

A:818098

B:$TokenB

C:$TokenC

D:$TokenD

E:$TokenE

F:$TokenF

G:$TokenG

H:$TokenH

I:$TokenI

J:$TokenJ

Example of submit_sm in form of HEX dump for long SMS:

```
0000017F:00000004:00000000:6DC16AFA:

0005004D:51536D73:53656E64:65720000:

00363134:34363532:31343532:31343532:

00000000:00000000:08000004:24014000:

41006300:74006900:76006100:74006900:

6F006E00:2F005200:65006700:69007300:

74007200:61007400:69006F00:6E002000:

76006900:61002000:4D004900:41003A00:
```

```
0D000A00:31003000:20005400:6F006B00:
65006E00:73002000:73006500:6E007400:
0D000A00:41003A00:38003100:38003000:
39003800:0D000A00:42003A00:24005400:
6F006B00:65006E00:42000D00:0A004300:
3A002400:54006F00:6B006500:6E004300:
0D000A00:44003A00:24005400:6F006B00:
65006E00:44000D00:0A004500:3A002400:
54006F00:6B006500:6E004500:0D000A00:
46003A00:24005400:6F006B00:65006E00:
46000D00:0A004700:3A002400:54006F00:
6B006500:6E004700:0D000A00:48003A00:
24005400:6F006B00:65006E00:48000D00:
0A004900:3A002400:54006F00:6B006500:
6E004900:0D000A00:4A003A00:24005400:
6F006B00:65006E00:4A000D00:0A067F
```

< PDU HEADER >

0000017F: -> **cmd_len** : 383 (hex to int)

00000004: -> **cmd_id** : 4 (hex to int)

00000000: -> **cmd_status** : 0 (hex to int)

6DC16AFA: -> **seq_no** : 1841392378 (hex to int)

< PDU HEADER END >

- 0005004D: ->

  00 => **service_type**:0 (hex to String)

05 => **source_addr_ton** : 5 (hex to int)

00 => **source_addr_npi** : 0 (hex to int)

4D => **source_addr starts** : 1 (hex to String)

- 51536D73: -> rest of **source_addr** : QSms (hex to String)
- 53656E64: -> rest of **source_addr** : Send (hex to String)
- 65720000: ->

  6572 00=> rest of **source_addr** : er (hex to String)

  00 => **dest_addr_ton** : 0 (hex to int)
- 00363134: ->

  00 => **dest_addr_npi** : 0 (hex to int)

  363134 => **destination_addr** : 614 (hex to String)
- 34363532 -> rest of **destination_addr** :4652 (hex to String)
- 31343532: -> rest of **destination_addr** : 1452 (hex to String)
- 31343532 -> rest of **destination_addr** : 1452 (hex to String)

  313400 => rest of **destination_addr** and its **end** (hex to String)

  Complete **destination_addr** : 614465214521452
- 00000000: ->

  00 => end of **destination_addr** (hex to String)

  00 => **esm_class** : 0 (hex to int)

  00 => **protocol_ID** : 0 (hex to int)

  00 => **priority_flag** : 0 (hex to int)
- 00000000: ->

  00 => **schedule_delivery_time** : 0 (hex to String)

  00 => **validity_period** : 0 (hex to String)

  00 => **registered_delivery_flag** : 0 (hex to int)

  00 => **replace_if_present_flag** : 0 (hex to int)
- 08000004: ->

  08 => **data_coding** : 8 (hex to int)

  00 => **sm_default_msg_id** : 0 (hex to int)

00 => **sm_length** : 0 (hex to int)

=> **short_message** : ""because sm_length is 0, this parameter will not be processed

04 => process for message_payload tag

- 24014000: ->

  24 => rest of message_payload tag : 1060

  0140 => message_payload len : 320

  00 => message_payload value **starts**

41006300:74006900:76006100:74006900:

6F006E00:2F005200:65006700:69007300:

74007200:61007400:69006F00:6E002000:

76006900:61002000:4D004900:41003A00:

0D000A00:31003000:20005400:6F006B00:

65006E00:73002000:73006500:6E007400:

0D000A00:41003A00:38003100:38003000:

39003800:0D000A00:42003A00:24005400:

6F006B00:65006E00:42000D00:0A004300:

3A002400:54006F00:6B006500:6E004300:

0D000A00:44003A00:24005400:6F006B00:

65006E00:44000D00:0A004500:3A002400:

54006F00:6B006500:6E004500:0D000A00:

46003A00:24005400:6F006B00:65006E00:

46000D00:0A004700:3A002400:54006F00:

6B006500:6E004700:0D000A00:48003A00:

24005400:6F006B00:65006E00:48000D00:

0A004900:3A002400:54006F00:6B006500:

6E004900:0D000A00:4A003A00:24005400:

6F006B00:65006E00:4A000D00:0A067F -> **message_payload** value **ends** (hex to String)

Activation/Registration via MIA:

10 Tokens sent

A:818098

B:$TokenB

C:$TokenC

D:$TokenD

E:$TokenE

F:$TokenF

G:$TokenG

H:$TokenH

I:$TokenI

J:$TokenJ

< PDU BODY END>

Message Security

The SMPP protocol does not enforce any security measures on its messaging; however, as the MQ server is not a real SMSC, **SMS via JMS Library** can encrypt the whole submit_sm message using an agreed 3DES key.

This option will not be available by default and the customer would need to officially request it before GPayments can commence the development.

Logging

The **SMS via JMS library** reads logging configuration from log4j.xml under the TOMCAT_HOME/bin/config folder. The library logs messages and events in ERROR, INFO and DEBUG levels only.

Deployment

The **SMS via JMS library** will be embedded into ActiveAccess installation package as a library.

Installation

To install the **SMS via JMS library**, proceed with the following instructions.

- If ActiveAccess version is 6.8.0 or lower, upgrade it to v6.8.1 or later.
- Open TOMCAT_HOME/bin/config/sms_jms_config.properties and update it with the preferred settings.
- Define a new SMS Centre in MIA >> System Management >> Device Management >> Edit Default Device Parameter-SMS >> SMS Centre >> New SMS Centre

Test Scenario

Message Validation Failed

SMS via JMS library successfully connects to MQ Server but there are persisting issues during processing and validating message:

- Message processing failed
- Invalid Submit_SM parameters.

Message processing failed

Process on message failed due to expected or unexpected exceptions, such as UnsupportedEncodingException when converting to other message formats.

Invalid Submit_SM parameters

All parameters' length must be checked and if limitation is exceeded, an exception will be thrown. Other validation on sumbit_sm message is mentioned below:

- **source_addr:** The sent source_addr's ton differs from source_addr_ton.
- **destination_addr:** The destination_addr is not defined or its ton differs from dest_addr_ton.
- **data_coding:** The sent data_coding is not defined or differs from short_message coding.
- **short_message:** short_message length is more than 254 bytes or differs from sm_length.
- **message_payload:** message_payload and short_message are both used simultaneously.
- **sm_length:** sm_length differs from short_message length or is not zero while message_payload has value.

Successful SMS sending

SMS via JMS library successfully connects to MQ Server and sends the message.