N-Squared Software High Performance Proxy SMPP Protocol Conformance Statement

Version 1.0

1   Document Information

1.1   Scope and Purpose

This document describes the implementation of the SMPP protocol using the N-Squared (N2) High Performance Proxy (HPP). It should be read in conjunction with the N2 HPP Technical Guide [R-1].

This document assumes a working knowledge of the relevant SMPP protocol documents and their network implementation.

1.2   Definitions, Acronyms, and Abbreviations

Term	Meaning
3GPP	Third-Generation Partnership Project
3GTS	3GPP Technical Specification
ASCII	American Standard Code for Information Interchange
DLR	Delivery Receipt
ESME	External Short Message Entity
GSM	Global System for Mobile communications
HPP	High Performance Proxy
IEC	International Electrotechnical Commission
IP	Internet Protocol
ISO	International Organisation for Standardisation
N2	N-Squared Software
PDU	Protocol Data Unit
SAR	Segmentation and Reassembly
SCTP	Secure TCP
SME	Short Message Entity
SMPP	Short Message Peer-to-Peer
SMSC	Short Message Service Centre
TCP	Transmission Control Protocol
TLV	Tag, Length, Value
UCS	Universal Coded Character Set
UDH	Userdata Header

1.3   References

The following documents are referenced within this document:

Reference	Document
[R-1]	N2 HPP Technical Guide
[R-2]	SMPP Developer Forum *Short Message Peer-to-Peer Protocol Specification* (v3.4)
[R-3]	SMPP Developer Forum *Short Message Peer-to-Peer Protocol Specification* (v5.0)
[R-4]	3GPP *Interface protocols for the connection of Short Message Service Centres (SMSCs) to Short Message Entities (SMEs)* (3GTS 23.039 version 2.0.0)
[R-5]	GSM TS 03.38 / ETSI TS 123 038 (3GPP TS 23.038)

1.4   Ownership and Usage

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3   Introduction

3.1   N2 HPP Overview

The N-Squared High Performance Proxy is a software system for real-time relay and manipulation of messages between client and server endpoints.

The HPP provides high availability and linear horizontal scalability and is deployed on low-cost commodity x86-64 hardware with minimal third-party licensing charges. The result is a cost-effective deployment which can be easily upscaled in response to future business growth.

Both BSS systems and southbound network components – including other N2 components, such as the N2 OCS - may access the HPP to provide brokering of messages and functionality across a wide range of batch-processed and real-time protocols. This includes SMPP, where the HPP can function as an SME or SMSC.

3.2   SMPP Overview

The SMPP protocol is widely used for short message exchange in IP networks. There are currently three versions that are used: v3.3, v3.4, and v5.0.

One notable feature of the SMPP protocol is its ability to allow custom Tag, Length, Value (TLV) message parameters to be used when both the SME and SMSC are configured to understand them.

3.3   General Restrictions

Specific compliance to the protocol documentation is described in section 5: RFC Compliance, but there are some high-level SMPP interactions and features that are not supported by the N2 HPP:

- Transport over X.25 is not supported. If desired, an external gateway can provide encapsulated transport over this protocol.
- Intermediate Notification and SME Delivery Acknowledgement (i.e. end-user read receipt) are not supported.
- Replace, query, and cancel message operations are only supported for SMPP proxying.

4   SMPP Messaging

4.1   Message Encoding

All SMPP messaging sent by the HPP will follow the basic encoding of the protocol documents [R-2, R-3]. Received SMPP messages must also follow this encoding.

4.1.1   SMPP Headers

All SMPP headers generated by the HPP are set in compliance with SMPP v3.4/5.0 section 3.2 [R-2, R-3]. For headers that are present in transferred messages, the HPP will alter values as required for routing and length changes, if any.

Field	Type / Length	Notes
command_length	Integer, 4 octets	Total message length, including header.
command_id	Integer, 4 octets	Identification value for operation. All operation types are supported.
command_status	Integer, 4 octets	Set according to SMPP v3.4 [R-2].
sequence_number	Integer, 4 octets	Set to 0 on the first message sent on a connection and increased by 1 for each subsequent message.

Table 1:   SMPP headers

4.1.2   SMPP Body

All SMPP PDU bodies generated by the HPP are set in compliance with SMPP v3.4/v5.0 section 4 [R-2, R-3]. For bodies of transferred messages, the HPP will not alter any values that have not been specifically configured to be changed.

All fixed body fields in all SMPP operations are supported.

4.1.3   SMPP TLVs

All SMPP TLVs generated by the HPP are set in compliance with SMPP v3.4 section 5.3 [R-2] and SMPP v5.0 sections 4.2.4/4.2.5 [R-3]. For TLVs that are present in transferred messages, the HPP will not alter any values that have not been specifically configured to be changed.

Field	Type / Length	Notes
tag	Integer, 2 octets	Set according to configuration and/or input.
length	Integer, 2 octets	Length of the TLV *value*.
value	Variable	As specified by the TLV *tag* and TLV *length*.

Table 2:   SMPP TLVs

In addition to the stated compliance to standard TLVs given in *Table 12: HPP compliance to SMPP v3.4*, the HPP may be configured to receive and send arbitrary standard or vendor-specific TLVs. Refer to the HPP Technical Guide for further details.

4.1.4   PDU Data Types

The HPP supports all data types specified in SMPP v3.4/5.0 section 3.1 [R-2, R-3]. Specifically, the following data types are supported for both fixed and optional fields:

- Octet String
- Integer
- C-Octet String (including Decimal and Hexadecimal)

4.1.5   SMPP Data Coding

The HPP supports flexible per-message encoding and/or decoding of SMS text based on the configured allowed data codings and the input and/or processing that has taken place. Refer to the HPP technical guide [R-1] for details.

The following encodings are supported:

- GSM 7-bit, all language tables (GSM 23.38)
- GSM 7-bit/8-bit, default language table only (GSM 23.38)
- GSM 7-bit/8-bit, Turkish national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Spanish national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Portugese national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Bengali national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Gujarati national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Hindi national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Kannada national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Malayalam national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Oriya national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Punjabi national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Tamil national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Telegu national language tables only (GSM 23.38)
- GSM 7-bit/8-bit, Urdu national language tables only (GSM 23.38)
- Windows-1252 (CP-1252)
- ASCII (ISO 646-US)
- Latin 1 (ISO/IEC 8859-1)
- Latin/Cyrillic (ISO/IEC 8859-5)
- Latin/Hebrew (ISO/IEC 8859-8)
- Latin 9 (ISO/IEC 8859-15)
- UCS2 (ISO 10646-UCS2)
- UTF8 (ISO 10646-UTF8)

Note that the correlation of the data coding used and the value of the *data_coding* fixed field is configurable globally.

For flash messaging, the HPP offers multiple operation modes per SMSC connection:

1. Use the standard SMPP flash class *1111xxxx* format for 7-bit and 8-bit encodings and optionally use the alternate GSM [R-5] *00xxxxxx* format with message class indicator for 16-bit encoding.
2. Use only the alternate GSM [R-5] *00xxxxxx* format with message class indicator for 7-bit, 8-bit, and 16-bit encodings.

3. Use the non-flash SMPP data coding values with the alternate SMPP message class indicator in the *dest_addr_subunit* TLV.

4.1.6   SMPP Message Segmentation

For overlength messages generated by the HPP, three segmentation schemes are available:

1. Do not segment; use the *payload* TLV for the entire message.
2. Segment message using UDH information, either 8-bit or 16-bit.
3. Segment message using SAR TLVs.

Note that segmented messages will always share a common data coding for messages generated by the HPP. Segmentation count limits are configurable globally. Messages that do not require segmentation will be sent entire.

4.2   Connection Management

The HPP may be configured to accept inbound TCP connections from or to invoke outbound TCP connections to other SMPP SMEs or SMSCs, following the *bind* operation specified in SMPP v3.4 section 4.1 [R-2] and SMPP v5.0 section 4.1.1 [R-3]. All SMPP connection management operations are supported by the HPP, specifically:

- *bind_transmitter* and *bind_transmitter_resp*
- *bind_receiver* and *bind_receiver_resp*
- *bind_transceiver* and *bind_transceiver_resp*
- *outbind*
- *unbind* and *unbind_resp*
- *enquire_link* and *enquire_link_resp*

The message parameters for these operations are shown in the following sections.

The HPP must be configured with a whitelist of information for SMEs or SMSCs that initiate connections to the HPP.

Connections may be made to and from the HPP over either TCP or SCTP.

Refer to the HPP Technical Guide [R-1] for details of the configuration allowed for connection management.

4.2.1   BIND Operation

The HPP supports all forms of *bind* messages for the establishment of connections to SMEs and SMSCs. Depending on whether the HPP is configured to listen or initiate connections, both *bind* requests and responses may be sent and/or received.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
system_id	1..16	C-Octet String	1	1	Must match configured entity credentials.	Set globally from configuration. Only included in responses if bind was successful

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	**Resp.**		
password	1..9	C-Octet String	1	0	Must match configured entity credentials.	Set globally from configuration.
system_type	1..13	C-Octet String	1	0	Not used.	Set globally from configuration.
interface_version	1	Integer	1	0	Not used.	Set to 0x50.
addr_ton	1	Integer	1	0	Not used.	Set to NULL.
addr_npi	1	Integer	1	0	Not used.	Set to NULL.
address_range	1..41	C-Octet String	1	0	Not used.	Set to NULL.
sc_interface_version	0+	TLV	0	0+	Not used.	Not sent.

Table 3:   BIND request/response body parameters

4.2.2   OUTBIND Operation

The HPP supports receiving *outbind* messages to request a *bind_receiver* message to be sent. These messages do not have responses.

The HPP does not send *outbind* messages.

Field	Size	Type	Presence	Inbound Notes
system_id	1..16	C-Octet String	1	Must match configured entity credentials.
password	1..9	C-Octet String	1	Must match configured entity credentials.

Table 4:   OUTBIND request/response body parameters

4.2.3   UNBIND Operation

When the HPP platform is taken out of service, an *unbind* message is sent to all connected SMEs and SMSCs. These entities may attempt to reconnect as required.

In cases where an *unbind* is received from a SME or SMSC and the HPP is configured to initiate connections, reconnections will be made on the configured schedule.

No body is present on *unbind* requests or responses.

4.2.4   ENQUIRE_LINK Operation

The HPP will send *enquire_link* requests to connected SMEs and SMSCs after no traffic is received from them for a configurable period. If no response or new traffic is received, or the request cannot be delivered, the HPP will behave as if an *unbind* request has been received, as set out in section *4.2.3: UNBIND Operation*.

Under normal circumstances, the HPP will always send a response to a received *enquire_link* from a connected entity to indicate that the system is functioning nominally.

No body is present on *enquire_link* requests or responses.

4.3   SMPP Messaging

4.3.1   SMPP Proxy

When functioning as an SMPP proxy, SMPP message *command_id* values are not directly used outside of the operations described in section *4.2: Connection Management*; all other SMPP operations are supported for pass-through.

Similarly, all TLVs are supported for pass-through with the following caveats:

- TLVs specified for inspection for routing purposes must either be natively defined in SMPP v3.4 [R-2] or SMPP v5.0 [R-3] or have their TLV definition specified in the HPP configuration.

Refer to the HPP Technical Guide [R-1] for details of the configuration required for custom TLVs.

4.3.2   Locally-Processed SMPP

The HPP may also generate its own SMPP messages outside of proxy operation or may receive SMPP messages for processing outside of its proxy function. The supported SMPP PDU operations for local SMPP generation and processing are:

- Send and receive *generic_nack*
- Send and receive *submit_sm* and *submit_sm_resp*
- Send and receive *submit_multi* and *submit_multi_resp*
- Send and receive *deliver_sm* and *deliver_sm_resp*
- Send and receive *data_sm* and *data_sm_resp*
- Send and receive *alert_notification*

The following operations are only supported for SMPP proxying, as set out in section *4.3.1: SMPP Proxy*:

- *broadcast_sm* and *broadcast_sm_resp*
- *cancel_broadcast_sm* and *cancel_broadcast_sm_resp*
- *query_broadcast_sm* and *query_broadcast_sm_resp*
- *query_sm* and *query_sm_resp*
- *cancel_sm* and *cancel_sm_resp*
- *replace_sm* and *replace_sm_resp*

4.3.2.1   GENERIC_NACK Operation

The HPP supports both sending and receiving *generic_nack* operations.

SMPP entities may return a *generic_nack* in cases where a message-specific response is not suitable. In such cases, the HPP will be unable to determine any specific error details from the response and will apply default error handling.

The HPP will only *generic_nack* responses if the received SMPP message is corrupt and the appropriate response with a corresponding *command_id* cannot be selected.

No body is present on *generic_nack* responses.

4.3.2.2   SUBMIT_SM Operation

The HPP supports receiving and sending submission of SMS via the *submit_sm* operation, depending on whether it is functioning as an SMSC or as an SME, respectively. This includes the processing or generation of appropriate *submit_sm_resp* messages.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
service_type	1..6	C-Octet String	1	0	Not used.	Set to NULL.
source_addr_ton	1	Integer	1	0	Used in number normalisation.	Set per-message from configuration.
source_addr_npi	1	Integer	1	0	Used in number normalisation.	Set per-message from configuration.
source_addr	1..21	C-Octet String	1	0	Used as source address.	Set per-message by input or processing.
dest_addr_ton	1	Integer	1	0	Used in number normalisation.	Set per-message from configuration.
dest_addr_npi	1	Integer	1	0	Used in number normalisation.	Set per-message from configuration.
destination_addr	1..21	C-Octet String	1	0	Used as destination address.	Set per-message by input or processing.
esm_class	1	Integer	1	0	Not used.	Set per-message by input or processing.
protocol_id	1	Integer	1	0	Not used.	Set to NULL.
priority_flag	1	Integer	1	0	Not used.	Set per-message by input or processing.
schedule_delivery_time	1|17	C-Octet String	1	0	Not used.	Set per-message by input or processing.
validity_period	1|17	C-Octet String	1	0	Not used.	Set per-message by input or processing.
registered_delivery	1	Integer	1	0	Not used.	Set per-message by input or processing. May only be set to 0x00 or 0x01.
replace_if_present_flag	1	Integer	1	0	Not used.	Set per-message by input or processing.
data_coding	1	Integer	1	0	Must match configured values for successful message decode.	Set per-message by input or processing. See section *4.1.5: SMPP Data Coding*.
sm_default_msg_id	1	Integer	1	0	Not used.	Set per-message by input or processing.
sm_length	1	Integer	1	0	Used for message decode.	Set per-message automatically.
short_message	0..254	Octet String	1	0	Used for message decode.	Set per-message by input or processing.
message_id	0..65	C-Octet String	0	0..1	Used for message correlation to DLR.	Set per-message automatically for success cases.
(TLVs)	As per *Table 10: Message submission TLVs*.					

Table 5:   SUBMIT_SM request/response body parameters

4.3.2.3   SUBMIT_MULTI Operation

The HPP supports receiving and sending submission of multiple SMS via the *submit_multi* operation, depending on whether it is functioning as an SMSC or as an SME, respectively. This includes the processing or generation of appropriate *submit_multi_resp* messages.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
service_type	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr_ton	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr_npi	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr	As per *Table 5: SUBMIT_SM request/response body parameters*.					
number_of_dests	1	Integer	1	0	Used as destination address count.	Set per-message by input or processing.
dest_flag	1	Integer	1+	0	Used in destination determination.	Set per-message automatically.
dest_addr_ton	1	Integer	0+	0	Used in number normalisation. Requires aligned *dest_addr_npi* and *destination_addr*.	Set per-message from configuration.
dest_addr_npi	1	Integer	0+	0	Used in number normalisation. Requires aligned *dest_addr_ton* and *destination_addr*.	Set per-message from configuration.
destination_addr	1..21	C-Octet String	0+	0	Used as destination address. Requires aligned *dest_addr_ton* and *dest_addr_npi*.	Set per-message by input or processing.
dl_name	1..21	C-Octet String	0+	0	Used as destination address.	Set per-message by input or processing.
esm_class	As per *Table 5: SUBMIT_SM request/response body parameters*.					
protocol_id	As per *Table 5: SUBMIT_SM request/response body parameters*.					
priority_flag	As per *Table 5: SUBMIT_SM request/response body parameters*.					
schedule_delivery_time	As per *Table 5: SUBMIT_SM request/response body parameters*.					
validity_period	As per *Table 5: SUBMIT_SM request/response body parameters*.					
registered_delivery	As per *Table 5: SUBMIT_SM request/response body parameters*.					
replace_if_present_flag	As per *Table 5: SUBMIT_SM request/response body parameters*.					
data_coding	As per *Table 5: SUBMIT_SM request/response body parameters*.					
sm_default_msg_id	As per *Table 5: SUBMIT_SM request/response body parameters*.					
sm_length	As per *Table 5: SUBMIT_SM request/response body parameters*.					
short_message	As per *Table 5: SUBMIT_SM request/response body parameters*.					
message_id	As per *Table 5: SUBMIT_SM request/response body parameters*.					
no_unsuccess	1	Integer	0	1	Used as failed destination address count.	Set per-message automatically.
unsuccess_sme	1	Integer	0	1	Used as failed destination address count.	Set per-message automatically.
dest_flag	1	Integer	0	1+	Used in failed destination determination.	Set per-message automatically.
dest_addr_ton	1	Integer	0	0+	Used in number normalisation. Requires aligned *dest_addr_npi* *destination_addr*, and *error_status_code*.	Set per-message from configuration.
dest_addr_npi	1	Integer	0	0+	Used in number normalisation. Requires aligned *dest_addr_ton*, *destination_addr*, and *error_status_code*.	Set per-message from configuration.
destination_addr	1..21	C-Octet String	0	0+	Used in failed destination determination. Requires aligned *dest_addr_ton*, *dest_addr_npi*, and *error_status_code*.	Set per-message automatically.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
error_status_code	4	Integer	0	0+	Used in failed destination determination. Requires aligned dest_addr_ton, dest_addr_npi, and destination_addr.	Set per-message automatically.
message_id	0..65	C-Octet String	0	0..1	Used for message correlation to DLR.	Set per-message automatically for success cases.
(TLVs)	As per Table 10: Message submission TLVs.					

Table 6:   SUBMIT_MULTI request/response body parameters

4.3.2.4   DELIVER_SM Operation

The HPP supports receiving and sending user-generated SMS via the *deliver_sm* operation, depending on whether it is functioning as an SMSC or as an SME, respectively. This includes the processing or generation of appropriate *deliver_sm_resp* messages.

Note that, as the HPP may only ever request SMSC delivery receipts in the *registered_delivery* field, the only supported delivery receipts are for the case of SMSC Delivery Receipt. SME Delivery Acknowledgment, SME Manual/User Acknowledgement, and Intermediate Notification are not supported.

When processing SMSC delivery receipts:

- The HPP will preferentially use the TLVs *network_error_code* and *message_state* to determine the status of the sent message.
- The HPP will preferentially use the TLV *receipted_message_id* to identify the original sent message. If this TLV is not available, the regular expression `^id:([^ ]+).*$` is used to determine the message identifier from the short message text.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
service_type	As per Table 5: SUBMIT_SM request/response body parameters.					
source_addr_ton	As per Table 5: SUBMIT_SM request/response body parameters.					
source_addr_npi	As per Table 5: SUBMIT_SM request/response body parameters.					
source_addr	As per Table 5: SUBMIT_SM request/response body parameters.					
dest_addr_ton	As per Table 5: SUBMIT_SM request/response body parameters.					
dest_addr_npi	As per Table 5: SUBMIT_SM request/response body parameters.					
destination_addr	As per Table 5: SUBMIT_SM request/response body parameters.					
esm_class	As per Table 5: SUBMIT_SM request/response body parameters.					
protocol_id	As per Table 5: SUBMIT_SM request/response body parameters.					
priority_flag	As per Table 5: SUBMIT_SM request/response body parameters.					
schedule_delivery_time	1	C-Octet String	1	0	Not used.	Set to NULL.
validity_period	1	C-Octet String	1	0	Not used.	Set to NULL.
registered_delivery	As per Table 5: SUBMIT_SM request/response body parameters.					
replace_if_present_flag	1	Integer	1	0	Not used.	Set to NULL.
data_coding	As per Table 5: SUBMIT_SM request/response body parameters.					
sm_default_msg_id	1	Integer	1	0	Not used.	Set to NULL.
sm_length	As per Table 5: SUBMIT_SM request/response body parameters.					

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
short_message	0..254	Octet String	1	0	Used for message decode. May be used in processing SMSC delivery receipts.	Set per-message by input or processing.
message_id	As per *Table 5: SUBMIT_SM request/response body parameters*.					

Table 7:   DELIVER_SM request/response body parameters

4.3.2.5   DATA_SM Operation

The HPP supports receiving and sending submission of SMS via the *submit_sm* operation, depending on whether it is functioning as an SMSC or as an SME, respectively. This includes the processing or generation of appropriate *submit_sm_resp* messages.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
service_type	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr_ton	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr_npi	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr	As per *Table 5: SUBMIT_SM request/response body parameters*.					
dest_addr_ton	As per *Table 5: SUBMIT_SM request/response body parameters*.					
dest_addr_npi	As per *Table 5: SUBMIT_SM request/response body parameters*.					
destination_addr	As per *Table 5: SUBMIT_SM request/response body parameters*.					
esm_class	As per *Table 5: SUBMIT_SM request/response body parameters*.					
registered_delivery	As per *Table 5: SUBMIT_SM request/response body parameters*.					
data_coding	As per *Table 5: SUBMIT_SM request/response body parameters*.					
message_id	0..65	C-Octet String	0	0..1	Used for message correlation to DLR.	Set per-message automatically for success cases.
(TLVs)	As per *Table 10: Message submission TLVs*.					

Table 8:   DATA_SM request/response body parameters

4.3.2.6   QUERY_SM Operation

The HPP only supports the *query_sm / query_sm_resp* operations for SMPP proxying, as set out in section *4.3.1: SMPP Proxy*.

4.3.2.7   CANCEL_SM Operation

The HPP only supports the *cancel_sm / cancel_sm_resp* operations for SMPP proxying, as set out in section *4.3.1: SMPP Proxy*.

4.3.2.8   REPLACE_SM Operation

The HPP only supports the *replace_sm / replace_sm_resp* operations for SMPP proxying, as set out in section *4.3.1: SMPP Proxy*.

4.3.2.9   ALERT_NOTIFICATION Operation

The HPP supports sending and receiving *alert_notification* operations, depending on whether it is functioning as an SMSC or as an SME, respectively.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
source_addr_ton	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr_npi	As per *Table 5: SUBMIT_SM request/response body parameters*.					
source_addr	As per *Table 5: SUBMIT_SM request/response body parameters*.					
esme_addr_ton	1	Integer	1	0	Used in number normalisation.	Set per-message from configuration.
esme_addr_npi	1	Integer	1	0	Used in number normalisation.	Set per-message from configuration.
esme_addr	1..65	C-Octet String	1	0	Used as destination address.	Set per-message by input or processing.
ms_availability_status	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.

Table 9: ALERT_NOTIFICATION request/response body parameters

4.3.2.10 Message Submission TLVs

The message submission operations *submit_sm*, *deliver_sm*, and *data_sm* and their associated responses may have various TLVs included in them. The HPP's support for sending and receiving these TLVs is given below.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
additional_status_info_text	0+	TLV	0	0..1	Not used.	Set per-message by input or processing.
alert_on_msg_delivery	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
billing_identification	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
callback_num	0+	TLV	0+	0	Not used.	Set per-message by input or processing.
callback_num_atag	0+	TLV	0+	0	Not used.	Set per-message by input or processing.
callback_num_pres_ind	0+	TLV	0+	0	Not used.	Set per-message by input or processing.
delivery_failure_reason	0+	TLV	0	0..1	Not used.	Set per-message by input or processing.
dest_addr_np_country	0+	TLV	0+	0	Not used.	Set per-message by input or processing.
dest_addr_np_information	0+	TLV	0+	0	Not used.	Set per-message by input or processing.
dest_addr_np_resolution	0+	TLV	0+	0	Not used.	Set per-message by input or processing.
dest_addr_subunit	0+	TLV	0..1	0	Not used.	Set per-message by input or processing. See section *4.1.5: SMPP Data Coding*.
dest_bearer_type	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
dest_network_id	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
dest_network_type	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
dest_node_id	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
dest_subaddress	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
dest_telematics_id	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
destination_port [R-2] dest_port [R-3]	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
display_time	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
dpf_result	0+	TLV	0	0..1	Not used.	Set per-message by input or processing.
its_reply_type	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
its_session_info	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
language_indicator	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
message_payload	0+	TLV	0..1[1] or 1[2]	0	Used for message decode.	Set per-message by input or processing.
more_messages_to_send	0+	TLV	0..1	0	Not used.	Set per-message automatically if UDH segmentation is used.
ms_msg_wait_facilities	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
ms_validity	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
network_error_code	0+	TLV	0	0..1	Not used.	Set per-message by input or processing.
number_of_messages	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
payload_type	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
privacy_indicator	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
qos_time_to_live	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
sar_msg_ref_num	0+	TLV	0..1	0	Not used.	Set per-message automatically if SAR segmentation is used.
sar_segment_seqnum	0+	TLV	0..1	0	Not used.	Set per-message automatically if SAR segmentation is used.
sar_total_segments	0+	TLV	0..1	0	Not used.	Set per-message automatically if SAR segmentation is used.
set_dpf	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
sms_signal	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
source_addr_subunit	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
source_bearer_type	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
source_network_id	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.

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[1] For *submit_sm* and *submit_multi*.

[2] For *data_sm*.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
source_node_id	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
source_port	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
source_subaddress	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
source_telematics_id	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
user_message_reference	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
user_response_code	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.
ussd_service_op	0+	TLV	0..1	0	Not used.	Set per-message by input or processing.

Table 10: Message submission TLVs

4.3.2.11 Message Delivery TLVs

The message delivery operations *deliver_sm* and *data_sm* and their associated responses may have various TLVs included in them. The HPP's support for sending and receiving these TLVs is given below.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
additional_status_info_text					As per *Table 10: Message submission TLVs*.	
callback_num					As per *Table 10: Message submission TLVs*.	
callback_num_atag					As per *Table 10: Message submission TLVs*.	
callback_num_pres_ind					As per *Table 10: Message submission TLVs*.	
delivery_failure_reason					As per *Table 10: Message submission TLVs*.	
dest_addr_np_country					As per *Table 10: Message submission TLVs*.	
dest_addr_np_information					As per *Table 10: Message submission TLVs*.	
dest_addr_np_resolution					As per *Table 10: Message submission TLVs*.	
dest_addr_subunit					As per *Table 10: Message submission TLVs*.	
dest_network_id					As per *Table 10: Message submission TLVs*.	
dest_node_id					As per *Table 10: Message submission TLVs*.	
dest_subaddress					As per *Table 10: Message submission TLVs*.	
destination_port [R-2] dest_port [R-3]					As per *Table 10: Message submission TLVs*.	
dpf_result					As per *Table 10: Message submission TLVs*.	
its_reply_type					As per *Table 10: Message submission TLVs*.	
its_session_info					As per *Table 10: Message submission TLVs*.	
language_indicator					As per *Table 10: Message submission TLVs*.	
message_payload					As per *Table 10: Message submission TLVs*.	
message_state	0+	TLV	0..1	0	Used for delivery status determination. May be used in processing SMSC delivery receipts.	Set per-message by input or processing.
network_error_code	0+	TLV	0..1	0..1	Used for delivery status determination. May be used in processing SMSC delivery receipts.	Set per-message by input or processing.

Field	Size	Type	Presence		Inbound Notes	Outbound Notes
			Req.	Resp.		
payload_type	As per *Table 10: Message submission TLVs*.					
privacy_indicator	As per *Table 10: Message submission TLVs*.					
receiped_message_id	0+	TLV	0..1	0	Used for delivery status determination. May be used in processing SMSC delivery receipts.	Set per-message by input or processing.
sar_msg_ref_num	As per *Table 10: Message submission TLVs*.					
sar_segment_seqnum	As per *Table 10: Message submission TLVs*.					
sar_total_segments	As per *Table 10: Message submission TLVs*.					
source_addr_subunit	As per *Table 10: Message submission TLVs*.					
source_network_id	As per *Table 10: Message submission TLVs*.					
source_node_id	As per *Table 10: Message submission TLVs*.					
source_port	As per *Table 10: Message submission TLVs*.					
source_subaddress	As per *Table 10: Message submission TLVs*.					
user_message_reference	As per *Table 10: Message submission TLVs*.					
user_response_code	As per *Table 10: Message submission TLVs*.					
ussd_service_op	As per *Table 10: Message submission TLVs*.					

Table 11: Message delivery TLVs

5   RFC Compliance

5.1   Compliance to SMPP v3.4

Section	Section Heading	Compliance	Notes
1	Introduction	Not applicable.	-
1.1	SMPP Overview	Not applicable.	-
1.2	Scope	Not applicable.	-
1.3	Glossary	Not applicable.	-
1.4	References	Not applicable.	-
2	SMPP Protocol Overview	Fully compliant.	-
2.1	SMPP Protocol Definition	Fully compliant.	-
2.2	SMPP Session Description	Fully compliant.	-
2.2.1	Outbind	Fully compliant.	-
2.3	SMPP PDUs	Partially compliant.	*query_sm* / *query_sm_resp*, *cancel_sm* / *cancel_sm_resp*, and *replace_sm* / *replace_sm_resp* only supported for SMPP proxying.
2.4	SMPP Network Layer Connections	Partially compliant.	X.25 not supported.
2.5	SMPP messages sent from ESME to SMSC	Partially compliant.	*query_sm*, *cancel_sm*, and *replace_sm* only supported for SMPP proxying.
2.5.1	SMPP Message Response from SMSC to ESME	Partially compliant.	*query_sm_resp*, *cancel_sm_resp*, and *replace_sm_resp* only supported for SMPP proxying.
2.5.2	Typical SMPP session sequence - ESME Transmitter	Partially compliant.	*query_sm* / *query_sm_resp* only supported for SMPP proxying. Responses may be out of order due to processing or external entities.
2.6	SMPP messages sent from SMSC to ESME	Fully compliant.	-
2.6.1	SMPP Message Response from ESME to SMSC	Fully compliant.	-
2.6.2	Typical SMPP session sequence - ESME Receiver	Partially compliant.	Responses may be out of order due to processing or external entities.
2.7	Duplex message exchange between an SMSC and an ESME	Partially compliant.	*query_sm*, *cancel_sm*, and *replace_sm* only supported for SMPP proxying.
2.7.1	Typical SMPP session sequence - ESME Transceiver	Partially compliant.	Responses may be out of order due to processing or external entities.
2.8	SMPP Error Handling	Fully compliant.	-
2.9	SMPP Timers	Fully compliant.	-
2.10	Message Modes	Not applicable.	-

Section	Section Heading	Compliance	Notes
2.10.1	Store and Forward Message Mode	Partially compliant.	Not used for non-proxy inbound messages as per *registered_delivery* in *Table 5: SUBMIT_SM request/response body parameters*.
2.10.2	Datagram Message Mode	Partially compliant.	Not used for non-proxy inbound messages as per *registered_delivery* in *Table 5: SUBMIT_SM request/response body parameters*.
2.10.3	Transaction Message Mode	Partially compliant.	Not used for non-proxy inbound messages as per *registered_delivery* in *Table 5: SUBMIT_SM request/response body parameters*.
2.11	Message Types	Partially compliant.	SME Delivery Acknowledgment, SME Manual/User Acknowledgement, and Intermediate Notification not supported.
3	SMPP PDU Type and Format Definitions	Not applicable.	-
3.1	SMPP PDU – Type Definitions	Fully compliant.	-
3.1.1	SMPP Parameter Field Size Notation	Not applicable.	-
3.2	SMPP PDU Format - Overview	Fully compliant.	-
3.2.1	SMPP PDU Layout	Fully compliant.	-
3.2.2	SMPP PDU Length	Fully compliant.	-
3.2.3	SMPP Message length and extended message length	Fully compliant.	-
3.2.4	Optional Parameters	Fully compliant.	-
3.2.4.1	Optional Parameter Format	Fully compliant.	-
3.3	Guidelines for SMPP Forward Compatibility	Fully compliant.	-
3.4	Guidelines for SMPP Backward Compatibility	Fully compliant.	-
4	SMPP PDU Definition	Not applicable.	-
4.1	"BIND" Operation	Fully compliant.	-
4.1.1	"BIND_TRANSMITTER" Syntax	Fully compliant.	-
4.1.2	"BIND_TRANSMITTER_RESP" Syntax	Partially compliant.	*sc_interface_version* not used.
4.1.3	"BIND_RECEIVER" Syntax	Fully compliant.	-
4.1.4	"BIND_RECEIVER_RESP"	Partially compliant.	*sc_interface_version* not used.
4.1.5	"BIND_TRANSCEIVER" Syntax	Fully compliant.	-
4.1.6	"BIND_TRANSCEIVER_RESP"	Partially compliant.	*sc_interface_version* not used.

Section	Section Heading	Compliance	Notes
4.1.7	"OUTBIND" Operation.	Fully compliant.	-
4.1.7.1	"OUTBIND" Syntax	Fully compliant.	-
4.2	"UNBIND" Operation	Fully compliant.	-
4.2.1	"UNBIND"	Fully compliant.	-
4.2.2	"UNBIND_RESP"	Fully compliant.	-
4.3	"GENERIC_NACK" PDU	Fully compliant.	-
4.3.1	"GENERIC_NACK" Syntax	Fully compliant.	-
4.4	"SUBMIT_SM" Operation	Not applicable.	-
4.4.1	"SUBMIT_SM" Syntax	Partially compliant.	Refer to *Table 5: SUBMIT_SM request/response body parameters*.
4.4.1.1	Source and Destination Addressing	Fully compliant.	-
4.4.1.2	Message Replace operation in "SUBMIT_SM"	Partially compliant.	Refer to *Table 5: SUBMIT_SM request/response body parameters*.
4.4.2	"SUBMIT_SM_RESP"	Fully compliant.	-
4.5	"SUBMIT_MULTI" Operation	Not applicable.	-
4.5.1	"SUBMIT_MULTI" Syntax	Partially compliant.	Refer to *Table 6: SUBMIT_MULTI request/response body parameters*.
4.5.1.1	Destination Address definition	Fully compliant.	-
4.5.1.2	Distribution List (DL) definition	Fully compliant.	-
4.5.2	"SUBMIT_MULTI_RESP" Syntax	Fully compliant.	-
4.5.2.1	Unsuccessful deliveries	Fully compliant.	-
4.6	"DELIVER_SM" Operation	Partially compliant.	SME Delivery Acknowledgment, SME Manual/User Acknowledgement, and Intermediate Notification not supported.
4.6.1	"DELIVER_SM" Syntax	Partially compliant.	Refer to *Table 7: DELIVER_SM request/response body parameters*.
4.6.2	"DELIVER_SM_RESP" Syntax	Fully compliant.	-
4.7	"DATA_SM" Operation	Partially compliant.	SME Delivery Acknowledgment, SME Manual/User Acknowledgement, and Intermediate Notification not supported.
4.7.1	"DATA_SM" Syntax	Partially compliant.	Refer to *Table 8: DATA_SM request/response body parameters*.
4.7.2	"DATA_SM_RESP" Syntax	Fully compliant.	-
4.8	"QUERY_SM" Operation	Not applicable.	-
4.8.1	"QUERY_SM" Syntax	Partially compliant.	Only supported for SMPP proxying.
4.8.2	"QUERY_SM_RESP" Syntax	Partially compliant.	Only supported for SMPP proxying.
4.9	"CANCEL_SM" Operation	Not applicable.	-

Section	Section Heading	Compliance	Notes
4.9.1	"CANCEL_SM" Syntax	Partially compliant.	Only supported for SMPP proxying.
4.9.2	"CANCEL_SM_RESP" Syntax	Partially compliant.	Only supported for SMPP proxying.
4.10	"REPLACE_SM" Operation	Not applicable.	-
4.10.1	"REPLACE_SM" Syntax	Partially compliant.	Only supported for SMPP proxying.
4.10.2	"REPLACE_SM_RESP" Syntax	Partially compliant.	Only supported for SMPP proxying.
4.11	"ENQUIRE_LINK" Operation	Fully compliant.	-
4.11.1	"ENQUIRE_LINK" Syntax	Fully compliant.	-
4.11.2	"ENQUIRE_LINK_RESP" Syntax	Fully compliant.	-
4.12	"ALERT_NOTIFICATION" Operation	Fully compliant.	-
4.12.1	"ALERT_NOTIFICATION" Syntax	Fully compliant.	-
5	SMPP Parameter Definition	Not applicable.	-
5.1	Command Header Parameters	Not applicable.	-
5.1.1	command_length	Fully compliant.	-
5.1.2	command_id	Fully compliant.	-
5.1.2.1	SMPP Command set	Fully compliant.	-
5.1.3	command_status	Fully compliant.	-
5.1.4	sequence_number	Fully compliant.	-
5.2	Mandatory SMPP Parameters	Not applicable.	-
5.2.1	system_id	Fully compliant.	-
5.2.2	password	Fully compliant.	-
5.2.3	system_type	Fully compliant.	-
5.2.4	interface_version	Fully compliant.	-
5.2.5	addr_ton, source_addr_ton, dest_addr_ton, esme_addr_ton	Fully compliant.	-
5.2.6	addr_npi, source_addr_npi, dest_addr_npi, esme_addr_npi	Fully compliant.	-
5.2.7	address_range	Fully compliant.	-
5.2.8	source_addr	Fully compliant.	-
5.2.9	destination_addr	Fully compliant.	-
5.2.10	esme_addr	Fully compliant.	-
5.2.11	service_type	Fully compliant.	-
5.2.12	esm_class	Fully compliant.	-
5.2.13	protocol_id	Fully compliant.	-
5.2.14	priority_flag	Fully compliant.	-
5.2.15	schedule_delivery_time	Fully compliant.	-
5.2.16	validity_period	Fully compliant.	-

Section	Section Heading	Compliance	Notes
5.2.17	registered_delivery	Fully compliant.	-
5.2.18	replace_if_present_flag	Fully compliant.	-
5.2.19	data_coding	Fully compliant.	Refer to section *4.1.5: SMPP Data Coding*.
5.2.20	sm_default_msg_id	Fully compliant.	-
5.2.21	sm_length	Fully compliant.	-
5.2.22	short_message	Fully compliant.	-
5.2.23	message_id	Fully compliant.	-
5.2.24	number_of_dests	Fully compliant.	-
5.2.25	dest_flag	Fully compliant.	-
5.2.26	no_unsuccess	Fully compliant.	-
5.2.27	dl_name	Fully compliant.	-
5.2.28	message_state	Fully compliant.	-
5.3	SMPP Optional Parameter Description	Not applicable.	-
5.3.1	Optional Parameter Tag Identifiers	Fully compliant.	-
5.3.2	SMPP Optional Parameter Tag definitions	Fully compliant.	-
5.3.2.1	dest_addr_subunit	Fully compliant.	See section *4.1.5: SMPP Data Coding*.
5.3.2.2	source_addr_subunit	Fully compliant.	-
5.3.2.3	dest_network_type	Fully compliant.	-
5.3.2.4	source_network_type	Fully compliant.	-
5.3.2.5	dest_bearer_type	Fully compliant.	-
5.3.2.6	source_bearer_type	Fully compliant.	-
5.3.2.7	dest_telematics_id	Fully compliant.	-
5.3.2.8	source_telematics_id	Fully compliant.	-
5.3.2.9	qos_time_to_live	Fully compliant.	-
5.3.2.10	payload_type	Fully compliant.	-
5.3.2.11	additional_status_info_text	Fully compliant.	-
5.3.2.12	receipted_message_id	Fully compliant.	-
5.3.2.13	ms_msg_wait_facilities	Fully compliant.	-
5.3.2.14	privacy_indicator	Fully compliant.	-
5.3.2.15	source_subaddress	Fully compliant.	-
5.3.2.16	dest_subaddress	Fully compliant.	-
5.3.2.17	user_message_reference	Fully compliant.	-
5.3.2.18	user_response_code	Fully compliant.	-
5.3.2.19	language_indicator	Fully compliant.	-
5.3.2.20	source_port	Fully compliant.	-
5.3.2.21	destination_port	Fully compliant.	-
5.3.2.22	sar_msg_ref_num	Fully compliant.	-

Section	Section Heading	Compliance	Notes
5.3.2.23	sar_total_segments	Fully compliant.	-
5.3.2.24	sar_segment_seqnum	Fully compliant.	-
5.3.2.25	sc_interface_version	Fully compliant.	-
5.3.2.26	display_time	Fully compliant.	-
5.3.2.27	ms_validity	Fully compliant.	-
5.3.2.28	dpf_result	Fully compliant.	-
5.3.2.29	set_dpf	Fully compliant.	-
5.3.2.30	ms_availability_status	Fully compliant.	-
5.3.2.31	network_error_code	Fully compliant.	-
5.3.2.32	message_payload	Fully compliant.	-
5.3.2.33	delivery_failure_reason	Fully compliant.	-
5.3.2.34	more_messages_to_send	Fully compliant.	-
5.3.2.35	message_state	Fully compliant.	-
5.3.2.36	callback_num	Fully compliant.	-
5.3.2.37	callback_num_pres_ind	Fully compliant.	-
5.3.2.38	callback_num_atag	Fully compliant.	-
5.3.2.39	number_of_messages	Fully compliant.	-
5.3.2.40	sms_signal	Fully compliant.	-
5.3.2.41	alert_on_message_delivery	Fully compliant.	-
5.3.2.42	its_reply_type	Fully compliant.	-
5.3.2.43	its_session_info	Fully compliant.	-
5.3.2.44	ussd_service_op	Fully compliant.	-
6	Network Implementation	Not applicable.	-
6.1	Network Error Codes	Not applicable.	-
6.2	Maximum Message Length	Not applicable.	-
7	General Definitions	Not applicable.	-
7.1	Time Definitions	Not applicable.	-
7.1.1	Time Format	Fully compliant.	-
7.1.1.1	Absolute Time format	Fully compliant.	-
7.1.1.2	Relative Time Format	Fully compliant.	-
7.2	Timer Definitions	Fully compliant.	-
Appendix A	Unix Regular Expressions	Not applicable.	-
Appendix B	Delivery Receipt Format	Not applicable.	Refer to section *4.3.2.4: DELIVER_SM Operation*.
Appendix C	SMPP and Year 2000 Conformance	Not applicable.	-

Table 12: HPP compliance to SMPP v3.4

5.2   Compliance to SMPP 5.0

Section	Section Heading	Compliance	Notes
1	Introduction	Not applicable.	-

Section	Section Heading	Compliance	Notes
1.1	Scope Of This Document	Not applicable.	-
1.2	Glossary	Not applicable.	-
1.3	References	Not applicable.	-
1.4	SMPP Overview	Not applicable.	-
1.4.1	Protocol Versions	Not applicable.	-
1.4.2	Supported Cellular Technologies	Not applicable.	-
1.4.3	Typical Applications of SMPP	Not applicable.	-
1.4.4	SMPP Sessions	Fully compliant.	-
1.4.5	Protocol Operations and PDUs	Not applicable.	-
1.4.5.1	Session Management Operations	Fully compliant.	-
1.4.5.2	Message Submission Operations	Fully compliant.	-
1.4.5.3	Message Delivery Operations	Fully compliant.	-
1.4.5.4	Message Broadcast Operations	Partially compliant.	Only supported for SMPP proxying.
1.4.5.5	Anciliary Submission Operations	Partially compliant.	Only supported for SMPP proxying.
1.4.5.6	Anciliary Broadcast Operations	Partially compliant.	Only supported for SMPP proxying.
2	SMPP Sessions	Not applicable.	-
2.1	Application Layer Communication	Not applicable.	-
2.2	Establishing a SMPP Session	Partially compliant.	X.25 not supported.
2.3	Session States	Partially compliant.	X.25 not supported.
2.3.1	Open	Fully compliant.	-
2.3.2	Bound_TX	Partially compliant.	Replace, query, and cancel message only supported for SMPP proxying.
2.3.3	Bound_RX	Fully compliant.	-
2.3.4	Bound_TRX	Partially compliant.	Replace, query, and cancel message only supported for SMPP proxying.
2.3.5	Unbound	Fully compliant.	-
2.3.6	Closed	Fully compliant.	-
2.3.7	Outbound	Fully compliant.	-
2.4	Operation Matrix	Partially compliant.	Replace, query, and cancel message only supported for SMPP proxying.
2.5	Sample Sessions	Not applicable.	-
2.5.1	Example Transmitter Session	Fully compliant.	-
2.5.2	Example Receiver Session	Fully compliant.	-
2.5.3	Example Transceiver Session	Partially compliant.	*query_sm* / *query_sm_resp* only supported for SMPP proxying.

Section	Section Heading	Compliance	Notes
2.5.4	Example Transmitter Session (Cell Broadcast Entity)	Partially compliant.	Broadcast messages only supported for SMPP proxying.
2.5.5	Example Outbind Session	Fully compliant.	-
2.6	PDU Sequencing	Not applicable.	-
2.6.1	The PDU Sequence Number	Fully compliant.	-
2.6.2	Why use Monotonically Increasing Sequence numbers?	Fully compliant.	-
2.6.3	Sequence Numbers Across Sessions	Fully compliant.	-
2.6.4	Synchronous Vs. Asynchronous	Fully compliant.	-
2.6.5	Why Asynchronous?	Not applicable.	-
2.7	Session Timers	Fully compliant.	-
2.8	Error Handling	Not applicable.	-
2.8.1	Handling Connection Failure	Fully compliant.	-
2.8.2	Operation Failure	Fully compliant.	-
2.9	Flow Control and Congestion Avoidance	Partially compliant.	Only supported for SMPP proxying.
2.10	Session Security and Encryption	Not applicable.	-
2.10.1	Leased Lines	Not applicable.	-
2.10.2	Secure Transport Layer	Partially compliant	No native support for transport security. OS-level transparent security may be used.
2.10.3	Secure VPN	Not applicable.	-
2.10.4	Secure Tunnel	Not applicable.	-
2.11	Forward and Backward Compatibility	Fully compliant.	-
2.11.1	Forward Compatibility	Fully compliant.	-
2.11.2	Backward Compatibility	Fully compliant.	-
3	SMPP Parameter and PDU Format	Not applicable.	-
3.1	Parameter Type Definitions	Fully compliant.	-
3.1.1	NULL Settings	Fully compliant.	-
3.1.2	SMPP Parameter Field Size Notation	Not applicable.	-
3.2	General PDU Format	Fully compliant.	-
3.2.1	PDU Format	Fully compliant.	-
3.2.1.1	Command_length	Fully compliant.	-
3.2.1.2	Command_id	Fully compliant.	-
3.2.1.3	Command_status	Fully compliant.	-
3.2.1.4	Sequence_number	Fully compliant.	-
3.2.1.5	Standard Parameters	Fully compliant.	-
3.2.1.6	TLV Parameters	Fully compliant.	-
3.2.2	A sample PDU	Not applicable.	-

Section	Section Heading	Compliance	Notes
4	SMPP PDU Definitions	Not applicable.	-
4.1	Session Management Operations	Not applicable.	-
4.1.1	Bind Operation	Fully compliant.	-
4.1.1.1	bind_transmitter Syntax	Fully compliant.	-
4.1.1.2	bind_transmitter_resp Syntax	Partially compliant.	*sc_interface_version* not used.
4.1.1.3	bind_receiver Syntax	Fully compliant.	-
4.1.1.4	bind_receiver_resp Syntax	Partially compliant.	*sc_interface_version* not used.
4.1.1.5	bind_transceiver Syntax	Fully compliant.	-
4.1.1.6	bind_transceiver_resp Syntax	Partially compliant.	*sc_interface_version* not used.
4.1.1.7	outbind Syntax.	Fully compliant.	-
4.1.1.8	unbind Syntax	Fully compliant.	-
4.1.1.9	unbind_resp Syntax	Fully compliant.	-
4.1.2	Enquire Link Operation	Fully compliant.	-
4.1.2.1	enquire_link Syntax	Fully compliant.	-
4.1.2.2	enquire_link_resp Syntax	Fully compliant.	-
4.1.3	Alert Notification Operation	Fully compliant.	-
4.1.3.1	alert_notification Syntax	Fully compliant.	-
4.1.4	Generic NACK Operation	Fully compliant.	-
4.1.4.1	generic_nack Syntax	Fully compliant.	-
4.2	Message Submission Operations	Not applicable.	-
4.2.1	submit_sm Operation	Not applicable.	-
4.2.1.1	submit_sm Syntax	Partially compliant.	Refer to *Table 5: SUBMIT_SM request/response body parameters.*
4.2.1.2	submit_sm_resp Syntax	Fully compliant.	-
4.2.2	data_sm Operation	Not applicable.	-
4.2.2.1	data_sm Syntax	Fully compliant.	-
4.2.2.2	data_sm_resp Syntax	Fully compliant.	-
4.2.3	submit_multi Operation	Not applicable.	-
4.2.3.1	submit_multi Syntax	Partially compliant.	Refer to *Table 6: SUBMIT_MULTI request/response body parameters*.
4.2.3.2	submit_multi_resp Syntax	Fully compliant.	-
4.2.4	Message Submission Request TLVs	Partially compliant.	Refer to *Table 10: Message submission TLVs*.
4.2.5	Message Submission Response TLVs	Partially compliant.	Refer to *Table 10: Message submission TLVs*.
4.2.6	Source and Destination Addressing	Fully compliant.	-
4.2.6.1	TON	Fully compliant.	-
4.2.6.1.1	International and National Format	Fully compliant.	-

Section	Section Heading	Compliance	Notes
4.2.6.1.2	Alphanumeric Format	Fully compliant.	-
4.2.6.2	NPI	Fully compliant.	-
4.2.6.3	ESME Addresses	Fully compliant.	-
4.2.7	Message Replace operation in submit_sm	Partially compliant.	Only supported for SMPP proxying.
4.2.8	Message Length	Fully compliant.	-
4.2.9	Message Types	Not applicable.	-
4.2.9.1	Registered	Fully compliant.	-
4.2.9.2	Scheduled	Fully compliant.	-
4.2.9.3	Pre-defined	Fully compliant.	-
4.2.10	Message Modes	Fully compliant.	-
4.2.10.1	Default Message Mode	Fully compliant.	-
4.2.10.2	Store and Forward Message Mode	Partially compliant.	Replace, query, and cancel message only supported for SMPP proxying.
4.2.10.3	Datagram Message Mode	Fully compliant.	-
4.2.10.4	Transaction Message Mode	Fully compliant.	-
4.3	Message Delivery Operations	Not applicable.	-
4.3.1	deliver_sm Operation	Not applicable.	-
4.3.1.1	deliver_sm Syntax	Partially compliant.	Refer to *Table 7: DELIVER_SM request/response body parameters*.
4.3.1.2	deliver_sm_resp Syntax	Fully compliant.	-
4.3.2	data_sm Operation	Partially compliant.	Refer to *Table 8: DATA_SM request/response body parameters*.
4.3.3	Message Delivery Request TLVs	Partially compliant.	Refer to *Table 11: Message delivery TLVs*.
4.3.4	Message Delivery Response TLVs	Partially compliant.	Refer to *Table 11: Message delivery TLVs*.
4.3.5	Delivery Message Types	Partially compliant.	SME Delivery Acknowledgment, SME Manual/User Acknowledgement, and Intermediate Notification not supported.
4.3.5.1	MC Delivery Receipt	Fully compliant.	Refer to section *4.3.2.4: DELIVER_SM Operation*.
4.3.5.2	Intermediate Notification	Not compliant.	Intermediate Notification not supported.
4.3.5.3	SME Delivery Acknowledgement	Not compliant.	SME Delivery Acknowledgment not supported.
4.3.5.4	SME Manual/User Acknowledgement	Not compliant.	SME Manual/User Acknowledgement not supported.
4.3.5.5	Conversation Abort	Fully compliant.	-

Section	Section Heading	Compliance	Notes
4.4	Message Broadcast Operations	Not applicable.	-
4.4.1	broadcast_sm Operation	Not applicable.	-
4.4.1.1	broadcast_sm Syntax	Partially compliant.	Only supported for SMPP proxying.
4.4.1.2	broadcast_sm_resp Syntax	Partially compliant.	Only supported for SMPP proxying.
4.4.2	Broadcast Request Optional TLVs	Partially compliant.	Only supported for SMPP proxying.
4.4.3	Broadcast Response Optional TLVs	Partially compliant.	Only supported for SMPP proxying.
4.4.4	Message Replacement with broadcast_sm	Partially compliant.	Only supported for SMPP proxying.
4.5	Ancillary Submission Operations	Not applicable.	-
4.5.1	cancel_sm Operation	Partially compliant.	Only supported for SMPP proxying.
4.5.1.1	cancel_sm Syntax	Partially compliant.	Only supported for SMPP proxying.
4.5.1.2	cancel_sm_resp Syntax	Partially compliant.	Only supported for SMPP proxying.
4.5.2	query_sm Operation	Partially compliant.	Only supported for SMPP proxying.
4.5.2.1	query_sm Syntax	Partially compliant.	Only supported for SMPP proxying.
4.5.2.2	query_sm_resp Syntax	Partially compliant.	Only supported for SMPP proxying.
4.5.3	replace_sm Operation	Partially compliant.	Only supported for SMPP proxying.
4.5.3.1	replace_sm Syntax	Partially compliant.	Only supported for SMPP proxying.
4.5.3.2	replace_sm_resp Syntax	Partially compliant.	Only supported for SMPP proxying.
4.5.3.3	Message Replacement TLVs	Partially compliant.	Only supported for SMPP proxying.
4.6	Ancillary Broadcast Operations	Not applicable.	-
4.6.1	query_broadcast_sm Operation	Partially compliant.	Only supported for SMPP proxying.
4.6.1.1	query_broadcast_sm Syntax	Partially compliant.	Only supported for SMPP proxying.
4.6.1.2	Query Broadcast Request Optional TLVs	Partially compliant.	Only supported for SMPP proxying.
4.6.1.3	query_broadcast_sm_resp Syntax	Partially compliant.	Only supported for SMPP proxying.
4.6.1.4	Query Broadcast Response Optional TLVs	Partially compliant.	Only supported for SMPP proxying.
4.6.2	cancel_broadcast_sm Operation	Partially compliant.	Only supported for SMPP proxying.

Section	Section Heading	Compliance	Notes
4.6.2.1	cancel_broadcast_sm Syntax	Partially compliant.	Only supported for SMPP proxying.
4.6.2.2	Cancel Broadcast Optional TLVs	Partially compliant.	Only supported for SMPP proxying.
4.6.2.3	cancel_broadcast_sm_resp Syntax	Partially compliant.	Only supported for SMPP proxying.
4.7	PDU Field Definitions	Not applicable.	-
4.7.1	addr_ton, source_addr_ton, dest_addr_ton, esme_addr_ton	Fully compliant.	-
4.7.2	addr_npi, source_addr_npi, dest_addr_npi, esme_addr_npi	Fully compliant.	-
4.7.3	address_range	Partially compliant.	Refer to *Table 3: BIND request/response body parameters*.
4.7.3.1	UNIX Regular Expressions	Not applicable.	-
4.7.4	command_length	Fully compliant.	-
4.7.5	command_id	Fully compliant.	-
4.7.6	command_status, error_status_code	Fully compliant.	-
4.7.7	data_coding	Fully compliant.	Refer to section *4.1.5: SMPP Data Coding*.
4.7.8	destination_addr	Fully compliant.	-
4.7.9	dest_flag	Fully compliant.	-
4.7.10	dl_name	Fully compliant.	-
4.7.11	esme_addr	Fully compliant.	-
4.7.12	esm_class	Fully compliant.	-
4.7.13	interface_version	Fully compliant.	-
4.7.14	message_id	Fully compliant.	-
4.7.15	message_state	Fully compliant.	-
4.7.16	no_unsuccess	Fully compliant.	-
4.7.17	number_of_dests	Fully compliant.	-
4.7.18	password	Fully compliant.	-
4.7.19	priority_flag	Fully compliant.	-
4.7.20	protocol_id	Fully compliant.	-
4.7.21	registered_delivery	Fully compliant.	-
4.7.22	replace_if_present_flag	Fully compliant.	-
4.7.23	scheduled_delivery_time, validity_period, final_date	Fully compliant.	-
4.7.23.1	scheduled_delivery_time	Fully compliant.	-
4.7.23.2	validity_period	Fully compliant.	-
4.7.23.3	final_date	Fully compliant.	-
4.7.23.4	Absolute Time Format	Fully compliant.	-
4.7.23.5	Relative Time Format	Fully compliant.	-

Section	Section Heading	Compliance	Notes
4.7.24	sequence_number	Fully compliant.	-
4.7.25	service_type	Fully compliant.	-
4.7.26	short_message	Fully compliant.	-
4.7.27	sm_default_msg_id	Fully compliant.	-
4.7.28	sm_length	Fully compliant.	-
4.7.29	source_addr	Fully compliant.	-
4.7.30	system_id	Fully compliant.	-
4.7.31	system_type	Fully compliant.	-
4.8	PDU TLV Definitions	Fully compliant.	-
4.8.1	TLV Tag	Fully compliant.	-
4.8.2	TLV Length	Fully compliant.	-
4.8.3	TLV Value	Fully compliant.	-
4.8.4	TLV Definitions	Fully compliant.	-
4.8.4.1	additional_status_info_text	Fully compliant.	-
4.8.4.2	alert_on_message_delivery	Fully compliant.	-
4.8.4.3	billing_identification	Fully compliant.	-
4.8.4.4	broadcast_area_identifier, failed_broadcast_area_identifier	Fully compliant.	-
4.8.4.4.1	Broadcast Area Format types	Fully compliant.	-
4.8.4.5	broadcast_area_success	Fully compliant.	-
4.8.4.6	broadcast_content_type_info	Fully compliant.	-
4.8.4.7	broadcast_channel_indicator	Fully compliant.	-
4.8.4.8	broadcast_content_type	Fully compliant.	-
4.8.4.9	broadcast_end_time	Fully compliant.	-
4.8.4.10	broadcast_error_status	Fully compliant.	-
4.8.4.11	broadcast _frequency _interval	Fully compliant.	-
4.8.4.12	broadcast_message_class	Fully compliant.	-
4.8.4.13	broadcast_rep_num	Fully compliant.	-
4.8.4.14	broadcast_service_group	Fully compliant.	-
4.8.4.15	callback_num	Fully compliant.	-
4.8.4.16	callback_num_atag	Fully compliant.	-
4.8.4.17	callback_num_pres_ind	Fully compliant.	-
4.8.4.18	congestion_state	Fully compliant.	-
4.8.4.19	delivery_failure_reason	Fully compliant.	-
4.8.4.20	dest_addr_np_country	Fully compliant.	-
4.8.4.21	dest_addr_np_information	Fully compliant.	-
4.8.4.22	dest_addr_np_resolution	Fully compliant.	-
4.8.4.23	dest_addr_subunit	Fully compliant.	See section *4.1.5: SMPP Data Coding*.
4.8.4.24	dest_bearer_type	Fully compliant.	-
4.8.4.25	dest_network_id	Fully compliant.	-

Section	Section Heading	Compliance	Notes
4.8.4.26	dest_network_type	Fully compliant.	-
4.8.4.27	dest_node_id	Fully compliant.	-
4.8.4.28	dest_subaddress	Fully compliant.	-
4.8.4.29	dest_telematics_id	Fully compliant.	-
4.8.4.30	dest_port	Fully compliant.	-
4.8.4.31	display_time	Fully compliant.	-
4.8.4.32	dpf_result	Fully compliant.	-
4.8.4.33	its_reply_type	Fully compliant.	-
4.8.4.34	its_session_info	Fully compliant.	-
4.8.4.35	language_indicator	Fully compliant.	-
4.8.4.36	message_payload	Fully compliant.	-
4.8.4.37	message_state	Fully compliant.	-
4.8.4.38	more_messages_to_send	Fully compliant.	-
4.8.4.39	ms_availability_status	Fully compliant.	-
4.8.4.40	ms_msg_wait_facilities	Fully compliant.	-
4.8.4.41	ms_validity	Fully compliant.	-
4.8.4.42	network_error_code	Fully compliant.	-
4.8.4.43	number_of_messages	Fully compliant.	-
4.8.4.44	payload_type	Fully compliant.	-
4.8.4.45	privacy_indicator	Fully compliant.	-
4.8.4.46	qos_time_to_live	Fully compliant.	-
4.8.4.47	receipted_message_id	Fully compliant.	-
4.8.4.48	sar_msg_ref_num	Fully compliant.	-
4.8.4.49	sar_segment_seqnum	Fully compliant.	-
4.8.4.50	sar_total_segments	Fully compliant.	-
4.8.4.51	sc_interface_version	Fully compliant.	-
4.8.4.52	set_dpf	Fully compliant.	-
4.8.4.53	sms_signal	Fully compliant.	-
4.8.4.54	source_addr_subunit	Fully compliant.	-
4.8.4.55	source_bearer_type	Fully compliant.	-
4.8.4.56	source_network_id	Fully compliant.	-
4.8.4.57	source_network_type	Fully compliant.	-
4.8.4.58	source_node_id	Fully compliant.	-
4.8.4.59	source_port	Fully compliant.	-
4.8.4.60	source_subaddress	Fully compliant.	-
4.8.4.61	source_telematics_id	Fully compliant.	-
4.8.4.62	user_message_reference	Fully compliant.	-
4.8.4.63	user_response_code	Fully compliant.	-
4.8.4.64	ussd_service_op	Fully compliant.	-

Table 13: HPP compliance to SMPP v5.0

5.3   Compliance to 3GPP TS 23.039 (version 2.0.0)

Section	Section Heading	Compliance	Notes
-	Intellectual Property Rights	Not applicable.	-
-	Foreword	Not applicable.	-
1	Scope	Not applicable.	-
2	References	Not applicable.	-
3	Abbreviations and definitions	Not applicable.	-
3.1	Abbreviations	Not applicable.	-
3.2	Definitions	Not applicable.	-
4	General	Not applicable.	-
Annex A	Short Message Peer to Peer (SMPP) Interface Specification	Not applicable.	-
A.1	Introduction	Not applicable.	-
A.1.1	Purpose	Not applicable.	-
A.1.2	Scope	Not applicable.	-
A.2	Functional overview	Not applicable.	-
A.2.1	ESMEs to SMSC	Fully compliant.	-
A.2.2	SMSC to ESME	Fully compliant.	-
A.2.3	Backward compatibility	Fully compliant.	-
A.3	Interface Specification	Partially compliant.	X.25 not supported.
A.4	Protocol Messages	Fully compliant.	-
A.5	Use of Primitives	Not applicable.	-
A.5.1	Initiation of Communication with SMSC	Fully compliant.	-
A.5.2	Steady-State Communication with the SMSC	Fully compliant.	-
A.5.3	Terminating Communication with the SMSC	Fully compliant.	-
A.5.4	Error Handling and Retransmission	Fully compliant.	-
A.5.5	Protocol Message Types	Fully compliant.	-
A.5.5.1	ESME to SMSC	Partially compliant.	*query_sm*, *cancel_sm*, and *replace_sm* only supported for SMPP proxying.
A.5.5.2	SMSC to ESME	Partially compliant.	*query_sm_resp*, *cancel_sm_resp*, and *replace_sm_resp* only supported for SMPP proxying.
A.6	Message Layouts	Fully compliant.	-
A.6.1	Definitions	Fully compliant.	-
A.6.2	Message Header Format	Fully compliant.	-
A.6.2.1	"Generic_Nack" Command	Fully compliant.	-
A.6.2.1.1	"Generic_Nack" Syntax	Fully compliant.	-
A.6.3	Message Body Formats	Not applicable.	-

Section	Section Heading	Compliance	Notes
A.6.3.1	"BIND" Operation	Fully compliant.	-
A.6.3.1.1	"BIND_RECEIVER" Syntax	Fully compliant.	-
A.6.3.1.2	"BIND_RECEIVER_RESP" Syntax	Fully compliant.	-
A.6.3.1.3	"BIND_TRANSMITTER" Syntax	Fully compliant.	-
A.6.3.1.4	"BIND_TRANSMITTER_RESP" Syntax	Fully compliant.	-
A.6.3.2	"UNBIND" Operation	Fully compliant.	-
A.6.3.2.1	"UNBIND" Syntax	Fully compliant.	-
A.6.3.2.2	"UNBIND_RESP" Syntax	Fully compliant.	-
A.6.3.3	"SUBMIT_SM" Operation	Fully compliant.	-
A.6.3.3.1	"SUBMIT_SM" Syntax	Fully compliant.	-
A.6.3.3.2	SUBMIT_SM_RESP" Syntax	Fully compliant.	-
A.6.3.4	"DELIVER_SM" Operation	Fully compliant.	-
A.6.3.4.1	"DELIVER_SM" Syntax	Fully compliant.	-
A.6.3.4.2	"DELIVER_SM_RESP" Syntax	Fully compliant.	-
A.6.3.5	"QUERY_SM" Operation	Partially compliant.	Only supported for SMPP proxying.
A.6.3.5.1	"QUERY_SM" Syntax	Partially compliant.	Only supported for SMPP proxying.
A.6.3.5.2	"QUERY_SM_RESP" Syntax	Partially compliant.	Only supported for SMPP proxying.
A.6.3.6	"CANCEL_SM" Operation	Partially compliant.	Only supported for SMPP proxying.
A.6.3.6.1	"CANCEL_SM" Syntax	Partially compliant.	Only supported for SMPP proxying.
A.6.3.6.2	"CANCEL_SM_RESP" Syntax	Partially compliant.	Only supported for SMPP proxying.
A.6.3.7	"REPLACE_SM" Operation	Partially compliant.	Only supported for SMPP proxying.
A.6.3.7.1	"REPLACE_SM" Syntax	Partially compliant.	Only supported for SMPP proxying.
A.6.3.7.2	"REPLACE_SM_RESP" Syntax	Partially compliant.	Only supported for SMPP proxying.
A.6.3.8	"ENQUIRE_LINK" Operation	Fully compliant.	-
A.6.3.8.1	"ENQUIRE_LINK" Syntax	Fully compliant.	-
A.6.3.8.2	"ENQUIRE_LINK_RESP" Syntax	Fully compliant.	-
A.7	System Definitions	Fully compliant.	-
A.7.1	Error Codes	Fully compliant.	-
A.7.2	Command I.D. Values	Fully compliant.	-
A.7.3	GSM Error Codes	Fully compliant.	-
A.7.4	Message States	Fully compliant.	-
A.7.5	Time Format	Fully compliant.	-

Section	Section Heading	Compliance	Notes
Annex B	Short Message Service Centre External Machine Interface	Not applicable.	-
Annex C	SMSC to SME interface specification	Not applicable.	-
Annex D	SMSC Open Interface Specification	Not applicable.	-
Annex E	SMSC Computer Access Service and Protocol Manual	Not applicable.	-
Annex F	Change Request History	Not applicable.	-
-	History	Not applicable.	-

Table 14: HPP compliance to 3GPP TS 23.039