

# EVERY8D

## Short Message Peer to Peer

## Protocol Specification v3.4

Document Version : V1.0

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2017/11/29

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# 1 Edit Record

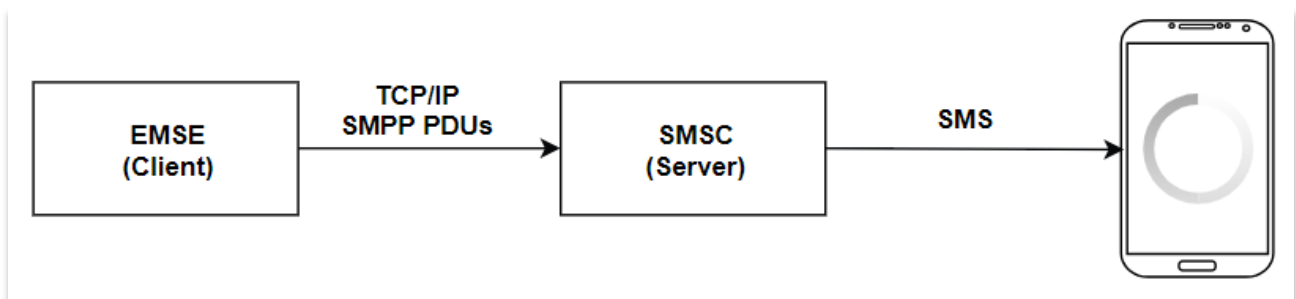
<b>Version</b>	<b>Date</b>	<b>Provider</b>	<b>Description</b>
V1.0	2017/11/29	Every8D	

## 2 Introduction

### 2.1 Scope

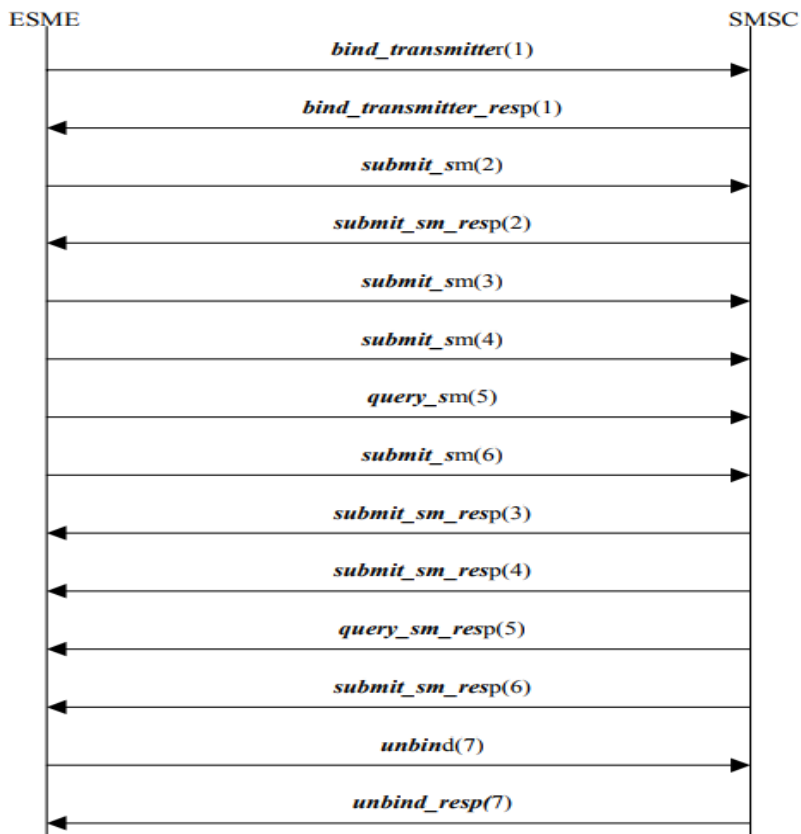
Every8d provide SMS Service. The SMS service is one-way SMS and the SMS is sent to the SMSC using SMPP (Short Message Point-to-Point Protocol). SMSC supports SMPP V3.4 via TCP / IP. Refer to 14 for functional interface restrictions. ◦

### 2.2 SMS sending flow



### 3 SMPP Session Description

#### 3.1 Typical SMPP session sequence - ESME Transmitter



- The exchange of SMPP request and response PDUs between an ESME Transmitter and SMSC may occur synchronously or asynchronously as shown above. Thus an ESME may, if desired, send multiple requests to the SMSC, without synchronously waiting for the associated response PDUs.
- A series of successive SMPP requests issued asynchronously by an ESME must be followed shortly after by a series of associated responses from the SMSC.
- SMPP responses should be returned by the SMSC in the same order in which the original requests were received from the ESME. However this is not mandatory within SMPP and the ESME should be capable of handling responses received out of sequence.

**Note:**

The maximum number of outstanding (i.e. unacknowledged) SMPP operations between an ESME and SMSC and vice versa is not specified explicitly in the SMPP Protocol Specification and will be governed by the SMPP implementation on the SMSC.

However, as a guideline it is recommended that no more than 10 (ten) SMPP messages are outstanding at any time.

## 4 SMPP PDU Type and Format Definitions

### 4.1 SMPP PDU - Type Definitions

Type	Description
Integer	An unsigned value with the defined number of octets. The octets will always be transmitted MSB first (Big Endian).
C-Octet String	A series of ASCII characters terminated with the NULL character.
C-Octet String(Decimal)	A series of ASCII characters, each character representing a decimal digit (0 - 9) and terminated with the NULL character
C-Octet String(Hex)	A series of ASCII characters, each character representing a hexadecimal digit (0 - F) and terminated with the NULL character.
Octet String	A series of octets, not necessarily NULL terminated.
TLV	Ref. 4.2

### 4.2 Optional Parameter Format

Parameter Name	Size	Type	Description
Tag	2	Integer	The Tag field is used to uniquely identify the particular optional parameter in question. The optional parameter Tag field is always 2 octets in length.
Length	2	Integer	The Length field indicates the length of the Value field in octets. Note that this length does not include the length of the Tag and Length fields. The optional parameter Length field is always 2 octets in length.
Value	variable	Variable	The Value field contains the actual data for the optional parameter in question.

## 5 SMPP PDU Definition

### 5.1 BIND Operation

The purpose of the SMPP bind operation is to register an instance of an ESME with the SMSC system and request an SMPP session over this network connection for the submission or delivery of messages.

Thus, the Bind operation may be viewed as a form of SMSC login request to authenticate the ESME entity wishing to establish a connection.

As described previously, an ESME can bind to the SMSC as a Transmitter (called ESME Transmitter).

#### 5.1.1 “bind\_transmitter” Syntax

The format of the SMPP bind\_transmitter PDU is defined in the following table.

H E A D E R	Field Name	Size octets	Type	Description	Ref
	command_length	4	Integer	Defines the overall length of the bind_transmitter PDU.	
	command_id	4	Integer	<b>bind_transmitter</b>	6.1.1
	command_status	4	Integer	Not used in bind_transmitter PDU. Must be set to NULL(0x00).	6.1.2
	sequence_number	4	Integer	Set to a unique sequence number. The associated bind_transmitter_resp PDU will echo the same sequence number.	
B O D Y	system_id	Var. Max 16	C-Octet String	Identifies the ESME system requesting to bind as a transmitter with the SMSC.	
	password	Var. Max 9	C-Octet String	The password may be used by the SMSC to authenticate the ESME requesting to bind.	
	system_type	Var. Max 13	C-Octet String	Must be set to NULL(0x00).	
	interface_version	1	Integer	Indicates the version of the SMPP protocol supported by the ESME. (0x34)	

	addr_ton	1	Integer	Set NULL(0x00)	
	addr_npi	1	Integer	Set NULL(0x00)	
	address_range	Var.	C-Octet	Set NULL(0x00)	
		Max 41	String		

### 5.1.2 “bind\_transmitter\_resp” Syntax

The SMPP bind\_transmitter\_resp PDU is used to reply to a bind\_transmitter request. The format of the SMPP bind\_transmitter\_resp PDU is defined in the following table.

<b>H E A D E R</b>	<b>Field Name</b>	<b>Size octets</b>	<b>Type</b>	<b>Description</b>	<b>Ref</b>
	command_length	4	Integer	Defines the overall length of the bind_transmitter_resp PDU.	
	command_id	4	Integer	<b>bind_transmitter_resp</b>	6.1.1
	command_status	4	Integer	Indicates status (success or error code) of original bind_transmitter request.	6.1.2
	sequence_number	4	Integer	Set to sequence number of original bind_transmitter request.	
<b>B O D Y</b>	system_id	Var. Max 16	C-Octet String	SMSC identifier. Identifies the SMSC to the ESME.	

**Note :**

The body portion of the SMPP bind\_transmitter\_resp PDU is not returned if the command\_status field contains a non-zero value; i.e., if there is an error in the original bind\_transmitter request, the SMSC system\_id is not returned.



## 5.2 SUBMIT\_SM Operation

This operation is used by an ESME to submit a short message to the SMSC for onward transmission to a specified short message entity (SME). The submit\_sm PDU does not support the transaction message mode.

### 5.2.1 “submit\_sm” Syntax

The format of the SMPP submit\_sm PDU is defined in the following table.

H E A D E R	Field Name	Size octets	Type	Description	Ref
	command_length	4	Integer	Set to overall length of PDU.	
	command_id	4	Integer	<b>submit_sm</b>	6.1.1
	command_status	4	Integer	Not used. Set to NULL(0x00).	6.1.2
	sequence_number	4	Integer	Set to a Unique sequence number. The associated submit_sm_resp PDU will echo this sequence number.	
M A N D A T O R Y P A R A M E T E R	service_type	Var. max 6	C-Octet String	Set NULL(0x00)	
	source_addr_ton	1	Integer	Set NULL(0x00)	
	source_addr_npi	1	Integer	Set NULL(0x00)	
	source_addr	Var. max 21	C-Octet String	NULL(0x00)	
	dest_addr_ton	1	Integer	Set NULL(0x00)	
	dest_addr_npi	1	Integer	Set NULL(0x00)	
	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	Set NULL(0x00)	
	protocol_id	1	Integer	Set NULL(0x00)	
	priority_flag	1	Integer	Set NULL(0x00)	
	schedule_delivery_time	1 or 17	C-Octet String	The short message is to be scheduled by the SMSC for delivery.	9

<b>S</b>				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.	9
	registered_delivery	1	Integer	Set NULL(0x00)	
	replace_if_present_flag	1	Integer	Set NULL(0x00)	
	data_coding	1	Integer	The default character set for SMSC is set to 0x00; the Chinese characters for short messages contain 0x08 for UCS2 (Big-Endian).	
	sm_default_msg_id	1	Integer	Set NULL(0x00)	
	sm_length	1	Integer	Length in octets of the short_message user data.	
	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. <b>Note:</b> The short message data should be inserted in either the short_message or message_payload fields. Both fields must not be used simultaneously.	

OPTIONAL PARAMETERS for SUBMIT_SM				
O P T I O N A L P A R A M E T E R S	Optional Parameter Name	Type	Description	Ref
		message_payload	TLV	<p>Contains the extended short message user data. Up to 63K octets can be transmitted.</p> <p>Note: The short message data should be inserted in either the short_message or message_payload fields. Both fields should not be used simultaneously.</p> <p>The sm_length field should be set to zero if using the message_payload parameter.</p>

### 5.2.2 “submit\_sm\_resp” Syntax

This is the response to the submit\_sm PDU and has the following format.

H E A D E R	Field Name	Size octets	Type	Description	Ref
	command_length	4	Integer	Set to overall length of PDU.	
	command_id	4	Integer	<b>submit_sm_resp</b>	6.1.1
	command_status	4	Integer	Indicates outcome of submit_sm request.	6.1.2
	sequence_number	4	Integer	Set to sequence number of original submit_sm PDU.	
<b>B O D Y</b>	message_id	Var. max 65	C- Octet String	This field contains the SMSC message ID of the submitted message. It may be used at a later stage to query the status of a message or cancel.	

**Note:** The submit\_sm\_resp PDU Body is not returned if the command\_status field contains a non-zero value.

## 5.3 QUERY\_SM Operation

This command is issued by the ESME to query the status of a previously submitted short message.

The matching mechanism is based on the SMSC assigned message\_id and source address.

Where the original submit\_sm ‘source address’ was defaulted to NULL, then the source address in the query\_sm command should also be set to NULL.

### 5.3.1 “query\_sm” Syntax

Following is the format of the SMPP query\_sm PDU.

<b>H E A D E R</b>	<b>Field Name</b>	<b>Size octets</b>	<b>Type</b>	<b>Description</b>	<b>Ref</b>
	command_length	4	Integer	Set to overall length of PDU	
	command_id	4	Integer	<b>query_sm</b>	6.1.1
	command_status	4	Integer	Not used. Set to NULL.	6.1.2
	sequence_number	4	Integer	Set to a unique sequence number. The associated <b>query_sm_resp</b> PDU should echo the same sequence number	
<b>B O D Y</b>	message_id	Var. Max 65	C-Octet String	Message ID of the message whose state is to be queried. This must be the SMSC assigned Message ID allocated to the original short message when submitted to the SMSC by the submit_sm command, and returned in the response PDU by the SMSC.	
	source_addr_ton	1	Integer	Type of Number of message originator. This is used for verification purposes, and must match that supplied in the original request PDU (e.g. submit_sm). If not known, set to NULL. <b>Set to NULL(0x00).</b>	

	source_addr_npi	1	Integer	Numbering Plan Identity of message originator. This is used for verification purposes, and must match that supplied in the original request PDU (e.g. submit_sm). <b>Set to NULL(0x00).</b>	
	source_addr	Var. Max 21	C-Octet String	Address of message originator. This is used for verification purposes, and must match that supplied in the original request PDU (e.g. submit_sm) <b>Set to NULL(0x00).</b>	

### 5.3.2 “query\_sm\_resp” Syntax

Following is the format of the SMPP query\_sm\_resp PDU.

<b>H E A D E R</b>	<b>Field Name</b>	<b>Size octets</b>	<b>Type</b>	<b>Description</b>	<b>Ref</b>
	command_length	4	Integer	Set to overall length of PDU	
	command_id	4	Integer	<b>query_sm_resp</b>	6.1.1
	command_status	4	Integer	Indicates outcome of query_sm request	6.1.2
	sequence_number	4	Integer	Set to sequence number of original query_sm PDU.	
<b>B O D Y</b>	message_id	Var. Max 65	C-Octet String	SMSC Message ID of the message whose state is being queried.	
	final_date	1 or 17	C-Octet String	Date and time when the queried message reached a final state. For messages which have not yet reached a final state this field will contain a single NULL octet.	9
	message_state	1	Integer	Specifies the status of the queried short message.	10
	error_code	1	Integer	Where appropriate this holds a network error code defining the	11

				reason for failure of message delivery.	
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## 5.4 CANCEL\_SM Operation

This command is issued by the ESME to cancel one previously submitted short messages that are still pending delivery.

- If the message\_id is set to the ID of a previously submitted message, then provided the source address supplied by the ESME matches that of the stored message, that message will be cancelled.

Where the original submit\_sm 'source address' was defaulted to NULL, then the source address in the cancel\_sm command should also be NULL.

### 5.4.1 “cancle\_sm” Syntax

Following is the format of the SMPP cancel\_sm PDU.

HEARD	Field Name	Size octets	Type	Description	Ref
A	command_length	4	Integer	Set to overall length of PDU.	
D	command_id	4	Integer	<b>cancel_sm</b>	6.1.1
E	command_status	4	Integer	Not used. Set to NULL.	6.1.2
R	sequence_number	4	Integer	Set to a unique sequence number. The associated cancel_sm_resp PDU should echo the same sequence number.	
B O D	service_type	Var. Max 6	C-Octet String	<b>Set to NULL(0x00).</b>	
Y	message_id	Var. Max 65	C-Octet String	Message ID of the message to be cancelled. This must be the SMSC assigned Message ID of the original message.	
	source_addr_ton	1	Integer	Type of Number of message originator.  This is used for verification purposes, and must match that supplied in the original message submission request PDU.	
	source_addr_npi	1	Integer	Numbering Plan Identity of message originator.  This is used for verification purposes, and must match that supplied in the original message submission request PDU.	
	source_addr	Var. Max 21	C-Octet String	Source address of message(s) to be cancelled. This is used for verification purposes, and must match that supplied in the original message submission request	

				PDU(s).	
	dest_addr_ton	1	Integer	Type of number of destination SME address of the message(s) to be cancelled. This is used for verification purposes, and must match that supplied in the original message submission request PDU (e.g. submit_sm).	
	dest_addr_npi	1	Integer	Numbering Plan Indicator of destination SME address of the message(s) to be cancelled. This is used for verification purposes, and must match that supplied in the original message submission request PDU.	
	destination_addr	Var. Max 21	C-Octet String	Destination address of message(s) to be cancelled. This is used for verification purposes, and must match that supplied in the original message submission request PDU.	

#### 5.4.2 “cancel\_sm\_resp” Syntax

The cancel\_sm\_resp PDU is used to reply to a cancel\_sm request. It comprises the SMPP message header only.

	Field Name	Size octets	Type	Description	Ref
<b>H</b>	command_length	4	Integer	Set to overall length of PDU.	
<b>E</b>	command_id	4	Integer	<b>cancel_sm_resp</b>	6.1.1
<b>A</b>	command_status	4	Integer	Indicates outcome of cancel_sm request.	6.1.2
<b>D</b>	sequence_number	4	Integer	Set to sequence number of cancel_sm PDU.	
<b>E</b>					
<b>R</b>					



## 5.5 UNBIND Operation

The purpose of the SMPP unbind operation is to deregister an instance of an ESME from the SMSC and inform the SMSC that the ESME no longer wishes to use this network connection for the submission or delivery of messages.

### 5.5.1 “unbind” Syntax

The format of the SMPP unbind PDU is defined in the following table. The `command_id` field must include the Command ID value corresponding to the unbind operation.

H E A D E R	Field Name	Size octets	Type	Description	Ref
	<code>command_length</code>	4	Integer	Defines the overall length of the PDU.	
	<code>command_id</code>	4	Integer	<b>unbind</b>	6.1.1
	<code>command_status</code>	4	Integer	Not used. Set to NULL.	6.1.2
	<code>sequence_number</code>	4	Integer	Set to a unique sequence number. The associated <code>unbind_resp</code> PDU will echo the same sequence number	

### 5.5.2 “unbind\_resp” Syntax

The SMPP `unbind_resp` PDU is used to reply to an unbind request. It comprises the SMPP message header only.

The format of the SMPP `unbind_resp` PDU is defined in the following table. The `command_id` field must include the Command ID value corresponding to the `unbind_resp` operation.

H E A D E R	Field Name	Size octets	Type	Description	Ref
	<code>command_length</code>	4	Integer	Defines the overall length of the PDU.	
	<code>command_id</code>	4	Integer	<b>unbind_resp</b>	6.1.1
	<code>command_status</code>	4	Integer	Indicates outcome of original unbind request.	6.1.2
	<code>sequence_number</code>	4	Integer	Set to sequence number of original unbind request.	

## 5. 6 ENQUIRE\_LINK Operation

This message can be sent by either the ESME or SMSC and is used to provide a confidencecheck of the communication path between an ESME and an SMSC.

On receipt of this request the receiving party should respond with an enquire\_link\_resp, thus verifying that the application level connection between the SMSC and the ESME is functioning.

### 5. 6. 1 “enquire\_link” Syntax

The enquire\_link PDU comprises the SMPP message header only.

<b>H</b>	<b>Field Name</b>	<b>Size</b>	<b>Type</b>	<b>Description</b>	<b>Ref</b>
<b>E</b>		<b>octets</b>			
<b>A</b>	command_length	4	Integer	Set to overall length of PDU	
<b>D</b>	command_id	4	Integer	enquire_link	6.1.1
<b>E</b>	command_status	4	Integer	Not used. Set to NULL.	6.1.2
<b>R</b>	sequence_number	4	Integer	Set to a unique sequence number. The associated enquire_link_resp PDU should echo the same sequence number	

### 5. 6. 2 ”enquire\_link\_resp” Syntax

The enquire\_link\_resp PDU is used to reply to an enquire\_link request. It comprises the SMPP message header only.

<b>H</b>	<b>Field Name</b>	<b>Size</b>	<b>Type</b>	<b>Description</b>	<b>Ref</b>
<b>E</b>		<b>octets</b>			
<b>A</b>	command_length	4	Integer	Set to overall length of PDU.	
<b>D</b>	command_id	4	Integer	<b>enquire_link_resp</b>	6.1.1
<b>E</b>	command_status	4	Integer	Set to ESME_ROK (Success)	6.1.2
<b>R</b>	sequence_number	4	Integer	Set to the same sequence number of original enquire_link PDU	

## **6 SMPP Header Description**

### **6.1 Command Header Parameters**

#### **6.1.1 command\_id**

##### **6.1.1.1 SMPP Service Request**

Ref. 7.1

##### **6.1.1.2 SMPP Service Response**

Ref. 7.2

#### **6.1.2 command\_status**

Ref. 8

## 6.2 message\_payload

message\_payload 參數用來放置簡訊內容。

Field	Size octets	Type	Description
Parameter Tag	2	Integer	sar_segment_seqnum (0x0424)
Length	2	Integer	Length of value part in octets
Value	Variable	Octet String	Contains the extended short message user data. Up to 63K 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_length field should be set to zero if using the message_payload parameter.

## 7 SMPP Command\_ID

The command\_id field identifies the type of message the SMPP PDU represents, for example, submit\_sm, query\_sm etc.

A command identifier is allocated to each SMPP request primitive. For reserved range value settings refer to Table 7.1.

A response command identifier is allocated to each response primitive. For reserved range value settings refer to Table 7.2.

### 7.1 SMPP Service Request

Command ID	Value
bind_transmitter	0x00000002
query_sm	0x00000003
submit_sm	0x00000004
unbind	0x00000006
cancel_sm	0x00000008
enquire_link	0x00000015

### 7.2 SMPP Service Response

Command ID	Value
generic_nack	0x80000000
bind_transmitter_resp	0x80000002
query_sm_resp	0x80000003
submit_sm_resp	0x80000004
unbind	0x00000006
unbind_resp	0x80000006
cancel_sm_resp	0x80000008
enquire_link_resp	0x80000015

## 8 SMPP Command\_Status

The command\_status field of an SMPP message response indicates the success or failure of an SMPP request. It is relevant only in the SMPP response message and should be set to NULL in SMPP request messages.

The SMPP Error status codes are returned by the SMSC in the command\_status field of the SMPP message header.

The complete set of SMPP Error Codes and their associated values are defined in the following table.

### 8.1 SMPP Service Error Tag

Command ID	Value	Description
ESME_ROK	0x00000000	No Error
ESME_RINVMSGLEN	0x00000001	Message Length is invalid
ESME_RINVCMDLEN	0x00000002	Command Length is invalid
ESME_RINVCMDID	0x00000003	Invalid Command ID
ESME_RINVBNDSTS	0x00000004	Incorrect BIND Status for given command
ESME_RALYBND	0x00000005	ESME Already in Bound State
ESME_RSYSERR	0x00000008	System Error
ESME_RINVSRCADR	0x0000000A	Invalid Source Address
ESME_RINVDSTADR	0x0000000B	Invalid Dest Addr
ESME_RINVMSGID	0x0000000C	Message ID is invalid
ESME_RBINDFAIL	0x0000000D	Bind Failed
ESME_RINVPASWD	0x0000000E	Invalid Password
ESME_RINVSYSID	0x0000000F	Invalid System ID
ESME_RSUBMITFAIL	0x00000045	submit_sm or submit_multi failed
ESME_RQUERYFAIL	0x00000067	query_sm request failed
ESME_RCANCELFAIL	0x00000011	Cancel SM Failed
ESME_RINVOPTPARSTREAM	0x000000C0	Error in the optional part of the PDU Body.
ESME_RUNKNOWNERR	0x000000FF	Unknown Error

## 9 Time Format

In this interface, all time/date related fields will be in ASCII with the following format:

“YYMMDDhhmmsstnp” where

	Description
YY	last two digits of the year (00-99)
MM	month (01-12)
DD	day (01-31)
hh	hour (00-23)
mm	minute (00-59)
ss	second (00-59)
t	tenths of second (0-9)
nn	Time difference in quarter hours between local time (as expressed in the first 13 octets) and UTC (Universal Time Constant) time (00-48).
p	(+) Local time is in quarter hours advanced in relation to UTC time.
	(-) Local time is in quarter hours retarded in relation to UTC time.
	(R) Local time is relative to the current SMSC time.

## 10 SMPP message\_state

The following is a list of allowable states for a short message. The message\_state value is returned by the SMSC to the ESME as part of the query\_sm\_resp PDU.

<b>Message Status</b>	<b>Value</b>	<b>Description</b>
Enroute	1	The message is in enroute state.
Delivered	2	Message is delivered to destination
Expired	3	Message validity period has expired.
Deleted	4	Message has been deleted.
Undeliverable	5	Message is undeliverable
Accepted	6	Message is in accepted state (i.e. has been manually read on behalf of the subscriber by customer service)
Unknown	7	Message is in invalid state
Rejected	8	Message is in a rejected state



## 11 SMPP error\_code

The SMPP PDU, query\_sm\_resp contains an “error\_code” field. The range of values this field may have, depends entirely on the underlying telecommunications network.

<b>Value</b>	<b>Description</b>
0	No Error
1	The phone's problem was not reached
2	Telecommunication equipment is abnormal, sending failed
3	Invalid phone number
4	Booking SMS
5	Not enough credit
6	Erase booking SMS
7	International phone number(out of +886)
8	SMS sent more than 24 hours overdue, SMS failed to send

# 12 Restriction

## 12.1 Connection

At the same time, only one account is allowed to connect to SMSC for packet transfer.

## 12.2 Transmission

SMPP is based on the exchange of request and response protocol data units (PDUs) between the ESME and the SMSC over an underlying TCP/IP network connection.

- **The maximum size of a packet is 64KB.**

ESME to submit a request to the SMSC to allow blocking or non-blocking, but only allows a single thread, ESME turn off the Nagle algorithm.

**Note:** The transmission interval for each SMPP PDU must be greater than 3 milliseconds.

- **Nagle's algorithm** is a means of improving the efficiency of TCP/IP networks by reducing the number of packets that need to be sent over the network. Nagle's algorithm works by combining a number of small outgoing messages and sending them all at once.

(Ref. <https://tools.ietf.org/html/rfc896> )

## 12.3 Session Sequence

- After completing the connection to the SMSC, you can submit\_sm, query\_sm, cancel\_sm and other operations. If you need to change the port number, unbind the PDU to finish the disconnection operation.