

Technical Standard

# **Development Guidelines for the Interface Specification of SZSE Market Data Communication System**

(Ver1.00)



**Shenzhen Stock Exchange**

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## Document Description

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# Development Guidelines for the Interface Specification of SZSE Market Data Communication System

## I. Preface

This document provides detailed instructions on the use of the Interface Specification of SZSE Market Data Communication System as a reference for technical development by users and their IT suppliers.

### Contact information:

In the course of development or testing, users can contact the technical department of Shenzhen Stock Exchange as follows.

- E-mail: [stsv5@szse.cn](mailto:stsv5@szse.cn)
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## II. System architecture diagram

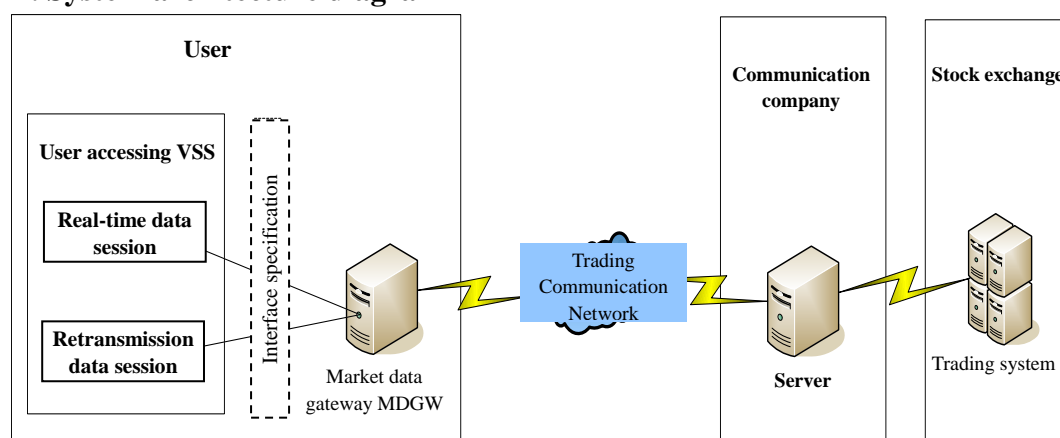


Figure 2-1 Architecture of New Generation Trading System

## III. Structure of Interface specification

The market data communication system provides both the STEP and Binary market data interface. The former is highly flexible and easily extensible, while the latter has high transmission performance. Users can choose either STEP or Binary interface.

This market data communication system interface specification mainly includes the following two parts.

- STEP market data protocol, in line with STEP1.2 and Fix5.0Sp2, is specifically extended by Shenzhen Stock Exchange.

**Lightweight STEP Session Layer Protocol:** stipulates session layer protocol, jointly formulated by the Shenzhen Stock Exchange and the Shanghai Stock Exchange.

**Shenzhen Stock Exchange STEP Market Data Protocol:** stipulates market data interface protocol at session layer.

- Binary market data protocol is a proprietary protocol customized by Shenzhen Stock Exchange based on binary message flow for data exchange, with message type and content corresponding to STEP message.

**Shenzhen Stock Exchange Binary Market Data Protocol:** stipulates market data protocol at session layer.

#### IV. Description of market data channel

Market data is divided into multiple categories by the service content, each may be sent via one or more channels depending on data size. Current market channels available in the new generation trading system are as follows. In the future, new market channels may be added according to business development, and further notice will be provided.

**Table 4-1 Description of channels**

Category	Channel code	Contents of channels
Market real-time status	0001	Securities real-time status message (390013) Market real-time status message (390019)
Bulletin	0002	Bulletin message (390012)
Index/trading volume statistical indicator snapshot	0010	Market data snapshot message (309011, 309111)
Snapshot market data of centralized bidding and trading	Stock	101x
	Fund	102x
	Bond	103x
	Warrant	104x
	Option	105x
	Pledge-type repo	106x
Tick-by-tick market data of centralized bidding and trading	Stock	201x
	Fund	202x
	Bond	203x
	Warrant	204x
	Pledge-type repo	206x
Snapshot market data of comprehensive financial service	300x	Market data snapshot message (306311)

Tick-by-tick market data of comprehensive financial service	400x	Tick-by-tick order message (300592, 300792) Tick-by-tick transaction message (300591, 300791)
Hong Kong stocks real-time market data	5001	Market data snapshot message (306311)

**Note: x in the table is a number from 1-9.**

## V. Market data gateway session

### 5.1 Classification of market data gateway session

Through sessions users can connect their systems to the market data gateway, a standard TCP/IP point-to-point connection.

The market data gateway is divided into "**Real-time Data Session**" and "**Retransmission Data Session**" by service.

**Real-time data session:** used to transmit real-time data. A gateway can have multiple real-time data sessions, but channels with different sessions cannot be repeated. Users can, according to their needs or processing performance requirements, configure multiple sessions to receive data from different channels, and in the gateway configuration, specify the monitor address, port and data channel for each real-time data session (under the realtime\_service\_list tag).

**Retransmission data session:** used to retransmit missing data. A gateway can only have one retransmission session. Users can, in the gateway configuration, specify the monitor address and port for retransmission sessions (under the resend\_service tag).

### 5.2 Market data gateway session protocol

Depending on users' requirements, market data users can choose "STEP" or "BINARY protocol" to access the gateway. The access protocols are specified in the gateway configuration (under the protocol tag). Users could access successfully only when the configuration protocol and the user's VSS protocol is consistent. The protocols used by "real-time data session" and "retransmission data session" to access the same gateway must be consistent.

Note: network byte order is used in BINARY protocol messages.

### 5.2.1 STEP specification

All application layer messages of STEP are composed of the STEP message layer and the FAST message layer. The specific structure is shown below:

**Table 5-1 STEP message layer format**

Tag	Domain name	Must	Note
	Standard Header	Y	
10201	Channel No	Y	Channel code
95	RawDataLength	Y	Length of part data of FAST message
96	RawData	Y	FAST message body Message body can contain multiple FAST encoded messages of this channel. Before decoding FAST message body, the FAST dictionary previous value of the decoder should be reset, that is, the FAST dictionary value of the decoder has to be reset every time a new STEP message is received. For the format definition of FAST coded messages, please refer to the <b>definition of FAST message layer</b> of the specific application message.
	Standard Trailer	Y	

Note: For details about the FAST1.1 protocol, please refer to <http://www.fixprotocol.org/>

### 5.3 Session security of market data gateway

The market data gateway and user market data system must be in the same secure network. The data transmitted between the two systems is unencrypted, and the data transmission security is guaranteed by the user network connected. The market data gateway also does not compress or trim the market data, therefore users have to ensure adequate bandwidth to receive market data.





31 2e 30 32 20 00 00  
00 c3

**Table 5-3 Description of STEP session login message**

Tag	Domain name	Value
8	BeginString	Currently fixed at FIXT.1.1
9	BodyLength	The sum of the length of the remaining fields except the tags "8", "9", "35", and "10".
35	MsgType	Login message type is "A"
49	SenderCompID	Specified by send_comp_id in the session configuration section of the gateway configuration.
56	TargetCompID	Consistent with gateway ID
34	MsgSeqNum	Login message is fixed at "1"
52	SendingTime	Sending time, UTCTimestamp type. Example: 20190829-15: 00: 00: 000
98	EncryptMethod	Encryption method is currently "0"
347	MessageEncoding	The character encoding type of the encoded field in the message. The default is GBK.
108	HeartBtInt	Heartbeat interval. User's vss needs to send heartbeat messages to the gateway according to the interval.
553	Username	User name, which can be filled in casually
554	Password	Specified by password in the session configuration section of gateway configuration.
1137	DefaultAppVerID	The default version of the FIX message used in this session. Currently fixed at "9", standing for "FIX50SP2"
1407	DefaultAppExtID	The default extension of the FIX message used in this session. Currently fixed at "124"
1408	DefaultCstmAppVerID	The default custom application version of the FIX message in this session. Current market data supports the following: "STEP_1.20_SZ_1.00" "STEP_1.20_SZ_1.01" "STEP_1.20_SZ_1.02"(latest)
10	Checksum	Checksum

Message example: (SenderCompID = oms\_rt\_1, gateway ID =N000055Q0001, HeartBeat =3, Password = 123456, SendingTime = 20190903-17:12:51.674, MessageEncoding=UTF-8):

8=FIXT.1.1<SOH>9=143<SOH>35=A<SOH>49=oms\_rt\_1<SOH>56=N000055Q0001<SOH>34=1<SOH>52=20190903-17:12:51.674<SOH>347=UTF-8<SOH>98=0<SOH>108=3<SOH>553=oms\_1<SOH>554=123456<SOH>1137=9<SOH>1407=124<SOH>1408=STEP1.20\_SZ\_1.02<SOH>10=023<SOH>

## 5.5 Market data gateway session heartbeat

After sending a session login message to establish a session with the market data gateway, users are required to send a session heartbeat to maintain session connection, otherwise the market data gateway will be disconnected due to timeout.

**Table 5-4 Description of BINARY heartbeat message**

Domain name	Value
MsgType	Heartbeat message type "3".
BodyLength	The heartbeat message length is fixed at "0".
Checksum	Checksum

Hexadecimal message example:

00 00 00 03 00 00 00 00 00 00 00 03

**Table 5-5 Description of STEP heartbeat message**

Tag	Domain name	Value
8	BeginString	Currently fixed at FIXT.1.1
9	BodyLength	The sum of the length of the remaining fields except the tags "8", "9", "35", and "10".
35	MsgType	Heartbeat message type "0"
49	SenderCompID	Specified by send_comp_id in the session configuration section of the gateway configuration.
56	TargetCompID	Consistent with gateway ID
34	MsgSeqNum	The message sequence number that should be maintained by the user's vss to keep continuously increasing in one session.
52	SendingTime	20190829-15:00:00:000Sending time, UTCTimestamp type. Example: 20190829-15:00:00:000
10	CheckSum	Checksum

Message example (SenderCompID = realtime\_1, gateway ID = N000055Q0001, SendingTime = 20190903-09:12:54.825):

8=FIXT.1.1<SOH>9=63<SOH>35=0<SOH>49=N000055Q0001<SOH>56=oms\_rt\_1<SOH>34=2<SOH>  
>52=20190903-09:12:54.825<SOH>10=222<SOH>

## 5.6 Market data gateway session logout

Market data gateway logout scenario:

1. After a session is established, a Logon message is received again on the same TCP when

current session continues. The reason for logout = Already connected.

Logout scenarios specific to STEP protocol sessions:

1. After a session is established, a Garbled Message is received, and the reason for logout = Garbled Message.
2. After a session is established, the message sequence number is not equal to the expected value, and the reason for logout = Incorrect MsgSeqNum.
3. MsgSeqNum (Tag # 34) does not exist, the reason for logout = Required tag missing.
4. MsgSeqNum (Tag # 34) data type is invalid. Reason for cancellation = Incorrect data format for value.
5. An error occurred before the MsgSeqNum (Tag # 34) field was parsed.

### **5.7 Market data gateway disconnected**

Scenarios where the market data gateway is disconnected:

1. If, in the login message received, the SenderCompID and TargetCompID are invalid, the gateway will immediately terminate the session without sending any Logout message.
2. When the send buffer is full because of user's failure to receive message in time, the gateway will immediately terminate session without sending any logout messages.
3. When STEP is used, the first message (Logon) received when the session is established is a Garbled Message.

Because of the possibility of network interruption at any time, the market data receiver should be prepared for the circumstances where no Logout messages are received but the TCP connection had been closed. It is recommended, but not required, to return a Logout message before disconnection.

### **5.8 Market data retransmission**

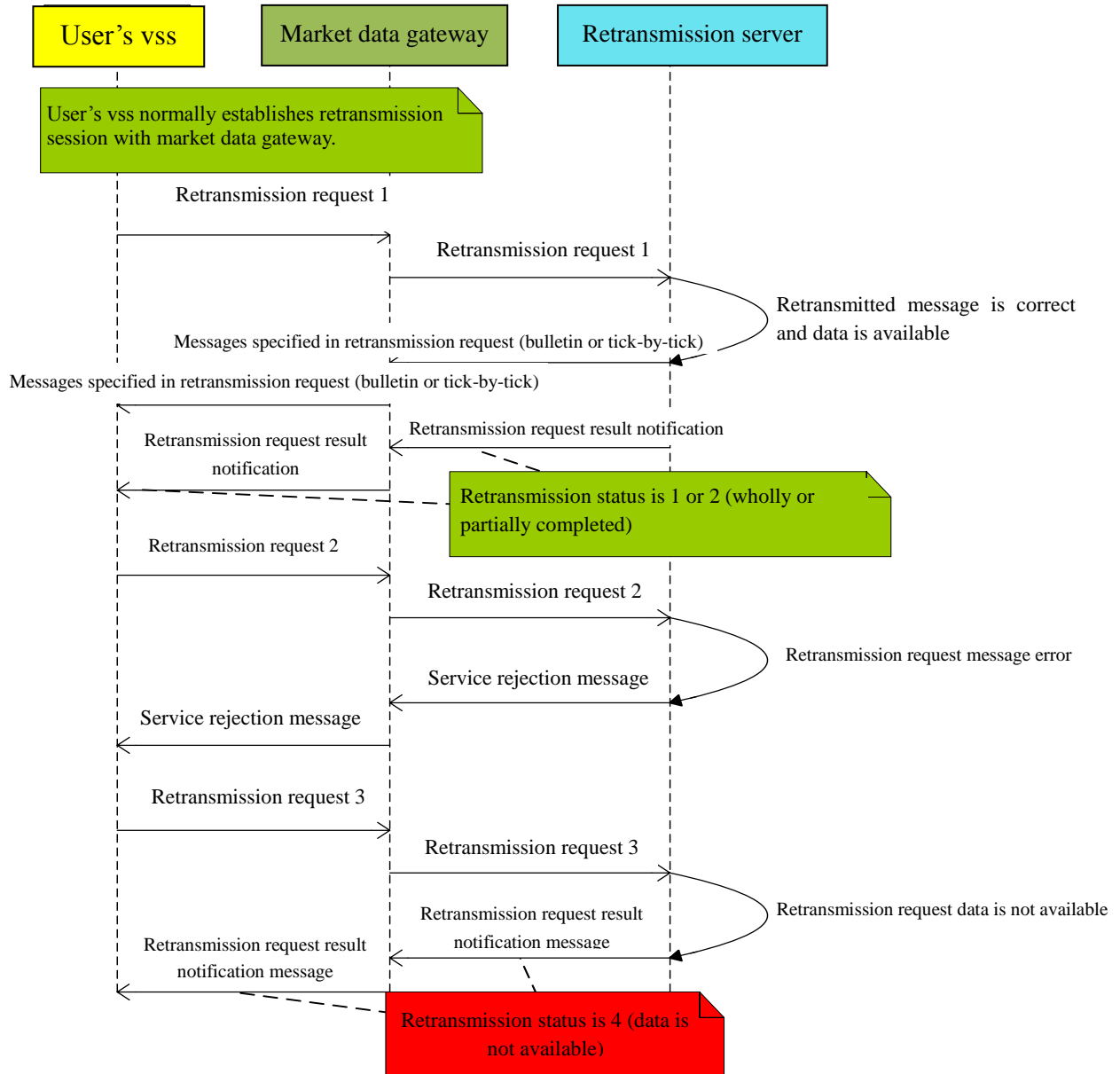
As to tick-by-tick market data, the channel code and message record number can be used to determine whether any messages have been lost. When the message record number received is less than or equal to the maximum message record number that the channel has received, it means the message has been received and should be ignored. When the sequence number

of the message received is greater than the maximum received message record number +1 (for example, the maximum message record number received = 10, new message record number = 12), a message loss has occurred, and the retransmission service shall be used to request missing data.

For the bulletin document, after receiving the bulletin summary, the bulletin summary shall be used to check whether the bulletin has been lost or changed and if any, the lost or changed bulletin file shall be requested through the retransmission service.

Users may request market data retransmission through market data gateway retransmission session, and request retransmission for multiple times in a retransmission session without having to re-establish session for each request.

### 5.8.1 Workflow of market data retransmission



## 5.8.2 Market data retransmission message

### 5.8.2.1 BINARY retransmission message

**Table 5-6 Description of BINARY tick-by-tick retransmission request message**

Domain name	Value
MsgType	The retransmission request message type is "390094".
BodyLength	The retransmission request message length is fixed at "44".
ResendType	Retransmission type, requesting retransmission tick-by-tick is "1"
ChannelNo	Channel code. This must be a tick-by-tick channel.
ApplBegSeqNum	Expected tick-by-tick start sequence number for retransmission, which must be an integer greater than 0.
ApplEndSeqNum	Expected tick-by-tick end sequence number for retransmission 1. If ApplEndSeqNum = 0, when the retransmission request reaches the retransmission server, the tick-by-tick market data stored on the server will reach the maximum value, and the tick-by-tick data generated will not be included in this retransmission after the retransmission request arrives . 2. It will be rejected by the service when ApplEndSeqNum < ApplBegSeqNum. 3. When ApplEndSeqNum ≥ ApplBegSeqNum, request a message from the sequence number ApplBegSeqNum to ApplEndSeqNum. 4. When the user requests more than 500 messages, the server only sends 500 messages.
NewsID	Fill in "All blank"
ResendStatus	Fill in the number 0
RejectText	Fill in "All blank"
Checksum	Checksum

Hexadecimal message example (ResendType = 1, ChannelNo = 2011, ApplBegSeqNum = 1, ApplEndSeqNum = 0):

```
00 05 f3 ce 00 00 00 2c 0107 db00 00 00 00 00 00 00 0100 00 00 00 00 00 00 0020 20 20 20 20 20 20
200120 20 20 20 20 20 20 20 20 20 20 20 20 20 20 2000 00 00 d7
```

**Table 5-7 Description of BINARY bulletin retransmission message**

Domain name	Value
MsgType	The retransmission request message type is "390094".
BodyLength	The retransmission request message length is fixed at "44".
ResendType	Retransmission type, request for bulletin retransmission is "2"

ChannelNo	Channel code. This must be a bulletin channel (currently "2").
ApplBegSeqNum	Fill in the number 0
ApplEndSeqNum	Fill in the number 0
NewsID	Here is the ID of the bulletin that is expected to be retransmitted. If the length is not sufficient, add "space(s)" on the right. When requesting retransmission bulletin summary, fill this field with "all blank".
ResendStatus	Fill in the number 0
RejectText	All blank
Checksum	Checksum

Hexadecimal message example (ResendType = 2, ChannelNo = 2,NewsID = N2345678):

00 05 f3 ce 00 00 00 2c 02 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 4e 32 33 34 35 36 37  
38 00 61 62 63 20 20 20 20 20 20 20 20 20 20 20 20 00 00 00 7d

**Table 5-8 Description of BINARY retransmission result message**

Domain name	Value
MsgType	The retransmission request message type is "390094".
BodyLength	The retransmission request message length is fixed at "44".
ResendType	Consistent with retransmission request
ChannelNo	Consistent with retransmission request
ApplBegSeqNum	Consistent with retransmission request
ApplEndSeqNum	Consistent with retransmission request
NewsID	Consistent with retransmission request
ResendStatus	Retransmission result status. "1" retransmission completed; "2" retransmission partially completed; "3" rejected. "4" requested data is not available;
RejectText	All blank
Checksum	Checksum

Hexadecimal example of tick-by-tick retransmission result message (ResendType = 1, ChannelNo = 2011, ApplBegSeqNum = 1,ApplEndSeqNum = 0, ResendStatus = 1):

00 05 f3 ce 00 00 00 2c 0107 db00 00 00 00 00 00 00 0100 00 00 00 00 00 00 0020 20 20 20 20 20 20  
200120 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 2000 00 00 d7

Hexadecimal example of bulletin retransmission result message (ResendType = 2, ChannelNo = 2,NewsID = N2345678, ResendStatus = 1):

00 05 f3 ce 00 00 00 2c 02 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 4e 32 33 34 35 36 37

380161 62 63 20 20 20 20 20 20 20 20 20 20 20 20 20 20 00 00 00 7e

**5.8.2.2 STEP retransmission message**

**Table 5-9 Description of STEP retransmission request message**

Tag	Domain name	Value
	MsgType	UA002
10201	ChannelNo	2001
95	RawDataLength	Message length after FAST encoding RawData
96	RawData	FAST encoded message body

FAST encoded RawData message structure

Tag	Domain name	Value
999	TemplateID	3002
10077	ResendType	1
10201	ChannelNo	2001
1182	ApplBegSeqNum	100
1183	ApplEndSeqNum	0

**Table 5-10 Description of STEP bulletin retransmission request message**

Tag	Domain name	Value
	MsgType	UA002
10201	ChannelNo	2
95	RawDataLength	Message length after FAST encoding RawData
96	RawData	Message body after FAST encoding

Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	3002
10077	ResendType	2
10201	ChannelNo	2
1472	NewsID	Here is the bulletin ID of the expected retransmission; When requesting retransmission of bulletin summary, fill in this field with "all blank".

**Table 5-11 Description of STEP retransmission result message**

Tag	Domain name	Value
-----	-------------	-------



	MsgType	UA002
10201	ChannelNo	Consistent with retransmission request.
95	RawDataLength	RawData message length after FAST encoding
96	RawData	Message body after FAST encoding

Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	3002
10077	ResendType	Consistent with retransmission request.
10201	ChannelNo	Consistent with retransmission request.
1182	ApplBegSeqNum	Consistent with retransmission request.
1183	ApplEndSeqNum	Consistent with retransmission request.
1472	NewsID	Consistent with retransmission request.
1472	ResendStatus	Retransmission result status. "1" retransmission completed; "2" retransmission partially completed; "3" rejected. "4" requested data is not available;
58	Text	No

**5.8.3 Description of retransmission rules**

Prerequisites:

Tick-by-tick channel 2011 of market data retransmission server, 1,000 tick-by-tick messages had been received.

Bulletin channel 2 of market data retransmission server, and 3 bulletin files, G001, G002 and G003, had been accepted.

**Table 5-12 Content of market data retransmission request and result comparison table**

Retransmission type	Retransmission channel	Starting sequence number	Ending sequence number	Bulletin ID	Received retransmission contents	Retransmission result status
1	2011	1	0	--	Tick-by-tick messages with sequence number from 1 to 500, 500 messages in total.	2
1	2011	800	0	--	Tick-by-tick messages with sequence number from 800 to 1,000, 201 messages in total.	1

1	2011	1	1	--	Tick-by-tick message with sequence number being 1, one message in total.	1
1	2011	1	200	--	Tick-by-tick messages with sequence number from 1 to 200, 200 messages in total.	1
1	2011	1	800	--	Tick-by-tick messages with sequence number from 1 to 500, 500 messages in total.	2
1	2011	800	1500	--	Tick-by-tick messages with sequence number from 800 to 1,000, 201 messages in total.	1
1	2011	1200	1500	--	No	4
1	9999	1	0	--	No	3
1	2011	0	0	--	Service rejection message, Reason 299999	No
1	2011	1	-1	--	Service rejection message, Reason 299999	No
1	2011	100	99	--	Service rejection message, Reason 299999	No
2	2	--	--	Full in space	Bulletin summary document	1
2	2	--	--	G001 (Add 4 spaces)	Bulletin G001	1
2	2	--	--	G004 (Add 4 spaces)	--	4
3	--	--	--	--	Service rejection message, Reason 299999	No

--"means irrelevant to the content

Retransmission result status is "None", which means that in this case, no retransmission result notification will be received.

## VI. Market data message

### 6.1 Protocol market data message

#### 6.1.1 Channel heartbeat

**Table 6-1 Example of market data channel heartbeat BINARY message**

Domain name	Value
MsgType	390095
ChannelNo	0010
ApplLastSeqNum	2937
EndOfChannel	N

#### 6.1.2 Securities real-time status

**Table 6-2 Example of securities real-time status BINARY message**

Domain name	Value
MsgType	390013
OrigTime	20130228-14:42:13:555
ChannelNo	0001
SecurityID	000001
SecurityIDSource	102
FinancialStatus	A
NoSwitch	1
SecuritySwitchType	1
SecuritySwitchStatus	Y

#### 6.1.3 Bulletin

**Table 6-3 Example of bulletin BINARY message**

Domain name	Value
MsgType	390012
OrigTime	20130228-14:42:13:555
ChannelNo	0002
NewsID	AA0001
Headline	Test bulletin
RawDataLength	(Length of bulletin content)
RawData	(bulletin content))

#### 6.1.4 Snapshot of centralized bidding market data

Centralized bidding Level II market data snapshot. In the example, a total of five prices are provided, three for selling and two for buying. Among them, the volume of top 10 orders are revealed at the optimal price.

**Table 6-4 Example of centralized bidding Level II BINARY market data snapshot message**

Domain name	Value
MsgType	300111
OrigTime	20140126-10:30:05:335
ChannelNo	1011
MStreamID	010
SecurityID	002001
SecurityIDSource	102
TradingPhaseCode	T0
PrevClosePx	17.4600
NumTrades	478
TotalVolumeTrade	24689.00
TotalValueTrade	405783.6700
NoMDEntries	15
MDEntryType	2
MDEntryPx	17.490000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	4
MDEntryPx	18.120000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	7
MDEntryPx	18.130000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	8

MDEntryPx	17.200000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	x1
MDEntryPx	0.030000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	x2
MDEntryPx	-0.010000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	x3
MDEntryPx	17.450000
MDEntrySize	369801.00
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	x4
MDEntryPx	17.460000
MDEntrySize	14689.00
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	x5
MDEntryPx	15.950000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0

NoOrders	0
MDEntryType	x6
MDEntryPx	16.120000
MDEntrySize	0
MDPriceLevel	0
NumberOfOrders	0
NoOrders	0
MDEntryType	1
MDEntryPx	18.460000
MDEntrySize	2340.00
MDPriceLevel	3
NumberOfOrders	56
NoOrders	0
MDEntryType	1
MDEntryPx	18.450000
MDEntrySize	1340.00
MDPriceLevel	2
NumberOfOrders	71
NoOrders	0
MDEntryType	1
MDEntryPx	18.420000
MDEntrySize	1350.00
MDPriceLevel	1
NumberOfOrders	16
NoOrders	10
OrderQty	10.00
OrderQty	10.00
OrderQty	20.00
OrderQty	10.00
OrderQty	13.00
OrderQty	17.00
OrderQty	103.00
OrderQty	21.00
OrderQty	16.00

OrderQty	11.00
MDEntryType	0
MDEntryPx	18.400000
MDEntrySize	27500.00
MDEntryPriceLevel	1
NumberOfOrders	23
NoOrders	10
OrderQty	100.00
OrderQty	100.00
OrderQty	200.00
OrderQty	100.00
OrderQty	130.00
OrderQty	170.00
OrderQty	100.00
OrderQty	200.00
OrderQty	160.00
OrderQty	110.00
MDEntryType	0
MDEntryPx	18.390000
MDEntrySize	17500.00
MDEntryPriceLevel	2
NumberOfOrders	53
NoOrders	0

### 6.1.5 Market data of tick-by-tick order

**Table 6-5 BINARY message example of centralized bidding Level II tick-by-tick order**

Domain name	Value
MsgType	300192
ChannelNo	2011
ApplSeqNum	100
MDEntryStreamID	011
SecurityID	000001
SecurityIDSource	102
Price	17.4800

OrderQty	1200.00
Side	1
TransactTime	20130228-14:42:13:555
OrdType	2
TimeInForce	0
MaxPriceLevels	0
MinQty	0

### 6.1.6 Market data of tick-by-tick trading

**Table 6-6 BINARY message example of centralized bidding Level II tick-by-tick trading**

Domain name	Value
MsgType	300191
ChannelNo	2011
ApplSeqNum	100
BidApplSeqNum	10
OfferApplSeqNum	20
MStreamID	011
SecurityID	000001
SecurityIDSource	102
LastPx	17.4800
LastQty	1200.00
ExecType	F
TransactTime	20130228-14:42:13:555

## 6.2 STEP market data message

### 6.2.1 Channel heartbeat

In the tick-by-tick channel for market data, channel heartbeat will be sent in case of no data.

**Table 6-7 Example of market data channel heartbeat STEP message**

Tag	Domain name	Value
	MsgType	UA001
10201	ChannelNo	0010
95	RawDataLength	



96	RawData	
----	---------	--

Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	3001
10201	ChannelNo	0010
1350	ApplLastSeqNum	2937
10205	EndOfChannel	N

Message example:

999=3001<SOH>10201=10<SOH>1350=2937<SOH>10205=N

## 6.2.2 Securities real-time status

**Table 6-8 Example of securities real-time status STEP message**

Tag	Domain name	Value
	MsgType	f
10201	ChannelNo	0001
95	RawDataLength	
96	RawData	

Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	4001
42	OrigTime	20130228-14:42:13:555
10201	ChannelNo	0001
48	SecurityID	000001
22	SecurityIDSource	102
291	FinancialStatus	A
10202	NoSwitch	1
10203	SecuritySwitchType	1
10204	SecuritySwitchStatus	Y

Message example:

999=4001<SOH>42=20130228-14:42:13:555<SOH>10201=1<SOH>48=000001<SOH>22=102<SOH>291=A<SOH>10202=1<SOH>10203=1<SOH>10204=Y

## 6.2.3 Bulletin

**Table 6-9 Example of bulletin STEP message**

Tag	Domain name	Value
	MsgType	B
10201	ChannelNo	0002

95	RawDataLength	
96	RawData	

Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	4002
42	OrigTime	20130228-14:42:13:555
10201	ChannelNo	0002
1472	NewsID	AA0001
148	Headline	Test bulletin
95	RawDataLength	(Length of bulletin content)
96	RawData	(bulletin content)

#### 6.2.4 Snapshot of centralized bidding market data

Centralized bidding Level II market data snapshot. In the example, a total of five prices are provided, three for selling and two for buying. Among them, the volume of top 10 orders is revealed at the optimal price.

**Table 6-10 STEP message example of centralized bidding Level II market data snapshot**

Tag	Domain name	Value
	MsgType	W
10201	ChannelNo	1011
95	RawDataLength	
96	RawData	

Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	4001
42	OrigTime	20140126-10:30:05:335
10201	ChannelNo	1011
1500	MDStreamID	010
48	SecurityID	002001
22	SecurityIDSource	102
8538	TradingPhaseCode	T0
140	PrevClosePx	17.4600
8503	NumTrades	478
387	TotalVolumeTrade	24689.00
8504	TotalValueTrade	405783.6700
268	NoMDEntries	15
269	MDEntryType	2
270	MDEntryPx	17.490000
269	MDEntryType	4

270	MDEntryPx	18.120000
269	MDEntryType	7
270	MDEntryPx	18.130000
269	MDEntryType	8
270	MDEntryPx	17.200000
269	MDEntryType	x1
270	MDEntryPx	0.030000
269	MDEntryType	x2
270	MDEntryPx	-0.010000
269	MDEntryType	x3
270	MDEntryPx	17.450000
271	MDEntrySize	369801.00
269	MDEntryType	x4
270	MDEntryPx	17.460000
271	MDEntrySize	14689.00
269	MDEntryType	x5
270	MDEntryPx	15.950000
269	MDEntryType	x6
270	MDEntryPx	16.120000
269	MDEntryType	1
270	MDEntryPx	18.460000
271	MDEntrySize	2340.00
1023	MDPriceLevel	3
346	NumberOfOrders	56
73	NoOrders	0
269	MDEntryType	1
270	MDEntryPx	18.450000
271	MDEntrySize	1340.00
1023	MDPriceLevel	2
346	NumberOfOrders	71
73	NoOrders	0
269	MDEntryType	1
270	MDEntryPx	18.420000
271	MDEntrySize	1350.00
1023	MDPriceLevel	1
346	NumberOfOrders	16
73	NoOrders	10
38	OrderQty	10.00
38	OrderQty	10.00
38	OrderQty	20.00
38	OrderQty	10.00
38	OrderQty	13.00
38	OrderQty	17.00

38	OrderQty	103.00
38	OrderQty	21.00
38	OrderQty	16.00
38	OrderQty	11.00
269	MDEntryType	0
270	MDEntryPx	18.400000
271	MDEntrySize	27500.00
1023	MDPriceLevel	1
346	NumberOfOrders	23
73	NoOrders	10
38	OrderQty	100.00
38	OrderQty	100.00
38	OrderQty	200.00
38	OrderQty	100.00
38	OrderQty	130.00
38	OrderQty	170.00
38	OrderQty	100.00
38	OrderQty	200.00
38	OrderQty	160.00
38	OrderQty	110.00
269	MDEntryType	0
270	MDEntryPx	18.390000
271	MDEntrySize	17500.00
1023	MDPriceLevel	2
346	NumberOfOrders	53
73	NoOrders	0

#### Message example:

999=4001<SOH>42=20140126-10:30:05:335<SOH>10201=1011<SOH>1500=010<SOH>48=002001<  
SOH>22=102<SOH>8538=T0<SOH>140=17.4600<SOH>8503=478<SOH>387=24689.00<SOH>8504  
=405783.6700<SOH>268=15<SOH>269=2<SOH>270=17.490000<SOH>269=4<SOH>270=18.120000  
<SOH>269=7<SOH>270=18.130000<SOH>269=8<SOH>270=17.200000<SOH>269=x1<SOH>270=0.  
030000<SOH>269=x2<SOH>270=-0.010000<SOH>269=x3<SOH>270=17.450000<SOH>271=369801  
.00<SOH>269=x4<SOH>270=17.460000<SOH>271=14689.00<SOH>269=x5<SOH>270=15.950000<  
SOH>269=x6<SOH>270=16.120000<SOH>269=1<SOH>270=18.460000<SOH>271=2340.00<SOH>1  
023=3<SOH>346=56<SOH>73=0<SOH>269=1<SOH>270=18.450000<SOH>271=1340.00<SOH>102  
3=2<SOH>346=71<SOH>73=0<SOH>269=1<SOH>270=18.420000<SOH>271=1350.00<SOH>1023=  
1<SOH>346=16<SOH>73=10<SOH>38=10.00<SOH>38=10.00<SOH>38=20.00<SOH>38=10.00<SO  
H>38=13.00<SOH>38=17.00<SOH>38=103.00<SOH>38=21.00<SOH>38=16.00<SOH>38=11.00<SO

H>269=0<SOH>270=18.400000<SOH>271=27500.00<SOH>1023=1<SOH>346=23<SOH>73=10<SOH>38=100.00<SOH>38=100.00<SOH>38=200.00<SOH>38=100.00<SOH>38=130.00<SOH>38=170.00<SOH>38=100.00<SOH>38=200.00<SOH>38=160.00<SOH>38=110.00<SOH>269=0<SOH>270=18.390000<SOH>271=17500.00<SOH>1023=2<SOH>346=53<SOH>73=0

### 6.2.5 Market data of tick-by-tick order

**Table 6-11 STEP message example of centralized bidding Level II tick-by-tick order**

Tag	Domain name	Value
	MsgType	UA201
10201	ChannelNo	2011
95	RawDataLength	
96	RawData	

Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	4201
10201	ChannelNo	2011
1500	MDSStreamID	011
1181	ApplSeqNum	100
48	SecurityID	000001
22	SecurityIDSource	102
44	Price	17.4800
38	OrderQty	1200.00
54	Side	1
40	OrdType	2
59	TimeInForce	0
1090	MaxPriceLevels	0
110	MinQty	0
60	TransactTime	20130228-14:42:13:555

Message example:

999=4201<SOH>10201=2011<SOH>1500=11<SOH>1181=100<SOH>48=000001<SOH>22=102<SOH>44=17.48<SOH>38=1200<SOH>54=1<SOH>40=2<SOH>59=0<SOH>1090=0<SOH>110=0<SOH>60=20130228-14:42:13:555

### 6.2.6 Market data of tick-by-tick trading

**Table 6-12 STEP message example of centralized bidding Level II tick-by-tick trading**

Tag	Domain name	Value
	MsgType	UA202
10201	ChannelNo	2011

95	RawDataLength	
96	RawData	

## Message structure before FAST encoding RawData

Tag	Domain name	Value
999	TemplateID	4202
10201	ChannelNo	2011
1500	MDStreamID	011
1181	ApplSeqNum	100
10116	BidApplSeqNum	10
10117	OfferApplSeqNum	20
48	SecurityID	000001
22	SecurityIDSource	102
31	LastPx	17.4800
32	LastQty	1200.00
150	ExecType	F
60	TransactTime	20130228-14:42:13:555

## Message example:

999=4202<SOH>10201=2011<SOH>1500=11<SOH>1181=100<SOH>10116=10<SOH>10117=20<SOH>48=000001<SOH>22=102<SOH>31=17.48<SOH>32=1200<SOH>150=F<SOH>60=20130228-14:42:13:555