FIX protocol specification for OTC System of Derivatives market

version 1.0.0

Moscow 2022

Table of Contents

History of changes

Date	Version	Changes

1. Introduction

1.1. Document purpose

The document below describes the protocol FIX provided by the Moscow Exchange for connection to OTC System of Derivatives market. The description is based on the standard FIX protocol (Financial Information Exchange, http://www.fixtrading.org, version 4.4) specification. The specification does not contain neither technical nor administrative details on network connection or security protection methods.

1.2. General description

OTC system - an additional module of the Derivatives market trading system, which is a service for attracting large-block liquidity (RFS), which allows members to submit a liquidity request and to withdraw the liquidity provided when a satisfactory offer. For more information of the OTC System of Derivatives market, please apply to **OTC_P2Gate_en.pdf** [http://ftp.moex.com/pub/OTC/RFS_IQS/prod/OTCGate/Docs/OTC_P2Gate_en.pdf].

The protocol provided is designed based on the standard FIX 4.4 protocol. The protocol consists of transport, session and application layers.

The transport layer defines rules of: a) transferring data as set of messages, b) composing message as set of fields, c) composing fields using field ID and field value. The transport layer description is a part of FIX 4.4 specification, therefore, it is not listed in this specification.

The session layer provides identification of each participant as well as guaranteed delivery and message consistent processing, connection status control and session recovery in case of a failure. This specification contains a brief description of the session layer protocol in order to cover certain parameters needed for establishing connection to FIX Gate.

This specification is based upon application layer protocol description, which defines rules of trading process.

1.3. Terms and definitions

This document contains the following terms, definitions and acronyms:

Term	Definition
BBO (Best Bid or Offer)	The best offer is the quote with the best buy / sell price. If there are several quotes with the same best buy / sell price, the quote with an automatic confirmation will be the best. If all such quotes have an automatic confirmation or no such quote has an automatic confirmation, the quote which is registered first will be the best.
CF	Clearing Firm
LC	liquidity consumer
LP	liquidity provider
OTC	OTC System of Derivatives Market
RFS	Subsystem RFS (Request for Stream)
Order	A trading instruction added into the SPECTRA trading system
Indicative Quote (or simply quote)	A trading instruction added into the OTC system without collateral verification
Indicative trade	A trade performed as a result of matching indicative quotes within OTC system.
Trade	A trade performed as a result of matching orders within SPECTRA trading system.

2. Data types

Within the protocol, the following data types are used:

Type	Details
char	Single character value, can include any alphanumeric character or punctuation except the delimiter. All char fields are case sensitive (i.e. m != M).
String	Alpha-numeric free format strings, can include any character or punctuation except the delimiter. All char fields are case sensitive (i.e. morstatt != Morstatt).
float	Sequence of digits with optional decimal point and sign character (ASCII characters "-", "0" - "9" and "."); the absence of the decimal point within the string will be interpreted as the float representation of an integer value. The number of decimal places used should be a factor of business/market needs and mutual agreement between counterparties. Note that float values may contain leading zeros (e.g. "00023.23" = "23.23") and may contain or omit trailing zeros after the decimal point (e.g. "23.0" = "23.0000" = "23" = "23.").
Price16.5	Float field representing a price. The number of significant digits is sixteen. The number of decimal places is five.
Int	Sequence of digits without commas or decimals and optional sign character (ASCII characters "-" and "0" - "9"). The sign character utilizes one byte (i.e. positive int is "99999" while negative int is "-99999"). Note that int values may contain leading zeros (e.g. "00023" = "23"). Examples: 723 in field 21 would be mapped int as |21=723|, -723 in field 12 would be mapped int as |12=-723|.
NumInGroup	Int field representing the number of entries in a repeating group. Value must be positive.
Int32	Integer signed, 4 bytes.
Int64	Integer signed, 8 bytes.
UInt32	Integer unsigned, 4 bytes
UInt64	Integer unsigned, 8 bytes
StringN	String of symbols with fixed length.
UTCTimestamp	Time/date combination represented in UTC (Universal Time Coordinated) in YYYYMMDD-HH:MM:SS.sss (milliseconds) or YYYYMMDD-HH:MM:SS.sssssssss (nanoseconds) format.
SeqNum	Int32 field representing a message sequence number. Value must be positive.
Boolean	Char field containing one of two values: 'Y' = True/Yes, 'N' = False/No.
LocalMktDate	Date of Local Market (vs. UTC) in YYYYMMDD format. Valid values: YYYY = 0000-9999, MM = 01-12, DD = 01-31.

3. Shared fields

There are some messages containing the same field sets, for example, the 'Standard Header' and 'Standard Trailer' fields which contain some service information. Some of such field sets are described below:

- **Tag** – the unique field ID, used for generating a FIX message.
- **Field** – the field name, not used for generating FIX messages and described for your reference only.
- **Mandatory** – a field attribute: specifies whether the field in a message is mandatory or optional.
  - Y - mandatory field;
  - N - optional field;
  - C - mandatory, if meets the condition (see 'Details').
- **Type** - field type.
- **Details** – detailed description of the field.
- **Allowable values** - additional limitations.

The "*****" symbol - flag of difference from the standard FIX protocol.

3.1. Standard Header group

The standard header contained in every message contains.

Tag	Field name	Mandatory	Type	Details	Allowable values
8	BeginString	Y	String7	Specifies message start and protocol version.	="FIX.4.4"
9	BodyLength	Y	Length	Message body length. Calculated in accordance with the standards.	
35	MsgType	Y	String10	The MsgType ID which is unique for every message.	
49	SenderCompID	Y	String64	Sender ID. The allowable values are specified by the exchange individually for every trading firm (broker firm).	
56	TargetCompID	Y	String	Recipient ID. (FIX-gate ID).	
34	MsgSeqNum	Y	SeqNum	Message sequential number.	
52	SendingTime	Y	UTCTimestamp	Message sending time.	
122	OrigSendingTime	N*	UTCTimestamp	Original message transmission time when resending messages in reply to resend request (message Resend Request (2)), in UTC. Mandatory if a message is sent in reply to resend request (message Resend Request (2)).	
97	PossResend	N	Boolean	Indicates the message containing some data which had been already sent with another sequential number.	
43	PossDupFlag	N	Boolean	Indicates the allowance for resending message using the same sequential number.	

3.2. Standard Trailer group

The standard trailer (end) which every message contains.

Tag	Field name	Mandatory	Type	Details
10	CheckSum	Y	String3	Message checksum. For calculation method description see FIX, Volume 2: 'Checksum Calculation'.

3.3. Parties group

Optional group 'Parties' is used in the following cases:

- - for transmitting a 4-character BF code in messages;
- - in unsolicited messages to indicate the login that performed the operation.

The fields order is fixed.

Tag	Field name	Type	Details
453	NoPartyIDs	NumInGroup	Elements quantity in block.
=> 448	PartyID	String64	Counterparty ID
=>447	PartyIDSource	char	PartyID source type
=>452	PartyRole	Int32	ID type.

4. Session layer protocol

Session layer protocol which provides parties authentication, guaranteed messages delivery and sequential message processing, connection status and session recovery in case of any failure.

4.1. Supported messages

- **Logon** - Initiates session.
- **Logout** - Initiates or confirms session termination.
- **Heartbeat** - Ensures that session is up and running.
- **Test Request** - Used as part of session establishment procedure, must be replied with specific Heartbeat message.
- **Reject** – Informs party about incorrect or unknown message.
- **Resend Request** - Informs party that messages in particular range must be resent.
- **Sequence Reset** - Used to skip administrative messages on resend – 'Gap Fill mode'. Also used to reset messages sequence – 'Reset mode'.

All the messages can be sent in both directions.

4.1.1. Logon

Initiates or confirms session start. This message must be the first in every session.

Tag	Field name	Mandatory	Type	Details
<'Header' group>		Y		Message type 'A'.
98	EncryptMethod	Y	Int	Encryption method. Must be set to '0' – NONE_OTHER – no message encryption..
108	HeartBtInt	Y	Int	Heartbeat messages sending interval.
141	ResetSeqNumFlag	N	Boolean	Reset messages sequence for both parties.
<'Trailer' group>		Y		

4.1.2. Logout

Initiates or confirms session termination.

Tag	Field name	Mandatory	Type	Details
<'Header' group>		Y		Message type '5'.
58	Text	N	String	Reason for session termination
<'Trailer' group>		Y		

4.1.3. Heartbeat

Ensures that session is up and running. If the 'Heartbeat' message is sent in response to the 'Test Request' message, the 'TestReqID' field must contain the 'Test Request' message ID.

Tag	Field name	Mandatory	Type	Details
<'Header' group>		Y		Message type '0'.
112	TestReqID	N	String	Mandatory if sent in response to the 'Test Request' message.
<'Trailer' group>		Y		

4.1.4. Test Request

The message calls/initiates/requests the 'Heartbeat' message from the opposite party..

Tag	Field name	Mandatory	Type	Details
<'Header' group>		Y		Message type '1'.
112	TestReqID	Y	String	Request message ID, returned in the 'Heartbeat' message.

Tag	Field name	Mandatory	Type	Details
<'Trailer' group>		Y		

4.1.5. Reject

The reject message should be issued when a message is received but cannot be properly processed due to a session-level rule violation. An example of when a reject may be appropriate would be the receipt of a message with invalid basic data which successfully passes CheckSum and BodyLength checks.

Tag	Field name	Mandatory	Type	Details
<'Header' group>		Y		Message type '3'.
45	RefSeqNum	Y	SeqNum	Rejected message number.
371	RefTagID	N	Int	Invalid field number.
372	RefMsgType	N	String	Rejected message type.
373	SessionRejectReason	N	Int	Rejection reason ID. • '0' – Incorrect tag. • '1' – Mandatory field missing. • '2' – Undefined tag for this message type. • ''3' – Undefined tag. • '4' – Value missing for this tag. • '5' – Incorrect value for this tag (vale limits exceeded). • '6' – Incorrect data format for this value. • '7' – Decoding error. • '8' – Signature error. • '9' – 'CompID' error. • '10' – 'SendingTime' accuracy error. • '11' – Incorrect message type. • '12' – XML validation error. • '13' – Tag already exists. • '14' – Tags definition order error. • '15' – Group fields definition order error. • '16' – Group elements number calculation error ('NumInGroup'). • '17' – Non-data field contains separator. • '99' - Other. • '7100' – Messages limit exceeded. • '7101' – System error.
58	Text	N	String	Rejection reason details.
<'Trailer' group>		Y		

4.1.6. Resend Request

The message initiates resending of a particular message range. Use 'BeginSeqNo=EndSeqNo' for a single message resending and 'EndSeqNo=0' for a range of messages starting from the particular one (where '0' indicates infinity).

Tag	Field name	Mandatory	Type	Details
<'Header' group>		Y		Message type '2'.

Tag	Field name	Mandatory	Type	Details
7	BeginSeqNo	Y	SeqNum	Number of the first message to resend.
16	EndSeqNo	Y	SeqNum	Number of the last message to resend.
<'Trailer' group>		Y		

4.1.7. Sequence Reset

Used to skip administrative messages on resend – 'Gap Fill mode'. Also used to reset messages sequence – 'Reset mode'.

Tag	Field name	Mandatory	Type	Details
<'Header' group>		Y		Message type '4'.
123	GapFillFlag	N	Boolean	Mode: • 'Y' - the 'Gap Fill' mode – the 'MsgSeqNum' field is used. If there are some administrative messages to be skipped, then the 'Sequence Reset' message is used for responding to the 'Resend Request' message. • 'N' - the 'Reset' mode - Messages sequence reset mode.
36	NewSeqNo	Y	SeqNum	New sequence number.
<'Trailer' group>		Y		

4.2. Session establishing and termination scenarios

4.2.1. Session establishing and termination

For establishing connection to FixGate a client must send the 'Logon' message including its 'SenderCompID'. If the 'Logon' message is valid and the sender was successfully authorized then FixGate sends the 'Logon' message in return, confirming that the connection has been successfully established.

For correct session termination, client must send the 'Logout' message to FixGate and receive one in return. Any other ways of session closing/termination are incorrect and may lead to an error.

Also, before sending the 'Logout' message it is recommended to send the 'Test Request' message to FixGate and receive the 'Heartbeat' message in return. This may help to avoid missing and/or lost messages.

When a connection has been established via FixGate, it is recommended to wait 30 seconds after closing the previous session before sending a new Logon message. Otherwise, the connection will be terminated by FixGate without any additional notifications.

4.2.2. Message resending request

During the initialization process or due to unexpected connection break there may be numeration error when the incoming message sequence number is greater than expected (while the common message number is always greater by 1 than that of the last message in log). In this case, a client must request the retransmission via sending the 'Resend Request' message including sequence number range for the missing messages (the 'BeginSeqNo', 'EndSeqNo' fields values).

4.2.3. Session status monitoring

The 'Heartbeat' message is used to monitor the FIX session status as well as gaps in messages sequence numbers in case of missing some incoming messages. In order to do this, the client application generates the 'Heartbeat' messages and sends it to FixGate in accordance with time interval specified by the 'HeartBtInt' field value in the 'Logon' Message.

If there is no reply from FixGate within the specified time interval (the 'HeartBtInt ' field value + transmission time), the client should generate and send the 'Test Request' message to FixGate. In case of no reply within the specified time interval the client should reestablish connection to the FixGate.

4.2.4. Resetting message sequence

The following methods are used to reset message sequence:

- Sending the 'Logon' message with the 'ResetSeqNumFlag' flag.
- Sending the 'Sequence Reset' in the 'Reset mode' mode.
- By schedule. For example, message sequence can be automatically reset by the Exchange before starting a trading session.

After message sequence was reset, there is no more option to resend any message via the 'Resend Request' procedure.

4.2.5. Session recovery after failure

In order to recover session after failure, the client should send the 'Logon' message which includes the sequence number 1 more than that of the last message in log (the 'MsgSeqNum' field). If the incoming 'Logon' message sequence number is greater than expected, then the client must request the retransmission via sending the 'Resend Request' message including sequence number range for the missing messages.

If the primary FixGate server is unreachable, the client is recommended to establish connection to the secondary server to continue working according to the rules stated above.

The primary and secondary servers do not synchronize message sequence numbers, so that a client will not be able to receive messages starting from the last received one once they have switched from one server to another. When trying to connect to another server, the client will receive a message with its sequence number less than expected. In this case, it is recommended to reset the message sequence number counter.

5. Application protocol

5.1. The roles of the RFS System participants

- **LC** (liquidity consumer) – active counterparty in trade execution. Consumer initiates request for liquidity and in case of matching offer takes the liquidity.
- **LP** (liquidity provider) – passive counterparty in trade execution. Liquidity providers see requests for liquidity and may respond with their quotes on requests.

5.2. Supported messages. The role of liquidity consumer

5.2.1. Messages from the Client to FixGate

5.2.1.1. QuoteRequest

Request for stream.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'R'.
1	Account	Y	String3	Client code, 3 characters
131	QuoteReqID	Y	String20	The unique identifier of the request for stream. The liquidity consumer uses it to identify the stream in the request to remove the stream and in the request for quote execution (Quote Hit).
146	NoRelatedSym	Y	NumInGroup	Possible values: '1'
=>537	QuoteType	Y	Int8	The allowable quote type: • '0' – all quotes; "indicative" quote which requires the approval from the provider (with Last Look), and "firm" quote with an automatic confirmation (no Last Look); • '1' – only “firm” quotes (no Last Look).
=>21000	SpeedBumpType	N	char	The minimum lifetime of quotes from liquidity providers: • '0' – not applicable; • '1' – 0.2 seconds; • '2' – 0.5 seconds; • '3' – 1 seconds; • '4' – 3 seconds; If there is no such field in the FIX message, FixGate sends SpeedBumpType = 0.
=>21011	StreamExposureDuration	N	char	The stream duration: • '0' – not applicable; • '1' – 30 seconds; • '2' – 60 seconds; • '3' – 90 seconds; • '4' – 120 seconds; If there is no such field in the FIX message, FixGate sends StreamExposureDuration = 0.
=>60	TransactTime	Y	UTCTimestamp	Message sending time in UTC. Format: YYYYMMDDHH:MM:SS.sssssssss
=>55	Symbol	Y	String25	The symbolic identifier of the instrument. It is possible to use both 'short_isin' and 'isin' of the instrument in the message.
=>453	NoPartyIDs	N	NumInGroup	Possible values: '1'
==>448	PartyID	N	String64	Broker code, 4 characters.
==>447	PartyIDSource	N	char	'D' - proprietary / custom codes

Tag	Field	Mandatory	Type	Details
==>452	PartyRole	N	int	'7' - broker code for CF level login.
=>38	OrderQty	Y	UInt64	The minimum quote volume in contracts.
=>54	Side	Y	char	The quote direction: • '1' – Buy. • '2' – Sell. • 'Y' – BothSides.
20027	ExternalID	N	UInt64	The external identifier of the stream.
21001	TextToLP	N	String20	The comment for the liquidity provider.
58	Text	N	String20	The comment for the liquidity consumer.
<'Trailer' group>		Y		

5.2.1.2. QuoteResponse

The request to remove the stream / the request for quote execution. It is defined by the value of the field 'QuoteRespType' (Tag=694).

QuoteResponse - The request to remove the stream

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'AJ'.
693	QuoteRespID	Y	String20	The identifier of the liquidity consumer's request.
131	QuoteReqID	Y	UInt64	The identifier of the stream assigned by the liquidity consumer.
453	NoPartyIDs	N	NumInGroup	Possible values: '1'
=>448	PartyID	C	String64	Broker code, 4 characters. Mandatory if NoPartyIDs=1.
=>447	PartyIDSource	C	char	'D' - Proprietary / Custom code. Mandatory if NoPartyIDs=1.
=>452	PartyRole	C	int	'7' - Entering Firm. Mandatory if NoPartyIDs=1.
694	QuoteRespType	Y	int	'6' – (Pass). The request to remove the stream
<'Trailer' group>		Y		

QuoteResponse - The request for quote execution

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'AJ'.
693	QuoteRespID	Y	String20	The identifier of the liquidity consumer's request.
131	QuoteReqID	Y	UInt64	The identifier of the stream assigned by the liquidity consumer.
694	QuoteRespType	Y	int	'1' – (Hit/Lift). The request for quote execution
44	Price	Y	Price16.5	Quote execution price.
54	Side	Y	char	The quote direction: • '1' – Buy. • '2' – Sell.
<'Trailer' group>		Y		

5.2.2. Messages from FixGate to the Client

5.2.2.1. Quote

- BBO (Best Bid or Offer) - messages with the best offer in the stream. The best offer is the quote with the best buy / sell price. If there are several quotes with the same best buy / sell price, the quote with an automatic confirmation will be the best. If all such quotes have an automatic confirmation or no such quote has an automatic confirmation, the quote which is registered first will be the best.
- The liquidity stream creation confirmation (empty quote - QuoteID=0, OfferSize=0, BidSize=0).

The message variant is determined by the values of the QuoteID, OfferSize and BidSize fields in the message. The table below contains all possible combinations of the values:

QuoteID,	OfferSize	BidSize	Details
0	0	0	Liquidity stream creation confirmation
> 0	0	0	Removing the best selling price and best buying price
> 0	0	Missing	Removing the best selling price
> 0	Missing	0	Removing the best buying price
> 0	> 0	> 0	Adding / changing the best selling price and best buying price
> 0	> 0	Missing	Adding / changing the best selling price
> 0	Missing	> 0	Adding / changing the best buying price

Quote - Best Bid or Offer.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'S'.
117	QuoteID	Y	UInt64	The identifier of the quote.
131	QuoteReqID	Y	String20	The identifier of the stream assigned by the liquidity consumer.
537	QuoteType	C	Int8	The quote type: • '0' – 'indicative' quote which requires the approval from the provider (with Last Look) • '1' – 'firm' quote with an automatic confirmation (no Last Look). Mandatory if OfferSize>0 and BidSize>0.
55	Symbol	Y	String25	The symbolic identifier of the instrument.
133	OfferPx	C	Price16.5	The best sell price. Mandatory if OfferSize>0.
135	OfferSize	N	UInt64	The sell quote volume. A value of '0' means no sell quotes in the liquidity stream.
132	BidPx	C	Price16.5	The best buy price. Mandatory if BidSize>0.
134	BidSize	N	UInt64	The buy quote volume. A value of '0' means no buy quotes in the liquidity stream.
<'Trailer' group>		Y		

Quote - liquidity stream creation confirmation.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'S'.
117	QuoteID	Y	UInt64	A value of '0' means confirmation of the stream.
131	QuoteReqID	Y	String20	The identifier of the stream assigned by the liquidity consumer.
21002	AuctionID	Y	UInt64	The identifier of the stream assigned by the RFS system.
60	TransactTime	Y	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
55	Symbol	Y	String25	The symbolic identifier of the instrument.
135	OfferSize	Y	UInt64	A value of '0'.
134	BidSize	Y	UInt64	A value of '0'.
20027	ExternalID	N	UInt64	The external identifier of the stream.
58	Text	N	String20	The comment of the liquidity consumer.
<'Trailer' group>		Y		

5.2.2.2. QuoteResponse

The message is used in the following cases:

- Successful closure of the liquidity stream.
- Refusal of a request to close the liquidity stream.
- Refusal of a request for quote execution.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'AJ'.
693	QuoteRespID	N	String20	The identifier of the request to close the liquidity stream or identifier of the request for quote execution. The field is absent in the unsolicited message about successful close of the liquidity stream.
131	QuoteReqID	Y	String20	The identifier of the stream assigned by the liquidity consumer
21002	AuctionID	C	UInt64	The identifier of the stream assigned by the RFS system. Mandatory if QuoteRespType=6 and QuoteRespType=3.
694	QuoteRespType	Y	int	The response type: • '6' – (Pass). The stream is closed. • '3' – (Expired). The stream is expired. • '1000' – (Rejected). The request is rejected.
55	Symbol	C	String25	The symbolic identifier of the instrument. Mandatory if QuoteRespType=6 and QuoteRespType=3.
58	Text	C	String255	Error code and description. Mandatory if QuoteRespType=1000. When the stream is closed by the trading administrator - Text='Closed by administrator'.
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<Group Parties>		N		Used to indicate in unsolicited messages the login name of the user who completed the operation.
<'Trailer' group>		Y		

5.2.2.3. QuoteRequestReject

The refusal to open the liquidity stream.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'AG'.
131	QuoteReqID	Y	String20	The identifier of the request for stream
658	QuoteRequestRejectReason	Y	Int8	=99 (Other)
58	Text	Y	String255	Error code and description
146	NoRelatedSym	Y	NumInGroup	=1
=>55	Symbol	Y	String25	The symbolic identifier of the instrument
<'Trailer' group>		Y		

5.2.2.4. ExecutionReport

The message is used in the following cases:

- The successful quote execution by the liquidity consumer - ExecType=F and OrdStatus=2.
- The quote execution by the liquidity consumer is not successful - ExecType=8 and OrdStatus=8.
- Refusal to confirm the transaction by the liquidity provider - ExecType=8 and OrdStatus=8.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type '8'.
1	Account	Y	String3	Client code, 3 characters
693	QuoteRespID	Y	String20	The identifier of the request for quote execution
131	QuoteReqID	Y	String20	The identifier of the stream assigned by the liquidity consumer
17	ExecID	Y	UInt64	The identifier of the execution
37	OrderID	Y	UInt64	The identifier of the liquidity consumer’s order sent to SPECTRA
21002	AuctionID	Y	UInt64	The identifier of the stream assigned by the system
55	Symbol	Y	String25	The symbolic identifier of the instrument.
150	ExecType	Y	char	Execution type:

Tag	Field	Manda-tory	Type	Details
				• 'F' – Trade. • '8' – Rejected.
39	OrdStatus	Y	char	The quote status: • '2' – Filled. • '8' – Rejected.
103	OrderRejReason	C	Int8	Rejection reason: • '99' – Other. • '0' – Broker/Exchange option. Mandatory if ExecType=8 and OrdStatus=8.
58	Text	C	String255	Error code and description. Mandatory if ExecType=8 and OrdStatus=8 and an error happened while adding the LC order to the SPECTRA.
54	Side	Y	char	The quote direction: • '1' – Buy. • '2' – Sell.
44	Price	Y	Price16.5	The quote execution price
6	AvgPx	Y	Price16.5	The quote execution price
14	CumQty	Y	UInt64	Trade volume
151	LeavesQty	Y	UInt64	Order volume
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<'Trailer' group>		Y		

5.2.2.5. TradingSessionStatus

Events in the Trading System.

Tag	Field	Manda-tory	Type	Details
<Group Header>		Y		Message type 'h'.
335	TradSesReqID	Y	Int64	The unique identifier of the event
336	TradingSessionID	Y	Int32	The identifier of the trading session
1368	TradSesEvent	Y	Int32	Event type: • '101' SessionDataReady - The data has been loaded from the clearing system into the trading session before the start of the trading session. • '102' IntradayClearingFinished - Settlement procedures during the intraday clearing session are applied. • '104' IntradayClearingStarted - Start of the intraday clearing session.. • '105' ClearingStarted - Start of the main clearing session. • '106' ExtensionOfLimitsFinished - Limit expansion is over. • '108' BrokerRecalcFinished - Cash is recounted after the intraday clearing session. • '10100' RfsSessionInited - RFS session is assigned. • '10101' RfsSessionStarted - RFS session has started. • '10102' RfsSessionSuspended - RFS session is suspended. • '10103' RfsSessionStoped - RFS session is stopped. • '10104' RfsSessionFinished - RFS session is finished.
58	Text	Y	String64	The event description

Tag	Field	Mandatory	Type	Details
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<'Trailer' group>		Y		

5.2.2.6. Unsolicited messages

Any FIX LC login has the right and obligation to receive all information on any liquidity stream initiated by him and only this information. If the stream created by the FIX login is closed by another login, an 'unsolicited message' is sent to the FIX session of LC-the creator of this stream. An unsolicited message is a normal FIX **QuoteResponse** message about a successfully liquidation stream closing for LC. But this message has no 'QuoteRespID' field and has an additional optional 'Parties' group, which is used to indicate the login that performed the operation.

Tag	Field	Mandatory	Type	Details
453	NoPartyIDs	N	NumInGroup	Repeating group below should contain unique combinations of PartyID, PartyIDSource, and PartyRole
=> 448	PartyID	Y	String20	Transaction initiator login
=> 447	PartyIDSource	Y	char	'C' - Generally accepted market participant identifier.
=> 452	PartyRole	Y	Int32	'3' - Client ID.

5.3. Supported messages. The role of the liquidity provider

5.3.1. Messages from the Client to FixGate

5.3.1.1. Quote

The request to add, change (move) or cancel quotes by the liquidity provider. The purpose of the message is determined by the values of 'OfferSize' and 'BidSize'. The table below contains possible combinations of the values and their interpretations by FixGate:

OfferSize	BidSize	FixGate interpretation
Missing	Missing	Error. Reject with SessionRejectReason=99 (Other); Text= 'Incorrect values in OfferSize and BidSize'.
> 0	0	Error. Reject with SessionRejectReason=99 (Other); Text= 'Incorrect values in OfferSize and BidSize'.
0	> 0	Error. Reject with SessionRejectReason=99 (Other); Text= 'Incorrect values in OfferSize and BidSize'.
0	0	The command to delete bilateral quote.
0	Missing	The command to delete sell quote.
Missing	0	The command to delete buy quote.
> 0	> 0	The command to add/move bilateral quote.
> 0	Missing	The command to add/move sell quote.
Missing	> 0	The command to add/move buy quote.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'S'.
1	Account	Y	String3	Client code, 3 characters
117	QuoteID	Y	String20	The identifier of the request to add, change (move) or cancel quotes assigned by the provider
131	QuoteReqID	Y	String20	The identifier of the stream assigned by the system
537	QuoteType	C	Int8	The quote type: • '0' – 'indicative' quote which requires the approval from the provider (with Last Look); • '1' – 'firm' quote with an automatic confirmation (no Last Look). The field is mandatory in the message with BidSize>0 or OfferSize>0.
453	NoPartyIDs	N	NumInGroup	Possible values: '1'

Tag	Field	Mandatory	Type	Details
=>448	PartyID	C	String64	Broker code, 4 characters. Mandatory if NoPartyIDs=1.
=>447	PartyIDSource	C	char	'D' - Proprietary / Custom code. Mandatory if NoPartyIDs=1.
=>452	PartyRole	C	int	'7' - Entering Firm. Mandatory if NoPartyIDs=1.
133	OfferPx	C	Price16.5	The sell quote price. The field is mandatory in the message with OfferSize>0.
135	OfferSize	C	UInt64	The sell quote volume. The field is mandatory in the message with no BidSize field.
132	BidPx	C	Price16.5	The buy quote price. The field is mandatory in the message with BidSize>0.
134	BidSize	C	UInt64	The buy quote volume. The field is mandatory in the message with no OfferSize field.
20025	OfferExternalID	N	UInt64	The external identifier of the sell quote
20024	BidExternalID	N	UInt64	The external identifier of the buy quote
1629	ExposureDuration	N	UInt64	The quote lifetime in microseconds. In the absence of a field in the message, the quote life time coincides with the liquidity stream lifetime.
20032	OfferText	N	UInt64	Comment to the sell quote
20031	BidText	N	UInt64	Comment to the buy quote
<'Trailer' group>		Y		

5.3.1.2. QuoteCancel

The request for a bulk removal of quotes by the liquidity provider.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'Z'.
117	QuoteID	Y	String20	The identifier of the request for a bulk removal of quotes
453	NoPartyIDs	N	NumInGroup	Possible values: '1'
=>448	PartyID	C	String64	Broker code, 4 characters. Mandatory if NoPartyIDs=1.
=>447	PartyIDSource	C	char	'D' - Proprietary / Custom code. Mandatory if NoPartyIDs=1.
=>452	PartyRole	C	int	'7' - Entering Firm. Mandatory if NoPartyIDs=1.
298	QuoteCancelType	Y	UInt64	Removal Method: • '1' (Cancel for Symbol) – by instrument code; • '1000' (Cancel for Client code) – by client code; • '1001' (Cancel by External identifier) – by external identifier of the stream.
1	Account	C	String3	Client code, 3 characters. The field is mandatory in the message with QuoteCancelType=1000.
55	Symbol	C	String25	The symbolic identifier of the instrument. The field is mandatory in the message with QuoteCancelType=1.
20027	ExternalID	C	UInt64	The external identifier of the stream. The field is mandatory in the message with QuoteCancelType=1001.
<'Trailer' group>		Y		

5.3.1.3. ExecutionReport

Trade confirmation by the liquidity provider.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type '8'.
11	ClOrdID	Y	String20	The identifier of the indicative trade confirmation send by the liquidity provider
131	QuoteReqID	Y	UInt64	The identifier of the stream assigned by the system
17	ExecID	Y	UInt64	The indicative trade identifier from request '6.3.2.5. NewOrderSingle'

Tag	Field	Manda-tory	Type	Details
37	OrderID	Y	Int64	ClOrdID (11) from request '6.3.2.5. NewOrderSingle' to confirm indicative trade received by LP from RFS system
55	Symbol	Y	String25	The symbolic identifier of the instrument
150	ExecType	Y	char	='F' (Trade)
39	OrdStatus	Y	char	='2' (Filled)
54	Side	Y	char	The quote direction: • '1' – Buy. • '2' – Sell.
44	Price	Y	Price16.5	The execution price
6	AvgPx	Y	Price16.5	The execution price
14	CumQty	Y	UInt64	The trade volume of the approved quote
151	LeavesQty	Y	UInt64	=0
<'Trailer' group>		Y		

5.3.2. Messages from FixGate to the Client

5.3.2.1. QuoteRequest

Notification to the liquidity provider that the stream is initiated by the liquidity consumer.

Tag	Field	Manda-tory	Type	Details
<Group Header>		Y		Message type 'R'.
131	QuoteReqID	Y	UInt64	The identifier of the stream assigned by the system
146	NoRelatedSym	Y	NumInGroup	=1
=>537	QuoteType	Y	Int8	The allowable quote type: • '0' – all quotes; 'indicative' quote which requires the approval from the provider (with Last Look), and 'firm' quote with an automatic confirmation (no Last Look); • '1' – only 'firm' quotes (no Last Look).
=>21000	SpeedBumpType	Y	char	The minimum lifetime of quotes from liquidity providers: • '0' – not applicable; • '1' – 0.2 seconds; • '2' – 0.5 seconds; • '3' – 1 seconds; • '4' – 3 seconds;
=>21011	StreamExposureDuration	Y	char	The stream duration: • '0' – not applicable; • '1' – 30 seconds; • '2' – 60 seconds; • '3' – 90 seconds; • '4' – 120 seconds;
=>60	TransactTime	Y	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss
=>55	Symbol	Y	String25	The symbolic identifier of the instrument
=>38	OrderQty	Y	UInt64	The quote volume in contracts
=>54	Side	Y	char	The quote direction: • '1' – Buy.

Tag	Field	Mandatory	Type	Details
				• '2' – Sell. • 'Y' – BothSides.
21001	TextToLP	N	String20	The comment for the liquidity provider
<'Trailer' group>		Y		

5.3.2.2. QuoteResponse

Notification to the liquidity provider that the stream is closed.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'AJ'.
693	QuoteRespID	Y	String20	Liquidity stream closure notification identifier. Unique in the trading session.
131	QuoteReqID	Y	UInt64	The identifier of the stream assigned by the system
694	QuoteRespType	Y	int	The response type: • '1' – (Hit/Lift). The stream was closed by a trade performed at the provider quote. • '6' – (Pass). The stream is closed. • '3' – (Expired). The stream is expired. • '5' – (Done Away). The stream was closed by a trade performed at the other provider quote. • '1001' – (Closed by administrator). The stream is closed by the administrator.
55	Symbol	Y	String25	The symbolic identifier of the instrument
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<'Trailer' group>		Y		

5.3.2.3. QuoteStatusReport

The message is used in the following cases:

- The liquidity provider successfully adds / moves / deletes quotes.
- The liquidity provider is refused to add / move / delete quotes.
- Bulk removal of quotes by the provider.
- Quotes are expired.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'AI'.
117	QuoteID	N	String20	Quote ID from provider request. The field is absent in the unsolicited message about the successful change / deletion of the quote.
131	QuoteReqID	N	UInt64	The identifier of the stream
297	QuoteStatus	Y	Int8	The quote status: • '0' – (Accepted). The quote is accepted. / Report on successful mass quotes removal. • '1' – (Canceled for Symbol). The quote is removed. The command Quote is sent by the provider. • '5' – (Rejected). The quote is rejected. / Report on unsuccessful mass removal of quotes. • '6' – (Removed from Market). The quote is removed. The command Quote Cancel (bulk removal) is sent by the provider or by the administrator.

Tag	Field	Mandatory	Type	Details
				• '7' – (Expired). The quote is expired.
135	OfferSize	C	UInt64	The sell quote volume. The field is mandatory in the case of a one-way sell quote and of a two-way quote. The field is missing in the message in case of a one-way buy quote.
134	BidSize	C	UInt64	The buy quote volume. The field is mandatory in the case of a one-way buy quote and of a two-way quote. The field is missing in the message in case of a one-way sell quote.
20025	OfferExternalID	C	UInt64	The external identifier of the sell quote. The field is mandatory in the case of a one-way sell quote and of a two-way quote. The field is missing in the message in case of a one-way buy quote.
20024	BidExternalID	C	UInt64	The external identifier of the buy quote. The field is mandatory in the case of a one-way buy quote and of a two-way quote. The field is missing in the message in case of a one-way sell quote.
658	QuoteRequestRejectReason	Y	Int8	=99 (Other)
1168	TotNoCxldQuotes	C	Int32	The number of removed quotes. The field is required in the report on successful mass removal of quotes (QuoteStatus = 0).
58	Text	C	String255	Error code and description. In the report on successful mass removal of quotes, this field transmits information on the number of not removed quotes.
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<Group Parties>		N		Used to indicate in unsolicited messages the login name of the user who completed the operation.
<'Trailer' group>		Y		

5.3.2.4. ExecutionReport

The message is used in the following cases:

- The trade is executed - ExecType=F and OrdStatus=2.
- The trade is not executed - ExecType=8 and OrdStatus=8.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type '8'.
1	Account	Y	String3	Client code, 3 characters
693	QuoteRespID	Y	String20	The identifier of the request for quote execution
17	ExecID	Y	UInt64	The identifier of the execution
37	OrderID	Y	UInt64	The identifier of the order sent to SPECTRA
21002	AuctionID	Y	UInt64	The identifier of the stream assigned by the system
55	Symbol	Y	String25	The symbolic identifier of the instrument
150	ExecType	Y	char	Execution type: • 'F' – Trade. • '8' – Rejected.
39	OrdStatus	Y	char	The quote status: • '2' – Filled. • '8' – Rejected.
103	OrderRejReason	C	Int8	Rejection reason: • '99' – Other. Mandatory if ExecType=8 and OrdStatus=8.
58	Text	C	String255	Error code and description. Mandatory if ExecType=8 and OrdStatus=8 and an error happened while adding the LP order to the SPECTRA.
54	Side	Y	char	The quote direction: • '1' – Buy.

Tag	Field	Mandatory	Type	Details
				• '2' – Sell.
44	Price	Y	Price16.5	Execution price
6	AvgPx	Y	Price16.5	Execution price
14	CumQty	Y	UInt64	Trade volume
151	LeavesQty	Y	UInt64	Order volume
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<'Trailer' group>		Y		

5.3.2.5. NewOrderSingle

The request for the trade confirmation by the provider

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'D'.
11	ClOrdID	Y	Int64	The identifier of a request for confirmation of an indicative trade sent by the RFS system to the LP provider
131	QuoteReqID	Y	UInt64	The identifier of the stream assigned by the system
117	QuoteID	Y	UInt64	The identifier of the quote to be confirmed
17	ExecID	Y	UInt64	The indicative trade identifier
55	Symbol	Y	String25	The symbolic identifier of the instrument
44	Price	Y	Price16.5	The quote price
40	OrdType	Y	cha	=2 (Limit)
38	OrderQty	Y	UInt64	Quote volume in contracts
54	Side	Y	char	The quote direction: • '1' – Buy. • '2' – Sell.
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<'Trailer' group>		Y		

5.3.2.6. TradingSessionStatus

Events in the Trading System.

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type 'h'.
335	TradSesReqID	Y	Int64	The unique identifier of the event
336	TradingSessionID	Y	Int32	The identifier of the trading session
1368	TradSesEvent	Y	Int32	Event type: • '101' SessionDataReady - The data has been loaded from the clearing system into the trading session before the start of the trading session. • '102' IntradayClearingFinished - Settlement procedures during the intraday clearing session are applied. • '104' IntradayClearingStarted - Start of the intraday clearing session.. • '105' ClearingStarted - Start of the main clearing session. • '106' ExtensionOfLimitsFinished - Limit expansion is over. • '108' BrokerRecalcFinished - Cash is recounted after the intraday clearing session. • '10100' RfsSessionInited - RFS session is assigned.

Tag	Field	Manda-tory	Type	Details
				• '10101' RfsSessionStarted - RFS session has started. • '10102' RfsSessionSuspended - RFS session is suspended. • '10103' RfsSessionStoped - RFS session is stopped. • '10104' RfsSessionFinished - RFS session is finished.
58	Text	Y	String64	The event description
60	TransactTime	N	UTCTimestamp	The date and time of the event. Format: YYYYMMDDHH:MM:SS.sssssssss.
<'Trailer' group>		Y		

5.3.2.7. Unsolicited messages

Any FIX LP login has the right and obligation to receive all information on any quote initiated by him. If the quote set by the FIX login is deleted / changed by another login, an 'unsolicited message' is sent to the FIX session of LP- owner this quote. An unsolicited message is a normal FIX **QuoteStatusReport** message about quote changing or deleting. But this message has no 'QuoteID' field and has an additional optional 'Parties' group, which is used to indicate the login that performed the operation.

Tag	Field	Manda-tory	Type	Details
453	NoPartyIDs	N	NumInGroup	Repeating group below should contain unique combinations of PartyID, PartyIDSource, and PartyRole
=> 448	PartyID	Y	String20	Transaction initiator login
=> 447	PartyIDSource	Y	char	'C' - Generally accepted market participant identifier.
=> 452	PartyRole	Y	Int32	'3' - Client ID.

5.4. Trading interaction scenarios

5.4.1. Adding a liquidity stream

LC creates a stream by sending the **QuoteRequest** message to the FixGate. If the liquidity stream is created successfully, FixGate sends LC the **Quote** message containing the stream ID assigned by RFS system in 'AuctionID' and 'QuoteReqID' fields. 'QuoteReqID' is the ID of a consumer unique to the consumer, it can be used by the consumer to delete the stream and to reply the quote. FixGate broadcasts the **QuoteRequest** message containing the stream ID assigned by RFS system to all LP's users in the 'QuoteReqID' field.

In case of the rejection FixGate sends LC the **QuoteRequestReject** message with an error code and error description.

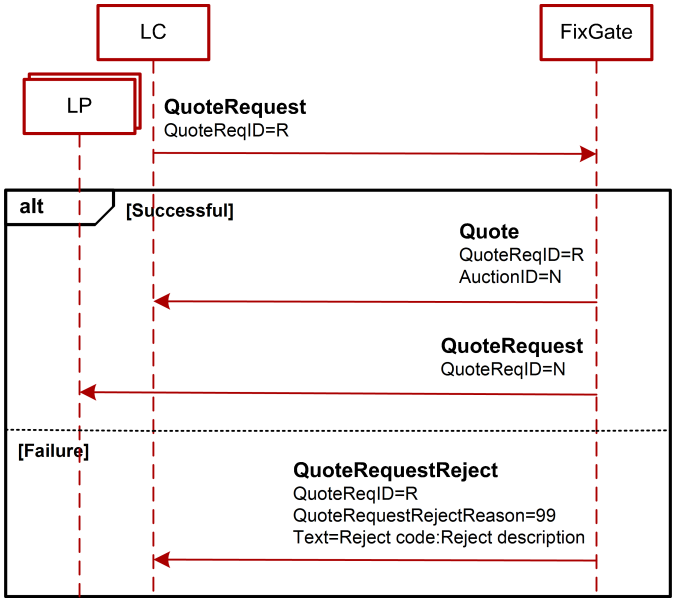

Figure 1. Diagram. Creation of a liquidity stream

5.4.2. Closing a liquidity stream

5.4.2.1. Closing a stream on LC's request

In order to close the liquidity stream LC sends the **QuoteResponse** message to the FixGate using 'QuoteReqID' to identify the stream and specifying QuoteRespType=6 (Pass). If deletion of the stream succeeds, FixGate sends LC the **QuoteResponse** message containing the stream ID in 'AuctionID' and 'QuoteReqID' fields and QuoteRespType=6 (Pass). FixGate broadcasts to all LP's users the **QuoteResponse** message containing the stream ID in the 'QuoteReqID' field, and QuoteRespType=6 (Pass).

In case of the rejection FixGate sends LC the **QuoteResponse** message with an error code.

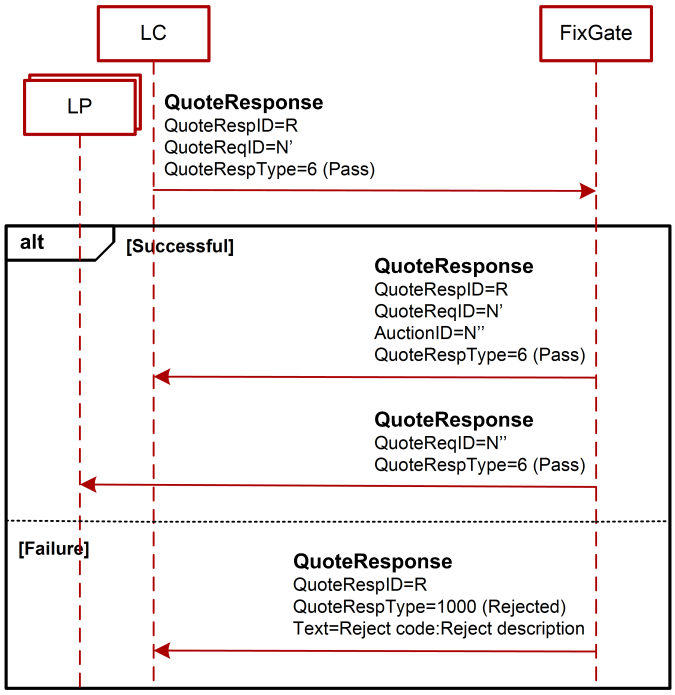

Figure 2. Diagram. Closing a stream on LC's request

5.4.2.2. Closing a stream at the end of the trading session or at the end of StreamExposureDuration

Upon the closing of a stream at the end of the trading session or at the end of StreamExposureDuration FixGate broadcasts the **QuoteResponse** message containing the liquidity stream identifiers in the 'AuctionID' and 'QuoteReqID' fields and QuoteRespType=3 (Expired) to the user who created the stream and all LP's users.

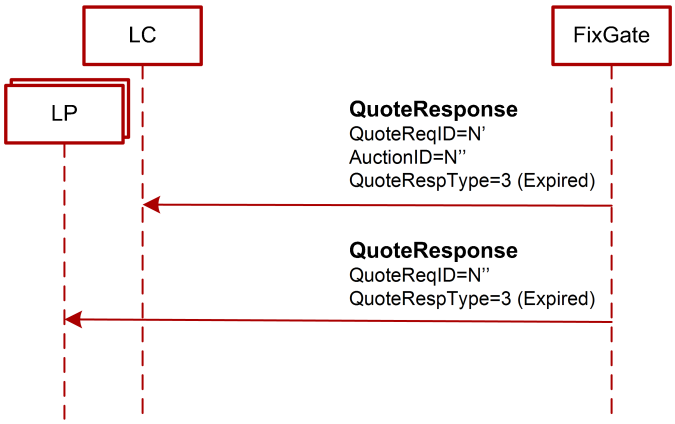

Figure 3. Diagram. Closing a stream at the end of the trading session or at the end of StreamExposureDuration

5.4.2.3. Closing a stream by the trade administrator

Upon the closing of a stream by the administrator FixGate broadcasts the **QuoteResponse** message containing the liquidity stream identifiers in the 'AuctionID' and 'QuoteReqID' fields and QuoteRespType=1001 (Closed by administrator) to the user who created the stream and all LP's users.

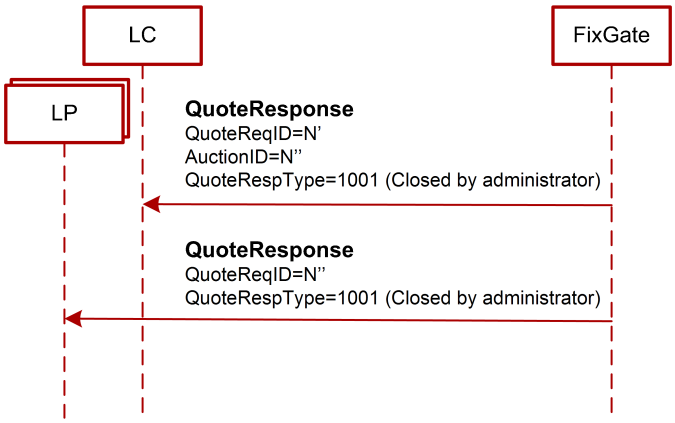

Figure 4. Diagram. Closing a stream by the trade administrator

5.4.3. Adding quotes into a liquidity stream by providers

5.4.3.1. Adding quotes into an empty stream

LP1 adds a new quote into an empty liquidity stream by sending the **Quote** message to the FixGate. If the quote is successfully added, FixGate sends the **QuoteStatusReport** message to LP1. If the quote is successfully added, FixGate sends the **Quote** message with a BBO update to LC.

In case of rejection FixGate sends LP1 the **QuoteStatusReport** message with an error code.

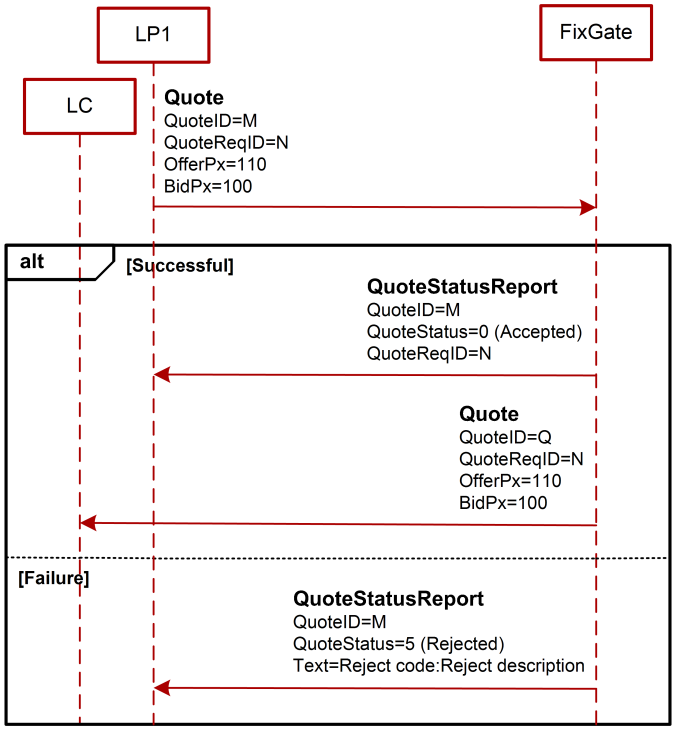

Figure 5. Diagram. Adding a quote into an empty stream

5.4.3.2. Adding a quote without changing the BBO

LP2 adds a new quote that is worse than the existing one from LP1 by sending a **Quote** message to the FixGate. If adding succeeds, FixGate sends the **QuoteStatusReport** message to LP2. If it's rejected, FixGate sends LP2 the **QuoteStatusReport** message with an error code. LP1 does not see LP2's quote.

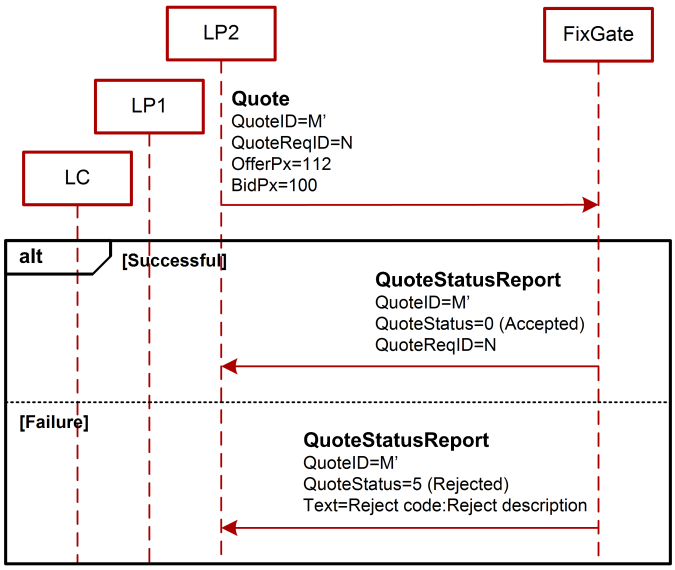

Figure 6. Diagram. Adding a quote without changing the BBO

5.4.3.3. Adding a quote with changing the BBO

LP2 adds a new quote that is better than the existing one from LP1 by sending a **Quote** message to the FixGate. Adding succeeds. FixGate sends the **QuoteStatusReport** message to LP2. FixGate sends the **Quote** message with the BBO update. LP1 does not see LP2's quote.

In case of rejection FixGate sends LP2 the **QuoteStatusReport** message with an error code.

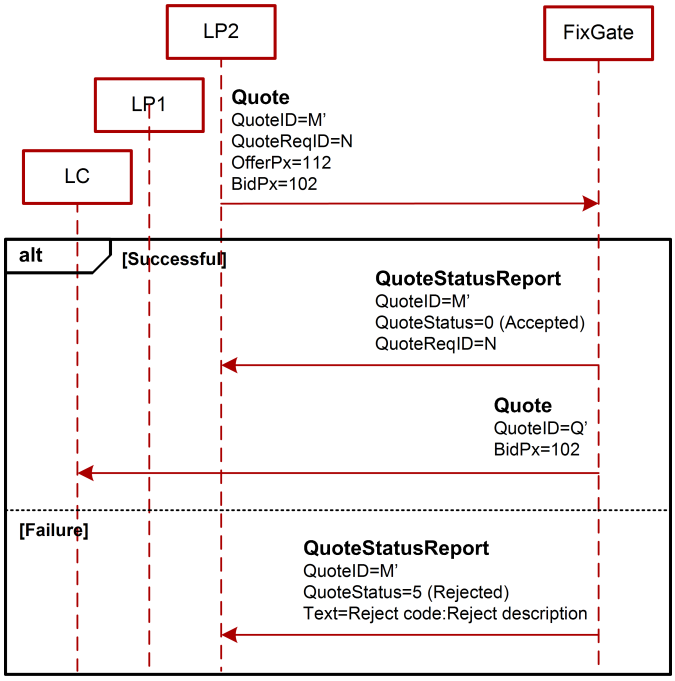

Figure 7. Diagram. Adding a quote with changing the BBO

5.4.4. Changing quotes by the provider

LP2 changes its quote by sending the **Quote** message to the FixGate. The changes do not affect BBO in the stream. If the quote successfully changes, FixGate sends the **QuoteStatusReport** message to LP2. In case of rejection (including the triggering of Speed bump) FixGate sends the **QuoteStatusReport** message to LP2.

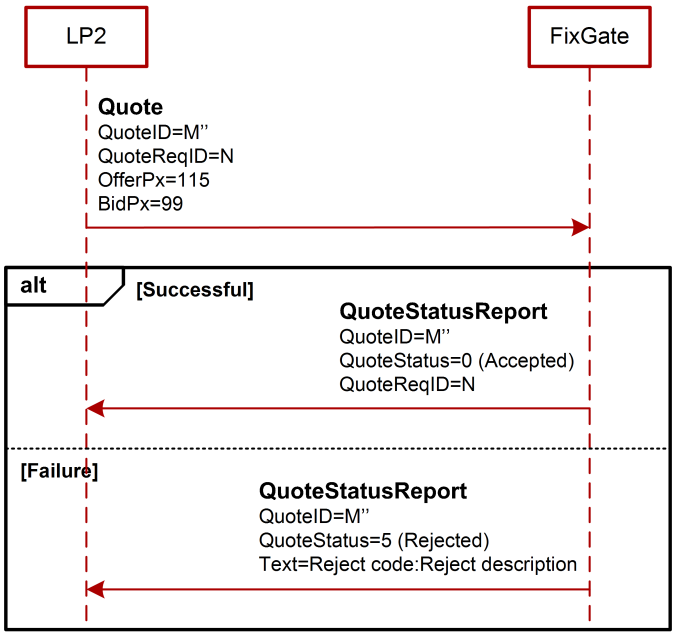

Figure 8. Diagram. Changing a quote

5.4.5. Deleting quotes by the provider

5.4.5.1. Deletion of a single quote

LP1 deletes a single quote by sending the **Quote** message with OfferSize=0 and BidSize=0 to the FixGate. If the deletion succeeds, FixGate returns the **QuoteStatusReport** message with OfferSize=0 and BidSize=0.

In case of rejection FixGate sends LP1 the **QuoteStatusReport** message with a rejection reason in the 'Text' field.

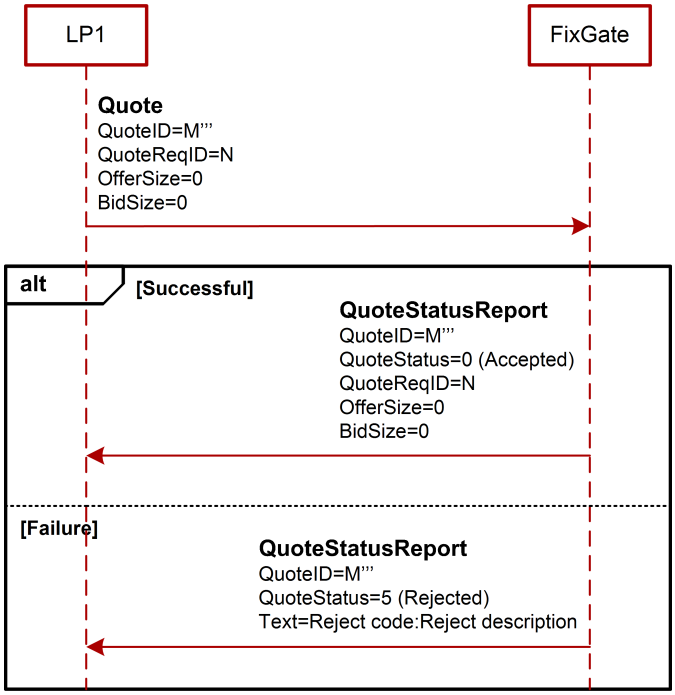

Figure 9. Diagram. Deletion of a single quote

5.4.5.2. Deletion of multiple quotes

Mass quote deletion can be performed:

- Using the instrument ID in the 'Symbol' field;
- Using the client ID in the 'Account' field;

- Using the external number in the 'ExternalID' field.

LP1 performs mass quote deletion using the instrument ID by sending the **QuoteCancel** message to FixGate. If the mass deletion succeeds, FixGate returns a **QuoteStatusReport** message with OfferSize=0 and/or BidSize=0 for each deleted quote. In the end FixGate sends LP1 the **QuoteStatusReport** message with the number of deleted quotes.

In case of rejection FixGate sends LP1 the **QuoteStatusReport** message with a rejection reason in the 'Text' field.

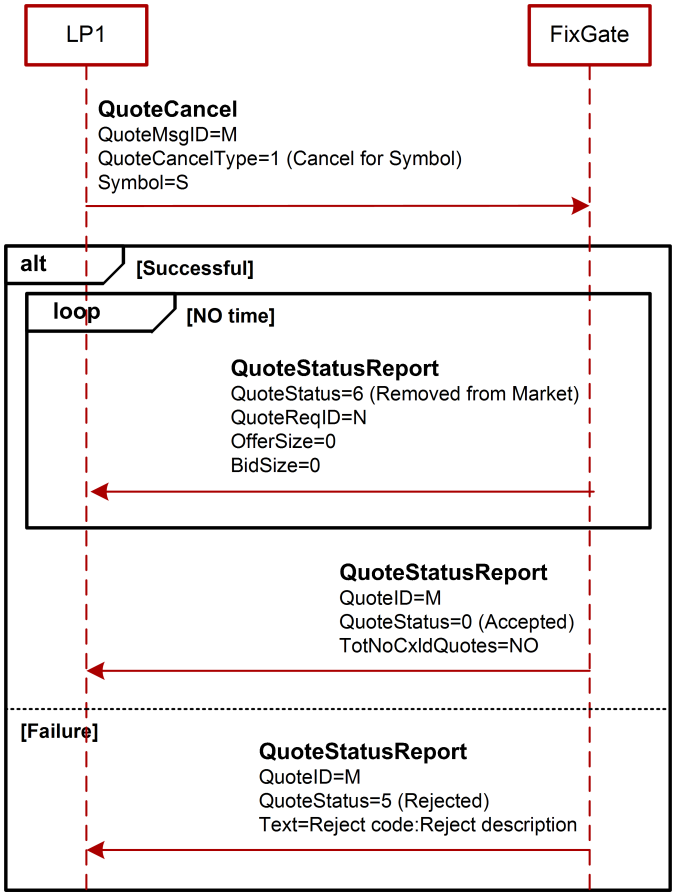

Figure 10. Diagram. Deletion of multiple quotes

5.4.6. Quote execution request in stream

In answer to quotes listed by providers liquidity consumer (LC) can send a **QuoteResponse** message with QuoteRespType=1 (Hit/Lift), thereby confirming the intension to make a trade at the suggested price (opposite quote). The trade is performed by the following algorithm:

- LC's and LP's quotes are being matched in the stream. After matching the quotes, a indicative trade is formed in RFS. An order from LC with attributes from the indicative trade is created in the SPECTRA trading system. All standard checks, including the collateral sufficiency verification, are performed before creating the order.
- If the order has not been added within SPECTRA, the indicative trade terminates in RFS, and the liquidity stream closes. LC and LP participating in the indicative trade receive **ExecutionReport** (Trade has not been performed) messages. LC and all LP receive a stream closing notification **QuoteResponse** with QuoteRespType=6 (Pass).
- If the order is added in SPECTRA, LP receives the **NewOrderSingle** message (Confirmation request). RFS waits for the provider's trade confirmation (Last Look) for a set (by the administrator) amount of time. This step is skipped if the quote has the 'QuoteType=1 (no Last Look)' type.
- If the provider rejects the trade (does not confirm the indicative trade), the indicative trade is terminated in RFS, the LP's quote is deleted from the stream, LC and LP receive **ExecutionReport** (Last look rejection) messages. If the BBO in the stream was changed, LC receives the **Quote** message with a BBO update.
- If the confirmation is received (or the quote had 'QuoteType=1'), an order from the provider is created in SPECTRA. All standard checks, including the collateral sufficiency verification, are performed before creating the order.
- If the order has not been added within SPECTRA, the indicative trade terminates in RFS, the LP's quote is deleted from the stream, LC and LP receive **ExecutionReport** (Trade has not been performed) messages. If the BBO in the stream was changed, LC receives the **Quote** message with a BBO update.
- If the LP order is added successfully and the LC and LP orders are matched into a trade in SPECTRA, the indicative trade completes in RFS-system and the liquidity stream closes. The following messages will be sent:

- LC receives **ExecutionReport** (Trade completed) message.
- LP participating in the indicative trade receives messages **ExecutionReport** (Trade completed) and **QuoteResponse** with QuoteRespType=1 (Hit/Lift).
- All the rest LPs receive stream closing notification **QuoteResponse** with QuoteRespType=5 (Done Away).

5.4.6.1. Execution request. Positive scenario

The diagram depicts a successful execution of a quote (in the stream without ‘Last look’) in the RFS system and a successful performing of a trade within the SPECTRA system.

LC sends a quote execution request by sending the **QuoteResponse** message with QuoteRespType=1 (Hit/Lift) to the FixGate. Upon successful execution of quotes FixGate sends the following messages:

- LC receives **ExecutionReport** (Trade completed) message.
- LP participating in the indicative trade receives messages **ExecutionReport** (Trade completed) and **QuoteResponse** with QuoteRespType=1 (Hit/Lift).
- All the rest LPs receive stream closing notification **QuoteResponse** with QuoteRespType=5 (Done Away).

In case of rejection FixGate sends LC the **QuoteResponse** message with a rejection reason in the 'Text' field.

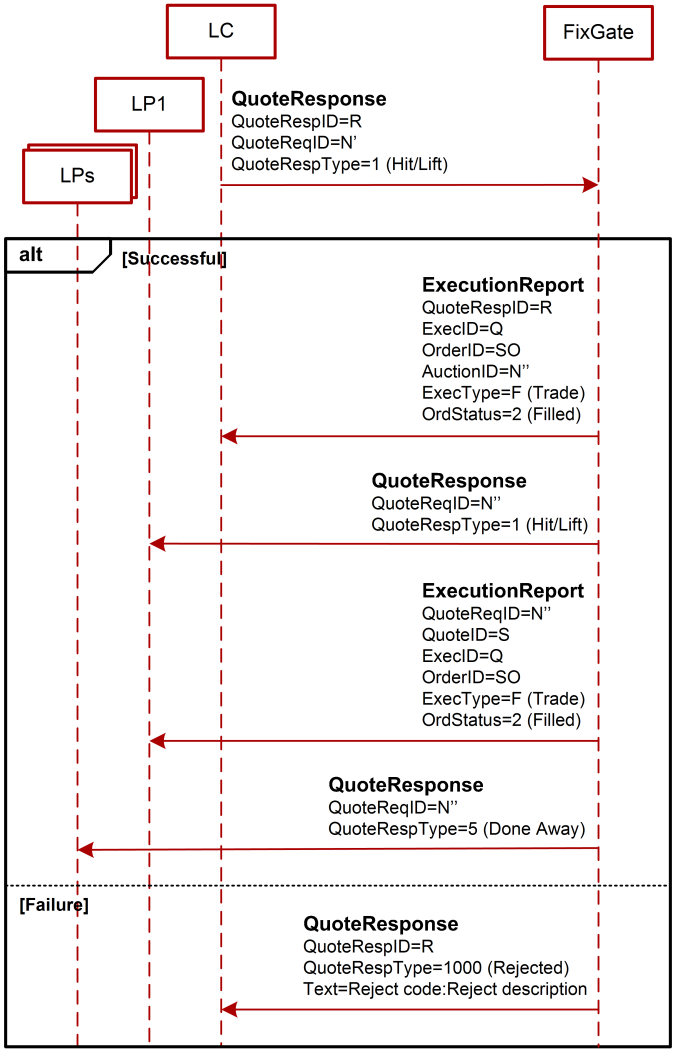

Figure 11. Diagram. Execution request. Positive scenario

5.4.6.2. Error in placing LC’s order

If the LC’s order has not been added in SPECTRA, the indicative trade terminates in RFS, and the liquidity stream closes. LC and LP1 participating in the indicative trade receive **ExecutionReport** messages with a rejection code in the 'Text' field. LC and all LP receive a stream closing notification **QuoteResponse** with QuoteRespType=6 (Pass).

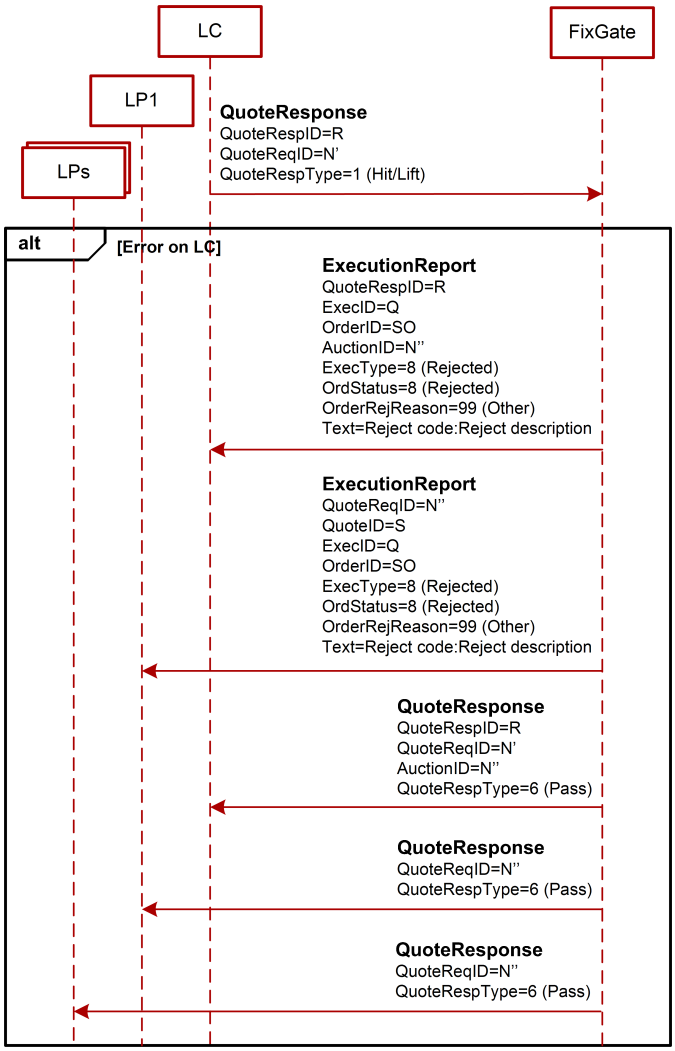

Figure 12. Diagram. Error in placing LC's order

5.4.6.3. Indicative trade confirmation

In the process of performing trades in OTC system there is a stage when the passive side can refuse the trade at the listed quote, or confirm the trade conditions (Last look). If the participant refuses the trade, he receives penalty. When listing a quote, the participant can opt out of the confirmation stage by specifying in the quote the QuoteType=1, this makes the quote confirmed by default. If 'Last look' is enabled, the passive side is required to confirm the indicative trade.

LC sends the execution request of the LP1's quote by sending the **QuoteResponse** message with QuoteRespType=1 (Hit/Lift) to the FixGate. If the quote is executed, FixGate sends the **NewOrderSingle** message to LP1, and LP1 sends the **ExecutionReport** message to the FixGate to confirm the trade. FixGate sends LC and LP1 notifications about the performed trade — **ExecutionReport**. The all LPs also receive **QuoteResponse** messages with QuoteRespType=5 (Done Away).

If LP1 did not send **ExecutionReport** before the timeout, RFS decides that LP1 rejected the trade. Liquidity stream continues, LP1's quote is deleted from the order book, FixGate sends LC and LP1 notifications about the non-confirmation of a trade - **ExecutionReport** with OrderRejReason=0 (Broker/Exchange option). If the BBO was changed, FixGate broadcasts the **Quote** message with a BBO update to LC, it is not shown on the diagram below for simplification.

In case of rejection of the indicative trade confirmation request FixGate sends LP1 the **ExecutionReport** message with a rejection reason in the 'Text' field.

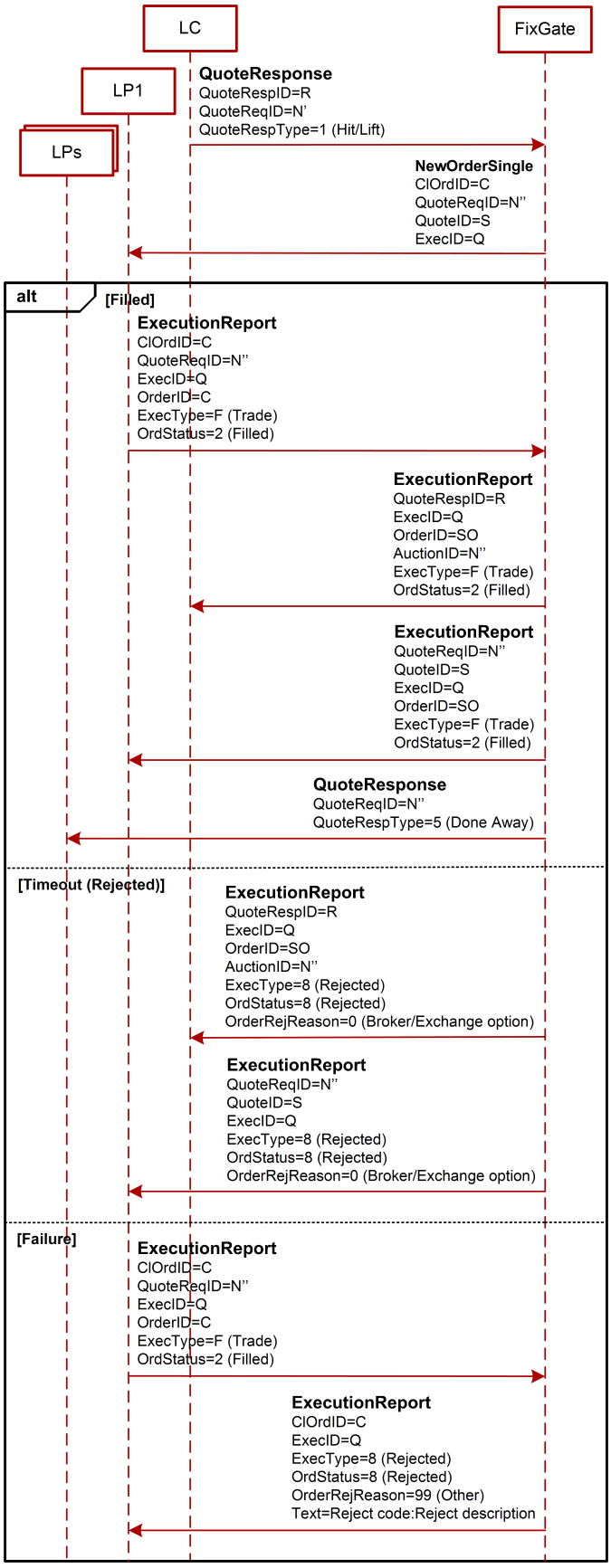

Figure 13. Diagram. Indicative trade confirmation

5.4.6.4. Error in placing LP’s order

If the LP’s order has not been added in SPECTRA, the indicative trade terminates in RFS, and the LP’s quote is deleted from the stream. LC and LP participating in the indicative trade receive **ExecutionReport** messages with a rejection code in the 'Text' field. If the BBO in the stream was changed, LC receives the **Quote** message with a BBO update.

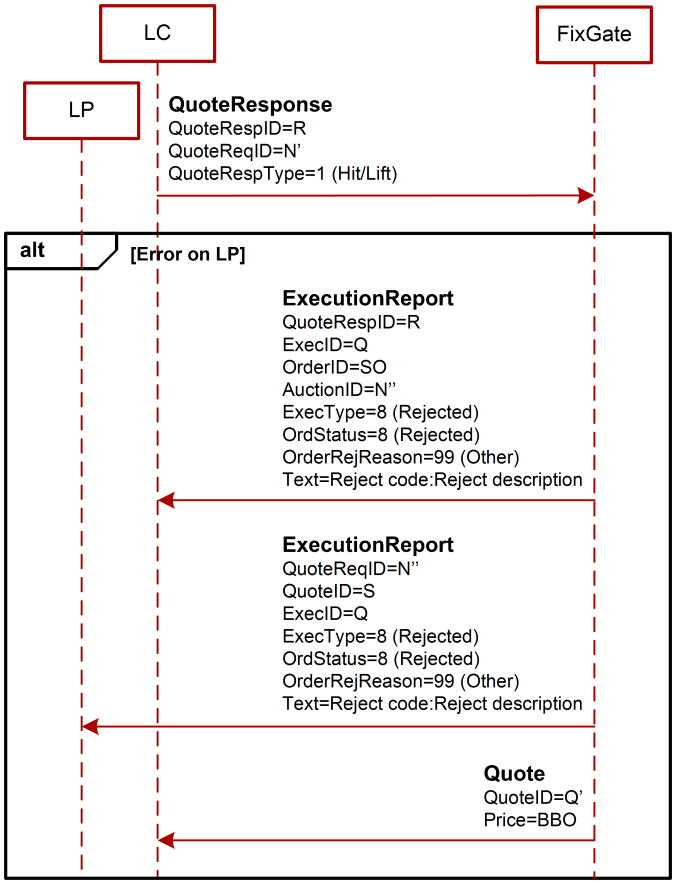

Figure 14. Diagram. Error in placing LP’s order

6. Flood Control

The control system of clients' application flood control is a part of the FixGate. It restricts client's application to send more transactions per time unit (for single fix session) than it is stated in the connection agreement. At present moment, you can acquire login with 30, 60, 90, etc. (but not more than 300) messages per second. If you exceed the limit of messages, the control system sends the user a reply message (Reject) of the following structure:

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type '3'.
373	SessionRejectReason	N	Int32	=7100 (Flood control)
58	Text	N	String255	Rejection reason details. Message text format: 'penalty_remain=%d;queue_size=%d;message=%s', where • Time in milliseconds after which the next message from this user will be successfully received. • queue_size - Number of messages for a single user. • message - error message text.
<Group Trailer>		Y		

The number of messages for the elapsed second is estimated while receiving every single message. Thus, if a user constantly sends requests with the frequency greater than it is allowed, then his messages will not be processed at all.

7. General System Error

In case of a system-level error in delivering and processing a message, the Client side receives message **Reject** containing the error details:

Tag	Field	Mandatory	Type	Details
<Group Header>		Y		Message type '3'.
373	SessionRejectReason	N	Int32	=7101 (System error)
58	Text	N	String255	Rejection reason details. Message text format: 'code=%d;message=%s'.
<Group Trailer>		Y		