Moscow Exchange Fix protocol specifications for OTC trades report system (OTC-monitor)

version 1.8.0

Moscow 2019

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History of changes

Date	Version	Changes
3.02.2016	1.5.0	Changes applied: • Section ‘4.1. Adding a trade report’: the following fields’ descriptions have been changed: TradeReportID, SecondaryTradeID, TrdType, SettlDate, SettlCurrency, CurrencyRatio, SecurityID, SecurityAltID. • Section ‘4.2. Canceling trade report’: field TradeReportID’s description have been changed. • Section ‘5.2. Trades broadcast’ now contains description of field LastPxRub. Description of field SettlCurrency has been removed from the section.
10.03.2016	1.5.1	Changes applied: • Section ‘4.1. Adding a trade report’: description of fields Currency and SettlCurrency now contains RUB instead of RUR. • Section ‘5.2. Trades broadcast’: description of field Currency now contains RUB instead of RUR.
23.03.2016	1.5.2	Changes applied: • Section ‘4.1. Adding a trade report’: the following fields’ descriptions have been changed: TradeReportID, SecondaryTradeID, Symbol. • Section ‘4.1. Adding a trade report’: message Trade Capture Report Ack (MsgType = AR), description of field TradeReportID has been changed. • Section ‘4.2. Canceling trade report’: descriptions of fields TradeReportID and SecondaryTradeID have been changed. • Section ‘5.2. Trades broadcast’ the following fields’ descriptions have been changed: TradeReportID, SecondaryTradeID, Symbol.
28.11.2016	1.5.3	Section ‘5.2. Trades broadcast’: flag Mandatory now changed to N in field SettlDate of message Trade Capture Report (MsgType = AE).
03.04.2017	1.5.3	Section ‘4.1. Adding a trade report’: the MarketID field’ description has been changed.
03.04.2019	1.8.0	Optional field **OnBehalfOfCompID** (participant code in the OTC-monitor system) added to message header - see section 2.1.

1. Introduction

1.1. Document purpose

The document below describes the protocol for interaction between the FIX Gate application and client's trading systems. The description is based on the standard FIX protocol (Financial Information Exchange, http://www.fixtradingcommunity.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

FIX Gate is a server application which provides availability for user applications such as robots, terminals, technical analysis systems, etc. to connect to the exchange trading sessions using the 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 document is based on description of the application layer protocol designed for interaction with OTC trades report system.

The FIX Gate for OTC-monitor allows to perform the following operations:

- add a trade report;
- add a trade deletion request.

Please note, that the directory of OTC-monitor instruments is not distributed via FIX Gate.

2. Description of fields and their values

There are many 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.
- **Presence** – a field attribute: specifies whether the field in message is mandatory or optional.
  - Y - mandatory field;
  - N - optional field;
  - C - mandatory, if meets the condition (see 'Description').
- **Description** – detailed description of the field.
- **Allowable values** - additional limitations.

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

2.1. Standard Header group

The standard header contained in every message contains.

Tag	Field name	Mandatory	Details
8	BeginString	Y	Specifies message start and protocol version.
9	BodyLength	Y	Message body length. Calculated in accordance with the standards.
35	MsgType	Y	The MsgType ID which is unique for every message.
49	SenderCompID	Y	Sender ID. The allowable values are specified by the exchange individually for every trading firm (broker firm).
115	OnBehalfOfCompID	N	Participant's ID added by the OTC-monitor system.
56	TargetCompID	Y	Recipient ID. (FIX-gate ID).
34	MsgSeqNum	Y	Message sequential number.
52	SendingTime	Y	Message sending time.
97	PossResend	N	Indicates the message containing some data which had been already sent with another sequential number.
43	PossDupFlag	N	Indicates the allowance for resending message using the same sequential number.

2.2. Standard Trailer group

The standard trailer (end) which every message contains.

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

3. 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.

3.1. 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.

3.1.1. Logon

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

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

3.1.2. Logout

Initiates or confirms session termination.

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

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

3.1.4. Test Request

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

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

3.1.5. 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 (e.g. MsgType=&) which successfully passes CheckSum and BodyLength checks.

Tag	Field name	Mandatory	Details
<'Header' group>		Y	Message type '3'.
45	RefSeqNum	Y	Rejected message number.
371	RefTagID	N	Invalid field number.
372	RefMsgType	N	Rejected message type.
373	SessionRejectReason	N	Rejection reason ID.
58	Text	N	Rejection reason details.
<'Trailer' group>		Y	

3.1.6. 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	Details
<'Header' group>		Y	Message type '2'.
7	BeginSeqNo	Y	Number of the first message to resend.
16	EndSeqNo	Y	Number of the last message to resend.
<'Trailer' group>		Y	

3.1.7. Sequence Reset

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

Tag	Field name	Mandatory	Details
<'Header' group>		Y	Message type '4'.
123	GapFillFlag	N	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.
16	NewSeqNo	Y	New sequence number.
<'Trailer' group>		Y	

3.2. Session establishing and termination scenarios

3.2.1. Session establishing and termination

For establishing connection to FIX Client a client must send the 'Logon' message including its 'SenderCompID'. If the 'Logon' message is valid and the sender was successfully authorized then FIX Gate 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 FIX Gate 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 FIX Gate and receive the 'Heartbeat' message in return. This may help to avoid missing and/or lost messages.

3.2.2. 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).

3.2.3. 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 FIX Gate in accordance with time interval specified by the 'HeartBtInt' field value in the 'Logon' Message.

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

3.2.4. 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.

3.2.5. 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 FIX gate server is unreachable, the client is recommended to establish connection to the secondary server to continue working according to the rules stated above.

The message numbers are synchronised between the primary and secondary FIX Gate servers, therefore, the message sequence will not be broken. However, there is a possibility of a severe failure which may lead message sequence to become out of sync. In this case, the client will receive a message with the sequence number less than expected. Due to this, it is recommended to the client either to wait the primary server to be recovered or use the message sequence resetting method.

4. Trading interaction

The message **Trade Capture Repor**t (**MsgType = AE**) is used both to add a trade report and to withdraw a trade report.

Now the participant can specify the participant code from the OTC-monitor system in the transaction report. To do this, a special optional field may be added to the message header **OnBehalfOfCompID**, containing this participant code (for details see section 2.1).

4.1. Adding a trade report

A client sends the '**Trade Capture Repor**t (**MsgType = AE**)' message to FIX Gate. The message contains 1 trade.

Tag	Field	Mandatory	Details
<Header group>		Y	Message type 'AE'.
856	TradeReportType	Y*	='0'
571	TradeReportID	Y*	Trade number within the Participant's internal accounting system.
1040	SecondaryTradeID	N	Purchase agreement number. Default value is ' '.
125	OrigTradeDate	Y*	Date of trade
552 =>54	NoSides = 1 Side	Y Y	Trade leg: • '1' - buy • '2' - sell All other values of the 'Side' tag are invalid and will be rejected.
=>453	NoPartyIDs = 2	Y*	
	=>448 PartyID =>447 PartyIDSource = D =>452 PartyRole = 3 (ClientID)	Y* Y* Y*	Participant's name on trade. Allowable values in **PartyID**: • 'P' - Participant themselves • 'A' - Client
	=>448 PartyID =>447 PartyIDSource = D =>452 PartyRole = 1 (Executing Firm)	Y* Y* Y*	Account on trade Allowable values in **PartyID**: • 'P' - Participant's account • 'A' - Client's account • 'T' - Funds under accounted management
55	Symbol	Y	Security ID/Bond ISIN/Mutual Fund Shares ISIN
32	LastQty	Y	Number of securities in trade.
31	LastPx	Y	Price of single security in trade. When report is received, the price value is truncated to 5 digits after decimal point. The initial price value will be stored in the OTC-monitor system database in a special field.
15	Currency	Y*	Price currency code: • 'RUB' - Rouble • 'USD' - US dollar • 'EUR' - Euro • 'PCT' code - percentage of nominal value (for trades with bonds)
828	TrdType	N	Flag of large trade: • '1' - 5 or more percents of the same securities kind and type/category to buy • '0' - all other cases (default value)
63	SettlType	Y*	Period of time to fulfill party's obligations for trade: • 'D5' - up to 5 days starting from the date of trade • 'D30' - 6 through 30 days starting from the date of trade • 'M1+' - more than 30 days starting from the date of trade

Tag	Field	Mandatory	Details
			If date of payment and date of settlement differ, the latest date is used as the value for this field.
64	SettlDate	C	The last date for parties to fulfill their payment and settlement obligations according to the specified period of time. If date of payment and date of settlement differ, the latest date is used as the value for this field (only if **TrdType='1'**). The field is filled in case of a large trade, when field TrdType contains 1.
120	SettlCurrency	N	Settlement currency code: • 'RUB' - Rouble • 'USD' - US dollar • 'EUR' - Euro • 'PCT' code - percentage of nominal value (for trades with bonds) Default value is ‘ ’.
1382	CurrencyRatio	N	Russian Ruble exchange rate. Default value is ‘0’.
1301	MarketID	N	Stock exchange code to perform report for. Allowable code: • 'M' - Moscow Exchange (default value)
22 48	SecurityIDSource = 4 SecurityID	N N	ISIN code of the instrument for trade (this field is optional). Default value is ‘ ’.
454 =>455 =>456	NoSecurityAltID = 1 SecurityAltID SecurityAltIDSource = 8	N N N	State registration code of the instrument for trade. If there are several issues with different registration codes in one trade, than it is recommended to leave this field blank. Default value is ‘ ’.

FIX Gate sends the **Trade Capture Report Ack (MsgType = AR)** message to client in reply.

Tag	Field name	Mandatory	Details
<Header group>		Y	Message type 'AR'.
571	TradeReportID	Y*	Trade number within the Participant's internal accounting system.
751	TradeReportRejectReason	Y*	Cancellation code. If '0' - the trade is accepted successfully.
1003	TradeID	N	Trade ID added by the OTC-monitor system. The field is transmitted only if the trade has been successfully added.
58	Text	N	The field contains: • if rejected - text description of errors occurred • if accepted - text description of some notes about procession of trade

4.2. Canceling trade report

A client sends the **Trade Capture Report (MsgType = AE)** message to FIX gate. The message contains order to cancel 1 trade.

Tag	Field name	Mandatory	Details
<Header group>		Y	Message type 'AE'.
856	TradeReportType	Y*	='6'
1003	TradeID	Y*	Trade ID added by the OTC-monitor system.
571	TradeReportID	Y*	Trade number within the Participant's internal accounting system.
1040	SecondaryTradeID	N	Purchase agreement number.
1328	RejectText	N	Trade cancellation reason (the field is optional)

FIX Gate sends the **Trade Capture Report Ack (MsgType = AR)** message to client in reply.

Tag	Field name	Mandatory	Details
<Header group>		Y	Message type 'AR'.
571	TradeReportID	Y*	Trade number within the Participant's internal accounting system.
751	TradeReportRejectReason	Y*	Cancellation code. If '0' - the trade is deleted successfully.
1003	TradeID	N	Trade ID of the canceled trade. The field is transmitted only if the trade has been successfully canceled.
58	Text	N	Text description of trade cancellation errors occurred. The field is transmitted only in case of cancellation error.

5. Drop Copy service

Drop Copy is a service, which allows clients to receive information on trades according to the participants code list using dedicated FIX session.

Each client is provided with the separate FIX login, which is not valid for making trading operations.

Once the system receives the '**Trade Capture Report (MsgType = AE)**' message from this login, the FIX Gate will send the '**Reject**' message in reply.

5.1. Session layer

The Drop Copy Service session layer is equal to that of the standard FIX session, i. e. clients are connected to and authenticated by the Drop Copy server using the standard methods, with possibility to exchange the 'Heartbeat' messages and make the 'Resend Request' requests.

5.2. Trades broadcast

Trades are broadcasted using the **Trade Capture Report (MsgType = AE)** messages.

Tag	Field	Mandatory	Details
<Header group>		Y	Message type 'AE'.
1003	TradeID	Y*	Trade ID added by the OTC-monitor system.
856	TradeReportType	Y*	Flag of trade cancellation. • '0' - at adding trade • '6' - at cancelling trade
1041	FirmTradeID	Y*	Participant's ID added by the OTC-monitor system.
=>453	NoPartyIDs = 2	Y*	
	=>448 PartyID =>447 PartyIDSource = D =>452 PartyRole = 3 (ClientID)	Y* Y* Y*	Participant's name on trade. Allowable values: • 'P' - Participant themselves • 'A' - Client
	=>448 PartyID =>447 PartyIDSource = D =>452 PartyRole = 1 (Executing Firm)	Y* Y* Y*	Account on trade Allowable values in : • 'P' - Participant's account • 'A' - Client's account • 'T' - Funds under accounted management
552 =>54	NoSides = 1 Side	Y Y	Trade leg: • '1' - buy • '2' - sell
55	Symbol	Y	Security ID/Bond ISIN/Mutual Fund Shares ISIN
32	LastQty	Y	Number of securities in trade.
15	Currency	Y*	Price currency code: • 'RUB' - Rouble • 'USD' - US dollar • 'EUR' - Euro • 'PCT' code - percentage of nominal value (for trades with bonds)
828	TrdType	Y*	Flag of large trade: • '1' - 5 or more percents of the same securities kind and type/category to buy • '0' - all other cases
75	TradeDate	Y*	Date of trade
63	SettlType	Y*	Period of time to fulfill party's obligations for trade:

Tag	Field	Mandatory	Details
			• 'D5' - up to 5 days starting from the date of trade • 'D30' - 6 through 30 days starting from the date of trade • 'M1+' - more than 30 days starting from the date of trade If date of payment and date of settlement differ, the latest date is used as the value for this field.
64	SettlDate	N	The last date for parties to fulfill their payment and settlement obligations according to the specified period of time. If date of payment and date of settlement differ, the latest date is used as the value for this field (only if **TrdType='1'**).
60	TransactTime	Y*	Date of trade registration
571	TradeReportID	N	Trade number within the Participant's internal accounting system.
1040	SecondaryTradeID	N	Purchase agreement number.
31	LastPx	Y	Price of single security in trade.
1301	MarketID	N	Stock exchange code to perform report for. Allowable codes: • 'M' - Moscow Exchange (default value) • 'F' - Moscow Interbank Currency Exchange (MICEX)
1382	CurrencyRatio	N	Rouble exchange rate to use for the control computation of trade price in roubles.
58	Text	N	Text description of some notes about procession of trade
22 48	SecurityIDSource = 4 SecurityID	N N	ISIN code of the instrument for trade
454 =>455 =>456	NoSecurityAltID = 1 SecurityAltID SecurityAltIDSource = 8	N N N	State registration code of the instrument for trade. Empty, if the instrument issue was not specified by Participant.
20020	LastPxRub	Y	Price of a single security in Russian Ruble.