FIX Trading Gateway (FIX 5.0)

Contents

Disclaimer

The London Stock Exchange Group has taken reasonable efforts to ensure that the information contained in this publication is correct at the time of going to press, but shall not be liable for decisions made in reliance on it. The London Stock Exchange Group will endeavour to provide notice to customers of changes being made to this document, but this notice cannot be guaranteed. Therefore, please note that this publication may be updated at any time. The information contained is therefore for guidance only.

1   Introduction

London Stock Exchange Group has provided a FIX trading gateway that enables member firms to submit orders and/or quotes and to receive real-time information on executed trades.

The interface is a point-to-point service based on the technology and industry standards TCP/IP, FIXT and FIX. The session and application event models and messages are based on versions 1.1 and 5.0 (Service Pack 2) of the FIXT and FIX protocols respectively.

1.1   Purpose

The purpose of this document is to provide a technical description of the FIX trading gateway available on the Millennium Exchange platform

1.2   Readership

This document outlines how to connect to the FIX trading gateway and the detailed message types and fields used.

When read in conjunction with the other Millennium Exchange guides, it is intended that these documents provide all of the details directly connected London Stock Exchange customers require to develop to the new services.

This document is particularly relevant to technical staff within the Exchange's member firms.

1.3   Document series

This document is part of series of documents providing a holistic view of full trading and information services available from London Stock Exchange post the migration to Millennium Exchange.

The current series of documents are set out below:

- MIT201 - Guide to the New Trading System
    - **MIT202 – FIX Trading Gateway (FIX 5.0) (this document)**
    - MIT203 – Native Trading Gateway Specification
    - MIT204 – Post Trade Gateway (FIX 5.0) Specification
    - MIT205 – Drop Copy Gateway (FIX 5.0) Specification

- MIT301 - Guide to Market Data Services
    - MIT302 – FIX/FAST Specification
    - MIT303 – Level 2-ITCH Specification
    - MIT304 - Regulatory News Service Specification

- MIT401 – Guide to Reference Data Services

- MIT501 – Guide to Testing Services

- o MIT502 - Guide to Application Certification
- o MIT503 - Certification Report

- MIT601 – Guide to Trading Services Disaster Recovery

- MIT701 – Guide to Sponsored Access

- MIT801 – Reject Codes

This series principally covers non-regulatory information. It does not override or supersede the Rules of the London Stock Exchange, the AIM Rules or Admission and Disclosure Standards and is intended to be read in conjunction with these Rules documents and the Millennium Exchange Parameters document.

The latest version of this document series can be found at the following link:

http://www.londonstockexchange.com/products-and-services/millennium-exchange/technicalinformation/technicalinformation.htm

1.4   Document history

This document has been through the follow iterations:

Issue	Date	Description
8.0	23 May 2011	Eighth issue of this document published via the London Stock Exchange's website and distributed to customers.
8.1	14 June 2011	New logon functionality will now be introduced in the next functional release which is yet to be scheduled. Please refer to page 28.
9.0	23 September 2011	Ninth issue of this document published via the London Stock Exchange's website and distributed to customers.
10.0	9 December 2011	Tenth issue of this document published via the London Stock Exchange's website and distributed to customers.
10.1	28 September 2012	Amended to include new PassiveOnlyOrder and PriceDifferential tags. Published on London Stock Exchange's website.
10.2	1 November 2012	Amended to include Connectivity Policy Section 3.4. Added additional guidance on Passive Only Order and Price Differential functionality.

10.3	22 March 2013	Amended to reflect the latest Millennium enhancements.
10.3	5 April 2013	Update to Sections 6.1.2.2; 6.1.3.2; 6.4.5; 6.5.5 to remove references to Trade Correct and to remove duplicate Tag 336 from Execution Report.

In subsequent issues, where amendments have been made to the previous version, these changes will be identified using a series of side bars as illustrated opposite.

1.5   Enquiries

Please contact either the Technical Account Management Team or your Technical Account Manager if you have any functional questions about the Millennium Exchange services outlined in this document. Client Technology Services (UK) can be contacted at:

- Telephone: +44 (0)20 7797 3939
- Email: londontam@londonstockexchange.com

2 Service description

2.1 Order handling

2.1.1 Order types & validity types

Clients may submit the order types outlined below via the New Order – Single message.

Order Type	Description	Relevant FIX Tags
Market	An order that will execute at the best available prices until it is fully filled. Any remainder will be expired.	OrderType (40) = 1
Limit	An order that will execute at or better than the specified price. The remainder, if any, is added to the order book or expired in terms of its TimeInForce (59).	OrderType (40) = 2 Price (44)
Stop	A market order that remains inactive until the market reaches a specified stop price.	OrderType (40) = 3 StopPx (99)
Stop Limit	A limit order that remains inactive until the market reaches a specified stop price.	OrderType (40) = 4 StopPx (99) Price (44)
Iceberg	An order that contains a disclosed quantity which will be the maximum quantity displayed in the order book. Once the displayed quantity is reduced to zero, it will be replenished by the lower of the disclosed quantity and the remainder.	DisplayQty (1138) OrderQty (38)
Hidden	An order that contains no displayed quantity.	DisplayQty (1138) = 0 DisplayMethod (1084) = 4 (optional)
Pegged	A hidden order pegged to the mid-point of the best bid and offer price for instrument.	OrderType (40) = P
Pegged Limit	A hidden order pegged to the mid-point of the best bid and offer price for instrument. If the Limit price specified is breached, the order will be cancelled.	OrderType (40) = P Price (44)
Named	An order for which the identity of the submitting member is disclosed in the pre-trade market data feed.	PreTradeAnonymity = N

Validity Type	Description	Relevant FIX Tags
Day	An order that will expire at the end of the day.	TimeInForce (59) = 0
Immediate or Cancel (IOC)	An order that will be executed on receipt and the remainder, if any, immediately expired.	TimeInForce (59) = 3
Fill or Kill (FOK)	An order that will be fully executed on receipt or immediately expired.	TimeInForce (59) = 4
On Open	An order that may only be executed in the opening auction.	TimeInForce (59) = 2
On Close	An order that may only be executed in the closing auction.	TimeInForce (59) = 7
Good for Intra-Day Auction (GFX)	An order that may only be executed in the EDSP auction.	TimeInForce (59) = 8
Good for Auction (GFA)	An order that may only be executed in the next auction.	TimeInForce (59) = 9
Good Till Time (GTT)	An order that will expire at a specified time during the current day.	TimeInForce (59) = 6 ExpireTime (126)
Good Till Date (GTD)	An order that will expire at the end of a specified day.	TimeInForce (59) = 6 ExpireDate (432)
Good Till Cancelled (GTC)	An order that will never expire. **This will not be available in Millennium Exchange.**	TimeInForce (59) = 1

2.1.1.1 Order Capacity

The server recognises four order capacities; agency, principal, Riskless principal and CFD Give Up. Clients are responsible for indicating the capacity an order is submitted under. If a New Order – Single message does not contain the OrderCapacity (528) field, it will be rejected.

The capacity "CFD Give Up" will be applicable only for Sponsored Access users who are given the privilege of capacity conversion.

2.1.2 Order Management

2.1.2.1 Cancellation

The remainder of a live order may be cancelled via the Order Cancel Request message. The server will respond with an Execution Report or Order Cancel Reject to confirm or reject the cancellation request respectively.

The client should identify the order being cancelled by either its OrigClOrdID (41) or OrderID (37). If an Order Cancel Request contains values for both OrigClOrdID (41) and OrderID (37), the server will only process the OrderID (37).

If an order submitted under a different SenderCompID (49) is being cancelled, the Order Cancel Request should include its OrderID (37).

2.1.2.2 Mass Cancellation

A client may mass cancel live orders via the Order Mass Cancel Request message. The server will respond with an Order Mass Cancel Report to indicate, via the MassCancel Response (531) field, whether the request is successful or not.

If the mass cancel request is accepted, the Order Mass Cancel Report will be sent first. The server will then immediately transmit Execution Reports for each order that is cancelled and Order Cancel Rejects for each order that could not be cancelled. The ClOrdID (11) of all such messages will be the ClOrdID (11) of the Order Mass Cancel Request.

If the mass cancel request is rejected, the reason will be specified in the MassCancelReject Reason (532) field of the Order Mass Cancel Report.

Clients may use the Order Mass Cancel Request to mass cancel all orders or only those for a particular instrument or segment. A mass cancel request may apply to all the orders of the member or only to those of a particular Trader Group. It is required to specify the trading party when an Order Mass Cancel Request is submitted. The FIX fields relevant to each of the supported mass cancel combinations are outlined below.

	Target Party	
	Trading Party	**Member**
All Orders	MassCancelRequestType (530) = 7 TargetPartyRole (1464) = 76 TargetPartyID (1462)	MassCancelRequestType (530) = 7 TargetPartyRole (1464) = 1 TargetPartyID (1462)
All Orders for an Instrument	MassCancelRequestType (530) = 1 SecurityID (48) SecurityIDSource (22) = 8 TargetPartyRole (1464) = 76 TargetPartyID (1462)	MassCancelRequestType (530) = 1 SecurityID (48) SecurityIDSource (22) = 8 TargetPartyRole (1464) = 1 TargetPartyID (1462)
All Orders for a Segment	MassCancelRequestType (530) = 9 MarketSegmentID (1300) TargetPartyRole (1464) = 76 TargetPartyID (1462)	MassCancelRequestType (530) = 9 MarketSegmentID (1300) TargetPartyRole (1464) = 1 TargetPartyID (1462)

Quotes and unmatched pre-negotiated trades may not be cancelled via an Order Mass Cancel Request.

2.1.2.3 Amending an Order

The following attributes of a live order may be amended via the Order Cancel/Replace Request message:

> Order quantity
>
> Disclosed quantity
>
> Price
>
> Stop price
>
> Expiration time (GTT orders)
>
> Expiration date (GTD orders)
>
> Client reference

The server will respond with an Execution Report or Order Cancel Reject to confirm or reject the amendment request respectively.

The client should identify the order being amended by either its OrigClOrdID (41) or OrderID (37). If an Order Cancel/Replace Request contains values for both OrigClOrdID (41) and OrderID (37), the server will only process the OrderID (37).

If an order submitted under a different SenderCompID (49) is being amended, the Order Cancel/Replace Request should include its OrderID (37). If the amendment is successfully, the order will be treated as one submitted under the SenderCompID (49) that sent the Order Cancel/Replace Request.

When an order amendment (Order Cancel/Replace message) is rejected, the order ID will be populated in the OrderID field of the Order Cancel Reject message.

An order will lose time priority if its order or disclosed quantity is increased or if its price is amended. A reduction in order or disclosed quantity of an order or the amendment of its expiration time, expiration date or client reference will not cause it to lose time priority. Clients may not amend orders that are fully filled.

The Stop price of a Stop / Stop Limit order cannot be amended once the order has been injected into the order book.

If Order Quantity is being amended then the Disclosed Quantity must also be amended at the same time.

2.1.3 Order Status

As specified in the FIX protocol, the OrdStatus (39) field is used to convey the current state of an order. If an order simultaneously exists in more than one order state, the value with highest precedence is reported as the OrdStatus (39). The relevant order statuses are given below from the highest to lowest precedence.

Value	Meaning
2	Filled
4	Cancelled
C	Expired
1	Partially Filled
0	New
8	Rejected
9	Suspended

Please refer to Section 8.1.1 for process flow diagrams on the various statuses that may apply to an order.

2.1.4 Execution Reports

The Execution Report message is used to communicate many different events to clients. The events are differentiated by the value in the ExecType (150) field as outlined below:

Exec Type	Usage	Order Status
0	**Order Accepted** Indicates that a new order has been accepted. This message will also be sent unsolicited if an order was submitted by Market Operations on behalf of the client. This message will also be sent when a parked order is injected and added to the order book without receiving an execution. This message will also be sent when a parked pegged orders is unparked and added to the order book without receiving an execution. This message will also be sent when a parked order with time in force GFX/GFA/ATC is unparked and added to the order book without receiving an execution.	0
8	**Order Rejected** Indicates that an order has been rejected. The reason for the rejection is specified in the field OrdRejReason (103).	8
F	**Order Executed** Indicates that an order has been partially or fully filled. The execution details (e.g. price and quantity) are specified. This message will also be sent when a parked order is injected and receives executions on aggression. This message will also be sent when a parked pegged orders is unparked and receives executions on aggression. This message will also be sent when a parked order with time in force GFX/GFA/ATC is unparked and receives executions on aggression.	1, 2

C	**Order Expired** Indicates that an order has expired in terms of its time qualifier. This message will also be sent when orders are expired upon entering the order book when the number of orders in the order book is at the maximum allowed level, when the incoming order is configured with the Self Execution Prevention[1] specifying CIO or CRO. The reason for the expiration is specified in the Text (58) field. This message will also be sent when a Market Order or a Stop Order is expired at the point of aggressing the order book during the Continuous Trading session, if a circuit breaker is breached during that aggression, The reason for the expiration is specified in the Text (58) field.		C
4	**Order Cancelled** Indicates that an order cancel request has been accepted and successfully processed. This message will also be sent unsolicited if the order was cancelled by the Market Operations. In such a scenario the Execution Report will include an ExecRestatementReason (378) of Market Option (8). It will not include an OrigClOrdID (41).		4
5	**Order Cancel/Replaced** Indicates that an order cancel/replace request has been accepted and successfully processed.		0, 1
D	**Order Cancel/Replace by Market Operations** Indicates that an order has been amended by the service desk. The unsolicited message will include an ExecRestatement Reason (378) of Market Option (8). It will not include an OrigClOrdID (41).		0, 1
H	**Trade Cancel** Indicates that an execution has been cancelled by Market Operations or by clients. An ExecRefID (19) to identify the execution being cancelled will be included.		0, 1
~~G~~	~~**Trade Correct**~~ ~~Indicates that an execution has been corrected by Market Operations. The message will include an ExecRefID (19) to identify the execution being corrected and the updated execution details (e.g. price and quantity). Not currently supported.~~		~~1, 2~~

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[1]
- Cancel Incoming Order (CIO), leaves the resting order
- Cancel Resting Order (CRO), allows the incoming order to be executed/rest

9	**Order Suspended**	9
	Indicates that an order has been parked by the system without adding it to the order book.	
	This message will be sent when an incoming stop or stop limit order is put in to the parked state.	
	This message will be sent when an incoming pegged order is put into the parked state.	
	This message will be sent when an incoming order with a time in force GFA/GFX/ATC is put into the parked state.	
	This message will be sent when orders submitted during CPP session are parked without adding to the order book.	

It should be noted that the Exchange will generally not amend orders or trades. These events are included in the above table for completeness.

2.1.5 Order and execution identifiers

2.1.5.1 Client Order IDs

The server will not validate each ClOrdID (11) for uniqueness. Clients should comply with the FIX protocol and ensure unique ClOrdIDs across all messages (e.g. New Order – Single, Order Cancel Request, etc.) sent under a particular SenderCompID (49). Given that the server supports GTD orders, clients should also ensure that their ClOrdIDs are unique across trading days (e.g. embed the date within the ClOrdID).

Clients must, in terms of the FIX protocol, specify the ClOrdID (11) when submitting an Order Cancel Request, Order Mass Cancel Request or Order Cancel/Replace Request.

2.1.5.2 Order IDs

The server will use the OrderID (37) field of the Execution Report to keep track of orders with the matching system. Order IDs will be unique across trading days.

In terms of the FIX protocol, unlike ClOrdID (11) which requires a chaining through cancel/replace requests and cancel requests, the OrderID (37) of an order will remain constant throughout its life.

Clients have the option of specifying the OrderID (37) when submitting an Order Cancel Request or Order Cancel/Replace Request.

2.1.5.3 Execution IDs

The server will use the ExecID (17) field to affix a unique identifier for each Execution Report. ExecIDs will be unique across trading days.

2.2 Quote handling

The server supports the submission of firm and executable quotes. A particular trading party may only have one active quote per instrument. If the server receives a

quote for a trading party that already has an active quote for the instrument, it will treat it as an update to the quote. A quote can be of principal/agency/riskless principal interest. All firm and executable quotes are considered as named.

Quotes are two-sided (i.e. bid and offer). If one side of a quote fails the validations (e.g. price tick, spread, etc.) of the server, both sides will be rejected. However, if a quote is accepted it is treated as two separate and independent limit orders. One side of a quote will not be automatically cancelled if the other side is fully filled.

Quotes may be submitted individually via the Quote message. All active quotes will expire at the end of the trading day.

Please refer to section 8.2 for process flow diagrams relating to quote handling.

2.2.1.1 Acknowledgement

The server will explicitly acknowledge or reject each Quote message via the Quote Status Report message. The QuoteStatus (297) field will indicate whether the quote is Accepted (0) or Rejected (5). If a quote is rejected, the reason will be specified in the QuoteRejectReason (300) field. A Quote Status Report will be sent to the client if a quote is expired.

2.2.1.2 Execution

The Execution Report message is used to notify the client if a quote is executed. The ClOrdID (11) of the message will contain the QuoteMsgID (1166) of the last Quote message that updated the executed quote.

The side, quantity and price fields (i.e. Side (54), LastQty (32), LastPx (31), LeavesQty (151), OrderQty (38), Price (44), etc.) will contain information for the executed side. As the server does not keep track of cumulative quantity for quotes, the value in the field CumQty (14) will be "0".

2.2.1.3 Cancellation by Market Operations

An unsolicited Quote Status Report will be sent to the client if a quote is cancelled by Market Operations. The QuoteStatus (297) of such a message will be removed from Market (6) and the QuoteMsgID (1166) will be the identifier of the last Quote message used to update the quote entry.

2.2.1.4 Expiration

A Quote Status Report will be sent to the client if a quote is expired. The QuoteStatus (297) of such a message will be Expired (7) and the QuoteMsgID (1166) will be the identifier of the last Quote message used to update the quote entry.

2.2.2   Quote management

2.2.2.1 Updating a quote

A client may update a live quote entry by sending another quote, via the Quote message, for the same instrument. When submitting an update, clients may:

(i)   Update both sides of a quote (for two-sided quotes)

(ii)   Update one side of a quote and leave the other side unchanged (for two-sided quotes)

(iii)   Update the only side of a quote (for single-sided quotes)

Clients may update a side of a quote by providing a new price and/or quantity. The bid or offer side of a quote will lose time priority in the order book if its quantity is increased or its price is updated. A reduction in quantity will not cause a side to lose time priority.

2.2.2.2 Cancelling a single quote

A client may use the Quote Cancel message to cancel a single quote entry. The message should include a QuoteCancelType (298) of Cancel for Instruments (1) and a NoQuoteEntries (295) of "1". The instrument to which the cancellation applies should also be specified. It is required to include the NoTargetPartyIDs (1461) block in the message and the TargetPartyRole (1464) should be Trader Group (76).

The server will explicitly acknowledge or reject such a Quote Cancel message via the Quote Status Report message. The QuoteStatus (297) field will indicate whether the quote is Cancelled (17) or whether the quote cancel request is Rejected (5). If a cancel request is rejected, the reason will be specified in the QuoteRejectReason (300) field.

2.2.2.3 Mass cancelling quotes

The client may also mass cancel quotes via a single Quote Cancel message. The server will respond with a Mass Quote Acknowledgement to indicate, via the QuoteStatus (297) field, whether the request is successful or not.

The Mass Quote Acknowledgement will not contain any quote sets or quote entries if the cancellation of all quotes covered by the request is either confirmed or rejected. If the entire request is rejected, the reason will be specified in the QuoteRejectReason (300) field.

If the cancellations of some quotes are confirmed while those of others are rejected, the Mass Quote Acknowledgement will contain each quote entry that was not cancelled. The QuoteEntryStatus (1167) of each quote entry will be Rejected (5) and the reason the cancellation was rejected will be specified in the field QuoteEntryRejectReason (368). All quote entries will be grouped under a single quote set.

Clients may use the Quote Cancel message to mass cancel all quotes or those for a specified list of instruments. If a Quote Cancel is used to cancel quotes for multiple instruments, it may not contain more than 25 entries in the NoQuoteEntries repeating block. A mass quote cancel request may apply to all the quotes of the member or only to those of a particular Trader Group. It is required to target the target party when the Quote Cancel is submitted. The FIX fields relevant to each of the supported mass cancel combinations are outlined below.

	Target Party	
	Other Party	**Member**
All Quotes	QuoteCancelType (298) = 4 TargetPartyRole (1464) = 76 TargetPartyID (1462)	QuoteCancelType (298) = 4 TargetPartyRole (1464) = 1 TargetPartyID (1462)
All Quotes for Specified Instruments	QuoteCancelType (298) = 1 TargetPartyRole (1464) = 76 TargetPartyID (1462) NoQuoteEntries (295) = n ➡ SecurityID (48) SecurityIDSource (22) = 8	QuoteCancelType (298) = 1 TargetPartyRole (1464) = 1 TargetPartyID (1462) NoQuoteEntries (295) = n ➡ SecurityID (48) SecurityIDSource (22) = 8

Orders and unmatched pre-negotiated trades may not be cancelled via a Quote Cancel.

2.2.3 Quote identifiers

2.2.3.1 Message identifiers

The server will not validate each QuoteMsgID (1166) for uniqueness. Clients should comply with the FIX protocol and ensure unique QuoteMsgIDs across all Quote and Quote Cancel messages sent under a particular SenderCompID (49).

2.2.3.2 Entity identifiers

A particular trading party may only have one active quote per instrument. The QuoteID (117) of a Quote should always be "1".

2.2.3.3 Set identifiers

If the server sends a Mass Quote Acknowledgement in response to a Quote Cancel message, the QuoteSetIDs of the message will be sequential numbers starting at one (1).

2.3 Security identification

Instruments will be identified using the SecurityID (48) field. It is required to specify SecurityIDSource (22) field as well.

2.4   Party identification

ID	Description	Relevant FIX Tags
Member ID	Identifier of the member the interest is submitted under.	PartyRole (452) = 1 PartyID (448)
Trader Group	Identifier of the trader group the interest is submitted under.	PartyRole (452) = 76 PartyID (448)
Trader ID	Identifier of the trader the interest is submitted under.	PartyRole (452) = 12 PartyID (448)
Client Reference	Client reference information applicable to an order	Account (1)

Trading privileges are, depending on how the participant is set up, assigned at the level of the SenderCompID (49), Trader Group or Trader ID.

A member of the London Stock Exchange is required to specify a Trader Group. Members of these markets may optionally specify a Trader ID in each message.

Trader Group (Party Role (452) = 76) must be specified in the New Order – Single, Order Cancel, Order Cancel/Replace and Quote messages. For the New Order Single (D), Order Cancel Request (F), Quote (S) and Order Cancel/Replace Request (G) messages, the message will be rejected if the Trading Party Component does not include a Party ID (448) Tag without a corresponding Party Role (452) Tag equal to 76 (Trader Group) within the same repeating group.

For rejected messages, the client will receive a Business Message Reject (j) message with the following tags specified:

Business Reject Reason (380) = '0'

Text (58) = "Trader Group not specified on message"

2.5   Market operations

2.5.1   Interest submission and management

Market Operations is able to submit an order cancel request quote cancel request on behalf of a client.

The client will be notified of the cancel request request submitted on its behalf if it is accepted. The client will not be notified if the action is rejected.

This feature is intended to help a client manage an emergency situation and should not be relied upon as a normal business practice.

2.5.2 Trade cancellations and corrections

Market Operations may cancel any on-book trade. The server will transmit Execution Reports to the relevant clients to notify them of a trade cancellation.

If an execution received by an order is cancelled, the cancelled quantity will either be cancelled or reinstated in the order book. If the quantity is cancelled, the order will be restated to reduce its order quantity by the cancelled quantity. The client will receive two notifications in such a scenario; one for the trade cancel and another for the restatement. The LeavesQty (151) and CumQty (14) of a live order will always add up to its OrderQty (38).

If an execution received by a quote is cancelled, the cancelled quantity will always be cancelled. The side of the quote will be restated to reduce its order quantity by the cancelled quantity. The client will receive two notifications in such a scenario; one for the trade cancel and another for the restatement. The LeavesQty (151) and CumQty (14) of one live side of a quote will always add up to its OrderQty (38).

2.6 Timestamps and dates

The timestamps SendingTime (52), OrigSendingTime (122) and TransactTime (60) should be in UTC and in the YYYYMMDD-HH:MM:SS.sss format. ExpireTime (126) should be in UTC and in the YYYYMMDD-HH:MM:SS format.

All dates (i.e. ExpireDate (432)) should be in the YYYYMMDD format and specified in the local date for the server (i.e. not in UTC)).

2.7 Repeating groups (Components/Component Block)

If a repeating group is used in a message, the NoXXX field (for example NoPartyIDs field in the trading party repeating group) should be specified first before the repeating group starts. This is applicable for both the messages generated by the client and the server.

The messages generated by the server will have the fields within a repeating group in order.

The messages generated by a client should have the first field in a repeating group in order. If the first field in a repeating group is in order, a message generated by a client will be accepted; else the message will be rejected.

2.8 Auto Cancel on Disconnect

When a client has enabled "Mass Cancel on Disconnect" and/or "Mass Cancel on Logout", client's orders and quotes will be cancelled upon disconnection or a log out respectively.

On a subsequent successful login the client will receive the execution report messages for cancelled orders but will not receive a Quote Status Report for cancelled quotes.

2.9 Generating Reject Messages

A session reject message will be sent by the server if a required tag or a conditionally required tag is missing in a message sent by a client.

Also if an unsupported value is sent within a tag, an execution report or an order cancel reject is sent by the server.

2.10 Functional and Implementation Limitations

2.10.1.1 As an exception to 2.9, a session reject message can also be generated for an unsupported value. This can happen if the FIX tag supports a different data type compared to the internal field (for example if an invalid capacity is sent with a New Order message, a session reject is sent but if an invalid account type is sent, an Execution Report message is sent).

2.10.1.2 Quote Type (537) will not be populated in Quote Status Report which is generated as a response for rejecting a Quote Cancel due to a duplicate quote message ID.

2.10.1.3 When a cancellation or amendment to a "Filled" or "Cancelled" or "Expired" order is rejected, order status is given as "Rejected" in the Order Cancel Reject instead of the actual status of the order.

2.10.1.4 As an exception to 2.9, when a quote is rejected due to an invalid quote type, a Reject is given rather than a Quote Status Report.

2.10.1.5 Order Status (39) can be "Rejected" in the Execution Report and Order Cancel Reject, if the order is unknown or the cancellation or amendment request cannot be processed anymore. There are some basic validations needs to be passed to process an order. If those validations are failed, an order will not be processed anymore hence some of the actual information of the order will not be stamped in the messages generated by the server. For example, an amend request to change the Order Quantity (38) or Display Quantity (1138) to a negative value will be rejected via a Order Cancel Reject with the Order Status (39) as "Rejected".

2.10.1.6 The order status will be communicated as "Expired" for an order which is getting cancelled in the case of MASS CANCEL ON LOGOUT / MASS CANCEL ON DISCONNECT after the user logs out/disconnects if the appropriate setting is turned on.

2.10.1.7 Within a client generated message, if the same FIX tag has been repeated with different values, the server takes the value in the last tag. The server will not reject such messages.

2.10.1.8 If the value Trader Group (76) has been repeated with the Party Role (452) in the Trading Party Component Block in a client generated message, the value in the last Party ID (448) (which is corresponding to the last Party Role (452)) is taken as the ID of the Trader Group. The server will not reject such messages.

2.10.1.9 If the client tries to amend the order quantity or the display quantity in the New Order message and if the request cannot be completely fulfilled due to edge conditions, the server will do the amendment to the maximum possible extent. The server will not reject the amend request.

For example if an order is sent with order quantity and display quantity as 800 and then tries to amend the display quantity to 500 two scenarios can happen. (a) The user may have already received a partial fill for 400 and tries to amend the leaves quantity via the display quantity which is not permitted. (b) While the amend request is on the wire, there may be a partial fill of 400 which is not known to user at the point of generating the amend request; at this case, rejecting the amend request is not ideal. The server cannot differentiate the two scenarios hence it has implemented fairer option which is to execute the amend request to the maximum possible extent.

2.10.1.10 Server does not keep track of filled/cancelled/expired/rejected orders or quotes (i.e. it does not keep track of orders or quotes whose life cycle is over). Also it is not possible to find whether there are active quotes for a particular instrument or not; hence server does not reject a mass quote cancel request in total just because there are no quotes for a particular user + instrument combination; the rest of the user + instrument combinations may have valid open quotes.

Due to the above behaviour and limitations, when a mass quote cancel is sent, server will try to cancel all the quotes requested. If a quote cannot be cancelled because it is already filled/cancelled/expired/rejected, the quote set repeating group will not be populated for such quotes in the mass quote acknowledgement as server does not have information of those quotes.

2.10.1.11 It is not possible to publish the TotalAffectedOrders (533) field in the Order Mass Cancel Report if the system sends the Order Mass Cancel Report before the Execution Reports (for orders that are cancelled) or Order Cancel Rejects (for orders that are not cancelled).

2.10.1.12 At present, if an order/quote mass cancel request is sent for instruments which are in multiple matching partitions, an Order Mass Cancel Report or Mass Quote Acknowledgement (depending on whether the request is for order or quotes respectively) will be sent per matching partition with the confirmation/rejection of the cancellations of orders/quotes in that respective partition. This is because the system handles mass cancel requests per partition internally. The relevant partition will be stamped in the ApplID (1180) field in the Order Mass Cancel Report and Mass Quote Acknowledgement.

2.10.1.13 When specifying the expiry time for a GTT order, a date component will also be specified along with the expiry time. The server takes the date

component into consideration when validating the expiry time. I.e. if a GTT order is sent with an already elapsed expiry time but with a future date in the date component, the order will be accepted and will be expired at the end of the trading of the current trading day. I.e. the order is treated as a DAY order.

2.10.1.14   An order mass cancel request should not be sent during Start of Trading session. If a request is sent, it will be rejected as expected. But thereafter in a subsequent session the client will not be able to mass cancel the same orders again. But the client can individually cancel orders.

2.10.1.15   If an undefined tag is sent along with any of the Administrative messages, then the system will ignore the undefined tags and process the rest of the message. This is a limitation exists in the FIX library.

2.10.1.16   Passive Only Order and Price Differential functionality is only available for certain instruments. Information on whether Passive Only Order and Price Differential functionality is available for a particular instrument can be found in the Millennium Exchange Business Parameters document.

2.11   Mapping FIX Order ID to ITCH Order ID

To convert FIX Order ID to ITCH Order ID:

Step 1 - Convert the 12 byte FIX Order ID from ASCII into a base 62 equivalent using the base 62 mapping table below

Step 2 – Convert this string into a base 10 (decimal) number

Step 3 – The ITCH Order ID is this base 10 number represented in binary

Note

- 64 bit integer data types should be used for the calculation otherwise integers will overflow

- Excel also rounds the value since its using a 64 bit float data type for the calculation

The Order ID format (ASCII):

12 bytes
0-9, A-Z, a-z
Base 62 encoded Order ID

The Order ID binary format is calculated as follows:

20 bits	2bits	3 bits	2bits	32 bits (4 bytes)
<number of sec>	[0-3]	[0-7]	[0-3]	
The number of 5 mins intervals from Jan 1, 2010)	ID	Partition id	Thread id	Order number

The base 62 mapping table:

0	0	20	K	40	e	60	y
1	1	21	L	41	f	61	z
2	2	22	M	42	g		
3	3	23	N	43	h		
4	4	24	O	44	i		
5	5	25	P	45	j		
6	6	26	Q	46	k		
7	7	27	R	47	l		
8	8	28	S	48	m		
9	9	29	T	49	n		
10	A	30	U	50	o		
11	B	31	V	51	p		
12	C	32	W	52	q		
13	D	33	X	53	r		
14	E	34	Y	54	s		
15	F	35	Z	55	t		
16	G	36	a	56	u		
17	H	37	b	57	v		
18	I	38	c	58	w		
19	J	39	d	59	x		

An Example:

ASCII Order ID for FIX	004Xj7Wu76ta
Base 62 equivalent	00,00,04,33,45,07,32,56,07,06,55,36
Base 10 (decimal) number	61512470073704470
ITCH Order ID	Binary encoding of the above decimal

2.12 Mapping Trade Match ID to ITCH Trade ID

To convert FIX Trade Match ID to ITCH Trade ID:

Step 1 - Convert the 10 byte Trade Match ID from ASCII into a base 36 equivalent using the base 36 mapping table below

Step 2 – Convert this string into a base 10 (decimal) number

Step 3 – The ITCH Trade ID is this base 10 number represented in binary

The Trade Match ID format (ASCII):

10 bytes
0-9, A-Z
Base 36 encoded trade id

The Trade Match ID binary format is calculated as follows:

20 bits	2bits	3 bits	2bits	24 bits
<number of sec>	[0-15]	[0-7]	[0-3]	
The number of 5 mins intervals from Jan 1, 2010)	ID	Partition id	Thread id	Trade number

The base 36 mapping table (G offset):

0	G	20	0
1	H	21	1
2	I	22	2
3	J	23	3
4	K	24	4
5	L	25	5
6	M	26	6
7	N	27	7
8	O	28	8
9	P	29	9
10	Q	30	A
11	R	31	B
12	S	32	C
13	T	33	D
14	U	34	E
15	V	35	F
16	W		
17	X		
18	Y		
19	Z		

An Example:

ASCII Trade ID for FIX	G5DIF33YV0
Base 36 equivalent	00,25,33,02,35,23,23,18,15,20
Base 10 (decimal) number	73120274710544
ITCH Trade ID	Binary encoding of the above decimal

3   Connectivity

3.1   CompIDs

The CompID of each client must be registered with the London Stock Exchange before FIX communications can begin. A single client may have multiple connections to the server (i.e. multiple FIX sessions, each with its own CompID).

The CompID of the server is **FGW**. The messages sent to the server should contain the CompID assigned to the client in the field SenderCompID (49) and FGW in the field TargetCompID (56). The messages sent from the server to the client will contain FGW in the field SenderCompID (49) and the CompID assigned to the client in the field TargetCompID (56).

3.1.1   Passwords

Each new CompID will be assigned a password on registration. Clients must change their password to one of their choosing at first login via the Logon message. The new password must comply with London Stock Exchange password policy.The status of the new password (i.e. whether it is accepted or rejected) will be specified in the SessionStatus (1409) field of the Logon sent by the server to confirm the establishment of a FIX connection. The new password will, if accepted, be effective for subsequent logins.

New passwords should adhere to the rules below:

- Minimum length – 8 characters
- Maximum length – 14 characters
- Minimum numeric characters – 1 character
- Minimum alpha characters – 1 character
- Minimum special characters – 1 character

3.2   Production IP addresses and ports

The IP addresses and ports for the post trade gateway are published in a separate configuration document which can found on the Millennium Exchange Technical Information website.

3.3   Failover and recovery

The system has been designed with fault tolerance and disaster recovery technology that ensures that trading should continue in the unlikely event of a process, gateway or site outage.

On unexpected disconnection from the primary gateway, a customer should ensure that their application behaves in accordance with the London Stock Exchange's connectivity policy.

3.4 Connectivity Policy

An application should attempt to connect a maximum of 3 times to the primary gateway with a minimum time out value of 3 seconds between attempts before attempting to connect to the secondary gateway – and this should be retried a maximum of a further 3 times. After 6 failed connection attempts (3 on each gateway) the clients should contact London Stock Exchange for further guidance.

Information on London Stock Exchange's Connectivity Policy can be found at the following link:

http://www.londonstockexchange.com/products-and-services/technical-library/technical-guidance-notes/technical-guidance-notes.htm

3.5 Message Rate Throttling

London Stock Exchange has implemented a scheme for throttling message traffic where each CompID is only permitted to submit up to a specified number of messages per second.

Additional information is provided in the MIT201 Guide to the New Trading System document.

Every message that exceeds the maximum rate of a CompID will be rejected via a Business Message Reject.

A CompID will be disconnected by the server if its message rate exceeds its maximum rate more than 5 times in any 30 second duration. In such a case, the server will transmit a Logout message and immediately terminate the TCP/IP connection. Mass Cancellation On Disconnect.

3.6 Mass Cancellation On Disconnect

At the request of the member firm, the server can be configured to automatically cancel all live orders and quotes submitted under a CompID whenever it disconnects from the server.

This feature does not guarantee that all outstanding orders will be successfully cancelled as executions that occur very near the time of disconnect may not be reported to the client. During such a situation, the client should contact Market Operations to verify that all orders have been cancelled and all Execution Reports have been received.

The configuration of the mass cancellation on disconnect feature cannot be updated during a FIX session.

4   FIX connections and sessions

4.1   Establishing a FIX connection

FIX connections and sessions between the client and server are maintained as specified in the FIX protocol.

Each client will use the assigned IP address and port to establish a TCP/IP session with the server. The client will initiate a FIX session at the start of each trading day by sending the Logon message. The client will identify itself using the SenderCompID (49) field. The server will validate the CompID, password and IP address of the client.

Once the client is authenticated, the server will respond with a Logon message. The SessionStatus (1409) of this message will be Session Active (0). If the client's Logon message included the field NewPassword (925) and the client is authenticated, the server will respond with a Logon message. The SessionStatus (1409) of this message will be Session Active (0).

The client must wait for the server's Logon before sending additional messages. If additional messages are received from the client before the exchange of Logon messages, the TCP/IP connection with the client will be disconnected.

When the client sends a logon with a sequence number higher than expected by the FIX Gateway, the FIX gateway will send a Resend Request.

Please note that the functionality grayed out below will now be introduced in a future functional release which is yet to be scheduled.

A successful logon response will always be followed by a Test Request Message. If the client responds to the Test Request with a Heartbeat message containing the appropriate Test Request ID and message sequence number, the server can start transmitting any missed messages or new messages in the Gateway.

If the client ignores the Test Request because the sequence number in the message is higher than the expected sequence number, the Client is expected to send a Resend Request asking for the missed messages. After responding to the Resend Request the FIX Gateway would send another Test Request to make sure both the client and server is in sync before sending out any missed or new application messages.

If the client sends a Resend Request before the FIX Gateway send a Test Request, then the FIX Gateway will serve the Resend Request first. After responding to the Resend Request the FIX Gateway would send a Test Request to make sure both the client and server are in sync before sending out any missed or new application messages.

When the client sends a logon with a sequence number higher than expected by the FIX Gateway, the FIX gateway will send a Resend Request and once the response/s to the Resend Request is processed by the FIX Gateway, the FIX Gateway would send a Test Request to make sure both the client and server is in sync before sending out any missed or new application messages.

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If a logon attempt fails because of an invalid SenderCompID, invalid TargetCompID, invalid IP address, invalid password or not having the appropriate privileges to login to the gateway, the server will break the TCP/IP connection with the client without sending a Logout or Reject message. If during a logon of a SenderCompID, the server receives a second connection attempt while a valid FIX session is already underway for that same SenderCompID, the server will break the TCP/IP connection with the second connection without sending a Logout or Reject message. As the logon attempt failed, the server will not increment the next inbound message sequence number expected from the client.

If a logon attempt fails because of a locked CompID or if logins are not currently permitted, the server will send a Logout message and then break the TCP/IP connection with the client. In these scenarios the next inbound sequence number expected from the client will be incremented but the outbound sequence number will not be incremented. The message sequence number '1' will be sent with the Logout message.

If a logon attempt fails because of a session level failure (e.g. due to invalid EncryptMethod or DefaultApplVerID…etc) both the inbound sequence number and the outbound sequence number will not be incremented. The message sequence number '1' will be sent with the Logout message.

However if a session level failure occurs due to a message sent by a client which contains a sequence number that is less than what is expected and the PossDupFlag (43) is not set to "Y", then the server will send a Logout message and terminate the FIX connection. In this scenario the inbound sequence number will not be incremented but the outbound sequence number will be incremented.

If during a logon of a SenderCompID, the server receives a second connection attempt via the same TCP/IP connection while a valid FIX session is already underway for that same SenderCompID, the server will send a Reject message and then break the TCP/IP connection with the client. The server will increment the next inbound message sequence number expected from the client as well as its own outbound message sequence number.

When the FIX session is not in sync the Business Reject Code(380) and the Text(58) of the Business Reject message should be sent as follows.

Business Reject Reason(380)=30

Text (58)=Session not established

The impact of logon failures on sequence numbers is summarised in the table below:

Reason for Logon Failure	Session status (of logout)	Inbound Sequence Number	Outbound Sequence Number
Invalid or expired password	8 (password expired)	Incremented by 1	Does not increase (defaulted to 1)
Locked/suspended/inactivated CompID	6 (account locked)	Incremented by 1	Does not increase (defaulted to 1)
Logins are not currently permitted	7 (logins are not allowed)	Incremented by 1	Does not increase (defaulted to 1)
Session level failure (e.g. due to invalid EncryptMethod or DefaultApplVerID…etc)	101 (logout session level failure)	Does not increase	Does not increase (defaulted to 1)
Login sequence number is less than the expected sequence number	101 (logout session level failure)	Does not increase	Incremented by 1
Second connection attempt	- (Blank as Reject message used instead.	Incremented by 1	Incremented by 1

4.2 Maintaining a FIX session

4.2.1 Message sequence numbers

As outlined in the FIX protocol, the client and server will each maintain a separate and independent set of incoming and outgoing message sequence numbers. Sequence numbers should be initialized to 1 (one) at the start of the FIX session and be incremented throughout the session.

Monitoring sequence numbers will enable parties to identify and react to missed messages and to gracefully synchronize applications when reconnecting during a FIX session.

If any message sent by the client contains a sequence number that is less than what is expected and the PossDupFlag (43) is not set to "Y", the server will send a Logout message and terminate the FIX connection. The Logout will contain the next expected sequence number as well as the received sequence number in the Text (58) field.

A FIX session may not continue to the next trading day. The server will initialize its sequence numbers at the start of each day. The client is expected to employ the same logic.

4.2.2 Heartbeats

The client and server will use the Heartbeat message to exercise the communication line during periods of inactivity and to verify that the interfaces at each end are available. The heartbeat interval will be the HeartBtInt (108) specified in the client's Logon message.

The server will send a Heartbeat anytime it has not transmitted a message for the heartbeat interval. The client is expected to employ the same logic.

If the server detects inactivity for a period longer than the heartbeat interval plus a reasonable transmission time, it will send a Test Request message to force a Heartbeat from the client. If a response to the Test Request is not received by a reasonable transmission time, the server will send a Logout and break the TCP/IP connection with the client. The client is expected to employ similar logic if inactivity is detected on the part of the server.

4.2.3 Increasing expected sequence number

The client or server may use the Sequence Reset message in Gap Fill mode if it wishes to increase the expected incoming sequence number of the other party.

The client or server may also use the Sequence Reset message in Sequence Reset mode if it wishes to increase the expected incoming sequence number of the other party. The Sequence Reset mode should only be used to recover from an emergency situation. It should not be relied upon as a regular practice.

4.3 Terminating a FIX connection

The client is expected to terminate each FIX connection at the end of each trading day before the server shuts down. The client will terminate a connection by sending the Logout message. The server will respond with a Logout to confirm the termination. The client will then break the TCP/IP connection with the server.

All open TCP/IP connections will be terminated by the server when it shuts down (a Logout will be sent). Under exceptional circumstances the server may initiate the termination of a connection during the trading day by sending the Logout message.

If, during the exchange of Logout messages, the client or server detects a sequence gap, it should send a Resend Request.

4.4 Re-establishing a FIX session

If a FIX connection is terminated during the trading day it may be re-established via an exchange of Logon messages.

Once the FIX session is re-established, the message sequence numbers will continue from the last message successfully transmitted prior to the termination.

Please note that the functionality grayed out below will now be introduced in** a **future functional release which is yet to be scheduled.

Once the FIX session is re-established, the FIX Gateway would also send a Test Request to confirm if the sequence numbers are in sync. The message sequence

numbers should continue from the last message successfully transmitted prior to the termination.

If the client responds to the Test Request with a Heartbeat message containing the appropriate Test Request ID and message sequence number, the server can start transmitting any missed messages or new messages in the Gateway. If the client does not respond to the Test Request during the heartbeat interval, the gateway will disconnect the client.

If the client ignores the Test Request because the sequence number in the message is higher than the expected sequence number, the Client is expected to send a Resend Request asking for the missed messages. After responding to the Resend Request the FIX Gateway would send another Test Request to make sure both the client and server is in sync before sending out any missed or new application messages.

If the client sends a Resend Request before the FIX Gateway send a Test Request, then the FIX Gateway will serve the Resend Request first. After responding to the Resend Request the FIX Gateway would send a Test Request to make sure both the client and server are in sync before sending out any missed or new application messages.

When the client sends a logon with a sequence number higher than expected by the FIX Gateway, the FIX gateway will send a Resend Request and once the response/s to the Resend Request is processed by the FIX Gateway, the FIX Gateway would send a Test Request to make sure both the client and server is in sync before sending out any missed or new application messages

4.4.1 Resetting sequence numbers: Starting a new FIX session

4.4.1.1 Reset initiated by the client

If the client requires both parties to initialize (i.e. reset to 1) sequence numbers, it may use the ResetSeqNumFlag (141) field of the Logon message. The server will respond with a Logon with the ResetSeqNumFlag (141) field set to "Y" to confirm the initialization of sequence numbers.

A client may also manually inform the service desk that it would like the server to initialize its sequence numbers prior to the client's next login attempt.

These features are intended to help a client manage an emergency situation. Initializing sequence numbers on a re-login should not be relied upon as a regular practice.

4.4.1.2 Reset initiated by the server

The system has been designed with fault tolerance and disaster recovery technology that should ensure that the server retains its incoming and outgoing message sequence numbers for each client in the unlikely event of an outage.

However, clients are required to support a manual request by London Stock Exchange to initialize sequence numbers prior to the next login attempt.

4.5   Matching system failure

In event of matching system failure, following order entry, clients will receive a
Business Reject Message with a BusinessRejectReason (380) of "4" indicating
"Application not available."

5 Recovery

5.1 Resend requests

The client may use the Resend Request message to recover any lost messages. As outlined in the FIX protocol, this message may be used in one of three modes:

(i) To request a single message. The BeginSeqNo (7) and EndSeqNo (16) should be the same.

(ii) To request a specific range of messages. The BeginSeqNo (7) should be the first message of the range and the EndSeqNo (16) should be the last of the range.

(iii) To request all messages after a particular message. The BeginSeqNo (7) should be the sequence number immediately after that of the last processed message and the EndSeqNo (16) should be zero (0).

The server caches a maximum number of messages transmitted to the client. Clients are unable to use a Resend Request to recover messages not in the server's cache. This cache size is available in the Trading Technical Parameters document that can found on the Millennium Exchange Technical Information website.

5.2 Possible duplicates

The server handles possible duplicates according to the FIX protocol. The client and server will use the PossDupFlag (43) field to indicate that a message may have been previously transmitted with the same MsgSeqNum (34).

5.3 Possible resends

5.3.1 Client-initiated messages

The server does not handle possible resends for the client-initiated messages (e.g. New Order – Single, Quote, etc.) and ignores the value in the PossResend (97) field of such messages.

5.3.2 Server-initiated messages

The server may, in the circumstances outlined in Sections 5.4 and 5.5, use the PossResend (97) field to indicate that an application message may have already been sent under a different MsgSeqNum (34). The client should validate the contents (e.g. ExecID) of such a message against those of messages already received during the current trading day to determine whether the new message should be ignored or processed.

5.4   Transmission of missed messages

The Execution Report, Order Cancel Reject, Order Mass Cancel Report, Quote Status Report, Mass Quote Acknowledgement and Business Message Reject messages generated during a period when a client is disconnected from the server will be sent to the client when it next reconnects. In the unlikely event the disconnection was due to an outage of the server, all such messages will include a PossResend (97) of "Y".

6 Message formats

This section provides details on the header and trailer, the seven administrative messages and twelve application messages utilized by the server. Client-initiated messages not included in this section are rejected by the server via a Reject or Business Message Reject. All fields are encoded using printable ASCII.

6.1 Supported message types

6.1.1 Administrative messages

All administrative messages may be initiated by either the client or the server.

Message	MsgType	Usage
Logon	A	Allows the client and server to establish a FIX session.
Logout	5	Allows the client and server to terminate a FIX session.
Heartbeat	0	Allows the client and server to exercise the communication line during periods of inactivity and verify that the interfaces at each end are available.
Test Request	1	Allows the client or server to request a response from the other party if inactivity is detected.
Resend Request	2	Allows for the recovery of messages lost during a malfunction of the communications layers.
Reject	3	Used to reject a message that does not comply with FIXT.
Sequence Reset	4	Allows the client or server to increase the expected incoming sequence number of the other party.

6.1.2 Application messages: order handling

6.1.2.1 Client-initiated

Message	MsgType	Usage
New Order – Single	D	Allows the client to submit a new order.
Order Cancel Request	F	Allows the client to cancel a live order.

Order Mass Cancel Request	q	Allows the client to mass cancel:
		(i) All live orders.
		(ii) All live orders for a particular instrument.
		(iii) All live orders for a particular segment.
		The mass cancel may apply to the orders of a particular trading party or to all orders of the member.
Order Cancel/Replace Request	G	Allows the client to cancel/replace a live order.

6.1.2.2 Server-initiated

Message	MsgType	Usage
Execution Report	8	Indicates one of the following:
		(i) Order accepted.
		(ii) Order rejected.
		(iii) Order executed.
		(iv) Order expired.
		(v) Order cancelled.
		(vi) Order cancel/replaced.
		(vii) Trade cancel.
		(viii) Trade correct.
		(ix) Order status.
Order Cancel Reject	9	Indicates that an order cancel request or order cancel/replace request has been rejected.
Order Mass Cancel Report	r	Indicates one of the following:
		(i) Mass order cancel request accepted.
		(ii) Mass order cancel request rejected.

6.1.3   Application messages: quote handling

6.1.3.1 Client-initiated

Message	MsgType	Usage
Quote	S	Allows the client to submit a quote for a single instrument.
Quote Cancel	Z	Allows the client to cancel a quote for a particular instrument. It may also use this message to mass cancel all quotes or those for a specified list of instruments.

6.1.3.2 Server-initiated

Message	MsgType	Usage
Quote Status Report	AI	Indicates one of the following: (i) Quote accepted (ii) Quote rejected (iii) Request to cancel a single quote accepted (iv) Request to cancel a single quote rejected (v) Quote cancelled by Market Operations
Mass Quote Acknowledgement	b	Indicates one of the following: (i) Request to mass cancel quotes accepted (ii) Request to mass cancel quotes rejected
Execution Report	8	Indicates one of the following: (i) Quote executed (ii) Trade cancel (iii) ~~Trade correct~~

6.1.4   Application messages: other

6.1.4.1 Server-initiated

Message	MsgType	Usage
Business Message Reject	j	(a) Indicates that an application message could not be processed

6.2 Message Header and Trailer

6.2.1 Message header

Tag	Field Name	Req	Description
8	BeginString	Y	FIXT.1.1
9	BodyLength	Y	Number of characters after this field up to and including the delimiter immediately preceding the CheckSum.
35	MsgType	Y	Message type.
49	SenderCompID	Y	CompID of the party sending the message.
56	TargetCompID	Y	CompID of the party the message is sent to.
34	MsgSeqNum	Y	Sequence number of the message.
43	PossDupFlag	N	Whether the message was previously transmitted under the same MsgSeqNum (34). Absence of this field is interpreted as Original Transmission (N). <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>Y</td><td>Possible Duplicate</td></tr><tr><td>N</td><td>Original Transmission</td></tr></table>
97	PossResend	N	Whether the message was previously transmitted under a different MsgSeqNum (34). Absence of this field is interpreted as Original Transmission (N). <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>Y</td><td>Possible Resend</td></tr><tr><td>N</td><td>Original Transmission</td></tr></table>
52	SendingTime	N	Time the message was transmitted. Not required for incoming messages sent by the clients (even if sent by a client, no validation will be done). Required for outgoing messages sent by the server.
122	OrigSendingTime	N	Time the message was originally transmitted. If the original time is not available, this should be the same value as SendingTime (52). Required if PossDupFlag (43) is Possible Duplicate (Y).

Tag	Field Name	Req	Description
1128	ApplVerID	N	Version of FIX used in the message. Required if the message is generated by the server.

Value	Meaning
9	FIX50SP2

Tag	Field Name	Req	Description
115	OnBehalfOfCompID	N	The ID of the party whose on behalf the message is sent; will only be used in client initiated messages
128	DeliverToCompID	N	The value specified in the OnBehalfOfCompID(115) field will be stamped; will only be used in server initiated messages

6.2.2 Message trailer

Tag	Field Name	Req	Description
10	CheckSum	Y	

6.3 Administrative messages

6.3.1 Logon

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	A = Logon
Message Body			
98	EncryptMethod	Y	Method of encryption.

Value	Meaning
0	None

Tag	Field Name	Req	Description
108	HeartBtInt	Y	Indicates the heartbeat interval in seconds.
141	ResetSeqNum Flag	N	Indicates whether the client and server should reset sequence numbers. Absence of this field is interpreted as Do Not Reset Sequence Numbers (N).

Value	Meaning
Y	Reset Sequence Numbers
N	Do Not Reset Sequence Numbers

554	Password	N	Password assigned to the CompID. Required if the message is generated by the client.		
925	NewPassword	N	New password for the CompID.		
1409	SessionStatus	N	Status of the FIX session or the request to change the password. Required if the message is generated by the server.		
			Value	**Meaning**	
			0	Session Active	
1137	DefaultApplVerID	Y	Default version of FIX messages used in this session and this value will be validated by the server.		
			Value	**Meaning**	
			9	FIX50SP2	
Standard Trailer					

6.3.2 Logout

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	5 = Logout
Message Body			
1409	SessionStatus	N	Status of the FIX session. Required if the message is generated by the server.<table><tr><td>**Value**</td><td>**Meaning**</td></tr><tr><td>4</td><td>Session logout complete</td></tr><tr><td>6</td><td>Account locked</td></tr><tr><td>7</td><td>Logons are not allowed at this time</td></tr><tr><td>8</td><td>Password expired</td></tr><tr><td>100</td><td>Other</td></tr><tr><td>101</td><td>Logout due to session level failure</td></tr><tr><td>102</td><td>Logout by market operations</td></tr></table>
58	Text	N	The field will contain the next expected sequence number as well as the received sequence number if the server terminated the connection after receiving a sequence number that was less than what was expected. In other cases the field will contain the reason for logout.
Standard Trailer			

6.3.3 Heartbeat

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	0 = Heartbeat
Message Body			
112	TestReqID	N	Required if the heartbeat is a response to a Test Request. The value in this field should echo the TestReqID (112) received in the Test Request.
Standard Trailer			

6.3.4   Test Request

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	1 = Test Request.
Message Body			
112	TestReqID	Y	Identifier for the request.
Standard Trailer			

6.3.5   Resend Request

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	2 = Resend Request
Message Body			
7	BeginSeqNo	Y	Sequence number of first message in range.
16	EndSeqNo	Y	Sequence number of last message in range.
Standard Trailer			

6.3.6   Reject

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	3 = Reject
Message Body			
45	RefSeqNum	Y	MsgSeqNum (34) of the rejected message.
372	RefMsgType	N	MsgType (35) of the rejected message.
371	RefTagID	N	If a message is rejected due to an issue with a particular field its tag number will be indicated.
373	SessionReject Reason	N	Code specifying the reason for the reject. Please refer to Section 7.3.1 for a list of reject codes.
58	Text	N	Text specifying the reason for the rejection.
Standard Trailer			

6.3.7 Sequence Reset

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	4 = Sequence Reset
Message Body			
36	NewSeqNo	Y	Sequence number of the next message to be transmitted.
123	GapFillFlag	N	Mode in which the message is being used. Absence of this field is interpreted as Sequence Reset (N). | Value	Meaning | |---|---| | Y | Gap Fill | | N | Sequence Reset |
Standard Trailer			

6.4 Application messages: order handling

6.4.1 New Order – Single

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	D = New Order - Single
Message Body			
11	ClOrdID	Y	Client specified identifier of the order.
Component Block <Trading Party>		Y	Identifier of the trading party, i.e. trader group. Please refer to section 6.7.1
1	Account	N	Client reference information.
48	SecurityID	Y	Identifier of the instrument.
22	SecurityIDSource	Y	Identifier of the source of the SecurityID (48) value.<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>8</td><td>Exchange Symbol</td></tr></table>
40	OrdType	Y	Type of the order.<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>1</td><td>Market</td></tr><tr><td>2</td><td>Limit</td></tr><tr><td>3</td><td>Stop</td></tr><tr><td>4</td><td>Stop Limit</td></tr><tr><td>P</td><td>Pegged</td></tr></table>
1091	PreTrade Anonymity	N	Whether the order is anonymous or named. Absence of this field is interpreted as Anonymous (Y).<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>Y</td><td>Anonymous</td></tr><tr><td>N</td><td>Named</td></tr></table>

59	TimeInForce	N	Time qualifier of the order. Absence of this field is interpreted as DAY (0).

Value	Meaning
0	DAY
2	At the Opening (OPG)
3	Immediate or Cancel (IOC)
4	Fill or Kill (FOK)
6	Good Till Date (GTD)
7	At the Close (ATC)
8	Good for Intra-Day Auction (GFX)
9	Good for Auction (GFA)

126	ExpireTime	N	Time the order expires which must be a time during the current trading day. Required if TimeInForce (59) is GTD (6) and ExpireDate (432) is not specified. If both the ExpireTime (126) and ExpireDate (432) are specified, the message will be rejected.
432	ExpireDate	N	Date the order expires. Required if TimeInForce (59) is GTD (6) and ExpireTime (126) is not specified.
54	Side	Y	Side of the order.

Value	Meaning
1	Buy
2	Sell

38	OrderQty	Y	Total order quantity.
1138	DisplayQty	Y	Maximum quantity that may be displayed. It is mandatory to specify the intended display quantity.

1084	DisplayMethod	N	Whether the order is a hidden order or the replenishment will be randomized.
			<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>3</td><td>Random (randomized value)</td></tr><tr><td>4</td><td>Undisclosed (Hidden Order)</td></tr></table>
			If this is populated with value "4" while a value which is greater than 0 is populated in DisplayQty (1138), the order will be considered as a Hidden (Reserve) Order.
			If this is populated with value "3" while a value which is greater than 0 and less than the Order Quantity is populated in DisplayQty (1138), the DisplayQty (1138) after a replenishment will be random.
			If blank while a value which is greater than 0 and less than the Order Quantity is populated in DisplayQty (1138), the DisplayQty (1138) after a replenishment will be "fixed peak".
44	Price	N	Limit price. Required if OrderType (40) is Limit (2) or Stop Limit (4).
99	StopPx	N	Stop price. Required if OrderType (40) is Stop (3) or Stop Limit (4).
581	AccountType	Y	Type of account associated with the order.
			<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>1</td><td>Client</td></tr><tr><td>3</td><td>House</td></tr></table>
528	OrderCapacity	Y	Capacity of the order.
			<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>A</td><td>Agency</td></tr><tr><td>P</td><td>Principal</td></tr><tr><td>R</td><td>Riskless Principal</td></tr><tr><td>C</td><td>CFD Give Up</td></tr></table>
60	TransactTime	Y	Time the order was created.
526	SecondaryClOrdID	N	A secondary ID assigned by the trading party.

583	ClOrdLinkID	N	Personal exposure of the trading party
~~20200~~	~~MESIndicator~~	N	~~Whether the order has a minimum executable size (MES). Absence of this field is interpreted as Non-MES (0)~~ ~~**Value** **Meaning**~~ ~~0 Non-MES~~ ~~1 MES~~
27010	PassiveOnlyOrder	N	Order level parameter to allow clients to specify that they would like their order to rest prior to execution, with flexibility for visible orders to rest at a specified price level on the book. Passive Only Orders will execute against hidden orders sat within the BBO on order entry. Any fully hidden order will be rejected if it has enum 100,1,2 or 3. No passive order validation will be done if field is not stamped or has 0 stamped on it. <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>0</td><td>No constraint (Default)</td></tr><tr><td>99</td><td>Only accept order if it will not match with visible contra order. Otherwise expire order</td></tr><tr><td>100</td><td>Only accept order if setting new visible BBO, otherwise expire order</td></tr><tr><td>1</td><td>Only accept order if setting new BBO or joining existing BBO. Otherwise expire order</td></tr><tr><td>2</td><td>Only accept order if will be at BBO or within one visible price-point. Otherwise expire order</td></tr><tr><td>3</td><td>Only accept order if will be at BBO or within two visible price-points. Otherwise expire order</td></tr></table>
Standard Trailer			

6.4.2 Order Cancel Request

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	F = Order Cancel Request
Message Body			
11	ClOrdID	Y	Client specified identifier of the cancel request.
41	OrigClOrdID	N	ClOrdID (11) of the order being cancelled. Required if OrderID (37) is not specified.
37	OrderID	N	Server specified identifier of the order being cancelled. Required if OrigClOrdID (41) is not specified.
48	SecurityID	Y	Identifier of the instrument.
22	SecurityIDSource	Y	Identifier of the source of the SecurityID (48) value. <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>8</td><td>Exchange Symbol</td></tr></table>
Component Block <Trading Party>		Y	Identifier of the trading party, i.e. trader group. Please refer to section 6.7.1
54	Side	Y	Must match the value in the order.
60	TransactTime	Y	Time the order cancel request was created.
Standard Trailer			

6.4.3   Order Mass Cancel Request

Tag	Field Name		Req	Description
Standard Header				
35	MsgType		Y	q = Order Mass Cancel Request
Message Body				
11	ClOrdID		Y	Client specified identifier of mass cancel request.
530	MassCancel RequestType		Y	Scope of the mass cancel request. | Value	Meaning | |---|---| | 1 | Cancel All Orders for Instrument | | 7 | Cancel All Orders | | 9 | Cancel All Orders for Segment |
48	SecurityID		N	Identifier of the instrument. Required if the scope of mass cancel is for an instrument.
22	SecurityIDSource		N	Identifier of the source of the SecurityID (48) value. Required if SecurityID (48) is specified. | Value	Meaning | |---|---| | 8 | Exchange Symbol |
1461	NoTargetPartyIDs		Y	Number of parties the mass cancel relates to. If specified, the value in this field will always be "1".
➡	1462	TargetPartyID	Y	Identifier of the party the mass cancel relates to. Required if NoTargetPartyIDs (1461) is specified.
➡	1463	TargetParty IDSource	Y	Required if NoTargetPartyIDs (1461) is specified. | Value	Meaning | |---|---| | D | Proprietary/Custom Code |

	1464	TargetParty Role	Y	Role of the TargetPartyID (1462). Required if NoTargetPartyIDs (1461) is specified.
➡				

Value	Meaning
1	Member ID
76	Trader Group

1300	MarketSegmentID		N	Identifier of the segment the mass cancel relates to. Required if MassCancelRequestType (530) is Cancel All for Segment (9).
60	TransactTime		Y	Time the mass cancel request was created.
Standard Trailer				

6.4.4 Order Cancel/Replace Request

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	G = Order Cancel/Replace Request
Message Body			
11	ClOrdID	Y	Client specified identifier of the cancel/replace request.
41	OrigClOrdID	N	ClOrdID (11) of the order being amended. Required if OrderID (37) is not specified.
37	OrderID	N	Server specified identifier of the order being amended. Required if OrigClOrdID (41) is not specified.
Component Block <Trading Party>		Y	Identifier of the trading party, i.e. trader group. Please refer to section 6.7.1
1	Account	N	Client reference information.
48	SecurityID	Y	Identifier of the instrument.
22	SecurityIDSource	Y	Identifier of the source of the SecurityID (48) value. | Value	Meaning
-------	---------
8	Exchange Symbol	
40	OrdType	Y	Must match the value in the order.
126	ExpireTime	N	Time the order expires which must be a time during the current trading day. Required if TimeInForce (59) is GTD (6) and ExpireDate (432) is not specified. If this is populated for a GTD Order when the new order had been submitted without this, then the message will be rejected. If both the ExpireTime (126) and ExpireDate (432) are specified, the message will not be rejected. If the New Order message contained the ExpireTime (126), the server processes only the expiry time and ignores ExpireDate (432) and vice versa.

432	ExpireDate	N	Date the order expires. Required if TimeInForce (59) is GTD (6) and ExpireTime (126) is not specified. If both the ExpireTime (126) and ExpireDate (432) are specified, the message will not be rejected. If the New Order message contained the ExpireTime (126), the server processes only the expiry time and ignores ExpireDate (432) and vice versa. If this is populated for a GTD Order when the new order had been submitted with an ExpireTime (126), then the message will be rejected.
54	Side	Y	Must match the value in the order.
38	OrderQty	Y	Total order quantity.
1138	DisplayQty	Y	Maximum quantity that may be displayed. It is mandatory to specify the intended display quantity.
1084	DisplayMethod	N	Whether the order is a hidden order. | Value	Meaning
---	---
3	Random (randomized value)
4	Undisclosed (Hidden Order)	 If this is populated with value "4" while a value which is greater than 0 is populated in DisplayQty (1138), the order will be considered as a Hidden (Reserve) Order. If this is populated with value "3" while a value which is greater than 0 and less than the Order Quantity is populated in DisplayQty (1138), the DisplayQty (1138) after a replenishment will be random.
44	Price	N	Limit price. Required if OrderType (40) is Limit (2) or Stop Limit (4).
99	StopPx	N	Stop price. Required if OrderType (40) is Stop (3) or Stop Limit (4).
60	TransactTime	Y	Time the cancel/replace request was created.

27010	PassiveOnlyOrder	N	Order level parameter to allow clients to specify that they would like their order to rest prior to execution, with flexibility for visible orders to rest at a specified price level on the book.
			Passive Only Orders will execute against hidden orders sat within the BBO on order entry.
			Any fully hidden order will be rejected if it has enum 100,1,2 or 3.
			No passive order validation will be done if field is not stamped or has 0 stamped on it.
			The newly amended or old PassiveOnlyOrder indicator stamped on an order amend message will not be evaluated.

Value	Meaning
0	No constraint (Default)
99	Only accept order if it will not match with visible contra order. Otherwise expire order
100	Only accept order if setting new visible BBO, otherwise expire order
1	Only accept order if setting new BBO or joining existing BBO. Otherwise expire order
2	Only accept order if will be at BBO or within one visible price-point. Otherwise expire order
3	Only accept order if will be at BBO or within two visible price-points. Otherwise expire order

Standard Trailer

6.4.5 Execution Report

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	8 = Execution Report
Message Body			
17	ExecID	Y	Server specified identifier of the message. This is a 62 base encoded value in ASCII format.
11	ClOrdID	Y	Client specified identifier of the order.
41	OrigClOrdID	N	Will be filled with the actual original client order id of the order irrespective of the fact whether OrigClOrdID was specified (valid or invalid value) or not in the order cancel or cancel/replace request.
37	OrderID	Y	Server specified identifier of the order. This will be a 62 base encoded value in ASCII format. By converting this to binary, this can be mapped with ITCH Order ID.
150	ExecType	Y	Reason the execution report was generated.
19	ExecRefID	N	Reference to the execution being cancelled or corrected. Required if ExecType (150) is Trade Cancel (H) 336 Trade Correct (G).

For ExecType (tag 150):

Value	Meaning
0	New
4	Cancelled
5	Replaced
8	Rejected
C	Expired
D	Restated
F	Trade
G	Trade Correct
H	Trade Cancel
9	Suspended

378	Exec Restatement Reason	N	Reason the order was restated. Required if ExecType (150) is Restated (D) and if order is cancelled via Market Operations.
			When an order is amended or cancelled by Market Supervision, value 8 will be populated.
			In some scenarios, when a trade is cancelled by market supervision, value 8 will be populated in the execution reports sent for order restatements.

Value	Meaning
8	Market Option
100	Order replenishment

39	OrdStatus	Y	Current status of the order.

Value	Meaning
0	New
1	Partially Filled
2	Filled
4	Cancelled
8	Rejected
C	Expired
9	Suspended

103	OrdRejReason	N	Code specifying the reason for the reject. Please refer to MIT801 for a list of reject codes. Required if ExecType (150) is Rejected (8) or for orders expired (C) due to Self-Execution Prevention validations.
58	Text	N	Text specifying the reason for the rejection or expiration
32	LastQty	N	Quantity executed in this fill. Required if ExecType (150) is Trade (F) or Trade Correct (G).
31	LastPx	N	Price of this fill. Required if ExecType (150) is Trade (F) or Trade Correct (G).

151	LeavesQty	Y	Quantity available for further execution. Will be "0" if OrdStatus (39) is Filled (2), Cancelled (4), Rejected (8) or Expired (C).	
14	CumQty	Y	Total cumulative quantity filled.	
48	SecurityID	Y	Identifier of the instrument.	
22	SecurityIDSource	Y	Identifier of the source of the SecurityID (48) value.	

Value	Meaning
8	Exchange Symbol

Component Block <Trading Party>		Y	Values specified in the order. Please refer to section 6.7.1	
1	Account	N	Value submitted with the order.	
40	OrdType	Y	Value submitted with the order.	
1091	PreTrade Anonymity	N	Value submitted with the order.	
59	TimeInForce	N	Value submitted with the order.	
126	ExpireTime	N	Value submitted with the order.	
432	ExpireDate	N	Value submitted with the order.	
54	Side	Y	Value submitted with the order.	
38	OrderQty	Y	Value submitted with the order.	
1138	DisplayQty	N	Quantity currently displayed in the order book.	
1084	DisplayMethod	N	Value submitted with the order.	
44	Price	N	Value submitted with the order.	
99	StopPx	N	Value submitted with the order.	
581	AccountType	Y	Type of account associated with the order.	

Value	Meaning
1	Client
3	House

528	OrderCapacity	Y	Capacity of the order.

Value	Meaning
A	Agency
P	Principal
R	Riskless Principal

60	TransactTime	Y	Time the transaction represented by the Execution Report occurred.
526	SecondaryClOrdID	N	Value submitted with the order.
583	ClOrdLinkID	N	Value submitted with the order.
103	OrdRejReason	N	Code specifying the reason for the reject. Please refer to Section 9.1.1 for a list of reject codes. Required if ExecType (150) is Rejected (8) or for self order Expirations
~~20200~~	~~MESIndicator~~	~~N~~	~~Value submitted with the order.~~
9730	TradeLiquidityIndicator	N	Whether the order added or removed liquidity. Required only for messages generated for a trade ~~trade corrections~~ or trade cancellations. Will be populated for both automatic trades (AT) and auction trades (UT). Possible values are:

Value	Meaning
A	Added Liquidity
R	Removed Liquidity
C	Auction

336	Trading SessionID	N	Indicates whether the order is a CPX order or not.

880	TradeMatchID	N	The unique ID of the trade.
			This will be a 36 base encoded value in ASCII format.
			Since the ITCH trade ID will be disseminated in binary format via the ITCH gateway, this Base 36 value needs to be converted to the binary format to compare against it.
			Required if ExecType (150) is Trade (F) or Trade Cancel (H).
			Also the identifier sent to the clearer.
20000	TypeOfTrade	N	Indicates whether the executed portion is visible or hidden. Required only if ExecType (150) = F - Trade.
			Value / Meaning
			0 Visible
			1 Hidden
			2 Not Specified
27010	PassiveOnlyOrder	N	Value submitted with the order or order amend request.

	Value	Meaning
	0	No constraint
	99	Only accept order if it will not match with visible contra order. Otherwise expire order
	100	Only accept order if setting new visible BBO, otherwise expire order
	1	Only accept order if setting new BBO or joining existing BBO. Otherwise expire order
	2	Only accept order if will be at BBO or within one visible price-point. Otherwise expire order
	3	Only accept order if will be at BBO or within two visible price-points. Otherwise expire order

27011	PriceDifferential	N	Value	Meaning
			A	Aggressive (an order (visible or hidden) which executes immediately; any residual if visible is then stamped based on its deviation from the current BBO or P if hidden)
			B	New visible BBO
			1	Join visible BBO
			2	Joining/setting 2nd best visible price
			3	Joining/setting 3rd best visible price
			4	Joining/setting 4th best visible price
			5	Joining/setting 5th best visible price
			6	Joining/setting 6th best visible price
			7	Joining/setting 7th best visible price
			8	Joining/setting 8th best visible price
			9	Joining/setting 9th best visible price or joining/ setting worse price point
			P	Passive (a Hidden order that rests i.e. does not execute. This is not valid for visible orders)
			This field will not be stamped if the trading parameter 'Capture Price Differential' is disabled.	
278	MDEntryID	Y	Public Order ID	
Standard Trailer				

6.4.6 Order Cancel Reject

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	9 = Order Cancel Reject
Message Body			
11	ClOrdID	Y	ClOrdID (11) that was submitted with the order cancel or cancel/replace request being rejected.
41	OrigClOrdID	N	OrigClOrdID (41), that was submitted with the order cancel or cancel/replace request being rejected.
37	OrderID	Y	Server specified identifier of the order for which the cancel or cancel/replace was submitted. Will be "NONE" if the order is unknown.
39	OrdStatus	Y	Current status of the order. Will be Rejected (8) if the order is unknown or the request cannot be processed. <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>0</td><td>New</td></tr><tr><td>1</td><td>Partially Filled</td></tr><tr><td>2</td><td>Filled</td></tr><tr><td>4</td><td>Cancelled</td></tr><tr><td>8</td><td>Rejected</td></tr><tr><td>C</td><td>Expired</td></tr><tr><td>9</td><td>Suspended</td></tr></table>
434	CxlRej ResponseTo	Y	Type of request being rejected. <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>1</td><td>Order Cancel Request</td></tr><tr><td>2</td><td>Order Cancel/Replace Request</td></tr></table>
102	CxlRejReason	Y	Code specifying the reason for the rejection. Please refer to Section 7.1.2 for a list of reject codes.
58	Text	N	Text specifying the reason for the rejection.
Standard Trailer			

6.4.7 Order Mass Cancel Report

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	r = Order Mass Cancel Report
Message Body			
1369	MassActionReportID	Y	Server specified identifier of the message.
11	ClOrdID	Y	Client specified identifier of mass cancel request.
530	MassCancel RequestType	Y	Value specified in the mass cancel request.
531	MassCancel Response	Y	Action taken by server. <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>0</td><td>Mass Cancel Request Rejected</td></tr><tr><td>1</td><td>Cancelled All Orders for Instrument</td></tr><tr><td>7</td><td>Cancelled All Orders</td></tr><tr><td>9</td><td>Cancelled All Orders for Segment</td></tr></table>
532	MassCancelReject Reason	N	Code specifying the reason for the rejection. Please refer to Section 7.1.3 for a list of reject codes. Required if MassCancelResponse (531) is Mass Cancel Request Rejected (0).
1180	AppIId	Y	Partition ID to which the Order Mass Cancel Report corresponds to.
Standard Trailer			

6.5 Application messages: quote handling

6.5.1 Quote

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	S = Quote
Message Body			
1166	QuoteMsgID	Y	Client specified identifier of the message.
117	QuoteID	Y	Identifier of the quote entry. The value is this field should always be "1".
537	QuoteType	N	Type of quote. Absence interpreted as Firm Quote (0). <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>0</td><td>Firm Quote</td></tr><tr><td>1</td><td>Executable Quote</td></tr></table>
48	SecurityID	Y	Identifier of the instrument.
22	SecurityIDSource	Y	Identifier of the source of the SecurityID (48) value. <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>8</td><td>Exchange Symbol</td></tr></table>
Component Block <Trading Party>		Y	Identifier of the trading party, i.e. trader group. Please refer to section 6.7.1
132	BidPx	N	Bid price. Required if BidSize (134) is specified.
134	BidSize	N	Bid quantity. Required if BidPx (132) is specified.
133	OfferPx	N	Offer price. Required if OfferSize (135) is specified.
135	OfferSize	N	Offer quantity. Required if OfferPx (133) is specified.

581	AccountType	Y	Type of account associated with the quote. Only required for Executable Quotes. | Value	Meaning | |---|---| | 1 | Client | | 3 | House |
528	OrderCapacity	N	Capacity of the order. Only required for Executable Quotes. | Value	Meaning | |---|---| | A | Agency | | P | Principal | | R | Riskless Principal |
Standard Trailer			

6.5.2   Quote Cancel

Tag	Field Name		Req	Description
Standard Header				
35	MsgType		Y	Z = Quote Cancel
Message Body				
1166	QuoteMsgID		Y	Client specified identifier of the message.
298	QuoteCancelType		Y	Type of quote cancel request. | Value	Meaning | |---|---| | 1 | Cancel for Instruments | | 4 | Cancel All Quotes |
1461	NoTargetPartyIDs		Y	Number of parties. If specified, the value in this field should always be "1".
➡	1462	TargetPartyID	Y	Identifier of the party the quote cancel relates to. Required if NoTargetPartyIDs (1461) is specified.
➡	1463	TargetParty IDSource	Y	Required if NoTargetPartyIDs (1461) is specified. | Value	Meaning | |---|---| | D | Proprietary/Custom Code |

	1464	TargetPartyRole	Y	Role of the TargetPartyID (1462). Required if NoTargetPartyIDs (1461) is specified.
➡				

Value	Meaning
1	Member ID
76	Trader Group

295	NoQuoteEntries		N	Number of instruments for which quotes are to be cancelled. The value in this field may not be greater than 25. Required if QuoteCancel Type (298) is Cancel for Instruments (1).
➡	48	SecurityID	N	Identifier of the instrument. Required of the type of quote cancel request is based on an instrument(s).
➡	22	SecurityIDSource	N	Identifier of the source of the SecurityID (48) value. Required if the SecurityID (48) is specified.

Value	Meaning
8	Exchange Symbol

Standard Trailer

6.5.3 Quote Status Report

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	AI = Quote Status Report
Message Body			
1166	QuoteMsgID	Y	Client specified identifier of the quote or quote cancel request the message relates to.
298	QuoteCancel Type	N	Value specified in the Quote Cancel request. Required if the message is sent in response to a Quote Cancel.
Component Block <Trading Party>		N	Value, if any, submitted with the quote. Not required when the message is sent as a response to a quote cancel request. Please refer to section 6.7.1
537	QuoteType	Y	Type of quote. | Value	Meaning
---	---
0	Firm Quote
1	Executable Quote	
297	QuoteStatus	Y	Status of the quote or cancel request. | Value	Meaning
---	---
0	Accepted
5	Rejected
6	Removed from Market
7	Expired
17	Cancelled	
300	QuoteReject Reason	N	Code specifying the reason for the reject. Please refer to Section 7.2.1 for a list of reject codes. Required if QuoteStatus (297) is Rejected (5).
58	Text	N	Text specifying the reason for the rejection or expiration.
Standard Trailer			

6.5.4 Mass Quote Acknowledgement

Tag	Field Name			Req	Description
Standard Header					
35	MsgType			Y	b = Mass Quote Acknowledgement
Message Body					
1180	ApplId			N	Partition ID to which the Order Mass Cancel Report corresponds to.
117	QuoteID			Y	QuoteMsgID (1166) of the Quote Cancel the message is sent in response to.
298	QuoteCancelType			N	Value submitted in the quote cancel request. Required if the message is sent in response to a Quote Cancel.
297	QuoteStatus			Y	Status of the cancel request. | Value	Meaning | |---|---| | 0 | Accepted | | 5 | Rejected |
300	QuoteRejectReason			N	Code specifying the reason for the rejection. Please refer to Section 7.2.2 for a list of reject codes. Required if QuoteStatus (297) is Rejected (5).
58	Text			N	Text specifying the reason for the rejection.
296	NoQuoteSets			N	Number of quote sets. Required if the message is a response to a quote cancel.
➡	302	QuoteSetID		N	Identifier of the quote set which should be the first entry in the repeating group. Required if NoQuoteSets (296) is specified.
➡	295	NoQuoteEntries		N	Number of quote entries in the quote set.
➡	➡	299	Quote EntryID	N	Identifier of the quote entry which should be the first entry in the repeating group. If specified, the value in this field will always be "1". Required if NoQuoteEntries (295) is specified.
➡	➡	48	SecurityID	N	Identifier of the instrument. Required if NoQuoteEntries (295) is specified.

		22	SecurityID Source	N	Identifier of the source of the SecurityID (48) value. Required if NoQuoteEntries (295) is specified.

Value	Meaning
8	Exchange Symbol

		1167	Quote Entry Status	N	Status of the cancel request for the quote entry. Required if NoQuoteEntries (295) is specified.

Value	Meaning
5	Rejected

		368	Quote Entry Reject Reason	N	Code specifying the reason the quote or cancel request for the quote entry was rejected. Please refer to Section 7.2.2 for a list of reject codes. Required if QuoteEntry Status (1167) is Rejected (5).

Standard Trailer

6.5.5 Execution Report

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	8 = Execution Report
Message Body			
17	ExecID	Y	Server specified identifier of the message.
11	ClOrdID	Y	QuoteMsgID (1166) of the message last used to update the quote entry.
37	OrderID	Y	Server specified identifier of the executed side. This will be a 62 base encoded value in ASCII format. By converting this to binary, this can be mapped with ITCH Order ID.
150	ExecType	Y	Reason the execution report was generated.
19	ExecRefID	N	Reference to the execution being cancelled or corrected. Required if ExecType (150) is Trade Cancel (H) ~~or Trade Correct (G).~~

Value	Meaning
F	Trade
~~G~~	~~Trade Correct~~
H	Trade Cancel

378	Exec Restatement Reason	N	Reason the order was restated. Required if ExecType (150) is Restated (D).

Value	Meaning
8	Market Option

54	Side	Y	Side of the quote that was executed.

Value	Meaning
1	Buy
2	Sell

32	LastQty	N	Quantity executed in this fill. Required if ExecType (150) is Trade (F) or Trade Correct (G).
31	LastPx	N	Price of this fill. Required if ExecType (150) is Trade (F) or Trade Correct (G).
39	OrdStatus	Y	Current status of the executed side of the quote entry.

Value	Meaning
0	New
1	Partially Filled
2	Filled
4	Cancelled
C	Expired

151	LeavesQty	Y	Quantity available for further execution. Will be "0" if OrdStatus (39) is Filled (2), Cancelled (4) or Expired (C).
14	CumQty	Y	Will always be "0".
48	SecurityID	Y	Identifier of the instrument.
22	SecurityIDSource	Y	Identifier of the source of the SecurityID (48) value.

Value	Meaning
8	Exchange Symbol

Component Block <Trading Party>	Y	Value submitted with the last update for the quote entry. Please refer to section 6.7.1

40	OrdType	Y		
			Value	**Meaning**
			2	Limit

59	TimeInForce	Y	Time qualifier of the quote entry.	
			Value	**Meaning**
			0	Day

38	OrderQty	Y	Order quantity is always NOT set to the bid or offer size submitted with the last update for the quote entry. It can even be the order quantity if it was an order which satisfies the below formula: Order Quantity = Leaves Quantity + Cumulative Executed Quantity

44	Price	Y	Bid or offer price submitted with the last update for the quote entry.

581	AccountType	N	Type of account associated with the quote. Only required for Executable quotes.	
			Value	**Meaning**
			1	Client
			3	House

528	OrderCapacity	N	Capacity of the quote entry. Only required for Executable quotes.	
			Value	**Meaning**
			A	Agency
			P	Principal
			R	Riskless Principal

60	TransactTime	Y	Time the transaction represented by the Execution Report occurred.

9730	TradeLiquidityIndicator	N	Whether the order added or removed liquidity. Required only for messages generated for a trade ~~trade corrections~~ or trade cancellations. Will be populated for both automatic trades (AT) and auction trades (UT). Possible values are:	
			Value	**Meaning**
			A	Added Liquidity
			R	Removed Liquidity
			C	Auction

880	TradeMatchID	N	The unique ID of the trade. This will be a 36 base encoded value in ASCII format.
			Since the ITCH trade ID will be disseminated in binary format via the ITCH gateway, this Base 36 value needs to be converted to the binary format to compare against it.
			Required only for messages generated for a trade ~~trade corrections~~ or trade cancellations.
			Also the identifier sent to the clearer.
Standard Trailer			

6.6   Application messages: others

6.6.1   Business Message Reject

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	j = Business Message Reject
Message Body			
379	BusinessReject RefID	N	Client specified identifier (e.g. ClOrdID, QuoteMsgID, etc.) of the rejected message if it is available.
45	RefSeqNum	Y	MsgSeqNum (34) of the rejected message.
372	RefMsgType	Y	MsgType (35) of the rejected message.
371	RefTagID	N	If a message is rejected to due to an issue with a particular field its tag number will be indicated.
380	BusinessReject Reason	Y	Code specifying the reason for the reject. Please refer to Section 7.3.2 for a list of reject codes.
58	Text	N	Text specifying the reason for the rejection (not including TagID. See RefTagID for this information).
Standard Trailer			

6.7   Components of application messages

6.7.1   Trading Party

Tag		Field Name	Req	Description
453		NoPartyIDs	Y	Number of party identifiers. The value in this field can be "1", "2" or "3".
➡	448	PartyID	Y	Identifier of the party.

	447	PartyID Source	Y	

Value	Meaning
D	Proprietary/Custom Code

	452	Party Role	Y	Role of the specified PartyID (448). Party Role Trader Group (76) is mandatory for the New Order – Single, Order Cancel Request, Order Cancel/Replace Request and Quote messages. The value specified in the Trader ID (12) will not be validated by the system.

Value	Meaning
12	Trader ID
17	Counterparty Firm
76	Trader Group

6.7.2   Trading Session

Tag	Field Name	Req	Description
386	NoTrading Sessions	N	Number of sessions the order is valid for. If specified, the value in this field should always be "1".
➡ 336	Trading Session ID	N	Session the order is valid for

Value	Meaning
A	Closing Price Cross

7 Reject codes

7.1 Order handling

7.1.1 Execution Report

OrdRej Reason	Meaning
2	Exchange closed
5	Unknown order
6	Duplicate order (i.e. duplicate ClOrdID)
18	Invalid price increment
99	Other

7.1.2 Order Cancel Reject

CxlRej Reason	Meaning
0	Too late to cancel
1	Unknown order
18	Invalid price increment
99	Other
113100	Invalid amend (attempting to amend a hidden order to an iceberg/fully visible order)
113101	Invalid amend (attempting to amend an iceberg/fully visible order to a hidden order)

7.1.3 Order Mass Cancel Report

Mass Cancel Reject Reason	Meaning
1	Unknown instrument
99	Other
100	Unknown executing member
101	Unknown trading party

7.2 Quote handling

7.2.1 Quote Status Report

Quote Reject Reason	Meaning
1	Unknown instrument
2	Exchange closed
6	Duplicate quote (i.e. duplicate QuoteMsgID (1166))
7	Invalid bid/ask spread
8	Invalid BidPx (132) or OfferPx (133)
9	Trading party not registered to quote instrument
99	Other

7.2.2 Mass Quote Acknowledgement

Quote Reject Reason	Meaning
1	Unknown instrument
2	Exchange closed
6	Duplicate quote (i.e. duplicate QuoteMsgID (1166))
9	Trading mnemonic not registered to quote security

The above reject codes apply to both the QuoteRejectReason (300) and QuoteEntryReject Reason (368) fields of the Mass Quote Acknowledgement.

7.3 Others

7.3.1 Reject

Session Reject Reason	Meaning
1	Required tag missing
2	Invalid tag
4	Tag specified without a value
5	Value is incorrect (out of range) for this tag
6	Incorrect data format for value
9	CompID problem

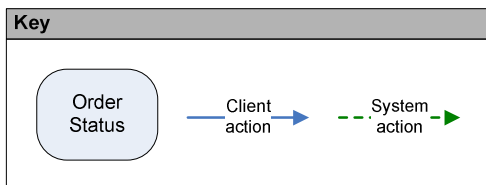| 11	Invalid message type
13	Tag appears more than once
14	Tag specified out of required order
15	Repeating group fields out of order
16	Incorrect NumInGroup count for repeating group
18	Invalid or unsupported application version
99	Other

7.3.2   Business Message Reject

Business Reject Reason	Meaning
0	Other
0	Message rate exceeded
0	Trader group not specified on message
2	Unknown instrument
3	Unsupported Message Type
4	Application not available
5	Conditionally required field missing

8 Process flows

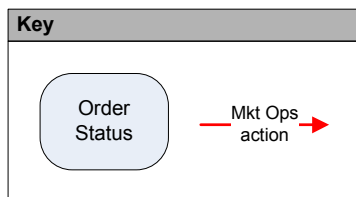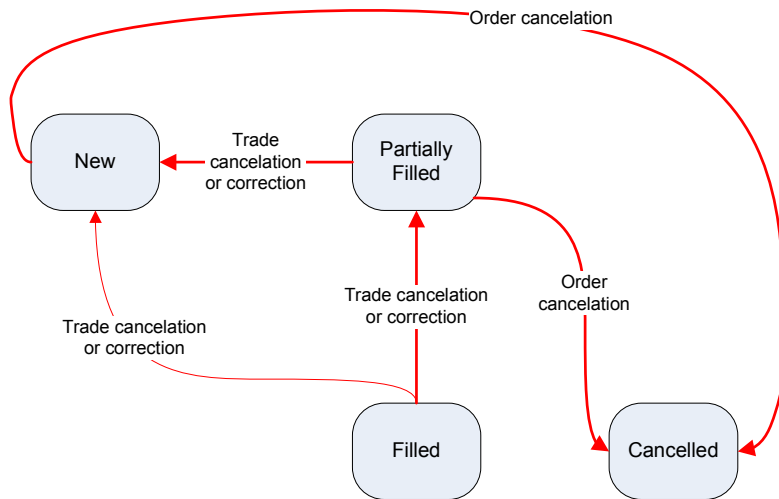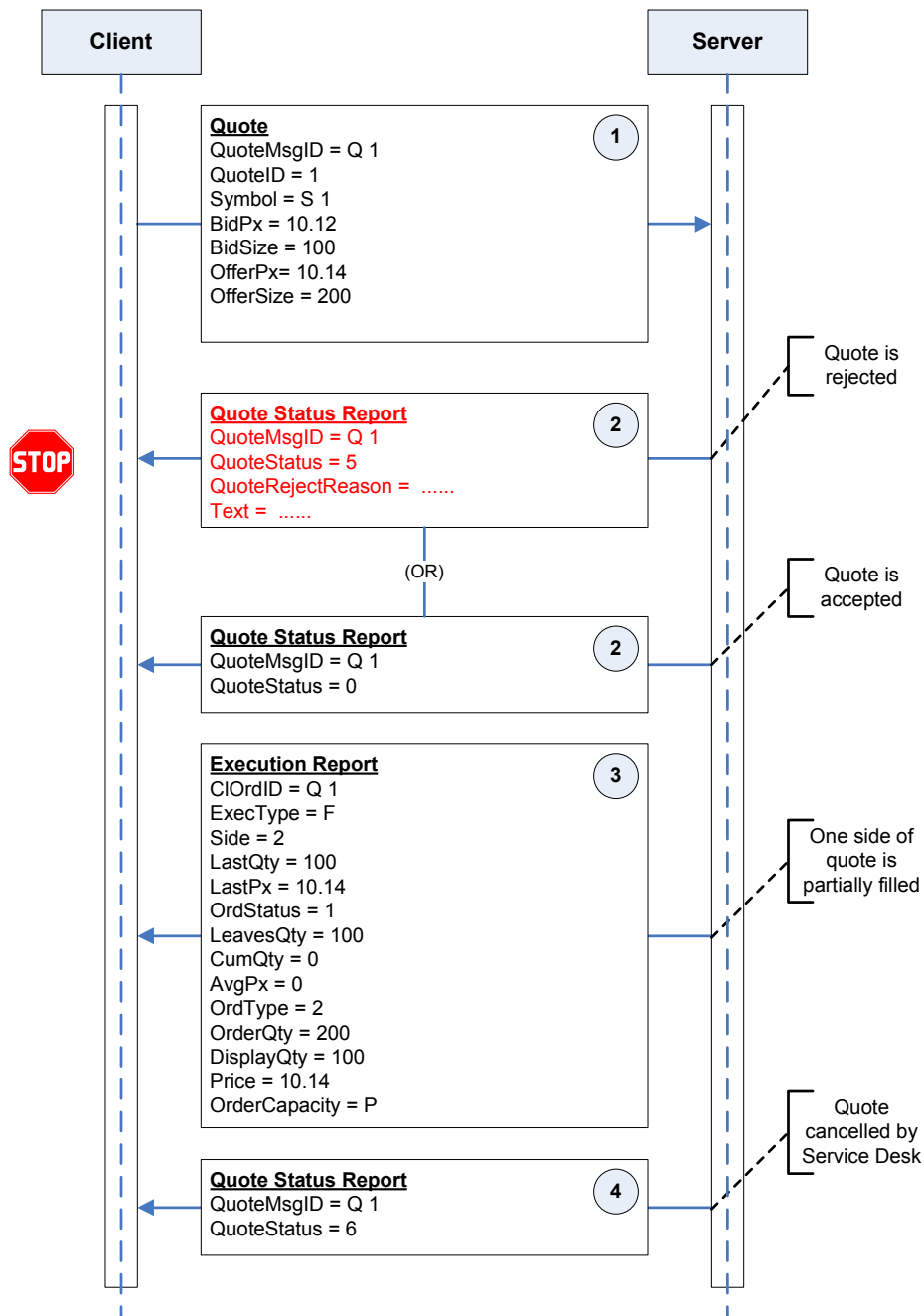## 8.1 Order handling

8.1.1 Order Status Changes
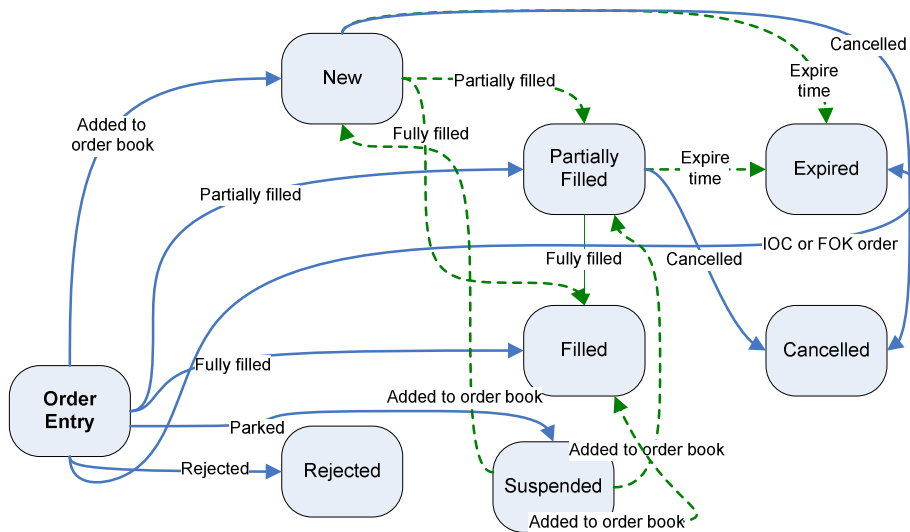
8.1.1.1 Market Operations actions

8.2 Quote handling

8.2.1 Single Quotes

Client

Server

Quote
QuoteMsgID = Q 1
QuoteID = 1
Symbol = S 1
BidPx = 10.12
BidSize = 100
OfferPx= 10.14
OfferSize = 200

(1)

Quote is rejected

Quote Status Report
QuoteMsgID = Q 1
QuoteStatus = 5
QuoteRejectReason = ...
Text = ...

(2)

STOP

(OR)

Quote is accepted

Quote Status Report
QuoteMsgID = Q 1
QuoteStatus = 0

(2)

Execution Report
ClOrdID = Q 1
ExecType = F
Side = 2
LastQty = 100
LastPx = 10.14
OrdStatus = 1
LeavesQty = 100
CumQty = 0
AvgPx = 0
OrdType = 2
OrderQty = 200
DisplayQty = 100
Price = 10.14
OrderCapacity = P

(3)

One side of quote is partially filled

Quote Status Report
QuoteMsgID = Q 1
QuoteStatus = 6

(4)

Quote cancelled by Service Desk

8.2.2 Quote cancellation

8.2.2.1 Cancellation of a single quote
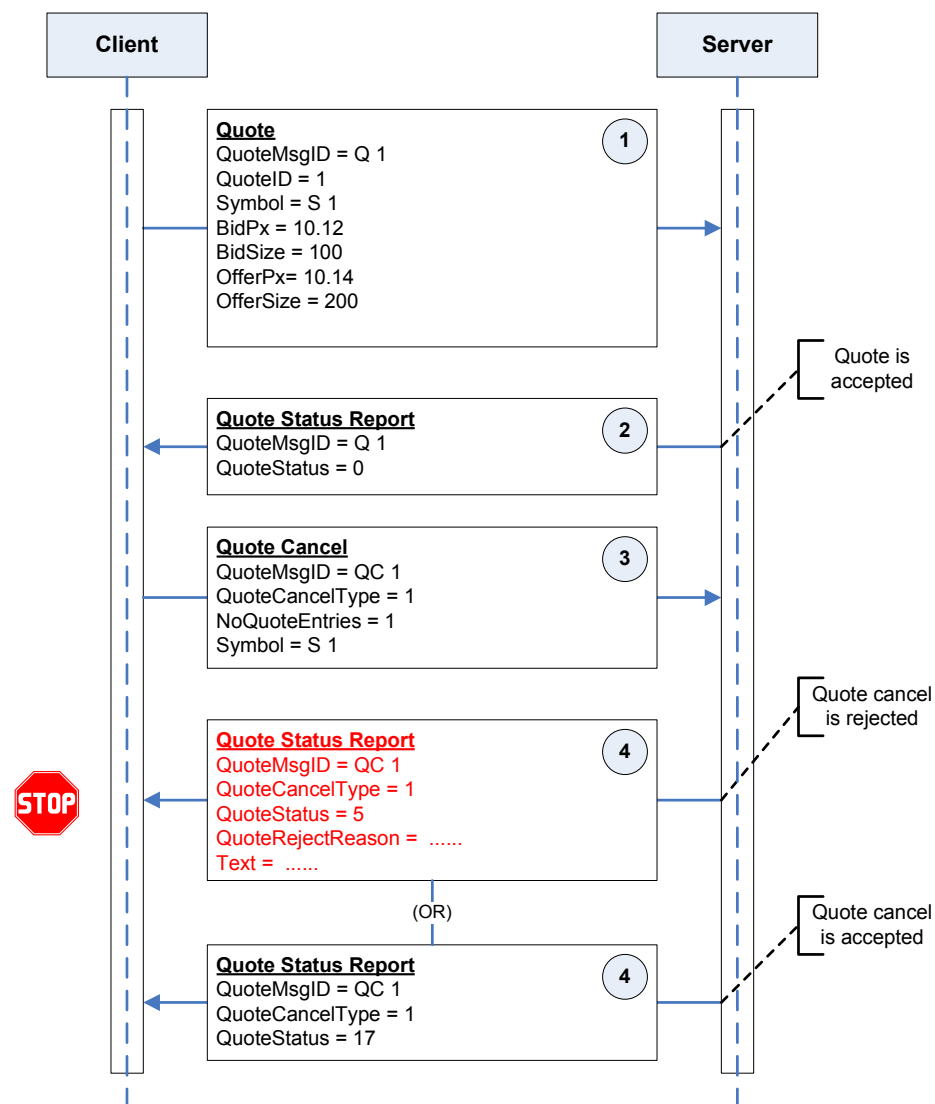
8.2.2.2 Mass cancellation of quotes

Client   **Server**

Quote Cancel   (1)
QuoteMsgID = QC 1
QuoteCancelType = 4

> Entire mass mass cancel is rejected

STOP

Mass Quote Acknowledgement   (2)
QuoteID = QC 1
QuoteStatus = 5
QuoteRejectReason = ...
Text = ...
QuoteCancelType = 4

(OR)

Mass Quote Acknowledgement   (2)
QuoteID = QC 1
QuoteCancelType = 4
QuoteStatus = 0

> All quote entries are cancelled

(OR)

Mass Quote Acknowledgement   (2)
QuoteID = QC 1
QuoteCancelType = 4
QuoteStatus = 0
NoQuoteSets = 1
QuoteSetID = 1
NoQuoteEntries = 2
QuoteEntryID = 1
Symbol = S 1
QuoteEntryStatus = 5
Quote Entry Reject Reason = ...
QuoteEntryID = 1
Symbol = S 2
QuoteEntryStatus = 5
QuoteEntryRejectReason = ...

> Some quote entries are cancelled. The cancellations of the rest are rejected

9   Service availability

Customer Activity	Availability
Telnet Access	02.00 - 18:17
Login Access	04.00 - 18:17
Order Deletion	07.50 - 17.15

Clients wishing to test connectivity outside of these hours should review
MIT501 – Guide to Testing Services for more information.

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