

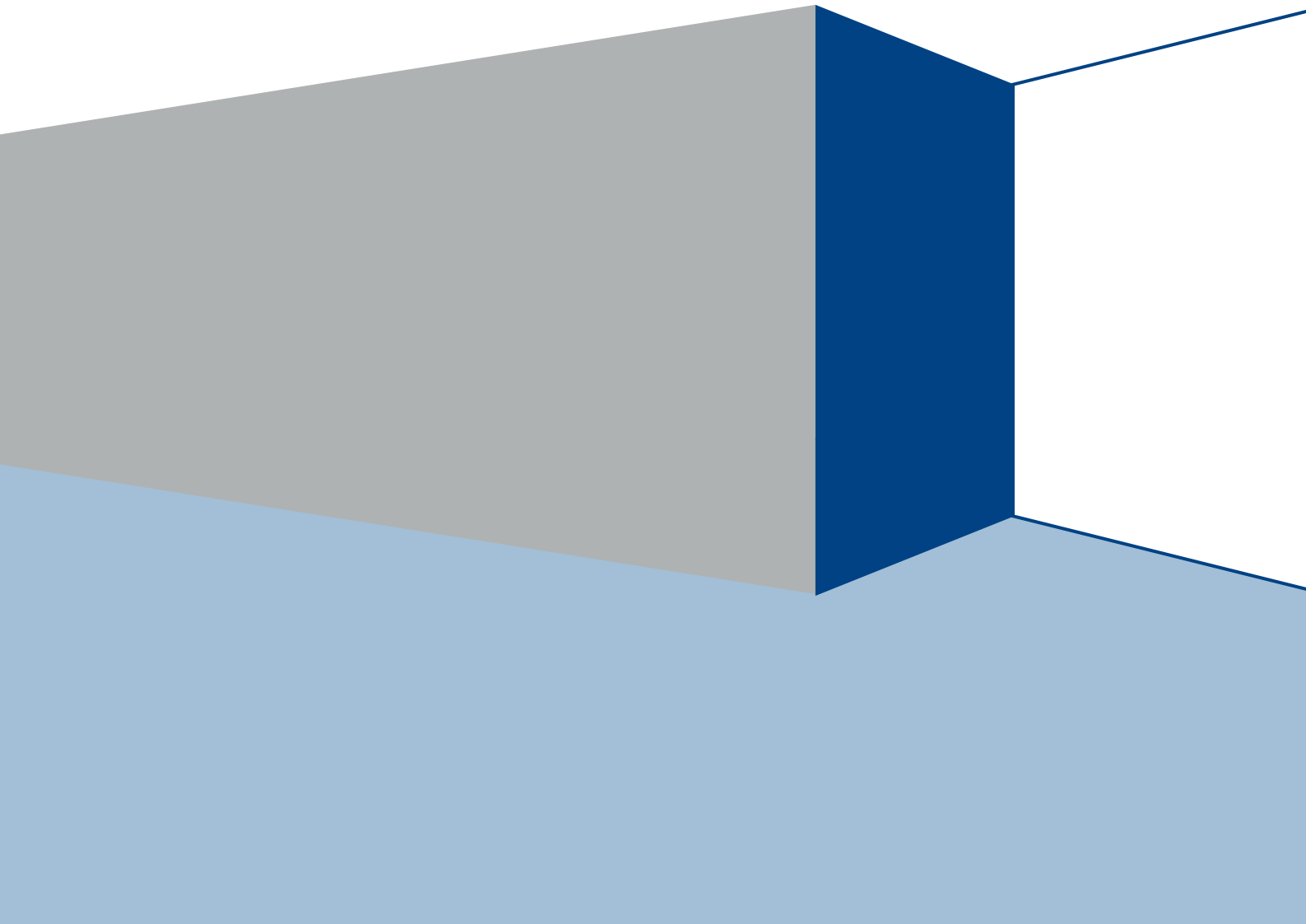


**London**  
Stock Exchange

MIT203 · MILLENNIUM EXCHANGE

# Native Trading Gateway

Issue 10.4 · 22 March 2013



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## **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

The London Stock Exchange has provided a Native Trading Gateway as a low latency connectivity solution.

The interface is a point-to-point service based on the TCP/IP standard.

## 1.1 Purpose

The purpose of this document is to provide an overview of the full range of services via the Native Trading Gateway Interface available on the Millennium Exchange.

## 1.2 Readership

This document outlines how to connect to the Native Trading Gateway and the detailed message types and fields used.

When read in conjunction with the message specifications 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 trading and technical staff within the Exchange's member firms and other market participants interested in developing to the London Stock Exchange Native Trading Gateway.

## 1.3 Document series

This document is part of series of documents providing a holistic view of full trading and information services available from the 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 Specification (FIX 5.0)
  - **MIT203 – Native Trading Gateway Specification (this document)**
  - 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 Message Specification
  - MIT303 – ITCH Message Specification
  - MIT304 - Regulatory News Service Specification
- MIT401 - Reference Data Service Specification
- MIT501 – Guide to the Customer Testing Services

- MIT502 - Guide to Application Certification
- 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 documents.

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	15 June 2011	Missed Message Request Ack Description on page 42, Value 2 Meaning has been changed from 'Invalid App ID or Service is unavailable' to 'Invalid App ID'.
9.0	23 September 2011	Ninth issue of this document published via the London Stock Exchange's website and distributed to customers.
9.1	5 December 2011	Introduction of the third partition
10.0	15 December 2011	Tenth issue of this document published via the London Stock Exchange's website and distributed to customers.
10.1	20 December 2011	Change field length in Reserve Field (offset 135) on page 55.
10.2	28 September 2012	Amended to include new PassiveOnlyOrder and PriceDifferential fields and additional information in Data Types section .

10.3	1 November 2012	Added Connectivity Policy section, changed wording of Reserved Field Handling in Data Types section and added additional guidance for Passive Only Orders and Price Differential fields.
10.4	22 March 2013	Amended to reflect the latest Millennium enhancements.
10.4	18 April 2013	8.4.6 – Enum 3 added to Restatement reason field in ER.

In subsequent issues, where amendments have been made to the previous issue, 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 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](mailto:londontam@londonstockexchange.com)

## 2 Service overview

London Stock Exchange Group offers a low latency native trading interface which allows member firms to send and manage their trading interest. The interface enables clients to perform the following activities.

- (a) Order handling
  - (i) Submit an order
  - (ii) Cancel an order
  - (iii) Mass cancel orders
  - (iv) Cancel/replace an order
  
- (b) Quote handling
  - (v) Submit and update a quote
  - (vi) Cancel a quote
  - (vii) Mass cancel quotes

The interface is a point-to-point service based on the TCP/IP standard.



## 3 Service description

### 3.1 System architecture

The Native Trading Gateway consists of two channels. A Real Time Channel which provides the main order management functionality and a Recovery Channel that allows clients to subscribe to missed messages due to disconnection from the Real Time Channel.

### 3.2 Order handling

#### 3.2.1 Order types

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

Order Type	Description
Market	An order that will execute at the best available prices until it is fully filled. Any remainder will be expired.
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.
Stop	A market order that remains inactive until the market reaches a specified stop price.
Stop Limit	A limit order that remains inactive until the market reaches a specified stop price.
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.
Hidden	An order that contains no displayed quantity and is not displayed in the order book.
Pegged	A hidden order pegged to the mid-point of the best bid and offer price for instrument.
Pegged Limit	A hidden order pegged to the mid-point of the best bid and offer price for instrument. If the limit price is breached, the order will be cancelled
Named	An order for which the identity of the submitting member is disclosed in the pre-trade market data feed.

### 3.2.1.1 Time in Force (TIF)

The server recognizes the following TIFs.

Time in Force	Description
Day	An order that will expire at the end of the day.
Immediate or Cancel (IOC)	An order that will be executed on receipt and the remainder, if any, immediately cancelled.
Fill or Kill (FOK)	An order that will be fully executed on receipt or immediately cancelled.
At the Open (OPG)	An order that may only be executed in the opening auction.
At the Close (ATC)	A market order that may only be executed in the closing auction.
Good Till Time (GTT)	An order that will expire at a specified time during the current day.
Good Till Date (GTD)	An order that will expire at the end of a specified day. Maximum 90 business day duration
Good Till Cancelled (GTC)	An order that will never expire. <b>This will not be available in Millennium Exchange.</b>
Good For Auction (GFA)	An order that may only be executed in the next auction
Good For Intraday Auction (GFX)	An order that may only be executed in the next EDSP Auction.

### 3.2.1.2 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.

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

## 3.2.2 Order management

### 3.2.2.1 Order ownership

Orders are the legal responsibility of the user specified in the logon message which initiates the session. A user is unable to input orders on behalf of another user.

### 3.2.2.2 Cancellation

The remainder of a live order may be cancelled via the Order Cancel Request message with the OrdSubType set to Order (0). 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 amended by either the Original Client Order ID or Order ID. If an Order Cancel/Replace Request contains values for both Original Client Order ID and Order ID, the server will only process the Order ID.

### 3.2.2.3 Mass cancellation

A client may mass cancel live orders via the Order Mass Cancel Request message with the OrdSubType set to Order (0). The server will respond with an Order Mass Cancel Report to indicate, via the MassCancelResponse 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 Client Order ID of all such messages will be the Client Order ID of the Order Mass Cancel Request.

If the mass cancel request is rejected, the reason will be specified in the MassCancelRejectReason 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 trading firm or only to those of a particular trading party. If the target party is not specified, the server will apply the request to the orders of the trading party that the Order Mass Cancel Request is submitted under.

A mass cancel request sent in by the Native Trading Gateway or the FIX Gateway, may cancel orders submitted through both gateways. In such a case, the execution reports for the order cancellation will be sent to the gateway through which, each order was submitted.

### 3.2.2.4 Amending an order

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

- (i) Order quantity
- (ii) Disclosed quantity
- (iii) Limit price
- (iv) Stop price
- (v) Expiration date/time (GTD/GTT orders)
- (vi) Client reference

For attributes the client wishes to update, the new values should be entered on the Order Cancel/Replace Request message. For attributes the client does not want to update, the Order Cancel/Replace Request message should contain the same value as the live version of the order

For Market and Stop orders, the Limit Price field should be filled with a negative value. 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 the Original Client Order ID or Order ID. If an Order Cancel/Replace Request contains values for both Original Client Order ID and Order ID, the server will only process the Order ID.

Clients may not amend orders that are fully filled.

### 3.2.3 Order status

The Order status 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 Order status. The relevant order statuses are given below from the highest to lowest precedence.

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

Please refer to section 9.1.1 process flow diagrams on the various statuses that may apply to an order.

### 3.2.4 Execution reports

The Execution Report message is used to communicate many different events to clients. The events are differentiated by the value in the Exec Type field as outlined below.

Exec Type	Usage	Ord Status	Container
0	<p><b>Order Accepted</b> Indicates that a new order has been accepted. This message will also be sent unsolicited if an order was submitted by the service desk 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.</p>	0	1,3,7
8	<p><b>Order Rejected</b> Indicates that an order has been rejected. The reason for the rejection is specified in the field Order Reject Code.</p>	8	0
F	<p><b>Order Executed</b> 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.</p>	1, 2	0,1,3,7
C	<p><b>Order Expired</b> Indicates that an order has expired in terms of its time qualifier or due to an execution limit or due to the preference given by the user for the relevant instruments Self Execution Prevention<sup>1</sup> criteria (If SEP is configured as either CIO or CRO.).</p>	6	0,1,3,5,6,7

1

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

4	<b>Order Cancelled</b> 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 Market Operations.	4	0,1,3,5,6,7
5	<b>Order Cancel/Replaced</b> Indicates that an order cancel/replace request has been accepted and successfully processed.	0, 1	1,3,5,6,7
D	<b>Order Cancel/Replace by Service Desk</b> Indicates that an order has been amended by the service desk.	0, 1	1,3,5,6,7
H	<b>Trade Cancel</b> Indicates that an execution has been cancelled by the service desk. An Execution Report Ref ID to identify the execution being cancelled will be included.	0, 1, 4, 6	1,7
9	<b>Order Suspended</b> 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 orders 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 the CPP session are parked without adding to the order book.	9	5,6

## Containers

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

### 3.2.5 Order and Execution IDs

The server does not validate each Client Order ID for uniqueness. However, it is recommended that clients ensure unique Client Order IDs across all messages (e.g. New Order, Order Cancel Request, etc.) per user. Given that the server supports GTD orders, it is

also advised that clients ensure that their Client Order IDs are unique across trading days (e.g. embed the date within the Client Order ID).

Clients must specify the Client Order ID when submitting a New Order, Order Cancel Request, Order Mass Cancel Request or Order Cancel/Replace Request.

#### **3.2.5.1 Order IDs**

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

Unlike Client Order ID which requires a chaining through cancel/replace requests and cancel requests, the Order ID of an order will remain constant throughout its life.

Clients have the option of specifying the Order ID (instead of the Original Client Order ID) when submitting an Order Cancel Request or Order Cancel/Replace Request.

#### **3.2.5.2 Execution IDs**

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

### **3.3 Quote handling**

The server supports the submission of 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

For two-sided quotes, if one side of a quote fails the validations (e.g. price tick, spread, etc.) of the server, both sides will be rejected. When 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. The privilege to submit quotes will be governed by the quoting privileges setup for the user.

All quotes will be defaulted to the time in force Day and all active quotes will expire at the end of the trading day.

#### **3.3.1 Quotes**

Quotes may be submitted via the New Quote message and will be acknowledged by two Execution Report messages for each of the sides with the same Client Order ID that was submitted with the New Quote message. If a quote is rejected, the reason will be specified in the Order Reject Code field of the Execution Report. The value in the Side field of such an Execution Report should be disregarded.

##### **3.3.1.1 Execution**

The Execution Report message is used to notify the client if a quote is executed. The side, quantity and price fields (i.e. Side, ExecutedPrice, LeavesQty, Executed Qty etc.) will contain information for the executed side.

## **3.3.2 Quote management**

### **3.3.2.1 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.

### **3.3.2.2 Cancelling a single quote**

A live quote may be cancelled via a single Order Cancel Request message. Clients can specify either side of the quote to be cancelled. The server will respond with two Execution Reports (representing the cancellation of both sides of the quote) or a single Order Cancel Reject to confirm or reject the cancellation request respectively.

### **3.3.2.3 Mass cancelling quotes**

A client may mass cancel live quotes via the Order Mass Cancel Request message with OrderSubType set to Quote (3). The server will respond with an Order Mass Cancel Report to indicate, via the MassCancelResponse field, whether the request is successful or not.

If the mass cancel request is accepted, the number of quote sides that will be cancelled will be indicated in the TotalAffectedOrders field of the Order Mass Cancel Report. The server will then immediately transmit Execution Reports for each quote side that is cancelled and Order Cancel Rejects for each quote side that could not be cancelled. The Client Order ID of all such messages will be the Client Order ID of the Order Mass Cancel Request.

If the mass cancel request is rejected, the reason will be specified in the MassCancelRejectReason field of the Order Mass Cancel Report.

Clients may use the Order Mass Cancel Request to mass cancel all quotes or only those for a particular instrument. A mass cancel request may apply to all the quotes of the trading firm or only to those of a particular trading party. If the target party is not specified, the server will apply the request to the quotes of the trading party that the Order Mass Cancel Request is submitted under.

### **3.3.2.4 Cancellation by market operations**

Unsolicited Execution Reports for each quote side will be sent to the client if a quote is cancelled by Market Operations. The Client Order ID of the quote will be stamped in such a message.

## **3.4 Security identification**

Instruments may be identified by the Instrument ID assigned by the Exchange to each security. The application messages transmitted by the server will always contain the Instrument ID.



## **3.5 Market Operations**

### **3.5.1 Order deletion**

Market Operations is able to delete an order on behalf of a client.

The client will be notified of the order deletion submitted on its behalf if and when 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.

### **3.5.2 Trade cancellations**

Market Operations may also cancel any (automatically executed) trade. Additionally participants may cancel their own trades. Execution Reports will be sent to the relevant clients to notify them of a trade cancellation.

If an execution resulting from an order is cancelled, the order will be restated to increase 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 order restatement.

If an execution resulting from a quote is cancelled, the quote will be restated to increase 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

## **3.6 Conditionally required fields**

All fields that are not conditionally required will be ignored by the server. (E.g.:- Stop Price field will be ignored for Limit and Market orders)

## **3.7 Timestamps and dates**

ExpireDateTime should be in Unix (Posix) time which will be the number of seconds elapsed since midnight proleptic Coordinated Universal Time (UTC) of January 1, 1970, not counting leap seconds.

The first 4 bytes of the TransactTime timestamp will represent the Unix (Posix) time while the next 4 bytes will specify the micro seconds. The TransactTime will be in UTC.

## 3.8 Functional and implementation limitations

- 3.8.1.1 It is not possible to publish the TotalAffectedOrders field in the Order Mass Cancel Report if the system to send the Order Mass Cancel Report before the Execution Reports (for orders that are cancelled) or Order Cancel Rejects (for orders that are not cancelled).
- 3.8.1.2 At present, if an order/quote mass cancel request is sent for instruments which are in multiple matching partitions, an Order Mass Cancel Report 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 field in the Order Mass Cancel Report.
- 3.8.1.3 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.
- 3.8.1.4 If an order cancel/replace request is of a cancel/replace nature (a limit price change or a stop price change), Matching Engine removes the order from the relevant container (e.g. order book, pegged order container etc-) (Cancel) and then apply the change (replace). Hence at the time of generating the Execution Report to confirm the amendment, there is no container for the order. Hence 0 (None) will be stamped in the "Container" field of the Execution Report.
- 3.8.1.5 If an order is successfully amended as in 3.8.1.4 and an execution is resulted during the aggression, there will be no container for the order at that time. Hence 0 (None) will be stamped in the "Container" field of the Execution Report which is generated to communicate the execution. Once the order is added to the relevant container, the appropriate value will be tagged for the "Container" field in Execution Reports which are generated for subsequent executions.
- 3.8.1.6 The server does not validate each Client Order ID for uniqueness (as mentioned in section 3.2.5). If a client mistakenly submitted more than one order with the same client order id (within a trading day or over a couple of days if GTD is used), they will only be able to cancel/amend the most recent order (using the client order id) but not the previous entries as the system maintains only one order for a client order id in a map and update/remove it once a cancel or amend is received.

3.8.1.7 It is not possible to populate the Client Order ID in the Reject message in the below scenarios:

- a) If the Client Order ID itself is invalid.
- b) If the Client Order ID is not the first field of the message and if any field above the Client Order ID is invalid.
- c) If the native message version is invalid.
- d) If the message header is incorrect (e.g. message type, message length).

3.8.1.8 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.

3.8.1.9 If the original TIF was 1, 3, 4, 5, 6, 8, 9 or 10 and if an Order Modification Request was sent with the TIF specified as '0' (DAY), then the amend request is accepted and not rejected; the TIF amendment will be ignored in this scenario and in the Execution Report to acknowledge the amend request, the original TIF of the order will be stamped.

3.8.1.10 The TIF amendment of an order is not allowed. Anyway if an amendment request is sent with TIF changed to DAY (where the original TIF is a different one), the system cannot differentiate whether a TIF was specified in the amend request or not (as DAY is represented by 0 and when a TIF is not specified, it will also come as 0). Hence it will stamp the original TIF of the order to the amend request. Hence if a GTT order is amended to have TIF DAY, system still consider the TIF to be GTT and to have a valid expiry time; if an expiry time is not specified or an invalid expiry time is specified, the amend request will be rejected with an Order Cancel Reject with reject code 1501 (invalid expire time (elapsed)).

### 3.9 Mapping Native Order ID to ITCH Order ID

To convert Native Order ID to ITCH Order ID:

Step 1 - Convert the 12 byte Native 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:

Order ID for Native in ASCII	01hbIXLE8st
Base 62 equivalent	01,43,37,18,33,21,14,08,54,55
Base 10 (decimal) number	23,057,063,777,141,547
ITCH order id	Binary encoding of above decimal

### 3.10 Field value validations

3.10.1.1 The below validations will be done. If a message is rejected, it will be rejected with the Reject message

3.10.1.2 The reject codes have to be as below:

- If a value is not specified for a required field, reject code 9900 will be used to reject the message.
- If a field value validation (greater than zero, greater than or equal to zero, equal to zero, less than zero, less than or equal to zero, expected value not there, format is incorrect) fails, reject code 9901 will be used to reject the messages.
- If the instrument is not specified for a mass cancel request, reject code 9900 will be used to reject the message.
- If the segment is not specified for a mass cancel request, reject code 9900 will be used to reject the message.

3.10.1.3 The problematic field name will be specified in the Reject Reason field in the Reject message.

3.10.1.4 The problematic message type will be specified in the Rejected Message Type field in the Reject message.

	Message	Field	Validation	Reject Code
3.10.1.5	Message Header	Length	The value has to be the actual length of the message. Otherwise reject the message.	9901

3.10.1.6		Length	The value has to be the actual length of the message. Otherwise reject the message.	9901
3.10.1.7		Message Type	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.8	Logon	User Name	If a value is not specified, reject the message. If the value contains invalid ASCII characters, reject the message.	9900 9901
3.10.1.9		Password	If a value is not specified, reject the message. If the value contains invalid ASCII characters, reject the message.	9900 9901
3.10.1.10		New Password	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.11		Message Version	The value has to be 1. Otherwise reject the message.	9901

3.10.1.12	Logout	Reason	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.13	Missed Message Request	AppID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
3.10.1.14		LastMsgSeqNum	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
3.10.1.15	New Order	Client Order ID	If a value is not specified, reject the message. If the value contains invalid ASCII characters, reject the message.	9900 9901
3.10.1.16		Trader ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.17		Account	If a value is specified and it contains invalid ASCII characters, reject the message.	9901

3.10.1.18		Clearing Account	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.19		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
<del>3.10.1.20</del>		<del>MES Qualifier</del>	<del>No validation will occur.</del>	
3.10.1.21		Reserved Field 1	The value has to be equal to 0 (=0). Otherwise reject the message.	9901
3.10.1.22		Order Type	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.23		TIF	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.24		ExpireDateTime	The value has to be greater than or equal to 0 (>=0). Otherwise reject the message.	9901
3.10.1.25		Side	If the value is out of range from the defined set of values, reject the message.	9901



3.10.1.26		Order Qty	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
3.10.1.27		DisplayQty	The value has to be greater than or equal to 0 (>=0). Otherwise reject the message.	9901
3.10.1.28		Limit Price	The value has to be greater than 0 (>0) if Order Type is Limit or Stop Limit. Otherwise reject the message.	9901
3.10.1.29		Capacity	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.30		Auto Cancel	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.31		Order Sub Type	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.32		Anonymity	If the value is out of range from the defined set of values, reject the message.	9901

3.10.1.33		Stopped Price	The value has to be greater than 0 (>0) if Order Type is Stop or Stop Limit.	9901
3.10.1.34		Reserved Field	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.35	Quote	Client Order ID	If a value is not specified, reject the message. If the value contains invalid ASCII characters, reject the message.	9900 9901
3.10.1.36		Trader ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.37		ClearingAccount	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.38		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901

3.10.1.39		BidPrice	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
3.10.1.40		BidSize	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
3.10.1.41		AskPrice	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
3.10.1.42		AskSize	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
3.10.1.43		Capacity	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.44		Auto Cancel	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.45		Reserved Field	If a value is specified and it contains invalid ASCII characters, reject the message.	9901

3.10.1.46	Cancel Request	Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.47		Original Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.48		Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.49		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
3.10.1.50		Reserved Field 1	No validation will occur.	
3.10.1.51		Reserved Field 2	No validation will occur.	
3.10.1.52		Side	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.53		Reserved Field	If a value is specified and it contains invalid ASCII characters, reject the message.	9901

3.10.1.54	Mass Cancel Request	Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.55		MassCancelRequestType	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.56		Instrument ID	The value has to be greater than 0 (>0) if the Mass Cancel Request Type is 3 or 9. Otherwise reject the message.	9901
3.10.1.57		Reserved Field 1	No validation will occur.	
3.10.1.58		Reserved Field 2	No validation will occur.	
3.10.1.59		Segment	If the value is not specified for Mass Cancel Request Types 4 and 15, reject the message.  If the value contains invalid ASCII characters, reject the message.	9900  9901
3.10.1.60		Order Sub Type	If the value is out of range from the defined set of values, reject the message.	9901

3.10.1.61		Reserved Field	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.62	Order Modification Request	Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.63		Original Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.64		Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.65		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
3.10.1.66		Reserved Field 1	The value has to be equal to 0 (=0). Otherwise reject the message.	9901
3.10.1.67		Reserved Field 2	The value has to be equal to 0 (=0). Otherwise reject the message.	9901

3.10.1.68		ExpireDateTime	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
3.10.1.69		Order Quantity	The value has to be greater than 0 ( $> 0$ ). Otherwise reject the message.	1000
3.10.1.70		Display Quantity	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
3.10.1.71		Account	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.72		TIF	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.73		Side	If the value is out of range from the defined set of values, reject the message.	9901
3.10.1.74		Reserved Field	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
3.10.1.75		Limit Price	No validation will be done.	
3.10.1.76		Stopped Price	No validation will be done.	

### 3.10.2 Validation of ASCII characters

The values which correspond to Decimal 0 to 127 should be accepted. Any other ASCII character will be rejected.

## 3.11 Rejection logic

All client initiated messages are subjected to two levels of gateway validations before the server receives the message.

Level one pertains to validations on the message header, data type and range defined for each field (valid values for a given field).

If the message successfully passes the first level of gateway validations, the system generates an internal message to check for conditional requirements of each field and any message specific validations. This forms the second level of gateway validations.

If a message fails to comply with any of gateway level validations, a Reject message would be generated which contains a reject code, along with the reason specified. The only exception to the gateway level rejection logic is when the server is unavailable in the unlikely event of an outage; a Business Reject message is generated instead of a Reject in this scenario.

Any client initiated message after passing gateway level validations will be subjected to internal validations upon reaching the server. Failure to pass server level validations will be notified to clients via an Execution Report with a reject code to which the reason is specified in the reject code specification.

An exception to the server level rejection logic is when the instrument or the order book could not be found, in which case a Business Reject is generated by the server.

The Business Reject sent to reject an order or quote and Cancel Reject sent to a cancel request or amend request for an unknown instrument should include a Partition ID of zero (0). This is the value used on Business Rejects sent when the system or a partition is suspended.



# 4 Connectivity

## 4.1 UserIDs

UserIDs will be confirmed with each client before communications can begin through the Native Trading Gateway. A single client may have multiple connections to the server (i.e. a user can maintain multiple sessions if he has multiple UserIDs).

### 4.1.1 Passwords

Each UserID will be assigned a password on registration. Clients will be required to change the password to one of their choosing via the Logon message. When a new password is submitted by the client, a successful login will indicate that the new password is accepted. The new password will, if accepted, be effective for subsequent logins. If a new password is rejected, the RejectReason of the Logon Reply will indicate why the password is rejected.

In terms of the London Stock Exchange password policy, the initial password of each username must be changed at least once. If not, the client will be unable to login to the server. In such a case, the client should contact the London Stock Exchange.

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

## 4.2 Production IP addresses and ports

The IP addresses and ports for the Native Trading Gateway are published in a separate configuration document which can be found on the Millennium Exchange Technical Information website.

## 4.3 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.

## 4.4 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>

#### **4.5 Message rate throttling**

The Exchange has implemented a scheme for throttling message traffic where each client is only permitted to submit up to a 1000 messages per second per CompID/UserID.

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

A client's connection will be disconnected by the server if its message rate exceeds the maximum rate for a specific time duration. In such a case, the server will transmit a Logout message and immediately terminate the TCP/IP connection.

#### **4.6 Mass Cancellation On Disconnect**

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

The user can mark each order through its Auto Cancel field; whether it should be automatically cancelled according to its user preferences, should a disconnection or logout happen. For each order an Execution Report generated with the 'Exec Type' and 'Order Status' fields stamped with the value 'Expired', as opposed to 'Cancelled' which would be stamped for all 'Firm Initiated Cancellations'

This feature does not guarantee that all outstanding marked 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 the service desk to verify that all marked 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 session.

#### **4.7 Expiration of Sponsored Users' orders on Sponsoring Firm Disconnect**

Sponsoring firms' users are able to constantly monitor their Sponsored Users via a Drop Copy Gateway connection. When a Member Firm user loses its ability to monitor their Sponsored Users (e.g. Disconnect, lose connection or logout) and not reconnect within the configurable amount of time, their Sponsored Users will be restricted from submitting new orders and all their existing orders will be expired.

#### **4.8 Mass cancellation on suspension of a Sponsored User**

Member firms will have the ability to suspend access of a Sponsored User via the Sponsor Portal. On suspension of a Sponsored User they will be restricted from submitting new orders, while all their existing orders will be expired.

# 5 Connections and sessions

## 5.1 Establishing a connection

Each client will use the assigned IP address and port to establish a TCP/IP session with the server. The client will initiate a session at the start of each trading day by sending the Logon message. If the client does not initiate the session by sending the Logon message within one heartbeat interval of establishing the session, the connection will be dropped by the server. The client will identify itself using the Username field. The server will validate the Username and password of the client.

Once the client is authenticated, the server will respond with a Logon Reply message. If the client's logon is successful or if the client's new password is accepted, the RejectCode of the Logon Reply will be Successful (0). If the client's logon is unsuccessful (eg. invalid or expired password, locked user etc.) the Logon Reply will include the RejectCode which corresponds to the reason for rejection. If the client's logon is unsuccessful due to an invalid username the response is not sent out.

The client must wait for the server's Logon before sending additional messages. Messages received from the client before the exchange of Logon messages will be rejected by the server.

## 5.2 Maintaining a session

### 5.2.1 Application sequence numbers

While the Server-initiated application messages will always have an AppID and a Sequence Number, the Client-initiated application messages will not be numbered. The AppID will correspond to the partition ID of the instrument the message is sent for, and the Sequence No will be a sequence number assigned to messages of the given partition.

The Sequence No received by a client for a particular AppID, although incremental, will not be sequential, since the sequence numbers are not maintained per client. Therefore, a client should not connect to the recovery channel and request for missed messages if the difference in Sequence No between two consecutive messages is more than one. Recovery should be requested only upon a reconnection after a session disconnection.

Uniqueness of Client-initiated messages will be achieved through the provision of unique Client Order IDs per user. It is the responsibility of the customer to ensure that a Client Order ID is unique over the life of an order.

### 5.2.2 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 three seconds.

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 five heartbeat intervals, 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.

### **5.3 Terminating a connection**

The client is expected to terminate each 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 message if the client's request is successful. 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.

Either party that wishes to terminate the connection may wait for the heartbeat interval duration before breaking the TCP/IP connection, in order to ensure that the other party received the Logout message.

# 6 Recovery

If a client gets disconnected from the server, the recovery channel shall be used to recover missed messages. This section explains the protocol to be followed when recovering missed messages.

## 6.1 Requesting missed messages

When a client needs to recover missed messages they must first connect to the Real Time Channel and establish a session by exchanging Logon and Logon Reply messages. The client may then connect to the Recovery Channel and exchange Logon and Logon Reply messages to establish a recovery session. Any attempt to connect to the Recovery Channel without first connecting to the Real Time Channel shall be rejected and the server will send a Logon Reply message, which will include the appropriate Reject Code. The client must ensure proper authentication (i.e. same username and password) when logging in to both channels. Any values sent for the NewPassword field in the Logon message sent to the Recovery Channel will be ignored.

After establishing a connection with the Recovery Channel, the client can send heartbeats to maintain the session or send a Missed Message Request with the relevant AppID and the last received Sequence No corresponding to that AppID. The user will have to send separate Missed Message Request messages to retrieve messages from each partition.

If a service interruption occurs in the Native Recovery Channel, the Native Gateway will send a System Status message to all logged in clients of that gateway's recovery channel with AppID stamped to indicate the service/partition is unavailable. When this message is received, clients can identify that the recovery service is not available for the partition indicated by AppID. They would be able to continue recovery activities on other partitions without interruptions. If the gateway was in the middle of serving a Missed Message Request, it will send a Missed Message Report message with 'ResponseType' = 3 (service unavailable) to the client. If a new Missed Message Request is sent by a user, the gateway will reject the message with a 'Missed Message Request Ack' with 'ResponseType' = 3 (service unavailable) to the client. Once the service is available again, Native Gateway will send another System Status message with AppID to indicate the service availability of the partition to the clients who are still connected on to the recovery channel with 'AppStatus' = 1. When this message is received, the clients are expected to resend the request for missed messages (preferably from the point of interruption) to the gateway to resume the missed message recovery

If a client is logged in and receives the System Status message indicating the system is unavailable, they can stay logged in (i.e. they will not get disconnected after three heartbeats from this message) and can stay heart beating until they receive the System Status message indicating the system is available again. Clients can then request missed messages and once satisfied they will be disconnected after three heartbeat interval and will need to log back in again.

If the matching system becomes unavailable, clients will receive a BusinessReject message with a value of "9998" indicating "Matching Partition Suspended." upon order entry.

## 6.2 Response to a Missed Message Request

The server will respond to the Missed Message Request with a Missed Message Request Ack to indicate whether the recovery request is successful or not. If the request is unsuccessful, the reason will be specified in the field ResponseType.

The total number of Missed Message Requests that a client may send on the Recovery channel is limited. This limit will be communicated at a later date. Once this limit is reached, the server will reject any additional request via a Missed Message Request Ack with a ResponseType of Recovery Request limit reached (1).

In the case of a successful recovery request, the server will transmit the requested messages immediately after the Missed Message Request Ack. It should be noted that due to race conditions duplicate messages may be transmitted via the recovery channel. Clients are advised to use the AppID and SeqNum to carry out duplicate discard.

Missed Messages sent in response to a Missed Message Request will not contain Order Cancel Reject messages and Business Reject messages since these messages are not retained in Order Cache.

Upon transmitting all the missed messages (i.e. messages from the last received Sequence No to the first message received through the Real Time Channel) the Recovery Channel will send a Missed Message Report which will indicate whether or not all requested messages have been sent.

The total number of messages that a client may receive is limited per Missed Message Request. Therefore, if the client's missed message request exceeds this limit, the server will send the first limited number of messages from the AppID and Sequence No provided, followed by a Missed Message Report with a Response Type of Message Limit Reached (1). These limit details will be communicated to customers at a later date.

A client should not send subsequent Missed Message Requests prior to receiving the Missed Message Report, since these will be ignored by the server.

Upon receiving the Missed Message Report, the client can send a Logout message and terminate the connection or submit a new Missed Message Request for any more messages that need to be transmitted.

## 6.3 Terminating the recovery session

Upon sending the Missed Message Report the server will wait three heartbeat intervals prior to disconnecting the client. If the client has received only part of the message set that was requested, the client may send in a new Missed Message Request message for the messages that were not recovered in the first attempt. However, if such a request is not sent within three heartbeat intervals the Server will terminate the connection. If the client is unable to send a new request within this time, the client can re-login to the Recovery Channel and send in the Missed Message Request.

# 7 Data types

The fields of the messages utilised by the server will support the data types outlined below.

Data Type	Length	Description
Alpha	1	A single byte used to hold one ASCII character.
Float	4	Signed Little-Endian encoded four byte integer field with four implied decimal places.
Price	8	Signed Little-Endian encoded eight byte integer field with eight implied decimal places.
Int8	1	Little-Endian encoded 8 bit signed integer.
Int16	2	Little-Endian encoded 16 bit signed integer.
UInt32	4	Little-Endian encoded 32 bit unsigned integer.
Int32	4	Little-Endian encoded 32 bit signed integer.
UInt64	8	Little-Endian encoded 64 bit unsigned integer.
String	Variable	These fields use standard ASCII character bytes. A field will be null terminated if the full fixed length is unused. The first byte will contain a null if the field is unused.

The description section of each of the messages will describe how each optional field should be represented when no data is sent through it.

Customers should design their applications such that:

- When sending messages, it populates all Reserved fields with nulls (hex 0x00)
- When receiving messages, it disregards and does not process any fields marked as Reserved

## 8 Message formats

This section provides details on the eight administrative messages and nine application messages utilised by the server. Any message not included in this section will be rejected by the server.

### 8.1 Supported message types

#### 8.1.1 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 session.
Logon Reply	B	Allows the server to acknowledge a client's Logon.
Logout	5	Allows the client and server to terminate a 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.
Missed Message Request	M	Allows the client to subscribe to missed messages through the Recovery Channel.
Missed Message Request Ack	N	Allows the server to acknowledge a client's Missed Message Request.
Missed Message Report	P	Allows the Server to communicate the result of a Missed Message Request.
Reject	3	Used to reject a message that does not comply with the Native Trading Gateway messaging protocol.
System Status	n	This message will be disseminated in the recovery channel to indicate Service Non Availability of a partition (due to order cache outage).



## 8.1.2 Application messages: order handling

### 8.1.2.1 Client-initiated

Message	MsgType	Usage
New Order	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 firm.
Order Cancel/Replace Request	G	Allows the client to cancel/replace a live order.

### 8.1.2.2 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) <del>Trade correct</del>
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.

### 8.1.3 Application messages: Quote handling

#### 8.1.3.1 Client-initiated

Message	MsgType	Usage
Quote	S	Allows the client to submit and update a quote.

### 8.1.4 Application messages: other

#### 8.1.4.1 Server-initiated

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

## 8.2 Message header

Field	Offset	Length	Data Type	Description
Start of Message	0	1	Int8	Indicates the start of the message. Clients will have to send the binary value of '2' at the start of each message. Server will also follow the same protocol.
Message Length	1	2	Int16	Length of the message from the Message Type field onwards.
Message Type	3	1	Alpha	Type of Message

## 8.3 Administrative messages

### 8.3.1 Logon

Field	Offset	Length	Data Type	Description
<b>Header</b>				
User Name	4	25	String	User name
Password	29	25	String	Password
New Password	54	25	String	New Password
Message Version	79	1	Int8	Message Version that will be used in this session. The value has to be always 1.

### 8.3.2 Logon Reply

Field	Offset	Length	Data Type	Description
<b>Header</b>				
Reject Code	4	4	Int32	Code specifying the reason for the reject. Please refer to the Reject Code Specification for the list of reject codes and meanings specific to LSE.
PasswordExpiryDayCount	8	30	String	The number of days before the password will expire

### 8.3.3 Logout

Field	Offset	Length	Data Type	Description
<b>Header</b>				
Reason	4	20	String	Reason for the logout.

### 8.3.4 Heartbeat

Field	Offset	Length	Data Type	Description
<b>Header</b>				

### 8.3.5 Missed Message Request

Field	Offset	Length	Data Type	Description
<b>Header</b>				
AppID	4	1	Int8	AppID this message relates to.
LastMsgSeqNum	5	4	Int32	Last received Sequence No.

### 8.3.6 Missed Message Request Ack

Field	Offset	Length	Data Type	Description										
<b>Header</b>														
Response Type	4	1	Int8	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Successful</td> </tr> <tr> <td>1</td> <td>Recovery Request limit reached</td> </tr> <tr> <td>2</td> <td>Invalid App ID</td> </tr> <tr> <td>3</td> <td>Service Unavailable</td> </tr> </tbody> </table>	Value	Meaning	0	Successful	1	Recovery Request limit reached	2	Invalid App ID	3	Service Unavailable
Value	Meaning													
0	Successful													
1	Recovery Request limit reached													
2	Invalid App ID													
3	Service Unavailable													

### 8.3.7 Missed Message Report

Field	Offset	Length	Data Type	Description								
<b>Header</b>												
Response Type	4	1	Int8	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Download Complete</td> </tr> <tr> <td>1</td> <td>Message limit reached</td> </tr> <tr> <td>3</td> <td>Service Unavailable</td> </tr> </tbody> </table>	Value	Meaning	0	Download Complete	1	Message limit reached	3	Service Unavailable
Value	Meaning											
0	Download Complete											
1	Message limit reached											
3	Service Unavailable											

### 8.3.8 Reject

Field	Offset	Length	Data Type	Description
<b>Header</b>				
Reject Code	4	4	Int32	Code specifying the reason for the reject. Please refer to the Reject Code Specification for the list of reject codes and meanings specific to LSE.
Reject Reason	8	30	String	Reject Reason.
Rejected Message Type	38	1	Alpha	Message type of the rejected message.
Client Order ID	39	20	String	Client specified identifier of the rejected message if it is available.

### 8.3.9 System Status

Field	Offset	Length	Data Type	Description	
<b>Header</b>					
AppID	4	1	Int8	Partition ID	
				<b>Value</b>	<b>Meaning</b>
				1	Partition 1
				2	Partition 2
3	Partition 3				
AppStatus	5	1	Int8	<b>Value</b>	
				<b>Meaning</b>	
				1	Recovery service resumed
2	Recovery service not available				

## 8.4 Application messages: order/quote handling

### 8.4.1 New Order

Field	Offset	Length	Data Type	Description	
<b>Header</b>					
Client Order ID	4	20	String	Client specified identifier of the order.	
Trader ID	24	11	String	Optional Trader ID that clients may submit	
Account	35	10	String	Optional reference of the investor the order is submitted for	
ClearingAccount	45	1	Int8	Clearing Account Type.	
				<b>Value</b>	<b>Meaning</b>
				1	Client
3	House				
Instrument ID	46	4	Int32	Identifier of the instrument for which the order is submitted.	
Reserved Field	50	1	Int8	Reserved for future use. This will always be 0.	
Reserved Field	51	1	Int8	Reserved for future use. This will always be 0.	

Order Type	52	1	Int8	Type of order <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Meaning	1	Market	2	Limit	3	Stop	4	Stop Limit										
Value	Meaning																							
1	Market																							
2	Limit																							
3	Stop																							
4	Stop Limit																							
TIF	53	1	Int8	Time qualifier of the order. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Day</td> </tr> <tr> <td>3</td> <td>Immediate or Cancel (IOC)</td> </tr> <tr> <td>4</td> <td>Fill or Kill (FOK)</td> </tr> <tr> <td>5</td> <td>At the Opening (OPG)</td> </tr> <tr> <td>6</td> <td>Good Till Date (GTD)</td> </tr> <tr> <td>8</td> <td>Good Till Time (GTT)</td> </tr> <tr> <td>10</td> <td>At the Close (ATC)</td> </tr> <tr> <td>50</td> <td>Good for Auction (GFA)</td> </tr> <tr> <td>51</td> <td>Good for Intraday Auction (GFX)</td> </tr> </tbody> </table>	Value	Meaning	0	Day	3	Immediate or Cancel (IOC)	4	Fill or Kill (FOK)	5	At the Opening (OPG)	6	Good Till Date (GTD)	8	Good Till Time (GTT)	10	At the Close (ATC)	50	Good for Auction (GFA)	51	Good for Intraday Auction (GFX)
Value	Meaning																							
0	Day																							
3	Immediate or Cancel (IOC)																							
4	Fill or Kill (FOK)																							
5	At the Opening (OPG)																							
6	Good Till Date (GTD)																							
8	Good Till Time (GTT)																							
10	At the Close (ATC)																							
50	Good for Auction (GFA)																							
51	Good for Intraday Auction (GFX)																							
ExpireDateTime	54	4	UInt32	This field will indicate the date or the time the order expires on.																				
Side	58	1	Int8	Side of the order. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buy</td> </tr> <tr> <td>2</td> <td>Sell</td> </tr> </tbody> </table>	Value	Meaning	1	Buy	2	Sell														
Value	Meaning																							
1	Buy																							
2	Sell																							
Order Qty	59	4	Int32	Total order quantity.																				
DisplayQty	63	4	Int32	Maximum quantity that may be displayed.																				
Limit Price	67	8	Price	Limit Price. Required if OrderType is Limit or Stop Limit. Else this field will be ignored.																				

Capacity	75	1	Int8	Capacity of the order. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Riskless Principal</td> </tr> <tr> <td>2</td> <td>Principal</td> </tr> <tr> <td>3</td> <td>Agency</td> </tr> <tr> <td>4</td> <td>CFD Give Up</td> </tr> </tbody> </table>	Value	Meaning	1	Riskless Principal	2	Principal	3	Agency	4	CFD Give Up
Value	Meaning													
1	Riskless Principal													
2	Principal													
3	Agency													
4	CFD Give Up													
Auto Cancel	76	1	Int8	Cancel orders on logout/disconnection of session <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Do not Cancel</td> </tr> <tr> <td>1</td> <td>Cancel</td> </tr> </tbody> </table>	Value	Meaning	0	Do not Cancel	1	Cancel				
Value	Meaning													
0	Do not Cancel													
1	Cancel													
Order Sub Type	77	1	Int8	Whether the order is a pegged order. If the client submits a Pegged Order with a limit price (so called a "Hard Limit"), the Order Type has to be Limit (2) along with Order Sub Type Pegged Order (5). If the client submits a Pegged without a limit price, the Order Type has to be Market (1) along with Order Sub Type Pegged Order (5). If this is populated with value "51" while a value which is greater than 0 and less than the Order Quantity is populated in DisplayQty, the DisplayQty after a replenishment will be randomly sized based on a percentage range upwards from the original DisplayQty. The DisplayQty after a replenishment will be "fixed peak". <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Order</td> </tr> <tr> <td>5</td> <td>Pegged Order</td> </tr> <tr> <td>51</td> <td>Random Peak size</td> </tr> </tbody> </table>	Value	Meaning	0	Order	5	Pegged Order	51	Random Peak size		
Value	Meaning													
0	Order													
5	Pegged Order													
51	Random Peak size													
Anonymity	78	1	Int8	Whether the order is a named or anonymous order <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Anonymous</td> </tr> <tr> <td>1</td> <td>Named</td> </tr> </tbody> </table>	Value	Meaning	0	Anonymous	1	Named				
Value	Meaning													
0	Anonymous													
1	Named													

Stopped Price	79	8	Price	Stop price. Required if OrderType is Stop or Stop Limit. Else this field will be ignored.														
PassiveOnlyOrder	87	1	UInt8	<p>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.</p> <p>Passive Only Orders will execute against hidden orders sat within the BBO on order entry.</p> <p>Any fully hidden order will be rejected if it has enum 100,1,2 or3.</p> <p>No passive only order validation will be done if field is not stamped or has 0 stamped on it.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <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> </tbody> </table>	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
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																	
Reserved Field	88	9	String	Reserved for future use														



### 8.4.2 New Quote

Field	Offset	Length	Data Type	Description								
<b>Header</b>												
<b>Message Body</b>												
Client Order ID	4	20	String	Client specified identifier of the quote.								
Trader ID	24	11	String	Optional Trader ID that clients may submit.								
ClearingAccount	35	1	Int8	Clearing Account Type. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Client</td> </tr> <tr> <td>3</td> <td>House</td> </tr> </tbody> </table>	Value	Meaning	1	Client	3	House		
Value	Meaning											
1	Client											
3	House											
Instrument ID	36	4	Int32	Identifier of the instrument for which the quote is submitted.								
BidPrice	40	8	Price	Bid price								
BidSize	48	4	Int32	Bid quantity								
AskPrice	52	8	Price	Offer price								
AskSize	60	4	Int32	Offer quantity								
Capacity	64	1	Int8	Capacity of the quote. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Riskless Principal</td> </tr> <tr> <td>2</td> <td>Principal</td> </tr> <tr> <td>3</td> <td>Agency</td> </tr> </tbody> </table>	Value	Meaning	1	Riskless Principal	2	Principal	3	Agency
Value	Meaning											
1	Riskless Principal											
2	Principal											
3	Agency											
Auto Cancel	65	1	Int8	Cancel orders on logout/disconnection of session <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Do not cancel</td> </tr> <tr> <td>1</td> <td>Cancel</td> </tr> </tbody> </table>	Value	Meaning	0	Do not cancel	1	Cancel		
Value	Meaning											
0	Do not cancel											
1	Cancel											
Reserved Field	66	10	String	Reserved for future use								

### 8.4.3 Order Cancel/Replace Request

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
Client Order ID	4	20	String	Client specified identifier of the request. . It is optional to specify this.
Original Client Order ID	24	20	String	Client Order ID of the order being amended. This field will be ignored if Order ID is also specified.
Order ID	44	12	String	Unique identifier of the order assigned by the matching system.
Instrument ID	56	4	Int32	Identifier of the instrument of the order being amended.
Reserved field1	60	1	Int8	This will always be 0.
Reserved field2	61	1	Int8	This will always be 0.
ExpireDateTime	62	4	UInt32	This field will indicate the date or the time the order expires on. It is mandatory to specify a valid value in this field for GTD/GTT orders. If 0 is specified for GTD/GTT orders, the request will be rejected. For non GTD/GTT orders, the value in this field will be ignored.
Order Qty	66	4	Int32	Total order quantity.
DisplayQty	70	4	Int32	Maximum quantity that may be displayed. The intended display quantity has to be inserted as this is a mandatory field.
Limit Price	74	8	Price	Only for Market and Stop orders this field should be filled with a negative value.
Account	82	10	String	The reference of the investor the order is submitted for. This field should be null if it is not being amended.

Field	Offset	Length	Data Type	Description																				
TIF	92	1	Int8	<p>Time qualifier of the order being amended.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Day</td> </tr> <tr> <td>3</td> <td>Immediate or Cancel (IOC)</td> </tr> <tr> <td>4</td> <td>Fill or Kill (FOK)</td> </tr> <tr> <td>5</td> <td>At the Opening (OPG)</td> </tr> <tr> <td>6</td> <td>Good Till Date (GTD)</td> </tr> <tr> <td>8</td> <td>Good Till Time (GTT)</td> </tr> <tr> <td>10</td> <td>At the Close (ATC)</td> </tr> <tr> <td>50</td> <td>Good for Auction (GFA)</td> </tr> <tr> <td>51</td> <td>Good for Intraday Auction (GFX)</td> </tr> </tbody> </table>	Value	Meaning	0	Day	3	Immediate or Cancel (IOC)	4	Fill or Kill (FOK)	5	At the Opening (OPG)	6	Good Till Date (GTD)	8	Good Till Time (GTT)	10	At the Close (ATC)	50	Good for Auction (GFA)	51	Good for Intraday Auction (GFX)
Value	Meaning																							
0	Day																							
3	Immediate or Cancel (IOC)																							
4	Fill or Kill (FOK)																							
5	At the Opening (OPG)																							
6	Good Till Date (GTD)																							
8	Good Till Time (GTT)																							
10	At the Close (ATC)																							
50	Good for Auction (GFA)																							
51	Good for Intraday Auction (GFX)																							
Side	93	1	Int8	<p>Side of the order.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buy</td> </tr> <tr> <td>2</td> <td>Sell</td> </tr> </tbody> </table>	Value	Meaning	1	Buy	2	Sell														
Value	Meaning																							
1	Buy																							
2	Sell																							
Stopped Price	94	8	Price	<p>Stop Price.</p> <p>A negative value should be entered if this field is not being amended. This applies to all order types.</p>																				
PassiveOnlyOrder	102	1	UInt8	<p>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.</p> <p>Passive Only Orders will execute against hidden orders sat within the BBO on order entry.</p> <p>Any fully hidden order will be rejected if it has enum 100, 1,2 or3.</p> <p>No passive only order validation will be done if field is not stamped or has 0 stamped on it.</p> <p>The newly amended or old PassiveOnlyOrder indicator stamped on an order amend message will not be</p>																				

				evaluated.														
				<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <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> </tbody> </table>	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
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																	
Reserved Field	103	9	String	Reserved for future use														

#### 8.4.4 Order Cancel Request

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
Client Order ID	4	20	String	Client specified identifier of the request. It is optional to specify this.
Original Client Order ID	24	20	String	Client Order ID of the order being amended. This field will be ignored if Order ID is also specified.
Order ID	44	12	String	Unique identifier of the order assigned by the matching system
Instrument ID	56	4	Int32	Identifier of the instrument of the order being cancelled.
Reserved field1	60	1	Int8	This will always be 0.
Reserved field2	61	1	Int8	This will always be 0.

Side	62	1	Int8	Side of the order.	
				<b>Value</b>	<b>Meaning</b>
				1	Buy
				2	Sell
Reserved Field	63	10	String	Reserved for future use	

#### 8.4.5 Order Mass Cancel Request

Field	Offset	Length	Data Type	Description	
<b>Header</b>					
<b>Message Body</b>					
Client Order ID	4	20	String	Client specified identifier of mass cancel request. It is optional to specify this.	
MassCancelRequestType	24	1	Int8	Type of Mass Cancellation	
				<b>Value</b>	<b>Meaning</b>
				3	All firm orders of an instrument
				4	All firm orders of a segment
				7	All orders submitted by the trader
				8	All firm orders
				9	All orders of an instrument, submitted by the trader
15	All orders of a segment, submitted by the trader.				
Instrument ID	25	4	Int32	Identifier of the instrument of the orders being cancelled. Required if MassCancelRequestType = 3 or 9. Else this field will be ignored.	
Reserved field1	29	1	Int8	This will always be 0.	
Reserved field2	30	1	Int8	This will always be 0.	

Segment	31	4	String	The segment for which the orders will be cancelled. Required if MassCancelRequestType = 4 or 15. Else this field will be ignored.						
Order Sub Type	35	1	Int8	Whether cancellation should be done on orders or quotes. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Order</td> </tr> <tr> <td>3</td> <td>Quote</td> </tr> </tbody> </table>	Value	Meaning	0	Order	3	Quote
Value	Meaning									
0	Order									
3	Quote									
Reserved Field	36	10	String	Reserved for future use						

#### 8.4.6 Execution Report

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
AppID	4	1	Int8	Partition ID
Sequence No	5	4	Int32	Sequence number of the message.
Execution ID	9	12	String	Unique ID of the Execution Report. Unique across all partitions, all days. This will be a 62 base encoded value in ASCII format.
Client Order ID	21	20	String	Client specified identifier of the order. If the execution report is generated as a response to order cancel or order mass cancel request, this will be the client order id specified in the order cancel or order mass cancel request. If a client order id is not specified in the order cancel or order mass cancel request, this will be the original client order id of the order being cancelled.
Order ID	41	12	String	Unique identifier of the order assigned by the matching system. This will be a 62 base encoded value in ASCII format. By converting this to binary, this can be mapped with ITCH Order ID.

Exec Type	53	1	Alpha	The reason the Execution Report is being sent.	
				<b>Value</b>	<b>Meaning</b>
				0	New
				4	Cancelled
				5	Replaced
				8	Rejected
				C	Expired
				D	Restated
				F	Trade
				G	<del>Trade Correct</del>
H	Trade Cancel				
9	Suspended				
Execution Report Ref ID	54	12	String	Reference to the execution being cancelled or corrected. Required if Exec Type is Trade Cancel or <del>Trade Correct</del> .	
Order Status	66	1	Int8	The status of the order.	
				<b>Value</b>	<b>Meaning</b>
				0	New
				1	Partially filled
				2	Filled
				4	Cancelled
				6	Expired
				8	Rejected
9	Suspended				
Order Reject Code	67	4	Int32	Code specifying the reason for the reject or the expiry. Please refer to the Reject Code Specification for the list of reject codes and meanings specific to LSE. The value in this field should be disregarded if Exec Type is not Rejected (8) except for orders expired (6) due to Self-Execution Prevention validations. (I.e. if an order is expired due to SEP validations, reject code 119200 will be populated <i>with Exec Type= C</i> )	
Executed Price	71	8	Price	Value of this fill. Required if Exec Type is Trade or <del>Trade Correct</del> .	
Executed Qty	79	4	Int32	Quantity that was executed in this fill.	

LeavesQty	83	4	Int32	Quantity available for further execution. Will be "0" if Order Status is Filled, Cancelled, Rejected or Expired.	
Container	87	1	Int8	The container which holds the order in the trading engine	
				<b>Value</b>	<b>Meaning</b>
				0	None
				1	Order Book
				3	Market Order Container
				6	Stop Order Queue
				7	Pegged Order Container
DisplayQty	88	4	Int32	Current visible quantity.	
Instrument ID	92	4	Int32	Identifier of the instrument the Execution Report is sent for.	
Restatement Reason	96	1	UInt8	Reason order was restated or cancelled. Required if ExecType (53) is Restated (D) or if the execution report is sent for an unsolicited cancellation.	
				8	Market Option
				100	Order Replenishment
Reserved field2	97	1	Int8	3	Order re-priced for CPX
Reserved field2	97	1	Int8	This will always be 0.	
				<b>Value</b>	<b>Meaning</b>
				1	Buy
Side	98	1	Int8	Side of the order.	
Side	98	1	Int8	Side of the order.	
				2	Sell
Reserved Field	99	8	UInt64	Reserved for future use.	
Counterparty	107	11	String	Counterparty Firm. If a trade is internalized, the Counterparty Firm will be populated with the user's own Firm ID. If a trade is cleared, the Counterparty Firm will be populated with CCP. If an on book trade is not cleared, the Counterparty Firm (17) will be populated with Contra Party Firm ID.	
Trade Liquidity	118	1	Alpha	Whether the order added or removed	



Indicator				<p>liquidity. The value in this field should only be considered if the Exec Type is Trade (F), <del>Trade Correct (G)</del> or Trade Cancel (H). For the rest of exec types, the value in this field should be ignored.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Added Liquidity</td> </tr> <tr> <td>R</td> <td>Removed Liquidity</td> </tr> <tr> <td>C</td> <td>Auction</td> </tr> </tbody> </table>	Value	Meaning	A	Added Liquidity	R	Removed Liquidity	C	Auction				
Value	Meaning															
A	Added Liquidity															
R	Removed Liquidity															
C	Auction															
TradeMatchID	119	8	UInt64	<p>Identifier of the trade. This will be the binary format value of the base 36 encoded trade id in the system. This will be same as ITCH Trade ID.</p> <p>Also the identifier sent to the clearer.</p>												
Transact Time	127	8	UInt64	Time the Execution Report was generated.												
Reserved Field	135	1	String	Reserved for future use.												
TypeOfTrade	136	1	Int8	<p>Indicates whether the executed portion is visible or hidden. Valid only if ExecType (53) = F. Ignore value in all other cases.</p> <p>Value / Meaning</p> <p>0 Visible</p> <p>1 Hidden</p> <p>2 Not Specified</p>												
Capacity	137	1	Int8	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Riskless Principal</td> </tr> <tr> <td>2</td> <td>Principal</td> </tr> <tr> <td>3</td> <td>Agency</td> </tr> </tbody> </table>	Value	Meaning	1	Riskless Principal	2	Principal	3	Agency				
Value	Meaning															
1	Riskless Principal															
2	Principal															
3	Agency															
PriceDifferential	138	1	Alpha	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>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)</td> </tr> <tr> <td>B</td> <td>New visible BBO</td> </tr> <tr> <td>1</td> <td>Join visible BBO</td> </tr> <tr> <td>2</td> <td>Joining/setting 2<sup>nd</sup> best visible price</td> </tr> <tr> <td>3</td> <td>Joining/setting 3<sup>rd</sup> best visible price</td> </tr> </tbody> </table>	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 2 <sup>nd</sup> best visible price	3	Joining/setting 3 <sup>rd</sup> best visible price
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 2 <sup>nd</sup> best visible price															
3	Joining/setting 3 <sup>rd</sup> best visible price															

				4 Joining/setting 4 <sup>th</sup> best visible price <hr/> 5 Joining/setting 5 <sup>th</sup> best visible price <hr/> 6 Joining/setting 6 <sup>th</sup> best visible price <hr/> 7 Joining/setting 7 <sup>th</sup> best visible price <hr/> 8 Joining/setting 8 <sup>th</sup> best visible price <hr/> 9 Joining/setting 9 <sup>th</sup> best visible price or joining/ setting worse price point <hr/> P Passive (a Hidden order that rests i.e. does not execute. This is not valid for visible orders) <hr/> This field will not be stamped if the trading parameter 'Capture Price Differential' is disabled.
Public Order ID	139	12	String	Maintained by matching engine, will be unique for each replenishment of a particular iceberg order. This will be a 62 base encoded value in ASCII format.

#### 8.4.7 Order Cancel Reject

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
AppID	4	1	Int8	Partition ID
Sequence No	5	4	Int32	Sequence number of the message.
Client Order ID	9	20	String	Client Order ID that was submitted with the order cancels or cancel/replace request being rejected.
Order ID	29	12	String	Server specified identifier of the order for which the cancel or cancel/replace was submitted. Will be "NONE" if the order is unknown
Cancel Reject Reason	41	4	Int32	Code specifying the reason for the reject. Please refer to the Reject Code Specification for the list of reject codes and meanings specific to LSE.

Transact Time	45	8	UInt64	Time the Order Cancel Reject occurred. The first 4 bytes of the Transact Time timestamp will represent the Unix (Posix) time while the next 4 bytes will specify the micro seconds. The Transact Time will be in UTC.
Reserved Field	53	10	String	Reserved for future use.

#### 8.4.8 Order Mass Cancel Report

Field	Offset	Length	Data Type	Description						
<b>Header</b>										
<b>Message Body</b>										
AppID	4	1	Int8	Partition ID						
Sequence No	5	4	Int32	Sequence number of the message.						
Client Order ID	9	20	String	Client specified identifier of mass cancel request.						
MassCancelResponse	29	1	Int8	Whether the Mass Cancel Request was accepted or rejected. <table border="1" data-bbox="981 1220 1401 1377"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Rejected</td> </tr> <tr> <td>7</td> <td>Accepted</td> </tr> </tbody> </table>	Value	Meaning	0	Rejected	7	Accepted
Value	Meaning									
0	Rejected									
7	Accepted									
MassCancelRejectReason	30	4	Int32	The code that identifies the reason the order mass cancel was rejected. Please refer to the Reject Code Specification for the list of reject codes and meanings specific to LSE.						
Reserved Field	34	4	Int32	Reserved for future use.						
Transact Time	38	8	UInt64	Time the order mass cancel report was generated. The first 4 bytes of the TransactTime timestamp will represent the Unix (Posix) time while the next 4 bytes will specify the micro seconds. The Transact Time will be in UTC.						
Reserved Field	46	10	String	Reserved for future use.						

## 8.5 Application messages: others

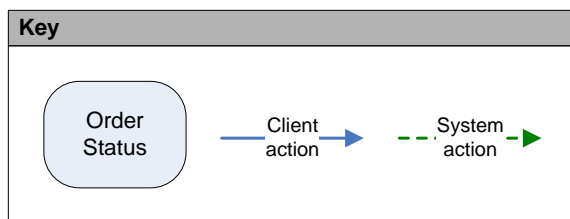
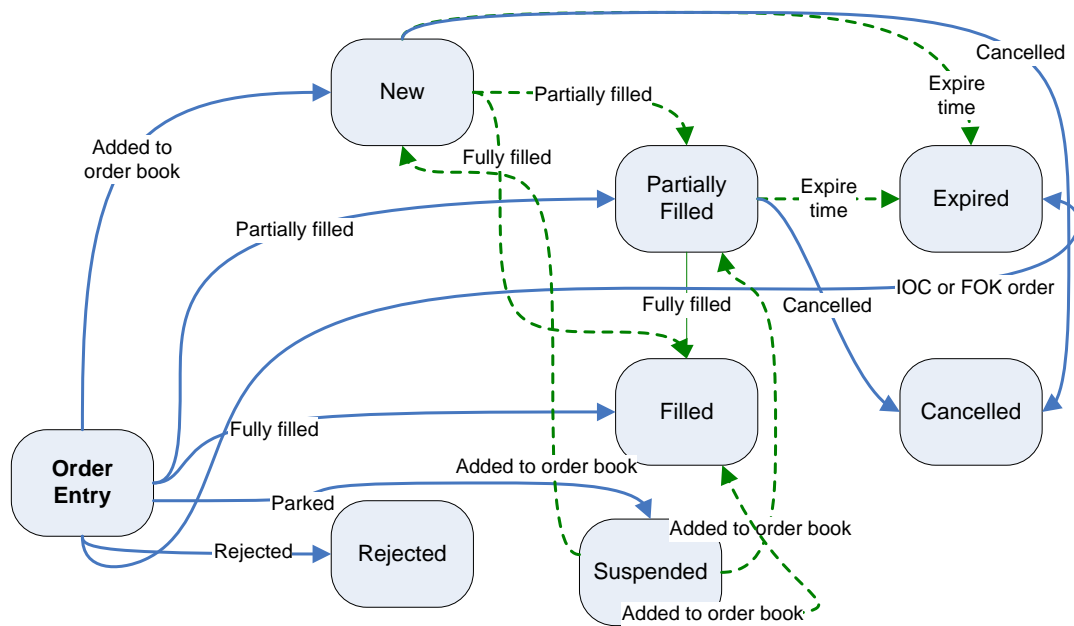
### 8.5.1 Business Reject

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
AppID	4	1	Int8	Partition ID
Sequence No	5	4	Int32	Sequence number of the message.
RejectCode	9	4	Int32	Code specifying the reason for the reject. Please refer to the Reject Code Specification for the list of reject codes and meanings specific to LSE.
Client Order ID	13	20	String	Client specified identifier of the order
Order ID	33	12	String	Unique identifier of the order assigned by the matching system
Transact Time	45	8	UInt64	Time the order mass cancel report was generated. The first 4 bytes of the TransactTime timestamp will represent the Unix (Posix) time while the next 4 bytes will specify the micro seconds. The Transact Time will be in UTC.
Reserved Field	53	10	String	Reserved for future use.

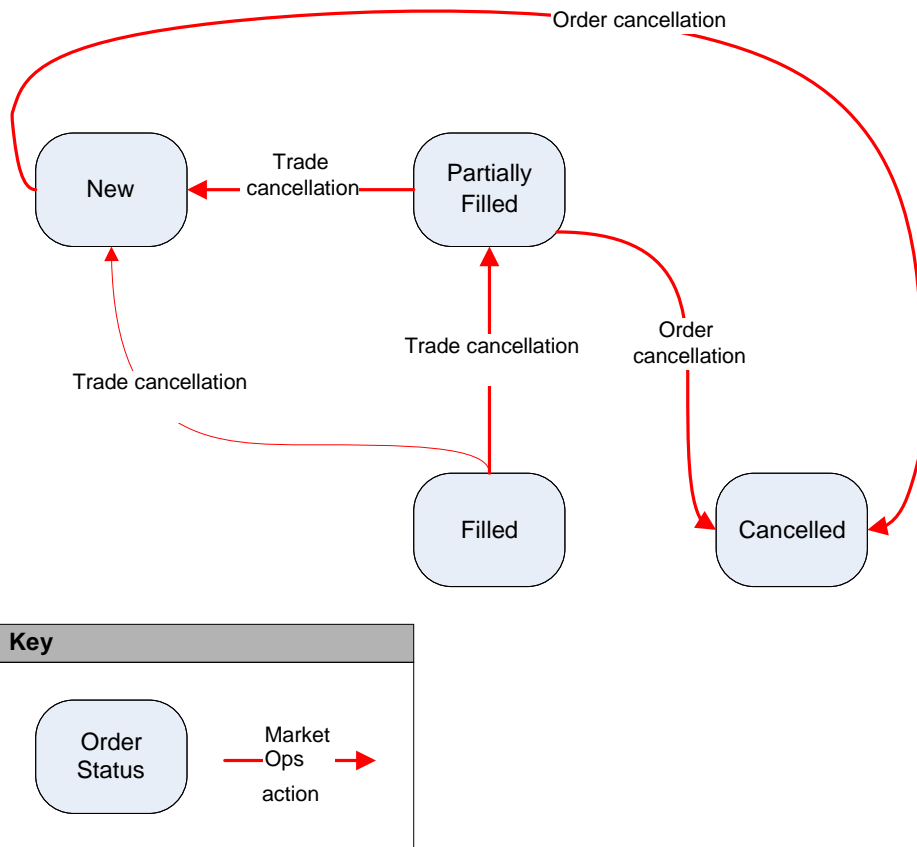
# 9 Process flows

## 9.1 Order handling

### 9.1.1 Order Status Changes



## 9.2 Market Operations actions



# 10 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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