

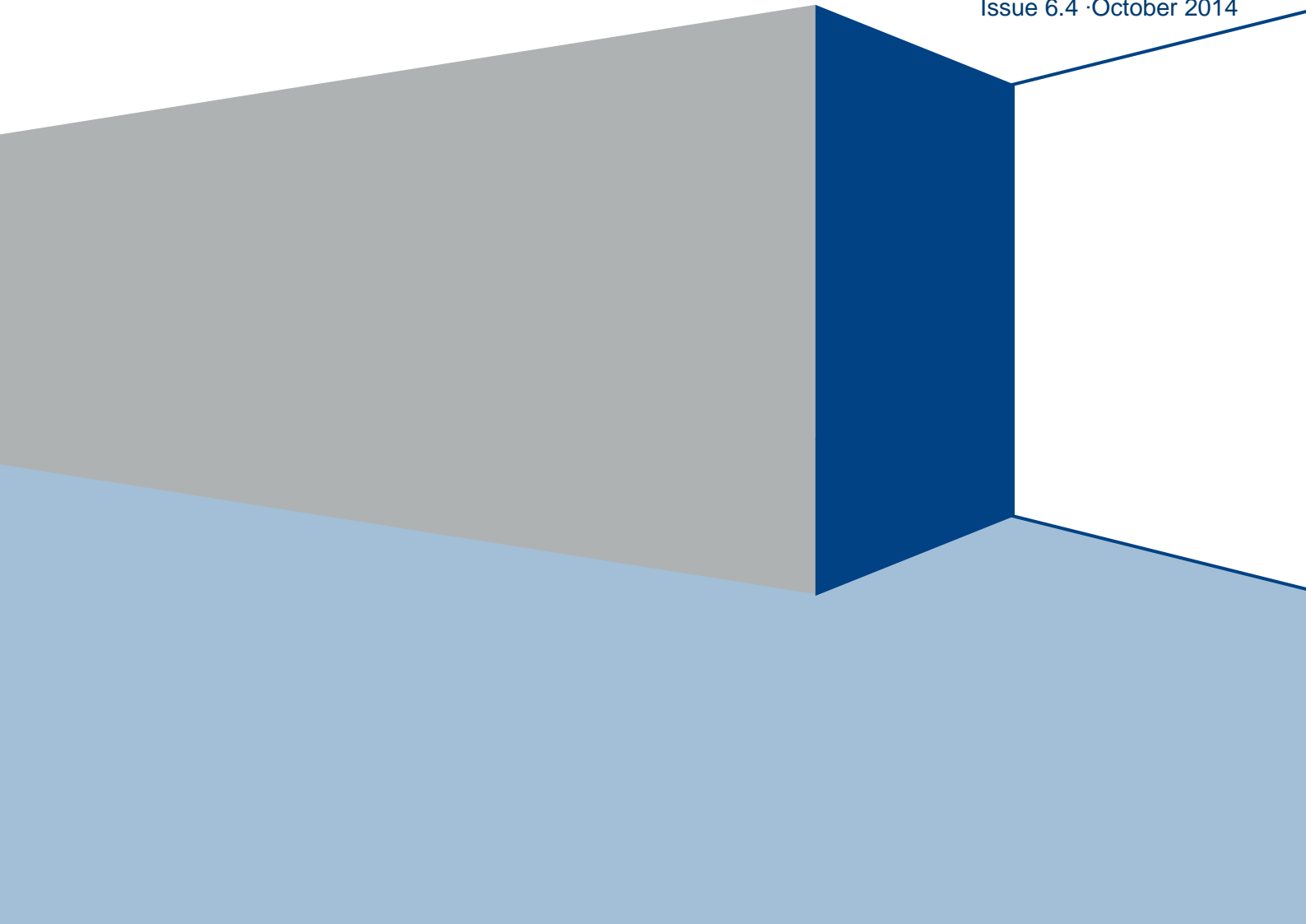


**London**  
Stock Exchange Group

MIT203 - BIT - MILLENNIUM EXCHANGE

# Native Trading Gateway

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## **Disclaimer**

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# 1 Introduction

Borsa Italiana 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 platform.

## 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 Borsa Italiana customers require to develop to the new services.

## 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 Borsa Italiana post the migration to Millennium Exchange.

The current series of documents are set out below:

### **Trading**

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

### **Market Data**

- MIT301 BIT – Guide to the Market Data Services
- MIT303 BIT – MITCH Specification
- MIT305 BIT – Markets Reference Data
- MIT306 BIT – MOT / EuroMOT Instrument Currency

This series principally covers non-regulatory information. It does not override or supersede the Rules of Borsa Italiana.

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

Italian Version:

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/migrazionemillenniumit-mit/millenniumitmigration.htm>

English Version:

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/migrazionemillenniumit-mit/millenniumitmigration.en.htm>

## 1.4 Document history

This document has been through the follow iterations:

Issue	Date	Description
1.0	August 2011	First issue of this document published via the Borsa Italiana's website and distributed to customers.
2.0	September 2011	Updated version of this document published via the Borsa Italiana's website and distributed to customers.  The changes are applied at the following sections: - Section 2.3.2.3 - Section 2.2.5 - Section 2.10 - Section 7.1.2.1 - Section 7.4.1 - Section 7.4.3 - Section 7.4.4 - Section 7.4.5 - Section 7.4.8
2.1	December 2011	Updated version of this document published via the Borsa Italiana's website and distributed to customers.  The section 2.9 is removed as the Order ID and Trade ID conversion is covered in MITCH Spec.  The changes are applied at the following sections: - 2.2.1.1, 2.2.2.4, 2.2.5.2, 6, 7.4.4, 7.4.5, 7.4.6, 7.4.7, 7.4.8
3.0	February 2012	Updated version of this document published via the Borsa Italiana's website and distributed to customers.  The changes are applied at the following sections: - added sections: 8, 8.1, 8.2, 8.3

		<p>- removed sections: 2.8.1.1</p> <p>- changed sections: 2.2.2.2, 7.4.1, 7.4.3, 7.4.4, 7.4.5, 7.4.6, 7.4.8</p>
3.1	March 2012	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>Added sections: 7.6</p> <p>The changes are applied at the following sections: 2.2.4, 2.2.5.1, 2.2.5.3, 2.5.2, 5.2, 7.1.1, 7.1.2.2, 7.4.6, 7.4.7</p>
4.0	April 2012	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: 2.3.2.1, 7.3.9, 7.4.4, 7.4.10, 7.6</p>
4.1	April 2012	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: 7.4.1, 7.4.8</p>
4.2	April 2012	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: 2.7, 7.4.8</p>
4.3	May 2012	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: 1.3, 7.4.3</p>
5.0	June 2012	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p>



		<p>The changes are applied at the following sections:</p> <p>2.9.1.2</p>
5.1	December 2012	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: 2.2.2.3, 2.3.2.3, 4.1</p> <p>removed the following sections: 2.8.1.2</p> <p>added the following sections: 2.8.1.7, 2.8.1.8, 2.8.1.9, 2.8.1.10, 2.8.1.11</p>
6.0	February 2013	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections:</p> <p>- added the following sections: 2.4, 2.9.1.4, 5.1, 5.2</p> <p>- changed the following sections: 2.3.2.3, 5.6, 7.4.1, 7.4.5, 7.4.8, 7.4.9</p>
6.1	April 2013	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: 4.1</p>
6.2	June 2013	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: 4.1, 7.4.8</p>
6.3	August 2013	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections: - added the following sections:</p>

		<p>2.9.1.14</p> <p>- changed the following sections:</p> <p>2.2.1.2, 7.4.6, 7.4.9</p>
6.4	October 2014	<p>Updated version of this document published via the Borsa Italiana's website and distributed to customers.</p> <p>The changes are applied at the following sections:</p> <p>- added the following sections: 2.9.1.13</p> <p>- changed the following sections: 1.3, 2.2.4, 2.10.2, 4.1, 7.1.2, 7.4.1, 7.4.8, 7.4.9, 7.5.1</p> <p>- Updated the data types</p>

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

- Telephone: +39 0272426409 - 348 – 606 – 647
- Service Desk Free Toll Number: 00800 26772000
- Email: MIT-migration@borsaitaliana.it ; clients-services@borsaitaliana.it

## 2 Service description

Borsa Italiana 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
  - (v) Submit a Cross/BTF order
  - (vi) Cancel a Committed Cross/BTF order
- (b) Quote handling
  - (vii) Submit and update a quote
  - (viii) Cancel a quote
  - (ix) Mass cancel quotes

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

### 2.1 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.

### 2.2 Order handling

#### 2.2.1 Order types

Clients may submit the order types outlined below via the [New Order](#) message.

Order Type	Description	Relevant Fields
Market	An order that will execute at the best available prices until it is filled. Any remainder will be cancelled.	Order Type = 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 Time In Force.	Order Type = 2 Limit Price

Stop	A market order that remains inactive until the market reaches a specified stop price.	Order Type = 3 Stop Price
Stop Limit	A limit order that remains inactive until the market reaches a specified stop price.	Order Type = 4 Stop Price Limit Price
Market to Limit	An order that will execute at the best available prices until it is filled. Any remainder will be converted to a limit order at the last traded price (means the auction price; in the absence of it, static reference price is used).	Order Type = 5
Iceberg	An order that contains a disclosed (displayed/visible) 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.	Display Quantity
Named	An order for which the identity of the submitting member is disclosed in the market data feed.	Anonymity = 1

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

Order Type	Description	Relevant Fields
Internal Cross	A dual sided order that will execute with each other side at a price between visible best bid & visible best offer (including extremes)	CrossType = 5
Internal BTF	A dual sided order that will execute with each other side at a price between visible best bid - % & visible best offer + % (including extremes)	CrossType = 6
Committed Cross	A single sided order that will execute with the other side of cross at a price between visible best bid & visible best offer (including extremes)	CrossType = 7
Committed BTF	A single sided order that will execute with the other side of BTF at a price between visible best bid - % & visible best offer + % (including extremes)	CrossType = 8

#### 2.2.1.1 Time in Force (TIF)

The server recognizes the following TIFs.

Order Type	Description	Relevant Fields
Day	An order that will expire at the end of the day (means at the market close).	Time In Force = 0
Immediate or Cancel (IOC)	An order that will be executed on receipt and the remainder, if any, immediately cancelled.	Time In Force = 3
Fill or Kill (FOK)	An order that will be fully executed on receipt or immediately cancelled.	Time In Force = 4
On Open (OPG)	An order that may only be executed in the opening auction.	Time In Force = 5
At the Close (ATC)	An order that may only be executed in the closing auction.	Time In Force = 10
Good Till Time (GTT)	An order that will expire at a specified time during the current day.	Time In Force = 8 Expire Time
Good Till Date (GTD)	An order that will expire at the end of a specified day (means at the market close of that day unless it is already fully filled, cancelled or expired).	Time In Force = 6 Expire Time
Good Till Cancelled (GTC)	An order that will never expire.	Time In Force = 1
Good For Auction (GFA)	An order that may only be executed in the next auction (and the remainder (if any) will be expired after the auction)	Time In Force = 9

### 2.2.1.2 Order capacity

The server recognises two order capacities: agency and principal. Clients are responsible for indicating the capacity an order is submitted under.

If an user submits an Order or a Quote with "Riskless Principal" or "CFD Give Up", it will get rejected with reject code 9901-Invalid Value in Field, with Reason "Capacity".

## 2.2.2 Order management

### 2.2.2.1 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. The server will associate the user entering the order as the Trader Group (Owner ID) of the order.

### 2.2.2.2 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.

An open Committed Cross/BTF order may be cancelled via the Cross Order Cancel Request. 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 Buy Side Original ClOrdID or Sell Side Original ClOrdID fields.

### 2.2.2.3 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 the native user.

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.

Any open Committed Cross/BTF Orders cannot be mass cancelled.

### 2.2.2.4 Amending an order

The following attributes of a live order may be amended via the [Order Modification Request](#) message:

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

While the field being amended will have to be filled with the new value, clients must fill in the current values of all the fields except the ones for which exceptions are specified (for example specifying a negative value for the stop price field if it is not being amended) in the Order Modification Request message that are not being amended. The client (i.e. the submitter/trader) who submits the Order Modification Request should be the same as the same client who submitted the original 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.

Any Cross/BTF orders cannot be amended.

### 2.2.3 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

Please refer to [section 8.1.1](#) process flow diagrams on the various statuses that may apply to an order.

### 2.2.4 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
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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.</p>	0
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
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.</p>	1, 2
C	<p><b>Order Expired</b> Indicates that an order has expired in terms of its time qualifier or due to an execution limit.</p> <p>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.</p> <p>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 Regular (Continuous) Trading session due to a circuit breaker is triggered during that aggression.</p> <p>This message will also be sent when an iceberg order is expired when an auction call is triggered.</p> <p>This message will also be sent when the remaining orders (except GTC and GTD) are expired at market close.</p> <p>This message will also be sent when order are expired based on the auto cancellation on disconnect/log out feature.</p>	6
4	<p><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 Supervision. In such a scenario the <a href="#">Execution Report</a> will include a Restatement Reason of Market Option (8). It will not be assigned a new Client Order ID.</p>	4
5	<p><b>Order Cancel/Replaced (Order Modified)</b> Indicates that an order cancel/replace request has been accepted and successfully processed.</p>	0, 1
L	<p><b>Triggered</b> Indicates that a parked ATC, GFA, CPX or stop/stop limit order has been activated and moved to the main container. The order is available for execution.</p>	0, 1
D	<p><b>Restated</b> Indicates that an order has been amended by Market Supervision. The unsolicited message will include a Restatement Reason of Market Option (8). It will not be assigned a new Client Order ID.</p>	0, 1



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
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### 2.2.5 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 can specify the Client Order ID when submitting an application message.

#### 2.2.5.1 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.

This will be a 62 base encoded value in ASCII format. By converting this to binary, this can be mapped with MITCH Order ID.

#### 2.2.5.2 Client Order IDs

Clients may specify a Client Order ID when submitting an application message.

The server does not validate each Client Order ID for uniqueness. Clients must ensure unique Client Order IDs across all application messages sent under a particular CompID. Given that the server supports GTD and GTC orders, clients must also ensure that 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.

#### 2.2.5.3 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.

This will be a 62 base encoded value in ASCII format.

## 2.3 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.

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.

If the quote may only participate in the opening auction it should include the TIF At the Open (5). If the quote may participate in any single auction it should include the TIF Good for Auction (9). Clients may not specify a TIF when submitting a quote if they require it to be valid for the entire trading day (means a DAY quote). All active quotes will expire at the end of the trading day.

### **2.3.1 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.

#### **2.3.1.1 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.

### **2.3.2 Quote management**

#### **2.3.2.1 Updating a quote**

A client may update a live quote entry by sending another new quote for the same instrument.

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.

When only a single side of the quote is updated (specifying a new client order ID), internally the client order IDs of both the sides are updated amended side. For the non updated side, the system will not disseminate a new execution report (even though the client order ID is updated internally).

#### **2.3.2.2 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.

### 2.3.2.3 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 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.

### 2.3.2.4 Cancellation by Market Supervision

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

### 2.3.3 Unsolicited Quote Updates

The [Execution Report](#) message is used to notify the client if one side of a quote is executed or expired. The Client Order ID of the message will be that of the last Quote message that successfully updated the executed quote.

## 2.4 Reject and Business Reject Messages

The server will generally reject a business message via an Execution Report, Cancel Reject or Mass Cancel Report message.

The Business Reject message will be used to reject a message for an unknown instrument. The Partition ID of a Business Reject will be zero (0) if the particular instrument is unknown. It will also be used to reject messages if a partition or the entire system is suspended in the unlikely event of a process outage. The Partition ID of a Business Reject will be zero (0) if the system is suspended.

A Reject message will be used to reject a malformed message (e.g. invalid data type, invalid value, required field missing, etc.).

## 2.5 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.

## 2.6 Market Supervision

### 2.6.1 Order deletion

Market Supervision 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.

However, it's highlighted that this feature is intended to help a client manage an emergency situation and should not be relied upon as a normal business practice.

### 2.6.2 Trade cancellations

Market Supervision may also cancel any trade. MIT Trading 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 be cancelled. If the quantity is cancelled, the order will be restated/ cancelled 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 order restatement/cancellation.

E.g. 1 Order with an order quantity 2000 receives two executions, one for 500 and another for 200. Execution for 500 is cancelled. The below two notifications will be sent:

1. Execution Report – Exec Type = H, Order Status = 1, LeavesQty = 1800 (internally Order Qty will be 2000 and Cumulative Executed Qty will be 200)
2. Execution Report – Exec Type = D, Order Status = 1, LeavesQty = 1300 (internally Order Qty will be 1500 and Cumulative Executed Qty will be 200)

E.g. 2 Order with an order quantity 2000 receives a single execution for 2000. Execution for 2000 is cancelled. The below two notifications will be sent:

1. Execution Report – Exec Type = H, Order Status = 0, LeavesQty = 2000 (internally Order Qty will be 2000 and Cumulative Executed Qty will be 0)
2. Execution Report – Exec Type = 4, Order Status = 4, LeavesQty = 0 (internally Order Qty will be 2000 and Cumulative Executed Qty will be 0)

If an execution received by a quote is cancelled, the cancelled quantity will 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.

## 2.7 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)

## 2.8 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.

## 2.9 Functional and implementation limitations

- 2.9.1.1 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.
- 2.9.1.2 A Mass Cancel Request should not be sent during the Pre Trading (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 same orders again. But the client can individually cancel orders.
- ~~2.9.1.3~~ If an Order Modification 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 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. Before removing the order from the relevant container, the container will be saved and this saved value will be stamped in the "Container" field of the Execution Report.
- 2.9.1.4 If an order is successfully amended as in 2.9.1.3 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.
- 2.9.1.5 The server does not validate each Client Order ID for uniqueness. 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.
- 2.9.1.6 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).

- 2.9.1.7 Committed Cross/BTF Orders can be cancelled via the Cancel Request message as well
- 2.9.1.8 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
- 2.9.1.9 Native Trading Gateway responds with a Mass Cancel Report with Mass Cancel Response Type - 7 (Accepted) in response to a submitted Mass Cancel Request during Pre-Trading session if "Cancel Orders in Pre-Trading Session" parameter is set to DISABLED, where as via FIX Trading Gateway, an Order Cancel Reject message will be sent to the client per order as soon as the Mass Cancel Report is sent out with Mass Cancel Response = 7 (Cancelled All Orders). But no such Cancel Rejects will be sent via the Native Trading GW
- 2.9.1.10 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)).
- 2.9.1.11 A Quote message is handled by the system as two separate buy and sell orders. Buy side of the quote is added to the order book before Sell side. Once a Quote message is received it will be acknowledged by two Execution Report messages. However, due to above behaviour if the sell side of the quote is cancelled upon the quote entry, system will initially send an Execution Report for the buy side with Order Status = New (0) and will be followed by two Execution Reports with Order Status = Expired (6).
- 2.9.1.12 It's not possible to perform negative number validations for fields with Unsigned Integer data types. For instance "Order Quantity" is of UInt64 data type. Since this field is unsigned, it is not possible to represent a negative number as "Order Quantity". This scenario could be described as below.

Say, Field A has data type UInt8 and Field B has data type Int8

Client submits -100 on Fields A and B

Representation of -100 on Field B (Int8):

1	1	1	0	0	1	0	0
Sign Bit	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
-	64	32	0	0	4	0	0

In signed integer types to represent negative values the sign bit or the leftmost bit is used. When it's set to 1 the value is negative, otherwise positive.

Representation of -100 on field A (UInt8)

In unsigned integers the sign bit is not considered as a negative value validation bit and is used as a digit to represent the number as other 7 bits do.

1	1	1	0	0	1	0	0
$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
128	64	32	0	0	4	0	0

So here, even though we expected to represent -100, the final outcome is number 228. If we used UInt64 to represent -100, the actual value will be 9.2233720368548E+18 which most probably would fire validations such as Maximum Size.

For instance, an order submitted with -100 as the Order Quantity, it would get rejected with OrderRejectCode=1003 (Invalid order size (> maximum size)) if it breaches the maximum size validation.

2.9.1.13 Clients can cancel or modify orders with Order ID as the identifier of the order being canceled. If these cancel/modify requests fail to reach the order identification stage, and is rejected by a validation prior to that, the actual order being cancelled/modified is not identified. If the above condition is true, the cancel/modification would receive a Cancel Reject message with the OrderID returned as NONE.

Example:

1. Send day order with Client Order ID 'X'
  - 1a. Execution Report received with Status 'New' with Order ID '123'
2. Send Order Modification Request for the same order with ClientOrderID 'X' and Order ID '123'
  - 2a. Order Cancel Reject is sent with RejectCode=8001 (Duplicate Client Order ID), OrderID=NONE

## 2.10 Field value validations

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

2.10.1.2 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 some types of mass cancel requests, reject code 9901 will be used to reject the message.
- If the segment is not specified for some types of mass cancel requests, reject code 9900 will be used to reject the message.

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

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

	Message	Field	Validation	Reject Code
2.10.1.5	Message Header	Length	The value has to be the actual length of the message. Otherwise reject the message.	9901
2.10.1.6		Length	The value has to be the actual length of the message. Otherwise reject the message.	9901
2.10.1.7		Message Type	If the value is out of range from the defined set of values, reject the message.	9901

2.10.1.8		User Name	If a value is not specified, reject the message. If the value contains invalid ASCII characters, reject the message.	9900 9901
2.10.1.9	Logon	Password	If a value is not specified, reject the message. If the value contains invalid ASCII characters, reject the message.	9900 9901
2.10.1.10		New Password	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.11		Message Version	The value has to be 1. Otherwise reject the message.	9901
2.10.1.12	Logout	Reason	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.13	Missed Message Request	AppID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901

2.10.1.14		LastMsgSeqNum	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
2.10.1.15	New Order	Client Order ID	If a value is not specified, reject the message.  If the value contains invalid ASCII characters, reject the message.	9901
2.10.1.16		Trader ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.17		Account	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.18		ClearingAccount	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.19		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
2.10.1.20		Reserved Field	N/A	N/A
2.10.1.21		Reserved Field	N/A	N/A

2.10.1.22		Order Type	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.23		TIF	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.24		ExpireDateTime	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
2.10.1.25		Side	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.26		Order Qty	The value has to be greater than 0 ( $> 0$ ). Otherwise reject the message.	9901
2.10.1.27		DisplayQty	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
2.10.1.28		Limit Price	The value has to be greater than 0 ( $> 0$ ) if Order Type is Limit or Stop Limit. Otherwise reject the message.	9901

2.10.1.29		Capacity	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.30		Auto Cancel	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.31		Order Sub Type	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.32		Anonymity	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.33		Stopped Price	The value has to be greater than 0 (>0) if Order Type is Stop or Stop Limit.	9901
2.10.1.34		Reserved Field	N/A	N/A
2.10.1.35	Quote	Client Order ID	If the value contains invalid ASCII characters, reject the message.	9901
2.10.1.36		Trader ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901

2.10.1.37		ClearingAccount	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.38		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
2.10.1.39		BidPrice	The value has to be greater than or equal to 0 (>=0). Otherwise reject the message.	9901
2.10.1.40		BidSize	The value has to be greater than or equal to 0 (>=0). Otherwise reject the message.	9901
2.10.1.41		AskPrice	The value has to be greater than or equal to 0 (>=0). Otherwise reject the message.	9901
2.10.1.42		AskSize	The value has to be greater than or equal to 0 (>=0). Otherwise reject the message.	9901
2.10.1.43		Capacity	If the value is out of range from the defined set of values, reject the message.	9901

2.10.1.44		Auto Cancel	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.45		Reserved Field	N/A	N/A
2.10.1.46	Cancel Request	Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.47		Original Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.48		Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.49		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
2.10.1.50		Reserved Field	N/A	N/A
2.10.1.51		Reserved Field	N/A	N/A
2.10.1.52		Side	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.53		Reserved Field	N/A	N/A

2.10.1.54	Mass Cancel Request	Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.55		MassCancelRequestType	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.56		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
2.10.1.57		Reserved Field	N/A	N/A
2.10.1.58		Reserved Field	N/A	N/A
2.10.1.59		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
2.10.1.60		Order Sub Type	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.61		Reserved Field	N/A	N/A



2.10.1.62	Order Modification Request	Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.63		Original Client Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.64		Order ID	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.65		Instrument ID	The value has to be greater than 0 (>0). Otherwise reject the message.	9901
2.10.1.66		Reserved Field	N/A	N/A
2.10.1.67		Reserved Field	N/A	N/A
2.10.1.68		ExpireDateTime	The value has to be greater than or equal to 0 (>=0). Otherwise reject the message.	9901
2.10.1.69		Order Quantity	The value has to be greater than 0 (>0). Otherwise reject the message.	9901

2.10.1.70		DisplayQuantity	The value has to be greater than or equal to 0 ( $\geq 0$ ). Otherwise reject the message.	9901
2.10.1.71		Account	If a value is specified and it contains invalid ASCII characters, reject the message.	9901
2.10.1.72		TIF	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.73		Side	If the value is out of range from the defined set of values, reject the message.	9901
2.10.1.74		Reserved Field	N/A	N/A
2.10.1.75		Limit Price	No validation will be done.	
2.10.1.76		Stopped Price	No validation will be done.	

### 2.10.2 Validation of ASCII characters

It should be noted that even though the values which correspond to Decimal 0 to 127 should be accepted and any other ASCII character will be rejected, customers are recommended to use ASCII characters from 32 to 126 Decimals included.

## 2.11 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.

# 3 Connectivity

## 3.1 Comp IDs

The User 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).

### 3.1.1 Passwords

Each User 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 Borsa Italiana 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 Borsa Italiana.

## 3.2 Production IP addresses and ports

The IP addresses and ports for the Native Trading Gateway will be published in a separate configuration document.

## 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 or site outage.

On unexpected disconnection from the primary gateway a client should try to reconnect 3 times to the primary gateway with a time out value of three seconds on each connection before attempting to connect to the secondary gateway – and this should then be retried a further 3 times. After six failed connection attempts (3 on each gateway) the client should contact the Exchange for guidance.

## 3.4 Message rate throttling

Borsa Italiana has implemented a scheme for throttling message traffic where each client is only permitted to submit up to a specified number messages per second per CompID/UserID.

Every message which exceeds the maximum rate of a CompID 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.

### **3.5 Mass Cancellation On Disconnect/Log out**

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 or logs out from the server.

The user can mark each order/quote 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 Connections and sessions

## 4.1 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 two heartbeat intervals (the interval is configurable on the Trading System) 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 Response message. If the client's logon is successful or if the client's new password is accepted, the RejectCode of the Logon Response will be Successful (0). If the client's logon is unsuccessful (eg. invalid or expired password, locked user etc.) the Logon Response will include the RejectCode which corresponds to the reason for rejection.

**If the login is sent to an invalid user ID, the gateway should reject the login and disconnect connection. No reject message will be sent on this instance.**

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

The Real-Time channel supports a configurable number concurrent logins. Once the number of logged in clients has reached this limit, the server will reject login requests from additional clients with a Logon Response and then break the TCP/IP connection. The Reject Code of such a message will be "9903".

If the client sends another Logon to the same connection with the same username and password, gateway does not respond to that message and does not break TCP/IP session.

If the client opens a new connection and sends another Logon with the same username and password, gateway sends a Logon Response with Reject Code = 2 (Already Logged) and closes the new TCP/IP connection. Initial TCP/IP connection is not closed in this case.

## 4.2 Maintaining a session

### 4.2.1 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.

#### **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 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.

This is applicable for both Real Time and Recovery channels.

### **4.3 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.

# 5 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.

## 5.1 Establishing a Connection

The client should be logged in to the Real-Time channel before it attempts to login to the Recovery channel.

Once a connection with the Real-Time channel is established, the client should use the relevant IP address and port (as outlined in Section 4.2) to establish a TCP/IP session with the Recovery channel. The client should then initiate a session with the Recovery channel by sending the Logon message. The client should identify itself using the CompID 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 Response message with the Reject Code "0". The value, if any, in the New Password field of the Logon will be ignored.

The client must wait for the server's Logon Response before sending additional messages on the Recovery channel. Messages received from the client before the acceptance of the login request are rejected via the Reject message.

If a logon attempt fails, the server will send a Logon Response message, which will include the appropriate Reject Code, and then break the TCP/IP connection with the client.

The Recovery channel supports a configurable number concurrent logins. Once the number of logged in clients has reached this limit, the server will reject login requests from additional clients with a Logon Response and then break the TCP/IP connection. The Reject Code of such a message will be "9903".

## 5.2 Heartbeats

The client and server will use the Heartbeat message to exercise the communication line and to verify that the interfaces at each end are available.

The server will send a Heartbeat at each heartbeat interval. The client is expected to employ the same logic.

If the server detects inactivity for a specific period, it will 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.

This is applicable for both Real Time and Recovery channels.

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

## 5.4 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.

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 ResponseType 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.

If a client cannot recover all the messages it requires due to the limit per Missed Message Request, it is advised to connect to FIX Drop Copy Gateway to get the current status of all open orders or connect to FIX Post Trade Gateway to get the details of all relevant trades happened.

## 5.5 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.

If the recovery service becomes unavailable while servicing a Missed Message Request from the client, the client will be disconnected from the recovery channel. Any further Missed Message Requests sent by the client after a re-login while the recovery service is unavailable will be rejected via a Missed Message Request Ack with the Response Type 2. The client can send a new Missed Message Request when the recovery service is available again to recover messages.

## 5.6 Unavailability of Recovery Channel

A System Status message with a Status of Recovery Service Unavailable (2) will be transmitted to all clients connected to the Recovery channel in the unlikely event the recovery service for a particular partition is unavailable. Missed Message Requests for the partition will be rejected via a Missed Message Request Ack with a Status of Service Unavailable (3) in such a case.

If the outage occurs while a Missed Message Request is being served (i.e. before all messages have been sent), the server will terminate the transmission of missed messages. A Transmission Complete (Missed Message Report) message with a Status of Service Unavailable (3) will be sent if the transmission is terminated prematurely.

Once the service is resumed, a System Status message with a Status of Recovery Service Resumed (1) will be transmitted to all clients connected to the Recovery channel. Clients are expected to submit a new Missed Message Request at this time.

## 6 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.
Byte	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.
UInt8	1	8 bit unsigned 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.

# 7 Message formats

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

## 7.1 Supported message types

### 7.1.1 Administrative messages

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

Message	MsgType	Usage
<a href="#">Logon</a>	A	Allows the client and server to establish a session.
<a href="#">Logon Response</a>	B	Allows the server to acknowledge a client's Logon.
<a href="#">Logout</a>	5	Allows the client and server to terminate a session.
<a href="#">Heartbeat</a>	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.
<a href="#">Missed Message Request</a>	M	Allows the client to subscribe to missed messages through the Recovery Channel.
<a href="#">Missed Message Request Ack</a>	N	Allows the server to acknowledge a client's Missed Message Request.
<a href="#">Transmission Complete</a> (Missed Message Report)	P	Allows the Server to communicate the result of a Missed Message Request.
<a href="#">Reject</a>	3	Used to reject a message that does not comply with the Native Trading Gateway messaging protocol.
<a href="#">System Status</a>	n	This message will be disseminated in the recovery channel to indicate Service Non Availability of a partition (due to order cache outage). This message will also be disseminated when the service is resumed.

## 7.1.2 Application messages: order handling

### 7.1.2.1 Client-initiated

Message	MsgType	Usage
<a href="#">New Order</a>	D	Allows the client to submit a new order.
<a href="#">Quote</a>	S	Allows the client to submit and update a quote.
<a href="#">Cancel Request</a>	F	Allows the client to cancel a live order.
<a href="#">Order Mass Cancel Request</a>	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 trader group or to all orders of the firm.
<a href="#">Order Modification Request</a>	G	Allows the client to cancel/replace a live order.
New Order Cross Message_	C	Allows the client to submit a Cross/BTF order.
Cross Order Cancel Request	H	Allows the client to cancel a Committed Cross/BTF order.

### 7.1.2.2 Server-initiated

Message	MsgType	Usage
---------	---------	-------

<a href="#">Execution Report</a>	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) Order Triggered
<a href="#">Order Cancel Reject</a>	9	Indicates that an order cancel request or order cancel/replace request has been rejected.
<a href="#">Mass Cancel Report</a>	r	Indicates one of the following: (i) Mass order cancel request accepted. (ii) Mass order cancel request rejected.
<a href="#">Business Reject</a>	j	(c) Indicates that an application message could not be processed.

### 7.1.3 Application messages: quote handling

#### 7.1.3.1 Client-initiated

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

### 7.1.4 Application messages: other

#### 7.1.4.1 Server-initiated

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

## 7.2 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

## 7.3 Administrative messages

### 7.3.1 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	UInt8	Message Version that will be used in this session. The value has to be always 1.

### 7.3.2 Logon Response

Field	Offset	Length	Data Type	Description
<b>Header</b>				
Reject Code	4	4	Int32	Code specifying the reason for the reject.
PasswordExpiry DayCount	8	30	String	The number of days before the password will expire

### 7.3.3 Logout

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

### 7.3.4 Heartbeat

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

### 7.3.5 Reject

Field	Offset	Length	Data Type	Description
<b>Header</b>				
Reject Code	4	4	Int32	Code specifying the reason for the reject.
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.

### 7.3.6 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.

### 7.3.7 Missed Message Request Ack

Field	Offset	Length	Data Type	Description										
<b>Header</b>														
Response Type	4	1	UInt8	<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													

### 7.3.8 Transmission Complete (Missed Message Report)

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



Response Type	4	1	UInt8	<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											

### 7.3.9 System Status

Field	Offset	Length	Data Type	Description								
<b>Header</b>												
AppID	4	1	UInt8	Partition ID <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Partition 1</td> </tr> <tr> <td>2</td> <td>Partition 2</td> </tr> <tr> <td>3</td> <td>Partition 3</td> </tr> </tbody> </table>	Value	Meaning	1	Partition 1	2	Partition 2	3	Partition 3
Value	Meaning											
1	Partition 1											
2	Partition 2											
3	Partition 3											
AppStatus	5	1	UInt8	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Recovery service resumed</td> </tr> <tr> <td>2</td> <td>Recovery service not available</td> </tr> </tbody> </table>	Value	Meaning	1	Recovery service resumed	2	Recovery service not available		
Value	Meaning											
1	Recovery service resumed											
2	Recovery service not available											

## 7.4 Application messages: order/quote handling

### 7.4.1 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	UInt8	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	46	4	Int32	Identifier of the instrument for which the order is submitted.						
Reserved Field	50	1	Int8	Reserved for Future Use						
Reserved field1	51	1	Int8	This will always be 0.						

Order Type	52	1	UInt8	<p>Type of order</p> <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> <tr> <td>5</td> <td>Market to Limit Order</td> </tr> </tbody> </table>	Value	Meaning	1	Market	2	Limit	3	Stop	4	Stop Limit	5	Market to Limit Order										
Value	Meaning																									
1	Market																									
2	Limit																									
3	Stop																									
4	Stop Limit																									
5	Market to Limit Order																									
TIF	53	1	UInt8	<p>Time qualifier of the order.</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>1</td> <td>Good Till Cancel (GTC)</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>9</td> <td>Good for Auction (GFA)</td> </tr> <tr> <td>10</td> <td>At the Close (ATC)</td> </tr> <tr> <td>12</td> <td>Closing Price Cross (CPX)</td> </tr> </tbody> </table>	Value	Meaning	0	Day	1	Good Till Cancel (GTC)	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)	9	Good for Auction (GFA)	10	At the Close (ATC)	12	Closing Price Cross (CPX)
Value	Meaning																									
0	Day																									
1	Good Till Cancel (GTC)																									
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)																									
9	Good for Auction (GFA)																									
10	At the Close (ATC)																									
12	Closing Price Cross (CPX)																									
ExpireDateTime	54	4	UInt32	<p>This field will indicate the date or the time the order expires on. Should be in Unix (Posix) time which will be the number of seconds elapsed since <a href="#">midnight proleptic Coordinated Universal Time (UTC)</a> of January 1, 1970, not counting <a href="#">leap seconds</a>.</p>																						
Side	58	1	UInt8	<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																									
Order Qty	59	8	UInt64	Total order quantity.																						
DisplayQty	67	8	UInt64	<p>Maximum quantity that may be displayed. The intended display quantity has to be inserted as this is a mandatory field</p>																						

Limit Price	75	8	Price	Limit Price. Required if OrderType is Limit or Stop Limit. If a Limit price is specified for all other order types, the order should be rejected						
Capacity	83	1	UInt8	Capacity of the order. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Principal</td> </tr> <tr> <td>3</td> <td>Agency</td> </tr> </tbody> </table>	Value	Meaning	2	Principal	3	Agency
Value	Meaning									
2	Principal									
3	Agency									
Auto Cancel	84	1	UInt8	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>Conform</td> </tr> </tbody> </table>	Value	Meaning	0	Do not cancel	1	Conform
Value	Meaning									
0	Do not cancel									
1	Conform									
Order Sub Type	85	1	UInt8	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Order</td> </tr> </tbody> </table>	Value	Meaning	0	Order		
Value	Meaning									
0	Order									
Anonymity	86	1	UInt8	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	87	8	Price	Stop price. Required if OrderType is Stop or Stop Limit. Else this field will be ignored.						
Reserved Field	95	10	String	Reserved for future use						

Order Source	105	1	Byte	Defines the source of the incoming order:	
				<b>Value</b>	<b>Meaning</b>
				1	Market participant that deals on own account
				3	Institutional client of the market participant
				7	Retail client that avails itself of an orders router different from the market participant
				8	Institutional client that avails itself of an orders router different from the market participant
9	Retail client of the market participant				

#### 7.4.2 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	UInt8	Clearing Account Type.	
				<b>Value</b>	<b>Meaning</b>
				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	8	UInt64	Bid quantity	
AskPrice	56	8	Price	Offer price	
AskSize	64	8	UInt64	Offer quantity	
Capacity	72	1	UInt8	Capacity of the quote.	
				<b>Value</b>	<b>Meaning</b>
				2	Principal
				3	Agency

Auto Cancel	73	1	UInt8	Cancel orders on logout/disconnection of session	
				<b>Value</b>	<b>Meaning</b>
				0	Do not cancel
				1	Conform
Reserved Field	74	10	String	Reserved for future use	
TIF	84	1	UInt8	Time qualifier of the quote. Absence of this is considered as a DAY quote.	
				<b>Value</b>	<b>Meaning</b>
				5	At the Open (OPG)
				9	Good For Auction (GFA)
Anonymity	85	1	UInt8	Whether the order is a named or anonymous order	
				<b>Value</b>	<b>Meaning</b>
				0	Anonymous
				1	Named

### 7.4.3 New Order Cross Message

Field	Offset	Length	Data Type	Description										
<b>Header</b>														
Cross ID	4	20	String	The ID of the Cross/BTF Order. Required for Cross/BTF Orders.										
Cross Type	24	1	UInt8	<p>The type of the Cross/BTF Order.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>Internal Cross</td> </tr> <tr> <td>6</td> <td>Internal BTF</td> </tr> <tr> <td>7</td> <td>Committed Cross</td> </tr> <tr> <td>8</td> <td>Committed BTF</td> </tr> </tbody> </table> <p>Any other value will be rejected via a Reject message.</p>	Value	Meaning	5	Internal Cross	6	Internal BTF	7	Committed Cross	8	Committed BTF
Value	Meaning													
5	Internal Cross													
6	Internal BTF													
7	Committed Cross													
8	Committed BTF													
Buy Side CIOrdID	25	20	String	Client specified identifier of the buy side.										
Buy Side Order Capacity	45	1	UInt8	<p>Capacity of the buy side.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Principal</td> </tr> <tr> <td>3</td> <td>Agency</td> </tr> </tbody> </table> <p>Any other value will be rejected via a Reject message.</p>	Value	Meaning	2	Principal	3	Agency				
Value	Meaning													
2	Principal													
3	Agency													
Buy Side Order Quantity	46	8	UInt64	Total order quantity of the Cross/BTF Order										
Buy Side Firm ID	54	11	String	Identifier of the Buy Side Firm										
Buy Side Party Role	65	1	UInt8	<p>Role of the specified Firm</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Executing Firm</td> </tr> <tr> <td>17</td> <td>Counterparty Firm</td> </tr> </tbody> </table> <p>Any other value will be rejected via a Reject message.</p>	Value	Meaning	1	Executing Firm	17	Counterparty Firm				
Value	Meaning													
1	Executing Firm													
17	Counterparty Firm													
Sell Side CIOrdID	66	20	String	Client specified identifier of the sell side.										

Sell Side Order Capacity	86	1	UInt8	Capacity of the sell side.		
				<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Principal</td> </tr> <tr> <td>3</td> <td>Agency</td> </tr> </tbody> </table> <p>Any other value will be rejected via a Reject message.</p>	Value	Meaning
Value	Meaning					
2	Principal					
3	Agency					
Sell Side Order Quantity	87	8	UInt64	Total order quantity of the Cross/BTF Order		
Sell Side Firm ID	95	11	String	Identifier of the Sell Side Firm		
Sell Side Party Role	106	1	UInt8	Role of the specified Firm		
				<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Executing Firm</td> </tr> <tr> <td>17</td> <td>Counterparty Firm</td> </tr> </tbody> </table> <p>Any other value will be rejected via a Reject message.</p>	Value	Meaning
Value	Meaning					
1	Executing Firm					
17	Counterparty Firm					
Instrument ID	107	4	Int32	Identifier of the instrument for which the Cross/BTF Order is submitted.		
Price	111	8	Price	Price of the Cross/BTF Order		
Order Type	119	1	UInt8	Type of the order.		
				<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Limit</td> </tr> </tbody> </table> <p>Any other value will be rejected via a Reject message.</p>	Value	Meaning
Value	Meaning					
2	Limit					
TIF	120	1	UInt8	Only DAY TIF is allowed for Committed and Internal Cross/BTF Orders. If not, it will be rejected via a session Reject with the reject code 9901 (Invalid value in field)		
				<p>TIF is optional for Internal Cross Orders, unlike for Committed Cross orders.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>DAY</td> </tr> </tbody> </table>	Value	Meaning
Value	Meaning					
0	DAY					



#### 7.4.4 Cross Order Cancel Request

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
Cross ID	4	20	String	An identifier of the Cancel Request itself. But this field will not be used as the unique identifier of the order being cancelled or the value in this field will not be validated for uniqueness.
Original Cross ID	24	20	String	Cross ID of the order being cancelled. This field is mandatory, but will not be used as the unique identifier of the order being cancelled. The value specified in this will not be validated against the value specified in the New Order Cross Message.
Cross Type	44	1	UInt8	The value submitted with the Cross/BTF Order to be cancelled. The value specified in this will not be validated against the value specified in the New Order Cross Message.
Buy Side Original ClOrdID	45	20	String	The value submitted in the "Buy Side ClOrdID" (in the New Order Cross Message) of the Cross/BTF Order to be cancelled. This will be a unique identifier of the order being cancelled.
Buy Side Order Quantity	65	8	UInt64	The value submitted with the Cross/BTF Order to be cancelled. Any other value will be rejected via a Reject message.
Sell Side Original ClOrdID	73	20	String	The value submitted "Sell Side ClOrdID" (in the New Order Cross Message) of the Cross/BTF Order to be cancelled. This will be a unique identifier of the order being cancelled.
Sell Side Order Quantity	93	8	UInt64	The value submitted with the Cross/BTF Order to be cancelled. The value specified in this will not be validated against the value specified in the New Order Cross Message.

Instrument ID	101	4	Int32	The value submitted with the Cross/BTF Order to be cancelled. Any other value will be rejected via a Reject message.
Client Order ID	105	20	String	A unique identifier of the cancel request itself. But this field will not be used as the unique identifier of the order being cancelled.

#### 7.4.5 Order Modification 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. Should be in Unix (Posix) time which will be the number of seconds elapsed since <a href="#">midnight proleptic Coordinated Universal Time</a> (UTC) of January 1, 1970, not counting <a href="#">leap seconds</a> .
Order Qty	66	8	UInt64	Total order quantity.

DisplayQty	74	8	UInt64	Maximum quantity that may be displayed. The intended display quantity has to be inserted as this is a mandatory field.																						
Limit Price	82	8	Price	Only for Market and Stop orders this field should be filled with a negative value.																						
Account	90	10	String	The reference of the investor the order is submitted for. This field should be null if it is not being amended.																						
TIF	100	1	UInt8	Time qualifier of the order being amended. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Day</td> </tr> <tr> <td>1</td> <td>Good Till Cancel (GTC)</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>9</td> <td>Good for Auction (GFA)</td> </tr> <tr> <td>10</td> <td>At the Close (ATC)</td> </tr> <tr> <td>12</td> <td>Closing Price Cross (CPX)</td> </tr> </tbody> </table>	Value	Meaning	0	Day	1	Good Till Cancel (GTC)	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)	9	Good for Auction (GFA)	10	At the Close (ATC)	12	Closing Price Cross (CPX)
Value	Meaning																									
0	Day																									
1	Good Till Cancel (GTC)																									
3	Immediate or Cancel (IOC)																									
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6	Good Till Date (GTD)																									
8	Good Till Time (GTT)																									
9	Good for Auction (GFA)																									
10	At the Close (ATC)																									
12	Closing Price Cross (CPX)																									
Side	101	1	UInt8	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																									
Stopped Price	102	8	Price	Stop Price. A negative value should be entered if this field is not being amended. This applies to all order types.																						
Reserved Field	110	10	String	Reserved for future use																						

#### 7.4.6 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/side of the quote being cancelled. This field will be ignored if Order ID is also specified.						
Order ID	44	12	String	Unique identifier of the order /side of the quote assigned by the matching system						
Instrument ID	56	4	Int32	Identifier of the instrument of the order being cancelled.						
Reserved field1	60	1	Int8	Reserved for Future Use						
Reserved field2	61	1	Int8	Reserved for Future Use						
Side	62	1	Int8	Side of the order/quote <table border="1" data-bbox="858 1279 1353 1435"> <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> Side tag [with value Buy or Sell] will be ignored for a single sided quote cancellation.	Value	Meaning	1	Buy	2	Sell
Value	Meaning									
1	Buy									
2	Sell									
Reserved Field	63	10	String	Reserved for future use						

#### 7.4.7 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	UInt8	Type of Mass Cancellation	
				<b>Value</b>	<b>Meaning</b>
				3	All firm orders/quotes of an instrument
				4	All firm orders/quotes of a segment
				7	All orders/group submitted by the trader group
				8	All firm orders/quotes
				9	All orders/quotes of an instrument, submitted by the trader group
15	All orders/quotes 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	Reserved for Future Use	
Reserved field2	30	1	Int8	Reserved for Future Use	
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	UInt8	Whether cancellation should be done an orders or quotes.	
				<b>Value</b>	<b>Meaning</b>
				0	Order
				3	Quote
Reserved Field	36	10	String	Reserved for future use	

#### 7.4.8 Execution Report

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
AppID	4	1	UInt8	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 a Cancel Request or Mass Cancel Request, this will be the client order id specified in Cancel Request or Mass Cancel Request. If a client order id is not specified in the Cancel Request or 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 MITCH Order ID.																				
Exec Type	53	1	Alpha	<p>The reason the Execution Report is being sent.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>New</td> </tr> <tr> <td>4</td> <td>Cancelled</td> </tr> <tr> <td>5</td> <td>Modified</td> </tr> <tr> <td>8</td> <td>Rejected</td> </tr> <tr> <td>C</td> <td>Expired</td> </tr> <tr> <td>D</td> <td>Restated</td> </tr> <tr> <td>F</td> <td>Trade</td> </tr> <tr> <td>H</td> <td>Trade Cancel</td> </tr> <tr> <td>L</td> <td>Triggered</td> </tr> </tbody> </table>	Value	Meaning	0	New	4	Cancelled	5	Modified	8	Rejected	C	Expired	D	Restated	F	Trade	H	Trade Cancel	L	Triggered
Value	Meaning																							
0	New																							
4	Cancelled																							
5	Modified																							
8	Rejected																							
C	Expired																							
D	Restated																							
F	Trade																							
H	Trade Cancel																							
L	Triggered																							
Execution Report Ref ID	54	12	String	Reference to the execution being cancelled. Required if Exec Type is Trade Cancel.																				

Order Status	66	1	UInt8	The status of the order.	
				<b>Value</b>	<b>Meaning</b>
				0	New
				1	Partially Filled
				2	Filled
				4	Cancelled
				8	Rejected
Order Reject Code	67	4	Int32	Code specifying the reason for the reject. Please refer to the list of reject codes and meanings specific to BIT. The value in this field should be disregarded if Exec Type is not Rejected (8).	
Executed Price	71	8	Price	Value of this fill. Required if Exec Type is Trade. For Yield traded instruments, this will communicate the executed yield. Should be ignored for Exec Types other than Trade (F) or Restated (D). If Exec Type is 'Restated (D)' this field represents the re-priced new value.	
Executed Qty	79	8	UInt64	Quantity that was executed in this fill.	
LeavesQty	87	8	UInt64	Quantity available for further execution. Will be "0" if Order Status is Filled, Cancelled, Rejected or Expired.	
Container	95	1	UInt8	The container which holds the order in the trading engine	
				<b>Value</b>	<b>Meaning</b>
				0	None
				1	Main
				3	Market Order
				5	Parked Order
				11	Cross Order
DisplayQty	96	8	UInt64	Current visible quantity.	
Instrument ID	104	4	Int32	Identifier of the instrument the Execution Report is sent for.	
Reserved for future use	108	1	Int8	Reserved for Future Use	
Reserved for future use	109	1	Int8	Reserved for Future Use	

Side	110	1	UInt8	Side of the order.	
				<b>Value</b>	<b>Meaning</b>
				1	Buy
				2	Sell
Reserved for future use	111	8	UInt64	Reserved for future use.	
Counterparty	119	11	String	Counterparty Firm	
Trade Liquidity Indicator	130	1	Alpha	Whether the order added or removed liquidity. The value in this field should only be considered if the Exec Type is Trade (F) (although will not be populated for Cross Order Trades) or Trade Cancel (H). For the rest of exec types, the value in this field should be ignored.	
				Value	Meaning
				A	Added Liquidity
				R	Removed Liquidity
TradeMatchID	131	8	UInt64	Identifier of the trade. This will be the binary format value of the base 62 encoded trade id in the system. This will be same as MITCH Trade ID.	
				Time the Execution Report was generated.	
Transact Time	139	8	UInt64	Time the Execution Report was generated.	
Reserved for future use	147	10	String	Reserved for future use.	



Order Source	157	1	Byte	Defines the source of the incoming order:	
				<b>Value</b>	<b>Meaning</b>
				1	Market participant that deals on own account
				3	Institutional client of the market participant
				7	Retail client that avails itself of an orders router different from the market participant
				8	Institutional client that avails itself of an orders router different from the market participant
9	Retail client of the market participant				
Avg Px	158	8	Price	Average Price of All Fills for an Order/side of a Quote. Will be updated for trade cancels as well.	
Implied Price	166	8	Price	The field will populate the Implied Price for an instrument traded on Yield. This field should be ignored if Execution Type is not Trade (F)	
Cross ID	174	20	String	The unique ID of the Cross/BTF Order. Only populated for execution report messages generated Committed Cross/BTF Orders. The value submitted with the New Order Cross Message will be populated.	
Cross Type	194	1	UInt8	The type of the Cross/BTF Order. Only populated for execution report messages generated Internal/Committed Cross/BTF Orders. The value submitted with the New Order Cross Message or Cross Order Cancel Request message will be populated.	
Original Cross ID	195	20	String	The unique identifier of the Cross/BTF Order being cancelled. Only populated for execution report messages generated Committed Cross/BTF Order cancellation. The value submitted with the Cross Order Cancel Request message will be populated.	

Restatement Reason	215	1	UInt8	<p>Reason order was restated or cancelled. Required if ExecType (150) is Restated (D) or if the execution report is sent for an unsolicited cancellation.</p> <p>When an order is amended/ cancelled by market supervision, value 8 will be populated.</p> <p>In some scenarios, when a trade is cancelled by market supervision, value 8 will be populated in the execution reports sent for order restatements.</p> <p>When a MTL Order is converted to a Limit Order, value 3 will be populated.</p> <p><b>Also when a Limit order is re-priced after moving from CPP to CPX session and when a Market order is converted to a Limit Order in CPX session value 3 will be received</b></p> <table border="1"> <tr> <td>1</td> <td>GT Renewal/Restatement</td> </tr> <tr> <td>3</td> <td>Order Re-Priced</td> </tr> <tr> <td>8</td> <td>Market Option</td> </tr> <tr> <td><b>51</b></td> <td><b>Partial Decline of OrderQty</b></td> </tr> <tr> <td>100</td> <td>Order Replenishment</td> </tr> </table>	1	GT Renewal/Restatement	3	Order Re-Priced	8	Market Option	<b>51</b>	<b>Partial Decline of OrderQty</b>	100	Order Replenishment
1	GT Renewal/Restatement													
3	Order Re-Priced													
8	Market Option													
<b>51</b>	<b>Partial Decline of OrderQty</b>													
100	Order Replenishment													
Public Order ID	216	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.										
TypeOfTrade	228	1	UInt8	<p>Indicates whether the executed portion is visible or hidden. Valid only if ExecType (150) = F. Ignore value in all other cases.</p> <p><b>Value / Meaning</b></p> <p>0 Visible</p> <p>1 Hidden</p> <p>2 Not specified (ie. Ignore this field)</p>										

#### 7.4.9 Order Cancel Reject

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
AppID	4	1	UInt8	Partition ID. AppID will be 0 for an unknown instrument.

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 cancel or cancel/replace request being rejected.
Order ID	29	12	String	Server generated ID of the order identified by the system upon verification of the cancel/modify request Would be NONE if the cancel/modification request is rejected prior to identifying the Order (OrderID/Original Client Order ID)
Cancel Reject Reason	41	4	Int32	Code specifying the reason for the reject.
Transact Time	45	8	UInt64	Time the Order Cancel Reject occurred.
Reserved for future use	53	10	String	Reserved for future use.

#### 7.4.10 Order Mass Cancel Report

Field	Offset	Length	Data Type	Description						
<b>Header</b>										
<b>Message Body</b>										
AppID	4	1	UInt8	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	UInt8	Whether the Mass Cancel Request was accepted or rejected. <table border="1" data-bbox="1007 1671 1353 1827"> <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.						
TotalAffectedOrders	34	4	Int32	The number of orders that will be cancelled.						

Transact Time	38	8	UInt64	Time the order mass cancel report was generated.
Reserved for future use	46	10	String	Reserved for future use.

## 7.5 Application messages: others

### 7.5.1 Business Reject

Field	Offset	Length	Data Type	Description
<b>Header</b>				
<b>Message Body</b>				
AppID	4	1	UInt8	Partition ID. AppID will be 0 for an unknown instrument.
Sequence No	5	4	Int32	Sequence number of the message.
RejectCode	9	4	Int32	Code specifying the reason for the reject.
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 transaction the reject message corresponds to occurred.
Reserved for future use	53	10	String	Reserved for future use.

## 7.6 Further specs

If a Mass Cancel Request is sent for instruments which are in multiple matching partitions, a Mass Cancel Report will be sent per matching partition with the confirmation/rejection of the cancellations of orders/quotes in that respective partition.

The server does not validate each Client Order ID for uniqueness. If a client submitted couple of orders with the same client order id (within a trading day or over a couple of days if GTD or GTC are used), the client will only be able to cancel/amend the most recent order (using the client order id) but not the rest 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.

Committed Cross/BTF Orders can be cancelled via the Cancel Request message as well.

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.

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)).

## 8 Reject Codes

Some of the key reject codes for the Logon Response, Reject and Business Reject messages are provided in this section.

### 8.1 Login Response

Reject Code	Description
1	Invalid CompID or password
10	Unauthorized Machine
100	Not logged into real-time channel
9903	Concurrent login limit reached
9906	Logons not allowed at this time

### 8.2 Reject

Reject Code	Description
105	Login request being processed
107	Not logged in
9900	Required field missing
9901	Invalid value in field
9990	Maximum message rate exceeded

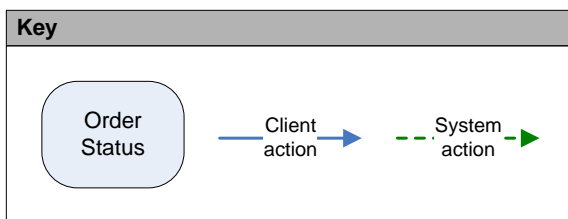
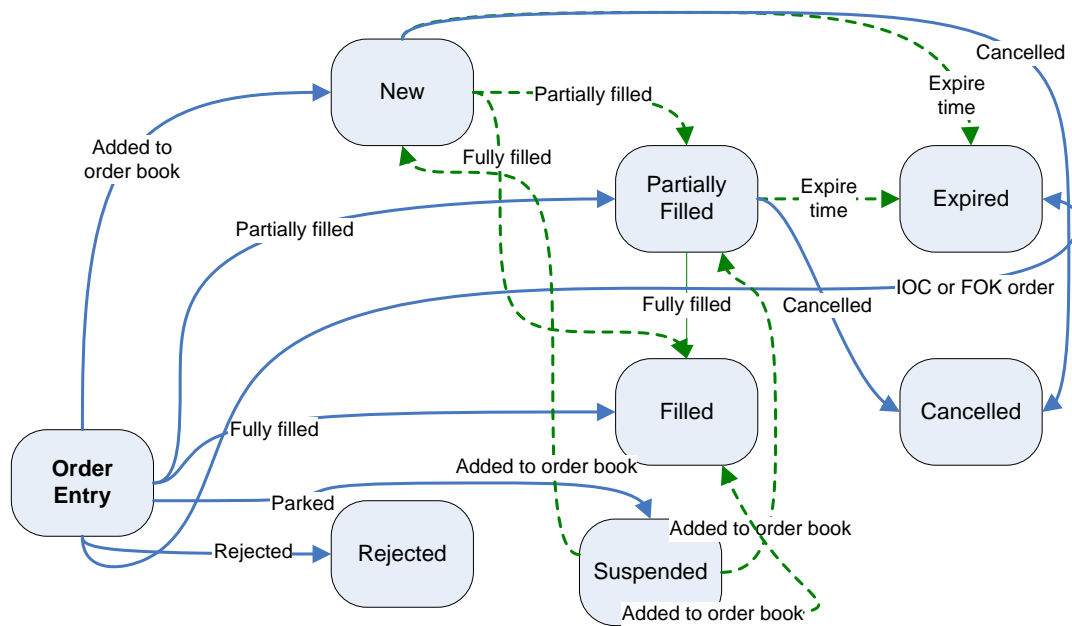
### 8.3 Business Reject

Reject Code	Description
9000	Unknown instrument
9998	Matching partition suspended
9999	System suspended

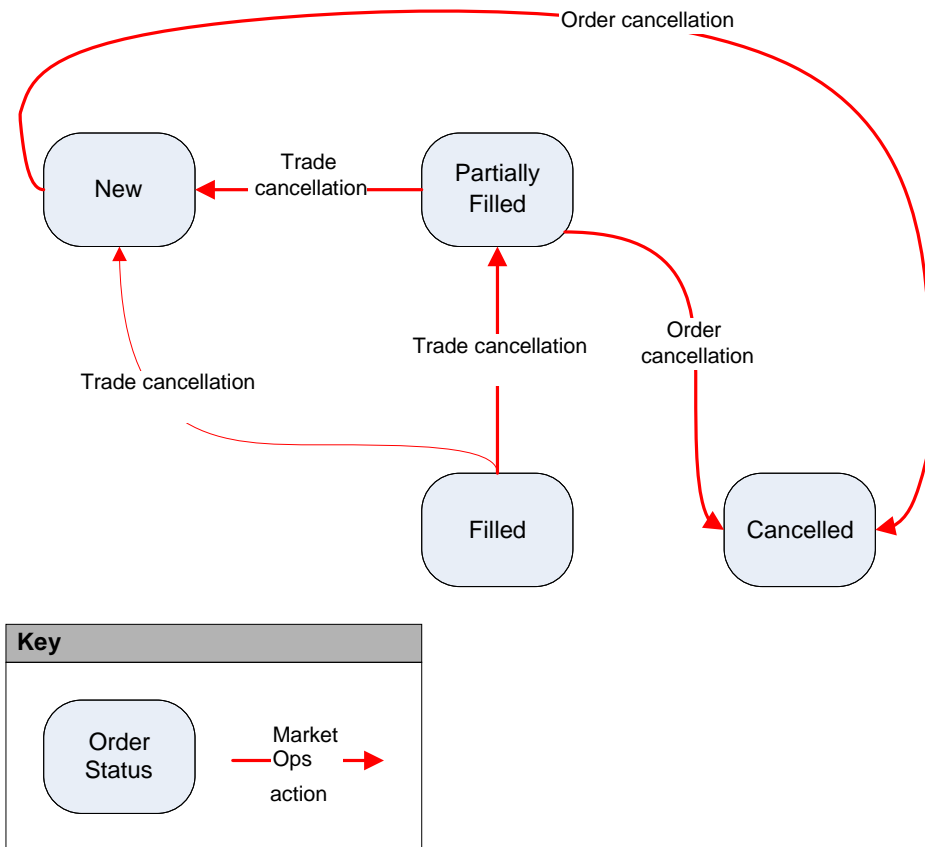
# 9 Process flows

## 9.1 Order handling

### 9.1.1 Order Status Changes



## 9.2 Market Supervision actions







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Stock Exchange

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