FIX Specification

IS Prime Limited

v1.3

19 May 2017

1 Version History

Date	Version	Author	Description
23rd Feb 2016	1.0	Jon Rowland	Initial release
23rd Mar 2016	1.1	Peter Lewin-Harris	Behaviour around missing prices
20th Jul 2016	1.2	Peter Lewin-Harris	Updated missing prices behaviour
16th May 2017	1.3	Peter Lewin-Harris	Add Settlement Date and Market Depth

2 Introduction

IS Prime offers electronic access to its liquidity via a FIX gateway. This allow a liquidity consumer to receive pricing, submit orders and receive executions using the industry standard FIX protocol. This document details the rules of engagement for interfacing with IS Prime's liquidity via FIX. It is expected that the reader is already familiar with the FIX protocol in general. If this is not the case, this information is available from the FIX standard maintainer at www.fixprotocol.org.

3 Connectivity

All FIX connections use version 4.4 of the FIX protocol and are provisioned as a pair of sessions – a QUOTE session, which is used for price messaging, and a TRADE session which is used for order and execution messaging. During the on-boarding process, IS Prime will provide the connection details for each of the two sessions. All FIX connections are configured with IS Prime as the ACCEPTOR, hence all clients must configure their FIX engines to be the INITIATOR of the connection. FIX session reset times will be agreed during on-boarding.

IS Prime maintains two environments for client use – CERT containing simulated data which is used for FIX conformance testing and PROD which is the live production environment. All clients must pass FIX conformance testing in the CERT environment before PROD credentials will be provisioned.

Security is enforced in each of the environments as below:

CERT / PROD

IPs are locked down – any source machine that may connect must be pre-approved
No FIX username or password are required
FIX level encryption is not used
SSL is required, either via the FIX engine, stunnel, or other means

4 Administration Messages

4.1 Standard Header

All FIX messages sent to and from IS Prime must contain standard header fields as below.

Standard Header

Tag	Field	Mandatory	Notes
8	BeginString	Y	Must be the first field, set to FIX.4.4.
9	BodyLength	Y	Must be the second field.
35	MsgType	Y	Must be the third field.
34	MsgSeqNum	Y	The message sequence number.
49	SenderCompID	Y	Provided during the on-boarding process.
52	Timestamp	Y	Message sending time in UTC.
56	TargetCompID	Y	Provided during the on-boarding process.
43	PossDupFlag	N	Set when a message is being retransmitted.

4.2 Standard Footer

All FIX messages sent to and from IS Prime must contain standard footer fields as below.

Standard Footer

Tag	Field	Mandatory	Notes
10	CheckSum	Y	The FIX message checksum.

4.3 Logon [MsgType A]

All FIX sessions start by the client sending a Logon message. A Logon message will also be sent in reply and must be used to validate the sequence numbers of the session. No further messages should be sent until the Logon reply has been received.

Logon

Tag	Field	Mandatory	Notes
98	EncryptMethod	Y	Must be 0.
108	HeartBeatInt	Y	Heartbeat interval – must be 30.
141	ResetSeqNumFlag	N	Set to Y to force a sequence number reset on the session. This should always be set to Y for QUOTE sessions.

Example

```
8=FIX.4.4|9=75|35=A|34=64|49=BANZAI-TRADE|52=20160209-
11:46:00.422|56=ISPRIME|98=0|108=30|10=158
```

4.4 Logout [MsgType 5]

A Logout message is sent from either side to terminate a FIX session.

Logout

Tag	Field	Mandatory	Notes
58	Text	N	Further details on the reason for the logout.

Example

```
8=FIX.4.4|9=64|35=5|34=280|49=BANZAI-TRADE|52=20160209-
13:30:52.308|56=ISPRIME|10=172
```

4.5 Heartbeat [MsgType 0]

Heartbeats are used in the FIX protocol to ensure that sessions remain active and to test the status of the session. A heartbeat message must also sent in response to a Test Request [MsgType 1] which can be initiated from either side.

Heartbeat

Tag	Field	Mandatory	Notes
112	TestReqID	N	Populated if responding to a test request.

4.6 Test Request [MsgType 1]

Test requests can be sent to validate the current connectivity. The receiver of the test request message must respond with a heartbeat message referencing the test request.

Test Request

Tag	Field	Mandatory	Notes
112	TestReqID	Y	Id which will be sent back in the heartbeat.

4.7 Resend Request [MsgType 2]

During session initiation, either side may detect from the sequence numbers that they have missed messages. In this instance a Resend Request may be sent to request that the other side resends the missing messages.

Resend Request

Tag	Field	Mandatory	Notes
7	BeginSeqNo	Y	The first sequence number to resend.
16	EndSeqNo	Y	The final sequence number to resend. If set to 0, all messages after the first sequence number requested will be resent.

4.8 Sequence Reset [MsgType 4]

During a recovery after disconnect, one side may instruct the other to reset the incoming sequence number to the supplied value if messages are no longer available or if resending is undesirable.

Sequence

Tag	Field	Mandatory	Notes
123	GapFillFlag	N	Set if the sequence reset message is replacing administrative or application messages which will not be resent. N – sequence reset Y – gap fill message
36	NewSeqNo	Y	The next outgoing sequence number from this sender.

4.9 Reject [MsgType 3]

If a FIX message is received which is badly formed, missing tags, or which does not pass basic validation, a Reject message will be sent. This normally indicates an error at the FIX level and is distinct from an order rejection for business reasons, e.g. a limit order not being filled due to a missed price which would be sent as an ExecutionReport.

Reject

Tag	Field	Mandatory	Notes
45	RefSeqNum	Y	The sequence number of the message being rejected.
371	RefTagID	N	The tag number of the field in error.
372	RefMsgType	N	The message type of the message being rejected.
373	SessionRejectReason	N	See FIX specification for possible values.
58	Text	N	Further details on the reason for the rejection.

Example

```
8=FIX.4.4|9=111|35=3|34=2|49=ISPRIME|52=20160209-13:37:11.448|56=BANZAI-
PRICE|45=2|58=Required tag missing|371=264|372=V|373=1|10=097
```

5 Market Data Messages

This section details the messages that may be sent and received in relation to market data. All market data is provided in the QUOTE session.

The general form of market data messaging is as follows:

1. Client sends a Market Data Request message requesting a subscription for a symbol
2. If invalid, a Market Data Request Reject message is sent as a response
3. If valid, market data will be sent as Market Data Snapshot Full Refresh messages

5.1 Market Data Request [MsgType V]

To subscribe to market data for a symbol, a Market Data Request is sent. Only full refresh market data snapshots are supported and requests must request both bid and offer to be sent.

Market Data Request (NOTE: fields in italics refer to a group field)

Tag	Field	Mandatory	Notes
262	MDReqID	Y	Unique identifier for this market data request.
263	SubscriptionRequestType	Y	1 – Subscribe 2 – Unsubscribe
264	MarketDepth	Y	1 – top of book, 0 – full book
265	MDUpdateType	Y	0 – full refresh
146	NoRelatedSym	Y	Group containing the symbols to subscribe.
55	*Symbol*	*Y*	*Symbol to subscribe.*
267	NoMDEntryTypes	Y	Group containing the entries to subscribe.
269	*MDEntryType*	*Y*	*0 – bid* *1 – offer*

Example

```
8=FIX.4.4|9=125|35=V|34=2|49=BANZAI-QUOTE|52=20160209-
13:43:49.602|56=ISPRIME|262=MDR12345|263=1|264=1|265=0|146=1|55=IDX.DE.30|267=2|26
9=0|269=1|10=089
```

5.2 Market Data Request Reject [MsgType Y]

If a market data subscription request cannot be processed, a Market Data Request Reject is returned. This could be the case if, for example, an incorrect symbol is requested.

Market Data Request Reject

Tag	Field	Mandatory	Notes
262	MDReqID	Y	Unique identifier for this market data request.
281	MDReqRejReason	Y	Error code for the rejection.
58	Text	N	Further details on the reason for the rejection.

Example

```
8=FIX.4.4|9=111|35=Y|34=2|49=ISPRIME|52=20160209-13:43:50.012|56=BANZAI-
QUOTE|58=Symbol [IDX.DE.30X] is not known|262=MDR12345|281=0|10=006
```

5.3 Market Data Snapshot Full Refresh [MsgType W]

All market data is supplied as a full snapshot of the order book for an instrument. This message contains both the bid and offer levels for the entire book and replaces any previously sent market data in full. Should no bid or offer price be available for the instrument, the message will send a message with NoMdEntries = 0.

When multiple price levels are included for a side in a full refresh message, each level should be treated as defining the upper end of a size band. The maximum liquidity available to transact is represented by the largest MDEntrySize returned on the side. The client should not expect to trade on multiple levels simultaneously should the total size of submitted orders exceeds this advertised maximum size.

Market Data Snapshot Full Refresh (NOTE: fields in italics refer to a group field)

Tag	Field	Mandatory	Notes
262	MDReqID	Y	The unique id of the market data subscription.
55	Symbol	Y	The symbol for the instrument.
268	NoMDEntries	Y	Group containing the price levels.
269	*MDEntryType*	*Y*	*0 – bid* *1 – offer*
270	*MDEntryPx*	*Y*	*The price of the level.*
271	*MDEntrySize*	*Y*	*The size of the level.*
273	*MDEntryTime*	*Y*	*The timestamp of the level update.*
276	*QuoteCondition*	*Y*	*A – Open / Active* *B – Closed / Inactive* *See FIX specification for other possible values.*

Example (TOB)

```
8=FIX.4.4|9=171|35=W|34=25655|49=ISPRIME|52=20160209-13:30:51.815|56=BANZAI-
QUOTE|55=IDX.DE.30|262=MDR12345|268=2|269=0|270=8829.5|273=13:30:51.815|276=A|269=
1|270=8830.5|273=13:30:51.815|276=A|10=062
```

Example (Full Depth)

```
8=FIX.4.4|9=608|35=W|34=561|49=CERT|52=20170519-12:30:33.376|56=BANZAI-
M_QUOTE|55=IDX.DE.30|262=TEST01|268=10|269=0|270=12610.3|271=2250|273=12:30:34.342
|276=A|269=0|270=12610.9|271=750|273=12:30:34.342|276=A|269=0|270=12611.3|271=375|
273=12:30:34.342|276=A|269=0|270=12611.6|271=187.5|273=12:30:34.342|276=A|269=0|27
0=12611.9|271=75|273=12:30:34.342|276=A|269=1|270=12612.7|271=75|273=12:30:34.342|
276=A|269=1|270=12613|271=187.5|273=12:30:34.342|276=A|269=1|270=12613.3|271=375|2
73=12:30:34.342|276=A|269=1|270=12613.7|271=750|273=12:30:34.342|276=A|269=1|270=1
2614.3|271=2250|273=12:30:34.342|276=A|10=201|
```

6 Order Messages

This section details the messages that may be sent and received in relation to orders and executions. All order messaging is provided in the TRADE session.

6.1 New Order Single [MsgType D]

To send a new order, a client must send a New Order Single message. All messages back from the server relating to the order will be sent as Execution Reports. Clients must supply a unique identifier for each new order. This identifier must be guaranteed to be unique for a period of at least 10 years and identifiers must not be reused even where orders have not been successfully processed.

New Order Single (NOTE: fields in italics refer to a group field)

Tag	Field	Mandatory	Notes
1	Account	Y	The client account that the order relates to. This will be provided during on-boarding.
11	ClOrdID	Y	A client assigned unique identifier for the order. This ID must be unique across all orders and sessions and must remain unique for at least 10 years.
526	SecondaryClOrdID	N	An additional client assigned unique identifier for the order. This identifier will be passed back on all execution reports for the order and can be used for order linking or reconciliation purposes. A suggested use for an MT4 integration would be the MT4 order id. In a bridge environment, this could be the original incoming ClOrdID to aid reconciliation.
453	NoPartyIDs	Y	Group containing the party ids. Exactly one party id is expected, reflecting the identity of the end-client. In an MT4 integration this is typically the MT4 login.
447	*PartyIDSource*	*Y*	*D – proprietary/custom code.*
448	*PartyID*	*Y*	*The end-client identifier.*
452	*PartyRole*	*Y*	*5 – investor id.*
38	OrderQty	Y	Quantity of the order.
44	Price	N	Price of the order. Mandatory for limit orders.
40	OrdType	Y	1 – market order 2 – limit order
54	Side	Y	1 – buy (from the client's perspective) 2 – sell (from the client's perspective)
55	Symbol	Y	The symbol for the instrument.
59	TimeInForce	Y	3 – immediate or cancel (IOC)

60	TransactTime	Y	UTC timestamp of the order creation time. Should not be reset if the message is resent.

Example

```
8=FIX.4.4|9=211|35=D|34=3|49=BANZAI-TRADE|52=20160212-
17:10:52.614|56=ISPRIME|1=FLX001|11=DP.CLI.JR.JyaNI.O.3N|38=10|40=2|44=9605|54=1|5
5=IDX.DE.30|59=3|60=20160212-
17:10:52.609|526=N3.O.INayJ.RJ.ILC.PD|453=1|448=UP.H.JR|447=D|452=5|10=035
```

6.2 Order Cancel Request [MsgType F]

Currently only market orders are supported with a time in force of IOC, hence order cancel requests are not supported.

6.3 Order Cancel Replace Request [MsgType G]

Currently only market orders are supported with a time in force of IOC, hence order cancel replace requests are not supported

6.4 Execution Report [MsgType 8]

Any status update for an order is communicated via an Execution Report message. This includes initial order acknowledgement, rejections, executions, cancellations or any other status update.

Execution Report

Tag	Field	Mandatory	Notes
37	OrderID	Y	Unique order id assigned by the server.
11	ClOrdID	Y	The client assigned unique identifier of the order.
526	SecondaryClOrdID	N	If a value was passed in the new order message, this will be returned in the execution report.
17	ExecID	Y	Unique execution report id assigned by the server.
150	ExecType	Y	The type of execution report. See FIX specification for possible values.
39	OrdStatus	Y	The current state of the order chain.
55	Symbol	Y	The symbol of the order.
54	Side	Y	The side of the order.
38	OrderQty	Y	The quantity of the order.
44	Price	N	The price of the order, if specified.
6	AvgPx	Y	The average prices of all executions.
14	CumQty	Y	The cumulative filled quantity of the order.
151	LeavesQty	Y	The remaining unfilled quantity of the order.
58	Text	N	Further information, e.g. rejection reason.
31	LastPx	N	The execution price for fill reports.
32	LastQty	N	The execution quantity for fill reports.
60	TransactTime	N	The UTC timestamp of the execution for fill reports.
64	SettlDate	N	Settlement date of the trade in YYYYMMDD format

Example – order acknowledgement

```
8=FIX.4.4|9=194|35=8|34=58|49=ISPRIME|52=20160209-11:39:45.807|56=BANZAI-
TRADE|6=0|11=DP.CLI.JR.JxuFW.O.1N|14=0|17=BANZAI-20160209110150-0000005|37=BANZAI-
20160209110150-
0000004|39=0|54=1|38=10|55=IDX.DE.30|64=20160211|150=0|151=10|10=165
```

Example – order rejection

```
8=FIX.4.4|9=247|35=8|34=80|49=ISPRIME|52=20160209-11:51:41.316|56=BANZAI-
TRADE|6=0|11=DP.CLI.JR.JxuFW.O.2N|14=0|17=BANZAI-20160209110150-0000008|37=BANZAI-
20160209110150-0000007|39=8|54=1|38=10|55=IDX.DE.30|58=Order Type unsupported.
Please send a market or limit order|150=8|151=0|10=155
```

Example – order filled

```
8=FIX.4.4|9=236|35=8|34=446|49=ISPRIME|52=20160209-14:52:50.378|56=BANZAI-
TRADE|6=8890|11=DP.CLI.JR.JxuFW.O.16N|14=5|17=BANZAI-20160209110150-
0000040|31=8890|32=5|37=BANZAI-20160209110150-
0000038|39=2|54=1|38=10|55=IDX.DE.30|64=20160211|60=20160209-
14:52:50.366|150=2|151=0|10=183
```