Currenex® FIX Real-Time STP Specification

Version 1.0, April 19, 2007
Revision 013

NOTICE

Table of Contents

1 Introduction

1.1 Purpose

The purpose of this document is to present in detail the Financial Information eXchange (FIX) protocol subset used by the Currenex FIX Real-Time service.

The Currenex FIX Real-Time offering supports the automatic sending of trade events that occur on the Currenex FXTrades platform in real time via FIX.

This document describes the Currenex FIX Real-Time offering and provides a detailed description of the supported FIX Real-Time message set.

1.2 Architecture

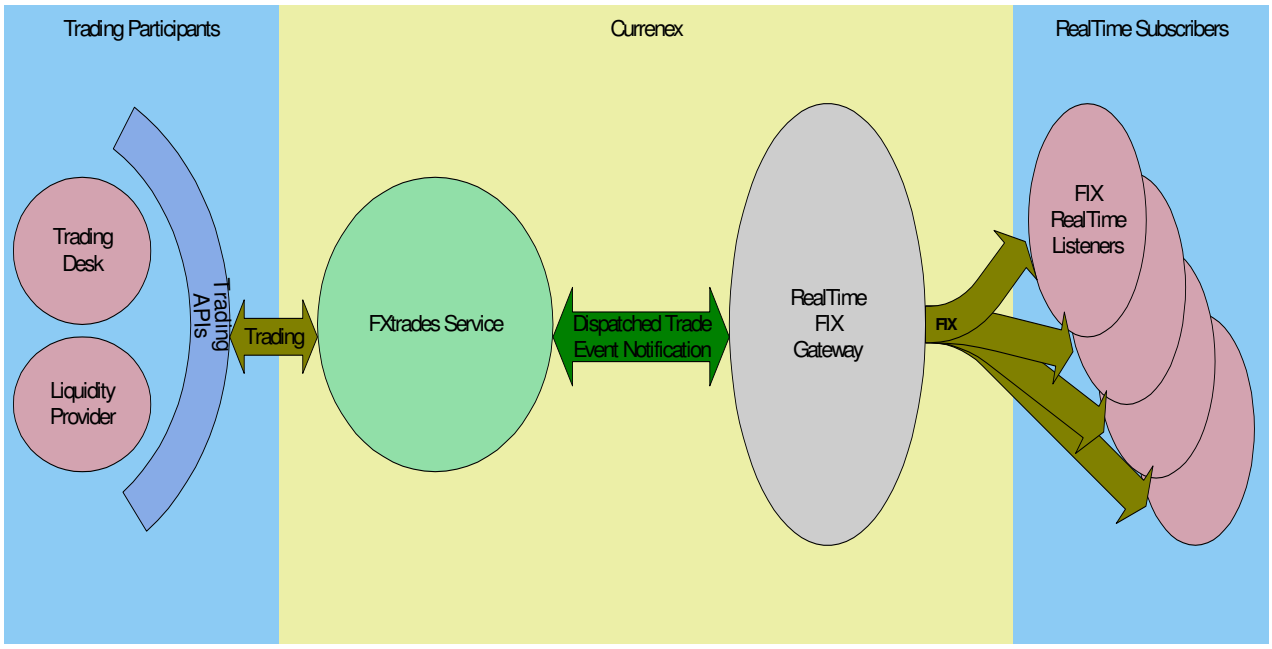

Figure 1: FIX Real-Time Architecture.

2 Connectivity

FIX Real-Time users can connect to the Currenex FIX Gateway via the Public Internet or a private network.

- **Public Internet**

  Clients can connect to the Currenex FIX Gateway over the public Internet. A Secure Socket Layer (SSL) channel must be used to ensure privacy and data integrity. The related Currenex server certificates are signed by established signing authorities and are available on line for verification.

- **Private Networks**

  Clients can connect to Currenex via Radianz, a private network provider. Use of SSL is optional for connections established over Radianz.

Provisioning for alternative private network connections is also available. Please contact your Currenex representative for further details.

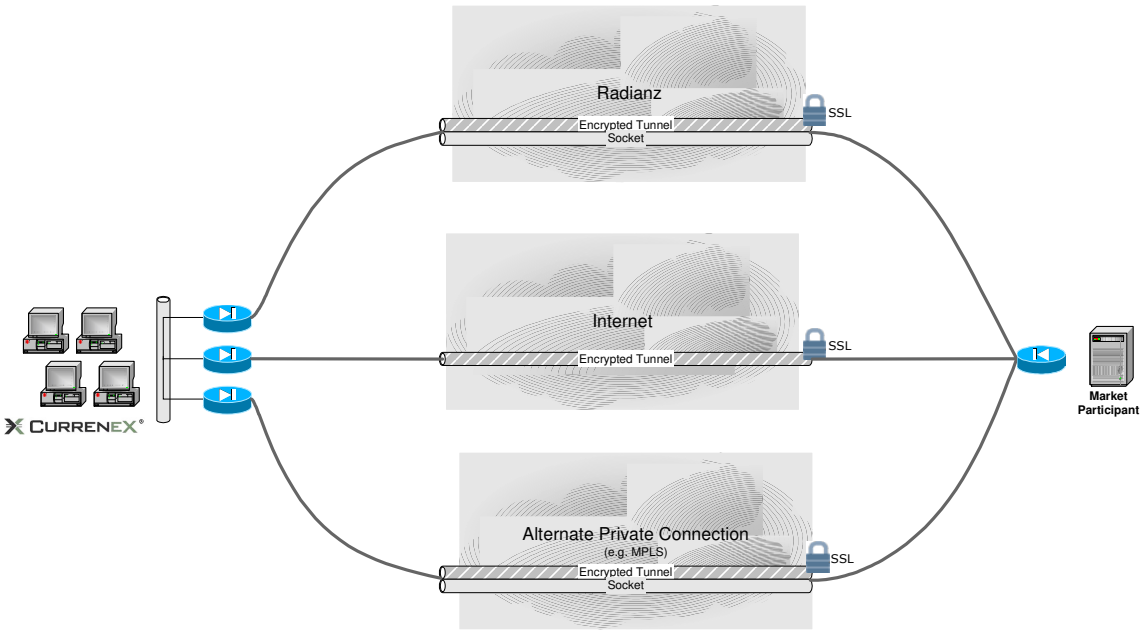

Figure 2: Available Network Connection Options for FIX Real-Time Users.

2.1 Account Type

One distinct connection is needed for receiving completed trade details via FIX. This connection is not persisted. Any reconnection must be made with inbound and outbound sequence numbers set to one (1).

2.2 SSL Tunneling

Secure Sockets Layer (SSL) is required when the public Internet is used to access the FIX Gateway. Its use is optional for users connecting across private networks. Any SSL implementation that supports SSL V3 with mutual authentication can be used.

If SSL support is not available in a client's FIX implementation, Currenex recommends Stunnel, an open-source implementation used widely as an SSL proxy tool. Refer to http:/www.stunnel.org for more information.

Currenex issues digital certificates for its integration and production environments. Initial connectivity and testing can be performed without SSL, but prior to going live, SSL connectivity, where required, must be tested.

3 Supported Messages

The Currenex FIX Real-Time implementation supports FIX version 4.4 messaging.

The following convention is used in this document to indicate message direction:

- In – a message from the FIX Real-Time Client to Currenex
- Out – a message from Currenex to FIX Real-Time Client.
- In/Out – a message that can be sent to or from a FIX Client or Currenex

Available fields, requirements, values and their associated meanings are documented in the Message Details beginning on page 16.

3.1 Session Messages

Session messages establish, maintain and terminate a FIX Real-Time client to Currenex connection.

- Logon – (In) message sent by a FIX Real-Time Client to initiate a FIX session to Currenex. The Logon message establishes the communication session, authenticates the connecting client, and initializes the message sequence number.

- Heartbeat – (In/Out) message sent by Currenex during periods of application inactivity to ensure connection validity. A Real Time client should respond to heartbeat messages upon receipt.

- Resend Request – (In/Out) message that can be sent by either Currenex or a client to request certain messages be resent. Often used when gaps are detected in the sequence numbering, when a message is lost, or during the initialization process.

- Test Request – (In/Out) used to verify session connectivity and to synchronize sequence numbers. Either Currenex or a MP can send a test request

message, which should be responded to with a heartbeat message from the receiving party.

- Logout ¯ (In) message signaling the normal termination of the trading session. Sessions terminated without a Logout message will be considered an abnormal condition. The Currenex FIX gateway treats a client as logged out whenever the communication session is dropped.

3.2 Application Messages

Once a proper session is established, MPs use application messages to subscribe to and receive completed trade information.

See the below summary. Refer to the Message Details section beginning on page 16 for detailed individual message descriptions.

If present in a message, the `Symbol` field refers to a foreign exchange (FX) currency pair, e.g., EUR/USD.

Currenex follows the International Organization for Standardization (ISO) currency pair symbol convention of BASE/TERM or CCY1/CCY2. Rates are expressed as one (1) unit of a quoted or BASE currency in units of the quoting or TERM currency. E.g., EUR/USD rate = 1.2000 means 1.2000 units of USD per one (1) unit of EUR.

- Business Message Reject – (Out) application message sent in response to any application level message that cannot be replied to with a normal matching response message.

  Also sent when a request message is received during non-Currenex trading hours. For a schedule of non-trading hours, please contact your Currenex service representative.

- Trade Capture Report Request – (In) message used in making a subscription request for trade capture reports. Only subscription requests are currently

supported. Individual report request are not supported.

- Trade Capture Report Request Ack – (Out) message used to acknowledge receipt of a subscription request. If the request was successful, Currenex will start publishing reports. This message can also be used to reject a report request.

- Trade Capture Report – (Out) message used to send completed trade details. Requires confirmation of receipt.

- Trade Capture Report Ack – (In) message used to confirm the receipt of a Trade Capture Report.

3.3 Nightly Sequence Number Reset

The Currenex FIX Real-Time service is offline each weekday from 17:00:00 EST/EDT until 17:05:00 EST/EDT. During this time, Currenex resets the FIX sequence number for its FIX services connections.

After 17:05:00 EST/EDT, the Currenex FIX Gateway service expects the initial message from each client reconnecting to have a sequence number equal to one (1). Currenex will reply to this with an outbound message with a sequence number also equal to one (1).

Currenex will then send a Logout message to disconnect all active client sessions. Upon receiving the Logout message, a client should disconnect. Upon reconnecting to the Currenex FIX Gateway, the inbound and outbound sequence numbers should be reset to one (1).

Note: FIX Real-Time connections are not persisted. A FIX Real-Time login message should always have an initial sequence number equal to one (1).

4 Message Workflow

4.1 General Workflow

Any message received by the Currenex FIX Real-Time engine that is outside the scope of this document will be rejected with a Business Message Reject message.

The following codes are used to indicate trading level errors and can appear in the `BusinessRejectReason` field:

0. Other
1. Unknown ID
2. Unknown security
3. Unsupported message type
4. Application not available
5. Conditionally required field missing

4.2 Subscription

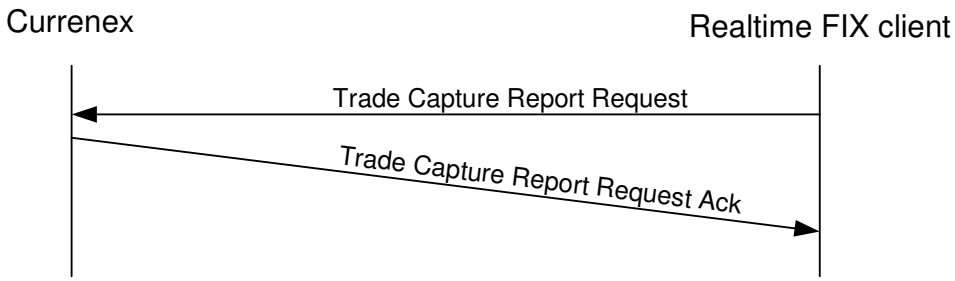

Figure 3: Capture Report Subscription Request and Acknowledgement

4.2.1 Trade Capture Report Request

A FIX Real-Time client subscribes on the Currenex FIX Gateway by sending a Trade Capture Report Request message. The results returned depend on the values specified for fields TradeRequestType (569) and SubscriptionRequestType (263):

`TradeRequestType`

- 0 – All trades

`SubscriptionRequestType`

- 1 – Snapshot + Updates: Currenex sends all unconfirmed reports and continues to send new reports based on new trade events.
- 9 – Updates: Currenex only sends new reports, from the time of subscription. This is a Currenex specific usage.

4.2.2 Trade Capture Request Acknowledgment

Currenex responds to a client's Trade Capture Request with a Trade Capture Report Request Ack message. The status of the request is indicated in the fields `TradeRequestResult` (749) and `TradeRequestStatus` (750).

`TradeRequestResult`

- 0 - Successful
- 8 - TradeRequestType not supported
- 9 - Unauthorized for Trade Capture Report Request
- 99 - Other

`TradeRequestStatus`

- 0 - Accepted
- 2 – Rejected

A Trade Capture Report Request acknowledgement containing `TradeRequestResult` = 0 and `TradeRequestStatus` = 0 means a successful request has been made.

4.2.3 Optional Request Fields

The optional fields `CaptureStartDate` (7563) and `PurgeUnsentReports` (7564) can be used to further define a Trade Capture Report Request.

`CaptureStartDate`

- Timestamp – the starting point from which to send unconfirmed Trade Capture Reports. This feature allows the client to skip previously unsent records.

  For example, if a client were trading for an extended period prior to implementing FIX Real Time, it would have a large number of historic trades that could be sent. If these trades had already been recorded via

an out-of-band process, this option can be used to avoid having them sent via FIX Real Time.

PurgeUnsentReports

- Boolean value (Y/N) - indicates for the Currenex FIX engine to skip and not send all previously unsent trade events. A client will receive all new trade events from after the moment logon is successful.

4.3 Trade Capture Models

Currenex supports the following trade capture subscription models:

- Receive all outstanding unconfirmed trade events and all new subsequent events

  `TradeRequestType` - 0 (All trades)
  `SubscriptionRequestType` - 1 (Snapshot + Updates)

- Receive all outstanding unconfirmed trade events from specified date and all new subsequent events.

  `TradeRequestType` - 0 (All trades)
  `SubscriptionRequestType` - 1 (Snapshot + Updates)
  `CaptureStartDate` Date (YYYYMMDD format)
  `PurgeUnsentReports` Optional value

- Receive only new events messages.

  `TradeRequestType` - 0 (All trades)
  `SubscriptionRequestType` - 9 (Updates)
  `PurgeUnsentReports` (Optional)

4.4 Trade Capture Reports

4.4.1 Overview

Before any Trade Capture Report messages will be sent, a client must establish a connection and make a Trade Capture Report request. The client acknowledges receipt of a report through a Trade Capture Report Acknowledgment (Ack) message.

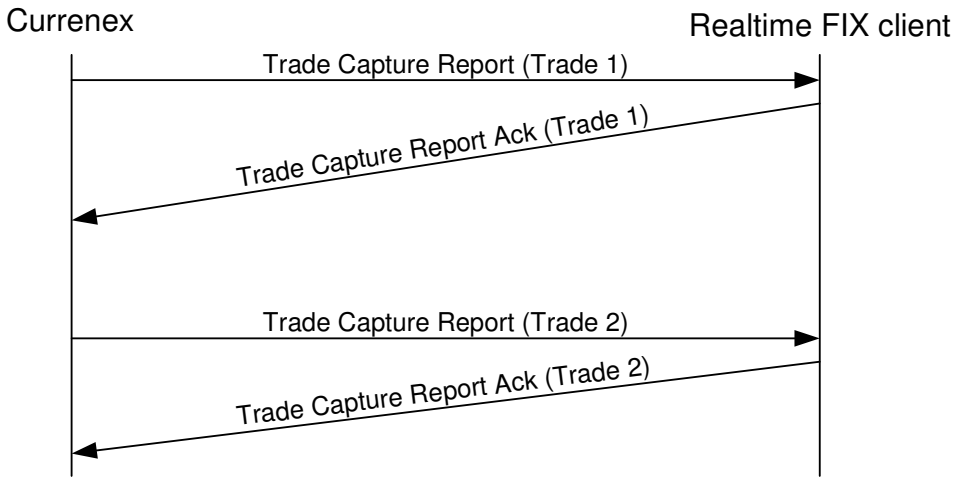

Figure 4. Capture Reports Processing under Normal Condition.

For optimum performance, Trade Capture reports should be acknowledged immediately.

4.4.2 Trade Report Process Order

Currenex only sends trade report messages to a client that has successfully established a FIX Real Time connection and made a Trade Report Request. If no connection is established, no messages are sent.

Upon receiving the Trade Report Request, Currenex processes Trade Report messages in the order the trades were done as follows:

- Trade Reports from Prior to the Request

  Trade Reports are sent in groups limited to twenty (20) trades

by default. See next section.

Upon Currenex receiving acknowledgment of one group, the next group will be sent

- New Trade Reports

  Upon all Trade Reports from prior to the request being acknowledged, Currenex will start to send reports for new trades completed since the Trade Report Request.

4.4.3 Trade Capture Reports Buffer Size

Trade Capture reports are sent in the order the trades were executed. Currenex can send a new trade event before a previously sent trade event has been acknowledged.

To prevent queue overflow, Currenex limits the number of outstanding unconfirmed trade reports. The system default queue size is twenty (20).

A client can use the *MaxUnconfirmedReportsNum* (7565) tag in the Trade Report Request message to change this value from one (1) to a maximum queue size of one hundred (100) trades.

4.4.4 Requesting or Purging Unacknowledged Reports

To avoid over loading the connection channel, a client that has been actively trading but disconnected from FIX Real Time for an extended period should not make a Trade Report request for all outstanding trades. Instead, the Trade Report request must be made in a controlled and measured manner.

For example, a Trade Report Request can be made for all outstanding unacknowledged trades from a specific start date using the CaptureStartDate (7563) tag. Once one day is processed, the client can work backwards a day at a time to request additional trades.

A client can choose to delete all outstanding unacknowledged trade reports by making a Trade Report Request with PurgeUnsentReports (7564) tag equal 'Y.' Only new trade reports from the point of the request will then be sent.

Contact the Currenex Support Desk for assistance with the above.

4.4.5 Duplicate Trade Reports

A trade marked acknowledged cannot be requested again. However, the Currenex Support Desk can be asked to resend an already acknowledged trade.

The requesting client must be able to handle the possibility of receiving duplicate trade capture reports. If multiple reports are received for a trade, all but the first report should be ignored.

5 Message Details

Currenex FIX Real Time supports FIX version 4.4 required fields and a portion of the non-required fields. Some Currenex customized fields are also used.

This section provides field details of all the supported FIX messages. For each message, all Currenex supported required and non-required fields are listed.

Field names in ***bold italics*** represent repeating groups of fields. Please refer to FIX specification 4.4 for details on repeating groups.

The values under the "Required" column indicate one of the following:

- 'Y' – field is mandatory and must be sent or received as a part of the message.
- 'N' – Non-required field that should be omitted unless directed otherwise by Currenex.
- 'C' – field is required if the condition in the associated comment box is met.

5.1 Session Messages

5.1.1 Standard Header

Tag	Field Name	Required	Comments
8	BeginString	Y	Handled by FIX engine.
9	BodyLength	Y	Should be handled by fix engine.
35	MsgType	Y	Refer to Message Details for MsgType value.
49	SenderCompID	Y	Provided by Currenex – should match the user's trading account id.
56	TargetCompID	Y	Default = CURRENEX-FXTRADES-FIX.
115	OnBehalfOfCompID	N	Trading partner company ID used when sending messages via a thrid party.
116	OnBehalfOfSubID	N	Trading partner SubID used when delivering messages via a third party.
50	SenderSubID	N	Provided by Currenex – not required unless otherwise noted.
34	MsgSeqNum	Y	Handled by FIX engine.
52	SendingTime	Y	Handled by FIX engine.

5.1.2 Standard Trailer

Tag	Field Name	Required	Comments
10	CheckSum	Y	A value calculated by the FIX engine from the message data and transferred with the data. If the data received does not match the CheckSum value, the data was corrupted in transit.

5.1.3 Heartbeat

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType tag 35 = 0
112	TestReqID	C	Required if heartbeat is due to a Test Request message.
	Standard Trailer	Y	

5.1.4 Logon

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType tag 35 = A
98	EncryptMethod	Y	0 – not encrypted is the only accepted value.
108	HeartBtInt	Y	Heartbeat interval in seconds.
141	ResetSeqNumFlag	N	Y – resets both the incoming and outgoing sequence numbers to 1.
	Standard Trailer	Y	

5.1.5 Logout

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType tag 35 = 5
58	Text	N	Descriptive text message.
	Standard Trailer	Y	

5.1.6 Resend Request

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType tag 35 = 2
7	BeginSeqNo	Y	First sequence number in the range to be resent.

Tag	Field Name	Required	Comments
16	EndSeqNo	Y	Last sequence number in the range to be resent. For single message resend requests, set BeginSeqNo = EndSeqNo. If request is for all messages subsequent to a particular message, EndSeqNo = 0.
	Standard Trailer	Y	

5.1.7 Test Request

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType tag 35 = 1
112	TestReqID	Y	Unique ID of test request.
	Standard Trailer	Y	

5.2 Application Messages

5.2.1 Business Message Reject

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType = j
372	RefMsgType	Y	The MsgType of the FIX message being rejected.
380	BusinessRejectReason	Y	Reject reason code: 0 = Other 1 = Unknown ID 2 = Unknown Security 3 = Unsupported Message Type 4 = Application not available 5 = Conditional Required Field Missing
	Standard Trailer	Y	

5.2.2 Trade Capture Report Request

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType = AD
568	TradeRequestID	Y	Id assigned by the client to the request.
569	TradeRequestType	Y	Trade Capture Report type: 0 = All trades.

Tag	Field Name	Required	Comments
263	SubscriptionRequestType	Y	Subscription Request Type: 1 = Snapshot + Updates. 9 = Updates only
7563	CaptureStartDate	N	Date from which unconfirmed reports are to be sent. Format = YYYYMMDD.
7564	PurgeUnsentReports	N	Send or do not send previous trade reports to the client: N – do not send Y – send
7565	MaxUnconfirmedReports Num	N	Maximum number of unconfirmed reports permitted outstanding: Valid values = 1 to 100.
	Standard Trailer	Y	

5.2.3 Trade Capture Report Request Ack

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType = AQ
568	TradeRequestID	Y	Id assigned by the client to the request.
569	TradeRequestType	Y	0 = All trades
263	SubscriptionRequestType	Y	1 = Snapshot + Updates 2 = Disable previous Snapshot + Update Request 9 = Updates.
749	TradeRequestResult	Y	0 = Successful 8 = Unsupported TradeRequestType 9 = Unauthorized for Trade Capture Report Request 99 = Other
750	TradeRequestStatus	Y	0 = Accepted 2 = Rejected
55	Symbol	*N*	Individual instrument subscription is not currently supported.
	Standard Trailer	Y	

5.2.4 Trade Capture Report

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType = AE
571	TradeReportID	Y	Unique identifier assigned by Currenex to the trade capture report.
568	TradeRequestID	Y	Id assigned by the client to the request when report is in response to a Trade Capture Report Request.
17	ExecID	Y	Currenex assigned trade id; e.g., A200623400QJB00
570	PreviouslyReported	Y	Indicates if a trade capture report has been previously sent: Y – previously sent N – not previously sent
55	Symbol	Y	Trade currency pair; e.g., GBP/USD
460	Product	Y	4 – only value supported
32	LastQty	Y	Amount of the trade in the currency shown in tag 15.
31	LastPx	Y	Price at which the trade was done.
194	LastSpotRate	Y	F/X spot rate.
195	LastForwardPoints	Y	F/X forward points to be added to LastSpotRate (194). Can be a negative value.
75	TradeDate	Y	Trade Date in YYYYMMDD format. If not present, it means current day and local time.
60	TransactTime	Y	Time the trade occurred.
64	FutSettDate	Y	Trade settlement date in YYYYMMDD format.
15	Currency	Y	The dealt currency for the amount specified in LastQty (32).
119	SettlCurrAmt	Y	Amount in the counter currency: SettleCurrency (120)
120	SettleCurrency	Y	Counter Currency
552	NoSides	Y	1 – only value supported
54	Side	Y	Order side: 1 - Buy 2 - Sell
37	OrderID	Y	N/A – only value supported
453	**NoPartyIDs**	Y	PartyID (448) and PartyRole (452) form a unique combination for each repeating

Tag	Field Name	Required	Comments
			group: 2 – only valid value
448	**PartyID**	Y	Identifies each party to the trade.
452	**PartyRole**	Y	Identifies role on the trade of the party identified in the PartyID (448): 1 – Executing firm 13 – Originating Customer 14 – Prime Broker 29 – Hub/Intermediary
802	**NoPartySubIds**	C	Present for PartyRoles (452) equal to 1 or 13: 1 – single entry is the only value supported.
523	**PartySubID**	Y	Currenex Id for firm identified in PartyID (448).
803	**PartySubIDType**	N	Identifies type of PartySubID. Supported values: 1 = Company 2 = Individual Person.
1	Account	Y	The account under which the trade was booked.

5.2.5 Trade Capture Report Ack

Tag	Field Name	Required	Comments
	Standard Header	Y	MsgType = AR
571	TradeReportID	Y	The TradeReportID (571) from Trade Capture Report being acknowledged.
	Standard Trailer	Y	

6 Appendix

6.1 UTC Time Format

All time and date formats must be in Coordinated Universal Time (UTC), more commonly known as Greenwich Mean Time (GMT). The formats of various dates as defined by the World Wide Web Consortium (W3C) are

Year:
YYYY (2003)

Year and month:
YYYYMM (200307)

Complete date:
YYYYMMDD (20030716)

Complete date plus hours and minutes:
YYYYMMDD-hh:mm (20030716-19:20)

Complete date plus hours, minutes and seconds:
YYYYMMDD-hh:mm:ss (20030716-19:20:30)

Complete date plus hours, minutes, seconds and milliseconds:
YYYYMMDD-hh:mm:ss.SSS (20030716-19:20:30)

Where

YYYY = four-digit year
MM = two-digit month (01=January, etc.)
DD = two-digit day of month (01 through 31)
hh = two digits of hour (00 through 23) (am/pm NOT allowed)
mm = two digits of minute (00 through 59)
ss = two digits of second (00 through 59)
SSS = tree digits represent milliseconds