Operating Omega ATS and Lynx ATS

Reallocation Binary Specification
For ITCH 5.00
(Market Data)

v. 1.02

OMEGA SECURITIES INC

Contents

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Revision History

Date	Revision	Description of Change
December 13, 2017	1.01	First Draft
December 19, 2017	1.02	General edits and formatting changes

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1. Overview

Omega participants may use Multicast QTP to acquire real-time depth of book quotations and execution information directly from Omega. There are two multicasting ITCH servers: A and B. Channel A is the main channel and Channel B is primarily used for recovering dropped messages.

Omega Multicast ITCH real-time events are delivered by using a published range of multicast addresses divided by market and symbol range. Dropped messages can be requested using a UDP/Unicast connection to the Retransmission server with replayed messages being delivered to the request source directly. Intraday, a spin of all open orders may be requested from a Reallocation Server. This capability allows a client to become current without requesting a gap for all messages up to that point in the day.

2. Reallocation Server

Omega Reallocation Server allows Participants to connect via TCP and receive a spin of all currently open orders. By using reallocation, a Participant gets the current Omega book quickly any time during trading session without requesting a gap for all messages up to that point in the day. The Reallocation Server listens on the well-known address/port for client requests and produces a snapshot of all currently open orders per particular session.

The Participant requests the spin for the orders up to the sequence number using a Login Request with Request Sequence Number specified.

Upon successful login from the client the Reallocation Server establishes the connection and sends Login Accepted Message with the sequence number which indicates the most recent message applied to the book. This sequence number is typically equal or greater than the sequence number received in Login Request message. The Server then proceeds with the dissemination that consists of Start-Of-Messages event, Add Order message and End-Of-Messages event. The Reallocation Server *will disconnect immediately after sending End-Of-Messages event*.

Only open orders are sent in the spin. Spin will not contain any message for an order which is no longer in the book. While receiving a spin the Participant must buffer any messages received with sequence number greater than the number specified in the Login Accepted message on the ITCH 5.00 multicast feed.

The Reallocation Server uses SoupTCP Binary protocol to communicate with its clients.

3. Assumptions and Terms

The document assumes that the reader is familiar with Omega SoupTCP Binary specification, Omega QTP Multicast Specification as well as Omega ITCH 5.0 specification and should refer to those documents for the details of corresponding protocols.

4. SoupTCP Binary Packets

a. Login Request Packet

The Reallocation client must send a Login Request Packet immediately upon establishing a new TCP/IP socket connection to the server.

The server can terminate an incoming TCP/IP socket if it does not receive a Login Request Packet within a reasonable period of time (typically 30 seconds).

If the Requested Session is unknown Reallocation Server will send Login Reject Message.

Name	Offset	Length	Value	Comments
Packet Length	0	2	Integer	Number of bytes after this field until the next packet.
Packet Type	2	1	'L'	Login Request Packet
Username	3	6	Alphanumeric	Not used
Password	9	10	Alphanumeric	Not used
Requested Session	19	10	Alphanumeric	Specifies session to log onto. All blanks to log onto the default session.
Requested Sequence Number	29	20	Numeric	Specifies the sequence number the client wants to receive open orders up to or 0 to request the latest state of the book.

b. Login Accepted Packet

The Reallocation server sends a Login Accepted Packet in response to receiving a valid Login Request from the client. This packet will always be the first packet sent by the server after a successful login request.

Name	Offset	Length	Value	Comments
Packet Length	0	2	Integer	Number of bytes after this field until the next packet.
Packet Type	2	1	'A'	Login Accept Packet
Session	3	10	Alphanumeric	Session ID of the session that is now logged into. Left padded with spaces.
Sequence Number	13	20	Numeric	The sequence number of the most recent message applied to the book. Left padded with spaces.

c. Login Rejected Packet

The Reallocation server sends this packet in response to an invalid Login Request Packet from the client. The server closes the socket connection after sending the Login Reject Packet. The Login Rejected Packet will be the only packet sent by the server in the case of an unsuccessful login attempt.

Name	Offset	Length	Value	Comments
Packet Length	0	2	Integer	Number of bytes after this field until the next packet.
Packet Type	2	1	'J'	Login Rejected Packet
Reject Reason Code	3	1	Alpha	'S' Session invalid or not available

d. Sequenced Data Packet

The Sequenced Data Packets act as an envelope to carry the Omega ITCH 5.0 sequenced data messages that are transferred from the server to the client. Each Sequenced Data Packet carries one message

from the higher-lever protocol. Only Start-Of-Messages event, Add Order message and End-Of-Messages event are used in the Reallocation.

Name	Offset	Length	Value	Comments
Packet Length	0	2	Integer	Number of bytes after this field until the next packet.
Packet Type	2	1	'S'	Sequenced Data Packed.
Message	3	Variable	Any	Defined by a higher-level protocol.

e. Client Heartbeat Packet

The client can send a Client Heartbeat Packet as defined in SoupTCP Binary Specification. No action from the Reallocation Server is expected.

Name	Offset	Length	Value	Comments
Packet Length	0	2	Integer	Number of bytes after this field until the next packet.
Packet Type	2	1	'R'	Client Heartbeat Packet

f. Logout Request Packet

The client may send a Logout Request Packet to request the connection be terminated. Upon receiving a Logout Request Packet, the Reallocation Server will immediately terminate the connection and close the associated TCP/IP socket.

Name	Offset	Length	Value	Comments
Packet Length	0	2	Integer	Number of bytes after this field until the next packet.
Packet Type	2	1	'O'	Logout Request Packet

5. Reallocation Server Usage Example

At the beginning, the participant has no state of the book and wants to become current. It receives ITCH messages 1001, 1002, discards them and requests a spin of all open orders up to and including sequence 1002 in Login Request Message. Meanwhile, ITCH message 1003 is received and is cached by the participant.

Reallocation Server sends Login Accept Message indicating that the spin is capable of giving all open orders up to and including sequence 1003. The participant discards the cached 1003 message. The Spin Server starts sending open orders. While the spin is in progress the Participant caches messages with sequence 1004 and 1005. When End-Of-Messages event is received the participant applies the cached messages to the book and continues listening to multicast.