Operating Omega ATS and Lynx ATS

REALLOCATION SERVER SPECIFICATION v 1.03

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Revision History

Date	Revision	Description of Change
April 15, 2016	1.00	Created
April 25 , 2016	1.01	Re-created the documentation.
June 2, 2016	1.02	Edits made to document.
June 10, 2016	1.03	Formatting and edits made to document for publishing.

Contents

1. Overview

OSI participants may use Multicast QTP to acquire real-time depth of book quotations and execution information directly from OSI. There are two multicasting ITCH servers: A and B. One feed may be used to recover missed messages from the other feed. SoupTCP server is unicasting.

OSI Multicast ITCH real-time events are delivered by using a published range of multicast addresses. Dropped messages can be requested using a UDP/Unicast connection to the Retransmission server with replayed messages being delivered on a separate set of multicast ranges reserved for packet retransmission. Intraday, a Reallocation 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

OSI Reallocation Server allows participants to connect via TCP and receive a replay of all current open orders on either Omega ATS' or Lynx ATS' book. By using this feature, a participant may get the current OSI book quickly at any time during the trading session without requesting a gap for all messages up to that point in the day. The Reallocation Server listens to the port specified by OSI and it produces a snapshot of all currently open orders per book.

A Participant can request for a reallocation of open 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 a Login Accepted Message with the sequence number which indicates the most recent message applied to the book. This sequence number is equal to or greater than the sequence number received in Login Request message. The Server then proceeds to send messages that consist of Start of Message Event, Add Order (long and/or short) messages and End of Message event. The Spin Server will disconnect immediately after sending End of Message event.

Only open orders are sent through the Reallocation server and it will not contain any message for an order which is no longer in the book. While receiving messages the Participant must buffer from multicast channel any messages received with sequence number greater than the number specified in the Login Accepted message.

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

3. Assumptions and Terms

The document assumes that the reader is familiar with OSI SoupTCP specification, OSI QTP specification as well as OSI ITCH 3.0 specification and should refer to those documents for the details of corresponding protocols.

4. SoupTCP Packets

4.1 Login Request Packet

The initiator 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 the Reallocation Server will send Login Reject Message.

Name	Offset	Length	Value	Comments
Packet Type	0	1	'L'	Login Request Packet
Username	1	6	Alphanumeric	Not used
Password	7	10	Alphanumeric	Not used
Requested Session	17	10	Alphanumeric	Specifies session to log onto. All blanks to log onto the default session.
Requested Sequence Number	27	10	Numeric	Specifies the sequence number the client wants to receive open orders up to or **0** to request the latest state of the book.
Terminating Linefeed	37	1	Linefeed Character	ASCII 10 decimal, 0x0A hex

4.2 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 Type	0	1	'A'	Login Accept Packet

Session	1	10	Alphanumeric	Session ID of the session that is now logged into. Left padded with spaces.
Sequence Number	11	10	Numeric	The sequence number of the most recent message applied to the book. Left padded with spaces.
Terminating Linefeed	21	1	Linefeed Character	ASCII 10 decimal, 0x0A hex.

4.3 Login Rejected Packet

The Spin 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 Type	0	1	'J'	Login Rejected Packet
Reject Reason Code	1	1	Alpha	'S' Session invalid or not available
Terminating Linefeed	2	1	Linefeed Character	ASCII 10 decimal,0x0A hex

4.4 Sequenced Data Packet

The Sequenced Data Packets act as an envelope to carry the OSI ITCH 3.0 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 Message Event, Add Order (long and/or short) messages and End of Message event are sent.

Name	Offset	Length	Value	Comments
Packet Type	0	1	'S'	Sequenced Data Packed.
Message	1	Variable	Alphanumeric	Defined by a higher-level protocol.
Terminating Linefeed	Payload Len+1	1	Linefeed Character	ASCII 10 decimal, 0x0A hex.

4.5 Client Heartbeat Packet

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

Name	Offset	Length	Value	Comments
Packet Type	0	1	'R'	Client Heartbeat Packet
Terminating Linefeed	1	1	Linefeed Character	ASCII 10 decimal,0xoA hex

4.6 Logout Request Packet

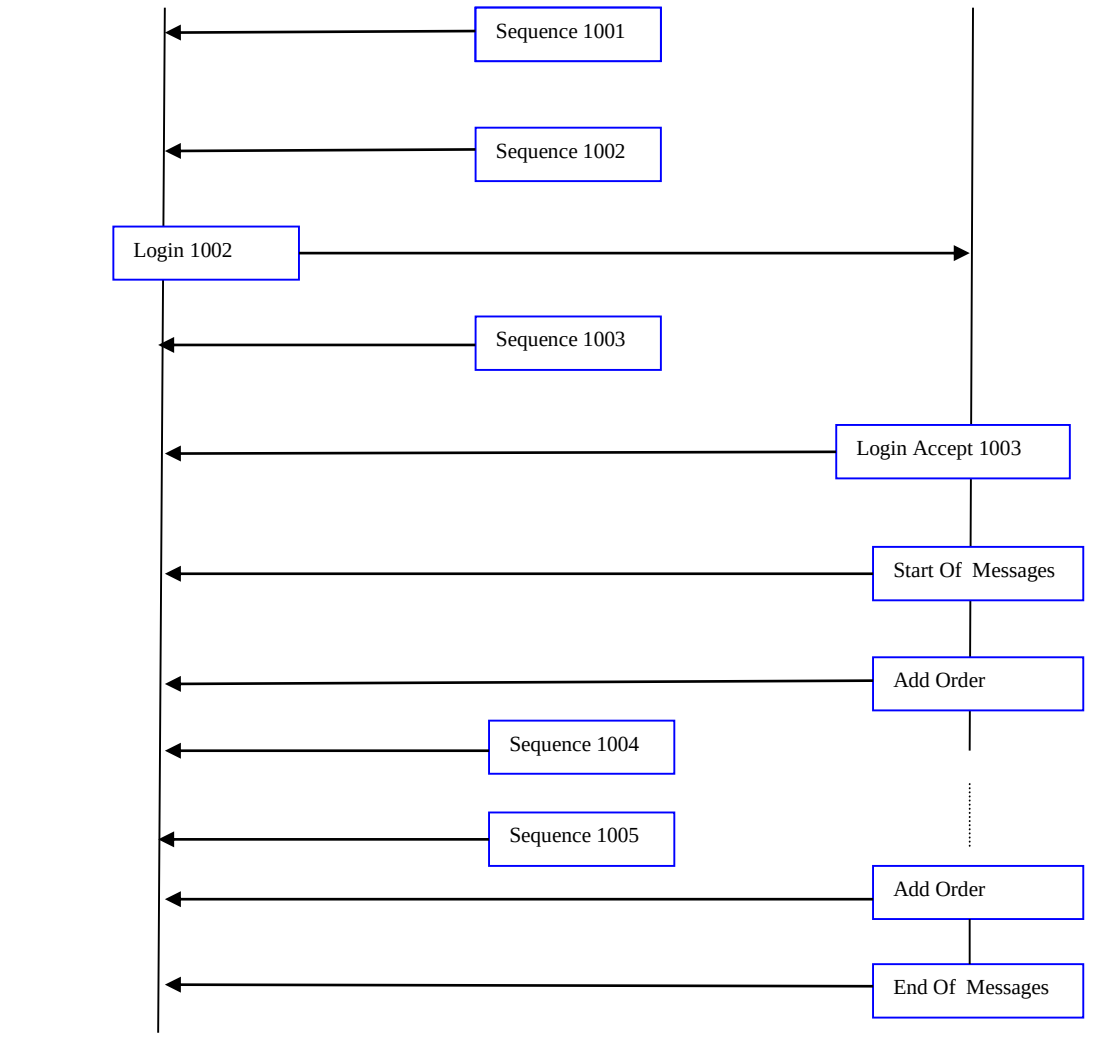
The client may send a Logout Request Packet to request the connection be terminated. Upon receiving a Logout Request Packet, the Reallocation Server will immediately terminate the connection and close the associated TCP/IP socket.

Name	Offset	Length	Value	Comments
Packet Type	0	1	'O'	Logout Request Packet
Terminating Linefeed	1	1	Linefeed Character	ASCII 10 decimal, 0x0A hex

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 reallocation 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 it is capable of giving all open orders up to and including sequence 1003. The participant discards the cached 1003 message. The Reallocation Server starts sending open orders. While the reallocation 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.


Participant
Multicast Itch Feed
Reallocation Server
Sequence 1001
Sequence 1002
Login 1002
Sequence 1003
Login Accept 1003
Start Of Messages
Add Order
Sequence 1004
Sequence 1005
Add Order
End Of Messages