



Lightspeed Gateway Splitter

Overview

The Lightspeed Gateway splitter disseminates the ECN data in a proprietary format via a UDP multicast packet service. The service also provides for direct real-time retransmission (or gap-fill) via UDP unicast.

Architecture

The service consists of two distinct components:

1. Real-time multicast
2. UDP retransmission

Both services are provided on standard UDP/IP datagram sockets. Each component may potentially have different IP and port assignments.

Each message contains a small header containing machine-encoded integers that provides various pieces of information about the payload. Though a packet may contain more than one message, the message will always be aligned by packet boundaries. Messages will not span multiple packets. Message data will contain all delimiters that would typically be appended to messages.

The real-time multicast service will send messages containing zero bytes of raw data once per second to function as heartbeats. These messages will contain the sequence number of the last message. Thus clients can determine if the real-time multicast service has failed, e.g. if no packets have been received in several seconds.

Client applications must synchronize to the multicast feed by using a combination of available services, including rewinds provided by unicast replay and extended snapshots provided by Lightspeed Books Engine.

Data Types

All message structures use binary fields. Message payload data are opaque sequences of octets carrying data as specified by the splitters native format. Please contact your Technical Account manager for documentation on the relevant feeds information.

All numbers express in this format are in decimal unless otherwise indicated. Numbers prefixed with Ox are in base 16 (hexadecimal).

Packet headers use the following primitive data types:

Data Type	Length	Description
Long	8 Octets	32-bit unsigned binary value, in network byte order, from 0 to 4,294,967,295
Short	4 Octets	16-bit unsigned binary value, in network byte order, from 0 to 65535

Real-time Multicast

Messages carrying current data will be transmitted to the Real-Time Multicast Group address using the following format:

Offset	Length	Type	Description
0	2	Short	Version Format ID (always 2)
2	2	Short	Message pay load
4	8	Long	Message Sequence Number
12	n	Splitter	Splitter messages

The payload length field is intended to provide a rapid check of message integrity. Packets whose size is not equal to 12+n should be discarded.

Clients must parse the splitter data and maintain an accurate sequence number by determining the number of sequenced messages present. Note the message data may contain a subsequence messages if applicable. If 0 bytes of splitter data are provided, the message is a Real-Time Multicast heartbeat and should be used to update the last known sequence number.

Unicast Retransmission Service

Clients may request specific messages to perform “gap-fill” operations in real-time using UDP unicast requests. These requests are best effort and maybe rejected for any reason. Additionally, requests and/or responses might be lost due to network congestion. If no response is received for a reasonable time, the request should be treated as failed and should be retired reasonably.

Responses will be unicast back to the sender's source IP address and UDP port.

These requests will be administratively limited in the following ways:

1. Size: Requests must be for fewer messages than the Request Size limit
2. Rate: Requests must be made at a rate slower than the Request Rate Limit (given in requests per second)
3. Window: Requests must be made for messages within the Request Window messages of the most recent sequence number.

Please contact your Technical Advisor for information regarding specific limits.

Request Format

Unicast Retransmission Requests should be transmitted to the unicast retransmission address in the following format:

Offset	Length	Type	Description
0	2	Short	Version Format ID (always 2)
2	8	Long	Sequence #
10	2	Short	Message Count

Response Format

Unicast Retransmission Responses are transmitted in the following format:

Offset	Length	Type	Description
0	2	Short	Version Format ID (always 2)
2	8	Long	Sequence #
10	2	Short	Message Count
12	n	Splitter	Splitter format

The sequence number and message count will match those of the request being fulfilled. No length information is provided. Clients wishing to validate received data should determine the number of messages in the payload and compare to the message count.

Synchronization

Clients must synchronize to the multicast data to create an accurate book.

TCP Rewind

Clients may synchronize by utilizing a TCP data distributor to request a rewind of all messages transmitted since the beginning of the day. During the rewind, clients should listen to the Real-Time Multicast Service to determine the latest sequence number. Clients can determine synchronization by

Copyright ©2011 Lightspeed Financial Proprietary information. All rights reserved.

comparing the last sequence number of the rewinding TCP service to that of the Real-Time Multicast service. Please contact your Technical Account Representative for details on TCP rewind.

Retransmission

Clients may obtain retransmission for lost messages by using the UDP Retransmission Service. To fill larger blocks of lost messages, clients may wish to utilize the TCP data distribution service. During extreme disaster scenarios, clients may wish to synchronize against all available sources.