



Alpha Production Multicast Connectivity Guide

Table of Contents

Glossary	2
Introduction.....	3
Scope	3
Intended Audience	3
Documents Referenced.....	3
Connectivity to Production Environment.....	4
Overview.....	4
Multicast Routing	5
TCP Recovery	6
Bandwidth Recommendations	6
Production Environment Configuration	7
Symbol Distribution.....	7
Production IP Addresses & Ports: Primary Data Centre.....	7
Production IP Addresses & Ports: Secondary Data Centre	8
DR IP Addresses & Ports: Secondary Data Centre.....	9
Support	9

Glossary

Term	Description
AS	Autonomous System
API	Alpha Extended Messaging API v5.0 or greater
BGP	Border Gateway Protocol
IGMP	Internet Group Management Protocol
IP	Internet Protocol
PIM	Protocol Independent Multicast
RP	Rendezvous Point

Introduction

Scope

Alpha ATS Subscribers may use the EMAPI Multicast feed to consume public market data for Alpha traded securities. This document further describes how to access the EMAPI Multicast feed in the Production Environment. The following feeds are available via IP Multicast:

- Public Orders
- Public Trades
- MBL Full
- MBL L1
- MBL L2

Intended Audience

Alpha ATS Subscribers who want to receive the Production Alpha Multicast Feed and Recovery Functionality.

Documents Referenced

Alpha ATS EMAPI Programmer's Guide v5.0

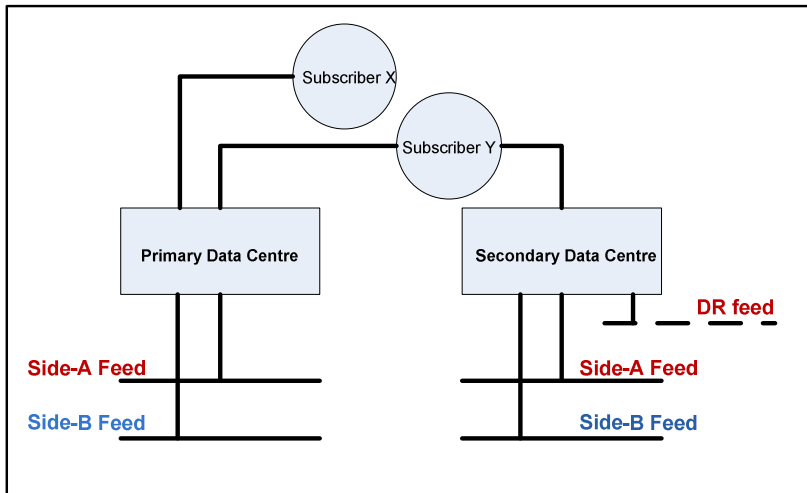
Connectivity to Production Environment

Overview

Alpha’s Multicast Feed will be provided from both primary and secondary data centres with local redundancy provided within each location. Also given the method of Subscriber connectivity, additional redundancy is available within each provisioned set of credentials.

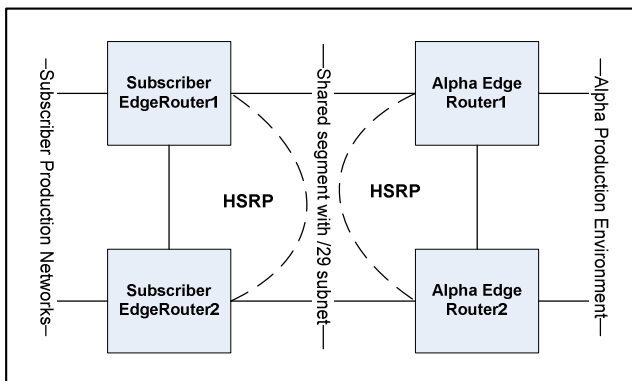
The following diagram illustrates data availability from Primary and Secondary Data Centres.

Feed availability in Primary and Secondary Data Centre

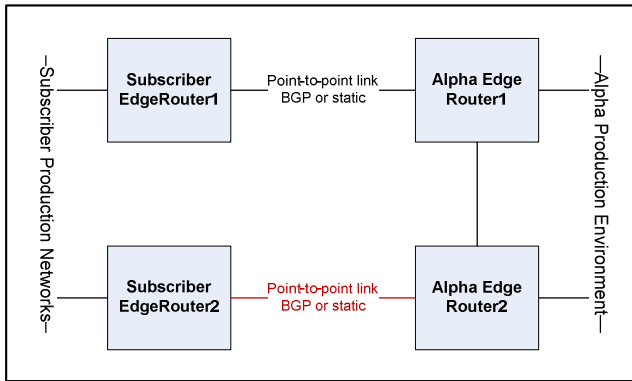


For multicast traffic to flow properly between Alpha edge routers and the Subscriber edge routers, certain modifications to existing cross-connects will be required. This is a requirement if existing cross-connects remain as part of the design.

Legacy Cross-Connect design with no support for IP Multicast



New Design with support for IP Multicast



Please contact Alpha Group Client Services at clientservices@alpha-group.ca to schedule migration from HSRP to point-to-point cross-connect.

Multicast Routing

The Alpha Production Environment uses the following registered multicast ranges:

- Primary Data Centre: 224.0.107.0/24
- Secondary Data Centre: 224.0.108.0/24

To allow for both current and future multicast channels, Alpha recommends Subscribers provision access for the entire range in each location.

Alpha edge routers will be configured for PIM Sparse Mode.

The routing information will be distributed via BGP or static, however the dynamic protocol is preferred. Alpha only supports the registered public address space and AS numbers. Alpha will assign the point-to-point address space.

Location	Multicast Address Range	RP	Multicast Source Address Range
Primary DC	224.0.107.0/25 224.0.107.128/25	69.171.222.225/32	69.171.220.0/25 69.171.220.128/25
Secondary DC	224.0.108.0/26 224.0.108.64/26	69.171.223.225/32	69.171.221.0/26 69.171.221.64/26
	224.0.108.128/26	69.171.223.226/32	69.171.208.0/26

TCP Recovery

There are two forms of TCP based recovery in the event of a loss of multicast market data.

Small gap recovery will be handled by the API via TCP to the appropriate recovery channel. If the gap cannot be filled from the TAX Server via TCP, the session is considered inactive and the client will receive an error callback per the EMAPI Programmer's Guide. In this scenario, a client must re-establish the session and do a replay to recover any lost messages.

Large gap recovery allows the client to replay all messages from start of day. This functionality remains consistent with current replay implementation available via TCP.

Location	Multicast Groups	Recovery Server Subnet	Recovery Ports
Primary DC	224.0.107.0/25	69.171.220.0/25	6868, 6869
	224.0.107.128/25	69.171.220.128/25	6870, 6871
Secondary DC	224.0.108.0/26	69.171.221.0/26	6868, 6869
	224.0.108.64/26	69.171.221.64/26	6870, 6871
	224.0.108.128/26	69.171.208.0/26	6868, 6869

Bandwidth Recommendations

The Alpha Public Multicast Feed bandwidth recommendation is consistent with the TCP Production values for a single instance of the service descriptions as outlined below (i.e. Public Orderbook Flow, MBL L1, etc...). As a result of market trends and forecasting, Alpha reserves the right to adjust the Minimum and Recommended bandwidth values with appropriate notice to its Subscribers.

Please note additional functionality has been introduced with the availability of the Public Multicast Feed which may impact your bandwidth needs. The Client API is able to receive redundant (2) multicast feeds for the same flow allowing for line arbitration by the API. This functionality is configurable within the API using the `pmcMaxNumberMcGroups` parameter and setting it to a value of 1 or 2. For further details please see the EMAPI Programmer's Guide.

Subscribers may also require additional bandwidth during the transition period from TCP to multicast as they support existing TCP based production applications. Please ensure sufficient bandwidth is available to support this timeframe.

Production Environment Configuration

Symbol Distribution

At this time, Alpha will maintain a single feed that contains all Alpha traded securities. Alpha reserves the right to partition its market data feed by symbology at a later time.

Production IP Addresses & Ports: Primary Data Centre

PIM: Sparse Mode
RP: 69.171.222.225/32
Multicast subnets: 224.0.107.0/25
 224.0.107.128/25

PRIMARY DC SIDE-A

TSX / TSXV Listed Alpha Listed	Service Description	Source IP	Multicast Group	Multicast Port	Recovery IP	Recovery Port
	Public Orders	69.171.220.5	224.0.107.1	56001	69.171.220.6	6868
	Public Trades		224.0.107.3	56003		6869
	MBL Full		224.0.107.5	56005		
	MBL L1		224.0.107.7	56007		
	MBL L2		224.0.107.9	56009		

PRIMARY DC SIDE-B

TSX / TSXV Listed Alpha Listed	Service Description	Source IP	Multicast Group	Multicast Port	Recovery IP	Recovery Port
	Public Orders	69.171.220.135	224.0.107.129	56129	69.171.220.136	6870
	Public Trades		224.0.107.131	56131		6871
	MBL Full		224.0.107.133	56133		
	MBL L1		224.0.107.135	56135		
	MBL L2		224.0.107.137	56137		

Production IP Addresses & Ports: Secondary Data Centre

PIM: Sparse Mode
RP: 69.171.223.225/32
Multicast subnets: 224.0.108.0/26
 224.0.108.64/26

SECONDARY DC SIDE-A

TSX / TSXV Listed Alpha Listed	Service Description	Source IP	Multicast Group	Multicast Port	Recovery IP	Recovery Port
	Public Orders	69.171.221.5	224.0.108.1	57001	69.171.221.6	6868
	Public Trades		224.0.108.3	57003		6869
	MBL Full		224.0.108.5	57005		
	MBL L1		224.0.108.7	57007		
	MBL L2		224.0.108.9	57009		

SECONDARY DC SIDE-B

TSX / TSXV Listed Alpha Listed	Service Description	Source IP	Multicast Group	Multicast Port	Recovery IP	Recovery Port
	Public Orders	69.171.221.70	224.0.108.65	57065	69.171.221.71	6870
	Public Trades		224.0.108.67	57067		6871
	MBL Full		224.0.108.69	57069		
	MBL L1		224.0.108.71	57071		
	MBL L2		224.0.108.73	57073		

DR IP Addresses & Ports: Secondary Data Centre

PIM: Sparse Mode
RP: 69.171.223.226/32
Multicast subnets: 224.0.108.128/26

DR SIDE-A*

	Service Description	Source IP	Multicast Group	Multicast Port	Recovery IP	Recovery Port
TSX / TSXV Listed Alpha Listed	Public Orders	69.171.208.40	224.0.108.129	58129	69.171.208.41	6868
	Public Trades		224.0.108.131	58131		6869
	MBL Full		224.0.108.133	58133		
	MBL L1		224.0.108.135	58135		
	MBL L2		224.0.108.137	58137		

* DR Side B is not available at this time.

Support

For further support, please contact Alpha Group Client Services at:

Phone: 647-259-0450 or 1-877-ATS-ALF1

E-mail: clientservices@alpha-group.ca