

MIAx Options

MIAx Pearl Options

MIAx Emerald Options

MIAx Pearl Equities

MIAx Express Network Interconnect Connectivity Guide

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Executive Summary

MIAX Options®, MIAX Pearl™ Options and Equities, and MIAX Emerald™ collectively referred to as MIAX, provides low latency network connectivity to diverse trading platforms, market data distribution systems, financial services, disaster recovery and test facilities through the MIAX Express Network Interconnect. The MIAX Express Network Interconnect, referred to as MENI (pronounced “MANY”), is an infrastructure comprised of Low Latency (LL) and Ultra Low Latency (ULL) equalized access to each of the MIAX exchange services within the data center across a variety of high speed network interfaces. MIAX offers latency equalized connectivity in its primary data center facility, collocated with Equinix at NY4 in Secaucus, New Jersey. MIAX’s disaster recovery (DR) data center, collocated with Equinix at CH4 in Chicago, Illinois, offers dedicated connectivity options for DR.

1 Overview

1.1 MIAX Express Network Interconnect (MENI)

The MENI network infrastructure is based on an architecture comprised of complementary industry leading solutions selected for the highest levels of performance, reliability and resiliency.

The MENI offers 1G or 10G fiber cross connects to establish the network layer connectivity to MIAX MENI network infrastructure.

IP connectivity between MENI and the customer firm is established via IP routing protocols (BGP) or by direct host interface attachment.

All Express Network Interconnect handoffs are IP based and provide:

- Equalized fiber lengths scoped to each of MIAX's exchange systems and the data recipient systems within the NY4 Data Center Complex.
- Simplified connectivity requirements and provisioning.
- Flexible entitlement and rapid service turn-up.
- Secure and reliable connectivity.

1.2 MIAX Express Network Interconnect Handoff

The MIAX Express Network Interconnects located within each MIAX Data Center provides access to the MIAX Options, MIAX Pearl and MIAX Emerald trading and support systems.

1.2.1 NY4 IBX Secaucus, NJ Data Center

The MIAX Options, MIAX Pearl Options and Equities, and MIAX Emerald "A" and "B" Trading Systems and Firm Test Platforms are collocated in the Equinix NY4 IBX Data Center Facility located in Secaucus, NJ.

1.2.1.1 MIAX Exchange Group Options Exchanges

The following table details the various connectivity options provided in the Equinix NY4 IBX Data Center for each of MIAX Exchange Group Options Exchanges:

MIAX Exchange Group Options Exchanges			
NY4 – Connectivity Options	MIAX Options	MIAX Pearl Options	MIAX Emerald
1G Low Latency (LL)	Accessible via MENI Shared Extranet	Accessible via MENI Shared Extranet	Accessible via MENI Shared Extranet
10G Ultra Low Latency (ULL)	Accessible via MENI <u>Dedicated</u> Extranet	Accessible via MENI <u>Dedicated</u> Extranet	Accessible via MENI <u>Dedicated</u> Extranet

As indicated above:

1. MIAX Options, MIAX Pearl and MIAX Emerald are all accessible via the MENI 1G LL Shared Extranet.
2. MIAX Options is accessible via the MENI 10G ULL Extranet dedicated to the MIAX Options Exchange.
3. MIAX Pearl is accessible via the MENI 10G ULL Extranet dedicated to the MIAX Pearl Options Exchange.
4. MIAX Emerald is accessible via the MENI 10G ULL Extranet dedicated to the MIAX Emerald Exchange.

1.2.1.2 MIAX Exchange Group Equities Exchange

The following table details the various connectivity options provided in the Equinix NY4 IBX Data Center for the MIAX Exchange Group Equities Exchange:

MIAX Exchange Group Equities Exchange	
NY4 – Connectivity Options	MIAX Pearl Equities
1G Ultra Low Latency (ULL)	Accessible via MENI <u>Dedicated</u> Extranet
10G Ultra Low Latency (ULL)	Accessible via MENI <u>Dedicated</u> Extranet 10G is recommended for consumption of Market Data Feeds

As indicated above:

1. MIAX Pearl Equities is accessible via the MENI 1G and 10G ULL Extranet dedicated to the Pearl Equities exchange.
2. 10G connectivity is recommended for customers consuming the MIAX Pearl Equities Top of Market (ToM) and/or the Depth of Market (DoM) market data feeds.

1.2.2 CH4 IBX Chicago, IL Data Center

The MIAX Options, MIAX Pearl Options and Equities, and MIAX Emerald Disaster Recovery Trading Systems are collocated in the Equinix CH4 IBX Data Center located in Chicago, IL.

1.2.2.1 MIAX Exchange Group Options Exchanges

The following table details the various connectivity options provided in the Equinix CH4 Data Center for each of MIAX Exchange Group Options Exchanges:

MIAX Exchange Group Options Exchanges			
CH4 - Connectivity Options	MIAX Options	MIAX Pearl Options	MIAX Emerald
1G Low Latency (LL)	Accessible via MENI Shared Extranet	Accessible via MENI Shared Extranet	Accessible via MENI Shared Extranet
10G Low Latency (LL)	Accessible via MENI Shared Extranet	Accessible via MENI Shared Extranet	Accessible via MENI Shared Extranet

1.2.2.2 MIAX Exchange Group Equities Exchange

The following table details the various connectivity options provided in the Equinix CH4 Data Center for the MIAX Exchange Group Equities Exchange:

MIAX Exchange Group Equities Exchange	
CH4 – Connectivity Options	MIAX Pearl Equities
1G Ultra Low Latency (ULL)	Accessible via MENI <u>Dedicated</u> Extranet
10G Ultra Low Latency (ULL)	Accessible via MENI <u>Dedicated</u> Extranet

MIAX highly recommends members establish redundant, diverse connections in each MENI Data Center facility to maintain network availability in case of an unforeseen service-affecting issue.

2 MENI Connectivity Methods

Connectivity to MENI can be established through a variety of access methods. Irrespective of the connectivity method selected, MIAX requires the member or service provider to provide and present an optical Ethernet interface as the handoff to the MIAX Express Network Interconnect. The MENI Data Center locations support the following interface speeds, optical signals, and fiber types:

Location	Port Option	Optical Signal	Fiber Type	Core/Cladding	Modal Bandwidth	Exchange
NY4	1 Gigabit	1000BASE-LX/LH	Single Mode Fiber (SMF)	9/125 µm	OS2	MIAX Options MIAX Pearl Options MIAX EMERALD MIAX Pearl Equities
NY4	10 Gigabit	10GBASE-LR (Default) SFP-10G-ER40 (1310nm)	Single Mode Fiber (SMF) Single Mode Fiber (SMF)	9/125 µm 9/125 µm	OS2 OS2	MIAX Options MIAX Pearl Options MIAX EMERALD MIAX Pearl Equities
CH4	1 Gigabit	1000BASE-LX/LH	Single Mode Fiber (SMF)	9/125 µm	OS2	MIAX Options MIAX Pearl Options MIAX EMERALD MIAX Pearl Equities
CH4	10 Gigabit	10GBASE-LR	Single Mode Fiber (SMF)	9/125 µm	OS2	MIAX Options MIAX Pearl Options MIAX EMERALD MIAX Pearl Equities

Members need to select the appropriate access method(s) and are in complete control of coordinating connectivity with their chosen provider to the MIAX Data Centers. Members may choose any of the following access methods for establishing MENI connectivity:

- Colocation Cross Connect
- Telco Carrier or Network Service Provider
- Extranet Provider
- Ethernet Service Provider (EPL, Metro and Long Haul)

2.1 Colocation Cross Connect

Members with an existing presence in any of the MIAX Data Centers may order cross connects to the MIAX MENI network demarcation point. The NY4 cross connects are latency equalized between the MIAX and member's demarcation points, regardless of NY4 data center location or proximity. The cross connect fiber is designed to provide identical performance characteristics for each and every connection type scoped to each specific Exchange.

The standard connector for MIAX Options, MIAX Pearl Options and MIAX Emerald Options used for latency equalized cross connects are terminated on SC connectors.

The standard connector for MIAX Pearl Equities used for latency equalized cross connects are terminated on LC connectors.

Equinix supplies and installs demarcation points in IBX private cages and offers an option to locate the demarcation points in the customer cabinet.

Members seeking equipment or colocation space for placing member owned equipment should contact Equinix (www.equinix.com).

2.1.1 Attachment Types

MENI supports direct attachment of customer/provider network equipment via the MIAX Network-to-Network Interface (MNNI) or host systems via the MIAX User Network Interface (MUNI).

- MIAX Network-to-Network Interface (MNNI)

The MNNI is a network-to-network interface (NNI) that provides a demarcation point for linking the customer's network to MIAX MENI for the purposes of establishing network connectivity and the exchange of IP route information.

- MIAX User Network Interface (MUNI)

The MUNI is a user network interface (UNI) that provides a demarcation point for linking the customer's server to MIAX MENI for the purposes of establishing secure direct host connectivity.

2.2 Telecommunications or Network Service Provider (NSP)

Members may choose to connect to MENI directly via a direct leased/private line at the MIA X Data Center location. The leased line will be terminated at the telco demarcation point in the Equinix datacenter and extended to the MIA X cage via a cross connect. This connectivity option provides a high degree of flexibility and choice for the member to choose an appropriate Telco or NSP service to fit their individual MAN or WAN requirements.

2.3 Extranet Service Provider

Members may connect to MENI via an Extranet Service Provider when an alternative solution to colocation or dedicated circuits is required. This option may provide a simpler means of connectivity and less complexity when a fully managed “*turnkey*” approach is more appropriate. The MIA X is provider neutral and will consider Extranet Provider requests to establish connectivity initiated by and on the member’s behalf. Please review the MIA X website for a current list of MIA X certified Extranet Service providers.

3 Available MENI Platforms

The MIAX Express Network Interconnect Infrastructure provides access to all MIAX financial services, trading, and test and certification systems in the primary NY4 data center facility. This includes the primary and secondary MIAX Options, MIAX Pearl Options and Equities, and MIAX Emerald trading platforms and their corresponding firm test and certification systems. The MIAX Options, MIAX Pearl Options and Equities, and MIAX Emerald disaster recovery systems are located in CH4 and dedicated connectivity is recommended for maintaining high availability to MIAX. The following table provides a summary of services and platforms provided by location:

MIAX Facility		
MIAX Data Center	NY4	CH4
Function/Role	Primary/Secondary	Disaster Recovery
Location	Secaucus	Chicago
Colocation Provider	Equinix	Equinix
Connectivity Method		
Latency Equalized Colocation Cross Connect	☑	☒
Colocation Cross Connect	☒	☑
Single-mode fiber	☑	☑
Multi-mode fiber	☒	☒
System Services		
MIAX Options Primary System	☑	☒
MIAX Options Secondary System	☑	☒
MIAX Options Firm Test & Certification System Current SW Release	☑	☒
MIAX Options Firm Test & Certification System Next SW Release	☑	☒
MIAX Options Disaster Recovery System	☒	☑
MIAX Pearl Options Primary System	☑	☒
MIAX Pearl Options Secondary System	☑	☒
MIAX Pearl Options Test & Certification System Current SW Release	☑	☒
MIAX Pearl Options Test & Certification System Next SW Release	☑	☒
MIAX Pearl Options Disaster Recovery System	☒	☑
MIAX Pearl Equities Primary System	☑	☒

MIAX Pearl Equities Secondary System	☒	☒
MIAX Pearl Equities Test & Certification System Current SW Release	☒	☒
MIAX Pearl Equities Test & Certification System Next SW Release	☒	☒
MIAX Pearl Equities Disaster Recovery System	☒	☒
MIAX Emerald Primary System	☒	☒
MIAX Emerald Secondary System	☒	☒
MIAX Emerald Test & Certification System Current SW Release	☒	☒
MIAX Emerald Test & Certification System Next SW Release	☒	☒
MIAX Emerald Disaster Recovery System	☒	☒

4 Network Specifications

4.1 MENI Protocol Support

MIAX supports standardization of internetworking technologies to foster and promote interoperability. To ensure seamless interworking of applications and infrastructure handoffs between autonomous systems comprised of heterogeneous borders, MIAX has selected the following protocols:

- Transmission Control Protocol (TCP) – MIAX host systems and applications will administer TCP as the transport layer protocol for connection oriented session based unicast traffic segments.
- User Datagram Protocol (UDP) – MIAX host systems and applications will administer UDP as the transport layer protocol for connectionless non-session based real-time datagram delivery such as market data feeds.
- Internet Protocol Version 4 (IPv4) – MIAX host systems and network devices will use IP as the network layer protocol for relaying data packets comprised of TCP segments or UDP datagrams from source to destination host systems across the MIAX and Member's Internetwork.
- Border Gateway Protocol Version 4 (BGP4) – MIAX Express Network Interconnect interfaces will use BGP as the dynamic exterior gateway routing protocol to exchange network reachability information with peer routers of the Member's Autonomous System.
- Static IP Protocol – MIAX Express Network Interconnect interfaces will be manually administered with static IP routes for providing network reachability to Member's destination IP networks when BGP is not an option for Member route exchange.
- Protocol Independent Multicast Sparse Mode (PIM-SM) - MIAX Express Network Interconnect interfaces will use PIM-SM as the dynamic multicast routing protocol to provide Member based receiver-initiated subscription of MIAX real-time IP multicast market data feeds.
- Internet Group Management Protocol Version 2 (IGMP) - MIAX will define IGMP static joins on the MENI edge interface to manually "nail up" firm facing IP multicast group memberships when PIM-SM is not an option for Member feed subscription.
- Internet Control Message Protocol Version 4 (ICMP) - MIAX reserves usage of ICMP for diagnostic analysis of IP packet errors and to confirm network reachability during the provisioning process of establishing Member connectivity.

4.2 IP Addressing and Autonomous System Number (ASN)

Members are recommended to use globally registered, unique IPv4 addresses for all host level communication with MIAX trading systems, platforms and hosts. Equally important, is the member's use of a registered Autonomous System Number (ASN) for BGP peering with the MIAX Express Network Interconnect.

MIAX will permit members to utilize private IPv4 addresses and/or Autonomous System Numbers, as long as MIAX administers, specifies and assigns the private IP address range and private Autonomous System Number. In this capacity, MIAX will serve as the Private Internet Registry (PIR) and the member will receive an address block allocation and/or Autonomous System Number assignment.

4.3 Traffic, Routing and Security Considerations

4.3.1 Redundant Connections and Roles

MENI provides a redundant connectivity model to provide failover, recovery and resiliency. Redundant cross connects can be used to receive the multicast market data A or B feeds on different cross connects, or can be used to share the load based on multicast source IP subnets/groups. They can be used to load share the unicast order flows based on different source IP subnets.

4.3.2 Route Exchange

MIAX will only advertise MIAX specific IP multicast source or destination host IP networks in outbound IP routing advertisements and will only accept globally registered or MIAX assigned inbound IP routing advertisements from Members across the MIAX Express Network Interconnect

4.3.3 Host Addresses and Protocol Ports

MIAX input systems and multicast feed sources will be administered in globally registered IPv4 address space and with static TCP and UDP ports from the IANA private port range.

4.3.4 Administration and Actions

MIAX reserves the right to control or police bandwidth, block protocols/ports, filter, capture, analyze and store data to or from any MENI connected device or client based session. MIAX also maintains the right to administratively disable any port, service or interface and physically disconnect, if necessary any link which is believed to be compromising security of MIAX platforms, systems, hosts or services in order to protect MIAX resources and/or other connected Members.

5 Obtaining More Information

Information such as (but not limited to) membership, rules, fees, support, connectivity and provisioning can be obtained by sending an email to Trading Operations (tradingoperations@MIAXOptions.com or tradingoperations@MIAXEquities.com) or by visiting the MIAX website at:

<http://www.MIAXOptions.com>

or

<http://www.MIAXEquities.com>

Appendix A: MIAX Options Services Address Information

MIAX Options Multicast Address Summary:

MIAX advertises the full subnets for MIAX Options A and B feeds. Please contact MIAX Trading Operations for further details on MIAX Options IP subnetting.

A side:

Group: 224.0.105.0/25

Source: 199.168.152.0/24

RP: 199.168.152.249

B side:

Group: 233.105.122.0/25

Source: 199.168.153.0/24

RP: 199.168.153.249

MIAX Options -- Top of Market (ToM) 'A' Feed Multicast Address and Port Information

MIAX Options -- Top of Market (ToM) 'A' Feed Multicast Address and Port Information

MIAX TOM A Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.152.68	224.0.105.1	51001
2	A	199.168.152.68	224.0.105.2	51002
3	A	199.168.152.68	224.0.105.3	51003
4	A	199.168.152.68	224.0.105.4	51004
5	A	199.168.152.69	224.0.105.5	51005
6	A	199.168.152.69	224.0.105.6	51006
7	A	199.168.152.69	224.0.105.7	51007
8	A	199.168.152.69	224.0.105.8	51008
9	A	199.168.152.70	224.0.105.9	51009
10	A	199.168.152.70	224.0.105.10	51010
11	A	199.168.152.70	224.0.105.11	51011
12	A	199.168.152.70	224.0.105.12	51012
13	A	199.168.152.71	224.0.105.13	51013
14	A	199.168.152.71	224.0.105.14	51014
15	A	199.168.152.71	224.0.105.15	51015
16	A	199.168.152.71	224.0.105.16	51016
17	A	199.168.152.72	224.0.105.17	51017
18	A	199.168.152.72	224.0.105.18	51018
19	A	199.168.152.72	224.0.105.19	51019
20	A	199.168.152.72	224.0.105.20	51020
21	A	199.168.152.73	224.0.105.21	51021
22	A	199.168.152.73	224.0.105.22	51022
23	A	199.168.152.73	224.0.105.23	51023
24	A	199.168.152.73	224.0.105.24	51024

MIAX Options Production Multicast Address Information

MIAX Options -- Top of Market (ToM) 'B' Feed Multicast Address and Port Information

MIAX TOM B Feed				
CloudFeed		Source IP	Multicast Group	Multicast Port
1	B	199.168.153.68	233.105.122.1	53001
2	B	199.168.153.68	233.105.122.2	53002
3	B	199.168.153.68	233.105.122.3	53003
4	B	199.168.153.68	233.105.122.4	53004
5	B	199.168.153.69	233.105.122.5	53005
6	B	199.168.153.69	233.105.122.6	53006
7	B	199.168.153.69	233.105.122.7	53007
8	B	199.168.153.69	233.105.122.8	53008
9	B	199.168.153.70	233.105.122.9	53009
10	B	199.168.153.70	233.105.122.10	53010
11	B	199.168.153.70	233.105.122.11	53011
12	B	199.168.153.70	233.105.122.12	53012
13	B	199.168.153.71	233.105.122.13	53013
14	B	199.168.153.71	233.105.122.14	53014
15	B	199.168.153.71	233.105.122.15	53015
16	B	199.168.153.71	233.105.122.16	53016
17	B	199.168.153.72	233.105.122.17	53017
18	B	199.168.153.72	233.105.122.18	53018
19	B	199.168.153.72	233.105.122.19	53019
20	B	199.168.153.72	233.105.122.20	53020
21	B	199.168.153.73	233.105.122.21	53021
22	B	199.168.153.73	233.105.122.22	53022
23	B	199.168.153.73	233.105.122.23	53023
24	B	199.168.153.73	233.105.122.24	53024

MIAX Options Production Retransmission Service Address Information

MIAX Options – Top of Market (ToM) Retransmission Service Address and Port Information

MIAX TOM A Feed Retransmission			
Cloud Feed	Destination IP	Destination Port	
1	A	199.168.152.161	51101
2	A	199.168.152.161	51102
3	A	199.168.152.161	51103
4	A	199.168.152.161	51104
5	A	199.168.152.162	51105
6	A	199.168.152.162	51106
7	A	199.168.152.162	51107
8	A	199.168.152.162	51108
9	A	199.168.152.163	51109
10	A	199.168.152.163	51110
11	A	199.168.152.163	51111
12	A	199.168.152.163	51112
13	A	199.168.152.164	51113
14	A	199.168.152.164	51114
15	A	199.168.152.164	51115
16	A	199.168.152.164	51116
17	A	199.168.152.165	51117
18	A	199.168.152.165	51118
19	A	199.168.152.165	51119
20	A	199.168.152.165	51120
21	A	199.168.152.166	51121
22	A	199.168.152.166	51122
23	A	199.168.152.166	51123
24	A	199.168.152.166	51124

MIAX Options Production Retransmission Service Address Information

MIAX Options – Top of Market (ToM) Retransmission Service Address and Port Information

MIAX TOM B Feed Retransmission			
CloudFeed	Destination IP	Destination Port	
1	B	199.168.153.161	53101
2	B	199.168.153.161	53102
3	B	199.168.153.161	53103
4	B	199.168.153.161	53104
5	B	199.168.153.162	53105
6	B	199.168.153.162	53106
7	B	199.168.153.162	53107
8	B	199.168.153.162	53108
9	B	199.168.153.163	53109
10	B	199.168.153.163	53110
11	B	199.168.153.163	53111
12	B	199.168.153.163	53112
13	B	199.168.153.164	53113
14	B	199.168.153.164	53114
15	B	199.168.153.164	53115
16	B	199.168.153.164	53116
17	B	199.168.153.165	53117
18	B	199.168.153.165	53118
19	B	199.168.153.165	53119
20	B	199.168.153.165	53120
21	B	199.168.153.166	53121
22	B	199.168.153.166	53122
23	B	199.168.153.166	53123
24	B	199.168.153.166	53124

MIAX Options Production Multicast Address Information

MIAX Options – MIAX Order Feed (MOR) 'A' Feed Multicast Address and Port Information

MIAX MOR A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	199.168.152.148	224.0.105.64	51049
2	A	199.168.152.148	224.0.105.65	51050
3	A	199.168.152.148	224.0.105.66	51051
4	A	199.168.152.148	224.0.105.67	51052
5	A	199.168.152.149	224.0.105.68	51053
6	A	199.168.152.149	224.0.105.69	51054
7	A	199.168.152.149	224.0.105.70	51055
8	A	199.168.152.149	224.0.105.71	51056
9	A	199.168.152.150	224.0.105.72	51057
10	A	199.168.152.150	224.0.105.73	51058
11	A	199.168.152.150	224.0.105.74	51059
12	A	199.168.152.150	224.0.105.75	51060
13	A	199.168.152.151	224.0.105.76	51061
14	A	199.168.152.151	224.0.105.77	51062
15	A	199.168.152.151	224.0.105.78	51063
16	A	199.168.152.151	224.0.105.79	51064
17	A	199.168.152.152	224.0.105.80	51065
18	A	199.168.152.152	224.0.105.81	51066
19	A	199.168.152.152	224.0.105.82	51067
20	A	199.168.152.152	224.0.105.83	51068
21	A	199.168.152.153	224.0.105.84	51069
22	A	199.168.152.153	224.0.105.85	51070
23	A	199.168.152.153	224.0.105.86	51071
24	A	199.168.152.153	224.0.105.87	51072

MIAX Options Production Multicast Address Information

MIAX Options – MIAXOrder Feed (MOR) 'B' Feed Multicast Address and Port Information

MIAX MOR B Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	B	199.168.153.148	233.105.122.64	53049
2	B	199.168.153.148	233.105.122.65	53050
3	B	199.168.153.148	233.105.122.66	53051
4	B	199.168.153.149	233.105.122.67	53052
5	B	199.168.153.149	233.105.122.68	53053
6	B	199.168.153.149	233.105.122.69	53054
7	B	199.168.153.150	233.105.122.70	53055
8	B	199.168.153.150	233.105.122.71	53056
9	B	199.168.153.150	233.105.122.72	53057
10	B	199.168.153.151	233.105.122.73	53058
11	B	199.168.153.151	233.105.122.74	53059
12	B	199.168.153.151	233.105.122.75	53060
13	B	199.168.153.152	233.105.122.76	53061
14	B	199.168.153.152	233.105.122.77	53062
15	B	199.168.153.152	233.105.122.78	53063
16	B	199.168.153.153	233.105.122.79	53064
17	B	199.168.153.153	233.105.122.80	53065
18	B	199.168.153.153	233.105.122.81	53066
19	B	199.168.153.154	233.105.122.82	53067
20	B	199.168.153.154	233.105.122.83	53068
21	B	199.168.153.154	233.105.122.84	53069
22	B	199.168.153.155	233.105.122.85	53070
23	B	199.168.153.155	233.105.122.86	53071
24	B	199.168.153.155	233.105.122.87	53072

MIAX Options Production Retransmission Service Address Information

MIAX Options – MIAX Order Feed (MOR) Retransmission Service Address and Port Information

MIAX MOR A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.152.161	51149
2	A	199.168.152.161	51150
3	A	199.168.152.161	51151
4	A	199.168.152.161	51152
5	A	199.168.152.162	51153
6	A	199.168.152.162	51154
7	A	199.168.152.162	51155
8	A	199.168.152.162	51156
9	A	199.168.152.163	51157
10	A	199.168.152.163	51158
11	A	199.168.152.163	51159
12	A	199.168.152.163	51160
13	A	199.168.152.164	51161
14	A	199.168.152.164	51162
15	A	199.168.152.164	51163
16	A	199.168.152.164	51164
17	A	199.168.152.165	51165
18	A	199.168.152.165	51166
19	A	199.168.152.165	51167
20	A	199.168.152.165	51168
21	A	199.168.152.166	51169
22	A	199.168.152.166	51170
23	A	199.168.152.166	51171
24	A	199.168.152.166	51172

MIAX Options Production Retransmission Service Address Information

MIAX Options – MIAXORder Feed (MOR) Retransmission Service Address and Port Information

MIAX MOR B Feed Retransmission			
Cloud	Feed	New Destination IP	Destination Port
1	B	199.168.153.161	53149
2	B	199.168.153.161	53150
3	B	199.168.153.161	53151
4	B	199.168.153.161	53152
5	B	199.168.153.162	53153
6	B	199.168.153.162	53154
7	B	199.168.153.162	53155
8	B	199.168.153.162	53156
9	B	199.168.153.163	53157
10	B	199.168.153.163	53158
11	B	199.168.153.163	53159
12	B	199.168.153.163	53160
13	B	199.168.153.164	53161
14	B	199.168.153.164	53162
15	B	199.168.153.164	53163
16	B	199.168.153.164	53164
17	B	199.168.153.165	53165
18	B	199.168.153.165	53166
19	B	199.168.153.165	53167
20	B	199.168.153.165	53168
21	B	199.168.153.166	53169
22	B	199.168.153.166	53170
23	B	199.168.153.166	53171
24	B	199.168.153.166	53172

MIAX Options Production Multicast Address Information

MIAX Options – Complex Top of Market (cToM) 'A' Feed Multicast Address and Port Information

MIAX Complex ToM A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	199.168.152.148	224.0.105.96	51073
2	A	199.168.152.148	224.0.105.97	51074
3	A	199.168.152.148	224.0.105.98	51075
4	A	199.168.152.148	224.0.105.99	51076
5	A	199.168.152.149	224.0.105.100	51077
6	A	199.168.152.149	224.0.105.101	51078
7	A	199.168.152.149	224.0.105.102	51079
8	A	199.168.152.149	224.0.105.103	51080
9	A	199.168.152.150	224.0.105.104	51081
10	A	199.168.152.150	224.0.105.105	51082
11	A	199.168.152.150	224.0.105.106	51083
12	A	199.168.152.150	224.0.105.107	51084
13	A	199.168.152.151	224.0.105.108	51085
14	A	199.168.152.151	224.0.105.109	51086
15	A	199.168.152.151	224.0.105.110	51087
16	A	199.168.152.151	224.0.105.111	51088
17	A	199.168.152.152	224.0.105.112	51089
18	A	199.168.152.152	224.0.105.113	51090
19	A	199.168.152.152	224.0.105.114	51091
20	A	199.168.152.152	224.0.105.115	51092
21	A	199.168.152.153	224.0.105.116	51093
22	A	199.168.152.153	224.0.105.117	51094
23	A	199.168.152.153	224.0.105.118	51095
24	A	199.168.152.153	224.0.105.119	51096

MIAX Options Production Multicast Address Information

MIAX Options – Complex Top of Market (cToM) 'B' Feed Multicast Address and Port Information

MIAX Complex ToM B Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	B	199.168.153.148	233.105.122.96	53073
2	B	199.168.153.148	233.105.122.97	53074
3	B	199.168.153.148	233.105.122.98	53075
4	B	199.168.153.148	233.105.122.99	53076
5	B	199.168.153.149	233.105.122.100	53077
6	B	199.168.153.149	233.105.122.101	53078
7	B	199.168.153.149	233.105.122.102	53079
8	B	199.168.153.149	233.105.122.103	53080
9	B	199.168.153.150	233.105.122.104	53081
10	B	199.168.153.150	233.105.122.105	53082
11	B	199.168.153.150	233.105.122.106	53083
12	B	199.168.153.150	233.105.122.107	53084
13	B	199.168.153.151	233.105.122.108	53085
14	B	199.168.153.151	233.105.122.109	53086
15	B	199.168.153.151	233.105.122.110	53087
16	B	199.168.153.151	233.105.122.111	53088
17	B	199.168.153.152	233.105.122.112	53089
18	B	199.168.153.152	233.105.122.113	53090
19	B	199.168.153.152	233.105.122.114	53091
20	B	199.168.153.152	233.105.122.115	53092
21	B	199.168.153.153	233.105.122.116	53093
22	B	199.168.153.153	233.105.122.117	53094
23	B	199.168.153.153	233.105.122.118	53095
24	B	199.168.153.153	233.105.122.119	53096

MIAX Options Production Retransmission Service Address Information

MIAX Options – Complex Top of Market (cToM) Retransmission Service Address and Port Information

MIAX Complex ToM A Feed Retransmission			
Cloud	Feed	New Destination IP	Destination Port
1	A	199.168.152.161	51173
2	A	199.168.152.161	51174
3	A	199.168.152.161	51175
4	A	199.168.152.161	51176
5	A	199.168.152.162	51177
6	A	199.168.152.162	51178
7	A	199.168.152.162	51179
8	A	199.168.152.162	51180
9	A	199.168.152.163	51181
10	A	199.168.152.163	51182
11	A	199.168.152.163	51183
12	A	199.168.152.163	51184
13	A	199.168.152.164	51185
14	A	199.168.152.164	51186
15	A	199.168.152.164	51187
16	A	199.168.152.164	51188
17	A	199.168.152.165	51189
18	A	199.168.152.165	51190
19	A	199.168.152.165	51191
20	A	199.168.152.165	51192
21	A	199.168.152.166	51193
22	A	199.168.152.166	51194
23	A	199.168.152.166	51195
24	A	199.168.152.166	51196

MIAX Options Production Retransmission Service Address Information

MIAX Options – Complex Top of Market (cToM) Retransmission Service Address and Port Information

MIAX Complex ToM B Feed Retransmission			
Cloud	Feed	New Destination IP	Destination Port
1	B	199.168.153.161	53173
2	B	199.168.153.161	53174
3	B	199.168.153.161	53175
4	B	199.168.153.161	53176
5	B	199.168.153.162	53177
6	B	199.168.153.162	53178
7	B	199.168.153.162	53179
8	B	199.168.153.162	53180
9	B	199.168.153.163	53181
10	B	199.168.153.163	53182
11	B	199.168.153.163	53183
12	B	199.168.153.163	53184
13	B	199.168.153.164	53185
14	B	199.168.153.164	53186
15	B	199.168.153.164	53187
16	B	199.168.153.164	53188
17	B	199.168.153.165	53189
18	B	199.168.153.165	53190
19	B	199.168.153.165	53191
20	B	199.168.153.165	53192
21	B	199.168.153.166	53193
22	B	199.168.153.166	53194
23	B	199.168.153.166	53195
24	B	199.168.153.166	53196

MIAX Options Production Multicast Address Information

MIAX Options – Administrative Information Subscriber (AIS) 'A' Feed Multicast Address and Port Information

MIAX AIS A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	199.168.152.68	224.0.105.32	51025
2	A	199.168.152.68	224.0.105.33	51026
3	A	199.168.152.68	224.0.105.34	51027
4	A	199.168.152.68	224.0.105.35	51028
5	A	199.168.152.69	224.0.105.36	51029
6	A	199.168.152.69	224.0.105.37	51030
7	A	199.168.152.69	224.0.105.38	51031
8	A	199.168.152.69	224.0.105.39	51032
9	A	199.168.152.70	224.0.105.40	51033
10	A	199.168.152.70	224.0.105.41	51034
11	A	199.168.152.70	224.0.105.42	51035
12	A	199.168.152.70	224.0.105.43	51036
13	A	199.168.152.71	224.0.105.44	51037
14	A	199.168.152.71	224.0.105.45	51038
15	A	199.168.152.71	224.0.105.46	51039
16	A	199.168.152.71	224.0.105.47	51040
17	A	199.168.152.72	224.0.105.48	51041
18	A	199.168.152.72	224.0.105.49	51042
19	A	199.168.152.72	224.0.105.50	51043
20	A	199.168.152.72	224.0.105.51	51044
21	A	199.168.152.73	224.0.105.52	51045
22	A	199.168.152.73	224.0.105.53	51046
23	A	199.168.152.73	224.0.105.54	51047
24	A	199.168.152.73	224.0.105.55	51048

MIAX Options Production Multicast Address Information

MIAX Options – Administrative Information Subscriber (AIS) 'B' Feed Multicast Address and Port Information

MIAX AIS B Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	B	199.168.153.68	233.105.122.32	53025
2	B	199.168.153.68	233.105.122.33	53026
3	B	199.168.153.68	233.105.122.34	53027
4	B	199.168.153.68	233.105.122.35	53028
5	B	199.168.153.69	233.105.122.36	53029
6	B	199.168.153.69	233.105.122.37	53030
7	B	199.168.153.69	233.105.122.38	53031
8	B	199.168.153.69	233.105.122.39	53032
9	B	199.168.153.70	233.105.122.40	53033
10	B	199.168.153.70	233.105.122.41	53034
11	B	199.168.153.70	233.105.122.42	53035
12	B	199.168.153.70	233.105.122.43	53036
13	B	199.168.153.71	233.105.122.44	53037
14	B	199.168.153.71	233.105.122.45	53038
15	B	199.168.153.71	233.105.122.46	53039
16	B	199.168.153.71	233.105.122.47	53040
17	B	199.168.153.72	233.105.122.48	53041
18	B	199.168.153.72	233.105.122.49	53042
19	B	199.168.153.72	233.105.122.50	53043
20	B	199.168.153.72	233.105.122.51	53044
21	B	199.168.153.73	233.105.122.52	53045
22	B	199.168.153.73	233.105.122.53	53046
23	B	199.168.153.73	233.105.122.54	53047
24	B	199.168.153.73	233.105.122.55	53048

MIAX Options Production Retransmission Service Address Information

MIAX Options – Administrative Information Subscriber (AIS) Retransmission Service Address and Port Information

MIAX AIS A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.152.161	51125
2	A	199.168.152.161	51126
3	A	199.168.152.161	51127
4	A	199.168.152.161	51128
5	A	199.168.152.162	51129
6	A	199.168.152.162	51130
7	A	199.168.152.162	51131
8	A	199.168.152.162	51132
9	A	199.168.152.163	51133
10	A	199.168.152.163	51134
11	A	199.168.152.163	51135
12	A	199.168.152.163	51136
13	A	199.168.152.164	51137
14	A	199.168.152.164	51138
15	A	199.168.152.164	51139
16	A	199.168.152.164	51140
17	A	199.168.152.165	51141
18	A	199.168.152.165	51142
19	A	199.168.152.165	51143
20	A	199.168.152.165	51144
21	A	199.168.152.166	51145
22	A	199.168.152.166	51146
23	A	199.168.152.166	51147
24	A	199.168.152.166	51148

MIAX Options Production Retransmission Service Address Information

MIAX Options – Administrative Information Subscriber (AIS) Retransmission Service Address and Port Information

MIAX AIS B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	199.168.153.161	53125
2	B	199.168.153.161	53126
3	B	199.168.153.161	53127
4	B	199.168.153.161	53128
5	B	199.168.153.162	53129
6	B	199.168.153.162	53130
7	B	199.168.153.162	53131
8	B	199.168.153.162	53132
9	B	199.168.153.163	53133
10	B	199.168.153.163	53134
11	B	199.168.153.163	53135
12	B	199.168.153.163	53136
13	B	199.168.153.164	53137
14	B	199.168.153.164	53138
15	B	199.168.153.164	53139
16	B	199.168.153.164	53140
17	B	199.168.153.165	53141
18	B	199.168.153.165	53142
19	B	199.168.153.165	53143
20	B	199.168.153.165	53144
21	B	199.168.153.166	53145
22	B	199.168.153.166	53146
23	B	199.168.153.166	53147
24	B	199.168.153.166	53148

MIAX Options Production Multicast Address Information

MIAX Options – MIAXProduct Feed (MPF) 'A' Feed Multicast Address and Port Information

MIAX MPF A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
24	A	199.168.152.153	224.0.105.120	51097

MIAX Options Production Multicast Address Information

MIAX Options – MIAXProduct Feed (MPF) 'B' Feed Multicast Address and Port Information

MIAX MPF B Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
24	B	199.168.153.153	233.105.122.120	53097

MIAX Options Production Retransmission Service Address Information

MIAX Options – MIAX Product Feed (MPF) Retransmission Service Address and Port Information

MIAX MPF A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
24	A	199.168.152.166	51197

MIAX Options – MIAX Product Feed (MPF) Retransmission Service Address and Port Information

MIAX MPF B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
24	B	199.168.153.166	53197

MIAX Options Disaster Recovery Multicast Address Information

MIAX Options Disaster Recovery Multicast Address Summary:

MIAX advertises the full subnets for MIAX Options DR feeds. Please contact MIAX Trading Operations for further details on MIAX Options IP subnetting.

Group: 233.87.168.128/25

Source: 199.168.154.0/24

RP: 199.168.154.249

MIAX Options Disaster Recovery -- Top of Market (ToM) 'A' Feed Multicast Address and Port Information

MIAX DR (CH4) TOM A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	199.168.154.68	233.87.168.128	51001
2	A	199.168.154.68	233.87.168.129	51002
3	A	199.168.154.68	233.87.168.130	51003
4	A	199.168.154.68	233.87.168.131	51004
5	A	199.168.154.68	233.87.168.132	51005
6	A	199.168.154.68	233.87.168.133	51006
7	A	199.168.154.69	233.87.168.134	51007
8	A	199.168.154.69	233.87.168.135	51008
9	A	199.168.154.69	233.87.168.136	51009
10	A	199.168.154.69	233.87.168.137	51010
11	A	199.168.154.69	233.87.168.138	51011
12	A	199.168.154.69	233.87.168.139	51012
13	A	199.168.154.70	233.87.168.140	51013
14	A	199.168.154.70	233.87.168.141	51014
15	A	199.168.154.70	233.87.168.142	51015
16	A	199.168.154.70	233.87.168.143	51016
17	A	199.168.154.70	233.87.168.144	51017
18	A	199.168.154.70	233.87.168.145	51018
19	A	199.168.154.71	233.87.168.146	51019
20	A	199.168.154.71	233.87.168.147	51020
21	A	199.168.154.71	233.87.168.148	51021
22	A	199.168.154.71	233.87.168.149	51022
23	A	199.168.154.71	233.87.168.150	51023
24	A	199.168.154.71	233.87.168.151	51024

MIAX Options Disaster Recovery – Top of Market (ToM) Retransmission Service Address and Port Information

MIAX DR (CH4) TOM A Feed Retransmission			
Cloud	Feed	Destination IP Address	Port
1	A	199.168.154.161	51101
2	A	199.168.154.161	51102
3	A	199.168.154.161	51103
4	A	199.168.154.161	51104
5	A	199.168.154.161	51105
6	A	199.168.154.161	51106
7	A	199.168.154.162	51107
8	A	199.168.154.162	51108
9	A	199.168.154.162	51109
10	A	199.168.154.162	51110
11	A	199.168.154.162	51111
12	A	199.168.154.162	51112
13	A	199.168.154.163	51113
14	A	199.168.154.163	51114
15	A	199.168.154.163	51115
16	A	199.168.154.163	51116
17	A	199.168.154.163	51117
18	A	199.168.154.163	51118
19	A	199.168.154.164	51119
20	A	199.168.154.164	51120
21	A	199.168.154.164	51121
22	A	199.168.154.164	51122
23	A	199.168.154.164	51123
24	A	199.168.154.164	51124

MIAX Options Disaster Recovery Multicast Address Information

MIAX Options Disaster Recovery – MIAX Order (MOR) 'A' Feed Multicast Address and Port Information

MIAX DR (CH4) MOR A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	199.168.154.148	233.87.168.176	51049
2	A	199.168.154.148	233.87.168.177	51050
3	A	199.168.154.148	233.87.168.178	51051
4	A	199.168.154.148	233.87.168.179	51052
5	A	199.168.154.148	233.87.168.180	51053
6	A	199.168.154.148	233.87.168.181	51054
7	A	199.168.154.149	233.87.168.182	51055
8	A	199.168.154.149	233.87.168.183	51056
9	A	199.168.154.149	233.87.168.184	51057
10	A	199.168.154.149	233.87.168.185	51058
11	A	199.168.154.149	233.87.168.186	51059
12	A	199.168.154.149	233.87.168.187	51060
13	A	199.168.154.150	233.87.168.188	51061
14	A	199.168.154.150	233.87.168.189	51062
15	A	199.168.154.150	233.87.168.190	51063
16	A	199.168.154.150	233.87.168.191	51064
17	A	199.168.154.150	233.87.168.192	51065
18	A	199.168.154.150	233.87.168.193	51066
19	A	199.168.154.151	233.87.168.194	51067
20	A	199.168.154.151	233.87.168.195	51068
21	A	199.168.154.151	233.87.168.196	51069
22	A	199.168.154.151	233.87.168.197	51070
23	A	199.168.154.151	233.87.168.198	51071
24	A	199.168.154.151	233.87.168.199	51072

MIAX Options Disaster Recovery – MIAX Order (MOR) Retransmission Service Address and Port Information

MIAX DR (CH4) MOR A Feed Retransmission			
Cloud	Feed	Destination IP Address	Port
1	A	199.168.154.161	51149
2	A	199.168.154.161	51150
3	A	199.168.154.161	51151
4	A	199.168.154.161	51152
5	A	199.168.154.161	51153
6	A	199.168.154.161	51154
7	A	199.168.154.162	51155
8	A	199.168.154.162	51156
9	A	199.168.154.162	51157
10	A	199.168.154.162	51158
11	A	199.168.154.162	51159
12	A	199.168.154.162	51160
13	A	199.168.154.163	51161
14	A	199.168.154.163	51162
15	A	199.168.154.163	51163
16	A	199.168.154.163	51164
17	A	199.168.154.163	51165
18	A	199.168.154.163	51166
19	A	199.168.154.164	51167
20	A	199.168.154.164	51168
21	A	199.168.154.164	51169
22	A	199.168.154.164	51170
23	A	199.168.154.164	51171
24	A	199.168.154.164	51172

MIAX Options Disaster Recovery Multicast Address Information

MIAX Options Disaster Recovery – Complex Top of Market (cToM) ‘A’ Feed Multicast Address and Port Information

MIAX DR (CH4) CTOM A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	199.168.154.148	233.87.168.200	51073
2	A	199.168.154.148	233.87.168.201	51074
3	A	199.168.154.148	233.87.168.202	51075
4	A	199.168.154.148	233.87.168.203	51076
5	A	199.168.154.148	233.87.168.204	51077
6	A	199.168.154.148	233.87.168.205	51078
7	A	199.168.154.149	233.87.168.206	51079
8	A	199.168.154.149	233.87.168.207	51080
9	A	199.168.154.149	233.87.168.208	51081
10	A	199.168.154.149	233.87.168.209	51082
11	A	199.168.154.149	233.87.168.210	51083
12	A	199.168.154.149	233.87.168.211	51084
13	A	199.168.154.150	233.87.168.212	51085
14	A	199.168.154.150	233.87.168.213	51086
15	A	199.168.154.150	233.87.168.214	51087
16	A	199.168.154.150	233.87.168.215	51088
17	A	199.168.154.150	233.87.168.216	51089
18	A	199.168.154.150	233.87.168.217	51090
19	A	199.168.154.151	233.87.168.218	51091
20	A	199.168.154.151	233.87.168.219	51092
21	A	199.168.154.151	233.87.168.220	51093
22	A	199.168.154.151	233.87.168.221	51094
23	A	199.168.154.151	233.87.168.222	51095
24	A	199.168.154.151	233.87.168.223	51096

MIAX Options Disaster Recovery – Complex Top of Market (cToM) Retransmission Service Address and Port Information

MIAX DR (CH4) CTOM A Feed Retransmission			
Cloud	Feed	Destination IP Address	Port
1	A	199.168.154.161	51173
2	A	199.168.154.161	51174
3	A	199.168.154.161	51175
4	A	199.168.154.161	51176
5	A	199.168.154.161	51177
6	A	199.168.154.161	51178
7	A	199.168.154.162	51179
8	A	199.168.154.162	51180
9	A	199.168.154.162	51181
10	A	199.168.154.162	51182
11	A	199.168.154.162	51183
12	A	199.168.154.162	51184
13	A	199.168.154.163	51185
14	A	199.168.154.163	51186
15	A	199.168.154.163	51187
16	A	199.168.154.163	51188
17	A	199.168.154.163	51189
18	A	199.168.154.163	51190
19	A	199.168.154.164	51191
20	A	199.168.154.164	51192
21	A	199.168.154.164	51193
22	A	199.168.154.164	51194
23	A	199.168.154.164	51195
24	A	199.168.154.164	51196

MIAX Options Disaster Recovery Multicast Address Information

MIAX Options Disaster Recovery – Administrative Information Subscriber (AIS) 'A' Feed Multicast Address and Port Information

MIAX DR (CH4) AIS A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	199.168.154.68	233.87.168.152	51025
2	A	199.168.154.68	233.87.168.153	51026
3	A	199.168.154.68	233.87.168.154	51027
4	A	199.168.154.68	233.87.168.155	51028
5	A	199.168.154.68	233.87.168.156	51029
6	A	199.168.154.68	233.87.168.157	51030
7	A	199.168.154.69	233.87.168.158	51031
8	A	199.168.154.69	233.87.168.159	51032
9	A	199.168.154.69	233.87.168.160	51033
10	A	199.168.154.69	233.87.168.161	51034
11	A	199.168.154.69	233.87.168.162	51035
12	A	199.168.154.69	233.87.168.163	51036
13	A	199.168.154.70	233.87.168.164	51037
14	A	199.168.154.70	233.87.168.165	51038
15	A	199.168.154.70	233.87.168.166	51039
16	A	199.168.154.70	233.87.168.167	51040
17	A	199.168.154.70	233.87.168.168	51041
18	A	199.168.154.70	233.87.168.169	51042
19	A	199.168.154.71	233.87.168.170	51043
20	A	199.168.154.71	233.87.168.171	51044
21	A	199.168.154.71	233.87.168.172	51045
22	A	199.168.154.71	233.87.168.173	51046
23	A	199.168.154.71	233.87.168.174	51047
24	A	199.168.154.71	233.87.168.175	51048

MIAX Options Disaster Recovery – Administrative Information Subscriber (AIS) Retransmission Service

Address and Port Information

MIAX DR (CH4) AIS A Feed Retransmission			
Cloud	Feed	Destination IP Address	Port
1	A	199.168.154.161	51125
2	A	199.168.154.161	51126
3	A	199.168.154.161	51127
4	A	199.168.154.161	51128
5	A	199.168.154.161	51129
6	A	199.168.154.161	51130
7	A	199.168.154.162	51131
8	A	199.168.154.162	51132
9	A	199.168.154.162	51133
10	A	199.168.154.162	51134
11	A	199.168.154.162	51135
12	A	199.168.154.162	51136
13	A	199.168.154.163	51137
14	A	199.168.154.163	51138
15	A	199.168.154.163	51139
16	A	199.168.154.163	51140
17	A	199.168.154.163	51141
18	A	199.168.154.163	51142
19	A	199.168.154.164	51143
20	A	199.168.154.164	51144
21	A	199.168.154.164	51145
22	A	199.168.154.164	51146
23	A	199.168.154.164	51147
24	A	199.168.154.164	51148

MIAX Options Disaster Recovery Multicast Address Information

MIAX Options Disaster Recovery – MIAX Product Feed (MPF) 'A' Feed Multicast Address and Port Information

MIAX DR (CH4) MPF A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
24	A	199.168.154.151	233.87.168.224	51097

MIAX Options Disaster Recovery – MIAX Product Feed (MPF) Retransmission Service Address and Port Information

MIAX DR (CH4) MPF A Feed Retransmission			
Cloud	Feed	Destination IP Address	Port
24	A	199.168.154.164	51197

MIAX Options Firm Test Bed 1 Address Information

MIAX Options Test Bed Multicast Address Summary:

MIAX advertises the full subnets for MIAX Options Test Beds. Please contact MIAX Trading Operations for further details on MIAX Options IP subnetting.

Group: See Below

Source: 199.168.155.32/28

RP: 199.168.152.249

MIAX Options Firm Test Bed 1 (Current Production Version)					
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port
TOM Cloud 1	1	199.168.155.33		224.0.105.61	60995
TOM Cloud 2	2	199.168.155.33		224.0.105.61	60996
TMR Cloud 1	1	199.168.155.33	60997		
TMR Cloud 2	2	199.168.155.33	60998		
AIS Cloud 1	1	199.168.155.33		224.0.105.59	60993
AIS Cloud 2	2	199.168.155.33		224.0.105.59	60994
AIR Cloud 1	1	199.168.155.33	60991		
AIR Cloud 2	2	199.168.155.33	60992		
MOR Cloud 1	1	199.168.155.33		224.0.105.57	60987
MOR Cloud 2	2	199.168.155.33		224.0.105.57	60988
MRR Cloud 1	1	199.168.155.33	60989		
MRR Cloud 2	2	199.168.155.33	60990		
CTOM Cloud 1	1	199.168.155.33		224.0.105.126	60983
CTOM Cloud 2	2	199.168.155.33		224.0.105.126	60984
CTMR Cloud 1	1	199.168.155.33	60985		
CTMR Cloud 2	2	199.168.155.33	60986		
MPF Cloud 1	1	199.168.155.33		224.0.105.61	60980
MPFR Cloud 1	2	199.168.155.33			

MIAX Options Firm Test Bed 2 Address Information

MIAX Options Firm Test Bed 2 (Future Production Version)					
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port
TOM Cloud 1	1	199.168.155.41		224.0.105.62	60995
TOM Cloud 2	2	199.168.155.41		224.0.105.62	60996
TMR Cloud 1	1	199.168.155.41	60997		
TMR Cloud 2	2	199.168.155.41	60998		
AIS Cloud 1	1	199.168.155.41		224.0.105.60	60993
AIS Cloud 2	2	199.168.155.41		224.0.105.60	60994
AIR Cloud 1	1	199.168.155.41	60991		
AIR Cloud 2	2	199.168.155.41	60992		
MOR Cloud 1	1	199.168.155.41		224.0.105.58	60987
MOR Cloud 2	2	199.168.155.41		224.0.105.58	60988
MRR Cloud 1	1	199.168.155.41	60989		
MRR Cloud 2	2	199.168.155.41	60990		
CTOM Cloud 1	1	199.168.155.41		224.0.105.127	60983
CTOM Cloud 2	2	199.168.155.41		224.0.105.127	60984
CTMR Cloud 1	1	199.168.155.41	60985		
CTMR Cloud 2	2	199.168.155.41	60986		
MPF Cloud 1	1	199.168.155.41		224.0.105.60	60980
MPFR Cloud 1	2	199.168.155.41	60981		

Appendix B: MIAx Pearl Options Services Address Information

MIAx Pearl Options -- Top of Market (ToM) 'A' Feed Multicast Address and Port Information

Group: 224.0.141.0/26

Source: 199.168.156.128/28

RP: 199.168.156.249

Pearl Options TOM A Feed				
Cloud Feed	Source IP	Multicast Group	Multicast Port	
1	A	199.168.156.131	224.0.141.1	57001
2	A	199.168.156.132	224.0.141.2	57002
3	A	199.168.156.133	224.0.141.3	57003
4	A	199.168.156.134	224.0.141.4	57004
5	A	199.168.156.135	224.0.141.5	57005
6	A	199.168.156.136	224.0.141.6	57006
7	A	199.168.156.137	224.0.141.7	57007
8	A	199.168.156.138	224.0.141.8	57008
9	A	199.168.156.139	224.0.141.9	57009
10	A	199.168.156.140	224.0.141.10	57010
11	A	199.168.156.141	224.0.141.11	57011
12	A	199.168.156.142	224.0.141.12	57012

MIAX Pearl Options -- Top of Market (ToM) 'B' Feed Multicast Address and Port Information

Group: 233.87.168.0/26

Source: 199.168.157.128/28

RP: 199.168.157.249

Pearl Options TOM B Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	B	199.168.157.131	233.87.168.1	58001
2	B	199.168.157.132	233.87.168.2	58002
3	B	199.168.157.133	233.87.168.3	58003
4	B	199.168.157.134	233.87.168.4	58004
5	B	199.168.157.135	233.87.168.5	58005
6	B	199.168.157.136	233.87.168.6	58006
7	B	199.168.157.137	233.87.168.7	58007
8	B	199.168.157.138	233.87.168.8	58008
9	B	199.168.157.139	233.87.168.9	58009
10	B	199.168.157.140	233.87.168.10	58010
11	B	199.168.157.141	233.87.168.11	58011
12	B	199.168.157.142	233.87.168.12	58012

MIAX Pearl Options Production Retransmission Service Address Information

MIAX Pearl Options – Top of Market (ToM) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.156.160/28

Pearl Options TOM A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.156.164	57101
2	A	199.168.156.164	57102
3	A	199.168.156.164	57103
4	A	199.168.156.165	57104
5	A	199.168.156.165	57105
6	A	199.168.156.165	57106
7	A	199.168.156.166	57107
8	A	199.168.156.166	57108
9	A	199.168.156.166	57109
10	A	199.168.156.167	57110
11	A	199.168.156.167	57111
12	A	199.168.156.167	57112

Retransmission Subnet: 199.168.157.160/28

Pearl Options TOM B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	199.168.157.164	58101
2	B	199.168.157.164	58102
3	B	199.168.157.164	58103
4	B	199.168.157.165	58104
5	B	199.168.157.165	58105
6	B	199.168.157.165	58106
7	B	199.168.157.166	58107
8	B	199.168.157.166	58108
9	B	199.168.157.166	58109
10	B	199.168.157.167	58110
11	B	199.168.157.167	58111
12	B	199.168.157.167	58112

MIAX Pearl Options Production Multicast Address Information

MIAX Pearl Options -- Pearl Liquidity Feed (PLF) 'A' Feed Multicast Address and Port Information

Group: 224.0.141.64/26

Source: 199.168.156.144/28

RP: 199.168.156.249

Pearl Options PLF A Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.156.145	224.0.141.64	57049
2	A	199.168.156.146	224.0.141.65	57050
3	A	199.168.156.147	224.0.141.66	57051
4	A	199.168.156.148	224.0.141.67	57052
5	A	199.168.156.149	224.0.141.68	57053
6	A	199.168.156.150	224.0.141.69	57054
7	A	199.168.156.151	224.0.141.70	57055
8	A	199.168.156.152	224.0.141.71	57056
9	A	199.168.156.153	224.0.141.72	57057
10	A	199.168.156.154	224.0.141.73	57058
11	A	199.168.156.155	224.0.141.74	57059
12	A	199.168.156.156	224.0.141.75	57060

MIAX Pearl Options -- Pearl Liquidity Feed (PLF) 'B' Feed Multicast Address and Port Information

Group: 233.87.168.64/26

Source: 199.168.157.144/28

RP: 199.168.157.249

Pearl Options PLF B Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	B	199.168.157.145	233.87.168.64	58049
2	B	199.168.157.146	233.87.168.65	58050
3	B	199.168.157.147	233.87.168.66	58051
4	B	199.168.157.148	233.87.168.67	58052
5	B	199.168.157.149	233.87.168.68	58053
6	B	199.168.157.150	233.87.168.69	58054
7	B	199.168.157.151	233.87.168.70	58055
8	B	199.168.157.152	233.87.168.71	58056
9	B	199.168.157.153	233.87.168.72	58057
10	B	199.168.157.154	233.87.168.73	58058
11	B	199.168.157.155	233.87.168.74	58059
12	B	199.168.157.156	233.87.168.75	58060

MIAX Pearl Options Production Retransmission Service Address Information

MIAX Pearl Options -- Pearl Liquidity Feed (PLF) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.156.160/28

Pearl Options PLF A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.156.164	57149
2	A	199.168.156.164	57150
3	A	199.168.156.164	57151
4	A	199.168.156.165	57152
5	A	199.168.156.165	57153
6	A	199.168.156.165	57154
7	A	199.168.156.166	57155
8	A	199.168.156.166	57156
9	A	199.168.156.166	57157
10	A	199.168.156.167	57158
11	A	199.168.156.167	57159
12	A	199.168.156.167	57160

Retransmission Subnet: 199.168.157.160/28

Pearl Options PLF B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	199.168.157.164	58149
2	B	199.168.157.164	58150
3	B	199.168.157.164	58151
4	B	199.168.157.165	58152
5	B	199.168.157.165	58153
6	B	199.168.157.165	58154
7	B	199.168.157.166	58155
8	B	199.168.157.166	58156
9	B	199.168.157.166	58157
10	B	199.168.157.167	58158
11	B	199.168.157.167	58159
12	B	199.168.157.167	58160

MIAX Pearl Options Disaster Recovery Multicast Address Information

MIAX Pearl Options DR -- Top of Market (ToM) 'A' Feed Multicast Address and Port Information

Group: 233.87.168.224/27

Source: 199.168.154.0/24

RP: 199.168.154.249

Pearl Options ToM Feed (CH4 DR)				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.154.84	233.87.168.224	57001
2	A	199.168.154.84	233.87.168.225	57002
3	A	199.168.154.84	233.87.168.226	57003
4	A	199.168.154.84	233.87.168.227	57004
5	A	199.168.154.85	233.87.168.228	57005
6	A	199.168.154.85	233.87.168.229	57006
7	A	199.168.154.85	233.87.168.230	57007
8	A	199.168.154.85	233.87.168.231	57008
9	A	199.168.154.86	233.87.168.232	57009
10	A	199.168.154.86	233.87.168.233	57010
11	A	199.168.154.86	233.87.168.234	57011
12	A	199.168.154.86	233.87.168.235	57012

MIAX Pearl Options DR -- Top of Market (ToM) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.154.224/29

Pearl Options ToM Retransmission Service (CH4 DR)			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.154.228	57101
2	A	199.168.154.228	57102
3	A	199.168.154.228	57103
4	A	199.168.154.228	57104
5	A	199.168.154.229	57105
6	A	199.168.154.229	57106
7	A	199.168.154.229	57107
8	A	199.168.154.229	57108
9	A	199.168.154.230	57109
10	A	199.168.154.230	57110
11	A	199.168.154.230	57111
12	A	199.168.154.230	57112

MIAX Pearl Options DR – Pearl Liquidity Feed (PLF) ‘A’ Feed Multicast Address and Port Information

Group: 233.87.168.224/27

Source: 199.168.154.0/24

RP: 199.168.154.249

Pearl Options PLF Feed (CH4 DR)				
Cloud Feed	Source IP	Multicast Group	Multicast Port	
1	A	199.168.154.84	233.87.168.236	57049
2	A	199.168.154.84	233.87.168.237	57050
3	A	199.168.154.84	233.87.168.238	57051
4	A	199.168.154.84	233.87.168.239	57052
5	A	199.168.154.85	233.87.168.240	57053
6	A	199.168.154.85	233.87.168.241	57054
7	A	199.168.154.85	233.87.168.242	57055
8	A	199.168.154.85	233.87.168.243	57056
9	A	199.168.154.86	233.87.168.244	57057
10	A	199.168.154.86	233.87.168.245	57058
11	A	199.168.154.86	233.87.168.246	57059
12	A	199.168.154.86	233.87.168.247	57060

MIAX Pearl DR - Pearl Liquidity Feed (PLF) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.154.224/29

Pearl PLF Retransmission Service (CH4 DR)			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.154.228	57149
2	A	199.168.154.228	57150
3	A	199.168.154.228	57151
4	A	199.168.154.228	57152
5	A	199.168.154.229	57153
6	A	199.168.154.229	57154
7	A	199.168.154.229	57155
8	A	199.168.154.229	57156
9	A	199.168.154.230	57157
10	A	199.168.154.230	57158
11	A	199.168.154.230	57159
12	A	199.168.154.230	57160

MIAX Pearl Options Firm Test Bed 1 Address Information

MIAX Pearl Options Test Bed Multicast Address Summary:

Group: 233.105.122.240/28

Source: 199.168.156.240/29

RP: 199.168.156.246

Pearl Options Firm Test Bed 1					
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port
TOM Cloud 1	1	199.168.156.241		233.105.122.248	60995
TOM Cloud 2	2	199.168.156.241		233.105.122.248	60996
TMR Cloud 1	1	199.168.156.241	60997		
TMR Cloud 2	2	199.168.156.241	60998		
PLF Cloud 1	1	199.168.156.241		233.105.122.249	60987
PLF Cloud 2	2	199.168.156.241		233.105.122.249	60988
PLFR Cloud 1	1	199.168.156.241	60989		
PLFR Cloud 2	2	199.168.156.241	60990		

MIAX Pearl Options Firm Test Bed 2 Address Information

MIAX Pearl Options Test Bed Multicast Address Summary:

Group: 233.105.122.240/28

Source: 199.168.156.240/29

RP: 199.168.156.246

Pearl Options Firm Test Bed 2					
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port
TOM Cloud 1	1	199.168.156.242		233.105.122.250	60995
TOM Cloud 2	2	199.168.156.242		233.105.122.250	60996
TMR Cloud 1	1	199.168.156.242	60997		
TMR Cloud 2	2	199.168.156.242	60998		
PLF Cloud 1	1	199.168.156.242		233.105.122.251	60987
PLF Cloud 2	2	199.168.156.242		233.105.122.251	60988
PLFR Cloud 1	1	199.168.156.242	60989		
PLFR Cloud 2	2	199.168.156.242	60990		

Appendix C: MIAx Emerald Services Address Information

MIAx Emerald -- Top of Market (ToM) 'A' Feed Multicast Address and Port Information

Group: 224.0.141.128/28

Source: 199.168.158.64/28

RP: 199.168.155.224

EMERALD TOM A Feed				
Cloud Feed	Source IP	Multicast Group	Multicast Port	
1	A	199.168.158.65	224.0.141.128	51001
2	A	199.168.158.66	224.0.141.129	51002
3	A	199.168.158.67	224.0.141.130	51003
4	A	199.168.158.68	224.0.141.131	51004
5	A	199.168.158.69	224.0.141.132	51005
6	A	199.168.158.70	224.0.141.133	51006
7	A	199.168.158.71	224.0.141.134	51007
8	A	199.168.158.72	224.0.141.135	51008
9	A	199.168.158.73	224.0.141.136	51009
10	A	199.168.158.74	224.0.141.137	51010
11	A	199.168.158.75	224.0.141.138	51011
12	A	199.168.158.76	224.0.141.139	51012

MIAX Emerald Production Multicast Address Information

MIAX Emerald -- Top of Market (ToM) 'B' Feed Multicast Address and Port Information

Group: 224.0.142.128/28

Source: 199.168.158.192/28

RP: 199.168.155.240

EMERALD TOM B Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	B	199.168.158.193	224.0.142.128	53001
2	B	199.168.158.194	224.0.142.129	53002
3	B	199.168.158.195	224.0.142.130	53003
4	B	199.168.158.196	224.0.142.131	53004
5	B	199.168.158.197	224.0.142.132	53005
6	B	199.168.158.198	224.0.142.133	53006
7	B	199.168.158.199	224.0.142.134	53007
8	B	199.168.158.200	224.0.142.135	53008
9	B	199.168.158.201	224.0.142.136	53009
10	B	199.168.158.202	224.0.142.137	53010
11	B	199.168.158.203	224.0.142.138	53011
12	B	199.168.158.204	224.0.142.139	53012

MIAX Emerald Production Retransmission Service Address Information

MIAX Emerald -- Top of Market (ToM) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.158.112/28

EMERALD TOM A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.158.113	51101
2	A	199.168.158.113	51102
3	A	199.168.158.113	51103
4	A	199.168.158.113	51104
5	A	199.168.158.114	51105
6	A	199.168.158.114	51106
7	A	199.168.158.114	51107
8	A	199.168.158.114	51108
9	A	199.168.158.115	51109
10	A	199.168.158.115	51110
11	A	199.168.158.115	51111
12	A	199.168.158.115	51112

Retransmission Subnet: 199.168.158.240/28

EMERALD TOM B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	199.168.158.241	53101
2	B	199.168.158.241	53102
3	B	199.168.158.241	53103
4	B	199.168.158.241	53104
5	B	199.168.158.242	53105
6	B	199.168.158.242	53106
7	B	199.168.158.242	53107
8	B	199.168.158.242	53108
9	B	199.168.158.243	53109
10	B	199.168.158.243	53110
11	B	199.168.158.243	53111
12	B	199.168.158.243	53112

MIAX Emerald Production Multicast Address Information

MIAX Emerald – MIAX ORder Feed (MOR) 'A' Feed Multicast Address and Port Information

Group: 224.0.141.160/28

Source: 199.168.158.80/28

RP: 199.168.155.224

EMERALD MOR A Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.158.80	224.0.141.160	51049
2	A	199.168.158.81	224.0.141.161	51050
3	A	199.168.158.82	224.0.141.162	51051
4	A	199.168.158.83	224.0.141.163	51052
5	A	199.168.158.84	224.0.141.164	51053
6	A	199.168.158.85	224.0.141.165	51054
7	A	199.168.158.86	224.0.141.166	51055
8	A	199.168.158.87	224.0.141.167	51056
9	A	199.168.158.88	224.0.141.168	51057
10	A	199.168.158.89	224.0.141.169	51058
11	A	199.168.158.90	224.0.141.170	51059
12	A	199.168.158.91	224.0.141.171	51060

MIAX Emerald Production Multicast Address Information

MIAX Emerald – MIAX ORder Feed (MOR) 'B' Feed Multicast Address and Port Information

Group: 224.0.142.160/28

Source: 199.168.158.208/28

RP: 199.168.155.240

EMERALD MOR B Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	B	199.168.158.208	224.0.142.160	53049
2	B	199.168.158.209	224.0.142.161	53050
3	B	199.168.158.210	224.0.142.162	53051
4	B	199.168.158.211	224.0.142.163	53052
5	B	199.168.158.212	224.0.142.164	53053
6	B	199.168.158.213	224.0.142.165	53054
7	B	199.168.158.214	224.0.142.166	53055
8	B	199.168.158.215	224.0.142.167	53056
9	B	199.168.158.216	224.0.142.168	53057
10	B	199.168.158.217	224.0.142.169	53058
11	B	199.168.158.218	224.0.142.170	53059
12	B	199.168.158.219	224.0.142.171	53060

MIAX Emerald Production Retransmission Service Address Information

MIAX Emerald – MIAX Order Feed (MOR) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.158.112/28

EMERALD MOR A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.158.113	51149
2	A	199.168.158.113	51150
3	A	199.168.158.113	51151
4	A	199.168.158.113	51152
5	A	199.168.158.114	51153
6	A	199.168.158.114	51154
7	A	199.168.158.114	51155
8	A	199.168.158.114	51156
9	A	199.168.158.115	51157
10	A	199.168.158.115	51158
11	A	199.168.158.115	51159
12	A	199.168.158.115	51160

Retransmission Subnet: 199.168.158.240/28

EMERALD MOR B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	199.168.158.241	53149
2	B	199.168.158.241	53150
3	B	199.168.158.241	53151
4	B	199.168.158.241	53152
5	B	199.168.158.242	53153
6	B	199.168.158.242	53154
7	B	199.168.158.242	53155
8	B	199.168.158.242	53156
9	B	199.168.158.243	53157
10	B	199.168.158.243	53158
11	B	199.168.158.243	53159
12	B	199.168.158.243	53160

MIAX Emerald Production Multicast Address Information

MIAX Emerald – Complex Top of Market (cToM) 'A' Feed Multicast Address and Port Information

Group: 224.0.141.176/28

Source: 199.168.158.80/28

RP: 199.168.155.224

EMERALD cToM A Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.158.80	224.0.141.176	51073
2	A	199.168.158.81	224.0.141.177	51074
3	A	199.168.158.82	224.0.141.178	51075
4	A	199.168.158.83	224.0.141.179	51076
5	A	199.168.158.84	224.0.141.180	51077
6	A	199.168.158.85	224.0.141.181	51078
7	A	199.168.158.86	224.0.141.182	51079
8	A	199.168.158.87	224.0.141.183	51080
9	A	199.168.158.88	224.0.141.184	51081
10	A	199.168.158.89	224.0.141.185	51082
11	A	199.168.158.90	224.0.141.186	51083
12	A	199.168.158.91	224.0.141.187	51084

MIAX Emerald Production Multicast Address Information

MIAX Emerald – Complex Top of Market (cToM) ‘B’ Feed Multicast Address and Port Information

Group: 224.0.142.176/28

Source: 199.168.158.208/28

RP: 199.168.155.240

EMERALD cToM B Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	B	199.168.158.208	224.0.142.176	53073
2	B	199.168.158.209	224.0.142.177	53074
3	B	199.168.158.210	224.0.142.178	53075
4	B	199.168.158.211	224.0.142.179	53076
5	B	199.168.158.212	224.0.142.180	53077
6	B	199.168.158.213	224.0.142.181	53078
7	B	199.168.158.214	224.0.142.182	53079
8	B	199.168.158.215	224.0.142.183	53080
9	B	199.168.158.216	224.0.142.184	53081
10	B	199.168.158.217	224.0.142.185	53082
11	B	199.168.158.218	224.0.142.186	53083
12	B	199.168.158.219	224.0.142.187	53084

MIAX Emerald Production Retransmission Service Address Information

MIAX Emerald -- Complex Top of Market (cToM) Service Address and Port Information

Retransmission Subnet: 199.168.158.112/28

EMERALD cToM A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.158.113	51173
2	A	199.168.158.113	51174
3	A	199.168.158.113	51175
4	A	199.168.158.113	51176
5	A	199.168.158.114	51177
6	A	199.168.158.114	51178
7	A	199.168.158.114	51179
8	A	199.168.158.114	51180
9	A	199.168.158.115	51181
10	A	199.168.158.115	51182
11	A	199.168.158.115	51183
12	A	199.168.158.115	51184

Retransmission Subnet: 199.168.158.240/28

EMERALD cToM B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	199.168.158.241	53173
2	B	199.168.158.241	53174
3	B	199.168.158.241	53175
4	B	199.168.158.241	53176
5	B	199.168.158.242	53177
6	B	199.168.158.242	53178
7	B	199.168.158.242	53179
8	B	199.168.158.242	53180
9	B	199.168.158.243	53181
10	B	199.168.158.243	53182
11	B	199.168.158.243	53183
12	B	199.168.158.243	53184

MIAX Emerald Production Multicast Address Information

MIAX Emerald – Administrative Information Subscriber (AIS) ‘A’ Feed Multicast Address and Port Information

Group: 224.0.141.144/28

Source: 199.168.158.80/28

RP: 199.168.155.224

EMERALD AIS A Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.158.80	224.0.141.144	51025
2	A	199.168.158.81	224.0.141.145	51026
3	A	199.168.158.82	224.0.141.146	51027
4	A	199.168.158.83	224.0.141.147	51028
5	A	199.168.158.84	224.0.141.148	51029
6	A	199.168.158.85	224.0.141.149	51030
7	A	199.168.158.86	224.0.141.150	51031
8	A	199.168.158.87	224.0.141.151	51032
9	A	199.168.158.88	224.0.141.152	51033
10	A	199.168.158.89	224.0.141.153	51034
11	A	199.168.158.90	224.0.141.154	51035
12	A	199.168.158.91	224.0.141.155	51036

MIAX Emerald Production Multicast Address Information

MIAX Emerald – Administrative Information Subscriber (AIS) ‘B’ Feed Multicast Address and Port Information

Group: 224.0.142.144/28

Source: 199.168.158.208/28

RP: 199.168.155.240

EMERALD AIS B Feed				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	B	199.168.158.208	224.0.142.144	53025
2	B	199.168.158.209	224.0.142.145	53026
3	B	199.168.158.210	224.0.142.146	53027
4	B	199.168.158.211	224.0.142.147	53028
5	B	199.168.158.212	224.0.142.148	53029
6	B	199.168.158.213	224.0.142.149	53030
7	B	199.168.158.214	224.0.142.150	53031
8	B	199.168.158.215	224.0.142.151	53032
9	B	199.168.158.216	224.0.142.152	53033
10	B	199.168.158.217	224.0.142.153	53034
11	B	199.168.158.218	224.0.142.154	53035
12	B	199.168.158.219	224.0.142.155	53036

MIAX Emerald Production Retransmission Service Address Information

MIAX Emerald -- Administrative Information Subscriber (AIS) Service Address and Port Information

Retransmission Subnet: 199.168.158.112/28

EMERALD AIS A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.158.113	51125
2	A	199.168.158.113	51126
3	A	199.168.158.113	51127
4	A	199.168.158.113	51128
5	A	199.168.158.114	51129
6	A	199.168.158.114	51130
7	A	199.168.158.114	51131
8	A	199.168.158.114	51132
9	A	199.168.158.115	51133
10	A	199.168.158.115	51134
11	A	199.168.158.115	51135
12	A	199.168.158.115	51136

Retransmission Subnet: 199.168.158.240/28

EMERALD AIS B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	199.168.158.241	53125
2	B	199.168.158.241	53126
3	B	199.168.158.241	53127
4	B	199.168.158.241	53128
5	B	199.168.158.242	53129
6	B	199.168.158.242	53130
7	B	199.168.158.242	53131
8	B	199.168.158.242	53132
9	B	199.168.158.243	53133
10	B	199.168.158.243	53134
11	B	199.168.158.243	53135
12	B	199.168.158.243	53136

MIAX Emerald Disaster Recovery Multicast Address Information

Multicast Address summary:

Group: 224.0.179.128/25

Source: 199.168.155.192/27

RP: 199.168.154.240

MIAX Emerald Disaster Recovery -- Top of Market (ToM) 'A' Feed Multicast Address and Port Information

Group: 224.0.179.128/28

Source: 199.168.155.192/29

RP: 199.168.154.240

EMERALD Top of Market Quote Feed (CH4 DR)				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.155.193	224.0.179.128	51001
2	A	199.168.155.193	224.0.179.129	51002
3	A	199.168.155.193	224.0.179.130	51003
4	A	199.168.155.193	224.0.179.131	51004
5	A	199.168.155.194	224.0.179.132	51005
6	A	199.168.155.194	224.0.179.133	51006
7	A	199.168.155.194	224.0.179.134	51007
8	A	199.168.155.194	224.0.179.135	51008
9	A	199.168.155.195	224.0.179.136	51009
10	A	199.168.155.195	224.0.179.137	51010
11	A	199.168.155.195	224.0.179.138	51011
12	A	199.168.155.195	224.0.179.139	51012

MIAX Emerald Disaster Recovery -- Top of Market (ToM) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.155.208/29

EMERALD Top of Market Retransmission Service (CH4 DR)			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.155.208	51101
2	A	199.168.155.208	51102
3	A	199.168.155.208	51103
4	A	199.168.155.208	51104
5	A	199.168.155. 208	51105
6	A	199.168.155.208	51106
7	A	199.168.155.209	51107
8	A	199.168.155.209	51108
9	A	199.168.155.209	51109
10	A	199.168.155.209	51110
11	A	199.168.155.209	51111
12	A	199.168.155.209	51112

MIAX Emerald Disaster Recovery Multicast Address Information

MIAX Emerald Disaster Recovery – MIAX Order (MOR) 'A' Feed Multicast Address and Port Information

Group: 224.0.179.160/28

Source: 199.168.155.192/29

RP: 199.168.154.240

EMERALD MOR Feed (CH4 DR)				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.155.193	224.0.179.160	51049
2	A	199.168.155.193	224.0.179.161	51050
3	A	199.168.155.193	224.0.179.162	51051
4	A	199.168.155.193	224.0.179.163	51052
5	A	199.168.155.194	224.0.179.164	51053
6	A	199.168.155.194	224.0.179.165	51054
7	A	199.168.155.194	224.0.179.166	51055
8	A	199.168.155.194	224.0.179.167	51056
9	A	199.168.155.195	224.0.179.168	51057
10	A	199.168.155.195	224.0.179.169	51058
11	A	199.168.155.195	224.0.179.170	51059
12	A	199.168.155.195	224.0.179.171	51060

MIAX Emerald Disaster Recovery – MIAX Order (MOR) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.155.208/29

EMERALD MOR Retransmission Service (CH4 DR)			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.155.208	51149
2	A	199.168.155.208	51150
3	A	199.168.155.208	51151
4	A	199.168.155.208	51152
5	A	199.168.155.208	51153
6	A	199.168.155.208	51154
7	A	199.168.155.209	51155
8	A	199.168.155.209	51156
9	A	199.168.155.209	51157
10	A	199.168.155.209	51158
11	A	199.168.155.209	51159
12	A	199.168.155.209	51160

MIAX Emerald Disaster Recovery Multicast Address Information

MIAX Emerald Disaster Recovery – Complex Top of Market (cToM) ‘A’ Feed Multicast Address and Port Information

Group: 224.0.179.176/28

Source: 199.168.155.192/29

RP: 199.168.154.240

EMERALD cToM (CH4 DR)				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.155.193	224.0.179.176	51073
2	A	199.168.155.193	224.0.179.177	51074
3	A	199.168.155.193	224.0.179.178	51075
4	A	199.168.155.193	224.0.179.179	51076
5	A	199.168.155.194	224.0.179.180	51077
6	A	199.168.155.194	224.0.179.181	51078
7	A	199.168.155.194	224.0.179.182	51079
8	A	199.168.155.194	224.0.179.183	51080
9	A	199.168.155.195	224.0.179.184	51081
10	A	199.168.155.195	224.0.179.185	51082
11	A	199.168.155.195	224.0.179.186	51083
12	A	199.168.155.195	224.0.179.187	51084

MIAX Emerald Disaster Recovery – Complex Top of Market (cToM) Retransmission Service Address and Port Information

Retransmission Subnet: 199.168.155.208/29

EMERALD cToM Retransmission Service (CH4 DR)			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.155.208	51173
2	A	199.168.155.208	51174
3	A	199.168.155.208	51175
4	A	199.168.155.208	51176
5	A	199.168.155.208	51177
6	A	199.168.155.208	51178
7	A	199.168.155.209	51179
8	A	199.168.155.209	51180
9	A	199.168.155.209	51181
10	A	199.168.155.209	51182
11	A	199.168.155.209	51183
12	A	199.168.155.209	51184

MIAX Emerald Disaster Recovery Multicast Address Information

MIAX Emerald Disaster Recovery – Administrative Information Subscriber (AIS) 'A' Feed Multicast

Address and Port Information

Group: 224.0.179.144/28

Source: 199.168.155.192/29

RP: 199.168.154.240

EMERALD AIS Feed (CH4 DR)				
Cloud Feed		Source IP	Multicast Group	Multicast Port
1	A	199.168.155.193	224.0.179.144	51025
2	A	199.168.155.193	224.0.179.145	51026
3	A	199.168.155.193	224.0.179.146	51027
4	A	199.168.155.193	224.0.179.147	51028
5	A	199.168.155.194	224.0.179.148	51029
6	A	199.168.155.194	224.0.179.149	51030
7	A	199.168.155.194	224.0.179.150	51031
8	A	199.168.155.194	224.0.179.151	51032
9	A	199.168.155.195	224.0.179.152	51033
10	A	199.168.155.195	224.0.179.153	51034
11	A	199.168.155.195	224.0.179.154	51035
12	A	199.168.155.195	224.0.179.155	51036

MIAX Emerald Disaster Recovery – Administrative Information Subscriber (AIS) Retransmission Service

Address and Port Information

Retransmission Subnet: 199.168.155.208/29

EMERALD AIS Retransmission Service (CH4 DR)			
Cloud	Feed	Destination IP	Destination Port
1	A	199.168.155.208	51125
2	A	199.168.155.208	51126
3	A	199.168.155.208	51127
4	A	199.168.155.208	51128
5	A	199.168.155.208	51129
6	A	199.168.155.208	51130
7	A	199.168.155.209	51131
8	A	199.168.155.209	51132
9	A	199.168.155.209	51133
10	A	199.168.155.209	51134
11	A	199.168.155.209	51135
12	A	199.168.155.209	51136

MIAX Emerald Firm Test Bed 1 Address Information

Test Bed Multicast Address Summary:

Group: 233.105.122.224/28

Source: 199.168.155.56/29

RP: 199.168.155.50

MIAX Emerald Firm Test Bed 1					
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port
TOM Cloud 1	1	199.168.155.57		233.105.122.224	60995
TOM Cloud 2	2	199.168.155.57		233.105.122.224	60996
TMR Cloud 1	1	199.168.155.57	60997		
TMR Cloud 2	2	199.168.155.57	60998		
AIS Cloud 1	1	199.168.155.57		233.105.122.226	60993
AIS Cloud 2	2	199.168.155.57		233.105.122.226	60994
AIR Cloud 1	1	199.168.155.57	60991		
AIR Cloud 2	2	199.168.155.57	60992		
MOR Cloud 1	1	199.168.155.57		233.105.122.228	60987
MOR Cloud 2	2	199.168.155.57		233.105.122.228	60988
MRR Cloud 1	1	199.168.155.57	60989		
MRR Cloud 2	2	199.168.155.57	60990		
CTOM Cloud 1	1	199.168.155.57		233.105.122.230	60983
CTOM Cloud 2	2	199.168.155.57		233.105.122.230	60984
CTMR Cloud 1	1	199.168.155.57	60985		
CTMR Cloud 2	2	199.168.155.57	60986		

MIAX Emerald Firm Test Bed 2 Address Information

MIAX Emerald Firm Test Bed 2					
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port
TOM Cloud 1	1	199.168.155.58		233.105.122.225	60995
TOM Cloud 2	2	199.168.155.58		233.105.122.225	60996
TMR Cloud 1	1	199.168.155.58	60997		
TMR Cloud 2	2	199.168.155.58	60998		
AIS Cloud 1	1	199.168.155.58		233.105.122.227	60993
AIS Cloud 2	2	199.168.155.58		233.105.122.227	60994
AIR Cloud 1	1	199.168.155.58	60991		
AIR Cloud 2	2	199.168.155.58	60992		
MOR Cloud 1	1	199.168.155.58		233.105.122.229	60987
MOR Cloud 2	2	199.168.155.58		233.105.122.229	60988
MRR Cloud 1	1	199.168.155.58	60989		
MRR Cloud 2	2	199.168.155.58	60990		
CTOM Cloud 1	1	199.168.155.58		233.105.122.231	60983
CTOM Cloud 2	2	199.168.155.58		233.105.122.231	60984
CTMR Cloud 1	1	199.168.155.58	60985		
CTMR Cloud 2	2	199.168.155.58	60986		

Appendix D: MIAX Pearl Equities Exchange Services Address Information

MIAX Pearl Equities Exchange Multicast Address Summary:

MIAX Pearl Equities Exchange advertises the full subnets for MIAX Pearl Equities Exchange A and B feeds. Please contact MIAX Trading Operations for further details on MIAX Options IP subnetting.

A side:

Group: 224.0.176.0/25

Source: 188.209.144.0/25

RP: 199.168.155.225

B side:

Group: 224.0.177.0/25

Source: 188.209.145.0/25

RP: 199.168.155.241

MIAX Pearl Equities Exchange Production Multicast Address Information

MIAX Pearl Equities Exchange – Top of Market (TOM) A Feed Service Addresses and Port Information

Group: 224.0.176.0/27

Source: 188.209.144.32/27

RP: 199.168.155.225

MIAX Pearl Equities Exchange TOM A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	188.209.144.32	224.0.176.1	55001
2	A	188.209.144.44	224.0.176.2	55002
3	A	188.209.144.33	224.0.176.3	55003
4	A	188.209.144.45	224.0.176.4	55004
5	A	188.209.144.34	224.0.176.5	55005
6	A	188.209.144.46	224.0.176.6	55006
7	A	188.209.144.35	224.0.176.7	55007
8	A	188.209.144.47	224.0.176.8	55008
9	A	188.209.144.36	224.0.176.9	55009
10	A	188.209.144.48	224.0.176.10	55010
11	A	188.209.144.37	224.0.176.11	55011
12	A	188.209.144.49	224.0.176.12	55012
13	A	188.209.144.38	224.0.176.13	55013
14	A	188.209.144.50	224.0.176.14	55014
15	A	188.209.144.39	224.0.176.15	55015
16	A	188.209.144.51	224.0.176.16	55016
17	A	188.209.144.40	224.0.176.17	55017
18	A	188.209.144.52	224.0.176.18	55018
19	A	188.209.144.41	224.0.176.19	55019
20	A	188.209.144.53	224.0.176.20	55020
21	A	188.209.144.42	224.0.176.21	55021
22	A	188.209.144.54	224.0.176.22	55022
23	A	188.209.144.43	224.0.176.23	55023
24	A	188.209.144.55	224.0.176.24	55024

MIAX Pearl Equities Exchange Production Multicast Address Information

MIAX Pearl Equities Exchange – Top of Market (TOM) B Feed Service Addresses and Port Information

Group: 224.0.177.0/27

Source: 188.209.145.32/27

RP: 199.168.155.241

MIAX Pearl Equities Exchange TOM B Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	B	188.209.145.32	224.0.177.1	56001
2	B	188.209.145.44	224.0.177.2	56002
3	B	188.209.145.33	224.0.177.3	56003
4	B	188.209.145.45	224.0.177.4	56004
5	B	188.209.145.34	224.0.177.5	56005
6	B	188.209.145.46	224.0.177.6	56006
7	B	188.209.145.35	224.0.177.7	56007
8	B	188.209.145.47	224.0.177.8	56008
9	B	188.209.145.36	224.0.177.9	56009
10	B	188.209.145.48	224.0.177.10	56010
11	B	188.209.145.37	224.0.177.11	56011
12	B	188.209.145.49	224.0.177.12	56012
13	B	188.209.145.38	224.0.177.13	56013
14	B	188.209.145.50	224.0.177.14	56014
15	B	188.209.145.39	224.0.177.15	56015
16	B	188.209.145.51	224.0.177.16	56016
17	B	188.209.145.40	224.0.177.17	56017
18	B	188.209.145.52	224.0.177.18	56018
19	B	188.209.145.41	224.0.177.19	56019
20	B	188.209.145.53	224.0.177.20	56020
21	B	188.209.145.42	224.0.177.21	56021
22	B	188.209.145.54	224.0.177.22	56022
23	B	188.209.145.43	224.0.177.23	56023
24	B	188.209.145.55	224.0.177.24	56024

MIAX Pearl Equities Exchange Production Multicast Address Information

MIAX Pearl Equities Exchange – Depth of Market (DOM) A Feed Service Addresses and Port Information

Group: 224.0.176.64/27

Source: 188.209.144.64/27

RP: 199.168.155.225

MIAX Pearl Equities Exchange DOM A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	188.209.144.64	224.0.176.65	55065
2	A	188.209.144.76	224.0.176.66	55066
3	A	188.209.144.65	224.0.176.67	55067
4	A	188.209.144.77	224.0.176.68	55068
5	A	188.209.144.66	224.0.176.69	55069
6	A	188.209.144.78	224.0.176.70	55070
7	A	188.209.144.67	224.0.176.71	55071
8	A	188.209.144.79	224.0.176.72	55072
9	A	188.209.144.68	224.0.176.73	55073
10	A	188.209.144.80	224.0.176.74	55074
11	A	188.209.144.69	224.0.176.75	55075
12	A	188.209.144.81	224.0.176.76	55076
13	A	188.209.144.70	224.0.176.77	55077
14	A	188.209.144.82	224.0.176.78	55078
15	A	188.209.144.71	224.0.176.79	55079
16	A	188.209.144.83	224.0.176.80	55080
17	A	188.209.144.72	224.0.176.81	55081
18	A	188.209.144.84	224.0.176.82	55082
19	A	188.209.144.73	224.0.176.83	55083
20	A	188.209.144.85	224.0.176.84	55084
21	A	188.209.144.74	224.0.176.85	55085
22	A	188.209.144.86	224.0.176.86	55086
23	A	188.209.144.75	224.0.176.87	55087
24	A	188.209.144.87	224.0.176.88	55088

MIAX Pearl Equities Exchange Production Multicast Address Information

MIAX Pearl Equities Exchange – Depth of Market (DOM) B Feed Service Addresses and Port Information

Group: 224.0.177.64/27

Source: 188.209.145.64/27

RP: 199.168.155.241

MIAX Pearl Equities Exchange DOM B Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	B	188.209.145.64	224.0.177.65	56065
2	B	188.209.145.76	224.0.177.66	56066
3	B	188.209.145.65	224.0.177.67	56067
4	B	188.209.145.77	224.0.177.68	56068
5	B	188.209.145.66	224.0.177.69	56069
6	B	188.209.145.78	224.0.177.70	56070
7	B	188.209.145.67	224.0.177.71	56071
8	B	188.209.145.79	224.0.177.72	56072
9	B	188.209.145.68	224.0.177.73	56073
10	B	188.209.145.80	224.0.177.74	56074
11	B	188.209.145.69	224.0.177.75	56075
12	B	188.209.145.81	224.0.177.76	56076
13	B	188.209.145.70	224.0.177.77	56077
14	B	188.209.145.82	224.0.177.78	56078
15	B	188.209.145.71	224.0.177.79	56079
16	B	188.209.145.83	224.0.177.80	56080
17	B	188.209.145.72	224.0.177.81	56081
18	B	188.209.145.84	224.0.177.82	56082
19	B	188.209.145.73	224.0.177.83	56083
20	B	188.209.145.85	224.0.177.84	56084
21	B	188.209.145.74	224.0.177.85	56085
22	B	188.209.145.86	224.0.177.86	56086
23	B	188.209.145.75	224.0.177.87	56087
24	B	188.209.145.87	224.0.177.88	56088

MIAX Pearl Equities Exchange Production Retransmission Service Address Information

MIAX Pearl Equities Exchange -- Top of Market (ToM) A Feed Retransmission Service Address and Port Information

Retransmission Subnet: 188.209.144.208/28

MIAX Pearl Equities Exchange TOM A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	188.209.144.209	55301
2	A	188.209.144.209	55302
3	A	188.209.144.209	55303
4	A	188.209.144.209	55304
5	A	188.209.144.210	55305
6	A	188.209.144.210	55306
7	A	188.209.144.210	55307
8	A	188.209.144.210	55308
9	A	188.209.144.211	55309
10	A	188.209.144.211	55310
11	A	188.209.144.211	55311
12	A	188.209.144.211	55312
13	A	188.209.144.212	55313
14	A	188.209.144.212	55314
15	A	188.209.144.212	55315
16	A	188.209.144.212	55316
17	A	188.209.144.213	55317
18	A	188.209.144.213	55318
19	A	188.209.144.213	55319
20	A	188.209.144.213	55320
21	A	188.209.144.214	55321
22	A	188.209.144.214	55322
23	A	188.209.144.214	55323
24	A	188.209.144.214	55324

MIAX Pearl Equities Exchange Production Retransmission Service Address Information

MIAX Pearl Equities Exchange -- Top of Market (ToM) B Feed Retransmission Service Address and Port Information

Retransmission Subnet: 188.209.145.208/28

MIAX Pearl Equities Exchange TOM B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	188.209.145.209	56301
2	B	188.209.145.209	56302
3	B	188.209.145.209	56303
4	B	188.209.145.209	56304
5	B	188.209.145.210	56305
6	B	188.209.145.210	56306
7	B	188.209.145.210	56307
8	B	188.209.145.210	56308
9	B	188.209.145.211	56309
10	B	188.209.145.211	56310
11	B	188.209.145.211	56311
12	B	188.209.145.211	56312
13	B	188.209.145.212	56313
14	B	188.209.145.212	56314
15	B	188.209.145.212	56315
16	B	188.209.145.212	56316
17	B	188.209.145.213	56317
18	B	188.209.145.213	56318
19	B	188.209.145.213	56319
20	B	188.209.145.213	56320
21	B	188.209.145.214	56321
22	B	188.209.145.214	56322
23	B	188.209.145.214	56323
24	B	188.209.145.214	56324

MIAX Pearl Equities Exchange Production Retransmission Service Address Information

MIAX Pearl Equities Exchange -- Depth of Market (DoM) A Feed Retransmission Service Address and Port Information

Retransmission Subnet: 188.209.144.208/28

MIAX Pearl Equities Exchange DOM A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	188.209.144.209	55365
2	A	188.209.144.209	55366
3	A	188.209.144.209	55367
4	A	188.209.144.209	55368
5	A	188.209.144.210	55369
6	A	188.209.144.210	55370
7	A	188.209.144.210	55371
8	A	188.209.144.210	55372
9	A	188.209.144.211	55373
10	A	188.209.144.211	55374
11	A	188.209.144.211	55375
12	A	188.209.144.211	55376
13	A	188.209.144.212	55377
14	A	188.209.144.212	55378
15	A	188.209.144.212	55379
16	A	188.209.144.212	55380
17	A	188.209.144.213	55381
18	A	188.209.144.213	55382
19	A	188.209.144.213	55383
20	A	188.209.144.213	55384
21	A	188.209.144.214	55385
22	A	188.209.144.214	55386
23	A	188.209.144.214	55387
24	A	188.209.144.214	55388

MIAX Pearl Equities Exchange Production Retransmission Service Address Information

MIAX Pearl Equities Exchange -- Depth of Market (DoM) B Feed Retransmission Service Address and Port Information

Retransmission Subnet: 188.209.145.208/28

MIAX Pearl Equities Exchange DOM B Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	B	188.209.145.209	56365
2	B	188.209.145.209	56366
3	B	188.209.145.209	56367
4	B	188.209.145.209	56368
5	B	188.209.145.210	56369
6	B	188.209.145.210	56370
7	B	188.209.145.210	56371
8	B	188.209.145.210	56372
9	B	188.209.145.211	56373
10	B	188.209.145.211	56374
11	B	188.209.145.211	56375
12	B	188.209.145.211	56376
13	B	188.209.145.212	56377
14	B	188.209.145.212	56378
15	B	188.209.145.212	56379
16	B	188.209.145.212	56380
17	B	188.209.145.213	56381
18	B	188.209.145.213	56382
19	B	188.209.145.213	56383
20	B	188.209.145.213	56384
21	B	188.209.145.214	56385
22	B	188.209.145.214	56386
23	B	188.209.145.214	56387
24	B	188.209.145.214	56388

MIAX Pearl Equities Exchange Disaster Recovery Multicast Address Information

MIAX Pearl Equities Exchange Disaster Recovery Multicast Address Summary:

MIAX Pearl Equities Exchange advertises the full subnets for MIAX Pearl Equities Exchange DR feeds. Please contact MIAX Trading Operations for further details on MIAX Options IP subnetting.

Group: 224.0.178.0/25

Source: 188.209.146.0/28

RP: 199.168.157.241

MIAX Pearl Equities Exchange Disaster Recovery Multicast Address Information

MIAX Pearl Equities Exchange Disaster Recovery -- Top of Market (ToM) Multicast Address and Port Information

Group: 224.0.178.0/27

Source: 188.209.146.0/28

RP: 199.168.157.241

MIAX Pearl Equities Exchange DR TOM A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	188.209.146.1	224.0.178.1	55001
2	A	188.209.146.1	224.0.178.2	55002
3	A	188.209.146.1	224.0.178.3	55003
4	A	188.209.146.1	224.0.178.4	55004
5	A	188.209.146.1	224.0.178.5	55005
6	A	188.209.146.1	224.0.178.6	55006
7	A	188.209.146.2	224.0.178.7	55007
8	A	188.209.146.2	224.0.178.8	55008
9	A	188.209.146.2	224.0.178.9	55009
10	A	188.209.146.2	224.0.178.10	55010
11	A	188.209.146.2	224.0.178.11	55011
12	A	188.209.146.2	224.0.178.12	55012
13	A	188.209.146.3	224.0.178.13	55013
14	A	188.209.146.3	224.0.178.14	55014
15	A	188.209.146.3	224.0.178.15	55015
16	A	188.209.146.3	224.0.178.16	55016
17	A	188.209.146.3	224.0.178.17	55017
18	A	188.209.146.3	224.0.178.18	55018
19	A	188.209.146.4	224.0.178.19	55019
20	A	188.209.146.4	224.0.178.20	55020
21	A	188.209.146.4	224.0.178.21	55021
22	A	188.209.146.4	224.0.178.22	55022
23	A	188.209.146.4	224.0.178.23	55023
24	A	188.209.146.4	224.0.178.24	55024

MIAX Pearl Equities Exchange Disaster Recovery Multicast Address Information

MIAX Pearl Equities Exchange Disaster Recovery -- Depth of Market (DoM) Multicast Address and Port Information

Group: 224.0.178.64/27

Source: 188.209.146.0/28

RP: 199.168.157.241

MIAX Pearl Equities Exchange DR DOM A Feed				
Cloud	Feed	Source IP	Multicast Group	Multicast Port
1	A	188.209.146.1	224.0.178.65	55065
2	A	188.209.146.1	224.0.178.66	55066
3	A	188.209.146.1	224.0.178.67	55067
4	A	188.209.146.1	224.0.178.68	55068
5	A	188.209.146.1	224.0.178.69	55069
6	A	188.209.146.1	224.0.178.70	55070
7	A	188.209.146.2	224.0.178.71	55071
8	A	188.209.146.2	224.0.178.72	55072
9	A	188.209.146.2	224.0.178.73	55073
10	A	188.209.146.2	224.0.178.74	55074
11	A	188.209.146.2	224.0.178.75	55075
12	A	188.209.146.2	224.0.178.76	55076
13	A	188.209.146.3	224.0.178.77	55077
14	A	188.209.146.3	224.0.178.78	55078
15	A	188.209.146.3	224.0.178.79	55079
16	A	188.209.146.3	224.0.178.80	55080
17	A	188.209.146.3	224.0.178.81	55081
18	A	188.209.146.3	224.0.178.82	55082
19	A	188.209.146.4	224.0.178.83	55083
20	A	188.209.146.4	224.0.178.84	55084
21	A	188.209.146.4	224.0.178.85	55085
22	A	188.209.146.4	224.0.178.86	55086
23	A	188.209.146.4	224.0.178.87	55087
24	A	188.209.146.4	224.0.178.88	55088

MIAX Pearl Equities Exchange Disaster Recovery Retransmission Service Address Information

MIAX Pearl Equities Exchange Disaster Recovery – Top of Market (ToM) Retransmission Service

Address and Port Information

Retransmission Subnet: 188.209.146.80/28

MIAX Pearl Equities DR (CH4) TOM A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	188.209.146.81	55301
2	A	188.209.146.81	55302
3	A	188.209.146.81	55303
4	A	188.209.146.81	55304
5	A	188.209.146.81	55305
6	A	188.209.146.81	55306
7	A	188.209.146.82	55307
8	A	188.209.146.82	55308
9	A	188.209.146.82	55309
10	A	188.209.146.82	55310
11	A	188.209.146.82	55311
12	A	188.209.146.82	55312
13	A	188.209.146.83	55313
14	A	188.209.146.83	55314
15	A	188.209.146.83	55315
16	A	188.209.146.83	55316
17	A	188.209.146.83	55317
18	A	188.209.146.83	55318
19	A	188.209.146.84	55319
20	A	188.209.146.84	55320
21	A	188.209.146.84	55321
22	A	188.209.146.84	55322
23	A	188.209.146.84	55323
24	A	188.209.146.84	55324

MIAX Pearl Equities Exchange Disaster Recovery Retransmission Service Address Information

MIAX Pearl Equities Exchange Disaster Recovery – Depth of Market (DoM) Retransmission Service

Address and Port Information

Retransmission Subnet: 188.209.146.80/28

MIAX Pearl Equities DR (CH4) DOM A Feed Retransmission			
Cloud	Feed	Destination IP	Destination Port
1	A	188.209.146.81	55365
2	A	188.209.146.81	55366
3	A	188.209.146.81	55367
4	A	188.209.146.81	55368
5	A	188.209.146.81	55369
6	A	188.209.146.81	55370
7	A	188.209.146.82	55371
8	A	188.209.146.82	55372
9	A	188.209.146.82	55373
10	A	188.209.146.82	55374
11	A	188.209.146.82	55375
12	A	188.209.146.82	55376
13	A	188.209.146.83	55377
14	A	188.209.146.83	55378
15	A	188.209.146.83	55379
16	A	188.209.146.83	55380
17	A	188.209.146.83	55381
18	A	188.209.146.83	55382
19	A	188.209.146.84	55383
20	A	188.209.146.84	55384
21	A	188.209.146.84	55385
22	A	188.209.146.84	55386
23	A	188.209.146.84	55387
24	A	188.209.146.84	55388



MIAX Pearl Equities Exchange Firm Test Bed 1 Address Information

Test Bed Multicast Address Summary:

Group: 233.105.122.208/28

Source: 199.168.155.72/29

RP: 199.168.155.77

MIAX Pearl Equities Exchange Firm Test Bed 1 (Current Production Version)										
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port	SesM Protocol Version	SesM Username	SesM Computer ID	Application Protocol	Description
ToM	1	199.168.155.73		233.105.122.208	61001				TOM1.0	TOM Cloud 1
ToM	2	199.168.155.73		233.105.122.208	61002				TOM1.0	TOM Cloud 2
TMR	1	199.168.155.73	61003			1.0	1tr1	1tr1	TOM1.0	TMR Cloud 1
TMR	2	199.168.155.73	61004			1.0	2tr1	2tr1	TOM1.0	TMR Cloud 2
DOM	1	199.168.155.73		233.105.122.209	61005				DOM1.0	DOM Cloud 1
DOM	2	199.168.155.73		233.105.122.209	61006				DOM1.0	DOM Cloud 2
DMR	1	199.168.155.73	61007			1.0	1dr1	1dr1	DOM1.0	DMR Cloud 1
DMR	2	199.168.155.73	61008			1.0	2dr1	2dr1	DOM1.0	DMR Cloud 2



MIAX Pearl Equities Exchange Firm Test Bed 2 Address Information

Test Bed Multicast Address Summary:

Group: 233.105.122.208/28

Source: 199.168.155.72/29

RP: 199.168.155.77

MIAX Pearl Equities Exchange Firm Test Bed 2 (Future Production Version)										
Service	Cloud	Source IP	SesM Port	Multicast Group	Multicast Port	SesM Protocol Version	SesM Username	SesM Computer ID	Application Protocol	Description
ToM	1	199.168.155.74		233.105.122.210	61001				TOM1.0	TOM Cloud 1
ToM	2	199.168.155.74		233.105.122.210	61002				TOM1.0	TOM Cloud 2
TMR	1	199.168.155.74	61003			1.0	1tr1	1tr1	TOM1.0	TMR Cloud 1
TMR	2	199.168.155.74	61004			1.0	2tr1	2tr1	TOM1.0	TMR Cloud 2
DOM	1	199.168.155.74		233.105.122.211	61005				DOM1.0	DOM Cloud 1
DOM	2	199.168.155.74		233.105.122.211	61006				DOM1.0	DOM Cloud 2
DMR	1	199.168.155.74	61007			1.0	1dr1	1dr1	DOM1.0	DMR Cloud 1
DMR	2	199.168.155.74	61008			1.0	2dr1	2dr1	DOM1.0	DMR Cloud 2

Appendix E: Market Data Feed Services Bandwidth Estimates

MIAX provides the following bandwidth estimates to assist firms in assessing their connectivity needs.

Customers are asked to perform their own measurements, both upon initial establishment of connectivity and periodically, to ensure that their connectivity is sized to meet their individualized ongoing needs.

MIAX Options:

Market Data Feed Service	Estimated Peak Bandwidth
Top of Market Feed (ToM)	~6 Gbps
MIAX Order Feed (MOR)	~400 Mbps
Complex Top of Market Feed (cToM)	~400 Mbps
Administrative Information Subscriber Feed (AIS)	~60 Mbps
MIAX Product Feed (MPF)	Nominal

NOTE: The above Estimated Peak Bandwidth metrics are updated periodically and may not necessarily reflect actual production peak rates due to variability in market activity.

MIAX Pearl Options:

Market Data Feed Service	Estimated Peak Bandwidth
Top of Market Feed (ToM)	~3 Gbps
Pearl Liquidity Feed (PLF)	~3 Gbps

NOTE: The above Estimated Peak Bandwidth metrics are updated periodically and may not necessarily reflect actual production peak rates due to variability in market activity.

MIAX Emerald:

Market Data Feed Service	Estimated Peak Bandwidth
Top of Market Feed (ToM)	~6 Gbps
MIAX Emerald Order Feed (MOR)	~400 Mbps
Complex Top of Market Feed (cToM)	~400 Mbps
Administrative Information Subscriber Feed (AIS)	~60 Mbps

NOTE: The above Estimated Peak Bandwidth metrics are updated periodically and may not necessarily reflect actual production peak rates due to variability in market activity.

MIAX Pearl Equities:

Market Data Feed Service	Estimated Peak Bandwidth
Top of Market Feed (ToM)	~3.40 Gbps at 1 ms intervals
Depth of Market Feed (DoM)	~3.49 Gbps at 1 ms intervals

NOTES:

- The above Estimated Peak Bandwidth metrics are updated periodically and may not necessarily reflect actual production peak rates due to variability in market activity.
- The bandwidth estimates are based on outputs at microburst intervals of 1 millisecond.
- Firms must utilize 10G cross connects if consuming the ToM and/or PLF feeds for MIAX Options, MIAX Pearl Options or MIAX Emerald Options. 10G cross connects are required for MIAX Pearl Options ToM and/or PLF feeds as well.

Appendix F: MIAX Contact List

Please visit the MIAX website for the most up-to-date information and contact list.

<http://www.MIAXOptions.com>

or

<http://www.MIAXEquities.com>

Appendix H: Revision History

Revision Date	Version	Description
Oct 11, 2018	3.4	Re-write and updated to include MIAX Emerald.
Oct 31, 2018	3.5	Added MIAX Product Feed (MPF)
Jan 11, 2019	3.6	Adjust Mcast Address for MPF 'B' Feed
June 6, 2019	3.6a	Minor changes
Feb 6, 2020	3.7c	Updated to include MIAX Pearl Equities
May 19, 2020	3.7d	Minor changes
Jul 29, 2020	3.7e	Minor changes to add note for additionally supported 10 Gb optics
Mar 26, 2021	4.1	Remove references to LL and ULL
Jan 3, 2023	4.3	Updates to reflect Shared Extranet Split



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