



# **SMALL EXCHANGE**

Connectivity Guide

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# 0. Revision History

Version	Date	Author	Description
2.0	May 10, 2020	Mike Kantowski	Updated SFTP info Cosmetic changes
2.1	Oct 1, 2020	Mike Kantowski	Added Cert/UAT Market Data 2.0 Channels
2.11	Jan 14, 2021	Mike Kantowski	Added SMO, STIX, S2Y, S30Y

# 1. Introduction

## 1.1 SMFE Environments

The Exchange operates the following customer facing environments:

- Production
- Disaster Recovery
- Certification

## 1.2 SMFE Backbone - ASN 33016

Customers may peer with ASN 33016 at any of our points of presence (POPs). All POPs offer access to all SMFE Environments.

Connected parties have the ability to route traffic to the SMFE Environments in a way that makes sense for their network/infrastructure and business needs. A BGP peering policy that provides preferred routing during normal operations and predictable routing in a failure scenario can be easily developed.

# 2. Connecting to the SMFE Backbone

## 2.1 SMFE POP and Environment Locations

The Exchange maintains Backbone POPs in the following locations:

SMFE POP CODE	Environment	Facility Operator / Name	Location
AB2	Production	CyrusOne / Bldg 2	2805 Diehl Rd - Aurora, IL
NY2	DR, Certification	Equinix / NY2	275 Hartz Way, Secaucus, NJ
CH1		Equinix / CH1	350 E. Cermak, Chicago, IL

## 2.2 Colo Cross Connects

In each location, 10G-LR optics over single-mode fiber cross connects is the standard way to connect to the Exchange. Please contact the Exchange to plan all physical and logical connectivity.

## 2.3 Connect via an extranet provider

The SMFE has partnered with the following extranet providers to offer access to the SMFE Backbone:

- ICE Global Network (SFTI)
- Options IT

## 2.4 Direct Peering Policy

The following high level peering policy applies for all direct peering relationships with the Exchange:

Peers must:

- Support BGP peering
- Support PIM Sparse-mode peering (if receiving multicast market data)

Peers should:

- Peer with a public BGP ASN
- Advertise registered IP addresses to the Exchange

Peers may:

- Request a private ASN with which to peer with the Exchange
- Request RFC1918 allocation from the Exchange

## 3. SMFE Market Data Feed and FIX Order Entry

### 3.1 SMFE Market Data Feed

The Small Exchange Market Data Feed (MDF) provides a “Market by Order” view of market activity and is delivered via industry standard methods:

- PIM Sparse-Mode UDP Multicast
- Redundant and Diverse A/B channels
- SBE based proprietary protocol

There are two Exchange Edge switches in Aurora, and each can supply the A and B feeds as the consumer desires. Edge switches are directly connected to the A and B rendezvous points/SPT devices.

Channel definitions and network information follow in Section 4.

### 3.2 FIX Order Entry and Drop Copy

Orders are entered using a FIX 4.4 based order management API. Order sessions are requested via the Exchange’s external ticketing system (account required):

<https://smallx.atlassian.net/servicedesk/customer/portal/5/group/22/create/62>

FIX Drop Copy sessions are available on request. Drop Copy sessions can be requested via the Exchange’s external ticketing system (account required):

<https://smallx.atlassian.net/servicedesk/customer/portal/5/group/22/create/63>

Link to Small Exchange JIRA Ticketing portal (account required):

<https://smallx.atlassian.net/servicedesk/customer/portal/5>

### 3.3 Download Latest Market Data and FIX Protocol Specs

Download from the Small Exchange Info Hub section of our website:

<https://www.smallexchange.com/hub>

## 4. IP Addressing

### 4.1 Unicast IP Address Summary

All unicast services (Order Entry, Drop copy, Market Data Retrans, QD TCP Market Data)

Production	
<b>204.137.28.0 /25</b>	Summary
204.137.28.0 /27	
204.137.28.32 /27	
204.137.28.64 /27	
204.137.28.96 /27	Not yet deployed

Disaster Recovery	
<b>204.63.168.0 /25</b>	Summary
204.63.168.0 /27	
204.63.168.32 /27	
204.63.168.64 /27	
204.63.168.96 /27	Not yet deployed

Certification	
204.63.170.0 /27	Single prefix

## 4.2 Multicast IP Address Summary

Use this section to create your static RP mappings and understand source network summary blocks.

Production			
A Feeds - RP 204.137.30.253		B Feeds - RP 204.137.30.254	
A Multicast Groups	A Source Networks	B Multicast Groups	B Source Networks
233.247.221.0 /26	204.137.29.0 /26	233.247.221.64 /26	204.137.29.64 /26
Disaster Recovery			
A Feeds - RP 204.63.170.253		B Feeds - RP 204.63.170.254	
A Multicast Groups	A Source Networks	B Multicast Groups	B Source Networks
233.142.36.0 /26	204.63.169.0 /26	233.142.36.64 /26	204.63.169.64 /26
Certification			
A Feeds - RP 204.63.170.251		B Feeds - RP 204.63.170.252	
A Multicast Groups	A Source Networks	B Multicast Groups	B Source Networks
233.142.36.128 /28	204.63.170.32 /28	233.142.36.144 /28	204.63.170.48 /28



## 4.3 Market Data Channels and Services

### 4.3.1 Production

#### Segment 1: SFX, SPRE, SMO, SMGO

##### A Feeds:

Futures Incremental:  
IP: 233.247.221.1  
port: 21001  
source: 204.137.29.[1,2,3]  
Futures Snapshot:  
IP: 233.247.221.2  
port: 21002  
source: 204.137.29.[1,2,3]

##### B Feeds:

Futures Incremental:  
IP: 233.247.221.65  
port: 22001  
source: 204.137.29.[65,66,67]  
Futures Snapshot:  
IP: 233.247.221.66  
port: 22002  
source: 204.137.29.[65,66,67]

##### Retransmission Servers for Segment 1:

IP: 204.137.28.9, 204.137.28.69  
port: 8916

---

#### Segment 2: SM75, STIX, S2Y, S10Y, S30Y

##### A Feeds:

Futures Incremental:  
IP: 233.247.221.3  
port: 21001  
source: 204.137.29.[17,18,19]  
Futures Snapshot:  
IP: 233.247.221.4  
port: 21002  
source: 204.137.29.[17,18,19]

##### B Feeds:

Futures Incremental:  
IP: 233.247.221.67  
port: 22001  
source: 204.137.29.[81,82,83]  
Futures Snapshot:  
IP: 233.247.221.68  
port: 22002  
source: 204.137.29.[81,82,83]

##### Retransmission Servers for Segment 2:

IP: 204.137.28.10, 204.137.28.70  
port: 8916

---

#### Index Feeds:

##### Index Snapshot A Feed:

IP: 233.247.221.5  
port: 21001  
source: 204.137.29.8

##### Index Snapshot B Feed:

IP: 233.247.221.69  
port: 22001  
source: 204.137.29.72

---

#### TCP Market Data in QD Format:

##### Server 1:

IP: 204.137.28.14  
port: 7908

##### Server2:

IP: 204.137.28.44  
port: 7908

## 4.3.2 Disaster Recovery

### Segment 1: SFX, SPRE, SMO, SMGO

#### A Feeds:

Futures Incremental:  
IP: 233.142.36.1  
port: 21001  
source: 204.63.169.[1,2,3]  
Futures Snapshot:  
IP: 233.142.36.2  
port: 21002  
source: 204.63.169.[1,2,3]

#### B Feeds:

Futures Incremental:  
IP: 233.142.36.65  
port: 22001  
source: 204.63.169.[65,66,67]  
Futures Snapshot:  
IP: 233.142.36.66  
port: 22002  
source: 204.63.169.[65,66,67]

#### Retransmission Servers for Segment 1:

IP: 204.63.168.4, 204.63.168.68  
port: 8916

---

### Segment 2: SM75, STIX, S2Y, S10Y, S30Y

#### A Feeds:

Futures Incremental:  
IP: 233.142.36.3  
port: 21001  
source: 204.63.169.[17,18,19]  
Futures Snapshot:  
IP: 233.142.36.4  
port: 21002  
source: 204.63.169.[17,18,19]

#### B Feeds:

Futures Incremental:  
IP: 233.142.36.67  
port: 22001  
source: 204.63.169.[81,82,83]  
Futures Snapshot:  
IP: 233.142.36.68  
port: 22002  
source: 204.63.169.[81,82,83]

#### Retransmission Servers for Segment 2:

IP: 204.63.168.5, 204.63.168.69  
port: 8916

---

### Index Feeds:

#### Index Snapshot A Feed:

IP: 233.142.36.5  
port: 21001  
source: 204.63.169.7

#### Index Snapshot B Feed:

IP: 233.142.36.69  
port: 22001  
source: 204.63.169.71

---

### TCP Market Data in QD Format:

#### Server 1:

IP: 204.63.168.7  
port: 7908

#### Server2:

IP: 204.63.168.37  
port: 7908

### 4.3.3 Certification

#### Segment 1: SFX, SPRE, SMO, SMGO

##### A Feeds:

###### Futures Incremental:

IP: 233.142.36.128

port: 21001

source: 204.63.170.34

###### Futures Snapshot:

IP: 233.142.36.129

port: 21002

source: 204.63.170.34

##### B Feeds:

###### Futures Incremental:

IP: 233.142.36.144

port: 22001

source: 204.63.170.50

###### Futures Snapshot:

IP: 233.142.36.145

port: 22002

source: 204.63.170.50

##### Retransmission Server for Segment 1:

IP: 204.63.170.10

port: 8916

---

#### Segment 2: SM75, STIX, S2Y, S10Y, S30Y

##### A Feeds:

###### Futures Incremental:

IP: 233.142.36.131

port: 21001

source: 204.63.170.36

###### Futures Snapshot:

IP: 233.142.36.132

port: 21002

source: 204.63.170.36

##### B Feeds:

###### Futures Incremental:

IP: 233.142.36.147

port: 22001

source: 204.63.170.52

###### Futures Snapshot:

IP: 233.142.36.148

port: 22002

source: 204.63.170.52

##### Retransmission Server for Segment 2:

IP: 204.63.170.27

port: 8916

---

#### Index Feeds:

##### Index Snapshot A Feed:

IP: 233.142.36.130

port: 21001

source: 204.63.170.35

##### Index Snapshot B Feed:

IP: 233.142.36.146

port: 22001

source: 204.63.170.51

---

#### TCP Market Data in QD Format:

##### MD Server 1:

IP: 204.63.170.10

port: 7908

##### MD Server 2:

IP: 204.63.170.27

port: 7908

## 4.4 SMFE Routing Policy Building Blocks

The goal of this section is to illustrate the BGP policy building blocks you can use to identify and apply policy to the Small Exchange advertised prefixes. For example, in the first listing, “**AB2: Aurora: PROD**”, we see the summary address 204.137.28.0/25, but the networks being advertised will all be /27’s. So if you build your policy to accept all /27’s contained within that /25, then you will always have all of the PROD unicast services networks (FIX services, market data retrans, etc...) Alternatively, you can use the BGP community attribute that such prefixes are tagged with. In this case, 63453:100.

### **AB2: Aurora: PROD**

204.137.28.0/25 eq /27 = All PROD unicast networks (community = 63453:100)

204.137.29.0/26 eq /28 = All PROD A side multicast sources (community = 63453:200)

204.137.30.253/32 = PROD A side RP (community = 63453:200)

204.137.29.64/26 eq /28 = All PROD B side multicast sources (community = 63453:300)

204.137.30.254/32 = PROD B side RP (community = 63453:300)

### **NY2: Secaucus: DR**

204.63.168.0/25 eq /27 = All DR unicast networks (community = 36388:100)

204.63.169.0/26 eq /28 = All DR A side multicast sources (community = 36388:200)

204.63.170.253/32 = DR A side RP (community = 36388:200)

204.63.169.64/26 eq /28 = All DR B side multicast sources (community = 36388:300)

204.63.170.254/32 = DR B side RP (community = 36388:300)

### **NY2: Secaucus: CERT/Dev**

204.63.170.0/27 = CERT unicast network (community = 36388:160)

204.63.170.32/28 = A side CERT multicast sources (community = 36388:260)

204.63.170.251/32 = CERT A side RP (community = 36388:260)

204.63.170.48/28 = B side CERT multicast sources (community = 36388:360)

204.63.170.252/32 = CERT B side RP (community = 36388:360)

## 5. SFTP

The Exchange uses SFTP for general file passing between the Exchange and various participants. Request SFTP provisioning here (account required):

<https://smallx.atlassian.net/servicedesk/customer/portal/5/group/18/create/100>

Here is basic information on how the service is provisioned.

1. Authentication
  - a. SSH public key authentication, RSA keys of at least 2048 bits, OpenSSH format
  - b. Use a separate key-pair per environment
  - c. Attach your public key files to the JIRA Service Desk request
  - d. Your username will be given to you
2. Source IP address(es)
  - a. Enter your source IP address(es) used to access the SFTP service in the JIRA Service Desk request.
3. The folder structure is like this:

```
/---|
|
|----public (Static Data Files)
|
|----FIRM_CODE
|
|-----in
|       |----ltr (Large Trader reports)
|       |----ocr (OCR reports)
|
|-----out
```

### Production/DR SFTP server

Hostname: sftp.smallexchange.com

Port: 22

IP addresses: 3.20.74.92, 3.130.168.78, 3.12.1.167

### Certification SFTP server

Hostname: cert-sftp.smallexchange.com

Port: 22

IP addresses: 3.12.100.237, 3.20.120.220, 3.12.106.248