



# **CBOE Financial Network**

## **Network Specification**

Version 4.2

December 1, 2010

## **OVERVIEW**

The CBOE Financial Network (CFN) disseminates multicast market data to CBOE Member Firms and Market Data Vendors. Different Market Data products are available via the CFN. The CFN is the only source for Current Quote / Last Sale (CQ/LS) information for the OneChicago Exchange (ONE) and for the CBOE Futures Exchange (CFE). Book Depth (BD) information for these two Exchanges is also available via the CFN.

CBOE, through its subsidiary, Market Data Express (MDX) offers a service comprised of various CBOE index values such as SPX, OEX, VIX, etc. This service is called Market Data Indices (MDI).

## **NETWORK DESIGN**

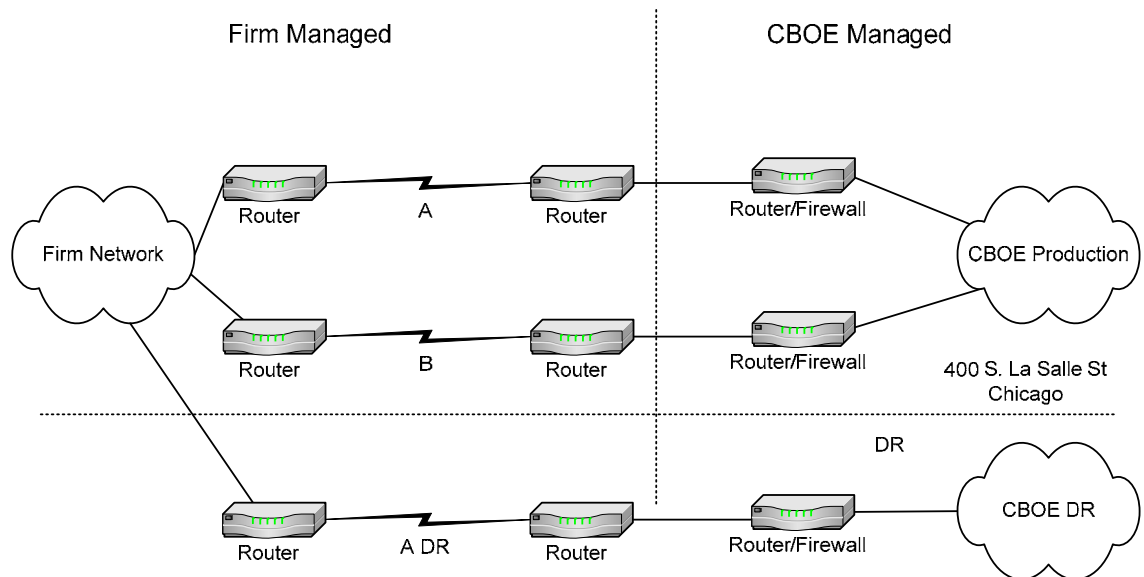
The CFN uses IP multicast to efficiently and equitably distribute market data to all connected Firms simultaneously. Identical copies of the data are sent to different A and B multicast groups that follow diverse network paths so that a network outage cannot affect both sets of groups. Since there is no provision for retransmitting missed data, firms should read both A and B groups to fill in any gaps.

There are two ways for firms to connect to the CFN:

- Direct Connections
- CBOE Approved Extranet Service Provider

With Direct Connections firms are responsible for ordering and managing their own WAN circuits to CBOE as well as their routers on the CBOE premises. The source for both A and B groups is at the CBOE location in downtown Chicago. In the event of a disaster, only the A groups will be transmitted from CBOE's Disaster Recovery (DR) site.

Figure 1 shows a Direct Connection.

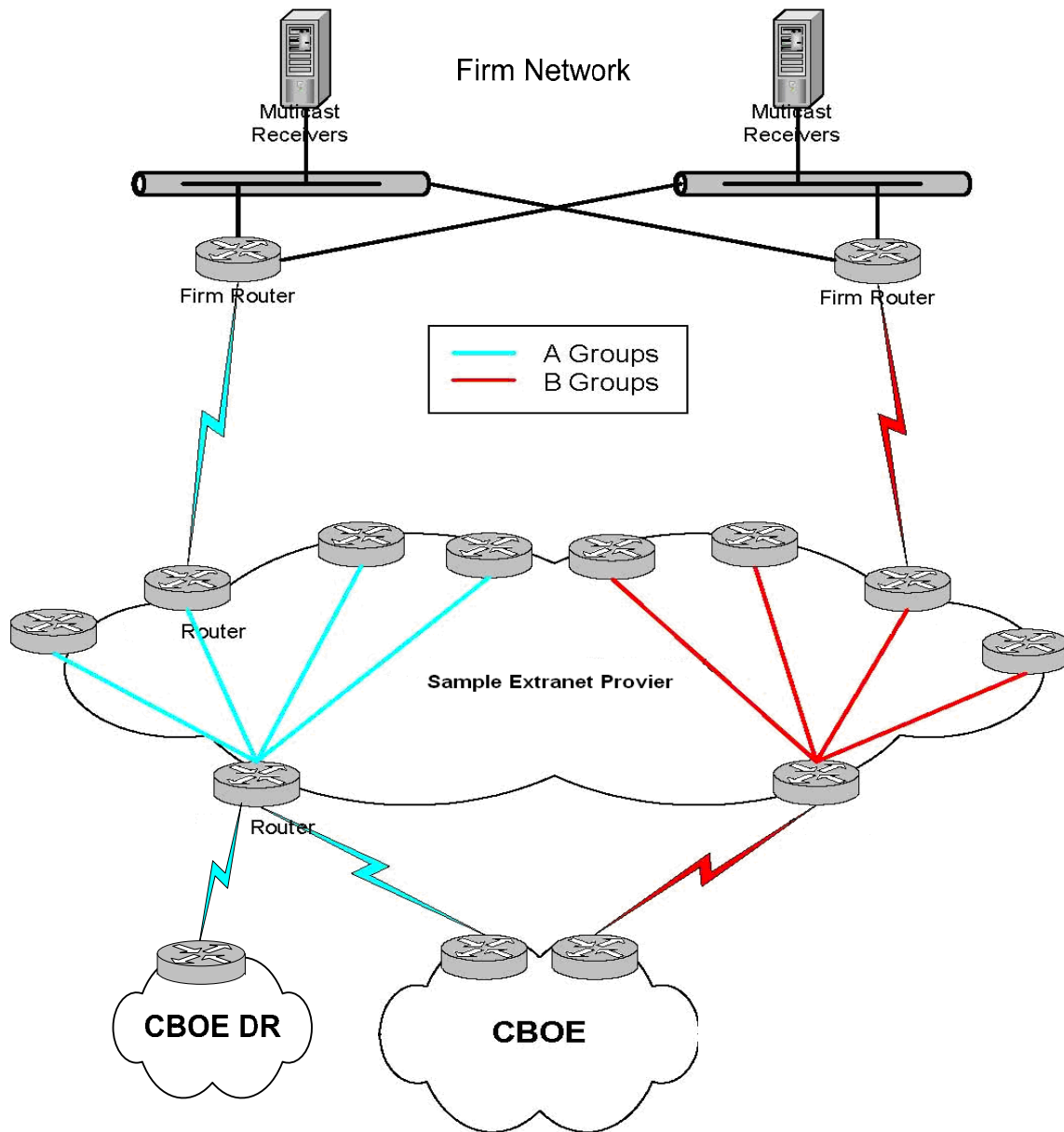


**Figure 1: Direct Connection**

The second type of CFN connection is via a CBOE approved Extranet Service Provider. Firms must first complete the CFN Connection Request form at the end of this document and return it to CBOE at [cfn@cboe.com](mailto:cfn@cboe.com) before ordering the connection through their Extranet Service Provider representative. Firms will be billed by CBOE for the data and by the Extranet Service Provider for the connectivity. For redundancy, the Firm must have two Extranet connections.

Figure 2 shows a sample Extranet Service Provider.

**Note:** Not all Extranet Service Providers have connections to the CBOE DR site.



**Figure 2: Extranet Service Provider**

## DATA CHANNEL INFORMATION

For each Data Channel, shown in Table 1 below, identical data is transmitted to two sets of multicast groups – A groups and B groups, with unique multicast group IP addresses and UDP port numbers. Bandwidth has been allocated to each Data Channel taking into consideration historical peak utilization and future growth.

The CFE and ONE Book Depth data channels use three multicast groups each. Products are distributed across the three groups alphabetically:

A-E - Multicast Group One  
 F-N - Multicast Group Two  
 O-Z - Multicast Group Three

**Table 1: Data Channel Information**

		A Groups		B Groups	
Data Channel	Bandwidth Allocation	Multicast IP Address	UDP Port	Multicast IP Address	UDP Port
ONE CQ/LS	15 Mbps	233.65.120.1	52101	233.65.120.2	52102
ONE BD	50 Mbps	233.65.120.3	52103	233.65.120.4	52104
		233.65.120.5	52105	233.65.120.6	52106
		233.65.120.7	52107	233.65.120.8	52108
CFE CQ/LS	10 Mbps	233.65.120.16	52116	233.65.120.17	52117
CFE BD		233.65.120.18	52118	233.65.120.19	52119
		233.65.120.20	52120	233.65.120.21	52121
		233.65.120.22	52122	233.65.120.23	52123
MDI	1 Mbps	233.65.120.32	52132	233.65.120.33	52133

## MULTICAST CONFIGURATION

Direct Connections require the use of PIM Sparse Mode. Configurations with Extranet Service Provider may be different. Firms will need to add routes to the appropriate multicast source networks listed in Table 2. The Rendezvous Points (RP) for the Data Channels is shown in Table 3.

**Table 2: Multicast Source Networks**

<b>Data Channel</b>	<b>Groups</b>	<b>Source Network</b>
<b>ONE CQ/LS</b>	A	170.137.92.0/24 170.137.100.0/28
	B	170.137.91.0/24
<b>ONE BD</b>	A	170.137.13.96/28
	B	170.137.13.112/28
<b>CFE CQ/LS</b>	A	170.137.92.0/24 170.137.100.0/28
	B	170.137.91.0/24
<b>CFE BD</b>	A	170.137.13.96/28
	B	170.137.13.112/28
<b>MDI</b>	A	170.137.13.96/28 170.137.100.0/28
	B	170.137.13.112/28

**Table 3: Multicast Rendezvous Points**

<b>Product</b>	<b>Groups</b>	<b>Rendezvous Point</b>
<b>ONE, CFE, MDI</b>	A	170.137.255.97/32
	B	170.137.255.98/32

## **DATA FORMATS**

The CFN does not process the market data or modify the data formats in any way. For information on the specific data formats please see these documents:

- CFE CQ/LS <http://systems.cboe.com/webAPI/CFEMarketDataSpec.pdf>
- CFE BD <http://systems.cboe.com/webAPI/CFEBookDepthSpec.pdf>
- ONE CQ/LS <http://systems.cboe.com/webAPI/OneMarketDataSpec.pdf>
- ONE BD <http://systems.cboe.com/webAPI/OneBookDepthSpec.pdf>
- MDI <http://systems.cboe.com/webAPI/MarketDataIndexSpec.pdf>

## **CONTACT INFORMATION**

To report a problem on an existing CFN connection, please call the CBOE Operations Department at 312-786-7642.

For all other inquiries, please send an email to [cfn@cboe.com](mailto:cfn@cboe.com).

# CFN Connection Request Form

## Requestor Information

### Billing information

Firm Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_  
Zip Code: \_\_\_\_\_  
Country: \_\_\_\_\_  
Firm Contact: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_

\_\_\_\_\_ Initial here if you approve the applicable fees for this service.  
Note, service will not be activated if this is not initialed.

### Requestor Contact (if different from above)

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
Cell Phone / Pager: \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_

### Data Channels (Add \_\_\_\_\_ Delete \_\_\_\_\_)

\_\_\_\_\_ CFE CQ/LS (inc. COF)

\_\_\_\_\_ ONE CQ/LS

\_\_\_\_\_ CFE BD

\_\_\_\_\_ ONE BD

\_\_\_\_\_ MDI

### Type of Connection

\_\_\_\_\_ Direct Connection

\_\_\_\_\_ Extranet Service Provider



# Extranet Service Provider

## Site A Information (A Groups)

### Site Address

Street Address: \_\_\_\_\_  
City / State / Zip Code: \_\_\_\_\_

### Site Contact Information

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
Cell Phone / Pager: \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_

Extranet Service Provider: \_\_\_\_\_

## Site B Information (B Groups)

Check if same as above \_\_\_\_\_

### Site Address

Street Address: \_\_\_\_\_  
City / State / Zip Code: \_\_\_\_\_

### Site Contact Information

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
Cell Phone / Pager: \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_

Extranet Service Provider (if different) \_\_\_\_\_

## Direct Connect Information

Equipment Location #1: (Floor/Cabinet#) \_\_\_\_\_

Equipment Location #2: (Floor/Cabinet#) \_\_\_\_\_