

Guide to Delta1

| An Overview

## Disclaimer

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Portions of this document have been taken from the Fix 4.4 Specification, which is property of FIX Protocol Ltd. (<http://www.fixtradingcommunity.org>).

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## Table of Contents

Disclaimer.....	1
Exchange Contact.....	1
P.1 Usage and Conventions .....	3
P.2 Future Enhancements.....	3
1.0 Introduction .....	4
1.1 Products, Contracts, and Instruments .....	4
1.1.1 Spread Pricing and Clearing Effect.....	7
1.2 Order Types.....	8
1.2.1 Time in Force.....	8
1.3 General System Architecture .....	10
1.4 Customer Roles .....	11
2.0 Interfacing with Delta1 .....	12
2.1 Public FTP Site .....	12
2.2 Trading Applications .....	14
2.2.1 Delta1 Trading Front-end.....	14
2.2.2 FIX44 Application Program Interface (API) .....	14
2.3 Risk Management .....	15
2.3.1 Risk Control for Delta1 .....	15
2.3.2 Restricted List.....	16
2.4 Market Data .....	17
2.4.1 Real-time Market Data (OCTP).....	17
2.5 Audit Trail.....	17
2.6 Billing Reports .....	18
3.0 Getting Started.....	19
3.1 Connecting to Delta1 .....	19
3.1 Trading Security Futures .....	20
3.1 Independent Software Vendors.....	21

## P.1 Usage and Conventions

All references to “the exchange” in this document shall mean OneChicago, LLC.

## P.2 Future Enhancements

The exchange reserves the right to make period system modifications that may result in changes to this guide. Such changes will be conveyed by way of a Software Change Notice and sent by email to all subscribers.

## 1.0 Introduction

This document serves to introduce the exchange's proprietary electronic trading platform, Delta1. The trading platform facilitates competitive matching of bids and offers via a central limit order book, as well as reporting of bilaterally negotiated block, spread, and Exchange of Future for Physical (EFP) transactions. All transactions matched or reported through Delta1 are centrally cleared at the Options Clearing Corporation (OCC).

### Services provided through Delta1:

- Electronic central limit order book for price-time priority matching of bids and offers
- Dedicated trade reporting engine for clearing off-exchange bilaterally negotiated security future block, spread, and EFP transactions.
- A discrete set of rules, maintained by the trading firm to assess and mitigate risk associated with trading activity.

## 1.1 Products, Contracts, and Instruments

Delta1 is a security futures platform that provides a central limit order book for security futures and security future spreads (throughout this document referred to as "calendar spreads"). Block and EFP transactions utilizing security futures are reportable to the Delta1 trade reporting engine as off-exchange, bilaterally negotiated transactions. All matched trades or reported transactions that occur on Delta1 are cleared as a security future with the appropriate designation (spread, EFP, block, or outright).

A **product** refers to a security future issue with defining characteristics and a **contract** refers to the expiration instance of that product. Products have codes used in exchange reports, audit trails, clearing house files, and back office systems.

- All Delta1 trades clear as a product-contract, where product-contract is the combination of a product and an available contract.
- Only product-contracts are settled
- Open interest can only be carried in a product-contract

Some examples of product and contract configurations (note that a single product can have multiple contracts):

Product Clearing Code	Characteristics	Security	Contracts
AAPL1D	<ul style="list-style-type: none"> <li>• T+2 settlement</li> <li>• No Dividend Risk issue</li> <li>• Contracts expire on the 3<sup>rd</sup> Friday of the month</li> </ul>	AAPL Equity	October 20, 2017 November 17, 2017 December 15, 2017 March 16, 2018
AAPL1J	<ul style="list-style-type: none"> <li>• T+2 settlement</li> <li>• No Dividend Risk issue</li> <li>• Contracts expire on the 2<sup>st</sup> Friday of the month</li> </ul>	AAPL Equity	October 13, 2017 November 10, 2017
AAPL1M	<ul style="list-style-type: none"> <li>• T+1 settlement</li> <li>• No Dividend Risk issue</li> <li>• Contracts expire on the 1<sup>st</sup> Monday of the month</li> </ul>	AAPL Equity	October 2, 2017

*For the complete list of available products and their related expiration cycles please visit the [Expiration Calendar](#) page of the OneChicago website.*

An **instrument** is defined as the logical container for one or many product-contract combinations. Each instrument carries a property and is actionable for the purposes of order entry and trade reporting.

An instrument is referenced by a numeric identifier in Delta1, this identifier is referred to as a marketplace security id or **MPSecID**.

### Types of Instruments:

#### *Central Limit Order Book (CLOB)*

Instrument	Description	Clearing Effect
SSF	Outright single stock future	1 x Outright single stock future
Calendar Spread	Combination of two single stock futures product-contracts priced as the difference between the back leg and the front leg.	2 x Outright single stock futures

#### *Trade Reporting Engine*

Instrument	Description	Clearing Effect
Block	Outright single stock future	1 x Outright single stock future with a block indicator
EFP	Exchange future for physical, combination trade priced as the differential between an SSF and its underlying security	1 x Outright security future with an EFP indicator
Block Calendar Spread	Combination of two single stock futures product-contracts priced as the difference between the back leg and the front leg.	2 x Outright single stock futures with a block indicator

### 1.1.1 Spread Pricing and Clearing Effect

Delta1 provides for a combination instrument called an SSF Spread. An SSF spread is comprised of two product-contracts more commonly referred to as “legs,” where the quoted price of the spread is expressed as the price of the back leg minus the price of the front leg. When bids and offers in spread markets transact, two trade records are generated, one for each leg. The price of the front leg is assigned by Delta1 (at fair-market value) and the back leg is calculated by adding the front leg assigned price to the matched spread price. The resulting two legs are then sent to clearing as individual SSF trades each having a spread designation.

Below are the field characteristics of a Trade Capture Report for trades as a result of a spread:

OCC DDS Fields	Value
TrdTyp	0
MLegRptTyp	2
ExchSpecInstr	Contains the Delta1 ReferenceID for the trade. This can be used to tie the legs together to the match event in the spread instrument on Delta1.

Spread side action reference table:

Spread Action	Front Leg Effect	Back Leg Effect
BUY	SELL	BUY
SELL	BUY	SELL

## 1.2 Order Types

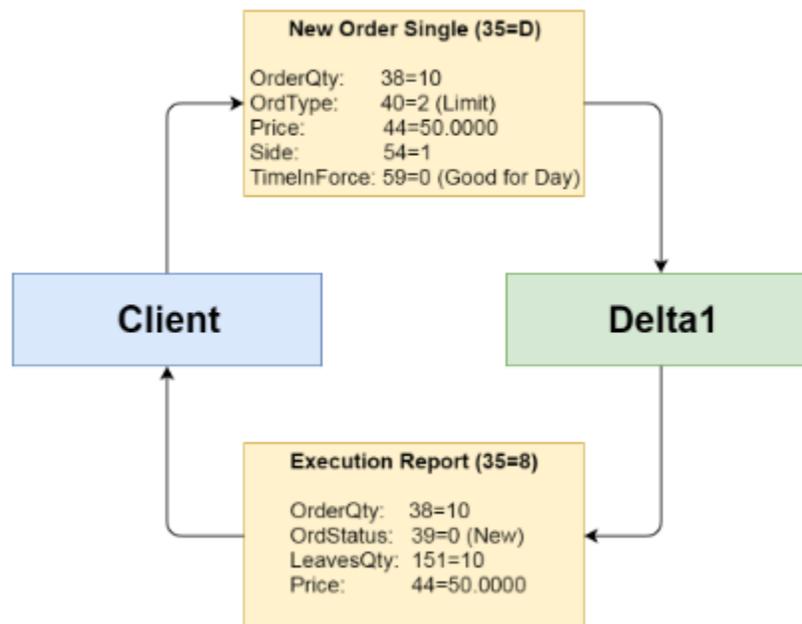
Delta1 allows users to submit **Limit Orders** to buy or sell specified quantities of contracts at (or better than) a specified price. A buy limit order can be executed at or below the limit order price; a sell limit order can be executed at or above the limit order price. Users are guaranteed to execute their order at (or better than) their price, however there is a chance that the order may not execute at all if there is not an opposing limit order to execute at that price.

### 1.2.1 Time in Force

Delta1 provides for users to specify the length of time their order is to remain active in the market, otherwise known as “Time in Force”.

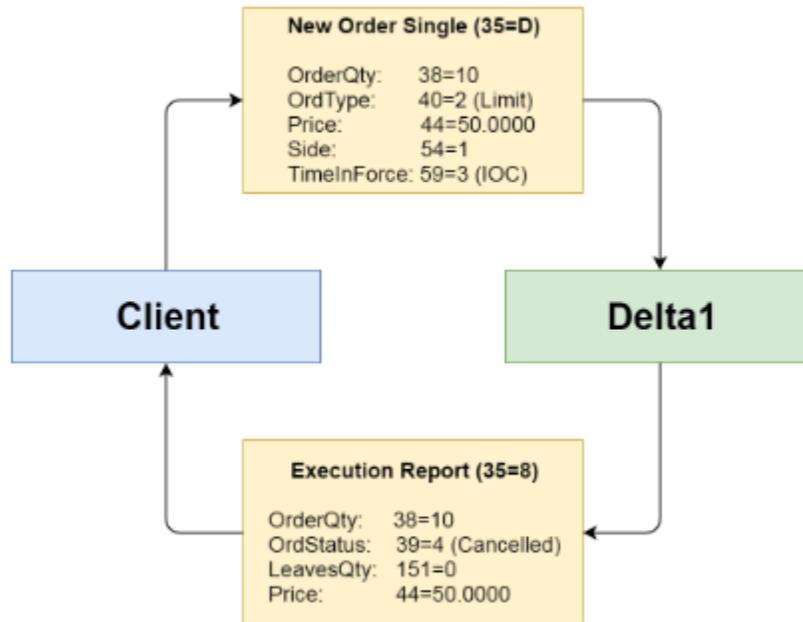
#### 1.2.1.1 Good for Day Orders:

A Good for Day Order (FIX tag 59 = 0) sets a maximum price to buy, or minimum price to sell, a specific quantity of an instrument. If a Good for Day Order is not instantly matched, it remains in the market until either: it is fully filled, cancelled by the user, or the day's trading session ends. Below is an example of an unmatched Good for Day Order that remains in the market:



### 1.2.1.2 Immediate or Cancel (IOC)

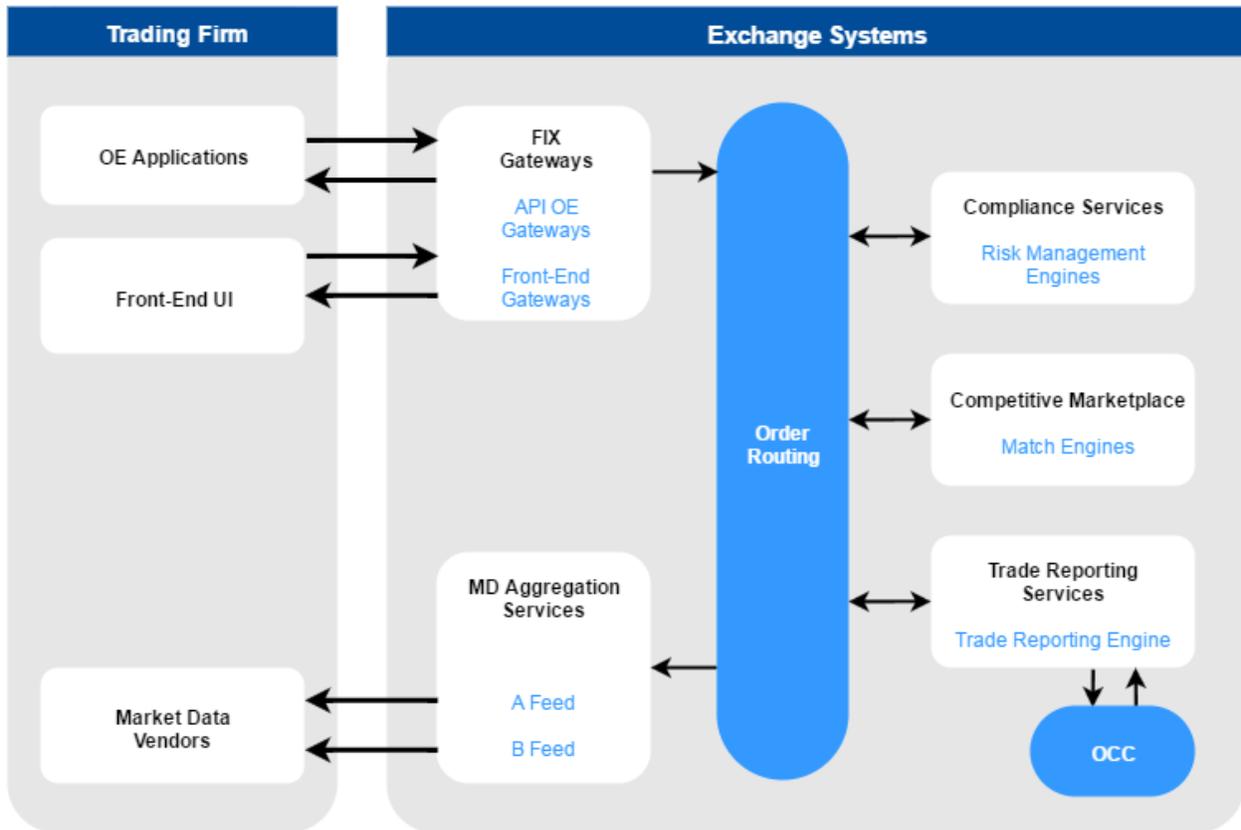
An Immediate or Cancel (IOC) Order (FIX tag 59 = 3) sets a maximum price to buy, or minimum price to sell, a specific quantity of an instrument. An IOC Order trades up to the price level entered and any remaining order quantity is then cancelled immediately. Below is an example of an IOC Order that is cancelled when there is no matching condition:



### 1.3 General System Architecture

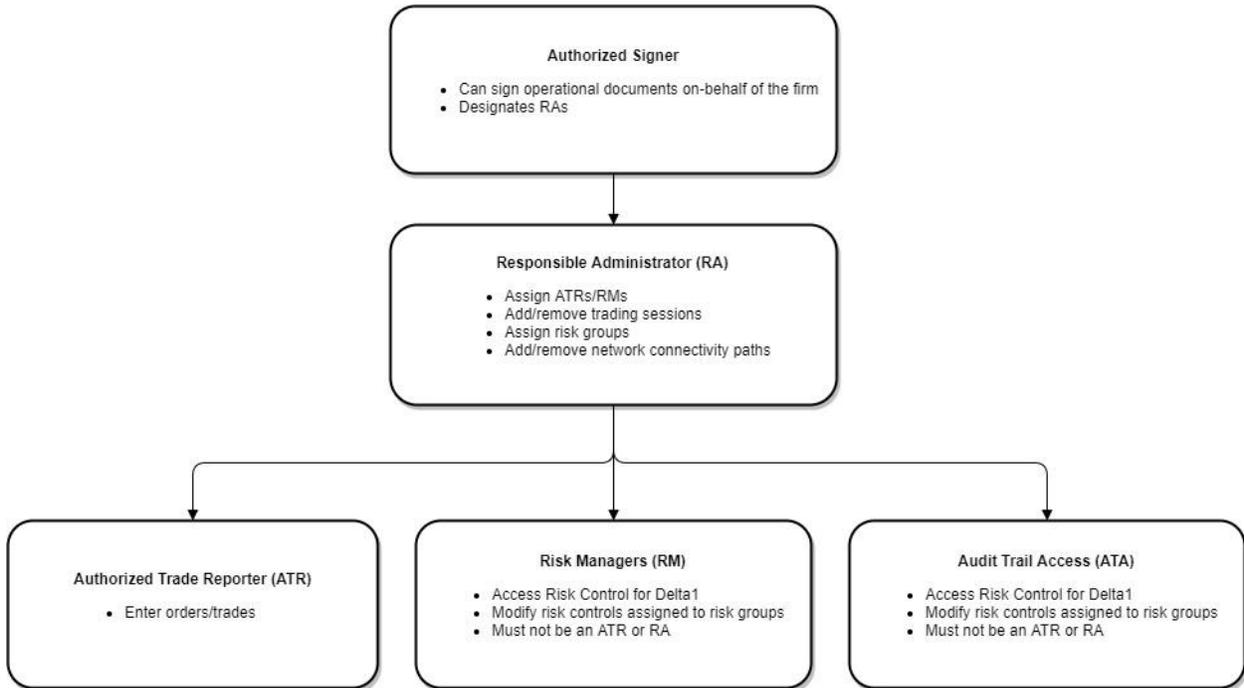
Delta1 provides for two methods of access for order entry and trade reporting, a FIX44 API and the Delta1 trading front-end.

Message flow and system architecture:



## 1.4 Customer Roles

There are a number of roles individuals within a customer firm may hold. Below is an organizational chart which illustrates these relationships and their respective functions.



## 2.0 Interfacing with Delta1

There are a variety of reasons for individuals to interface with Delta1. This section briefly outlines the application services available and the business case for each instance.

### 2.1 Public FTP Site

The exchange provides free publicly available content on a daily basis by way of our [public FTP site](#). Additional information regarding these files and their content is located in their respective [Technical Specification Document](#).

**Dividend Adjustments:** All SSF products where a stock underlies the future are classified as “No Dividend Risk.” The day prior to a dividend ex-date of a stock, the exchange publishes the value to be adjusted for the associated product-contracts on ex-date.

**Position Limits:** Position limit files are published daily and contain the aggregate position limits expressed in contracts by the SSF (underlying) primary listing symbol.

**Product Listings:** The product listings file is created daily and contains the complete product-contract availability as of the publication date. All instruments are generated from this data set. Customers are encouraged to obtain product and contract definitions from this data set or from the OCC DDS security files.

**Market Data > Product Catalog:** The market data product catalog is the same data provided over the Real-time Market Data (OCTP) feeds. This data set contains relational mappings between *instruments* and *product-contracts* available for the specified trading day. This file serves to provide actionable *instrument* identifiers, *MPSecID*, for the purposes of processing market data, facilitating order entry and bilateral trade reporting. Additional information

regarding the types of *instruments* available on Delta1 is located in the section titled “Products, Contracts, and Instruments.”

**Market Data > Settlement Prices:** The settlement prices file simply provides daily settlement prices by clearing code and expiration date.

**Market Data > Exchange Summary:** Published twice throughout the day, the exchange summary file mirrors the start of day and end of day exchange summary stream disseminated over the Real-time Market Data (OCTP) feeds. This file contains open, high, low, close, volume, open interest, and settlement prices for the specified trading day. Open interest figures are updated on the respective summary files T+1.

**Market Data > Trades:** The trade file is refreshed throughout the trading day and contains the same information disseminated over Real-time Market Data (OCTP) feeds. Trade events are reported at the *instrument* level. As such calendar spread transactions appear as a single record with the *EntryLegPriceNear* field indicating the price of the cleared front leg. The back leg is calculated by adding the *EntryLegPriceNear* to the *EntryPrice* of the trade record.

## 2.2 Trading Applications

Delta1 provides for two methods for interacting with the marketplace (1) Delta1 Trading Front-end and (2) FIX44 API for order entry and trade reporting.

### 2.2.1 Delta1 Trading Front-end

The exchange provides a simple light-weight Java Web Start application which supports real-time top-of-book/book-depth market data, order entry/modification, and bilaterally negotiated trade reporting. Access to Delta1 through this application is achieved through a [Session Request](#) form. Please note that a site-to-site VPN or direct connect to the respective Delta1 networks is required. Additional information regarding access and minimum system requirements is located in the [Delta1 Trading Front-end Quick Start Guide](#).

### 2.2.2 FIX44 Application Program Interface (API)

FIX sessions can be requested by completing a [Session Request](#). Customers are required to schedule and pass a conformance test in the Delta1 User Acceptance Testing (UAT) environment prior to obtaining production FIX sessions and FIX Gateway configurations. Interested parties should contact [apigroup@onechicago.com](mailto:apigroup@onechicago.com) to discuss performance and capacity requirements for their application. Access to the FIX44 API is only permitted through a physical connection to the Delta1 network at the respective data center. For additional information please see Connecting to Delta1. Technical information for developing an application to the Delta1 FIX44 API is available in the [Delta1 FIX44 API Guide to Messages and Content – Technical Specifications](#). Note that this service does not provide market data in FIX format. Real-time market data is available over the Delta1 Real-time Market Data (OCTP) multicast feeds.

## 2.3 Risk Management

FIX sessions and front-end logins are assigned to a *Risk Group*. Risk controls are applied by way of assessing order flow and trading activity against various parameters configured for the desired group. All sessions/logins assigned to a risk group are subject to the group's configured parameter values. Each group is managed by designated representatives of the clearing firm.

Below are the parameters enforced:

- Maximum number of contracts per order or bilaterally reported transaction
- Maximum notional value per order or bilaterally reported transaction
- Aggregate daily notional value of all executed transactions and working orders
- Prohibited order entry or trade reporting for any contract that contains a restricted security as one of its underlying components
- Upper and lower limit price banding applied at order entry or trade reporting, as a percentage of the fair-market-value.

Firms are permitted to create any number of Risk Groups and freely designate risk managers by submitting a [Session Request](#) form.

### 2.3.1 Risk Control for Delta1

Risk Control is a web application for managing the risk parameters assigned to Risk Groups and. Risk Control is a simple web interface that supports:

- Real-time display of the cumulative notional value statistic captured by the risk engines (working orders + filled orders/trades)
- Management of select risk parameters enforced in real-time

Risk Control is available over general internet and permits only whitelisted IP addresses for access. To request access to Risk Control please submit a [Session Request](#) form.

### 2.3.2 Restricted List

Delta1 supports an active restricted securities list for a Risk Group. Items on this list are expressed as a security ticker symbol and when active, prohibit order entry or trade reporting for any contract that contains the restricted security as one or more of its underlying components. Access to this system is provided by way of SFTP file submissions. The SFTP file server is available over general internet and permits only whitelisted IP addresses for access. To request access, please complete the [SFTP Subscription](#) form. The technical specifications for this file are located in the [Restricted List File – Technical Specification](#).

## 2.4 Market Data

The exchange provides both licensed and unlicensed market data for interested parties. Delta1 licensed market data is obtained through a registered market data vendor or directly from the exchange via Delta1 Real-time Market Data (OCTP). A list of market data vendors is available on the [Obtaining Market Data](#) page of the OneChicago website. For more information regarding licensing please contact [Market Data](#).

Select Delta1 market data is also publically available free of charge on the [OneChicago FTP site](#). Content is comma separated value formatted, organized into daily files, and uploaded incrementally throughout the day. Each file maintains a [Technical Specification Document](#).

### 2.4.1 Real-time Market Data (OCTP)

Delta1 market data is disseminated in real-time via the OCTP primary and secondary multicast feeds. OCTP has full refresh and incremental update feeds for both level 1 and level 2 data. Message bodies are encoded with Google Protocol Buffers. The required proto files as well as sample data are available in the [OCTP section](#) of the public FTP site. Technical guidance for developing feed handlers is available in the [Delta1 Real-time Market Data \(OCTP\) – Technical Specifications](#).

## 2.5 Audit Trail

Firms can access audit trails for trading accounts via two solutions depending on their access method.

- For Delta1 Trading Front-end users, audit trail is updated incrementally throughout the day to a private SFTP account hosted on Delta1 SFTP servers (sftp.onechicago.com). Technical guidance for this file layout is available in the [Audit Trail Report File – Technical Specification](#). Reports are generated per username and access is registered by completing the [SFTP Subscription](#) form.

- A FIX44 API is available for capturing audit trail for FIX Sessions. A detailed explanation of this service is located in [Delta1 FIX44 API Guide to Messages and Content – Read-only Session](#).

## 2.6 Billing Reports

The exchange generates a month total summary file for fees associated with services provided by, and transactions entered on, the exchange. This line item summary is delivered monthly to a designated secure FTP directory hosted by the exchange. Please complete a [SFTP Subscription](#) form to set up a billing directory to receive billing reports.

Additionally, the exchange provides detailed (daily/monthly) reports in CSV format for all fees assessed by fee category.

### Daily Reports (Month-to-date)

- [Execution Report](#)
- [Carry Report](#)
- [Carry Supplement](#)
- [Reduced Carry Supplement](#)
- [Position Delivery Report](#)

### Monthly Reports

- [Total Summary](#)
- [Network Connectivity Report](#)
- [Gateway Port Audit](#)
- [Delta1 User Audit](#)
- [Other Subscribed Services](#)

## 3.0 Getting Started

### 3.1 Connecting to Delta1

FIX Gateways reside in the Delta1 production, disaster recovery, and UAT networks behind exchange firewalls. Other services are available over general internet and require customer IP addresses to be whitelisted for access. Please reference the below tables for information regarding connectivity requirements and site designation. All network related inquiries can be directed to the [Network Operations Center](#).

	Direct Connect	Site-to-site IPsec VPN	General Internet
<b>Equinix NY4 (Production)</b>			
FIX44 API	✓		
Trading Front-end	✓	✓	
Real-time Market Data (OCTP)	✓		
<b>Equinix CH1 (Disaster Recovery)</b>			
FIX44 API	✓		
Trading Front-end	✓	✓	
Real-time Market Data (OCTP)	✓		
<b>Equinix CH1 (User Acceptance Test)</b>			
FIX44 API	✓	✓	
Trading Front-end	✓	✓	
Real-time Market Data (OCTP)	✓		
<b>Non-Site Dependent Services (Production and UAT)</b>			
Public Reports (FTP)			✓
Risk Control			✓
SFTP Audit Trail			✓
SFTP Billing Reports			✓
SFTP Restricted List			✓
SFTP OCR			✓

To gain connectivity to any of the exchange networks customers must have a signed/executed [Connectivity Service Agreement \(CSA\)](#) and submit the supporting Connectivity Request Form (CRF) for the connection. Upon the successful execution of the CSA, exchange staff will send all required CRFs and LOAs. All customers with connectivity to Delta1 networks are subject to the [Fee Schedule to the Connectivity Service Agreement](#).

Colocation with the desired exchange network is required to gain access to the FIX44 API. Customers can gain colocation through an extranet provider. A list of connected providers is available on the [Getting Connected](#) page of the OneChicago website.

### 3.1 Trading Security Futures

Below are the registration options for trading on Delta1:

**Clearing Firm:** Customer must be a clearing member at the Options Clearing Corporation (OCC) and is required to complete the Clearing Firm Registration process with the exchange.

**Trading Firm:** Customer must obtain a clearing member guarantee from an exchange registered clearing firm.

**Exchange Member:** Registration is available to any person or entity with member trading privileges on the CME, CBOE, or CBoT, provided such trading privileges are in effect as of March 15<sup>th</sup>, 2006. Additional information regarding this type of registration is located in the [OneChicago Rulebook](#).

None of these? Please see our list of [Connected Brokers](#). Brokers registered with the exchange provide an alternate path for end-users to participate on OneChicago.

All registrants are required to maintain a signed and executed [Delta1 User Agreement](#) with the exchange. All customers trading on Delta1 are subject to the

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[Fee Schedule to the Delta1 User Agreement](#). For more information and assistance with the registration process please contact [Trading Operations](#).

### 3.1 Independent Software Vendors

Customers may employ Independent Software Vendors (ISVs) for technology access to Delta1. Programmatic interfacing with Delta1 is achieved through the FIX44 API. A list of ISVs is provided on the [Getting Connected](#) page of the OneChicago website.

To become an ISV, the interested party is required to complete a [Development and Testing Agreement](#) as well as register and certify their application with the exchange.

For more information regarding the certification testing and registration process please contact [Trading Operations](#).