



INVESTORS EXCHANGE CONNECTIVITY MANUAL

Version 1.81

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Table of Contents

INTRODUCTION.....	3
Overview.....	3
Connectivity Matrix.....	4
Physical Interfaces	5
CONNECTIVITY CHOICES.....	5
Internet.....	5
Cross-Connect.....	5
Customer-Facing IP Prefixes Scheme.....	6
Extranet.....	7
Direct Connectivity via Private Line Ethernet	7
ORDERING A CROSS CONNECT TO IEX	7
Agreement and Order Form.....	7
LOA	8
Data Center Provider Request	8
BANDWIDTH	8
Market Data Feeds	8
FIX Order Entry.....	9
EQUITY PORTS	9
FIX Order Entry.....	9
Drop Copy Information.....	9
MARKET DATA.....	10
Top of Book Quote and Last Sale Feed (TOPS).....	10
Depth of Book and Last Sale Feed (DEEP)	10
TELECOMMUNICATIONS PROVIDERS	11
Extranet Providers.....	11
SUPPORT	12
Support Hours.....	12
REVISION HISTORY	14



INTRODUCTION

Overview

IEX's primary trading platform, Investors Exchange (the "Exchange"), located in Cyxtera data center (NJ2) in Weehawken, NJ, is accessible to Members, Sponsored Participants, Service Bureaus, Data Recipients (collectively, "Participants"), and Extranet Providers from the IEX POP ("point-of-presence" or "POP"). IEX offers a POP located in an Equinix data center (NY5) in Secaucus, NJ. The POP is designed to provide Participants with 350-microseconds of latency from the POP to the primary trading platform.

IEX will only accept Equity Port and Market Data connections to the primary trading platform through the IEX POP.

IEX's secondary data center (the "Disaster Recovery data center") is located at the Equinix data center (CH4) in Chicago, IL. Connectivity to the IEX Disaster Recovery data center, while not a mandatory requirement for all Participants, is recommended to minimize service disruption in the event of an issue at the primary trading platform data center. Weehawken and Secaucus are the "primary" or "hot" sites, with Chicago being "secondary" or "cold."¹ Participants will not be able to connect to order entry systems nor receive market data in Chicago until IEX declares the primary trading platform in Weehawken "down."

The IEX Test Facility ("ITF") is located at the Equinix data center (NY5) in Secaucus, NJ. Participants may use the ITF for FIX certification and non-production testing of trading system functionality. Connections to the ITF are available over cross-connect or the Internet.

IEX does not offer co-location services. Participants are responsible for choosing their telecommunications provider, and arranging for connections to the IEX POP, Disaster Recovery data center, and ITF.

IEX CONNECTIVITY DATA CENTER LOCATIONS		
IEX POP ("Primary")	Disaster Recovery ("Secondary")	IEX Test Facility ("ITF")
Equinix (NY5) 800 Secaucus Rd Secaucus, NJ	Equinix (CH4) 350 E Cermak Rd Chicago, IL	Equinix (NY5) 800 Secaucus Rd Secaucus, NJ

Please note that all connectivity options are subject to the possibility of variations in performance, including delays to system access and trade execution resulting from, for example, such events as market volatility and heightened quote and trading volumes.

IEX supports the following network connectivity choices for access:

¹ IEX will use best efforts to support T+2-hour resumption of trading but no later than the start of trading on the next business day..



- Internet (only for certification or test sessions in the ITF);
- Cross-Connect (i.e., for Participants co-located in the same data center as the POP, ITF, or the Chicago data center)
- Extranet Providers (see the [IEX Approved Extranet Provider](#) section for a list of approved Extranet Providers);
- Private Line Ethernet (circuit extension from a carrier to the IEX POP, ITF, or the Chicago data center, see the [Carriers](#) section for a list of Carriers).

Connectivity Matrix

	IEX POP	DISASTER RECOVERY	ITF
Data Center Role	Primary Connectivity	Secondary	Testing Facility
Data Center Provider	Equinix (NY5)	Equinix (CH4)	Equinix (NY5)
Site Location	Secaucus, NJ	Chicago, IL	Secaucus, NJ
Site Status	POP for Primary	Cold/Secondary	Non-Production
Accepts Co-location Cross-connects?	Yes	Yes	Yes
Accepts Circuit Extension from Telco?	Yes	Yes	Yes
Access to Production Sessions/Feeds?	Yes	No	No
Access to Disaster Recovery Sessions/Feeds?	No	Yes	No
Access to Test Sessions/Feeds?	No	No	Yes
Co-location of Network Equipment?	Yes	Yes	Yes
1G Monthly Recurring Connectivity Fees	See IEX Fee Schedule for details		
10G Monthly Recurring Connectivity Fees			
Supported Media Types	SMF	SMF	SMF
Round Trip Time to Production FIX Gateways	700μs (350μs each way)	N/A	N/A
One Way Trip Time from Production Market Data Feed Dissemination Source	350μs	N/A	N/A
IEX Contact	netops@iextrading.com		
Data Center Contact	Scott Leonard 646.430.6820		



Physical Interfaces

The following standard physical interface specifications are supported. For other interface specifications, contact netops@iextrading.com.

Interface	Type	Environment Availability
10G	LR (single-mode)	IEX POP, Disaster Recovery, ITF
1G*	LX/LH (single-mode)	ITF (default interface)

* Note that 1Gbps physical interfaces are an order of magnitude slower than 10Gbps. 1Gbps physical interfaces are not recommended for bandwidth and/or latency sensitive participants, and are no longer offered for access to the primary or secondary trading platform.

CONNECTIVITY CHOICES

Internet

Participants may connect over the Internet to the ITF:

- Access to Equities Port for test and certification purposes.
- IP address of the host presented to IEX must be registered.

Cross-Connect

Participants and Extranet Providers with a presence at the POP location may cross-connect to IEX at Secaucus (Equinix NY2/NY4/NY5/NY6) for access to the primary trading platform. Participants and Extranet Providers with a presence at the ITF location may cross-connect to IEX at Secaucus (Equinix NY2/NY4/NY5/NY6) for access to the testing facility. Participants and Extranet Providers with a presence at the Disaster Recovery data center may cross-connect to IEX at Chicago (Equinix CH4) for access to the Disaster Recovery platform.

- Participants and Extranet Providers with their own space in the data center may request an in-house cross-connect directly from the data center providers to connect from the Participant's demarcation point to IEX's demarcation point.
- Participants and Extranet Providers that do not have a presence can lease space in either data center from the data center providers directly (please see the [Connectivity Matrix](#) above for contact information).
- Single mode fiber – 10Gbps or 1Gbps (ITF only).
- Each physical port connection (10Gbps or 1Gbps) within the Secaucus (Equinix NY2/NY4/NY5/NY6) and Chicago (CH4) data centers may be subject to a monthly recurring charge. See the IEX Fee Schedule posted at www.iextrading.com for more information.
- Participants and Extranet Providers desiring to cross-connect must execute an [IEX Connectivity Services Agreement and Forms](#).



Customer-Facing IP Prefixes Scheme

IP Address	Purpose	Site	XC Type
23.226.144.0/21 23.226.155.128/28 23.226.155.160/28	Order Entry Gateways Summary Prefix FEEDS-A Multicast Market Data Publishers FEEDS-A Unicast Market Data Retransmitters	IEX POP (Equinix NY5)	Primary (A)
23.226.144.0/21 23.226.155.192/28 23.226.155.224/28	Order Entry Gateways Summary Prefix FEEDS-B Multicast Market Data Publishers FEEDS-B Unicast Market Data Retransmitters	IEX POP (Equinix NY5)	Secondary (B)
23.226.156.0/22 23.226.152.0/23 23.226.155.176/28 23.226.155.240/28	DR Order Entry Gateways Prefix DR Order Entry Gateways Prefix DR FEEDS-C Multicast Market Data Publishers DR FEEDS-C Unicast Market Data Retransmitters	Disaster Recovery (Equinix CH4)	Tertiary (C)
23.226.155.0/29 23.226.155.8/29 23.226.155.16/29	ITF Order Entry Gateways Prefix ITF Multicast Market Data Publishers ITF Unicast Market Data Retransmitters	IEX ITF (Equinix NY5)	ITF (I)



Extranet

Participants may provision connectivity to IEX via an extranet.

- Extranets have provisioned redundant, high speed connections to the POP, ITF, or Chicago data center for use by multiple Participants.
- Contact information for available extranet providers can be found within the [IEX Approved Extranet Providers](#) section below.

This method is an attractive alternative when:

- The Participant would otherwise have to provision a long-haul private line;
- Outsourcing of network services and network management is an option; or
- The ease and speed of turn-up are important (when both the Participant and IEX have an existing connection to the extranet).

Direct Connectivity via Private Line Ethernet

Participants and Extranet Providers may connect to IEX via Private Line Ethernet.

- No co-location space is required. Cross-connect from Telco demarcation point to IEX's network via a 1 or 10 Gigabit Ethernet interface.
- Each physical port connection (10Gbps or 1Gbps) within the Secaucus (Equinix NY2/NY4/NY5/NY6) and Chicago (CH4) data centers may be subject to a monthly recurring charge. See the IEX Fee Schedule posted at www.iextrading.com for more information.
- Contact your carrier of choice to arrange connectivity to IEX (see the [Carriers](#) section below).
- Participants and Extranet Providers desiring direct-connectivity must execute an [IEX Connectivity Services Agreement and Forms](#).

ORDERING A CROSS CONNECT TO IEX

Agreement and Order Form

Participants must execute and deliver an [IEX Connectivity Services Agreement and Forms](#) via email to marketops@iextrading.com or postal mail to:

Investors' Exchange LLC
Attn: Market Operations
3 World Trade Center, 58th Floor
New York, NY 10007



LOA

Upon approval of cross connect request, IEX Network Operations will provide a Letter of Authorization (“LOA”) with the “Z-side” cage, cabinet, panel, and port pair assignment. The Participant or Extranet Provider requesting the cross connect is known as the “A-Side.”

Data Center Provider Request

The requesting Participant or Extranet Provider submits a cross connect request with the appropriate data center provider:

- Equinix: NY2, NY4, NY5, NY6 and CH4

The data center provider will need the LOA and the “A-Side” details to complete the connection. The “A-Side” customer is responsible for any data center setup fees and monthly recurring costs associated with the cross connect. As the “A-Side” customer, the Participant or Extranet Provider is also responsible for initiating troubleshooting requests with the data center provider in the event of a down cross connect.

BANDWIDTH

Market Data Feeds

IEX offers two types of market data feeds:

- TOPS (Top of Book Quote and Last Sale Feed)
- DEEP (Depth of Book and Last Sale Feed)

IEX understands that firms will have varying levels of sensitivity with respect to latency and as such encourages Participants to use the statistics provided below to make a well-informed decision regarding the bandwidth they will require based on their organization’s latency sensitivity.

The table below shows the bandwidth statistics for historical highs for the IEX market data feeds. The table shows the bandwidth and messages per second (MPS) peaks for 1 millisecond, 10 milliseconds, and 1-second intervals.

Interval Seconds	TOPS		DEEP	
	MPS	Mb/s	MPS	Mb/s
0.001	140,000	49	430,000	147
0.010	104,000	36	315,000	108
1.000	26,000	9	80,000	27

Statistics are approximations using data from March 2017, DEEP statistics are projections.



It should be noted that IEX data will have microbursts within the one-second interval above, and that these microbursts will exceed the peak rates at the one-second interval. This is demonstrated within the 1 and 10 millisecond interval statistics. The extent to which the network connection to the Participant will cope with the microbursts exceeding the available bandwidth without packet loss will depend heavily on the buffers in the end-to-end path.

During spikes in quote updates, Participants using less than sufficient bandwidth will experience queuing of their market data. Participants using the same bandwidth to both receive quotes and transmit orders may expect their orders to be slightly delayed if they have less than sufficient bandwidth. Some Participants will find these delays unacceptable and should provision their bandwidth to reduce these delays.

As the volume on the Exchange increases, the market data feed bandwidth required to accommodate peaks will also grow. Participants can obtain the latest published market data bandwidth and serialization statistics within this Connectivity Manual.

FIX Order Entry

Bandwidth recommended for submitting orders via FIX depends on expected Participant order volume. If a Participant intends to submit orders to IEX and will not receive market data, then it is possible that the Participant can connect with less than 1.5Mbps of bandwidth.

EQUITY PORTS

FIX Order Entry

IEX supports FIX 4.2 for order entry; refer to the [IEX FIX Specification](#) for implementation details. With a FIX connection between Participants' systems and IEX, Participants can easily send orders to IEX automatically from their trade blotter, providing instant access to trading opportunities and liquidity.

Drop Copy Information

IEX supports FIX 4.2 for drop copy information; refer to the [IEX FIX Specification](#) for implementation details. With a FIX connection between your system and IEX, you can easily receive drop copy information from IEX in real-time. They may be configured to send order flow based on various combinations of information relating to specific Member firms, clearing MPIDs, and/or sessions. With proper authorization (e.g. clearing relationship), a single FIX drop copy session can be used to obtain information about multiple Members.



ITF TCP/IP Connectivity Addresses

SITE	XC Type	Service	Server	Port
IEX Testing Facility (Equinix NY5)	ITF (I)	Certification Gateway	http:// 23.226.155.4	443
		FIX Order Entry / FIX Certification	23.226.155.4	8443
		Drop Copy Information	23.226.155.4	8442
		FIX Simulation	23.226.155.4	8444

MARKET DATA

Top of Book Quote and Last Sale Feed (TOPS)

Participants may use TOPS to receive real-time top of book quotations direct from IEX. The quotations received via TOPS provide an aggregated size and do not indicate the size or number of individual orders at the best bid or ask. Non-displayed orders and non-displayed portions of reserve orders are not represented in TOPS. TOPS also provides last trade price and size information. Refer to the [IEX TOPS Specification](#) on the IEX web site for complete details.

Multicast Addresses

Refer to the [IEX TOPS Specification](#) for multicast addresses.

Depth of Book and Last Sale Feed (DEEP)

Participants may use DEEP to receive real-time depth of book quotations direct from IEX. The depth of book quotations received via DEEP provide an aggregated size at a price and side, and do not indicate the number or size of individual orders at any price level. Non-displayed orders and non-displayed portions of reserve orders are not represented in DEEP. DEEP also provides last trade price and size information. Refer to the [IEX DEEP Specification](#) on the IEX web site for complete details.

Multicast Addresses

Refer to the [IEX DEEP Specification](#) for multicast addresses.



TELECOMMUNICATIONS PROVIDERS

Some telecom providers available within the Secaucus (Equinix NY5) and/or Chicago (Equinix CH4) data centers are listed below. This list is a summary and is not indicative of IEX preference or recommendation. For telecom providers not included on the list, please contact IEX Network Operations to discuss.

Extranet Providers

IEX partners with several extranet providers to aggregate Participant connectivity and provide low cost, value-added B2B services such as multicast market data feeds. Extranet providers are required to sign an Extranet Addendum to the [IEX Connectivity Services Agreement and Forms](#) after meeting the requirements outlined in the [IEX Extranet Provider Manual](#).

IEX Approved Extranet Providers

COMPANY	CONTACT	IEX LOCATION
BT Radianz	Pam Friedberg 212.205.1895	NY5 & CH4
IPC	Andrew Matlak 212.709.1150	NY5 & CH4
NYSE Technologies, SFTI Network	Rick Gilbody 347.276.2935	Charles Pepe 347.224.9933
CenturyLink	Danielle Durkin 201.472.2823	NY5 & CH4
TMX Atrium	Des Peck 44.20.3194.2510	NY5 & CH4
TNS	John Owens 703.453.8410	NY5 & CH4
GuavaTech	Michael Pappas 312.604.4300	NY5
Options-IT	Ken Barnes 646.205.2586	NY5

Carriers

Telecommunications carriers provide a dedicated circuit between Participants in different data centers to a demarcation point in the POP, ITF, or Chicago data center. The circuit is extended from the demarcation point to an IEX network device.

It is recommended that Participants use redundant connectivity via multiple telecom providers to the POP, ITF, and Disaster Recovery data center.



Contact the IEX Network Operations for information about circuit ordering details.

COMPANY	IEX LOCATION
AT&T Corp.	NY5 & CH4
CABLEVISION LIGHTPATH INC.	NY5
CENTURYLINK	NY5 & CH4
CFN SERVICES	NY5 & CH4
COGENT COMMUNICATIONS	NY5
FIBERMEDIA GROUP LLC	NY5
HIBERNIA ATLANTIC US, LLC	NY5 & CH4
HUDSON FIBER NETWORKS INC.	NY5
LEVEL (3) COMMUNICATIONS, LLC	NY5 & CH4
LEXENT METRO CONNECT. LLC	NY5
LIGHT TOWER FIBER	NY5
NEXGEN NETWORKS, CORP.	NY5 & CH4
SIDERA (RCN) NETWORKS, LLC	NY5 & CH4
SPREAD NETWORKS	NY5 & CH4
SPRINT	NY5 & CH4
VERIZON	NY5 & CH4
WBS CONNECT, LLC.	NY5
XO COMMUNICATIONS SERVICES, LLC.	NY5 & CH4
ZAYO (Abovenet) GROUP, LLC.	NY5

SUPPORT

Please email questions or comments regarding this manual to netops@iextrading.com. IEX Network Operations is a one-call shop that supports Participants, Extranet Providers, and telecommunications providers during initial setup and continuing support of connectivity to IEX.

Support Hours

- Phone: 646.343.2245
- Email: netops@iextrading.com



- Core phone support hours are 7:30 AM – 6:00 PM ET Monday – Friday
- Outside of core support hours, to report a network issue that must be addressed prior to market open – leave a voice mail with the firm name, contact number, and nature of the issue along with an email to netops@iextrading.com.
- For non-critical issues or for information, please email IEX Network Operations and your request will be responded to by the next business day.



REVISION HISTORY

Version	Date	Change
1.00	August 20, 2015	Initial Document
1.10	January 29, 2016	Drop Copy Information added to Equity Ports section Multicast addresses for TOPS references the TOPS Specification LAST information added to the Market Data section.
1.20	February 18, 2016	Reflect a single POP. Add Equinix contact to lease data center space. Update links.
1.30	June 27, 2016	Removed references to a separate last sale feed and added last sale information to TOPS
1.40	April 12, 2017	Introduced DEEP. Updated description of the Disaster Recovery platform. Incorporated information about the ITF.
1.50	May 25, 2017	Provided connectivity information to the ITF for FIX Order Entry / FIX Certification, Drop Copy, and FIX Simulation services.
1.60	April 11, 2018	Replaced CenturyLink with Cyxtera.
1.70	October 1, 2018	Removed the condition that IEX supports disaster recovery on a T+1 basis, as the Exchange now supports intraday recovery .
1.80	October 22, 2018	Updated IEX address from 4WTC to 3WTC.
1.81	May 7, 2020	Updated ITF TCP/IP Connectivity Addresses and Port numbers. Updated the Exchange disaster recovery times in the Overview section. Updated the Cross-Connect section to add customer-facing IP prefixes.