



Cboe FX Connectivity Manual

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Version 2.2

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Change Log

Version	Description of change
1.3	Change Log added Definition of terms added Connectivity Order process added Updated Appendix B
1.4	List of Port's and IP's updated for London LD4 Port and IP list added for NY5 Connectivity Order process updated
1.5	More detail on internet migration options in NY5 Trans-Atlantic WAN availability Clarification of NY5 demarcation
1.6	NY5 certification requirement removed
1.7	Cboe FX Link port ranges added for NY5 and LD4 Prod and Cert
1.8	Significant post-migration updates added Trans-Atlantic WAN connectivity details added Legacy connectivity decommission timelines added
1.9	Port ranges for local MD repeaters added Test TCP Ports added 545 decommission timeline added Connectivity testing paragraph added Clarification on Tran-Atlantic WAN service availability
2.0	Change to port range and IP's for Cboe FX Link Updated description of trans-Atlantic service
2.1	Legacy connectivity table in appendix B updated
2.2	Certification Cboe FX Link port update

Introduction

This document explains the connectivity options available to both the US & UK Cboe FX matching engines. This document will be updated regularly as further information becomes available, participants should ensure they are reading the latest version published at:

[https://fx.cboe.com/pdfs/Cboe FX Connectivity Manual 2.2.pdf](https://fx.cboe.com/pdfs/Cboe%20FX%20Connectivity%20Manual%202.2.pdf)

In summary:

The London matching engine is located at Equinix LD4

The New York matching engine is located at Equinix NY5

Participants are responsible for choosing their connectivity provider, arranging for connectivity to the data centre and paying all associated communications charges including cross-connects within the data centre.

It is not possible to access any Cboe FX market using Cboe equities market connectivity, similarly Cboe Equities markets are not accessible from Cboe FX connectivity.

Contacts

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Connectivity Ordering Process

Participants requesting new cross connects are required to sign the Cboe FX Connectivity Order Form.

[https://fx.cboe.com/pdfs/Hotspot Connectivity Order Form.pdf](https://fx.cboe.com/pdfs/Hotspot%20Connectivity%20Order%20Form.pdf)

The signed document should be returned to your account manager or prodsupport@hotspotfx.com.

Connectivity Options

The following Connectivity options only are supported, as detailed below:

- Data centre cross-connect
- Directly connected via metro ethernet circuit
- Extranet
- Internet
- NY5 <--> LD4 transatlantic WAN

Details of the migration from legacy connectivity is provided in Appendix B.

Data Centre Cross-Connect

London: Participants may cross connect from any of the Equinix Slough campus data centres i.e., LD4, LD5 and LD6

New York: Participants may cross connect from any of the Equinix Secaucus campus data centres i.e., NY2, NY4, NY5 and NY6. Cross connects between participants and Cboe FX in both NY4 & NY5 are the shortest path and of equal length. Further details can be provided on request.

- The technical and commercial relationship is between Equinix and the participant, Cboe FX is not involved.
- Participant orders and pays for the cross connect.

Directly Connected via Metro Ethernet

Participants may connect via a metro ethernet circuit.

- No co-location space is required.
- Cboe FX does not host telco equipment.
- The cross-connect from telco demarcation point can be ordered by Hotspot and re-charged to the participant.

Extranet

Participants may connect using an extranet.

- Extranet supplier provisions high-speed up links for multiple participants.
- The technical and commercial relationship is between the extranet provider and the participant.
- Extranets must be approved by Cboe FX.

Internet

- Both certification and production services are available.
- Full details are provided in Appendix A.1 (NY5) and Appendix A.2 (LD4)

Transatlantic Connectivity Between LD4 & NY5

Cboe FX offers access to the NY5 matching engine from LD4 and vice-versa via a Cboe FX provided transatlantic wide area network. This service allows access to all Cboe FX markets via a single connection in either NY5 or LD4.

The expected latency will be 67mS except under failure conditions.

Transatlantic access is only available via datacentre cross-connects and directly connected metro ethernet circuits.

The following services are available in production only:

- Cboe FX ITCH Market data
- Cboe FX FIX Market data
- Cboe FX FIX order entry (excluding market making activity)
- Cboe FX Java order entry (excluding market making activity)
- Cboe FX STP/DropCopy

Market data from the transatlantic market will be distributed via ITCH repeaters in the local data centre. Participants don't connect over the transatlantic circuit for this but rather to a local ITCH repeater.

Transatlantic connectivity is a chargeable service, see the Connectivity Price List for details.

https://fx.cboe.com/pdfs/press/Hotspot_ConnectivityPricing.pdf

Demarcation

London: The demarcation between Cboe FX and participant at Equinix LD4 is the patch frame within the Cboe FX suite.

New York: The demarcation between Cboe FX and participant at Equinix NY4 & NY5 are the satellite patching cabinets in NY4 & NY5.

Bandwidth Guidance

- Cboe FX suggest a minimum of 1G.
- Insufficient bandwidth will cause dropped packets and TCP retransmissions which may lead to data being delayed.

Physical Interfaces

Only the following physical interface specifications are supported.

Location	Speed	Media
Equinix NY5 / NY4 - US	10G	LR (single-mode)
	1G	LX (single-mode)
	100Meg	100BaseT (copper)
Equinix NY2, NY6 - US	10G	LR (single-mode)
	1G	LX (single-mode)
Equinix LD4 - UK	10G	LR (single-mode) & SR (multi-mode)
	1G	LX (single-mode), SX (multi-mode) & 1000BaseT
	100Meg	100BaseT (copper)
Equinix LD5, LD6 - UK	10G	LR (single-mode)
	1G	LX (single-mode)

IP Addressing

The details below apply to all Connectivity methods

- Cboe FX hosts use registered addresses for all data flows.
- Cboe FX supports publicly registered participant addresses.
- If required, Cboe FX can allocate a 10.x.y.z address block. This subnet can be split to provide transit P2P and host/NAT subnets if needed.
- Cboe FX supports static routing and dynamic routing via BGP.

Connectivity Testing

- Cboe FX runs TCP port listeners 24/7 on the highest TCP port in every TCP port range as is shown in Appendix A.1 and A2, "IP addresses & TCP Ports for Cboe FX" tables
- Participants can use this feature to ensure their connectivity to Cboe FX is working, for example following a new circuit install or a change.

Appendix A.1 – IP Addresses & TCP Ports for Cboe FX NY5

Cboe FX NY5 connectivity via cross connects				
Environment	Service	IP Prefix	TCP Port Range	Test TCP Port
Production	Drop Copy / STP	208.90.208.0/27	9088 - 9215	9215
Production	FIX Order Entry	208.90.208.0/27	6016 - 6143	6143
Production	FIX MM - Link	208.90.208.32/27	27137 - 27379	27379
Production	Java API	208.90.208.0/27	5120 - 5247	5247
Production	Java GUI	208.90.208.0/27	443	n/a
Production	FIX BookFeed	208.90.208.32/27	7040 - 7167	7167
Production	FIX BookFeed - LD4	208.90.208.32/27	7168 - 7295	7295
Production	FIX BookFeed - Link	208.90.208.32/27	27380 - 27623	27623
Production	Cboe FX ITCH	208.90.208.32/27	8064 - 8191	8191
Production	Cboe FX ITCH - LD4	208.90.208.32/27	8192 - 8319	8319
Certification	Drop Copy / STP	208.90.208.240/28	19200 - 19327	19327
Certification	FIX Order Entry	208.90.208.240/28	16128 - 16255	16255
Certification	FIX Order Entry - Link	208.90.208.240/28	36224 - 36351	36351
Certification	Java API	208.90.208.240/28	15104 - 15231	15231
Certification	Java GUI	208.90.208.240/28	443	n/a
Certification	FIX BookFeed	208.90.208.240/28	17152 - 17279	17279
Certification	FIX MM - Link	208.90.208.240/28	37348 - 37360	37360
Certification	FIX BookFeed - Link	208.90.208.240/28	37361 - 37375	37375
Certification	Cboe FX ITCH	208.90.208.240/28	18176 - 18303	18303

Cboe FX NY5 connectivity via Internet - Un-encrypted order entry via the internet is not supported.						
Environment	Service	Internet IP address	TCP Port Range	Test TCP Port	Open Internet	Restricted Internet
Production	Drop Copy / STP	74.115.129.5	9088 - 9215	9215	-	Yes
Production	FIX Order Entry (SSL)	74.115.129.3	6017 - 6019	6019	-	Yes
Production	Java API	74.115.129.3	5120 - 5247	5247	-	Yes
Production	Java GUI	74.115.129.3	443	n/a	Yes	-
Production	FIX BookFeed	74.115.129.4	7040 - 7167	7167	-	Yes
Certification	Drop Copy / STP	74.115.129.6	19200 - 19327	19327	-	Yes
Certification	FIX Order Entry	74.115.129.6	16128 - 16255	16255	-	Yes
Certification	Java API	74.115.129.6	15104 - 15231	15231	-	Yes
Certification	Java GUI	74.115.129.6	443	n/a	Yes	-
Certification	FIX BookFeed	74.115.129.6	17152 - 17279	17279	-	Yes
Certification	Cboe FX ITCH	74.115.129.6	18176 - 18303	18303	-	Yes

Appendix A.2 – IP Addresses & TCP Ports for London LD4

Cboe FX London LD4 connectivity via cross connects				
Environment	Service	IP Prefix	TCP Port Range	Test TCP Port
Production	Drop Copy / STP	195.3.208.0/27	9088 - 9215	9215
Production	FIX Order Entry	195.3.208.0/27	6016 - 6143	6143
Production	FIX MM - Link	195.3.208.32/27	27137 - 27379	27379
Production	Java API	195.3.208.0/27	5120 - 5247	5247
Production	FIX BookFeed	195.3.208.32/27	7040 - 7167	7167
Production	FIX BookFeed - NY5	195.3.208.32/27	7168 - 7295	7295
Production	FIX BookFeed - Link	195.3.208.32/27	27380 - 27623	27623
Production	Cboe FX ITCH	195.3.208.32/27	8064 - 8191	8191
Production	Cboe FX ITCH - NY5	195.3.208.32/27	8192 - 8319	8319
Certification	Drop Copy / STP	195.3.211.0/28	19200 - 19327	19327
Certification	FIX Order Entry	195.3.211.0/28	16128 - 16255	16255
Certification	FIX Order Entry - Link	195.3.211.0/28	36224 - 36351	36351
Certification	Java API	195.3.211.0/28	15104 - 15231	15231
Certification	FIX BookFeed	195.3.211.0/28	17152 - 17279	17279
Certification	FIX MM - Link	195.3.211.0/28	37348 - 37360	37360
Certification	FIX BookFeed - Link	195.3.211.0/28	37361 - 37375	37375
Certification	Cboe FX ITCH	195.3.211.0/28	18176 - 18303	18303

Cboe FX London LD4 connectivity via Internet - Un-encrypted order entry via the internet is not supported.						
Environment	Service	Internet IP address	TCP Port Range	Test TCP Port	Open Internet	Restricted Internet
Production	Drop Copy / STP	195.93.197.195	9088 - 9215	9215	-	Yes
Production	FIX Order Entry (SSL)	195.93.197.193	6017 - 6019	6019	-	Yes
Production	Java API	195.93.197.193	5120 - 5247	5247	-	Yes
Production	FIX BookFeed	195.93.197.194	7040 - 7167	7167	-	Yes
Certification	Drop Copy / STP	195.93.197.225	19200 - 19327	19327	-	Yes
Certification	FIX Order Entry	195.93.197.225	16128 - 16255	16255	-	Yes
Certification	Java API	195.93.197.225	15104 - 15231	15231	-	Yes
Certification	FIX BookFeed	195.93.197.225	17152 - 17279	17279	-	Yes
Certification	Cboe FX ITCH	195.93.197.225	18176 - 18303	18303	-	Yes

Note

There is no Java GUI access to the LD4 matching engine.

Appendix B – Legacy Connectivity

This refers to connectivity that participants previously used to access the legacy New Jersey Cboe FX matching engine in 545 Washington, which will be decommissioned in due course.

Legacy Connectivity is in the following locations:

- NY4 (Legacy KCG)
- 545 Washington (New Jersey)
- TY3
- Internet (Natted via 545 Washington)

Legacy Connectivity does not give access to the Cboe FX matching engine in LD4, and will only be supported through the following dates:

Legacy Connectivity Decommission Timeline	
Location	Decommission Date
KCG NY4	9 December 2016
545	30 June 2016
TY3	30 June 2016

Participants will be required to migrate to the relevant supported connectivity option.