Important Cboe Options Exchange Migration Update

Reference ID: C2019092300

Overview

Cboe Options Exchange ("C1") is pleased to announce the migration to Bats technology remains on track for October 7, 2019*, subject to regulatory review and approval.*

In the following sections, important updates are highlighted which relate to:

- ➢ Migration Timeline (Updated)
- ➢ Feature Packs
- ➢ Technical Reference Documents (Updated)
- ➢ Testing Opportunities and Script (Updated)
- ➢ OCC Testing Opportunities
- ➢ OCC Clearing Reference
- ➢ Customer Support Contacts
- ➢ Trading Floor Updates
- ➢ Logical Port Requirements for Floor Systems/Independent Service Vendors (ISV)
- ➢ Invoices
- ➢ Logical Production Port Billing
- ➢ Physical Port Billing
- ➢ Platform Notifications
- ➢ Market Makers
- ➢ TPH Appointment/Registration
- ➢ Platform Contingency/Fallback Plans (Updated)

Migration Timeline (Updated)

Customer Milestone	Target Availability Date
Review technical specification for C1 on Bats technology	AVAILABLE
Establish physical network connectivity to new C1 certification, production, and disaster recovery	AVAILABLE
Confirm Firm Administrator access to Customer Web Portal	AVAILABLE

Order logical sessions for C1 certification	AVAILABLE
Complete C1 BOE and/or FIX certification	AVAILABLE
~~Customer call~~	~~03/19/19~~
Update C1 production order entry and DROP session counts	AVAILABLE
Update default C1 production session settings	AVAILABLE
Participate in weekday production environment testing using test symbols	AVAILABLE
~~Customer call~~	~~05/21/19~~
~~Customer call~~	~~07/09/19~~
~~Customer call~~	~~09/05/19~~
Participate in weekend test opportunity *(Including support for the trading floor.)*	~~06/15/19~~ ~~07/27/19~~ ~~08/24/19~~ ~~09/14/19~~ 09/28/19 (DR) 10/05/19
Completion of C1 migration to Bats technology in NY5 (Go-Live)	10/7/19

IMPORTANT: Good-'til-canceled ("GTC") orders existing on the legacy C1 platform at the close on Friday, October 4, 2019, will be cancelled after the close at 4:45 p.m. ET and will need to be resubmitted on the new C1 platform.

Feature Packs

In preparation for the C1 migration and in an effort to unify functionality as much as possible across Cboe's four options platforms while further de-risking the migration of C1 to the Bats technology platform, Cboe has introduced a total of nine Feature Packs across the BZX Options, C2 Options and/or EDGX Options exchanges, subject to regulatory review and approval. Rollout of the Feature Packs began in the fourth quarter of 2018 and continued through to the third quarter of 2019.

All nine Feature Packs have been deployed. The Feature Packs have been bundled to focus on functionality as follows:

Feature Pack	Target Availability Date (Certification)	Target Availability Date (Production)
#1 – Entitlements / Reserve Orders	AVAILABLE	AVAILABLE
#2 – Quoting Interface	AVAILABLE	AVAILABLE
#3 – Electronic API for Post Trade Edits	AVAILABLE	AVAILABLE
#4 – Market Data	AVAILABLE	AVAILABLE
#5 – Simple Order Auctions	AVAILABLE	AVAILABLE
#6 – All-or-None Orders	AVAILABLE	AVAILABLE
#7 – Global Trading Hours / Opening Process	AVAILABLE	AVAILABLE
#8 – Complex Crossing	AVAILABLE	AVAILABLE

#9 – Complex with Stock Legs	AVAILABLE	AVAILABLE

Technical Reference Documents (Updated)

Details regarding C1 functionality are available within the technical specifications noted below. Links to these specifications are available on both the C1 Integration page as well as within the normal Technical Specifications page on markets.cboe.com. Options Market Data feed specifications have been updated with certification environment IP port and unit distribution information.

- ➤ C1 Technical Integration FAQ (Updated)
- ➤ C1 Platform Change Matrix (Updated)
- ➤ US Options FIX Specification (Updated)
- ➤ US Options BOE Specification (Updated)
- ➤ US Options Risk Management Specification
- ➤ US Options Clearing Editor Specification
- ➤ US Options Web Portal Port Controls Specification
- ➤ US Options Auction Process
- ➤ US Options Auction Feed Specification
- ➤ US Options Opening Process
- ➤ US Options Opening Process Feed Specification
- ➤ Secure Web API
- ➤ US Customer Web Portal Specification
- ➤ Cboe Symbology Reference
- ➤ US Options Multicast TOP Specification
- ➤ US Options Multicast PITCH Specification
- ➤ US Options Complex Book Process
- ➤ US Options Complex Auction Multicast PITCH Specification
- ➤ US Options Complex Multicast TOP Specification
- ➤ US Options Complex Multicast PITCH Specification
- ➤ Cboe Options Exchange FLEX Feed Specification
- ➤ Cboe C1 Options Exchange Connectivity Manual
- ➤ US Extranet Manual
- ➤ US Options Message-to-Data Feed Matrix

Testing Opportunities and Script (Updated)

The first of six weekend test opportunities occurred on June 15, 2019. **The final production readiness weekend test is scheduled for Saturday, October 5, 2019.** Additionally, a functional Disaster Recovery ("DR") data center test will occur on Saturday, September 28, 2019 to

allow firms with Reg SCI DR testing requirements for C1 an opportunity to perform a functional pre-test before the October 26, 2019 Reg SCI test.

Note logical connectivity to the new C1 DR trading environment is currently available 24x7.

Note that all TPHs with a floor presence are **required** to participate in the final production readiness weekend test in addition to **at least one** other test.

Refer to the Migration Timeline for the complete list of test dates.

All symbols supported on the current production trading platform will be made available for test trading during each weekend test. The following market transition states will be supported:

8:00 a.m. ET	C1 Options production environment available for connection.
8:30 a.m. ET	GTH session opens for SPX, VIX, and FLEX products. Pre-open queuing session begins for Regular Trading Hours ("RTH").
9:15 a.m. ET	GTH session ends.
9:30 a.m. ET	RTH session opens.
1:00 p.m. ET	RTH session closes.

TPHs and ISVs that have certified to the new C1 trading platform will be allowed to connect, submit orders, and receive market data for the duration of the test. The trade date for all transactions on all exchange messaging (e.g. order acknowledgements, execution reports, drop, and market data) during this test will be the actual date (e.g. 10/05/2019).

In order to test any other transitions, including persistence of GTCs, please plan to participate in testing in the production environment using test symbols during a normal weekday. A list of supported test symbols is available on markets.cboe.com. The file can be found by navigating to "Our Markets" > "U.S. Options" > "Market Statistics" > "Product Info" > "All Series (CSV)".

The Cboe Trade Desk (913.815.7001) and NOC (913.815.7005) will be available for support for the duration of all weekend test opportunities as well as during normal business hours.

OCC Testing Opportunities

OCC will be participating with Cboe during the test of the new **C1 production trading platform** on the weekend test dates noted in the Migration Timeline. Customers will not be able to obtain any real-time clearing records on Saturday during testing from the OCC, but if they wish to obtain DDS records for the Saturday test date activity, they may submit a testing request with OCC (see link below). The test trades will be executed in one of OCC's external test environments, and DDS test records will have a business date of the Monday following each Saturday test date.

Additionally, please be advised that the **C1 certification trading platform** will be submitting real-time clearing data to the OCC's external test environments Monday through Friday until Friday, October 4, 2019. Firms interested in accessing test clearing records based on C1 certification environment test activity during this time may also submit an OCC testing request.

OCC external testing requests are initiated by completing an online form with the OCC. The form is available on the OCC Website (www.theocc.com) from the 'Clearing & Services / Certification Testing Services' menus or directly from the following link:

➤ http://www.theocc.com/clearing/certification-testing/default.jsp

OCC supports a minimum 1-week lead time for all test requests in order to confirm system and resource availability as well as to complete any pre-test verifications.

Submitted test requests will be responded to within two business days of receipt; please be sure to reference C1 Certification Testing. The Technical Certification and Documentation Services group will then initiate the process of confirming the scope, timeline, and needed inputs/outputs for the test, including test connectivity.

OCC Clearing Reference

OCC Mapping (FIXML Tag)	Field Name (FIX Tag) (Legacy C1)	Field Name (FIX Tag) (C1 on Bats Technology)
Clearing Member Number (4)	**ExecBroker** (76)	**OnBehalfOfCompID** (115) Clearing Number Associated with EFID
Customer ID (24) Account Number	**ClearingAccount** (440)	**Account** (1) Only the first ten characters will appear in the Account Num field.
Executing Broker (2)	N/A	**SenderCompID** (49)
Trade ID (1003) Exchange assigned Trade ID.	**ExecID** (17)	**ExecID** (17)
ExchSpecInstr (1139) Exchange Optional Data	**OrderID** (37)	**OrderID** (37)
ClOrdId (11) Client Order ID assigned by Clearing Member.	**ClOrdId** (11)	**ClOrdId** (11)
Give-Up Clearing Member (14) Required for CMTA allocation trades.	**ClearingFirm** (439)	**ClearingFirm** (439)
Sub Account ID (38)	**Account** (1)	**ClearingAccount** (440) Only sent for Market Maker account type. Non-Market Maker account types with a Sub Account ID will be rejected by the Exchange unless explicitly requested by the TPH to be allowable.

Txt (58) Clearing Member Optional Data field.	**ClearingOptionalData** (9324)	**ClearingOptionalData** (9324)

Customer Support Contacts

The Cboe Trade Desk (tradedesk@cboe.com – 913.815.7001) and Cboe Network Operations Center (noc@cboe.com - 913.815.7005) will be the primary points of contact for the new C1 trading platform.

The Cboe Operations Support Center (osc@cboe.com – 866.728.2263) will be the primary point of contact for floor specific support needs (e.g. PAR, Pulse, and the data wall).

Trading Floor Updates

TPHs are **required** to participate in the final production readiness weekend test in addition to **at least one** other test, and are highly encouraged to participate in more weekend tests. Support will be provided for testing on the Cboe trading floor for each scheduled weekend test.

Logical Port Requirements for Floor Terminals/ Independent Service Vendors (ISV)

Each firm is required to have one logical port per ISV provider due to port-level configuration settings that are unique to each ISV. For example, if a firm has two Silexx terminals, one Pulse terminal, and one Blaze terminal, that firm will need at least three separate logical FIX ports to accommodate the necessary connections. Logical port fee information can be found in the Cboe Options Exchange Access and Capacity Fee Schedule notice.

Invoices

Effective upon platform migration, TPHs will be required to use the Cboe Customer Web Portal for accessing invoices. Invoices will be made available in the same format currently used for BZX, C2, and EDGX Options. Please work with your firm's Portal Account Admin to ensure billing associates have access to the Cboe Customer Web Portal.

Logical Production Port Billing

Logical order entry sessions (FIX, BOE, and BOE Bulk) will be created for each participant in the new production environment based on logins in use on the legacy C1 platform as of April 1, 2019. Additionally, a single DROP session will be created for each TPH.

Subject to regulatory review, C1 logical port fees for FIX, BOE and Drop ports will be assessed the full month rates for October 2019 for logical ports existing on the new trading platform at any time

on October 7, 2019. C1 logical port fees for ports added on or after October 8, 2019, will be pro-rated. Legacy CMI and FIX Logins in use prior to October 7, 2019, on the legacy C1 system will not be billed during the October 2019 billing cycle.

Fees will be assessed for all Order Entry and Drop logical ports automatically created in April 2019 for users on the new trading platform unless they are removed upon request prior to October 7, 2019. In addition, fees for other ports such as Purge, Spin Server, and GRP will be pro-rated beginning October 7, 2019, as these ports can only be used within the new platform.

As part of the transition, TPHs will no longer be charged bandwidth packet fees. Instead, firms may be assessed fees for additional logical ports based upon the average daily orders entered by the firm over a given calendar month. TPHs may subscribe to an "Implied Logical Port Fee" report for the new C1 trading platform by contacting the Cboe Trade Desk prior to the migration date. This is a daily report with month to date data which estimates what the derived logical port cost would be if the month ended on the day each report is delivered. Effective April 2, 2019, firms may either use the "Logical Ports" tool in the Customer Web Portal or contact the Cboe Trade Desk for the current list of ports configured for their firm.

Physical Port Billing

TPHs that continue to leverage legacy C1 platform physical connections (i.e. that are not directly connected to the latency equalized network) will be billed the current C1 physical port fees through October 2019. If a TPH obtains a new C1 latency equalized physical connection to be used upon the launch of the new system, and terminates the legacy physical port within the month of October, the TPH will not be billed for the NEW C1 platform physical connection until November 2019.

Please note that:
- legacy C1 platform physical connectivity will remain viable after–completion of the C1 platform migration, until January 31, 2020.
- legacy connectivity will have a latency disadvantage compared to the new connectivity.

Equinix Fee Waiver
Cboe Global Markets has obtained a waiver from Equinix for the initial cross connect install fee and the Equinix Monthly Recurring Charges (MRC) for up to six months on new cross connects run to the new C1 latency-equalized infrastructure built in preparation for the migration to Bats technology. Cboe TPHs and vendors will need to contact their Equinix representatives directly to ensure they are issued the paperwork necessary to obtain waivers.

For any additional questions, please contact Greg Nelson (gnelson@equinix.com), Account Director at Equinix.

Sunset of Legacy C1 Physical Connection Access

Cboe will sunset legacy C1 platform physical connection access to the new C1 platform on January 31, 2020.

Before January 31, 2020, firms will be required to connect to the latency equalized network through a new physical connection. Cboe recommends TPHs using the legacy C1 connectivity work with the Cboe NOC on a migration plan to obtain connection(s) directly into the Cboe latency equalized network infrastructure. Please note that physical connectivity for C1 production cannot be utilized to access any other Cboe exchange platforms at this time.

Platform Notifications

C1 Trade Desk notices are available at https://markets.cboe.com/us/options/notices/ and customers can also request an email subscription to the available distribution lists via tradedesk@cboe.com. Currently, the categories of Options notifications available for subscription include:

- ➢ System Status
- ➢ Fee Schedule
- ➢ Trade Desk Updates (e.g. feature/function updates)
- ➢ Schedule Updates (holiday schedules and key test date updates)
- ➢ Delistings
- ➢ Product Update
- ➢ Restrictions*^
- ➢ Reasonability Notices*
- ➢ Trader E-News (weekly Cboe bulletin covering updates across all Cboe-operated platforms)

*Applicable to Cboe Options Exchange only.
^Email distribution equivalent to "Product Updates" distribution list.

Market Makers

C1 Options Exchange Market Makers need to work with the Cboe Trade Desk to ensure the qualified person(s) who will be maintaining the firm's Market Maker list have established their credentials to access the Market Maker tool via the Cboe website. Alternatively, the firm's Web Portal Account Admin can provision users with appropriate access using the "User Management" tools available in the [Customer Web Portal](#).

Additionally, on the new platform Cboe will offer a Market Maker Coverage Report that details a firm's quoting activity in registered symbols. Firms may subscribe by emailing the Trade Desk at tradedesk@cboe.com.

Please remember Cboe requires that firms notify Membership Services of any changes to the list of approved traders submitted with the firm's application.

TPH Appointment/Registration

Cboe Global Markets will not complete the transfer of Appointments/Registrations for TPHs upon completion of the C1 migration to Bats technology. TPHs must complete appointments using the Customer Web Portal prior to October 7, 2019.

Platform Contingency/Fallback Plans (Updated)

In the unlikely event a systemic issue with the new C1 platform necessitates a fallback to the legacy C1 system on the business day of the migration, please be aware of the following:

1. Cboe will keep customers apprised of the current status and plans via Options System Status Updates. These updates will be posted on the notices page referenced in the previous section and will also be distributed via email to customers subscribed to the System Status distribution list. Any status updates will be provided to the trading floor by the Operations Support Center ("OSC").
2. Cboe intends to first attempt to address issues encountered on the new system before considering the option to fallback to the legacy system.
3. Customers would not be able to connect to the legacy platform order entry or market data connections until such time as would be announced via a System Status Update.
4. Cboe would provide a time at which customers could reconnect to the legacy system, a time at which orders would be accepted for queuing, and a time at which trading would begin.
5. TPHs using FIX would need to reset their FIX inbound and outbound sequence number to 1/1.
6. The legacy C1 platform would return to running on Central Time, **not** Eastern Time as the new system will run.
7. Customers taking market data would be required to connect to the multicast groups associated with the legacy platform.
8. Technical support for the legacy platform would be available via osc@cboe.com.
9. Customer settings and configurations on the legacy system would be the same as they were when the system shut down on Friday, October 4. They will not be transitioned from the new system to the old system.
10. Any open orders on the new platform would be cancelled (including GTC) and would have to be resubmitted to the legacy system.
11. Market data statistics for the day posted to the public web site may not immediately be complete. Automated reporting regarding trading statistics and real time market data for the day would only disseminate data related to the active platform.
12. Cboe would not reactivate the new C1 platform until the start of a new week, which would be announced via a Trade Desk Update.

More Information

Please contact the Cboe Trade Desk, Cboe NOC, or your Business Development contact for support or with any questions. Additionally, you may refer to the C1 integration website for more details at https://batsintegration.cboe.com/c1.

We appreciate your business and remain committed to powering your potential with Cboe products, technologies, and solutions.

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