MATCHNow ("MN") Technical Integration Frequently Asked Questions

Last Updated: <mark>June 22, 2021</mark>

GENERAL QUESTIONS

What's happening with MN?

- ➢ We plan to migrate MN to Cboe technology on February 1, 2022.
- ➢ The migration process began this year and details will continue to be made available on the MATCHNow Integration Microsite (matchnow.cboe.com) as the integration progresses.
- ➢ An integration timeline is also available on the [MATCHNow Integration Microsite](#).

Will functionality of MN change?

- ➢ Please refer to the [Platform Change Matrix](#) for a summary of key functional changes planned for the new MN platform.
- ➢ Refer to the new MN platform Technical Specifications found on the [MATCHNow Integration Microsite.](#)
- ➢ As part of our technology migration on February 1, 2022, MN will be enhancing our Conditionals Book with BIDS Trading technology, including its sponsored access model. Full details on all the planned changes will be released on June 22, 2021, the same day as our recently announced Cboe LIS Canada Client Call.

Will changes be made to Conditional Order Functionality? (New!)

Yes, changes to Conditional Order functionality are planned. The following items are planned to be added or changed.

- ➢ New Sponsored Access Model
- ➢ Invitation Sequencing, Time Limits, and Minimum Size
- ➢ Pro-Rata Allocation Replaced by One-to-One Matching (Price/Broker/Size/Time Priority)
- ➢ Executions at All Eligible Price Levels At or Within the Protected National Bid or Offer

➢ Updates to Conditional Compliance Mechanism
➢ Improved Reporting for Subscribers

A full list of changes can be found in the Platform Change Matrix, and further details can be found in the MN FIX Specification, and the MN In Detail Specification.

Will changes be made to the MN pro-rata allocation method?

Yes, changes to our pro-rata methodology are planned. There will be slight changes to the pro-rata allocation logic. The changes will affect the allocation process as follows:
➢ Randomization will be removed in the rare edge-cases where it applies and it will be replaced with arrival-time priority for allocation.
➢ After an initial round of pro-rata allocation, the residuals after rounding will be allocated to those orders that were negatively affected by any rounding down that occurred in the first round.

Are you keeping all order types and product offerings of both companies?

➢ No. Most, but not all current MN order types and functionality will continue to be supported, while other new order entry functionality will be made available. For example, support is being added to allow MN Subscribers to route Conditional Orders to a new platform that is based on BIDS Trading technology.
➢ There will be certain minor changes resulting from the migration to the Cboe technology, but the functionality and differentiation that are core to MN's marketplace will remain unchanged.
➢ More details regarding functionality can be found within the new technical specifications and the Platform Change Matrix, both of which are available on the MATCHNow Integration Microsite.

How will time zone changes impact the MN migration?

➢ There will be no change to the time zone management on the platform. Upon migration to Cboe technology, all trading times and system timestamps will continue to operate in the Eastern Time (ET) zone.

Will the trading hours of MN change?

Upon migration to Cboe technology, MN session hours will remain unchanged.

Pre-Open Order Acceptance	8:00 a.m. - 9:30 a.m. ET
Regular Trading Hours	9:30 a.m. - 4:00 p.m. ET

Will Subscribers need to sign a new Subscriber Agreement or fill out any other new Subscriber materials for MN?

➢ We do not currently anticipate any need to repaper the formal legal relationship between MN and existing Subscribers, as set out in their respective Subscriber Agreements. However, Subscribers will be asked to fill out a new attachment ("Schedule A") to their existing agreement, to provide certain details to Cboe's Membership Services team, insofar as those details are not already captured in the existing Subscriber Agreement.

➢ For Subscribers that wish to offer the sponsored access that will be a cornerstone of the new BIDS Trading-based Conditionals functionality, they will need to sign a new "Sponsored Access" addendum to their existing Subscriber Agreement.

Will Subscribers be restricted to a specific number of FIX sessions? What will order entry session restrictions look like on Cboe technology?

➢ No. Each Subscriber may maintain as many logical order entry sessions as they are willing to purchase.

➢ Logical order entry sessions will have a substantially higher message-per-second rate and capacity than existing MN order entry sessions.

What is a Firm ID?

➢ A Firm ID is a 4-character identifier that will be generated by Cboe's Membership Services team. Once the Firm ID is established Membership Services will contact the Subscriber to inform them of the Firm ID. For Subscribers, a Firm ID will have a one-to-one relationship with existing 3-digit Broker IDs (sometimes referred to as "Participating Organization numbers" or "PO numbers").

➢ Firm IDs will be referenced on invoices, reports, within the Cboe North American Customer Web Portal, and within various other references relating to a Subscriber.

Is my Trader ID changing?

➢ No. Existing Trader IDs will be migrated to the Cboe Technology platform and associated with the appropriate Firm ID/Broker ID. Once the migration is completed (*date TBD*), Subscribers will be able to add, delete, or modify Trader IDs associated with their firm via the Cboe North American Customer Web Portal.

Will the customer call presentations be made available for download?

➢ Yes. You may access the customer call presentations from the MATCHNow Integration Microsite. Note there will likely be a delay of a few days after a call before the call recordings are posted.

Who do I call if I have a question?

➤ The MATCHNow Trade Desk will continue to operate as they have in the past and will be the primary point of contact for Subscribers related to MN trading and operations support. That said, MN Trade Desk will be working very closely with the Cboe U.S. Trade Desk during the technology platform migration and the U.S. Trade Desk will provide supplementary support for the integration efforts until the platform migration is complete.

➤ If your firm would like to request a Technical Review, please contact the MN Trade Desk or reach out to your firm's Account Manager.

➤ Subscribers may contact the Cboe Network Operations Center ("NOC") with any questions regarding connectivity to the new production, disaster recovery, and certification platforms.
   o Cboe NOC: noc@cboe.com or +1.913.815.7005

➤ New Subscribers that will only trade using the new Cboe technology platform will work with Cboe Membership Services (membershipservices@cboe.com) to initiate the on-boarding process and to complete their Subscriber Agreement. Membership Services will take full responsibility for initial onboarding efforts upon migration to the new platform.

➤ Unless a representative from Cboe has informed you otherwise, your additional contacts such as business development or sales remain unchanged at this time.

TECHNOLOGY/INTEGRATION QUESTIONS

What is the integration transition timeline? When will MN transition to Cboe technology?

➤ Subject to regulatory approval, our plan is to migrate MN to Cboe technology in the Equinix TR2 data center on February 1, 2022, at which point the legacy MN platform will be retired.

➤ The Integration Timeline as well as more details can be found on the MATCHNow Integration Microsite.

➤ We will remain in close dialogue with our clients and provide regular communication and ample notice on any technology changes we plan to make that will impact their businesses.

What is the plan for the MN data centers? Will you continue to operate in the same ones in which you currently operate?

➤ The new MN Production and Certification platforms will be relocated from the TMX facility in Markham to TR2 ("the primary data center"), a state-of-the-art data center that is part of the Equinix Toronto campus.

➤ The new Disaster Recovery (DR) platform will be relocated to 350 Cermak ("the secondary data center)", in Chicago, Illinois (U.S.A.).

- All Subscribers will be required to connect to MN in the primary data center using a latency equalized connection. To equalize the latency across all Subscriber connections, an estimated 8 to 10 microseconds of round trip latency will be incurred for all connections; this will ensure that proximity to the MN trading systems will not provide an advantage for any Subscriber versus another.
- Orders for physical connectivity to the new MN platform will be accepted beginning on September 1, 2021.

Will MN Subscribers have the ability to access other Cboe markets from a single connection?

- In our DR location, yes. Physical connection into Cboe's 350 Cermak ecosystem allows for Cboe customer access to all Cboe DR platforms that will be supported from this secondary data center, including MN.
- Access to other Cboe (US) markets, however, will not be available through our primary data center (i.e., the Production TR2 data center).

Will MN Subscribers require separate connections for order entry and market data?

- No. Both order entry and market data will be available over a single physical connection.

Will Internet connectivity be available for use to access the Certification environment?

- Yes. We will allow VPN connectivity over the Internet for access to the Certification environment only.
- Internet connectivity will NOT be available in production.
- Contact the Cboe NOC (noc@cboe.com) for more information on gaining access to the new MN Certification environment via an Internet based VPN.

Will MN production migration occur in a single day?

- Yes, we plan to migrate MN to TR2 on Cboe technology on February 1, 2022.
- To ensure the migration goes well, we will be conducting multiple weekend dress rehearsals. The first Saturday production test is currently scheduled for Saturday, October 16, 2021.
- MN also intends to allow for trading of test symbols in TR2 on the new MN production trading platform during normal production trading hours in advance of the migration to further aide in Subscriber readiness. Trading for test symbols in TR2 on the new platform will begin to be supported during standard trading hours Monday through Friday beginning on Monday, October 18, 2021. The list of test symbols to be used will be published prior to this date.

If there are platform issues on February 1, 2022, will there be a fallback?

➢ If there are any issues on the migration date, Cboe will have to evaluate the circumstances of the issue to determine next steps.

➢ Given the requirement for Subscribers to certify to the new platform, the fact that the production environment will be active and available for use (with test symbols) for multiple months prior to the migration, and given that there will be 5 weekend testing opportunities for Subscribers to use the new platform, Cboe does not anticipate there will be any material issues.

➢ In the event of an issue, Cboe will aim to push forward to resolve the issue on the new trading platform.

➢ In a worst case scenario, Cboe may consider reverting to activating the former platform for trading on the next business date (February 2, 2022).

Will Equinix offer a fee waiver for cross connects ordered at TR2 before the migration?

➢ Yes, Equinix has agreed to waive initial install fees and Monthly Recurring Charges (MRC) from September 1, 2021 through January 31, 2022 for new cross connect orders in the Toronto TR2 data center to the new MN production platform.

➢ You must contact your Equinix account manager to request the waiver paperwork; cross connect requests submitted via the Equinix Portal will not receive the waiver.

Will fee waivers be offered for Disaster Recovery site connectivity at 350 Cermak before the migration?

➢ No. Given that connectivity to Cboe network infrastructure at 350 Cermak provides for access to various Cboe trading platforms through a single connection, no waiver will be offered for early access to the new MN DR platform.

What kind of physical connectivity will be offered for MN?

➢ 1Gb and 10Gb connections will be offered in both TR2 (primary) and 350 Cermak (secondary) data centers.

Will I be charged for physical port (connectivity) fees if I bring up a new TR2 connection prior to the production integration date?

➢ No. Physical ports in TR2 that connect to the new MN environments and are used solely for MN access will not be billable until after the MN production migration is complete.

Will Subscribers, Extranets, or Telco providers be allowed co-location space within the new MN TR2 cage?

➢ No.

What options are available to Subscribers that don't have a point of presence in the 350 Cermak DR location? Will any Extranets or Telco providers be allowed?

➢ Yes. Direct access and access via Extranets will be supported in 350 Cermak. Please refer to the new MN Connectivity Manual and Extranet Manual for more information.

Which order entry protocols will be supported?

➢ Cboe's FIX implementation is based on FIX 4.2 (as is the case for the legacy platform).
➢ Cboe's BOE protocol may be introduced post-migration based on client demand.
➢ Technical specifications are available on the MATCHNow Integration Microsite.

Will my firm's legacy production logical order entry sessions be converted to order entry sessions on the new Cboe technology platform?

➢ No. The legacy MN platform required a distinct order entry session for each of the 4 destinations (Liquidity, Odd Lot, Conditionals, and Market Flow), whereas the Cboe platform will only require a single session to access all 4 destinations, so a preemptive setup and/or migration of settings did not make sense for this migration.
➢ Clients will need to request new order entry sessions via the Logical Port Request "add" tool (*coming soon*) in the Cboe North American Customer Web Portal. Default session settings will be applied as defined within the FIX specification. Settings may be updated by making a "Modify" Logical Port Request update in the Cboe North American Customer Web Portal.
➢ FIX DROP and Order by Order ("ODROP") sessions will also need to be requested to be created on the new platform using the Logical Port Request "add" tool (*coming soon*) in the Cboe North American Customer Web Portal. Prior to the production launch, firms will be able to work with the MN Trade Desk as well as their Account Managers to ensure DROP ports are configured in the manner expected.
➢ Subscribers may obtain their logical session connection information via the Ports tool (*coming soon*) within the Cboe North American Customer Web Portal.

CERTIFICATION QUESTIONS

May I use my existing MN Certification sessions?

➢ No. Upon migration to Cboe technology, all existing MN Certification sessions will be decommissioned and will not be available for use to certify the new Cboe-based MN trading platform. There will be no automatic transfer of Certification sessions from the legacy platform to the Cboe technology platform.

How do I request a new MN Certification session?

➢ Once Subscribers establish physical connectivity to the new latency equalized network infrastructure within the TR2 data center, free of charge Certification order entry, market data, and drop sessions may be requested via the Logical Port Request form (*coming soon*) found in the Cboe North American Customer Web Portal. In their requests, Subscribers should specify any desired port settings other than the port defaults which can be found in the FIX Specification located on the MATCHNow Integration Microsite.

During what hours can I connect to the Certification environments?

➢ Subscribers may connect to Certification sessions during normal production trading hours.
➢ Certification sessions are available during normal trading hours. They are not available on weekends or market holidays.
➢ Certification sessions will be available during production extended hours trading sessions.

What should I do prior to scheduling a Certification appointment?

➢ Subscribers must first establish physical connectivity to the new MN latency equalized network infrastructure within the TR2 data center and must then request new Certification sessions. The Cboe Conformance Certification Tool (*coming soon*) available in the Cboe North American Customer Web Portal may be utilized to perform and submit an unattended MN certification. In order to avoid delays and/or undesired rescheduling, Subscribers are expected to complete sufficient unattended testing prior to their appointment.

What symbols can I use for testing?

➢ Certification will support testing for the same test and production classes that will be available for trading in the MN production environment.

Will there be trading simulator traffic in the certification environment?

➢ Order generators will be configured in the new MN certification environment to allow Subscribers to conduct unattended testing.

➢ Order generators will generate resting liquidity as well as periodic trades to ensure market data feed handlers can be tested using certification environment traffic.

What pricing will be used in the certification environment? Will it be based off Production or the Certification data?

➢ The MATCHNow certification environment will receive market data from both the GTE and production systems in order to calculate and establish Protected NBBOs (PNBBOs) for each symbol.

➢ GTE PNBBO data will be used on each Monday, Thursday, and Friday.

➢ Production PNBBO data will be used on Tuesday and Wednesday.

How do I use the Certification website to test Customer Web Portal functionality?

➢ Subscribers may request a Certification web login by emailing the MN Trade Desk at caops@cboe.com. This will allow Subscribers to become familiar with the full suite of production web portal tools.

How do I schedule a Certification appointment?

➢ Subscribers can use the Conformance Certification Tool (*coming soon*) available in the Cboe North American Customer Web Portal to complete their certifications.

For which features will I be required to certify?

➢ All Subscribers must certify for basic functionality, including establishing and maintaining connectivity, order entry, and disconnect recovery.

➢ Subscribers are expected to certify for all functionalities they intend to use in production, but they will only be required to certify for order types or order modifiers they intend to use in production.

If I have certified on one of the Cboe Exchanges already on Cboe technology, do I need to certify for MN after it is migrated?

➢ Yes. Even if a client has completed a successful certification for a Cboe (US) Exchange, the client will still be required to complete additional certification for functionalities unique to MN in order to submit production orders to it.

What happens after I certify?

➢ Upon successful Certification, Subscribers will receive an emailed copy of their completed Certification script. Subscribers will be able to request and connect to FIX sessions created in the TR2 data center with the certified functionalities enabled (once the new production platform is made available).

➢ Note that regardless of any prior production and/or Certification session settings, all new production sessions will be created with the default session settings. Therefore, it is the responsibility of the Subscriber to specify any desired non-default settings when requesting new production sessions.

➢ For reference, a list of port default settings is available within the FIX specification located on the MATCHNow Integration Microsite. Subscribers may also view the port and default port settings through the Logical Ports tool (*coming soon*) available on the Cboe North American Customer Web Portal. To view default port settings, from the Port Status page simply click the "More Options" icon and select "View Port Attributes Info".

➢ Additional order entry sessions may be requested via the Logical Port Request form (*coming soon*) found in the Cboe North American Customer Web Portal; these requests are typically filled same day for next-day connectivity.

Where can I find the technical specification for Cboe technology order entry protocols?

➢ The most recent specifications can be found on the MATCHNow Integration Microsite.

MARKET DATA QUESTIONS

Which market data protocols will be supported post-migration?

➢ The Cboe technology market data protocol Multicast PITCH will be the standard protocol for MN following the technology migration. The technical specifications can be found on the MATCHNow Integration Microsite.

What changes can I expect to the Cboe technology market data protocols in support of MN?

➢ The market data protocol for MN will be based on existing Multicast PITCH Cboe technology market data protocols used by other Cboe technology trading platforms. The technical specification for Multicast PITCH can be found on the [MATCHNow Integration Microsite](#).

If I currently subscribe to MN Market Data but not Cboe technology Market Data, will I have to complete a new agreement?

➢ Yes. On September 1, 2021, Cboe will be migrating all current MN market data recipients to one integrated [Cboe Global Markets North American Market Data Agreement](#). No additional agreements will be required to receive MN data (or any other Cboe-related market data).

What changes can I expect regarding my Market Data bills?

➢ Following the billing migration for MN, MN market data fees will be transitioned to an invoice from Cboe Global Markets. Following that transition, there may be changes to the names of the feeds on your invoice (e.g., MN Multicast PITCH).

➢ As part of the migration, Subscribers will be required to leverage the [Cboe North American Customer Web Portal](#) for accessing their invoices.

➢ All invoices and billing will utilize CAD. USD will not be supported.

How will Market Data reporting requirements change?

➢ Reporting requirements may change based upon whether the client is carrying out internal and/or external distribution of the MN market data it is purchasing.

➢ MN data recipients can use the [Cboe Data Declarations Tool](#) within the [Cboe North American Customer Web Portal](#) for reporting data feed users and/or usage. For additional information regarding reporting requirements, please review the [Cboe Global Markets North American Data Policies](#).

BILLING QUESTIONS

How will billing be impacted by the integration?

➢ Billing for MN will be migrated to enhanced Cboe technology; the invoices will follow the style and structure of the invoices currently in use for services provided by Cboe's U.S. equities exchanges.

➢ As is the case today for Cboe's U.S. clients, basic transaction billing – including rebates and related adjustments - will appear on invoices with a 4-character Firm ID, similar to how they do for other Cboe trading systems. Note the 4-character Firm IDs will be generated by Cboe's Membership Services team and each existing 3-digit Broker ID will be associated with a Cboe Firm ID.

➢ Various other MN charges and rebates may appear in invoices related to Subscriber fixed rate fees (e.g. DROP ports), as applicable.

➢ As part of the platform migration, Subscribers will be required to obtain credentials for, and begin using the [Cboe North American Customer Web Portal](#) for accessing their invoices.

➢ All invoices and billing will utilize CAD. USD will not be supported.

Can I get a preview of the new invoices?

➢ Preview versions of the new MN invoices for transaction fees will be made available under "Sample Billing Reports" on the [MATCHNow Integration Microsite](#) at a future date (*to be determined*).

➢ These previews are drafts only, allowing you time to prepare for the new look of the invoices.

➢ As noted, the basic look and feel of the MN invoices after migration will be that of the existing Cboe invoices.

How can I view my trade detail for MN?

➢ Your trade detail will be made available online via the [Cboe North American Customer Web Portal](#) upon completion of the platform migration.

➢ Contact the MATCHNow Trade Desk for more information regarding how to set up access to the [Cboe North American Customer Web Portal](#).