IT Webinar Nasdaq Nordics

May 25, 2021
Agenda

• Equity Derivatives Trading Replatform
  ▪ Master Time Schedule
  ▪ Protocol updates
  ▪ Clearing Impact
  ▪ Onboarding
  ▪ Conformance testing
  ▪ Market Data
  - Anders Bergström

• INET Cash Equity
  ▪ Mandatory Ouch 5, FIX 5.0 SP2 migration
  ▪ Enhancements - N@M, ITCH
  - Ronny Thellman
Equity Derivatives
Trading Replatform
Project Timeline – Go Live Feb 21, 2022

2020 2021 2022

Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar

Preparation Market Readiness

- Connectivity
- Onboarding
- Login test

Onboarding and development

- Functional testing in EqD Test

Transition Period

- EqD Test: External test environment
- EqD Test: Conformance test period
- All applications tested
- Preproduction environment
- MWATs

Backup Period

End to end testing including Clearing in Ext4 Final Protocol specifications available

Go-Live

Webinars

- Draft Protocol specifications available
- Final Protocol specifications available
## Key Milestones & Activities

### Connectivity & Protocol
- **Publication of IP Plan, Port Ranges**: October 2020
- **Draft Specifications**: 27 November 2020
- **Final Specifications**: 31 May 2021
- **Login test**: December 2020 – February 2021

### Testing
- **Functional Test available in Test Environment (EqD Test)**: Start 3 May 2021
- **End to end testing with clearing in Ext4**: Start 31 May 2021

### Conformance Test (Certification)
- **Conformance Test period**: September - December 2021

### Market Wide Acceptance Test (MWAT)
- **MWAT I**: January 2022
- **MWAT II**

### Launch /Transition period
- **Launch Rehearsal with contingency/rollback scenarios**: Jan-Feb 2022
- **Production Verification**: Feb 2022
- **Launch**: 21 Feb 2022
Equity Derivatives Test (EqD Test) Open

• Markets in test open in accordance with Market Model
  • EqD Trading Re-platform Market Model

• Clearing integration to Ext4 currently limited to Intra day transactions being visible in FIX, OMnet, CW1 and Q-Port.

• Full end to end clearing in Ext4 for equity derivatives from May 31

• Fixed Income and Commodities in Ext4 at a later stage

• Known Limitations document available in Member Portal
Test Support – Normal Support Channels

• For port requests:
  ▪ Member Services
    E-mail: ms.gi@nasdaq.com
    Tel: +46 8 405 6660

• For technical questions:
  ▪ Technical Support
    E-mail: technicalsupport@nasdaq.com
    Tel: +46 8 405 6750

• For order management questions:
  ▪ Trading Operations
    E-mail: tradingoperations@nasdaq.com
    Tel: +46 8 405 7360
Protocol updates
Protocol Update

• OUCH, FIX, ITCH, Glimpse and AMD protocol specifications available in Member Portal

• Updated specifications for FIX, OUCH and ITCH

• XML version of FIX specification available. XML versions of OUCH and ITCH to come

• Final specifications May 31
Protocol Workshop

• A workshop dedicated to the new protocols aimed at developers and business analysts will soon be held

• We are looking forward to suggestions on areas and topics to be included from our developing partners and customers
Clearing and Genium INET impact
Nordic Derivatives Trading System

Future Platform
- Same platform live in the US (Nasdaq BX Options)
- Based on INET technology leveraging the Nasdaq Financial Framework (NFF) program
- Protocols
  - Order Entry: OUCH, FIX
  - Market Data: ITCH, GCF, AMD, Glimpse

Trading Front-End
- Equity derivatives will migrate to a new web-based trading GUI

Genium INET™

Fixed Income Trading
Commodities Trading
Clearing – Eq. Derivatives, Fixed Income & Commodities

Front-End – Trading Workstation

Protocols:
- FIX (order entry, drop)
- Ouchnet API
- AMD (Market Data)
- ITCH (Market Data)
- GCF (Market Data)

INET Nordic

Front-End (Eq. Deriv Version)
Front-End (Equity Version)
Cash Equities Trading

Protocols:
- FIX (order entry, drop)
- OUCH (order entry)
- ITCH (Market Data)
- GCF (Market Data)
Impact on Genium INET and Clearing

• Trading Statistics not available in Genium INET
  ▪ Clearing Workstation 1 and Q-Port will not have data for equity derivatives in Trading Statistics window
  ▪ OMnet Trading Statistics IQ42 query will not return trading statistics data for equity derivatives instruments.
  ▪ For Open Interest CQ20 and for Settlement Prices RQ46 can be used in OMnet

• Trade Reporting for equity derivatives will not be available in Genium INET except for Flexible OTC Trade Reports which can be done from CW1
• All the above only applies for equity derivatives. Fixed Income cash/derivatives and Commodities are not impacted
Impact on Genium INET and Clearing

- Order handling and trade reporting will not be supported for equity derivatives instruments via Genium INET OMnet or FIX
- Trade and Position management will remain available via Genium INET OMnet and FIX
- The Genium INET FIX drop will remain as today
- Trading Session states in Genium INET will change for equity derivatives
- Trader, Marker Maker and Price Information users will be discontinued, and Price and Trade Information users will only provide dedicated trade information, not market data for equity derivatives.
- "Changes to Genium INET” document with more details is available in Member Portal
Onboarding
Conformance Testing
Communication
Project Contact

• Every firm should appoint one or more contact persons for Derivatives Replatforming project
  (See Member Portal “My Required Actions” > “Contact person for Derivatives Replatforming project”)

• Information sent to "Member Administrator" and "Authorized Requestor IT"

• Action to be completed by "Member Administrator" as soon as possible, deadline **June 16**
Port requests for Nasdaq Derivatives Trading System Test (EqD Test)

- Requests for test ports (FIX and OUCH Order Entry, FIX Drop, GLIMPSE, ITCH Re-request) can be submitted via Member Portal under "Ports”

- Requests for Reference and Market Data (TIP, FDS, ITCH Multicast, AMD) can be submitted via a separate form

- Technical access fees are initially free of charge. From go-live, prices are according to a future version of the “Nasdaq Nordic Technical Services Pricelist”, to be published on the European Market Connectivity Services webpage
Changes to AMD Connectivity details

- AMD = An ITCH-like direct data feed product that distributes complementary market data not contained in the regular Nordic Derivatives ITCH feed

- Source IP:s and Multicast group addresses to be changed, updates available in the Connectivity Guideline shortly: https://www.nasdaq.com/solutions/nordic-equity-derivatives-platform-migration
Conformance Testing

• Conformance Testing process moved into Member Portal
  ▪ Register Application
  ▪ Request for Conformance test & agree on time slot for conformance appointment
  ▪ Conformance test scripts to be added to Member Portal
  ▪ Conformance testing is done in interaction with Nasdaq Support: Client executes specified conformance test cases and Nasdaq verifies that the client application fulfils the expected requirements and behaviour

• Conformance Testing period: September – December 2021

• More information to come after the summer vacation period
Project webpage

Member Portal – My Required Actions

My Required Actions: https://memberportal.nasdaq.com/
Member Portal – Nasdaq Resources

Nasdaq Resources > Equity Derivatives Trading Replatform: [https://memberportal.nasdaq.com/](https://memberportal.nasdaq.com/)
IT-Notices

“IT Information – Derivatives”:
Trading & Market Data Interfaces
**Market Data Feeds Overview**

<table>
<thead>
<tr>
<th>Functionality</th>
<th>ITCH</th>
<th>AMD</th>
<th>GCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order &amp; Quote Level Data</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Price Level Aggregated Data</td>
<td>-</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Net Order Imbalance Info</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Quote Requests</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Order Book Trades</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>(executions)</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Off-Book Trades</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Trade Cancels/Corrections</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Trade Statistics, Settlement Prices &amp;OI</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Market Status</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Instrument Ref Data</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tick Size Tables</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Trading Ref Data</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

- **New ITCH feed**
  - Transaction data
  - Low latency
  - Off-book trades and trade cancels/corrections added enabling a complete trade feed

- **New Auxiliary Market Data Feed**
  - ITCH like format
  - Additional data which is not part of the ITCH feed (open interest, settlement prices etc)

- **Genium Consolidated Feed (GCF)**
  - Limited impact
  - New source, new source ID
  - New message: Quote Request

- **File Delivery Services (FDS)**
  - Limited impact
  - Same changes as for GCF
Market Data - Testing

• GCF TST4
  ▪ All existing accounts with Equity derivatives content automatically changed to support the new Equity Derivatives trading source

• FDS TST4
  ▪ All existing accounts with Equity derivatives content automatically changed to support the new Equity Derivatives trading source

• ITCH Multicast
  ▪ Access need to be requested, please contact dataeurope@nasdaq.com

• AMD Multicast
  ▪ AMD feed not available for testing at this point
  ▪ Access need to be requested, please contact dataeurope@nasdaq.com

• Glimpse
  ▪ Access for test account can be requested via MemberPortal
Testing – Known limitations

• Known limitations in the market data feeds
  ▪ The following will not be available before June
    ◦ Combinations
    ◦ Trading Halts triggered by Circuit Breakers
    ◦ Stressed and exceptional market conditions
    ◦ Quote Request message
    ◦ Trade Cancellations
    ◦ Settlement Prices
    ◦ Open Interest
    ◦ AMD feed
INET Enhancements 2022

• Nasdaq Nordic plans to implement mandatory changes and enhancements to the INET Nordic trading system during second half of 2022.

• The plan is to enhance the INET Nordic trading system to meet client needs when it comes to additional functionalities to be offered over OUCH, and to achieve lower latency for all FIX users.

• Nasdaq Nordic plans to add the following Advanced Order Handling functionalities to a new OUCH 5 protocol, currently available via FIX only:
  ▪ Reserve orders (Iceberg)
  ▪ Pegged orders (including Market orders)
  ▪ Nordic@Mid dark pool midpoint pegged orders (will be available via current OUCH during the fall 2021)
  ▪ Good Till Cancel (GTC)
OUCH5 External Impact

- Mandatory upgrade for all INET OUCH users to a new OUCH protocol version
- OUCH5 features:
  - Additional Advanced Order functionalities – Reserve/Iceberg orders, Pegged orders, Nordic@Mid mid point pegged orders (incl. a N@M sweep functionality), GTC orders
  - Replacing the Order Token concept with a new UserRefNum field (harmonization and performance purposes)
  - Replacing the Optional Fields Bitmask data structure with TagValue elements in an Appendage (harmonization purpose)
- Not backwards compatible
- Certification of OUCH needed
- Smooth transition period, client upgrades at their own leisure (OUCH4 and OUCH5 runs in parallel during a migration window)
- Harmonization with Equity Derivatives Trading OUCH project
FIX DROP for OUCH update

• FIX Order Entry and FIX Drop protocols will be upgraded from FIX 4.2 to FIX 5.0 SP2 (harmonization across Nasdaq trading systems).

• A new FIX Drop for OUCH version will support the new order types introduced with OUCH5.

• A common protocol specification will be introduced for both FIX DROP for OUCH drop ports and FIX DROP for FIX Order Entry drop ports.

• The new FIX DROP for OUCH will be made available together with the new OUCH5 ports for a smooth client migration.
FIX updates

- FIX Order Entry and FIX Drop protocols will be upgraded from FIX 4.2 to FIX 5.0 SP2 (harmonization across Nasdaq trading systems).
- The new INET Nordic architecture will provide clients with new FIX Order Entry and Drop ports to achieve lower latency than the current FIX Engine provides.
- New FIX 5.0 ports will be made available in parallel with existing client setup. New IPs and Port numbers will be communicated in due time.
  - US Equities and the new Equity Derivatives Trading system performing the same change (harmonization)
Implementation Schedule

• Nasdaq Nordic aims to give access to the new OUCH 5 version according to the following timeline:
  ▪ INET Test (NTF): Q1, 2022
  ▪ INET Production: Q3-Q4 2022

• Nasdaq Nordic plans to present a detailed OUCH and FIX migration plan during Q3, 2021. After the migration current versions of the protocols will be retired.
Nordic@Mid dark pool via OUCH4

- Based on increased trading and member request, Nasdaq Nordic is planning to add support for Nodic@Mid (N@M) in OUCH.
- Nasdaq Nordic also intends to offer a Dark-Lit Sweep in OUCH.
Nordic@Mid dark pool via OUCH4

• Existing Display and Peg field will be used to indicate a N@M order.

• Tentative launch during the fall, 2021

• Nasdaq Nordic aims to publish specifications early June 2021.
Execution Summary Message to ITCH

• Based on members’ request, Nasdaq Nordic plans to introduce a new message type to ITCH feed: Execution Summary Message. This type of summary message has become a standard in other European exchanges.

• Execution Summary Message is published immediately ahead of batch of execution messages resulting from an aggressive order matching against passive orders. It contains a summary of aggregated executed and expired volume, far price - see the full content on next slide.

• Applicable only for shares during continuous trading in lit book
  ▪ Other instrument types excluded (ETFs, warrants & certificates etc)
  ▪ Nordic@Mid, AoD and all auctions excluded

• Use of the new message is optional.
  ▪ In case participant does not intend to use the new message, participant should use decoders that ignore unknown message types.

• Tentative launch during the fall, 2021.
Execution Summary Message content

- **Aggressor Side**: the side of the incoming (aggressive) order that triggered the Execution Summary Message. Applicable values: Sell, Buy and no side (blank), where no side is used when only hidden quantity is executed.
- **Total quantity of the match.**
- **Total hidden quantity of the match.**
- **Quantity deleted due to Self Trade Prevention (STP) during an execution.**
- **Far price**: the highest price of the match in case of an aggressing buy order, or the lowest price in case of an aggressing sell order.
- **Add quantity**: The price included in the definition of far price. Only for lit aggressive orders that will result in an ITCH add message.
- **Number of atomic lit executions.**
Upcoming changes in INET Nordic

Changes for May 31 (see IT-Notice 14/21):

• **Change of Pre-Trade Controls for shares traded on Auction Only Trading segments**
  - The current Pre-Trade Controls will be changed for all shares traded on the Auction Only Trading segments.
  - The Order Price Collar will use the reference price of the corresponding main share.
  - The shares on this segment will also inherit the percentage collar thresholds from the main share.
  - These changes will also apply to Nasdaq Nordic’s Pre-trade Risk Management (PRM) Fat Finger Checks.

• **Enhancement to the Trading at Closing Price service on Nasdaq Copenhagen**
  - Enhance T@CP by enabling good-till-cancel (GTC) order entry during the T@P phase (17:00-17:10 CET).

• **Enhancement to current Buy-Back and Sold-Out Buy-Back functionalities**
  - Enhancement to current Buy-Back (BB) and Sold-Out Buy-Back (SO) functionalities, applies to all Warrants and Certificates with Market Maker (MMO) functionality enabled.
  - Allow posting of limit offers during BB and SO, awaiting eligibility to match with a MMO bid if it is updated (remove current IOC rule where an offer that doesn’t match with a MMO bid will be automatically converted to IOC, and therefore cancelled).
  - Furthermore, the Indicative Close Price (ICP) for Warrants and Certificates, as described in INET Nordic Market Model, will be updated to be based on the MMO Bid during SO and BB.
Support and contacts
Communication and where to find more information

- **IT-Notices:**

- **INET Nordic Functional Enhancement:**

- **INET Nordic Protocol Specifications:**

- **INET Nordic Environments (Production and NTF information, Conformance Testing):**

- **Nasdaq Member Portal:**
  [https://memberportal.nasdaq.com/](https://memberportal.nasdaq.com/)

- **Market Models**
All information contained herein is obtained by Nasdaq Stockholm AB from sources believed to be accurate and reliable. However, all information herein may be subject to change from ongoing discussions and necessary regulatory approval and/or review processes, as applicable. Neither Nasdaq Stockholm AB nor any of its affiliates or subsidiaries (collectively “Nasdaq”) assumes any responsibility for any errors or omission contained herein. The information herein is not intended to provide legal advice on any matter, nor is it intended to be comprehensive. All information is provided “as is” without warranty of any kind. While the information has been prepared on the basis of the best information available, Nasdaq accepts no liability for decisions taken by any party, based on this information.