CBOE Application Programming Interface

CBOE FIX 4.2 Version 4.2.2 - Release Notes

Provides an overview of the updates and changes to the FIX 4.2 with this version release.

CBOE PROPRIETARY INFORMATION

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Document #[FIX-00]

Front Matter

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Support and Questions Regarding This Document

Questions regarding this document can be directed to The Chicago Board Options Exchange at 312.786.7300 or via e-mail: api@cboe.com.

The latest version of this document can be found at the CBOE web site http://systems.cboe.com.

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Overview

The material presented in this document highlight upcoming changes for the new release of the FIX 4.2 API, Version 4.2.2. Documentation changes are detailed in the sections below. Your feedback or questions regarding this document should be sent to API@cboe.com

FIX 4.2 Highlights

CBSX Enhancements

CBSX enhancements include new trade type billing indicators for the W_STOCK session. A new user defined field, **TradeLiquidityIndicator [Tag 9730]**, has been created to publish on FIX fill reports when the billing indicators are available. Billing indicators include: maker, taker, cross, flash, flash response, cross, link away, linked away response and opening.

Below are descriptions of the billing indicators available for the W_STOCK session.

- **Maker = 'A'**: refers to the person adding liquidity to the market, by basically having an order or quote resting in the book to be traded against. (i.e. they are establishing the price)

- **Taker = 'R'**: refers to the person taking liquidity from the market, by basically sending an order to trade against the book. (i.e. they are coming in and taking out the best price)

- **Flash= 'F'**: refers to an order that is being presented to the dealers for a short-term auction for step-up, before the order is routed to an away exchange for a fill.

- **Flash Response= 'E'**: refers to the dealer responding to a flash and effectively stepping up to improve the CBSX market to the prevailing price and fulfilling the customer here.

- **Linked Away= 'X'**: refers to an order that was sent to another market for execution.

- **Linked Away Response= 'L'**: refers to the response from the other exchange filling the CBSX order sent to them.

- **Opening = 'O'**: refers to all executions that take place as part of the opening rotation process itself.

- **Cross= 'C'**: refers to a trade whereby both buyer and seller are represented on a single transaction. Thus, neither is really a maker or taker per se, but rather virtually meet one another.

Example of New Order Report using TradeLiquidityIndicator [tag9730]

New Order Report

```
[8=FIX.4.2^A9=0315^A35=8^A34=135^A49=DFIX301^A56=TEST301^A52=20070419-
16:26:54^A6=0^A11=DRL0002-
20070419^A14=0^A84=0^A426=0^A425=0^A424=100^A389=0^A76=CBOE:690^A17=578
63:186.0:0.1^A20=0^A150=0^A22=8^A31=0^A32=0^A151=100^A37=57863:186^A38=
100^A39=0^A40=2^A44=3^A201=0^A47=C^A207=W^A48=69210569^A167=CS^A54=2^A2
02=0^A55=DELL^A59=0^A336=W_STOCK^A60=20070419-
16:26:54^A9369=2^A10=134^A]
```

Fill

```
[8=FIX. 4. 2^A9=0422^A35=8^A34=142^A49=DFIX301^A56=TEST301^A52=20070419-
16: 30: 05^A6=0^A11=DRL0002-
20070419^A14=100^A84=0^A426=0^A425=100^A424=100^A389=0^A76=CBOE: 690^A17
=57863: 186. 57877: 500044. 0^A20=0^A150=2^A22=8^A31=3^A32=100^A151=0^A442=
1^A382=1^A375=CBOEW: 000^A337=XXW^A437=100^A438=20070419-
16: 30: 05^A37=57863: 186^A38=100^A39=2^A40=2^A44=3^A201=0^A47=C^A207=W^A4
8=69210569^A167=CS^A54=2^A202=0^A55=DELL^A59=0^A336=W_STOCK^A60=2007041
9-16: 30: 05^A9369=2^A9465=CBOE: BUF^A9433=XXW^A9730=A^A10=135^A]
```

Indicator for Non Real-Time Clearing

It will be possible to add an indication for non real-time clearing ("Names Later") orders. This can be specified by entering "NLTR" in the ClearingOptionalData UDF [9324]. If the order gets executed, the trade will not automatically clear. The trader will have to provide the contra-party information at the end of the day before the trade clears. Like other ClearingOptionalData, this will be echoed on every execution report. Below is an order that requests this. Note, when it fills, it also carries a TradeLiquidityIndicator.

Order

```
[8=FIX. 4. 2^A9=0181^A35=D^A34=341^A49=TEST301^A56=DFIX301^A52=20070419-
19: 36: 37^A11=VQP0002-
20070419^A76=690^A21=1^A40=2^A55=DELL^A167=CS^A54=1^A38=100^A44=3. 00^A4
7=C^A60=20041020-12: 00: 00^A386=1^A336=W_STOCK^A9324=NLTR^A10=154^A]
```

Fill

```
[8=FIX. 4. 2^A9=0434^A35=8^A34=344^A49=DFIX301^A56=TEST301^A52=20070419-
19: 36: 38^A6=0^A11=VQP0002-
20070419^A14=100^A84=0^A426=0^A425=100^A424=100^A389=0^A76=CBOE: 690^A17
=57863: 427. 57879: 700233. 0^A20=0^A150=2^A22=8^A31=2. 2^A32=100^A151=0^A44
2=1^A382=1^A375=CBOEW: 000^A337=XXW^A437=100^A438=20070419-
19: 36: 37^A37=57863: 427^A38=100^A39=2^A40=2^A44=3^A201=0^A47=C^A207=W^A4
8=69210569^A167=CS^A54=1^A202=0^A55=DELL^A59=0^A336=W_STOCK^A60=2007041
9-
19: 36: 37^A9324=NLTR^A9369=2^A9465=CBOE: BUF^A9433=XXW^A9730=R^A10=141^A]
```

New Cross Orders

Two new cross order contingency types are introduced in this release, CROSS_WITHIN and TIED_CROSS_WITHIN. The CROSS_WITHIN order shall trade at or better than the NBBO and within CBOE's market. The TIED_CROSS_WITHIN contingency allows the order to trade through the NBBO and must trade within CBOE's market.

- The Execution Instruction field, ExecInst [Tag18], has been updated to include

    CROSS_WITHIN="j"

    TIED_CROSS_WITHIN="k"

- The Order Type field, OrdType [Tag40], has been updated to include

    CROSS_WITHIN = 2 (Limit)

    TIED_CROSS_WITHIN = 2 (Limit)

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Stock NBBO Indicator

The Stock NBBO indicator (Flash), in the W_STOCK session will be published on the auction event channel. This is not a new auction but it is being used as an AuctionType in order to share the auction event channel. The AuctionType field [tag9383] will include the new auction type, STOCK_NBBO_FLASH = 6.

FIX Compressed Fill Report

When Fill Reports from CBOE are translated into FIX Execution Reports, extremely large messages can be generated. The primary cause for this is that when multiple Contra Parties participate in a single trade, each of the individual Contra Party participations in the fill is reported in that one message. Also, if an individual Contra Party has more than one transaction involved in the fill, each of those transactions is also listed in the list of Contra Parties (e.g. if Contra Party "A" has 2 1-lot orders involved in the trade, the list of Contra Parties will include Contra Party A, two times). In order to alleviate this, CBOE is introducing an optional feature designed to minimize the size of FIX Execution Reports representing fills.

In order to use this optional feature, it must be designated at Login, and will be in effect for that login session. This is done by adding ":COMPFILLRPT" to TargetSubID (tag 57), after the required environment type. For example,

[8=FIX.4.2^A9=0127^A35=A^A50=BUF:BUF^A57=TEST:COMPFILLRPT
^A34=1^A49=TEST301^A56=DFIX301^A52=20070517-
18:37:29^A98=0^A108=30^A10=094^A]

Three Levels of Compressed Fill Reports

Level 1: When Compressed Fill Reports are requested, this limits the number of Contra Parties in any one FIX Execution Message to a maximum (default of 50). If the "raw" or standard fill report does not exceed that maximum, it is sent out normally.

To ease testing, it is possible to set this maximum number of Contra Parties to a different value at login by appending ".<num>" to the ":COMPFILLRPT" switch. For example, `^A57=TEST:COMPFILLRPT.3` would set a maximum of 3 Contra Party entries.

Level 2: Contra Party Unit Summarization – this feature sums all of the entries for any one Contra Party into a single entry in the array of Contra Parties, rather than an entry of each transaction. If this "unit summarization" reduces the number of Contra Parties to the maximum (or less), the message is sent out with the "summarized" Contra Party array in place of the "raw" Contra Party array.

Level 3: If, after unit summarization, there are still in excess of the maximum number of Contra Parties to be listed, then the report is "split", and sent out in multiple messages (each of which will have, at most, the maximum number of unit summarized Contra Parties listed).

Example

The Contra Limit was set to 3. Four Contras put in 3 orders each (3 1-lots from "A", 3 10-lots from "B", 3 100-lots from "C", and 3 1000-lots from "D"). Below is what was generated when a single order for quantity 3333 was entered on the other side.

The Order and the Ack

[8=FIX.4.2_9=0194_35=D_34=5_49=TEST301_56=DFIX301_52=20070517-18:38:39_11=YUL0003-
20070517_76=690_21=1_40=2_55=A_167=OPT_200=200609_202=25.00_201=1_54=2_38=3333_44=3.
00_47=C_60=20041020-12:00:00_386=1_336=W_MAIN_10=020_]

[8=FIX.4.2_9=0334_35=8_34=24_49=DFIX301_56=TEST301_52=20070517-
18:38:43_6=0_11=YUL0003-
20070517_14=0_84=0_426=0_425=0_424=3333_389=0_76=CBOE:690_17=58314:121.0:0.1_20=0_150=
0_22=8_31=0_32=0_151=3333_205=16_200=200609_37=58314:121_38=3333_39=0_40=2_44=3_201=1
_47=C_207=W_48=276448507_167=OPT_54=2_202=25_55=A_59=0_336=W_MAIN_60=20070517-
18:38:43_9369=2_10=195_]

The "split" Execution Reports

[8=FIX.4.2_9=0552_35=8_34=25_49=DFIX301_56=TEST301_52=20070517-
18:38:43_6=3_11=YUL0003-
20070517_14=3333_84=0_426=3_425=3333_424=3333_389=0_76=CBOE:690_17=58314:121.58311:23
00831.0_20=0_150=2_22=8_31=3_32=3330_151=0_205=16_200=200609_442=1_382=3_375=CBOE:69
0_337=XXH_437=300_438=20070517-18:38:43_375=CBOE:110_337=XXH_437=30_438=20070517-
18:38:43_375=CBOE:009_337=XXH_437=3000_438=20070517-
18:38:43_37=58314:121_38=3333_39=2_40=2_44=3_201=1_47=C_198=18_207=W_48=276448507_167
=OPT_54=2_202=25_55=A_59=0_336=W_MAIN_60=20070517-
18:38:43_9369=2_9465=CBOE:BUF_9433=XXH_9730=R_10=041_]

[8=FIX.4.2_9=0447_35=8_34=26_49=DFIX301_56=TEST301_52=20070517-
18:38:43_6=3_11=YUL0003-
20070517_14=3333_84=0_426=3_425=3333_424=3333_389=0_76=CBOE:690_17=58314:121.58311:23
00831.0.1_20=0_150=2_22=8_31=3_32=3_151=0_205=16_200=200609_442=1_382=1_375=CBOE:549_
337=XXH_437=3_438=20070517-
18:38:43_37=58314:121_38=3333_39=2_40=2_44=3_201=1_47=C_198=18_207=W_48=276448507_167
=OPT_54=2_202=25_55=A_59=0_336=W_MAIN_60=20070517-
18:38:43_9369=2_9465=CBOE:BUF_9433=XXH_9730=R_10=234_]

Things to Consider

(1) Both (all) Execution Reports will have the same ExecType (tag 150), OrderStatus (tag 39),
CumQty (tag 14), etc. values as a report that had "not" needed splitting. E.g. in the above
example, that means 2 messages reporting complete fills for 3333 units.

(2) The LastShares (tag 32) for each "split" report will match the contents of the ContraBroker
entries listed in the message, and each "split' message will have a unique ExecID (tag 17) value.

Document Changes

FIX-01

- No changes

FIX-03a

- Added a section for FIX Compressed Fill Report.

- Updated the TargetSubId [Tag57], in the Logon Message (*MsgType=A*), to include the verbiage:

    To compress fill report messages, you must append:

    ":COMPFILLRP"

    after the *Environment*.

FIX-03b (Including Tag Dictionary)

- Updated the tag dictionary to include new user defined fields:

    - TradeLiquidityIndicator [Tag 9730]

    - MultilegPricePerLeg [Tag 9379]

    - EquitySession [Tag 9467]

FIX-03c

- Added a new section "Determining Trade Participants." The section reads as follows.

    - The trade ID is one way to determine participants in a trade. The trade ID is unique, however, it will be the same for all orders and quotes that participated in the trade. Orders have a unique CBOE identifier (high+low) but they are not unique versus a quote ID. Currently, a given user can only have one quote per series, therefore, using the user ID is an option. For either an order or trade, you will need the transaction sequence number as there can be multiple fills generated for each.

        - To search for order fills, you will need the trade ID, OrderID.high, OrderId.low and the TransactionSequenceNumber.

        - To search for quote fills, you will need the trade ID, userID and TransactionSequenceNumber.

- Modified the description of SecondaryOrderID [Tag 198] to read: "Will be assigned by CBOE. This is the CBOE's Order Routing System (ORS) order Id (also called ORS ID). Any non-auction Option order will route through TPF and receive an ORS ID."

- Changed the order limitations for W_STOCK from 100 orders per second to 200 orders per second.

- Added a new UDF, TradeLiquidityIndicator [Tag9730], for CBSX trade type billing indicators.

- Updated the New Strategy Order—Single Message (*MsgType[35]* = D) to include two new user defined fields.

- MultilegPricePerLeg [Tag 9379]: Used for submitting "Delta-Neutral" Orders. This field is used to specify individual leg prices as a comma delimited list of prices. It is important to know whether the strategy was created with the legs "As Defined" or "Opposite." The leg prices will be applied to the systems leg's order descriptions, irrespective of the order in the Security Definition Request.

- EquitySession [Tag 9467]: For Buy_writes. Used to specify which "Session" the Equity Leg of the strategy product can be found. Currently, there is only one supported EquitySession value, which is the default ("Underlying").

- Updated the New Strategy Order—Single Message (*MsgType[35]* = D) to include the following verbiage in ClearingOptionalData [Tag 9324].

- For Delta Neutrals: Instructions to TPF are passed in this tag. Delta Neutral Instructions to TPF are a maximum of 24 characters in length, and are delimited by a leading digraph ("X:"), and terminated by a semi-colon (";").

- Updated field ClearingOptionalData [Tag9324] to include the following.

    For AIM Auctions: Enter A:AIM as the first characters. If a Firm does not wish to cancel the primary order when the auction expires, the Firm must enter A:AIR, instead of A:AIM, in this field. This will designate the primary order to be returned to the system and trade or book as a regular order.

    Stock: "NLTR" (Names Later) is entered in this field to indicate non real-time clearing orders in the W_STOCK session. If the order gets executed, the trade will not automatically clear. Traders will have to provide the contra-party information at the end of the day before the trade clears.

- Changed the definition of TIED_CROSS to read: Similar to Cross orders except that they can trade at or better than CBOE's current market and NBBO trade through is allowed.

- Included the two new W_STOCK cross order contingency types, CROSS_WITHIN and TIED_CROSS_WITHIN to the Contingency Mapping table.

- The Execution Instruction field, ExecInst [Tag18], has been updated to include

    CROSS_WITHIN="j"

    TIED_CROSS_WITHIN="k"

- The Order Type field, OrdType [Tag40], has been updated to include

    CROSS_WITHIN = 2 (Limit)

    TIED_CROSS_WITHIN = 2 (Limit)

FIX-03d

- Updated the User Input Monitor (UIM) section to state: "This feature is awaiting regulatory approval and is not currently enabled."

- Updated AuctionType [Tag9383] to include STOCK_NBBO_FLASH = 6. This is not a new auction type. This value is used as an NBBO indicator in the W_STOCK session. It is being used as an AuctionType in order to share the auction event channel. If the user tries to respond with an auction, a reject message will be received.

FIX-06

- No changes

FIX-07

- No changes

Test Plan Changes

FIX Phase 2 Test Plans

3a, Security Definition Test Plan

- No changes

3b, Market Data Test Plan

- No changes

3c, Quote Test Plan - Hybrid-ONE-CFE (includes 3j, Hybrid Sections and 3L, CFE Supplemental Tests)

- No changes

3e, W_MAIN-ONE-CFE Order Test Plan (includes 3k, CFE Supplemental Tests)

- No changes

3f, Clearing Firm, Duplicate Message Test Plan

- No changes

3g, Strategy Quote Test Plan - ONE-CFE

- No changes

3i, W_MAIN-ONE-CFE Strategy Order Test Plan

- No changes

3m, Stock Trading On CBOEdirect (STOC) Order Test Plan

- No changes

3n, Stock Trading On CBOEdirect (STOC) Quote Test Plan

- No changes

3o, Stock Trading On CBOEdirect (STOC) DPM Administrative Test Plan

- No changes

Phase 4 Test Plan

- No changes