Inbound FIXML Developer Reference Guide
Exchange Trades

Version 1.22
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Contents

Document Overview

This document provides a detailed description of the inbound FIXML message layout for Exchange Trades. It is intended for use as a transmission mapping reference for FIXML developers. This guide includes the FIXML elements, transmission layouts, message structures, and sample messages for each transmission type.

The Inbound FIXML Exchange Trade transmissions below are defined in the following sections:

- Exchange Trade
- Trade Balance Set

Inbound FIXML Implementation Considerations

General

- The formatting of the sample messages contained in this document is for display purposes only. Actual FIXML messages will be contained on a single line and should not be broken into multiple lines or blocks. Messages formatted on more than one line will not be accepted.

Things to Remember

- Data tags should only be present if they contain values. For example, if there is no Optional Data then the Txt tag should not be present; Txt="" should not be included within the FIXML.
- Data tags are case sensitive and capital letters must be used where required. For example, Position Maintenance Request should be entered as PosMntReq, not as posmntreq.
- Leading and trailing zeros are not required, and numeric fields are read the same way, regardless of whether or not the zeros are entered. For example, StrkPx="00022.5000" and StrkPx="22.5" are read as the same value.
- For Price data types, the Max Length indicates the maximum for both the integer and decimal portion; the decimal point does not count as a byte. For example, StrkPx for options on futures has a max length of 9; 5-bytes for the integer and 4-bytes for the decimal.
- There are a set of special characters, (&, <, >, “, ‘,), which invalidate xml. Do not include any of these special characters within quotes in a FIXML trade; messages containing these characters will be unable to be parsed.

Exchange/MIC Mapping

Exchange Name	Exchange Acronym	Market Identifier Code (MIC)
Cboe BZX Options Exchange	BATS	BATO
Cboe EDGX Options Exchange	EDGX	EDGO
BOX Exchange, LLC	BOX	XBOX
Cboe C2 Options Exchange	C2	C2OX
Cboe Futures Exchange	CFE	XCBF
Cboe Options Exchange	CBOE	XCBO
MIAX Emerald, LLC	EMLD	EMLD
MIAX Options Exchange	MIAX	XMIO
MIAX PEARL, LLC	MPRL	MPRL
Nasdaq BX Options	NOBO	XBXO
Nasdaq GEMX	GEM	GMNI
Nasdaq ISE	ISE	XISX
Nasdaq MRX	MCRY	MCRY
Nasdaq Options Market	NSDQ	XNDQ
Nasdaq PHLX, LLC	PHLX	XPHO
NYSE American Options	AMEX	XASE
NYSE Arca Options	ARCA	XPSE
Small Exchange, Inc.	SML	SMFE

Glossary of Terms

Batch – In a computer, a batch job is a program that is assigned to the computer to run without further user interaction. In larger commercial computers or servers, batch jobs are usually initiated by a system user. Some are defined to run automatically at a certain time.

ENCORE – The clearing system within OCC.

FIXML (Financial Information eXchange Markup Language) – The XML derived grammar of the FIX protocol. A FIXML implementation will have message format validation, cleaner, more expressive structure, and leverage off existing standards. The initial goal is to provide the ability to embed FIXML messages within traditional FIX header and trailers to minimize the impact on existing implementations.

Real-Time – A level of computer responsiveness that a user senses as sufficiently immediate or that enables the computer to keep up with some external process (for example, to present trade data as trades are executed and cleared). *Real-time* is an adjective pertaining to computers or processes that operate in real time. Real time describes a human rather than a machine sense of time.

XML (eXtensible Markup Language) – A simple and flexible text format derived from SGML (ISO 8879). Originally designed to meet the challenges of large-scale electronic publishing, XML is also playing an increasingly important role in the exchange of a wide variety of data on the Web and elsewhere. Special purpose XML languages and standards are commonly developed with several hundred already adopted since XML 1.0 was released in February 1998.

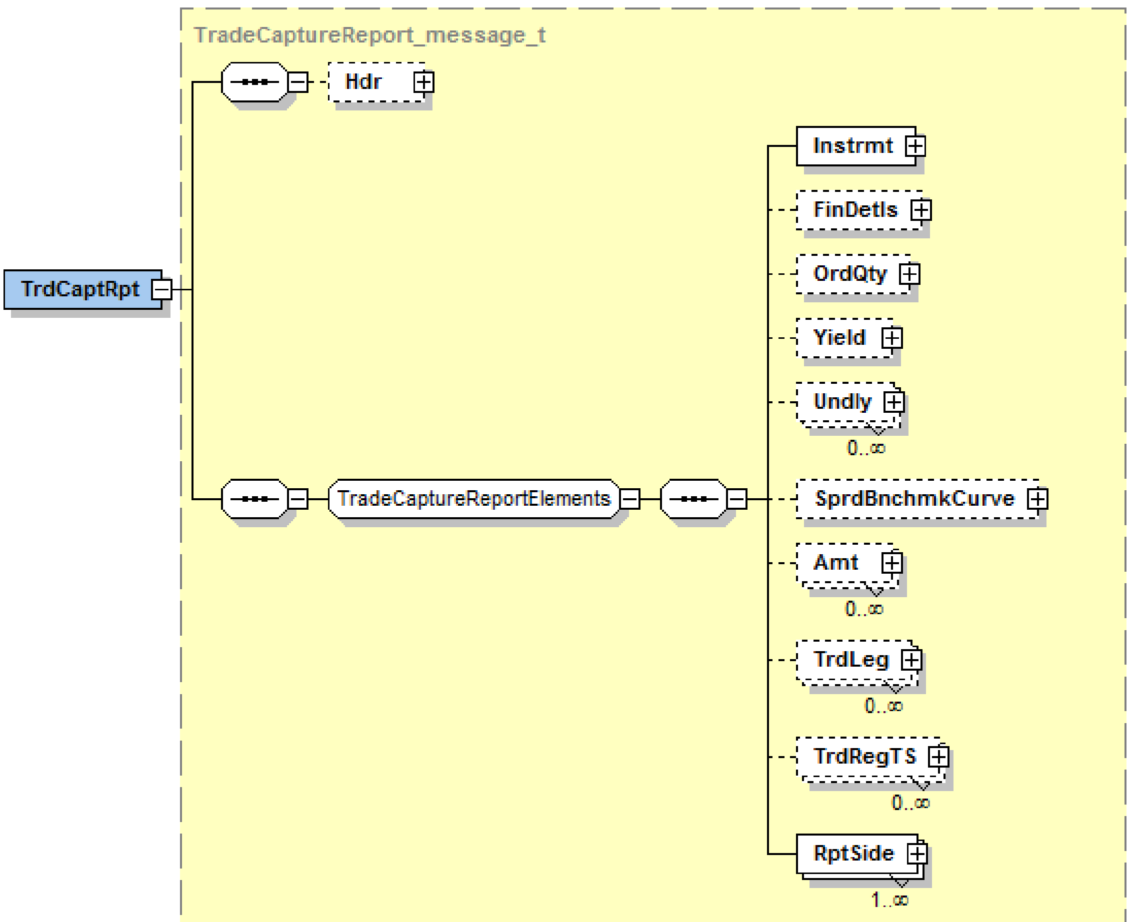
FIX Message: Exchange to OCC	Trade Capture Report

Overview

The Exchange Trade transmission extends to OCC cleared Options, Futures and Options on Futures products.

The FIXML Trade Record must be submitted in a real-time message-by-message basis over the existing lines and MQ infrastructure and submitted as a batch file (for back-up purposes only).

Message Structure



Message Layout – Trade Capture Report - Exchange Trades

FIXML Message							Definitions			
Tag #	**Report**	**Comp**	**Sub Comp**	**Sub Sub Comp**	**Field Name**	**Data**	**Data Type**	**Sample Data**	**Max Length**	**Usage**
	TrdCaptRpt									
487					TransTyp	Transaction Type 0 = New Trade 1 = Cancel/Bust Trade	Integer	0	1	Required
856					RptTyp	Type of Trade Report 0 = Submit	Integer	0	1	Required
715					BizDt	Clearing Business Date	LocalMkt Date	2013-12-02	10	Required
60					TxnTm	Transaction Time	UTCTimeStamp	2013-12-02T17:58:15	19	Required
828					TrdTyp	Type of Trade 0 = Regular Trade 1 = Block Trade 2 = Exchange for Physical (EFP) 20 = Cabinet Trade	Integer	0	2	Required
1301					MktID	Trade Source (MIC Code)	Exchange	XASE	4	Required
880					MtchID	Exchange Assigned Clearing Sequence Number (CSN)	String	0000065	7	Required
75					TrdDt	Trade As Of Date	LocalMkt Date (YYYY-MM-DD)	2013-12-02	10	Optional
32					LastQty	Trade Quantity	Quantity	15	7	Required

FIXML Message							Definitions			
Tag #	**Report**	**Comp**	**Sub Comp**	**Sub Sub Comp**	**Field Name**	**Data**	**Data Type**	**Sample Data**	**Max Length**	**Usage**
31					LastPx	Trade Price	Price	55.25	13 (5 for the integer, 8 for the decimal)	Required
15					Ccy	Trade Currency (Currency that price is quoted in)	Currency	USD	3	Optional
	➔	Instrmt								
167					SecTyp	Security Type OPT = Option FUT = Future OOF = Options on Futures	String	OPT	3	Required
55					Sym	Symbol	String	IBM	6	Required
201					PutCall	Call/Put Code 0 = Put 1 = Call	Integer	1	1	Required for Options (SecTyp = OPT or OOF)
200					MMY	Series/Contract Date – contract known as date	MonthYear (YYYYMMDD)	20140117	8	Required
202					StrkPx	Strike Price (Decimal Format)	Price	30.50	9 (5 for the integer, 4 for the decimal)	Required for Options (SecTyp = OPT or OOF)
	➔	/Instrmt								
	➔	RptSide	**Note**: The RptSide block will be included twice in each TradeCaptRpt, once for the Buy side (Side=”1”) and once for the Sell side (Side=”2”)							

FIXML Message							Definitions			
Tag #	Report	Comp	Sub Comp	Sub Sub Comp	Field Name	Data	Data Type	Sample Data	Max Length	Usage
54					Side	Buy/Sell Code 1 = Buy 2 = Sell	Character	1	1	Required
77					PosEfct	Open/Close Code O = Open C = Close	Character	O	1	Optional (OCC defaults to Open if not present)
1003					TrdID	Exchange Assigned Trade ID	String	B98766542372	20	Recommended
1139					ExchSpecInstr	Exchange Optional Data	String	BUY6548	15	Optional
11					ClOrdID	CM Assigned Branch Sequence Number or Order ID	String	987654	20	Optional
58					Txt	Clearing Member Optional Data	String	XOCD12345	16	Optional
582					CustCpcty	CTI Code 1 = Member trading for their own account 2 = Clearing Firm trading for its proprietary account 3 = Member trading for another member 4 = All other	Integer	1	1	Optional
CUST					TrdCode	Trade Code	String	01	2	Optional

FIXML Message							Definitions			
Tag #	**Report**	**Comp**	**Sub Comp**	**Sub Sub Comp**	**Field Name**	**Data**	**Data Type**	**Sample Data**	**Max Length**	**Usage**
826					AllocInd	Trade Allocation Indicator 3 = Executor wishes to give up trade via allocation	Integer	3	1	Conditionally required for Give Up Trades on Futures/Option on Futures
1008					TrdSubTyp	Additional Trade Type Identifier 0 = CMTA Trade	Integer	0	1	Optional
752					MLegRptTyp	Spread Indicator 1 = Single Security/Outright (default if not provided) 2 = Individual Leg of Multi-leg Security/Spread	Integer	1	1	Supported for Futures trades. Contact OCC for details
	➔	➔	Pty							
448					ID	Clearing Member Number	String	00123	5	Required
452					R	4 = Clearing Member	Integer	4	3	Required
	➔	➔	➔	Sub						
523					ID	Account Type C = Customer F = Firm M = Market Maker	String	M	1	Required
803					Typ	26 = Position Account Type	Integer	26	3	Required
	➔	➔	➔	/Sub						

FIXML Message							Definitions			
Tag #	Report	Comp	Sub Comp	Sub Sub Comp	Field Name	Data	Data Type	Sample Data	Max Length	Usage
	➔	➔	/Pty							
	➔	➔	Pty							
448					ID	Sub Account ID	String	KTZ	4	Conditionally required for M acct type and for C & F sub accounts
452					R	38 = Position Account	Integer	38	3	
	➔	➔	/Pty							
	➔	➔	Pty							
448					ID	Give-Up Clearing Member	String	00897	5	Conditionally required for CMTA or allocation trades
452					R	14 = Give-Up Clearing Firm	Integer	14	3	Required if populating Give-Up Clearing Member
	➔	➔	/Pty							
	➔	➔	Pty							
448					ID	Executing Broker	String	Z14	4	Optional
452					R	2 = Executing Broker	Integer	2	3	Required if populating Executing Broker
	➔	➔	/Pty							
	➔	➔	Pty							

FIXML Message							Definitions			
Tag #	Report	Comp	Sub Comp	Sub Sub Comp	Field Name	Data	Data Type	Sample Data	Max Length	Usage
448					ID	Customer ID (Account Number)	String	5468FGR5	10	Required if Security Type = OPT or OOF and if Acct Type = C or F
452					R	24 = Customer Account Number	Integer	24	3	Required if populating Account Number
	➔	➔	/Pty							
	➔	/RptSide								
	/TrdCaptRpt									

Sample Messages – Trade Report – Exchange Trades

Options Trade


```
<TrdCaptRpt TransTyp="0" RptTyp="0" BizDt="2013-01-03" TxnTm="2013-01-03T14:21:56" TrdTyp="0" MktID="XABC"
MtchID="0072908" LastQty="1" LastPx="0.05" Ccy="USD">
      <Instrmt SecTyp="OPT" Sym="FMCN" PutCall="0" MMY="20130119" StrkPx="21.000"/>
      <RptSide Side="1" PosEfct="O" ExchSpeclInstr="09AS000AV" TrdID="9327YD00OMX0" ClOrdID="IOA2377-
      20130103" TrdCode="01">
            <Pty ID="00123" R="4">
                  <Sub ID="C" Typ="26"/>
            </Pty>
            <Pty ID="00456" R="14"/>
            <Pty ID="BELZ" R="2"/>
      </RptSide>
      <RptSide Side="2" PosEfct="C" ExchSpeclInstr="09AS000AV" TrdID="9327YD00OMX1" ClOrdID="35084:2933916"
      TrdCode="02">
            <Pty ID="00789" R="4">
                  <Sub ID="M" Typ="26"/>
            </Pty>
            <Pty ID="CIT" R="38"/>
            <Pty ID="CDRG" R="2"/>
            <Pty ID="ACCOUNT123" R="24"/>
      </RptSide>
</TrdCaptRpt>
```

Futures Trade


```xml
<TrdCaptRpt TransTyp="0" RptTyp="0" BizDt="2013-01-03" TxnTm="2013-01-03T08:16:00" TrdTyp="0" MktID="XJKL"
MtchID="0000001" TrdDt="2013-01-03" LastQty="1" LastPx="31.16900000">
      <Instrmt SecTyp="FUT" Sym="YY" MMY="20130315" />
      <RptSide Side="1" PosEfct="C" TrdID="021218500B" ExchSpeclInstr="70MGOULD"
      ClOrdID="00072082884901739422" CustCpcty="2" >
            <Pty ID="00123" R="4">
                  <Sub ID="M" Typ="26"/>
            </Pty>
            <Pty ID="JNO" R="2"/>
            <Pty ID="00456" R="24"/>
      </RptSide>
      <RptSide Side="2" PosEfct="O" TrdID="021218500S" ExchSpeclInstr="9900004487"
      ClOrdID="00072082884901739419" Txt="281558134" CustCpcty="4" >
            <Pty ID="00789" R="4">
                  <Sub ID="C" Typ="26"/>
            </Pty>
            <Pty ID="H71" R="2"/>
            <Pty ID="335CTMAR" R="24"/>
      </RptSide>
</TrdCaptRpt>
```

Options on Futures Trade


```
<TrdCaptRpt TransTyp="0" RptTyp="0" BizDt="2013-08-28" TxnTm="2013-08-28T06:45:22" TrdTyp="0" MktID="XABC"
MtchID="0000011" TrdDt="2013-08-28" LastQty="1" LastPx="22.0000">
      <Instrmt SecTyp="OOF" Sym="ZZ" PutCall="1" MMY="20130920" StrkPx="32.5000"/>
      <RptSide Side="1" PosEfct="C" TrdID="0762100B" ExchSpeclInstr="trade182746"
      ClOrdID="00072113669131000715" CustCpcty="4" >
            <Pty ID="00800" R="4">
                  <Sub ID="C" Typ="26"/>
            </Pty>
            <Pty ID="A05" R="2"/>
            <Pty ID="ACCOUNTB " R="24"/>
      </RptSide>
      <RptSide Side="2" PosEfct="O" TrdID="0762100S" ExchSpeclInstr="Tra_Car-re"
      ClOrdID="00072113669131000716" Txt="testRef" CustCpcty="1" >
            <Pty ID="00900" R="4">
                  <Sub ID="F" Typ="26"/>
            </Pty>
            <Pty ID="2ZF" R="2"/>
            <Pty ID="ACCOUNTA" R="24"/>
      </RptSide>
</TrdCaptRpt>
```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Implementation Considerations

Some additional considerations for Exchange Trades include the following information.

Clearing Member Number and Give Up Clearing Member Number

The Clearing Member Number values (ID value within a Pty Block with R=1 or R=14) must be right-justified and padded with zeroes to make the value 5-bytes long, for example ID="00123".

Trade Date / As of Date

Trade Date (TrdDt) is an optional field that represents the "As of Date". It should only be provided if different from the Business Date (BizDt).

Exchange Assigned Trade ID

Exchange Assigned Trade ID (TrdID) is intended to connect clearing confirm to trade confirm and it is recommended that all exchanges populate this field.

While OCC trade processing does not require the population of Trade ID, however its population is required downstream by the CFTC for CFTC regulated Futures and Commodity Options/Options on Futures Trades. In addition, OCC post trade processing for allocations on CFTC regulated products requires the population of Trade ID from the originating Trade(s). For these products, the CFTC has outlined that the Trade ID value must be unique per Exchange, per side (Buy/Sell) of the trade, and across 5 business days.

Trade Code

Trade Code (TrdCode) is an OCC custom field that is conditionally required on Option Linkage Trades. For linkage trades, a value of "31" is required to identify the side of the trade that was routed off of the exchange.

Customer ID (Account Number)

Customer ID (Account Number) is to be used as an "Actionable Identifier" included on all customer and firm securities options trades submitted to OCC for processing, other than Market-Makers trades. The identifier assists Clearing Members in identifying trades transmitted as part of a CMTA arrangement, as well as trades transmitted through the "give-up" process at exchanges. The actionable identifier is a name, series of numbers, or other identifying information assigned by a Clearing Member to the client account that originated the transaction.

Truncation

The Max Length column in the FIXML layout provides the number of bytes that OCC processes (starting from the first byte). OCC has identified certain fields where truncation will cause a trade to reject, since the fields (such as price, quantity, product, account, etc.) could prevent or materially change how OCC clears that trade. Fields that can cause a trade to reject are not truncated. Fields that can be truncated without causing a trade to reject (such as remarks or customer ID numbers) are truncated for any additional bytes beyond the Max Length.

Trades where truncated values were processed may be identified on the new Encore Raw Trades screen using the Parse Code field (Truncated).

Leading/Trailing Spaces and Tabs

OCC will not trim leading or trailing spaces or tabs. Leading and trailing spaces and tabs are considered as a byte of data.

Duplicates

Duplicate tags cause a parsing error and the trade will be rejected.

ENCORE Transmission: Trade Balance Set

FIX Message: Exchange to OCC	Trade Balance Set

Overview

The Trade Balance Set message(s) ensures that OCC and the exchange agree that all trades have been received prior to OCC initiating the end of day finalization process.

The Trade Balance Set message(s) must be submitted real-time over the existing lines and MQ infrastructure and included in the End of Day batch file (for back-up purposes only).

This message is a custom transmission developed by OCC.

Message Layout – Trade Balance Set

FIXML Message						Definitions			
Report	Comp	Sub Comp	Sub Sub Comp	Field Name	Data	Data Type	Sample Data	Max Length	Usage
TrdBalSet									
				MktID	Trade Source MIC	Exchange	BATO	4	Required
				BizDt	Clearing Business Date	LocalMktDate	2013-01-21	10	Required
➔	BalSet								
				BalSetCode	Balance Set Code 1 = Standard Options 2 = FLEX Options 5 = Futures and Options on Futures	Integer	5	2	Required
				TotRecords	Total Number of Records	Quantity	41000	12	Required
				TotTrades	Total Number of New Trades	Quantity	40000	12	Required
				TotBusts	Total Number of Busts	Quantity	1000	12	Required
				TotContracts	Total Contract Quantity of New Trades	Quantity	96500	24	Required
➔	/BalSet								
/TrdBalSet									

Sample Messages – Trade Balance Set

Options Balance Set

```
<TrdBalSet MktID="BATO" BizDt="2013-01-03">
      <BalSet BalSetCode="1" TotRecords="72918" TotTrades="72745" TotBusts="173" TotContracts="721473"/>
</TrdBalSet>
```

Futures and Commodity Options/Options on Futures Balance Set

```
<TrdBalSet MktID="XNLI" BizDt="2013-01-03">
      <BalSet BalSetCode="5" TotRecords="19140" TotTrades="19140" TotContracts="32080" TotBusts="0" />
</TrdBalSet>
```

> **NOTE: The formatting of the sample messages contained in this document is for display purposes only. Actual FIXML messages will be contained on a single line and should not be broken into multiple lines or blocks. Messages formatted on more than one line will not be accepted.**

End of Day Trade (Backup) File

At the conclusion of every clearing business date the exchange must submit an End of Day Trade (Backup) file. This file must be submitted as a batch file and contain a record for each trade and the corresponding trade balance set message(s) for those trades.

End of Day Trades

Exchanges may choose whether to include every trade record and every bust record, or only the net trades, those trades which were not busted. The record layout for each trade is the same as the real-time trades sent earlier in the day. The FIXML End of Day Trade (Backup) file is simply a batch file recapping all of the day's trades.

Trade Balance Set

Along with a recap of the day's trades, the End of Day Trade (Backup) file must contain the corresponding Trade Balance Set message(s) for the trades sent in the End of Day Trade file.

Batch File Structure

The FIXML End of Day Trade (Backup) batch file will be structured as shown below, noting that messages have been abbreviated.

```
<FIXML r="20030618" s="20040109" v="4.4" xr="FIA" xv="1.1"
xmlns="http://fixprotocol.org/FIXML-4-4">
<Batch>
<TrdCaptRpt ... </TrdCaptRpt>
<TrdCaptRpt ... </TrdCaptRpt>
<TrdCaptRpt ... </TrdCaptRpt>
<TrdCaptRpt ... </TrdCaptRpt>
<TrdBalSet ... </TrdBalSet>
</Batch>
</FIXML>
```

Appendix

Revision History

Version	Date	Author	Version Updates
1.0	12/03/2013	OCC	Initial version.
1.1	03/18/2014	OCC	Corrected Truncation portion of the Implementation Considerations section. Added Appendix and Revision History table.
1.2	6/30/2014	OCC	Removed references to NYL. Updated footer and cover page logo.
1.3	4/16/2015	OCC	Update NASDAQ Futures Inc. name in Exchange listing. Update Exchange Trades layout, Series Contract Date data description.
1.4	9/2/2015	OCC	Add EDGX to Exchange listing.
1.5	12/15/2015	OCC	Add MCRY to Exchange listing.
1.6	12/6/2016	OCC	Add MPRL to Exchange listing.
1.7	4/3/2017	OCC	Change spelling of “NASDAQ” to “Nasdaq”. Revise names of three Nasdaq/ISE exchanges.
1.8	8/24/2017	OCC	Revise names of two Bats exchanges. Revise name of NYSE American Options exchange.
1.9	11/9/2017	OCC	Revised Cboe exchange names, update other trading facility names.
1.10	6/15/2018	OCC	Revised Trade Capture Report - Exchange Trades layout to reflect trade prices containing up to five integers.
1.11	8/24/2018	OCC	Applied rebranding updates. Removed ELX exchange references.
1.12	11/12/2018	OCC	Add EMLD to exchange listing. Revise name of Box exchange.
1.13	2/21/2019	OCC	Revised Trade Capture Report – Exchange Trades layout and implementation considerations to remove SLEDS-related information.
1.14	2/25/2019	OCC	Revised MIAX Emerald exchange name in exchange listing.
1.15	6/14/2019	OCC	Revised Trade Capture Report – Exchange Trades layout, sample messages, and Implementation Considerations to reflect Customer ID (Account Number) as Required for customer and firm securities options trades, other than Market-Makers trades.
1.16	8/30/2019	OCC	Add SML to exchange listing.
1.17	9/3/2019	OCC	Revised Trade Capture Report - Exchange Trades layout and implementation considerations to reflect futures and options on futures prices containing up to six integers.
1.18	9/25/2019	OCC	Revised Trade Capture Report - Exchange Trades layout and implementation considerations to remove reference to “futures” from Strike Price Max Length comments.
1.19	10/16/2019	OCC	Revised Trade Capture Report - Exchange Trades layout and implementation considerations to indicate that futures and options on futures prices containing up to six integers is being considered as a future enhancement.
1.20	11/20/2019	OCC	Remove updates related to an enhancement which was being considered which would have expanded price integers to six digits for futures and option on futures.
1.21	6/22/2020	OCC	Remove NFX from exchange/MIC mapping table.
1.22	9/23/2020	OCC	Remove ONE from exchange/MIC mapping table.