



FIX 4.4 STP Specification
For TME V4.1
Straight Through Processing (STP)

Please contact Cboe Digital sales representatives for more information on this documentation.

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1 Change History

Date	Message(s)	Description
2019-09-23	V 2.0	
2019-12-09	V 3.0	Updated to Include details for Futures
2020-04-20	V 3.6	Updated for Block Trades
	TradeCaptureReport	Added Tag 438 ContraTradeTime Tag 818 SecondaryTradeReportId
2021-10-15	TradeCaptureReport	Included TargetSubID (57) and TargetLocationID (143) in the Standard Header
2021-10-28	Trade Report Process Order	Storage of unacknowledged order records changes from 72 hours to 24 hours
2022-08-04	V 3.7	
	Weekly Sequence Number Resets	Add information on weekly sequence number reset handling and resubscription
2022-09-23	V 3.8	
	Trade Capture Report	Add support for RootPartyRole(1119) = 24 and 38
2023-09-14	V3.9	
	NaN	Changed ErisX to Cboe Digital
	Trade Capture Report	Removed TargetLocationId, Added MaturityMonthYear, MaturityDate, AccountType, CustOrderCapacity
2023-12-20	V3.9.1 Futures Regulatory Tags	Updated descriptions for CTI code (CustOrderCapacity) tag 582
2024-08-29	V4.0	Removed all Spot related information
2024-11-01	V4.1	Minor edits for Cboe Clear Digital name change to Cboe Clear US

2 Introduction

2.1 Purpose

The purpose of this document is to present in detail the FIX protocol messages for the Straight Through Processing (STP) service which provides guaranteed trade capture reports for an account and can be used for middle and back office reconciliation.

3 Supported Messages

The Cboe Digital FIX specification supports FIX version 4.4 only.

The following convention is used in this document to indicate message direction:

- In: a message type received by Cboe Digital
- Out: a message type originating from Cboe Digital

In/Out: a message type that can be sent to or from Cboe Digital

Available fields, requirements, values and their associated meanings are documented in the Message Details section.

Members are advised to ensure their FIX engine observes the standard FIX 4.4 protocol in which only the order of the first three (3) fields of the header need to be guaranteed.

3.1 FIX Session Sequence Number Management

FIX Sessions can be maintained across sequential network connections. After an initial session is created, new sessions can continue from the end of the last session by using the last outbound sequence number. On reconnect client applications can use the logon confirmation message sequence number to detect a gap since the last received message. If the client application detects a gap, the client application can request all missed messages using a ResendRequest.

All available requested messages will be resent with updated SendingTime(52), OrigSendTime(122) included, PossDupFlag(43) field set to 'Y' and recalculated CheckSum value.

A gapFill message will be sent in lieu of the administrative messages or when messages are no longer available. Client applications should avoid submitting subsequent ResendRequest messages. This will simply replace the prior ResendRequest resulting in a delay of normal processing.

3.1.1 Weekly Sequence Number Resets

With the goal of enabling 24/7 FIX sessions, Cboe Digital has implemented a weekly Sequence Number Reset workflow. At the same moment, password expiration checks will also take place.

At 14:00 CT every Sunday, the following message flow takes place:

- Cboe Digital will send a Logon(A) message with ResetSeqNumFlag(141)=Y and MsgSeqNum(34) = 1. The other tags and values will correspond to the last known Logon(A) message previous to the reset. This message will be sent to all Logged On FIX sessions on all three kinds of FIX gateways (Order Management, Market Data and Drop Copy).
- The user should process the message by resetting the sequence numbers and responding with a Logon(A) message with ResetSeqNumFlag(141)=Y and MsgSeqNum(34) = 1.
- Upon receiving the Logon(A) message from the client, Cboe Digital will send a TradingSessionStatus(h) with a new sequence number MsgSeqNum(34) >=2. The sequence number for the 35=h can be greater than 2 if a Trade occurs before the gateway receives the client Logon(A) response and a TraderCaptureReport(AE) has been sent.

When the Drop Copy gateway receives a Logon(A) message, any existing subscriptions are removed. A Drop Copy session that is connected during the sequence reset and responds with the proper Logon(A) message will need to send a new TradeCaptureReportRequest(AD) in order to continue receiving Trade Capture Reports(AE)

3.2 Session Messages

Session messages establish, maintain and terminate an Cboe Digital connection.

- Logon – (In/Out) message sent to initiate a FIX session to Cboe Digital. The Logon message establishes the communication session, authenticates the connecting client application, and initializes the message sequence number.
- Heartbeat – (In/Out) message sent by Cboe Digital during periods of application inactivity to ensure connection validity. The receiving party should always respond with a heartbeat message.
- Resend Request – (In/Out) request that certain messages be resent. Often used when gaps are detected in the sequence numbering, when a message is lost, or during the initialization process.
- Test Request – (In/Out) used to verify session connectivity and to synchronize sequence numbers. The receiving party should always respond with a heartbeat message.
- Logout – (In) signals the normal termination of the trading session. A session terminated without a Logout message will be considered an abnormal condition. The Cboe Digital FIX gateway treats a session as logged out whenever the communication session is dropped.

3.3 Timestamping / TransactTime (tag 60)

Messages sent by client applications will need to include TransactTime (60). The system will validate the value sent down to one second precision and accuracy.

Responses from the match engine will include TransactTime (60) and will be sent with nanosecond precision. YYYYMMDD-HH:MM:ss.SSSSSSSS.

The timestamp on outgoing messages will represent the time the corresponding message was received by the FIX gateway that resulted in the update.

3.4 Application Messages

Once a proper session is established, application messages are used to receive market data, to submit orders, and to receive executions reports.

Messages:

- **Business Message Reject** – (Out) application message sent in response to any application level message that cannot be replied to with a normal matching response message. For example, Cboe Digital sends it when an application level message is received prior to a Trading Session Status message having been sent.

Also sent when a request message is received during non- Cboe Digital trading hours. For a schedule of non-trading hours, please contact your Cboe Digital member service representative.

- **Trade Capture Report Request** – (In) message used in making a subscription request for trade capture reports. Only subscription requests are currently supported. Individual report requests are not supported.
- **Trade Capture Report Request Ack** – (Out) message used to acknowledge receipt of a subscription request. If the request was successful, Cboe Digital will start publishing reports. This message can also be used to reject a report request.
- **Trade Capture Report** – (Out) message used to send completed trade details. Requires confirmation of receipt.
- **Trade Capture Report Ack** – (In) message used to confirm the receipt of a Trade Capture Report.

4 Message Workflow

4.1 General Workflow

A successful logon is required before further messages are sent and the session must receive Trading Session Status messages with TradSesStatus (340) = 101, System Ready. Any message received by the Cboe Digital FIX STP engine that is outside the scope of this document will be rejected with a Business Message Reject message.

4.2 Passwords for Logon Messages

The Cboe Digital FIX service requires users connecting via the FIX protocol to present a password as part of the Logon (35=A) message. To successfully connect, a user needs to set the password field, tag 554, a Cboe Digital customized tag, to the valid password associated with the id specified in tag 49.

A Logon message containing an invalid password will be rejected. The Cboe Digital response to a valid Logon message will not contain tag 554.

It is recommended that users change their session passwords after receiving them from Cboe Digital Client Services team.

An expired password must be reset before any application messages. Upon successful Logon, if a password needs to be reset, a TradingSessionStatus (35=h) message will be returned with tag 340=1 and tag 58 set to 'Password reset is required.' Until the password is reset, all further application messages will be rejected by the Cboe Digital FIX gateway.

An account is locked after five (5) invalid password logon attempts. A locked account must be unlocked by the Cboe Digital support desk before a user can logon successfully again.

As long as the account is not locked, its password can be reset by the user at any time by sending the appropriate UserRequest (35=BE) message.

Users should refer to the Cboe Digital FIX 4.4 Specification document for full details of the Logon and Password messages.

5 Trade Capture Request

5.1 Trade Capture Report Model

A STP client application subscribes to the Cboe Digital FIX Gateway by sending a Trade Capture Report Request message. The results returned depend on the values specified for fields TradeRequestType and SubscriptionRequestType.

- Receive all outstanding unconfirmed trade events and all new subsequent events:
 - TradeRequestType: 569=0 (All trades)
 - SubscriptionRequestType: 570=1 (Snapshot + Updates)
- Receive only new events messages:
 - TradeRequestType: 569=0 (All trades)
 - SubscriptionRequestType: 570=9 (Updates)

5.2 Trade Capture Report Request Acknowledgement

Cboe Digital responds to a client application Trade Capture Request with a Trade Capture Report Request Ack message. The status of the request is indicated in the fields TradeRequestResult (749) and TradeRequestStatus (750).

If no TradeCaptureReportRequestAcknowledgement (35=AQ) message is received from Cboe Digital within fifteen (15) seconds of sending a TradeCaptureReportRequest (35=AD) message, the client should disconnect and re-login.

A Trade Capture Report Request acknowledgement containing TradeRequestResult (749) = 0 and TradeRequestStatus (750) = 0 means a successful request has been made.

6 Trade Capture Reports

6.1 Trade Report Process Order

Trade Capture reports are sent in the order in which trades are executed. A new trade event can be sent before a previously sent trade event is acknowledged.

The number of Trade Reports that can be outstanding is limited by a system default. If this limit is reached, a one (1) to one (1) relationship becomes effective in which one (1) Trade Report will be sent for each report acknowledged until the outstanding number of unacknowledged reports is less than the system limit.

- Any reports for trades done prior to the request are sent first.
- Once all Trade Reports from prior to the request, if any, are acknowledged, Cboe Digital will send reports for new trades completed since the Trade Report Request was made.

Cboe Digital will maintain a record of unacknowledged orders for 24 hours. For execution history before that period users should utilize the Cboe Clear US Member Portal or their SFTP folder.

6.2 Duplicate Trade Reports

An acknowledged trade cannot be requested again. However, client applications should be able to handle the possibility of receiving duplicate trade capture reports. If multiple reports are received for a trade, all but the first report should be ignored.

7 Message Details

The fields that make up each message are described in this section.

In the tables below, specific messages are presented in columns: “Tag”, “Field Name,” “Required”, “New Spec” and “What’s Changed?”.

As we update our FIX specification the “New Spec” field will contain the updated information relevant to the change. Users should review the “What’s Changed” column to quickly review changes between versions and be proactive in testing changes to make sure they do not affect operations.

Order related message follow the same table format as used except that the “Required” column values are relative to the value specified in OrdType (40) field.

Note the following conventions:

The values under the “Required” column indicate one of the following:

- ‘Y’ – field is mandatory and must be sent or received as a part of the message.
- ‘N’ – Non-required field that should be omitted unless directed otherwise by Cboe Digital.
- ‘NA’ – field is not used at all in the context for the message.
- ‘F’ - field is mandatory for futures contracts.

7.1 Session Messages

For a description of Cboe Digital FIX Session messages, please refer to the Cboe Digital FIX 4.4 Specification document. Application Messages.

7.2 Application Messages

7.2.1 TradeCaptureReportRequest

Tag	Field Name	Rqd	New Spec	What's Changed?
Standard Header		Y	MsgType tag 35=AD	
568	TradeRequestID	Y	Id assigned by the client to the request.	
569	TradeRequestType	Y	0 = All trades.	
263	SubscriptionRequestType	Y	1 = Snapshot + Updates 9 = Updates only	
55	Symbol	N	"Supported value: "NA" Individual instrument subscription not supported."	
167	SecurityType	N	Indicates type of security.	
Standard Trailer		Y		

7.2.2 TradeCaptureReportRequestAck

Tag	Field Name	Rqd	New Spec	What's Changed?
Standard Header		Y	MsgType tag 35=AQ	
568	TradeRequestID	Y	Id assigned by the client to the request.	
569	TradeRequestType	Y	0 = All trades.	
263	SubscriptionRequestType	Y	1 = Snapshot + Updates 9 = Updates only	
749	TradeRequestResult	Y	0 = Successful 8 = Unsupported TradeRequestType 9 = Unauthorized for Trade Capture Report Request 99 = Other	
750	TradeRequestStatus	Y	0 = Accepted 2 = Rejected	
55	Symbol	N	Supported value: "NA". This will always be set to NA	
167	SecurityType	N	Indicates type of security.	
Standard Trailer		Y		

7.2.3 TradeCaptureReport

Tag	Field Name	Rqd	New Spec	What's Changed?
Standard Header		Y	MsgType 35=AE	
15	Currency	Y	The currency for the amount specified in the LastQty (32) field.	
31	LastPx	Y	Trade Price	
32	LastQty	Y	Trade amount in Currency (15)	
57	TargetSubID	F	Value used to identify the user that entered the order	Added V3.6
Component <Instrument>		Y		
55	Symbol	Y	Instrument (E.g. BTC/USD)	
End <Instrument>				
60	TransactTime	Y	Execution Reports will be sent with nanosecond precision - YYYYMMDD-HH:MM:SS.ssssssss	
75	TradeDate	Y	Trade Date in YYYYMMDD format.	
150	ExecType	Y	0 = New Trade: generated upon a trade execution	
167	SecurityType	N	FUT = Future	Added V3.0
194	LastSpotRate	N	Trade Price	
207	SecurityExchange	N	ERSX	Added V3.0
231	ContractMultiplier	N	Specifies the ratio to convert from futures contracts to underlying amount	Added V3.0
438	ContraTradeTime	N	Populated with the Block negotiation time in nanoseconds only for Block Trades.	Added V3.6
461	CFICode	N	Futures = FCXSSX	Added V3.0
200	MaturityMonthYear	F	Month when contract expires, format: YYYYMM	Added V3.9
541	MaturityDate	F	Date when contract expires, format: YYYYMMDD	Added V3.9
Component <TrdCapRptSideGrp>		Y		
552	NoSides	Y	1 – only value supported	
54	Side	Y	1 = Buy, 2 = Sell	
11	ClOrdID	Y	Last submitted Client Order ID	
1	Account	Y	The account under which the trade was booked	
581	AccountType	F	Used to indicate whether an order is for a Customer(1) or House(2) account.	Added V3.9
582	CustOrderCapacity	F	Used to indicate whether the user entering the order is placing it for themselves or for another member. 1. Transactions initiated and executed by an individual TPH for the TPH's own account, for an account the	Added V3.9

			<p>TPH controls, or for the account in which the TPH has an ownership or financial interest</p> <p>2. Transactions executed for the proprietary account of a clearing member or non-clearing member TPH.</p> <p>3. Transactions where an individual TPH or authorized trader executes for the personal account of another individual TPH, for an account the other individual TPH controls or for an account in which the other individual TPH has an ownership or financial interest.</p> <p>4. Any transaction not meeting the definition of CTI 1, 2 or 3. (These should be non-TPH customer transactions)</p>	
Component <CommissionData>		Y		
12	Commission	N	Actual Commission	
13	CommType	Y	3 = Absolute (Total monetary amount)	
479	CommCurrency	Y	Currency Commission (USD, BTC)	
End <CommissionData>		Y		
120	SettlCurrency	N	Counter currency.	
568	TradeRequestID	Y	Assigned by the client to the request when the report is in response to a Trade Capture Report Request.	
571	TradeReportID	Y	Unique identifier assigned by Cboe Digital to the Trade Capture report.	
818	SecondaryTradeReportId	N	Populated with RequestId from Block API Request	Added V3.6
828	TrdType	N	Supported Values: 0 = Regular Trade, 1 = Block Trade	Added V3.0
1003	TradeID	Y	Cboe Digital assigned trade ID.	
1056	CalculatedCcyLastQty	Y	Trade amount counter currency tag 120	
1057	AggressorIndicator	N	Present on trades with RootPartyRole = 13: Y = Aggressor, N = Aggressed	
Component <RootParties>		Y		
1116	NoRootPartyIDs	Y	Number of RootPartyID's	
1117	RootPartyID	Y	Identifies each party to the trade.	
1119	RootPartyRole	Y	<p>Role of the party identified in the RootPartyID:</p> <p>13 = Originating Customer (Account ID)</p> <p>29 = Intermediary (Cboe Digital)</p> <p>21 = Clearing Organization</p> <p>22 = Exchange</p> <p>24 = Customer Account Reference (FCM Back office Account)</p> <p>38 = Position Account (Customer Gross Margin Account as it appears in the FCM Back office)</p> <p>44 = Order Entry Operator ID</p> <p>75 = Location ID</p>	

Component <RootSubParties>		N		
1120	NoRootSubParties	N	Number of NoRootSubParties	
1121	RootPartySubID	N	Additional identifier related to RootPartyID (1117). This will be the FIX ID	
1122	RootPartySubID Type	N	Type of RootPartySubID (1121): 2 = Individual Person 32=Execution Venue	
End Component <RootSubParties>		Y		
End Component <RootParties>		Y		
End <TrdCapRptSideGrp>		Y		
Standard Trailer		Y		

7.2.4 TradeCaptureReportAck

Tag	Field Name	Rqd	New Spec	What's Changed?
Standard Header		Y	MsgType 35=AR	
571	TradeReportID	Y	The TradeReportID (571) from the Trade Capture Report being acknowledged.	
55	Symbol	Y	Supported value: "NA".	
Standard Trailer		Y		