

CAT Billing Scenarios

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Executive Summary

On September 6, 2023, the SEC [approved](#) an amendment to the CAT NMS Plan to implement a funding model for the CAT. Under the CAT Funding Model, an Industry Member that is a “CAT Executing Broker,” as defined in the CAT NMS Plan, will be subject to CAT fees and therefore will be issued CAT invoices for such CAT fees.

“CAT Executing Broker” is defined in Section 1.1 of the Plan. “CAT Executing Broker” means “(a) with respect to a transaction in an Eligible Security that is executed on an exchange, the Industry Member identified as the Industry Member responsible for the order on the buy-side of the transaction and the Industry Member responsible for the sell-side of the transaction in the equity order trade event and option trade event in the CAT Data submitted to the CAT by the relevant exchange pursuant to the Participant Technical Specifications; and (b) with respect to a transaction in an Eligible Security that is executed otherwise than on an exchange and required to be reported to an equity trade reporting facility of a registered national securities association, the Industry Member identified as the executing broker and the Industry Member identified as the contra-side executing broker in the TRF/ORF/ADF transaction data event in the CAT Data submitted to the CAT by FINRA pursuant to the Participant Technical Specifications; provided, however, in those circumstances where there is a non-Industry Member identified as the contra-side executing broker in the TRF/ORF/ADF transaction data event or no contra-side executing broker is identified in the TRF/ORF/ADF transaction data event, then the Industry Member identified as the executing broker in the TRF/ORF/ADF transaction data event would be treated as CAT Executing Broker for the Buyer and for the Seller.”

The identity of the CAT Executing Brokers will be determined from transaction reports reported to the CAT by the exchanges or FINRA.

- Under the Participant Technical Specifications, for transactions occurring on a Participant exchange, there is a field for the exchange to report the market participant identifier (“MPID”) of “the member firm that is responsible for the order on this side of the trade.” The Industry Members identified in these fields for the transaction reports are the CAT Executing Brokers for transactions executed on an exchange.
- FINRA is required to report the MPID of the executing party as well as the MPID of the contra-side executing party on the TRF reports it submits to CAT. The Industry Members identified in these two fields for the tape-reported transaction reports are the CAT Executing Brokers for over-the-counter transactions. Non-tape reports (e.g., regulatory reports or clearing reports), are not used for CAT billing. For more details on transactions on Alternative Trading Systems and transactions involving a non-FINRA member, see Section A.1.a (Treatment of ATSS) and A.1.c (Non-Industry Members on Transaction Reports) of the amendment.

This document describes how CAT data reported by Plan Participants is used to identify the CAT Executing Brokers subject to CAT fees for purposes of CAT billing. This document should be read in conjunction with companion materials related to CAT billing, including [Section V](#) of the FAQs, [CAT Alert 2023-02](#) and CAT Billing Webinars, [Part 1](#) and [Part 2](#).

Other CAT billing documents include:

- [CAT Technical Specifications for Billing Trade Details](#)
- [Trade Details Schemas](#)

Version	Date	Author	Description
1.0	11/30/23	Consolidated Audit Trail, LLC	Initial Publication
1.1	05/21/24	Consolidated Audit Trail, LLC	Added Exchange-specific Floor Broker scenarios
1.1.1	11/11/24	Consolidated Audit Trail, LLC	Updated Scenario 4.4.2 to reflect an NYSE processing change to the way the Member field is populated on AMEROP and ARCAOP Options Floor Trade events effective 11/11/24
1.1.2	04/07/25	Consolidated Audit Trail, LLC	Updated Scenario 4.1.2 to reflect a BOX processing change to the way the Member field is populated on BOX Floor Trade events effective 4/1/25.
1.1.3	05/29/25	Consolidated Audit Trail, LLC	Added MIAX Sapphire Exchange-specific Floor Broker scenarios Corrected minor typo in the illustration for Scenario 4.3.1 PHLX: Listed Options Offsetting Orders Routed to Floor Broker for Crossing

1. Introduction

This document is organized to show how CAT data reported by the Participant exchanges and CAT data reported by FINRA for various order flows are used to identify the CAT Executing Brokers subject to CAT fees for the purposes of CAT billing.

Exchange trade data and TRF/ORF data reported to CAT by the exchanges and FINRA respectively are used to identify the CAT Executing Brokers. This includes:

- Tape (media) exchange trade events (OT/EOT)
- TRF/ORF tape (media) reports
- TRF/ORF non-tape (non-media) reports where the sale condition indicates “away from market” (consistent with FINRA Section 3 Regulatory Transaction Fees)

Exchange trade data and TRF/ORF data reported to CAT by the exchanges and FINRA that are **not** in scope for purposes of identifying CAT Executing Brokers subject to CAT fees include non-tape/non-media leg of a riskless principal flip, step out trades, and clearing-only and regulatory-only reports.

CAT fees are assessed on the CAT Executing Broker for the buyer and the CAT Executing Broker for the seller, which are depicted in each scenario. CAT fees are detailed in a CAT invoice and CAT invoices are generated at the CRD-level. Since CRD numbers are not provided on the exchange trade data and TRF/ORF data reported to CAT by the exchanges and FINRA, the Plan Processor maps the CAT Executing Brokers to its associated CRD, as explained in each scenario.

For each scenario, a description of the scenario along with a diagram is provided and followed by a table that shows an audit trail of the events required to be reported to the Transaction Subsystem. The audit trail events highlighted in grey are not used to identify the CAT Executing Brokers but are included so that Industry Members can link what was reported to the Transaction Subsystem to the [Trade Details Schemas](#), which are provided to show the underlying trades resulting in CAT billable activity. The audit trail event(s) highlighted in purple are used to identify the CAT Executing Brokers. The audit trail events are depicted for purposes of illustrating CAT billing concepts. See the [CAT Industry Member Technical Specifications](#) and [Industry Member Reporting Scenarios](#) for requirements for reporting to the Transaction Subsystem.

This section illustrates sample scenarios where the trade is executed off-exchange and reported to a FINRA Trade Reporting Facility.

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when an Industry Member routes an order to another Industry Member which executes the order against its own proprietary account. In this scenario, Industry Member Broker 1 (“IMB1”), routes an order to buy 500 shares of an NMS Stock to Industry Member Broker 2 (“IMB2”). IMB2 accepts the buy order, executes it as principal and reports the trade to the TRF.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the TRF media report (highlighted in purple) is used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID	Routed Order ID	Branch Seq ID/Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra Executing MPID
IMB1	MENO	500	Buy						4512		
IMB1	MEOR	500	Buy	IMB2	IMB1	345			4512		
IMB2	MEOA	500	Buy		IMB1	345			9721		
IMB2	MEOT	500	Buy				67402388		9721		
	TRF-Media	500					67402388	Sell		IMB2	IMB1

- IMB2 is identified in the Reporting Executing MPID field and IMB1 is identified in the Contra Executing MPID field. Therefore, IMB1 will be identified as the CAT Executing Broker for the buyer and IMB2 will be identified as the CAT Executing Broker for the seller.

- IMB1 is mapped to CRD 4512 and IMB2 is mapped to CRD 9721. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 4512 and a sell-side transaction on the CAT invoice for CRD 9721.

2.2. Principal Execution of Customer's OTC Equity Order

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a non-broker-dealer customer places a buy order for 750 shares in an OTC equity security at Industry Member Broker 1 ("IMB1"). IMB1 accepts the buy order, executes it as principal and reports the trade to the ORF.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the ORF media report (highlighted in purple) is used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field.

CAT Reporter	Event Type	Qty	Side	Compliance ID/Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra Executing MPID
IMB1	MENO	750	Buy			4512		
IMB1	MEOT	750	Buy	67402227		4512		
	ORF-Media	750		67402227	Sell		IMB1	

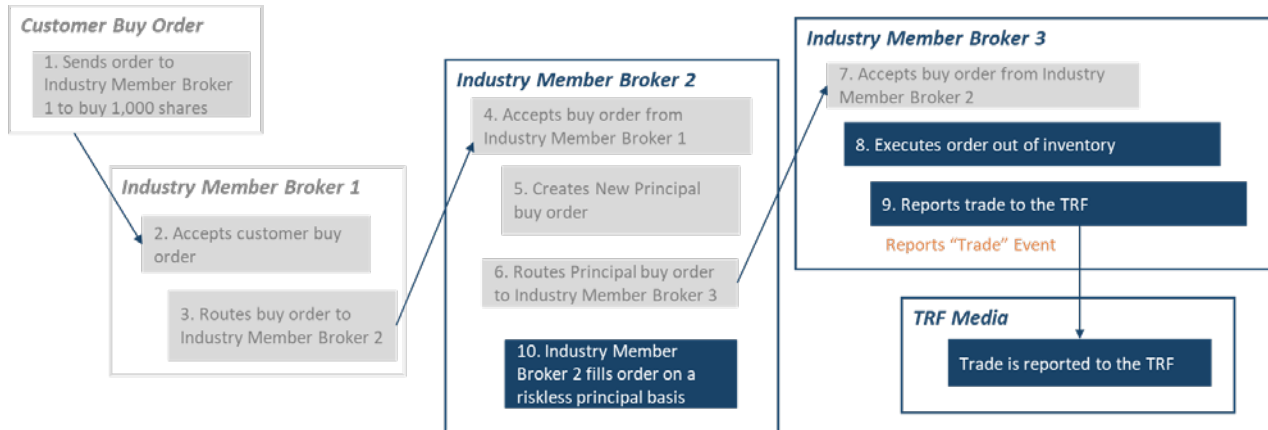
For this sample transaction:

- IMB1 is identified in the Reporting Executing MPID field. Since this is a principal trade for a non-broker-dealer customer, the Contra Executing MPID field is blank/null. Therefore, IMB1 will be identified as the CAT Executing Broker for the buyer and the CAT Executing Broker for the seller.
- IMB1 is mapped to CRD 4512. Therefore, this will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 4512.

- Although the buy order originated with a non-broker-dealer customer, it was not identified on the ORF media report. Therefore, the non-broker-dealer customer is not a CAT Executing Broker and will not be issued a CAT invoice.

2.3. Execution of Order as Riskless Principal

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when an Industry Member fills a customer order on a Riskless Principal basis. In this scenario, Industry Member Broker 1 ("IMB1") receives a buy order for 1,000 shares of an NMS Stock and routes it to Industry Member Broker 2 ("IMB2"). IMB2 accepts the order and generates a representative order to facilitate the execution of the buy order. IMB2 routes the representative buy order to Industry Member Broker 3 ("IMB3"). IMB3 accepts the buy order, executes it out of inventory and reports the trade to the TRF. IMB2 flips the 1,000 shares to IMB1 as riskless principal.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the TRF media report (highlighted in purple) is used to identify the CAT Executing Brokers. The non-media leg of a riskless principal flip is not in scope for purposes of identifying the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field of the media report.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID	Routed Order ID	Branch Seq ID/Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra Executing MPID
IMB1	MENO	1000	Buy						4512		
IMB1	MEOR	1000	Buy	IMB2	IMB1	123			4512		
IMB2	MEOA	1000	Buy		IMB1	123			9721		
IMB2	MENO	1000	Buy						9721		
IMB2	MEOR	1000	Buy	IMB3	IMB2	456			9721		

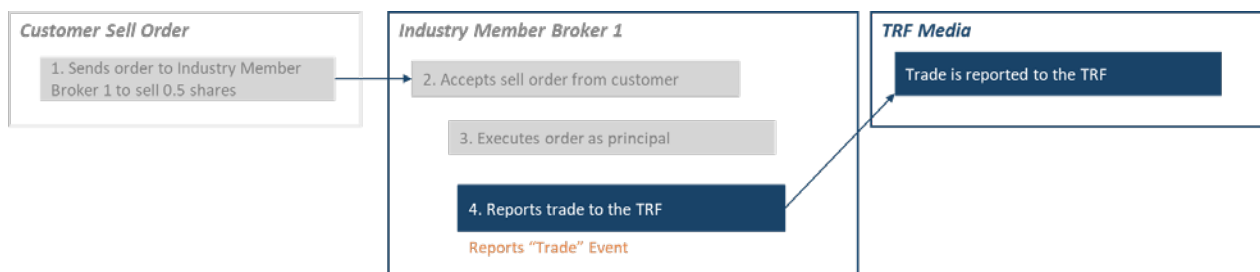
IMB3	MEOA	1000	Buy		IMB2	456			6565		
IMB3	MEOT	1000	Buy				67402229		6565		
	TRF-Media	1000					67402229	Sell		IMB3	IMB2
IMB2	MEOF	1000	Buy						9721		

For this sample transaction:

- IMB3 is identified in the Reporting Executing MPID field and IMB2 is identified in the Contra Executing MPID field. Therefore, IMB2 will be identified as the CAT Executing Broker for the buyer and IMB3 will be identified as the CAT Executing Broker for the seller.
- IMB2 is mapped to CRD 9721 and IMB3 is mapped to CRD 6565. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 9721 and a sell-side transaction on the CAT invoice for CRD 6565.
- Although the buy order originated at IMB1, IMB1 was not identified on the TRF media report. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

2.4. Execution of a Fractional Share Order

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a fractional share is executed principally for a non-broker-dealer customer and the trade is reported to the TRF. In this scenario, a non-broker-dealer customer enters an order to liquidate 0.5 shares of an NMS Stock at Industry Member Broker 1 ("IMB1"). IMB1 accepts the order, executes it as principal and reports the trade to the TRF.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the TRF media report is used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field.

CAT Reporter	Event Type	Qty	Side	Compliance ID/ Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra-Executing MPID
IMB1	MENO	0.5	Sell			4512		
IMB1	MEOT	0.5	Sell	67402236		4512		
	TRF-Media	1		67402236	Buy		IMB1	

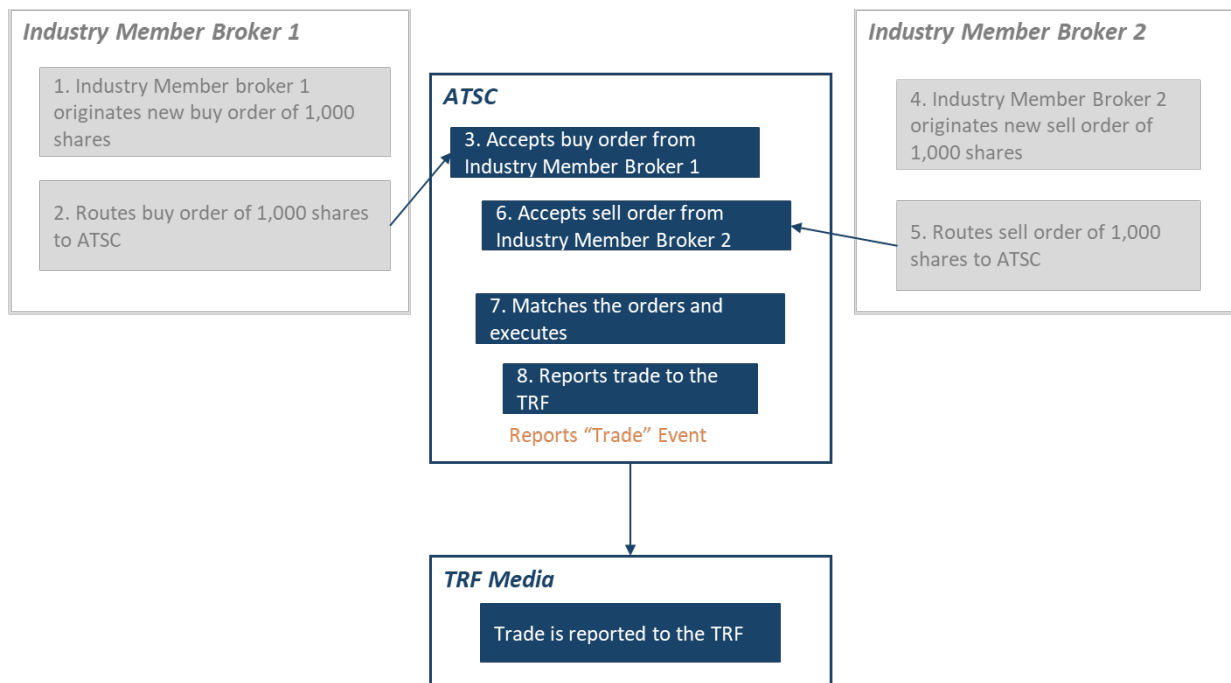
For this sample transaction:

- IMB1 is identified in the Reporting Executing MPID field. Since this is a principal trade for a non-broker-dealer customer, the Contra Executing MPID field is blank/null. Therefore, IMB1 will be identified as the CAT Executing Broker for the buyer and the CAT Executing Broker for the seller.
- IMB1 is mapped to CRD 4512. Therefore, this transaction will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 4512.
- Although the buy order originated with a non-broker-dealer customer, it was not identified on the TRF media report. Therefore, the non-broker-dealer customer is not a CAT Executing Broker and will not be issued a CAT invoice.
- The TRF does not currently support the entry of fractional share quantities and requires rounding quantities up to 1, if less than one share. Therefore, a quantity of “1” will be used to calculate the executed equivalent shares detailed on the CAT invoice.

2.5. Orders Routed to and Executed on an ATS

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when an order is executed on an Alternative Trading System (“ATS”) and the ATS reports the trade to the TRF. Since trade reporting rules provide ATSs with three alternatives for reporting to the tape, this scenario is depicted with three alternatives for identifying the CAT Executing Brokers.

In this scenario, Industry Member Broker 1 (“IMB1”) routes a buy order for 1,000 shares in an NMS Stock to an ATS (“ATSC”) and ATSC accepts the buy order. Industry Member Broker 2 (“IMB2”) routes a sell order for 1,000 shares in the same NMS Stock to ATSC. ATSC accepts the sell order, matches it against the buy order and executes 1,000 shares. ATSC reports the trade to the TRF.



Alternative 1: The ATS reports the trade as a cross to the TRF media report.

The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In Alternative 1, ATSC reports the trade as a cross to the TRF. The TRF media report (highlighted in purple) is used to identify the CAT Executing Brokers. The non-media regulatory reports are not in scope for purposes of identifying the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID	Routed Order ID	Branch Seq ID/ Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra Executing MPID
IMB1	MENO	1000	Buy						4512		
IMB1	MEOR	1000	Buy	ATSC	IMB1	123			4512		
IMB2	MENO	1000	Sell						9721		
IMB2	MEOR	1000	Sell	ATSC	IMB2	456			9721		
ATSC	MEOA	1000	Buy			123			555		
ATSC	MEOA	1000	Sell			456			555		
ATSC	MEOT	1000	Buy				67402227		555		
ATSC	MEOT	1000	Sell				67402227		555		
	TRF-Media	1000					67402227	X (Cross)		ATSC	

In Alternative 1:

- ATSC is identified in the Reporting Executing MPID field. Since this trade was reported to the tape as a cross, the Contra Executing MPID field is blank/null. Therefore, ATSC will be identified as the CAT Executing Broker for the buyer and the CAT Executing Broker for the seller.
- ATSC is mapped to CRD 555. Therefore, this transaction will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 555.
- Although the buy order originated at IMB1 and the sell order originated at IMB2, they were not identified on the TRF media report. Therefore, IMB1 and IMB2 are not a CAT Executing Brokers and will not be issued a CAT invoice.

Alternative 2: The ATS identifies the buy side on the TRF media report.

The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In Alternative 2, ATSC identified itself as the Reporting Executing MPID on the TRF media report and IMB1, representing the buy side, as the Contra Executing MPID. The TRF media report (highlighted in purple) is used to identify the CAT Executing Brokers. The non-media regulatory report is not in scope for purposes of identifying the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID	Routed Order ID	Branch Seq ID/ Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra Executing MPID
IMB1	MENO	1000	Buy						4512		
IMB1	MEOR	1000	Buy	ATSC	IMB1	123			4512		
IMB2	MENO	1000	Sell						9721		
IMB2	MEOR	1000	Sell	ATSC	IMB2	456			9721		
ATSC	MEOA	1000	Buy			123			555		
ATSC	MEOA	1000	Sell			456			555		
ATSC	MEOT	1000	Buy				67402227		555		
ATSC	MEOT	1000	Sell				67402227		555		
	TRF-Media	1000					67402227	Sell		ATSC	IMB1

In Alternative 2:

- ATSC is identified in the Reporting Executing MPID field and IMB1 is identified in the Contra Executing MPID field. Therefore, IMB1 will be identified as the CAT Executing Broker for the buyer and ATSC will be identified as the CAT Executing Broker for the seller.
- IMB1 is mapped to CRD 4512. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 4512.

- ATSC is mapped to CRD 555. Therefore, this transaction will appear as a sell-side transaction on the CAT invoice for CRD 555.
- Although the sell order originated at IMB2, it was not identified on the TRF media report. Therefore, IMB2 is not a CAT Executing Broker and will not be issued a CAT invoice.

Alternative 3: The ATS identifies the sell side on the TRF media report.

The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In Alternative 3, ATSC identified itself as the Reporting Executing MPID on the TRF media report and IMB2, representing the sell side, as the Contra Executing MPID. The TRF media report (highlighted in purple) is used to identify the CAT Executing Brokers. The non-media regulatory report is not in scope for purposes of identifying the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID	Routed Order ID	Branch Seq ID/ Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra Executing MPID
IMB1	MENO	1000	Buy						4512		
IMB1	MEOR	1000	Buy	ATSC	IMB1	123			4512		
IMB2	MENO	1000	Sell						9721		
IMB2	MEOR	1000	Sell	ATSC	IMB2	456			9721		
ATSC	MEOA	1000	Buy			123			555		
ATSC	MEOA	1000	Sell			456			555		
ATSC	MEOT	1000	Buy				67402227		555		
ATSC	MEOT	1000	Sell				67402227		555		
	TRF-Media	1000					67402227	Buy		ATSC	IMB2

In Alternative 3:

- ATSC is identified in the Reporting Executing MPID field and IMB2 is identified in the Contra Executing MPID field. Therefore, IMB2 will be identified as the CAT Executing Broker for the seller and ATSC will be identified as the CAT Executing Broker for the buyer.
- IMB2 is mapped to CRD 9721. Therefore, this transaction will appear as a sell-side transaction on the CAT invoice for CRD 9721.
- ATSC is mapped to CRD 555. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 555.
- Although the buy order originated at IMB1, it was not identified on the TRF media report. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

2.6. Execution of Order Received from a Canadian Non-Industry Member

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a Canadian non-Industry Member broker-dealer routes an order to an Industry Member and the Industry Member executes the order as principal and reports the trade to the TRF, identifying the Canadian broker-dealer on the tape report. In this scenario, a Canadian Non-Industry Member broker-dealer (“CDA”) routes a buy order for 2,500 shares in an NMS Stock to Industry Member Broker 1 (“IMB1”). IMB1 accepts the buy order, executes it as principal and reports the trade to the TRF.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the TRF media report (highlighted in purple) is used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the MPID reported in the Reporting Executing MPID field and Contra Executing MPID field.

CAT Reporter	Event Type	Qty	Side	Branch Seq ID/ Tape Trade ID	Reporting Side	CAT Reporter CRD (Derived)	Reporting Executing MPID	Contra Executing MPID
IMB1	MENO	2500	Buy			4512		
IMB1	MEOT	2500	Buy	67402227		4512		
	TRF-Media	2500		67402227	Sell		IMB1	CDA

For this sample transaction:

- IMB1 is identified in the Reporting Executing MPID field and CDA is identified in the Contra Executing MPID field. However, since CDA is not an Industry Member, it will not be identified as a CAT Executing Broker. Therefore, IMB1 will be identified as the CAT Executing Broker for the buyer and the CAT Executing Broker for the seller.
- IMB1 is mapped to CRD 4512. Therefore, this transaction will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 4512.

3. On Exchange Trades

This section illustrates sample scenarios where the trade is executed on an exchange. For any trade executed on an exchange, only members of the executing exchange can be identified as the CAT Executing Broker. Industry Members that are not a member of the executing exchange will not be identified as the CAT Executing Broker.

3.1. Orders Executed on an Equities Exchange

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a non-exchange member routes an order to an exchange member and the order is executed on the exchange. In this scenario, Industry Member Broker 1 ("IMB1") routes a buy order for 1,000 shares in an NMS Stock to Exchange Member Broker 2 ("EM2"), a member of Exchange A. EM2 routes the order to Exchange A and Exchange A accepts the order. Exchange Member Broker 3 ("EM3"), also a member of Exchange A, routes a sell order in the same NMS Stock to Exchange A. Exchange A accepts the sell order, matches it against the buy order, executes 1,000 shares.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the Equity Order Trade Events ("EOT") reported by Exchange A (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic reported in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	CAT Reporter CRD (Derived)	Member
IMB1	MENO	1000	Buy				4512	
IMB1	MEOR	1000	Buy	EM2	IMB1	123	4512	
EM2	MEOA	1000	Buy		IMB1	123	8420	
EM2	MEOR	1000	Buy	EXCHA	EM2	345	8420	

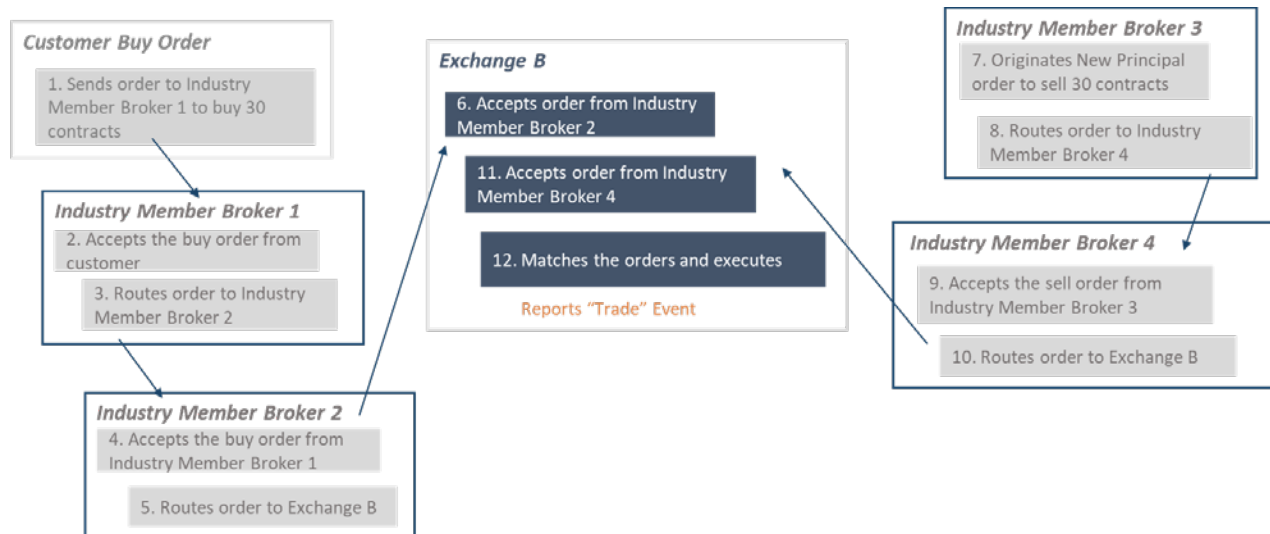
EM3	MENO	1000	Sell				6310	
EM3	MEOR	1000	Sell	EXCHA	EM3	987	6310	
EXCHA	EOA	1000	Buy		EM2	345		EM2
EXCHA	EOA	1000	Sell		EM3	987		EM3
EXCHA	EOT	1000	Buy					EM2
EXCHA	EOT	1000	Sell					EM3

For this sample transaction:

- Exchange A has identified EM2 and EM3 as the parties responsible for the underlying order in the Member field of the EOT. Therefore, EM2 and EM3 are the CAT Executing Brokers for this transaction.
- EM2 is mapped to CRD 8420 and EM3 is mapped to CRD 6310. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 8420 and a sell side transaction on the CAT invoice for CRD 6310.
- Although the buy order originated at IMB1, it was not identified by Exchange A as a party responsible for the underlying order. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT Billing Invoice.

3.2. Listed Options Orders Executed on an Exchange

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a listed options contract is executed on an exchange. In this scenario, Industry Member Broker 1 ("IMB1") receives a simple electronic options order from a customer to buy 30 contracts and routes the order to Industry Member Broker 2 ("IMB2"). IMB2 accepts the buy order and routes it to Exchange B. Industry Member Broker 3 ("IMB3"), originates a new simple electronic options order to sell as principal 30 contracts in the same options series, and routes the order to Industry Member Broker 4 ("IMB4"). IMB4 accepts the sell order and routes it to Exchange B. Exchange B accepts the sell order, matches it against the buy order executes 30 contracts.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, Simple Option Trade (“OT”) events reported by Exchange B (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic reported in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	CAT Reporter CRD (Derived)	Member
IMB1	MONO	30	Buy				4512	
IMB1	MOOR	30	Buy	IMB2	IMB1	333	4512	
IMB2	MOOA	30	Buy		IMB1	333	9721	
IMB2	MOOR	30	Buy	EXCHB	IMB2	588	9721	
IMB3	MONO	30	Sell				6565	
IMB3	MOOR	30	Sell	IMB4	IMB3	299	6565	
IMB4	MOOA	30	Sell		IMB3	299	1862	
IMB4	MOOR	30	Sell	EXCHB	IMB4	421	1862	
EXCHB	OOA	30	Buy		IMB2	588		IMB2
EXCHB	OOA	30	Sell		IMB4	421		IMB4
EXCHB	OT	30	Buy					IMB2
EXCHB	OT	30	Sell					IMB4

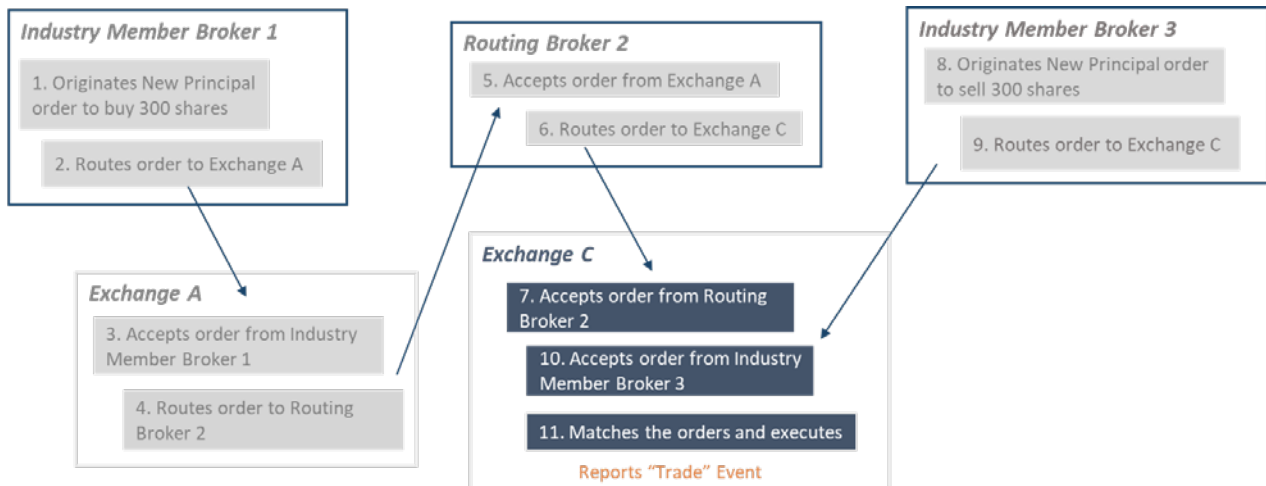
For this sample transaction:

- Exchange B has identified IMB2 and IMB4 as the parties responsible for the underlying order in the Member field. Therefore, IMB2 and IMB4 are the CAT Executing Brokers for this transaction.
- IMB2 is mapped to CRD 9721 and IMB4 is mapped to CRD1862. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 9721 and a sell-side transaction on the CAT invoice for CRD 1862.

- Although the buy order originated at IMB1 and the sell order originated at IMB3, they were not identified by Exchange B as the parties responsible for the underlying orders. Therefore, IMB1 and IMB3 are not CAT Executing Brokers and they will not be issued CAT invoices.

3.3. Order Routed from an Exchange's Affiliated Routing Broker and Executed on Another Exchange

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when an exchange routes an order through its affiliated routing broker to another exchange where the order is executed. In this scenario, Industry Member Broker 1 ("IMB1") routes an order to buy 300 shares of an NMS Stock to Exchange A and Exchange A accepts the buy order. Exchange A routes the order (for example, due to a regulatory requirement) to its affiliated routing broker, Routing Broker 2 ("RB2"), who routes the order to Exchange C. Exchange C accepts the buy order from RB2. Industry Member Broker 3 ("IMB3") originates a new order to sell as principal 300 shares of the same NMS Stock. IMB3 routes the sell order to Exchange C. Exchange C accepts the sell order, matches it against the buy order and executes 300 shares.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the Equity Order Trade Events ("EOT") reported by Exchange C (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic reported in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/ Routing Party/ Exchange	Routed Order ID	CAT Reporter CRD (Derived)	Member
IMB1	MENO	300	Buy				4512	
IMB1	MEOR	300	Buy	EXCHA	IMB1	J311	4512	

EXCHA	EOA	300	Buy		IMB1	J311		BD1
EXCHA	EOR	300	Buy	RB2	EXCHA	EXA77		
RB2	MEOA	300	Buy		EXCHA	EXA77	7777	
RB2	MEOR	300	Buy	EXCHC	RB2	Y2222	7777	
IMB3	MENO	300	Sell				6565	
IMB3	MEOR	300	Sell	EXCHC	IMB3	111	6565	
EXCHC	EOA	300	Buy		RB2	Y2222		RB2
EXCHC	EOA	300	Sell		IMB3	111		IMB3
EXCHC	EOT	300	Buy					RB2
EXCHC	EOT	300	Sell					IMB3

For this sample transaction:

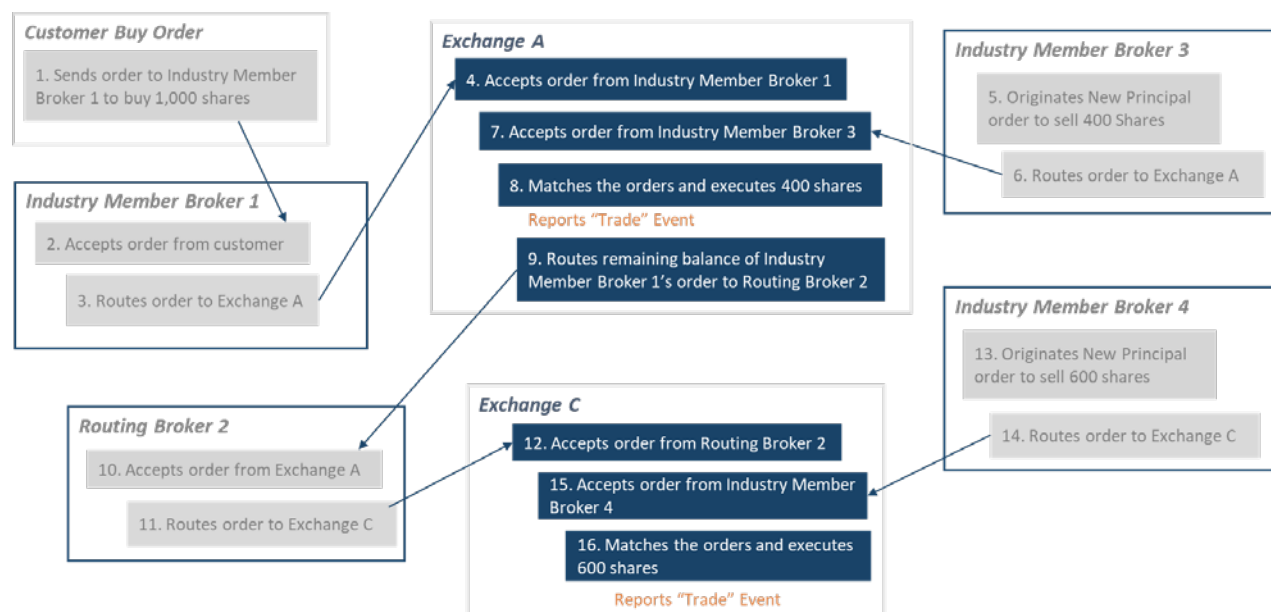
- Exchange C has identified RB2 and IMB3 as the parties responsible for the underlying order in the Member field. Therefore, RB2 and IMB3 are the CAT Executing Brokers for this transaction.
- RB2 is mapped to CRD 7777 and IMB3 is mapped to CRD 6565. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 7777 and a sell-side transaction on the CAT invoice for CRD 6565.
- Although the buy order originated at IMB1, it was not identified by Exchange C as a party responsible for the underlying order. Therefore, IMB1 is not a CAT Executing Brokers and will not be issued a CAT invoice.
- Although the buy order was originally sent to Exchange A, Exchange A did not report a Trade Event. Therefore, Exchange A's CAT reports are not in scope for purposes of identifying the CAT Executing Brokers.

3.4. Order Partially Routed Through Exchange's Affiliated Routing Broker and Balance Executed on the Exchange

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when an order is routed to an exchange where it is partially executed and the balance is routed to another exchange. In this scenario, Industry Member Broker 1 ("IMB1") receives an order from a customer to buy 1,000 shares of an NMS Stock. IMB1 routes the order to Exchange A with instructions to route any unexecuted balance of the order to Exchange C. Industry Member Broker 3 ("IMB3") originates a new order to sell as principal 400 shares of the same NMS Stock and routes the order to Exchange A. Exchange A accepts the sell order, matches it against the buy order executes 400 shares.

Per IMB1's instruction to route the remaining balance, Exchange A routes the remaining 600 shares of the buy order to its affiliated routing broker, Routing Broker 2 ("RB2"). RB2 accepts the buy order and routes it to Exchange C. Exchange C accepts the buy order for 600 shares.

Industry Member Broker 4 (“IMB4”) originates a new order to sell as principal 600 shares of the same NMS Stock and routes the order to Exchange C. Exchange C accepts the sell order, matches it against the buy order and executes 600 shares.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem, including the CRD field which is derived by the Plan Processor. In this scenario, the Equity Order Trade Events (“EOT”) reported by Exchange A and Exchange C (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic reported in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party/Exchange	Routed Order ID	CAT Reporter CRD (Derived)	Member
IMB1	MENO	1000	Buy				4512	
IMB1	MEOR	1000	Buy	EXCHA	IMB1	125	4512	
IMB3	MENO	400	Sell				6565	
IMB3	MEOR	400	Sell	EXCHA	IMB3	4581	6565	
EXCHA	EOA	1000	Buy		IMB1	125		IMB1
EXCHA	EOA	400	Sell		IMB3	4581		IMB3
EXCHA	EOT	400	Buy					IMB1
EXCHA	EOT	400	Sell					IMB3
EXCHA	EOR	600	Buy	RB2	EXCHA	EXA99		
RB2	MEOA	600	Buy		EXCHA	EXA99	7777	
RB2	MEOR	600	Buy	EXCHC	RB2	EXA99-1	7777	
IMB4	MENO	600	Sell				1862	
IMB4	MEOR	600	Sell	EXCHC	IMB4	237	1862	
EXCHC	EOA	600	Buy		RB2	EXA99-1		RB2

EXCHC	EOA	600	Sell		IMB4	237		IMB4
EXCHC	EOT	600	Buy					RB2
EXCHC	EOT	600	Sell					IMB4
EXCHA	EOF	600	Buy					IMB1

For the execution of 400 shares occurring on Exchange A:

- Exchange A has identified IMB1 and IMB3 as the parties responsible for the underlying order in the Member field. Therefore, IMB1 and IMB3 are the CAT Executing Brokers for this transaction.
- IMB1 is mapped to CRD 4512 and IMB3 is mapped to CRD 6565. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 4512 and a sell-side transaction on the CAT invoice for CRD 6565.
- Although the buy order originated at IMB1 for 1,000 shares, IMB1 was identified as the CAT Executing Broker on an EOT by Exchange A for 400 shares. Therefore, IMB1 will only have CAT billable activity for 400 shares.

For the execution of 600 shares occurring on Exchange C:

- Exchange C has identified RB2 and IMB4 as the parties responsible for the underlying order. Therefore, RB2 and IMB4 are the CAT Executing Brokers for this transaction.
- RB2 is mapped to CRD 7777 and IMB4 is mapped to CRD 1862. Therefore, this transaction will appear as a buy-side transaction on the CAT invoice for CRD 7777 and a sell-side transaction on the CAT invoice for CRD 1862.

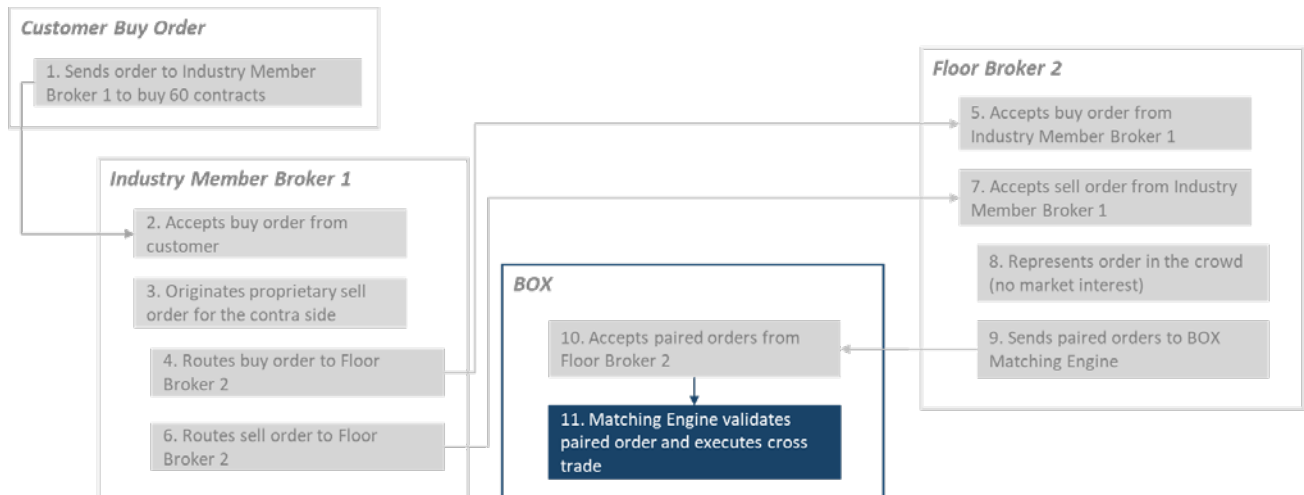
4. Floor Trading Scenarios

4.1. BOX Floor Trading Scenarios

This section illustrates the CAT billing scenarios for BOX Floor Trading.

4.1.1. BOX: Listed Options Offsetting Orders Routed to Floor Broker for Crossing

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution. In this scenario, Industry Member Broker 1 ("IMB1") receives a customer order to buy 60 contracts and originates a proprietary order for the contra side to sell 60 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 ("FB2"), a member of the BOX Option Exchange ("BOX"), for execution. Upon receipt of the orders, FB2 matches the buy and sell orders and represents the trade in open outcry on the exchange floor. There is no market interest. FB2 routes the paired orders to the BOX matching engine for execution. BOX accepts the paired orders and executes the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) reported by BOX (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	60	Buy					4512	
IMB1	MONO	60	Sell					4512	
IMB1	MOOR	60	Buy	FB2	IMB1	331		4512	
FB2	MOOA	60	Buy		IMB1	331		8420	
IMB1	MOOR	60	Sell	FB2	IMB1	332		4512	
FB2	MOOA	60	Sell		IMB1	332		8420	
FB2	MOOR	60	Buy	BOX	FB2	401		8420	
FB2	MOOR	60	Sell	BOX	FB2	402		8420	
BOX	OOA	60	Buy		FB2	401		8420	FB2
BOX	OOA	60	Sell		FB2	402		8420	FB2
BOX	OT	60	Buy					8420	FB2
BOX	OT	60	Sell					8420	FB2

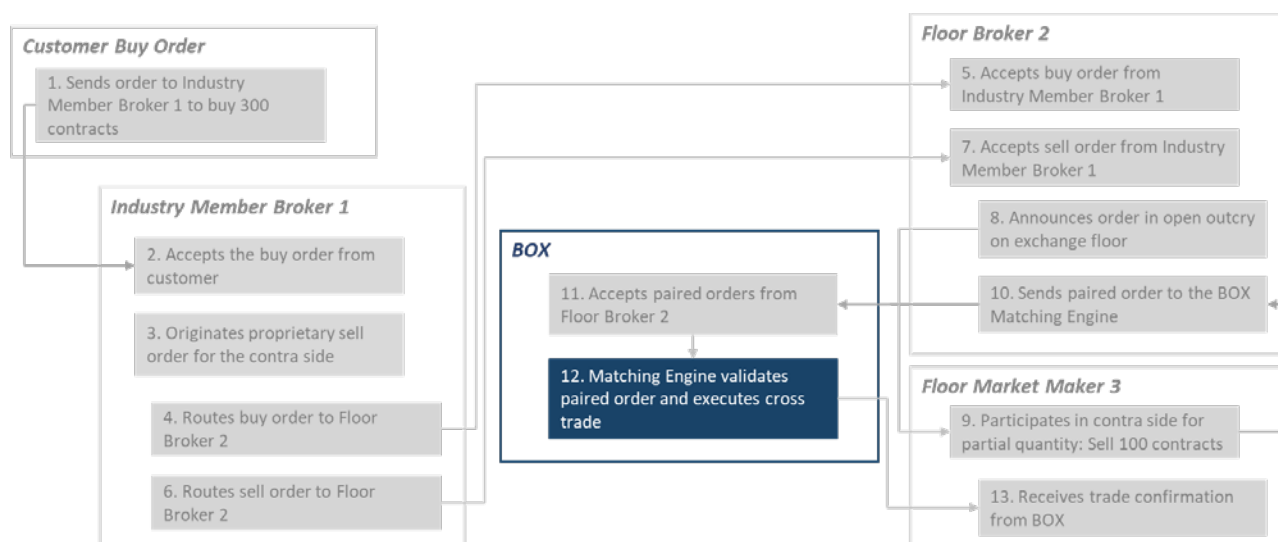
For this sample transaction:

- BOX has identified FB2 as the party responsible for the underlying orders in the Member field. Therefore, FB2 is the CAT Executing Broker for this transaction.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 8420.

- Although the buy and sell orders originated at IMB1, it was not identified by BOX as a party responsible for the underlying orders. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

4.1.2. BOX: Listed Options Offsetting Orders Routed to Floor Broker with Floor Market Maker Participation

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution and a floor market maker participates in the contra side. In this scenario, Industry Member Broker 1 (“IMB1”) receives a customer order to buy 300 contracts and originates a proprietary order for the contra side to sell 300 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 (“FB2”), a member of the BOX Options Exchange (“BOX”), for execution. Upon receipt of the orders, FB2 represents the trade in the crowd and a Floor Market Maker (“FMM3”) wants to participate in the cross for a partial quantity. FB2 routes the paired orders to the BOX matching engine for execution. BOX accepts the paired orders and executes the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) and Simple Option Trade Correction Events (“OTC”) reported by BOX (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	300	Buy					4512	
IMB1	MONO	300	Sell					4512	
IMB1	MOOR	300	Buy	FB2	IMB1	331		4512	
FB2	MOOA	300	Buy		IMB1	331		8420	
IMB1	MOOR	300	Sell	FB2	IMB1	332		4512	
FB2	MOOA	300	Sell		IMB1	332		8420	
FB2	MOOR	300	Buy	BOX	FB2	401		8420	
FB2	MOOR	300	Sell	BOX	FB2	402		8420	
BOX	OOA	300	Buy		FB2	401		8420	FB2
BOX	OOA	300	Sell		FB2	402		8420	FB2
FMM3	MOOT	100	Sell				T1234	9999	
BOX	OT	300	Buy					8420	FB2
BOX	OT	300	Sell				T1234	8420	FB2
BOX	OTC	100	Buy					8420	FB2
BOX	OTC	100	Sell					9999	FMM3
BOX	OTC	200	Buy					8420	FB2
BOX	OTC	200	Sell					8420	FB2

For this sample transaction:

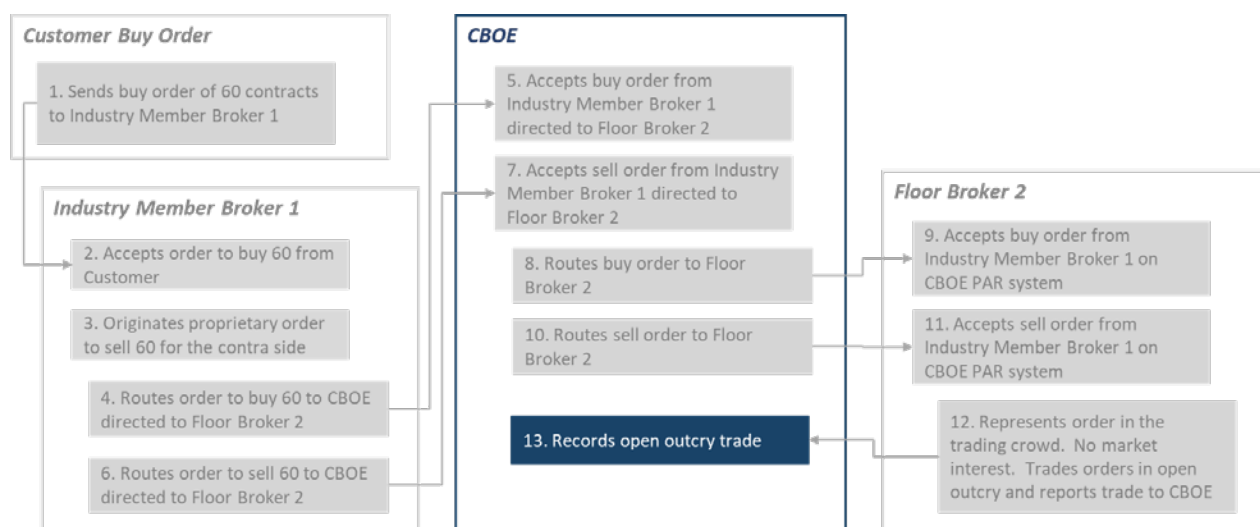
- BOX has identified FB2 and FMM3 as the parties responsible for the underlying orders in the Member field. Therefore, FB2 and FMM3 are the CAT Executing Brokers for this transaction.
- Option Trade Correction (OTC) events are used to update the trades to reflect the actual floor participants. The values reported in the Member field on OTC events supersede the values on the original Option Trade (OT) events for purposes of identifying the parties responsible for the underlying orders. In this scenario, an OTC event identified FMM3 as the Member on the sell-side for 100 contracts and therefore, FMM3 is a CAT Executing Broker. In addition, three OTC events identified FB2 as the Member on the buy-side for a total of 300 contracts and on the sell-side for 200 contracts, therefore, FB2 is a CAT Executing Broker.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side transaction for 300 contracts and a sell-side transaction for 200 contracts (as indicated on the final OTC breakdown) on the CAT invoice for CRD 8420.
- FMM3 is mapped to CRD 9999. Therefore, this transaction will appear as a sell-side transaction for 100 contracts (as indicated on the final OTC breakdown) on the CAT invoice for CRD 9999.
- Although the buy and sell orders originated at IMB1, it is not identified by BOX as a party responsible for the underlying orders. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

4.2. CBOE Floor Trading Scenarios

This section illustrates CAT billing scenarios for CBOE Floor Trading.

4.2.1. CBOE: Listed Options Offsetting Orders Routed to Floor Broker and Executed in Open Outcry as a Cross

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution and the floor broker crosses the order against a contra-side order in open outcry on Cboe Exchange, Inc. (“Cboe Options Exchange” or “CBOE”). In this scenario, Industry Member Broker 1 (“IMB1”) receives a customer order to buy 60 contracts and originates a proprietary contra-side order to sell 60 contracts. IMB1 electronically routes both the buy and sell orders to CBOE with instructions to direct the orders to Floor Broker 2 (“FB2”), a TPH/member of CBOE, for execution. CBOE receives the orders and immediately routes them to the PAR Workstation of FB2. Upon receipt of the orders, after providing an opportunity for bids and offers to be made in open outcry, FB2 represents the buy and sell orders in the crowd on the Exchange floor. There is no market interest, so FB2 verbally executes the two orders against each other in open outcry and reports the trade to CBOE per the Exchange Rules. CBOE accepts and records the trade.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) reported by CBOE (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	60	Buy					4512	

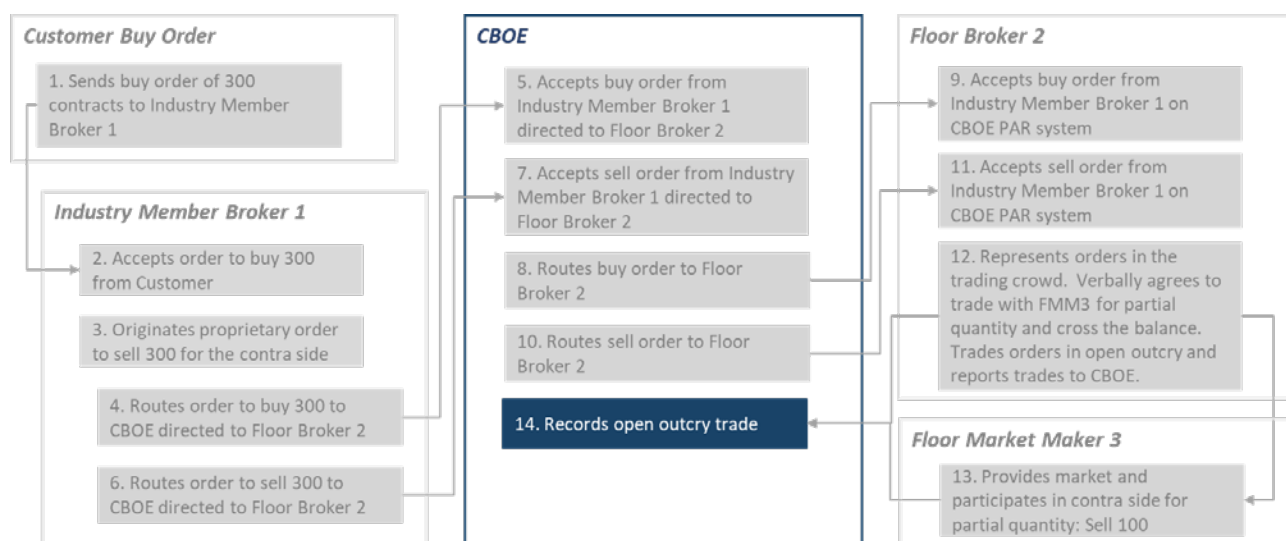
CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	60	Sell					4512	
IMB1	MOOR	60	Buy	CBOE	IMB1	331		4512	
CBOE	OOA	60	Buy		IMB1	331			
CBOE	OOR			FB2	CBOE	OX111			
FB2	MOOA	60	Buy		CBOE	OX111		8420	
IMB1	MOOR	60	Sell	CBOE	IMB1	332		4512	
CBOE	OOA	60	Sell		IMB1	332			
CBOE	OOR	60	Sell	FB2	CBOE	OX112			
FB2	MOOA	60	Sell		CBOE	OX112		8420	
FB2	MOOT	60	Buy				T123B	8420	
FB2	MOOT	60	Sell				T123S	8420	
CBOE	OT	60	Buy				T123B	8420	FB2
CBOE	OT	60	Sell				T123S	8420	FB2

For this sample transaction:

- CBOE has identified FB2 as the party responsible for the transactions in the Member field for both the buy-side OT and the sell-side OT. Therefore, FB2 is the CAT Executing Broker for the Buyer and the CAT Executing Broker for the Seller for this transaction.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side transaction (for 60 contracts) and a separate sell-side transaction (for 60 contracts) on the CAT invoice for CRD 8420.
- Although the buy and sell orders originated at IMB1, it was not identified by CBOE as a party responsible for transactions for purposes of billing on either the buy-side or sell-side. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

4.2.2. CBOE: Listed Options Offsetting Orders Routed to Floor Broker and Executed in Open Outcry with Floor Market Maker Participation

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution and the floor broker crosses a portion of the order with a contra-side order and also trades a portion of the order with a floor market maker in open outcry on Cboe Exchange, Inc. ("Cboe Options Exchange" or "CBOE"). In this scenario, Industry Member Broker 1 ("IMB1") receives a customer order to buy 300 contracts and also originates a proprietary contra-side order to sell 300 contracts. IMB1 electronically routes both the buy and sell orders to CBOE with instructions to direct the orders to Floor Broker 2 ("FB2"), a TPH/member of CBOE, for execution. CBOE receives the orders and immediately routes them to the PAR Workstation of FB2. Upon receipt of the orders, after providing an opportunity for bids and offers to be made in open outcry, FB2 represents the buy and sell orders in the crowd on the Exchange floor and a Floor Market Maker ("FMM3") provides a quote. FB2 and FMM3 verbally agree to trade in open outcry, with FB2 executing 200 with the contra-side sell order and FMM3 executing 100, and they report the trades to CBOE per the Exchange Rules. CBOE accepts and records the trades.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events ("OT") reported by CBOE (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	300	Buy					4512	
IMB1	MONO	300	Sell					4512	

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MOOR	300	Buy	CBOE	IMB1	331		4512	
CBOE	OOA	300	Buy		IMB1	331			
CBOE	OOA	300	Buy	FB2	CBOE	OX111			
FB2	MOOA	300	Buy		CBOE	OX111		8420	
IMB1	MOOR	300	Sell	CBOE	IMB1	332		4512	
CBOE	OOA	300	Sell		IMB1	332			
CBOE	OOA	300	Sell	FB2	CBOE	OX112			
FB2	MOOA	300	Sell		CBOE	OX112		8420	
FB2	MOOT	200	Buy				T123B	8420	
FB2	MOOT	200	Sell				T123S	8420	
FB2	MOOT	100	Buy				T124B	8420	
FMM3	MOOT	100	Sell				T124S	9999	
CBOE	OT	200	Buy				T123B	8420	FB2
CBOE	OT	200	Sell				T123S	8420	FB2
CBOE	OT	100	Buy				T124B	8420	FB2
CBOE	OT	100	Sell				T124S	9999	FMM3

For this sample transaction:

- CBOE has identified FB2 and FMM3 as the parties responsible for the transactions in the Member field. Therefore, FB2 is the CAT Executing Broker for the Buyer for this transaction, and FB2 and FMM3 are the CAT Executing Brokers for the Sellers for this transaction.
- FB2 is mapped to CRD 8420. Therefore, these transactions will appear as buy-side transactions (300 total contracts) and a sell-side transaction (200 contracts) on the CAT invoice for CRD 8420.
- FMM3 is mapped to CRD 9999. Therefore, this transaction will appear as a sell-side transaction (100 contracts) on the CAT invoice for CRD 9999.
- Although the buy and sell orders originated at IMB1, it was not identified by CBOE as a party responsible for the transactions for purposes of billing on either the buy-side or sell-side. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

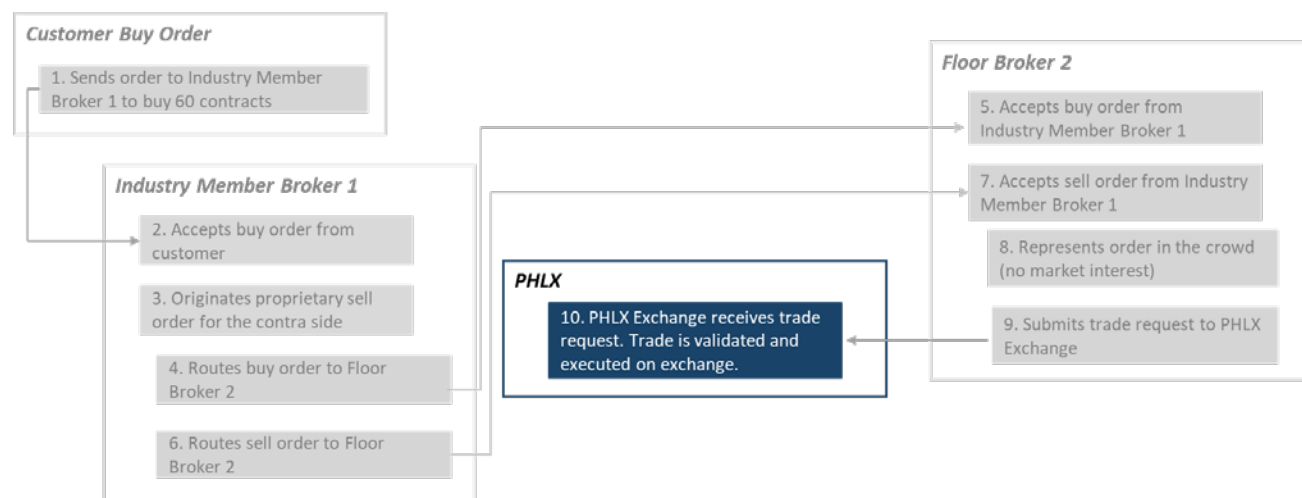
4.3. PHLX Floor Broker Scenarios

This section illustrates CAT billing scenarios for PHLX Floor Brokers.

4.3.1. PHLX: Listed Options Offsetting Orders Routed to Floor Broker for Crossing

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution. In this scenario, Industry Member Broker 1 ("IMB1") receives a customer order to buy 60 contracts and originates a proprietary order for the contra side to sell 60 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 ("FB2"), a

member of the Nasdaq PHLX Option Exchange (“PHLX”), for execution. Upon receipt of the orders, FB2 matches the buy and sell orders and represents the trade in open outcry on the exchange floor. There is no market interest. PHLX accepts and records the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) reported by PHLX (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	60	Buy					4512	
IMB1	MONO	60	Sell					4512	
IMB1	MOOR	60	Buy	FB2	IMB1	331		4512	
FB2	MOOA	60	Buy		IMB1	331		8420	
IMB1	MOOR	60	Sell	FB2	IMB1	332		4512	
FB2	MOOA	60	Sell		IMB1	332		8420	
FB2	MOOT	60	Buy	PHLX	FB2		T123B	8420	
FB2	MOOT	60	Sell	PHLX	FB2		T123S	8420	
PHLX	OT	60	Buy				T123B	8420	FB2
PHLX	OT	60	Sell				T123S	8420	FB2

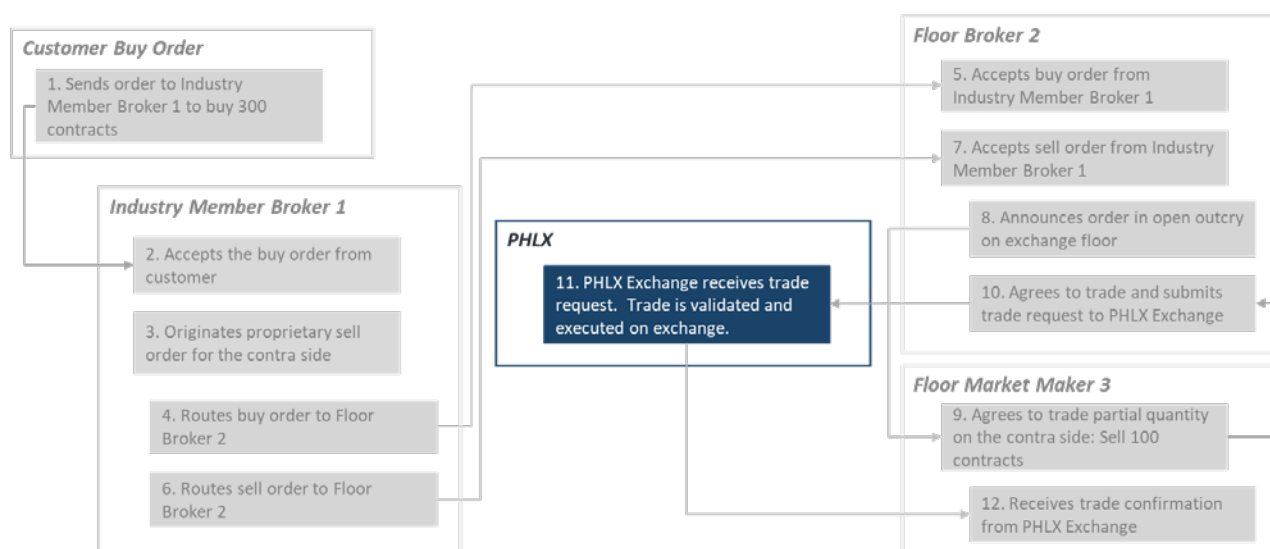
For this sample transaction:

- PHLX has identified FB2 as the party responsible for the underlying order in the Member field. Therefore, FB2 is the CAT Executing Broker for this transaction.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 8420.

- Although the buy and sell orders originated at IMB1, it was not identified by PHLX as a party responsible for the underlying order. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

4.3.2. PHLX: Listed Options Offsetting Orders Routed to Floor Broker with Floor Market Maker Participation

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution and a floor market maker participates in the contra side. In this scenario, Industry Member Broker 1 (“IMB1”) receives a customer order to buy 300 contracts and originates a proprietary order for the contra side to sell 300 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 (“FB2”), a member of the PHLX Options Exchange (“PHLX”), for execution. Upon receipt of the orders, FB2 represents the trade in the crowd and a Floor Market Maker (“FMM3”) wants to participate in the cross for a partial quantity. PHLX accepts and records the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) reported by PHLX (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	300	Buy					4512	
IMB1	MONO	300	Sell					4512	
IMB1	MOOR	300	Buy	FB2	IMB1	331		4512	

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
FB2	MOOA	300	Buy		IMB1	331		8420	
IMB1	MOOR	300	Sell	FB2	IMB1	332		4512	
FB2	MOOA	300	Sell		IMB1	332		8420	
FB2	MOOT	200	Buy				T123B	8420	
FB2	MOOT	200	Sell				T123S	8420	
FB2	MOOT	100	Buy				T124B	8420	
FMM3	MOOT	100	Sell				T124S	9999	
PHLX	OT	200	Buy				T123B	8420	FB2
PHLX	OT	200	Sell				T123S	8420	FB2
PHLX	OT	100	Buy				T124B	8420	FB2
PHLX	OT	100	Sell				T124S	9999	FMM3

For this sample transaction:

- PHLX has identified FB2 and FMM3 as the parties responsible for the underlying orders in the Member field. Therefore, FB2 and FMM3 are the CAT Executing Brokers for this transaction.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side (300 contracts) and sell-side transaction (200 contracts) on the CAT invoice for CRD 8420.
- FMM3 is mapped to CRD 9999. Therefore, this transaction will appear as a sell-side transaction (100 contracts) on the CAT invoice for CRD 9999.
- Although the buy and sell orders originated at IMB1, it is not identified by PHLX as a party responsible for the underlying order. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

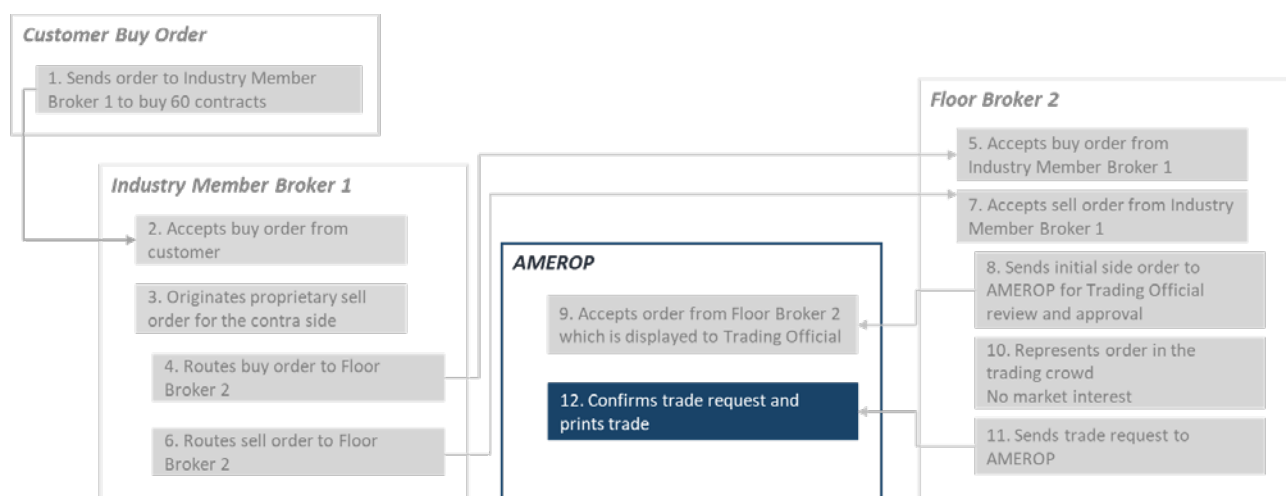
4.4. NYSE Floor Broker Scenarios

Both NYSE options exchanges – NYSE American Options Exchange (“AMEROP”) and NYSE Arca Options Exchange (“ARCAOP”) use the same trading platform and have the same procedures for open outcry trading on their option trading floors. For simplicity, one scenario below takes place on AMEROP and the other scenario takes place on ARCAOP, but each scenario applies to both NYSE option exchanges interchangeably.

4.4.1. NYSE Options: Listed Options Offsetting Orders Routed to Floor Broker for Crossing

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution. In this scenario, Industry Member Broker 1 (“IMB1”) receives a customer order to buy 60 contracts and originates a proprietary order for the contra side to sell 60 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 (“FB2”), a member of the NYSE American Option Exchange (“AMEROP”), for execution. Upon receipt of the orders,

FB2 routes the initial side order to AMEROP for Trading Official review and approval. FB2 then represents the orders in open outcry on the exchange floor. There is no market interest. FB2 routes the trade request to AMEROP for execution. AMEROP accepts the trade request and executes the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) reported by AMEROP (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	60	Buy					4512	
IMB1	MONO	60	Sell					4512	
IMB1	MOOR	60	Buy	FB2	IMB1	331		4512	
FB2	MOOA	60	Buy		IMB1	331		8420	
IMB1	MOOR	60	Sell	FB2	IMB1	332		4512	
FB2	MOOA	60	Sell		IMB1	332		8420	
FB2	MOOR	60	Buy	AMEROP	FB2	401		8420	
FB2	MOOT	60	Sell				T123S	8420	
AMEROP	OOA	60	Buy		FB2	401		8420	FB2
AMEROP	OT	60	Buy			401	T123B	8420	FB2
AMEROP	OT	60	Sell				T123S	8420	FB2

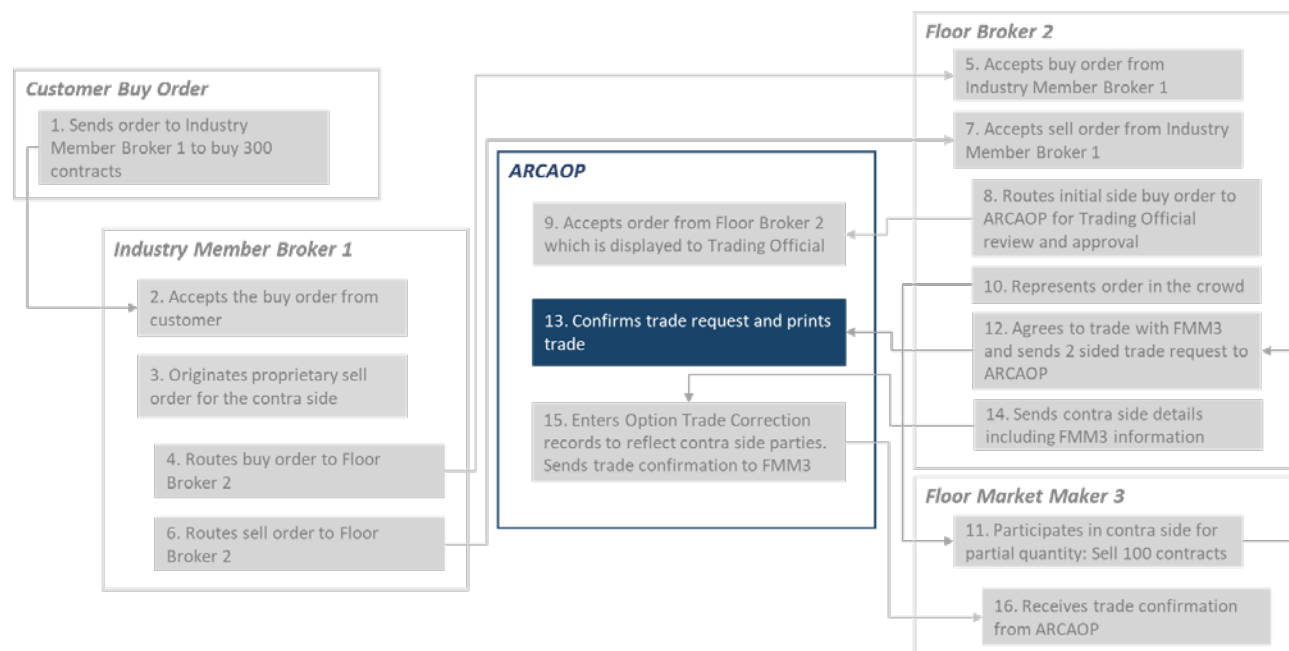
For this sample transaction:

- AMEROP has identified FB2 as the party responsible for the underlying orders in the Member field. Therefore, FB2 is the CAT Executing Broker for this transaction.

- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 8420.
- Although the buy and sell orders originated at IMB1, it was not identified by AMEROP as a party responsible for the underlying orders. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

4.4.2. NYSE Options: Listed Options Offsetting Orders Routed to Floor Broker with Floor Market Maker Participation

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution and a floor market maker participates in the contra side. In this scenario, Industry Member Broker 1 (“IMB1”) receives a customer order to buy 300 contracts and originates a proprietary order for the contra side to sell 300 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 (“FB2”), a member of the NYSE Arca Options Exchange (“ARCAOP”), for execution. Upon receipt of the orders, FB2 routes the initial side order to ARCAOP for Trading Official approval. FB2 then represents the trade in the crowd and a Floor Market Maker (“FMM3”) wants to participate in the cross for a partial quantity. FB2 submits a trade request to the ARCAOP for execution. ARCAOP accepts the trade request and executes the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) and Simple Option Trade Correction Events

("OTC") reported by ARCAOP (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	300	Buy					4512	
IMB1	MONO	300	Sell					4512	
IMB1	MOOR	300	Buy	FB2	IMB1	331		4512	
FB2	MOOA	300	Buy		IMB1	331		8420	
IMB1	MOOR	300	Sell	FB2	IMB1	332		4512	
FB2	MOOA	300	Sell		IMB1	332		8420	
FB2	MOOR	300	Buy	AMEROP	FB2	401		8420	
FB2	MOOT	200	Sell				T123S	8420	
FMM3	MOOT	100	Sell				T123S	9999	
AMEROP	OOA	300	Buy		FB2	401		8420	FB2
AMEROP	OT	300	Buy			401	T123B	8420	FB2
AMEROP	OT	300	Sell				T123S	8420	FB2
AMEROP	OTC	200	Buy			401		8420	FB2
AMEROP	OTC	200	Sell					8420	FB2
AMEROP	OTC	100	Buy			401		8420	FB2
AMEROP	OTC	100	Sell					9999	FMM3

For this sample transaction:

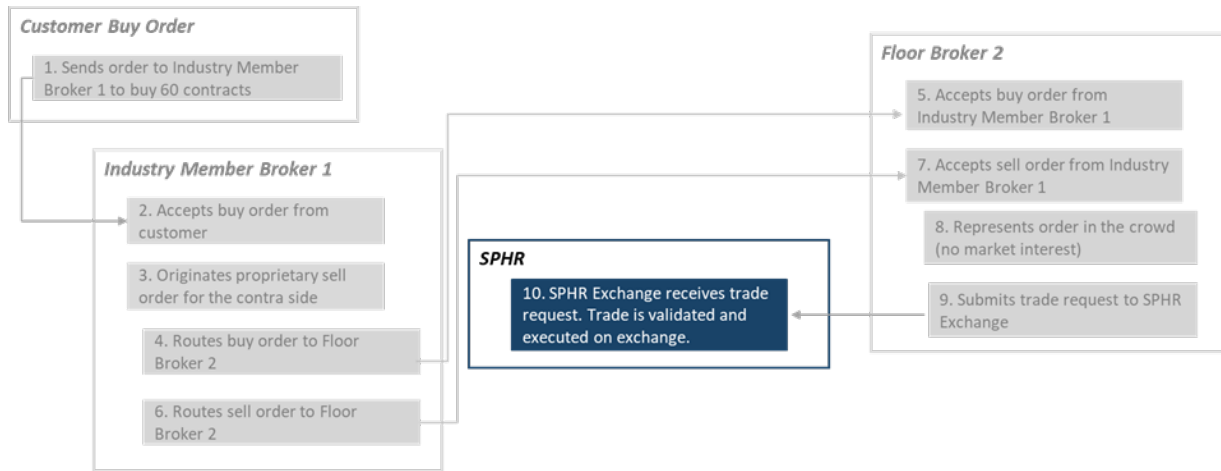
- ARCAOP has identified FB2 and FMM3 as the parties responsible for the underlying orders in the Member field. Therefore, FB2 and FMM3 are the CAT Executing Brokers for this transaction.
- Option Trade Correction (OTC) events are used to update the trades to reflect the actual floor participants. The values reported in the Member field on OTC events supersede the values on the original Option Trade (OT) events for purposes of identifying the parties responsible for the underlying orders. In this scenario, an OTC event identified FMM3 as the Member on the sell-side for 100 contracts and therefore, FMM3 is a CAT Executing Broker. In addition, three OTC events identified FB2 as the Member on the buy-side for a total of 300 contracts and on the sell-side for 200 contracts, therefore, FB2 is a CAT Executing Broker.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side transaction for 300 contracts and a sell-side transaction for 200 contracts (as indicated on the final OTC breakdown) on the CAT invoice for CRD 8420.
- FMM3 is mapped to CRD 9999. Therefore, this transaction will appear as a sell-side transaction for 100 contracts (as indicated on the final OTC breakdown) on the CAT invoice for CRD 9999.
- Although the buy and sell orders originated at IMB1, it is not identified by ARCAOP as a party responsible for the underlying orders. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

4.5. SPHR Floor Broker Scenarios

This section illustrates CAT billing scenarios for SPHR Floor Brokers.

4.5.1. SPHR: Listed Options Offsetting Orders Routed to Floor Broker for Crossing

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution. In this scenario, Industry Member Broker 1 (“IMB1”) receives a customer order to buy 60 contracts and originates a proprietary order for the contra side to sell 60 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 (“FB2”), a member of the MIAX Sapphire Option Exchange (“SPHR”), for execution. Upon receipt of the orders, FB2 matches the buy and sell orders and represents the trade in open outcry on the exchange floor. There is no market interest. SPHR accepts and records the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) reported by SPHR (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONQ	60	Buy					4512	
IMB1	MONQ	60	Sell					4512	
IMB1	MOOR	60	Buy	FB2	IMB1	331		4512	
FB2	MOOA	60	Buy		IMB1	331		8420	
IMB1	MOOR	60	Sell	FB2	IMB1	332		4512	
FB2	MOOA	60	Sell		IMB1	332		8420	
FB2	MOOT	60	Buy	SPHR	FB2		T123B	8420	

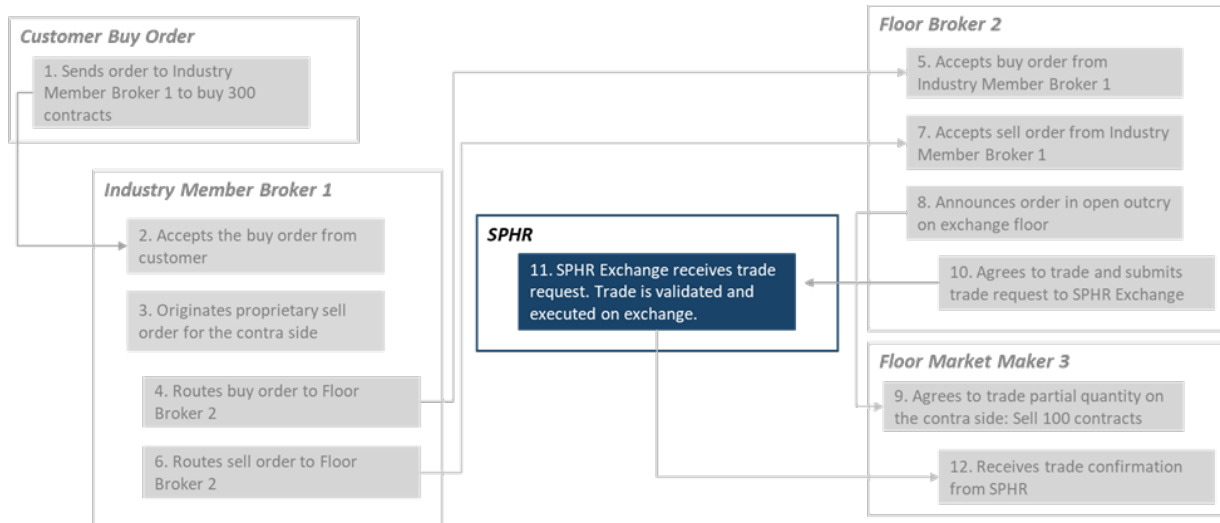
<u>CAT Reporter</u>	<u>Event Type</u>	<u>Qty</u>	<u>Side</u>	<u>Destination</u>	<u>Sender IMD/Routing Party</u>	<u>Routed Order ID</u>	<u>Tape TradeID/ MOOTLINK</u>	<u>CAT Reporter CRD (Derived)</u>	<u>Member</u>
<u>FB2</u>	<u>MOOT</u>	<u>60</u>	<u>Sell</u>	<u>SPHR</u>	<u>FB2</u>		<u>T123S</u>	<u>8420</u>	
<u>SPHR</u>	<u>OT</u>	<u>60</u>	<u>Buy</u>				<u>T123B</u>	<u>8420</u>	<u>FB2</u>
<u>SPHR</u>	<u>OT</u>	<u>60</u>	<u>Sell</u>				<u>T123S</u>	<u>8420</u>	<u>FB2</u>

For this sample transaction:

- SPHR has identified FB2 as the party responsible for the underlying order in the Member field. Therefore, FB2 is the CAT Executing Broker for this transaction.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side and sell-side transaction on the CAT invoice for CRD 8420.
- Although the buy and sell orders originated at IMB1, it was not identified by SPHR as a party responsible for the underlying order. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.

4.5.2. SPHR: Listed Options Offsetting Orders Routed to Floor Broker with Floor Market Maker Participation

This scenario illustrates which Industry Members will be identified as CAT Executing Brokers for billing purposes when a customer order is sent to a floor broker for execution and a floor market maker participates in the contra side. In this scenario, Industry Member Broker 1 ("IMB1") receives a customer order to buy 300 contracts and originates a proprietary order for the contra side to sell 300 contracts. IMB1 routes both the buy and sell orders to Floor Broker 2 ("FB2"), a member of the MIAX Sapphire Option Exchange ("SPHR"), for execution. Upon receipt of the orders, FB2 represents the trade in the crowd and a Floor Market Maker ("FMM3") wants to participate in the cross for a partial quantity. SPHR accepts and records the trade per the exchange rules.



The table below shows an audit trail of the events required to be reported to the Transaction Subsystem. In this scenario, the Simple Option Trade Events (“OT”) reported by SPHR (highlighted in purple) are used to identify the CAT Executing Brokers. The identity of the CAT Executing Brokers will be determined by the mnemonic in the Member field.

CAT Reporter	Event Type	Qty	Side	Destination	Sender IMID/Routing Party	Routed Order ID	Tape TradeID/ MOOTLINK	CAT Reporter CRD (Derived)	Member
IMB1	MONO	300	Buy					4512	
IMB1	MONO	300	Sell					4512	
IMB1	MOOR	300	Buy	FB2	IMB1	331		4512	
FB2	MOOA	300	Buy		IMB1	331		8420	
IMB1	MOOR	300	Sell	FB2	IMB1	332		4512	
FB2	MOOA	300	Sell		IMB1	332		8420	
FB2	MOOT	200	Buy				T123B	8420	
FB2	MOOT	200	Sell				T123S	8420	
FB2	MOOT	100	Buy				T124B	8420	
FMM3	MOOT	100	Sell				T124S	9999	
SPHR	OT	200	Buy				T123B	8420	FB2
SPHR	OT	200	Sell				T123S	8420	FB2
SPHR	OT	100	Buy				T124B	8420	FB2
SPHR	OT	100	Sell				T124S	9999	FMM3

For this sample transaction:

- SPHR has identified FB2 and FMM3 as the parties responsible for the underlying orders in the Member field. Therefore, FB2 and FMM3 are the CAT Executing Brokers for this transaction.
- FB2 is mapped to CRD 8420. Therefore, this transaction will appear as a buy-side (300 contracts) and sell-side transaction (200 contracts) on the CAT invoice for CRD 8420.

- FMM3 is mapped to CRD 9999. Therefore, this transaction will appear as a sell-side transaction (100 contracts) on the CAT invoice for CRD 9999.
- Although the buy and sell orders originated at IMB1, it is not identified by SPHR as a party responsible for the underlying order. Therefore, IMB1 is not a CAT Executing Broker and will not be issued a CAT invoice.