Consolidated Audit Trail

Interfirm Linkage Overview 8/12/20

Agenda

- Release Schedule
- General Processing Refresher
- Day 1 Results Analysis

Industry Member 2a/2b – Release 3 (Interfirm) Release Rollout

Interfirm Release 3.1
Industry Test – 7/27/2020

Production – 8/10/2020

- Machine-to-Machine Interfirm Validations & Feedback including Named Errors

CAT Reporter Portal
- Download Interfirm Feedback including Named Errors
- Set preference for Named Feedback (JSON vs CSV)

Interfirm Release 3.2
Industry Test – 8/10/2020

Production – 8/10/2020

CAT Reporter Portal
- **Reporting Summary** (Interfirm Link Eligible, Errors, Warnings and Adjusted Error Rate)
- Counterparty statistics downloadable for Interfirm Unlinked and Unlinked Named Errors
- **Error Code Count** screen to include Interfirm Errors and Warning including Named Errors
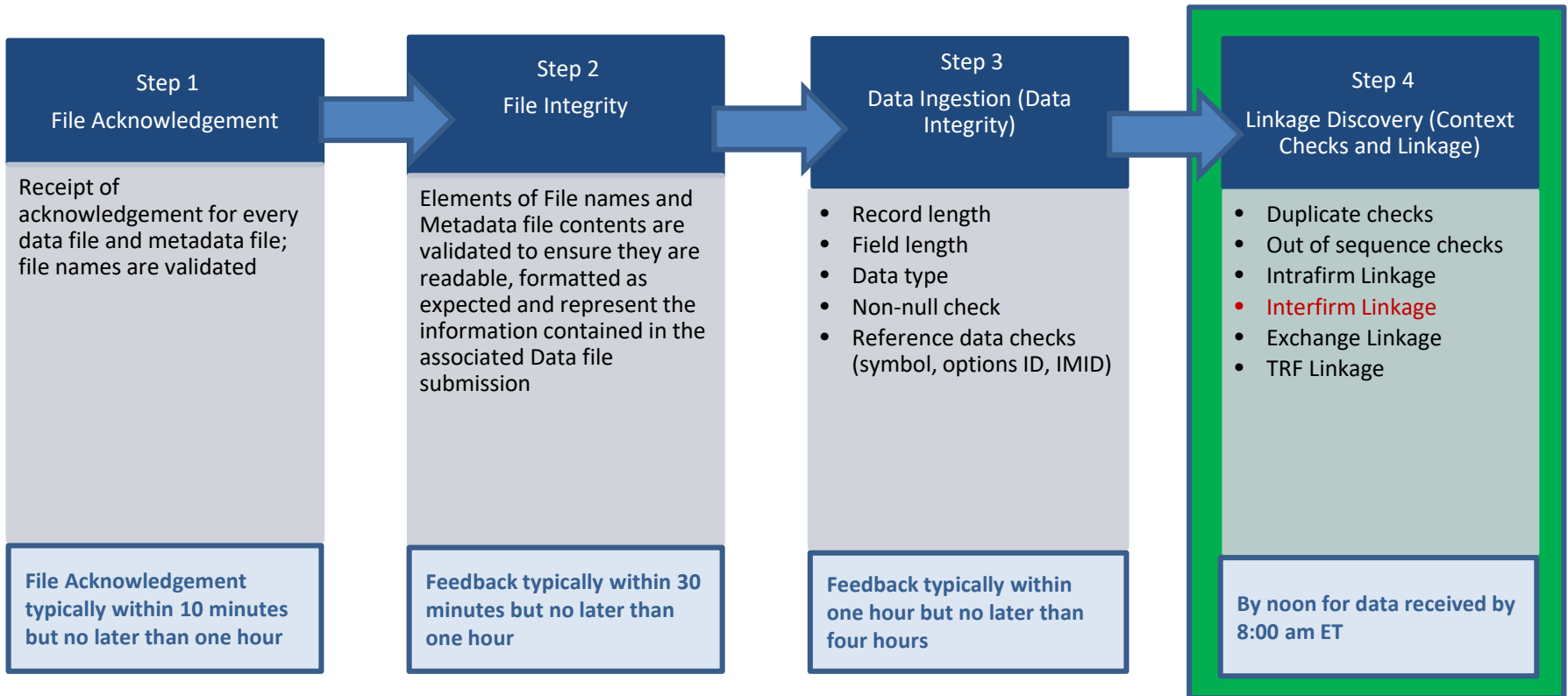- **Error Search** screen ability to view and correct Interfirm Linkage Errors (No Named Errors)

Interfirm Release 3.3
Industry Test – 9/21/2020

Production – 9/28/2020

CAT Reporter Portal
- **Error Search** screen ability to view Named Interfirm Errors (Not repairable via the Portal)
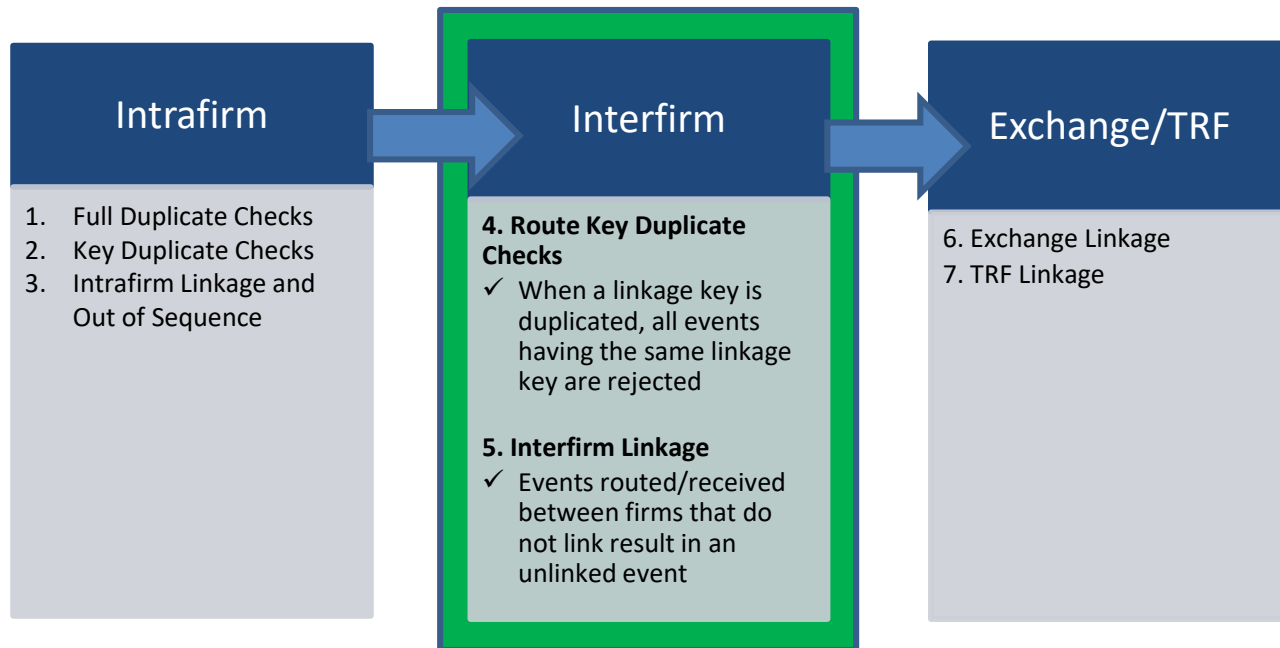- **New Screen** for Interfirm statistics by counterparty

Phase 2a Interfirm/Exchange/TRF Compliance Date – 10/26/2020
Phase 2b Interfirm/Exchange/TRF Compliance Date – 1/4/2021

General Processing Overview

CAT Processing

Step 1	Step 2	Step 3	Step 4
File Acknowledgement	**File Integrity**	**Data Ingestion (Data Integrity)**	**Linkage Discovery (Context Checks and Linkage)**
Receipt of acknowledgement for every data file and metadata file; file names are validated	Elements of File names and Metadata file contents are validated to ensure they are readable, formatted as expected and represent the information contained in the associated Data file submission	• Record length • Field length • Data type • Non-null check • Reference data checks (symbol, options ID, IMID)	• Duplicate checks • Out of sequence checks • Intrafirm Linkage • Interfirm Linkage • Exchange Linkage • TRF Linkage
File Acknowledgement typically within 10 minutes but no later than one hour	**Feedback typically within 30 minutes but no later than one hour**	**Feedback typically within one hour but no later than four hours**	**By noon for data received by 8:00 am ET**

Linkage Discovery Steps

Intrafirm	Interfirm	Exchange/TRF
1. Full Duplicate Checks 2. Key Duplicate Checks 3. Intrafirm Linkage and Out of Sequence	**4. Route Key Duplicate Checks** ✓ When a linkage key is duplicated, all events having the same linkage key are rejected **5. Interfirm Linkage** ✓ Events routed/received between firms that do not link result in an unlinked event	6. Exchange Linkage 7. TRF Linkage

Interfirm Route Linkage Key

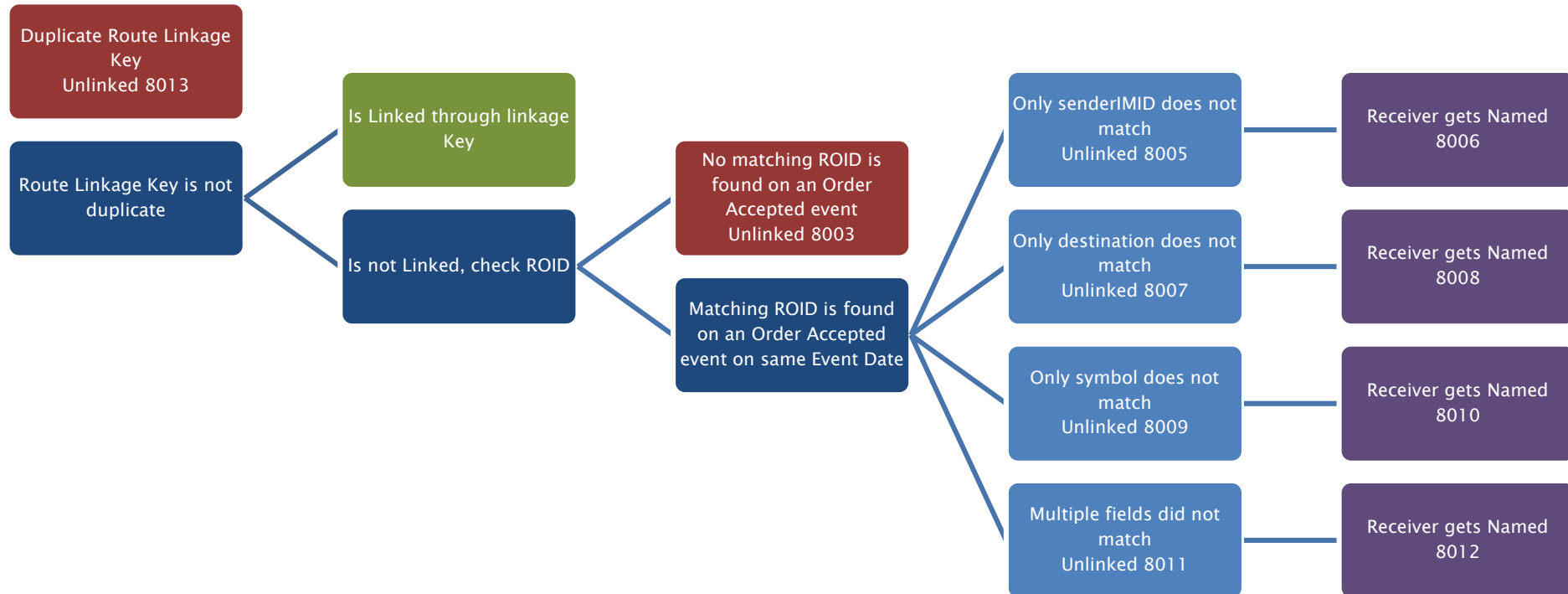| Sender (MEOR)	Receiver (MEOA/MEOM)
senderIMID	senderIMID
destination (IMID)	receiverIMID
Event Date portion of eventTimestamp	Event Date portion of eventTimestamp
symbol (or optionID)	symbol (or optionID)
routedOrderID	routedOrderID

▸ Route Linkage Key must be equal between the sender and the receiver.

▸ Route Linkage key must be unique within the combination of the above noted fields. Uniqueness requirements apply to both the sender and the receiver.

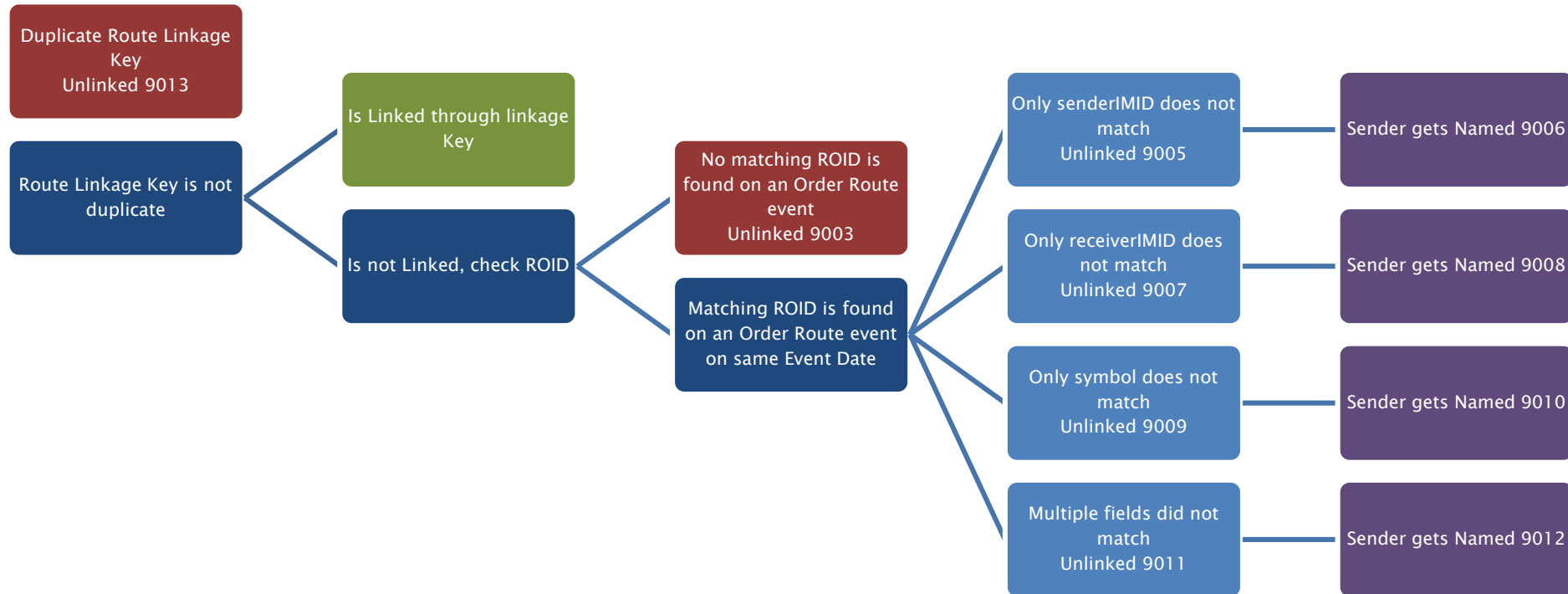▸ Session does not participate in Route Linkage key for routes between IMs.

Note about IMIDs:

▸ senderIMID, destination and receiverIMID do not have to be the same as the CAT Reporter IMID which is the identifier used to report to CAT and is populated in file submissions.

▸ CRD and IMID are both populated in the IMID fields using the format <CRD>:<IMID>

  ◦ The CRD prefix is required to avoid managing IMID conflicts

  ◦ The IMID portion facilitates Route Linkage Key uniqueness for firms that cannot guarantee uniqueness at the CRD level. That is, using different IMIDs within the same CRD can reduce the scope of uniqueness required for routedOrderIds.

Refer to **Section 2.6.3** of the IM Tech Spec for additional information/examples.

Order Route event – Linkage Order of Operations

Duplicate Route Linkage Key
Unlinked 8013

Route Linkage Key is not duplicate

Is Linked through linkage Key

Is not Linked, check ROID

No matching ROID is found on an Order Accepted event
Unlinked 8003

Matching ROID is found on an Order Accepted event on same Event Date

Only senderIMID does not match
Unlinked 8005

Only destination does not match
Unlinked 8007

Only symbol does not match
Unlinked 8009

Multiple fields did not match
Unlinked 8011

Receiver gets Named 8006

Receiver gets Named 8008

Receiver gets Named 8010

Receiver gets Named 8012

Order Accepted/Order Modified events – Linkage Order of Operations

```
Duplicate Route Linkage Key
Unlinked 9013

Route Linkage Key is not duplicate
    ├── Is Linked through linkage Key
    └── Is not Linked, check ROID
            ├── No matching ROID is found on an Order Route event
            │   Unlinked 9003
            └── Matching ROID is found on an Order Route event on same Event Date
                    ├── Only senderIMID does not match
                    │   Unlinked 9005 ──── Sender gets Named 9006
                    ├── Only receiverIMID does not match
                    │   Unlinked 9007 ──── Sender gets Named 9008
                    ├── Only symbol does not match
                    │   Unlinked 9009 ──── Sender gets Named 9010
                    └── Multiple fields did not match
                        Unlinked 9011 ──── Sender gets Named 9012
```

Interfirm Route Linkage Key Example

▸ Unlinked Errors occur when Sender and Receiver do not populate the same IMIDs in the Route Linkage Key

▸ When an event is unlinked, two types of feedback are provided:

  ◦ Unlinked feedback is provided to the CAT Reporter of the Event

  ◦ Unlinked NAMED feedback is provided to named identifier in the unlinked event

▸ Example: IMIDA erroneously names IMIDX instead of IMIDB in its MEOR event.

CRD	CATRptrIMID	Event	Order Key	Route Link Key	ErrorROEID
123	IMIDA	MENO	4/24/2020, IMIDA, AAPL, 12345		
123	IMIDA	MEOR	4/24/2020, IMIDA, AAPL, 12345	123:IMIDA, 456:IMIDX, 4/24/2020, AAPL, ROID1	8007
456	IMIDB	MEOA	4/24/2020, IMIDB, AAPL, 33333	123:IMIDA, 456:IMIDB, 4/24/2020, AAPL, ROID1	9007
	Named Errors				
456	**IMIDX**			123:IMIDA, **456:IMIDX**, 4/24/2020, AAPL, ROID1	8008
123	IMIDA			**123:IMIDA**, 456:IMIDB, 4/24/2020, AAPL, ROID1	9008

Day 1 Results

Initial Interfirm Results

▸ Overall Interfirm Linkage Error Rate for 8/10

Unlinked Routes	Unlinked Order Accept/Modifies
43.82%	40.15%

8/10 Interfirm Results

▸ Breakdown of Overall Error Rate

REASONS:	Percentage of Overall Error Rate	
	Sender (Routes)	Receiver (Accept/Modify)
Routed Order ID mismatch (8003/9003)	82%	68%
SenderIMID mismatch (8005/9005)	10%	23%
ReceiverIMID mismatch (8007/9007)	4%	5%
Symbol mismatch (8009/9009)	0%	0%
Multiple mismatches (8011/9011)	3%	3%
Route key duplicate (8013/9013)	<1%	<1%

Routed Order ID Mismatches

▶ Causes:

  ◦ Counter Party is not there or was misidentified at the CRD level

  ◦ Counter Party is there but Routed Order ID does not match

Sender/Receiver IMID Mismatches

▸ Routed Order ID was identified from same CRD, but IMID did not match

▸ CRD prefix is NOT the issue as any firm submitting without this will receive a rejection – rejection rates overall are very low (.01%)

Best Practices for Populating IMIDs on messages between Industry Members

▸ OATS Reporters should leverage the identifiers already used to report and match in OATS for use as Sender/Receiver IDs in CAT.

▸ Senders and Receivers must **mutually agree** on the Sender/Receiver IMIDs to use for CAT Reporting (NOT required to be the same as CAT Reporter IMID).

▸ While the Sender/Receiver IMIDs do not need to be the same as the CAT Reporter IMID, FINRA CAT has observed that most Industry Members use the same identifier for the CAT Reporter IMID and Sender/Receiver IMIDs.

▸ If there is no predetermined agreement between the sender and the receiver (Refer to Section 2.4.1.2 of Technical Specifications),

◦ Firms may use the default IMID found on the IMID list. (https://catnmsplan.com/reference-data)

◦ Senders should choose the identifier and communicate with the Receiving Industry Member.

Determining Which Sender/Receiver IMID to Populate (Section 2.4.1.2 of the Spec)

▸ If an Industry Member has more than one IMID, the following criteria should be used in this order to determine how to populate the *senderIMID*, *receiverIMID*, and *destination* fields:

1. For orders received from or routed to an alternative trading system (ATS), the FINRA ATS MPID must be used.

2. FINRA members must use the same MPID for CAT reporting that it uses for related trade reporting facility (TRF) trade reporting, or, for quoting on an IDQS.

3. If there is no ATS, TRF or quoting MPID requirement, firms may agree to use any valid FINRA MPID when routing to or receiving from another FINRA member. **Both CAT Reporters must use the same MPID as the IMID**.

4. For orders received from or routed to a non-FINRA member firm, any effective identifier of the firm may be used. **Both CAT Reporters must use the same MPID as the IMID**.

▸ The *senderIMID*, *receiverIMID*, and *destination* fields can be different than the CAT Reporter IMID.

▸ Prior to additions to the spec, this guidance was previously provided in CAT Alert 2018-03.

Named Errors

Named Errors

Named Errors occur when the CAT Reporter was named in a record submitted by another CAT Reporter (Industry Member, Exchange or TRF/ADF/ORF) that is unlinked.

▸ Primary Goal of Named Feedback is to assist firms in identifying instances of non-reporting.

Review of Named Errors

▸ A named error could indicate that:

1. An event was NOT reported to CAT; A late submission will resolve the named error

2. An event was reported to CAT, but was rejected; A correction for the rejected event will resolve the named error

3. An event was reported to CAT, but the linkage key was inaccurate; A correction for the unlinked event by the party that made the error will resolve the named error

▸ If your firm does not do business with the party that named you, it is possible that your firm was named in an erroneous CAT report. Named errors from erroneous records can be resolved if the reporting party deletes the erroneous record.

Additional Named Error Information: Feedback Files

- Filename for Named Errors begins with:
  <CRD of named identifier>_<named identifier>

- If other unlinked errors are found for the same CRD/named identifier, the errors will be provided in the same file

- Feedback files are formatted using format of original submission, or using the user specified format as entered into the Reporter Portal

How to Ask a Question during Today's Call

- **For participants using computer audio:**
  - Click the "Raise Hand" button at the bottom of the participants window.
  - A visual prompt will indicate that your line has been unmuted.

- **For participants using phone audio:**
  - Enter *9 on your phone keypad.
  - An audio prompt will indicate that your line has been unmuted.