

# SEC Rule 613 - Consolidated Audit Trail (CAT)

Proposed RFP Concepts  
December 5, 2012



# About this document

- The purpose of this document is to outline potential concepts that may be included in the request for proposal (RFP) regarding the creation and implementation of a consolidated audit trail (CAT), which will be released in the first quarter 2013. In general, this document:
  - Provides an overview of the CAT;
  - Describes the fundamental components of the CAT, including the business and technical requirements necessary to operate the CAT;
  - Provides a general overview of the anticipated functions necessary to operate the CAT, for which bidders will need to provide an end-to-end solution; and
  - Requests feedback from industry members, potential bidders and other interested parties regarding the feasibility and costs of the RFP concepts presented
- Comments on the concepts in this document may be submitted to [feedback@catnmsplan.com](mailto:feedback@catnmsplan.com).
- Feedback and comments provided to the SROs will be published as received on the [catnmsplan.com](http://catnmsplan.com) website.
- Please note the contents in this slide presentation are not in any way a final representation of the content of the forthcoming RFP. The SROs collectively reserve the right to publish an RFP with materially different content from this document.
- The Guiding Principles of the RFP can be found on the [catnmsplan.com](http://catnmsplan.com) website.
- The content and information in this document are the property of the SROs collectively developing the CAT NMS Plan.

# RFP Timeline

Formal selection of a bidder is subject to SEC approval of the NMS Plan.

- In accordance with the NMS Plan, the SROs will select a plan processor to perform or oversee the functions described in this document. The plan processor will be subject to the oversight of the SROs.
- SEC Rule 613 requires that a plan processor be selected within two months of the effectiveness of the NMS Plan.

Currently, the NMS Plan must be filed by April 26, 2013. However, given the significant work and analysis that is required to develop the NMS plan, including the issuance of an RFP, the SROs plan to submit an exemption request to the SEC to extend the due date for filing the NMS Plan until December 2013. If approved by the SEC, the RFP timeline will be as follows:

- Feedback on RFP concepts needed by January 18, 2013
- Publish RFP mid-February 2013
- RFP responses due early April 2013

Therefore, based on the proposed timeline, the SROs anticipate formal selection of a bidder would occur sometime in 2014.

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# **ANTICIPATED CAT REQUIREMENTS**

# Overview

The purpose of the NMS Plan is to create a central repository for the SROs and the SEC to perform surveillance on order event data, linked to customer and account information, and to permit regulators to efficiently and effectively perform market reconstructions. The repository will be used exclusively by SROs and the SEC for regulatory purposes.

## ■ General structure

- The CAT will be supported by two primary types of functions: technical functions and administrative functions.
- The technical functions, administrative functions and deliverables will be subject to ultimate review and approval by the SROs.

## ■ The SROs anticipate that technical functions would include:

- Build, operate and maintain CAT technology system and infrastructure
- Receive broker dealer customer/account information and order events, FINRA transaction data, exchange quote and order events, and supplemental data (e.g., NBBO, administrative messages)
- Ingest, validate and process data to support surveillance by SROs and the SEC
- Provide submission feedback and receive data corrections
- Maintain the data and provide it to regulators in a manner that meets the requirements of Rule 613
  - Support market reconstruction
  - Bulk data interface to provide data back to the SROs and the SEC for surveillance processing
- Build and maintain the central repository
- Maintain CAT submission and processing status web site

## ■ The SROs anticipate that administrative functions would include:

- Business Operations
- Compliance
- Legal
- Finance

# Anticipated Technical Functions

*The following are anticipated functions required for the technology solution:*

## ■ Technical Requirements

- Develop data interface specifications for data objects and data elements for data submission and access
- Develop functional and systems requirements specifications
- Develop ongoing requirements for system changes
- Prioritize and manage technical requirements modification requests and defect correction

## ■ Architecture and Design

- Develop logical and physical data architecture
- Develop systems architecture
- Develop systems interface specifications including data submission and data access
- Design user interfaces
- Design disaster recovery plan
- As new technologies become available identify how they can be leveraged to increase efficiency and throughput

## ■ Network & Systems Infrastructure

- Design network and systems infrastructure
- Build and configure communication infrastructure
- Build and configure system infrastructure (e.g. servers and storage)

## ■ Build and Maintenance

- Build applications, components, interfaces, and data models
  - Data ingestion process
  - Error handling process
  - Data enrichment and order lifecycle construction
  - Central repository
  - Market reconstruction
  - Analysis and reporting
- Build central repository
- Maintain a central repository of corrected data that is searchable electronically without any manual intervention for a period of not less than five years

# Anticipated Technical Functions (cont'd)

## ■ Build and Maintenance (cont'd)

- Maintain raw data (e.g., uncorrected data) submissions for five years
- Maintain system regression testing
- Implement modification requests and defect fixes
- Maintain software and infrastructure at the current and supported versions

## ■ Testing (The CAT & Industry)

- Testing for initial implementation with broker dealers and exchanges
- Unit, integration and system testing, including integration testing with CAT Reporters and the SEC
- Onboarding testing for new data providers and users
- Testing for upgraded interfaces
- On demand testing for CAT Reporters related to system changes and updates

## ■ Technical Operations

- Onboarding of new broker dealers and exchanges
  - Set up and test system interfaces
  - Set up and test data submission
- Monitor, manage and support for CAT systems including:
  - Regularly test and maintain disaster recovery plan
  - Provide 24/7 technical support
  - Monitor security and access
  - Monitor network infrastructure
  - Monitor systems
  - Test network failover

# Data Processing Requirements

## ■ Data Ingestion

- Receive CAT reportable events (e.g., orders, quotes, trades) from CAT Reporters
- Receive account and customer data from broker-dealers
- Ingest market data (e.g., SIP, OPRA) and administrative messages (e.g., instrument master, trade halts) from exchanges and FINRA
- Accept timestamps to the finest increment used by CAT Reporters if finer than the minimum increment required by the NMS Plan

## ■ Data Processing

- Validate data and process corrected data from CAT Reporters
- Create lifecycle linkages, including account and customer data for each order
- Process and store data in a secure manner while ensuring efficient retrieval and use of lifecycle linkages

## ■ Data Access

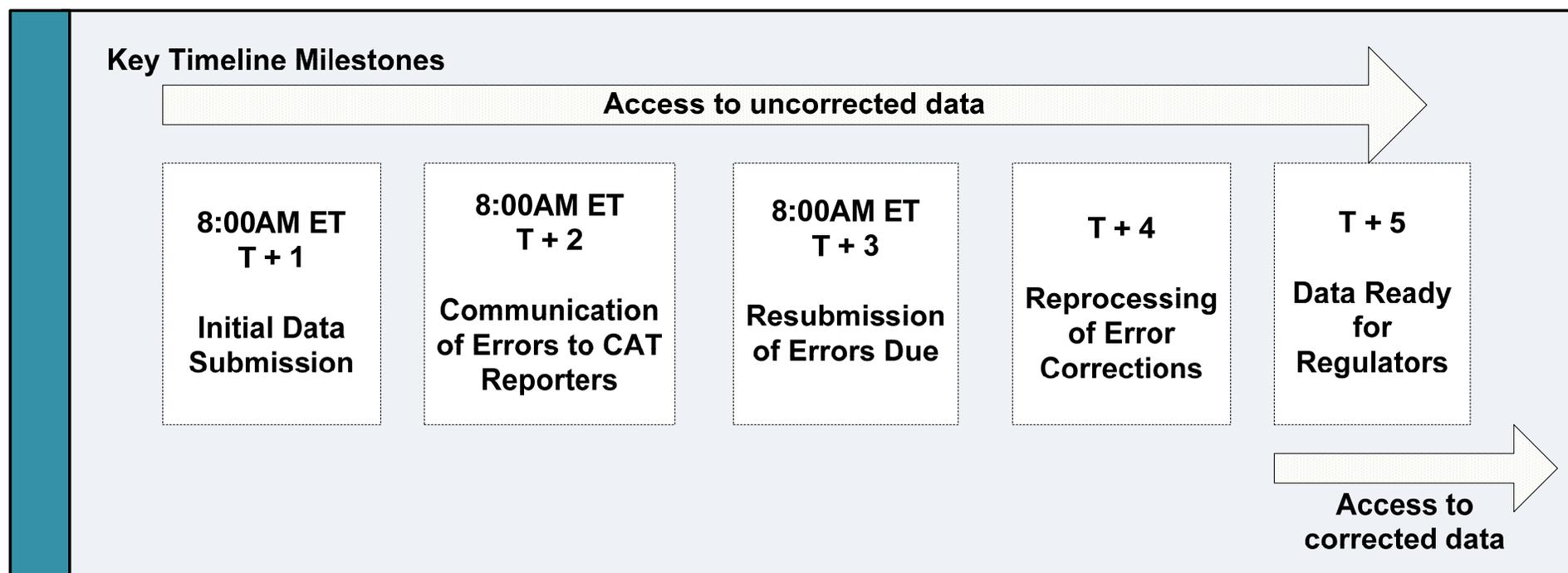
- Support data extracts by the SEC and SROs
- Support targeted data queries and analysis by the SEC and SROs

# Data Validation and Error Handling

- The following data validations must be included:
  - Data file format validation
  - Data format and syntax check
  - Data context check
  - Identification of unlinked lifecycle events
- CAT Reporters must be notified of data errors within established timeframes.
- All data corrections must be submitted and re-processed within established timeframes.
- Daily reporting statistics and error rates must be calculated and made available for analysis of overall CAT reporting compliance.
- Exception reports must be generated when the error rate exceeds the maximum allowable error rate established by the NMS Plan.

# Timeframe for Data Validation and Error Handling

- CAT order events must be processed within established timeframes to ensure data can be made available to SROs and the SEC in a timely manner. The processing timelines start on the day the order event is received by the CAT for processing.
- The SROs are considering the following timeframes for the identification, communication and correction of errors from the time an order event is received by the processor:
  - 8:00 am T+ 2 (transaction date + 2 days) – Communication of errors to CAT Reporters
  - 8:00 am T+ 3 (transaction date + 3 days) – Re-submission of corrected data
  - 8:00 am T+ 5 (transaction date + 5 days) – Corrected data available to SROs and the SEC



# Technical Infrastructure Requirements

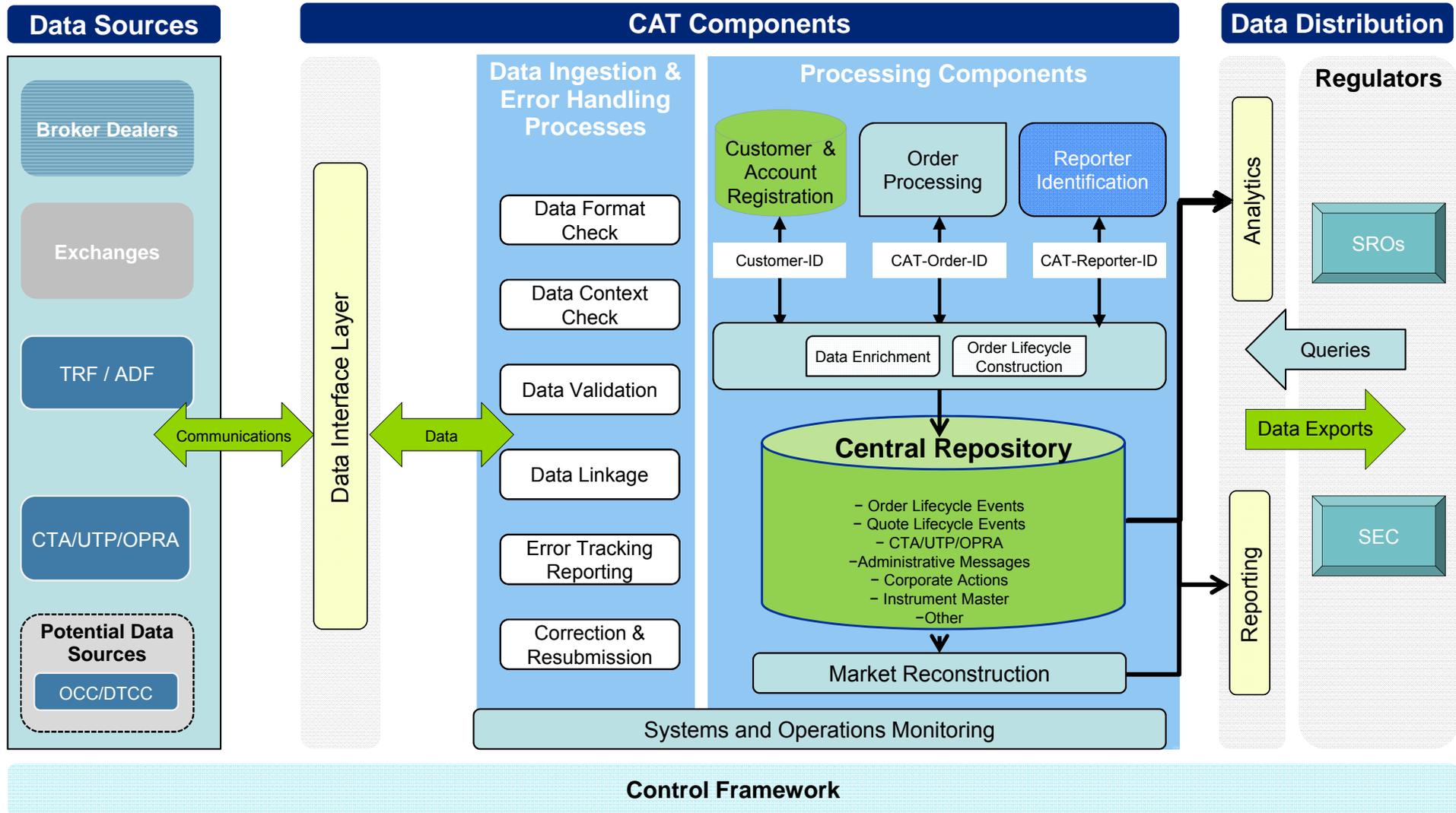
- Scalable infrastructure with capacity to support anticipated daily volume in excess of 50 billion records and a 25% annual growth factor.
- The technology solution must include the following environments:
  - Production
  - Disaster Recovery
  - Industry Testing (simulated production environment)
  - User Acceptance Testing/System Integration Testing
  - Development

# Data Confidentiality and Security

- CAT technology and administration design must ensure the security and confidentiality of all information reported to, and maintained by, the central repository.
  - Solution must include the protection of data during transmission, processing and at rest (stored in the repository), and include dedicated staff to enforce a comprehensive information security program
  - Only staff designated by plan sponsors are to be permitted access to the central repository
  - Data access must be logged and managed through authentication and entitlements controls

# Overview of the CAT Process

The following diagram provides a high level overview of how the data would move through the CAT environment and the necessary processes that will validate and enrich the data as it travels to the repository. The environment will be governed through a control framework driven by Data Governance, Security, Data Management, Audit and Business Continuity Plan (BCP) requirements.



# Anticipated Administrative Functions

*The following are anticipated functions required for administration:*

## ■ Operations

- CAT Reporter Support Center
  - Support on-boarding/off-boarding and changes of CAT Reporters, and maintain associated books and records
  - Manage CAT Reporter authentication and entitlements of CAT processing systems
  - Support CAT Reporters with data submissions and data corrections
  - Support CAT Reporters with data and reporting interpretations
  - Coordinate and support system testing for CAT Reporters to perform individual system tests based on changes to their respective systems
  - Maintain a call log and incident tracking; escalate issues to the second and third level support
  - Produce metrics on the performance of the help desk to track call volume, issue resolution and escalation; collect call data for a knowledge database
  - Coordinate technical activities
  - Provide help desk support with 24/7 hours of availability

## ■ Operations (cont'd)

- Manage customer information, account information and customer privacy, potentially including the administration and support of a separate customer utility/database
- Establish and operate a program management office and change management programs
- Produce operational and compliance reports
- Coordinate industry activities and communications
- Coordinate industry tests
- Manage Business Continuity Plans/Disaster Recovery events
- Manage data security and confidentiality breaches
- Provide an external website for publication of questions and answers, reporting notifications, system status, self-help and contact information

# Anticipated Administrative Functions (cont'd)

## ■ Compliance

- Monitor reporting compliance of CAT Reporters
- Develop compliance reports (e.g. Report Cards)

## ■ Legal

- Advise/manage licensing agreements (software, vendor, etc.)
- Advise/manage third party contracts
- Establish Service Level Agreements

## ■ Finance

- Manage and structure finance function, including:
  - Accounts Payable
  - Accounts Receivable
- Billing and invoicing
- Budgeting and forecasting
- Bookkeeping
- Produce all required financial reports
- Support tax filings

## ■ Other

- Operate procurement
- Manage facilities
- Audits and oversights
- Draft and implement policies, procedures and controls
- Production of board level operational and performance management information
- Support interaction with the SEC and SROs

# **KEY REPORTING CONCEPTS**

# Key Reporting Concepts

- The SEC Rule 613 includes three key identifiers that are required to build the complete lifecycle of an order from receipt or origination through execution or cancellation, including:
  1. CAT-Reporter-ID
  2. Customer-ID
  3. CAT-Order-ID
- Rule 613 does not specify the exact form these identifiers must take, but instead gives the SROs some flexibility in developing the specific reporting requirements for each identifier. Given that the reporting requirements for each of these key identifiers will impact both CAT Reporters and the CAT technology solution, the SROs are seeking comment on the approaches being considered before deciding on the final approach that will be included in the RFP and the NMS Plan filed with the SEC.
- Certain proposed approaches may require exemptive relief or other action by the SEC to be implemented.

# CAT-Reporter-ID

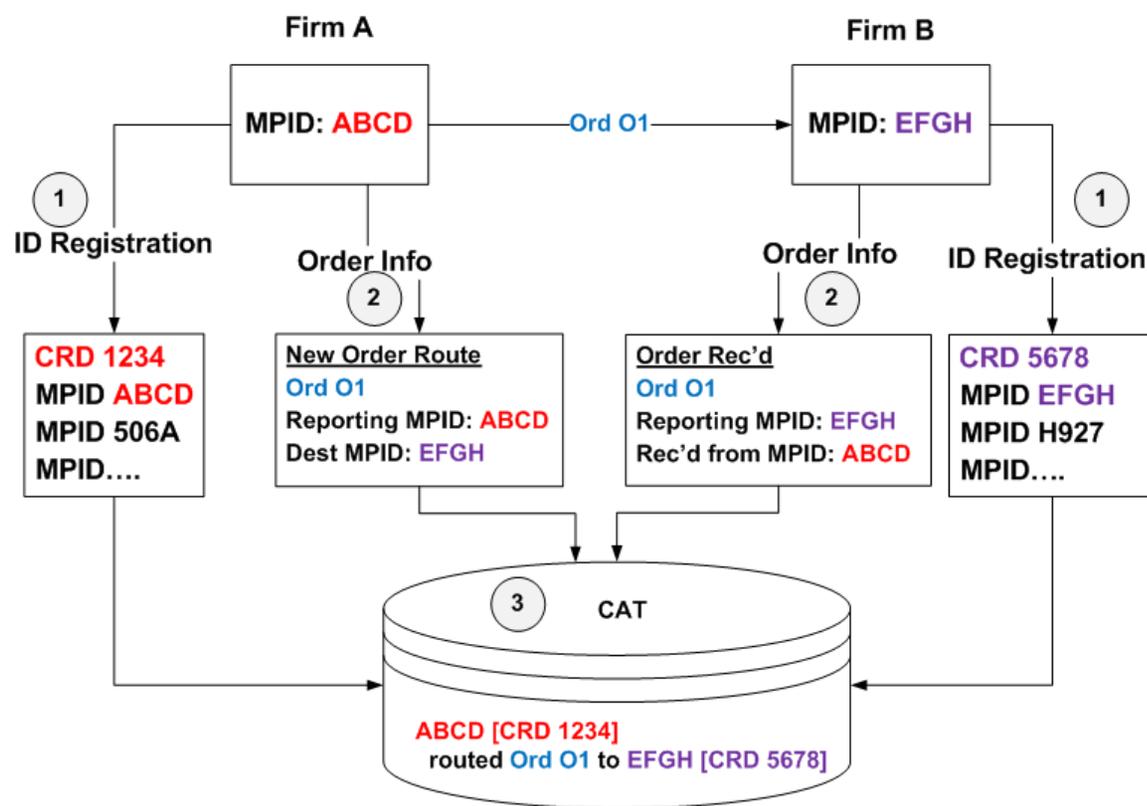
Rule 613 defines CAT-Reporter-ID as a code that uniquely identifies each CAT Reporter for the purposes of providing data to the central repository.

- The SROs believe the CAT-Reporter-ID approach should minimize the effect on current realtime business processes and data flows, and should allow existing identifiers used for order routing and execution to remain intact.
- The SROs are considering leveraging CRD to assign the CAT-Reporter-ID for each CAT Reporter. The number assigned would be used as the primary identifier for submitting data to the CAT.
- The SROs are considering an approach whereby each CAT Reporter would register with the CAT all market participant identifiers (e.g., FINRA MPID, NASDAQ MPID, NYSE Mnemonic, CBOE User Acronym, CHX Acronym) used in the routing or execution of any CAT reportable event along with its CAT-Reporter-ID. Once registered with the CAT, market participant identifiers could be used when reporting order events to the CAT. Only market participant identifiers assigned by an SRO could be used for reporting to the CAT.

# CAT-Reporter-ID: CRD Approach

Example: Firm A routes an order to Firm B

1. Firm A and Firm B provide all eligible market participant identifiers for the trading day to the CAT.
2. Firm A would submit the new order using its CAT-Reporter-ID and identifying itself on the order with its MPID, and when identifying the entity to which the order was routed (Firm B), Firm A would use the registered identifier used by Firm B (e.g., MPID or other identifier). Firm B similarly would submit its new order to the CAT using its CAT-Reporter-ID and identifying itself on the order with its MPID, and could identify the entity that it received the order from (Firm A) using Firm A's registered identifier.
3. The CAT would link Firm A and Firm B's orders using MPID along with CAT-Order-ID and other information to construct the order lifecycle. The CAT would identify the CAT Reporter associated with each market participant identifier based on the registration of such identifiers with the CAT.



# Customer-ID

Rule 613 Requirement: A unique Customer-ID must be recorded and reported to the CAT for each order received from a customer.

In order to implement the Customer-ID requirement as defined in Rule 613, broker-dealers would need to submit detailed customer information, including SSN, ITIN and other unique identifying information, to the CAT to obtain a unique Customer-ID before orders could be reported to the CAT.

- This would require intraday transmissions between broker-dealers and the CAT for new customers
- This would also require broker-dealers to change systems to capture a CAT-assigned Customer-ID
- SSN, ITIN and other similar identifiers would be used by the CAT to guarantee uniqueness of Customer-ID across CAT Reporters

## Customer-ID: Account Number Approach

The SROs are considering an alternative approach to capture customer information and assign Customer-IDs that would not require broker-dealers to obtain and store a unique Customer-ID from the CAT. This approach would instead rely on account number and customer associations stored by the CAT and used to obtain Customer-ID(s) for each order. Specifically:

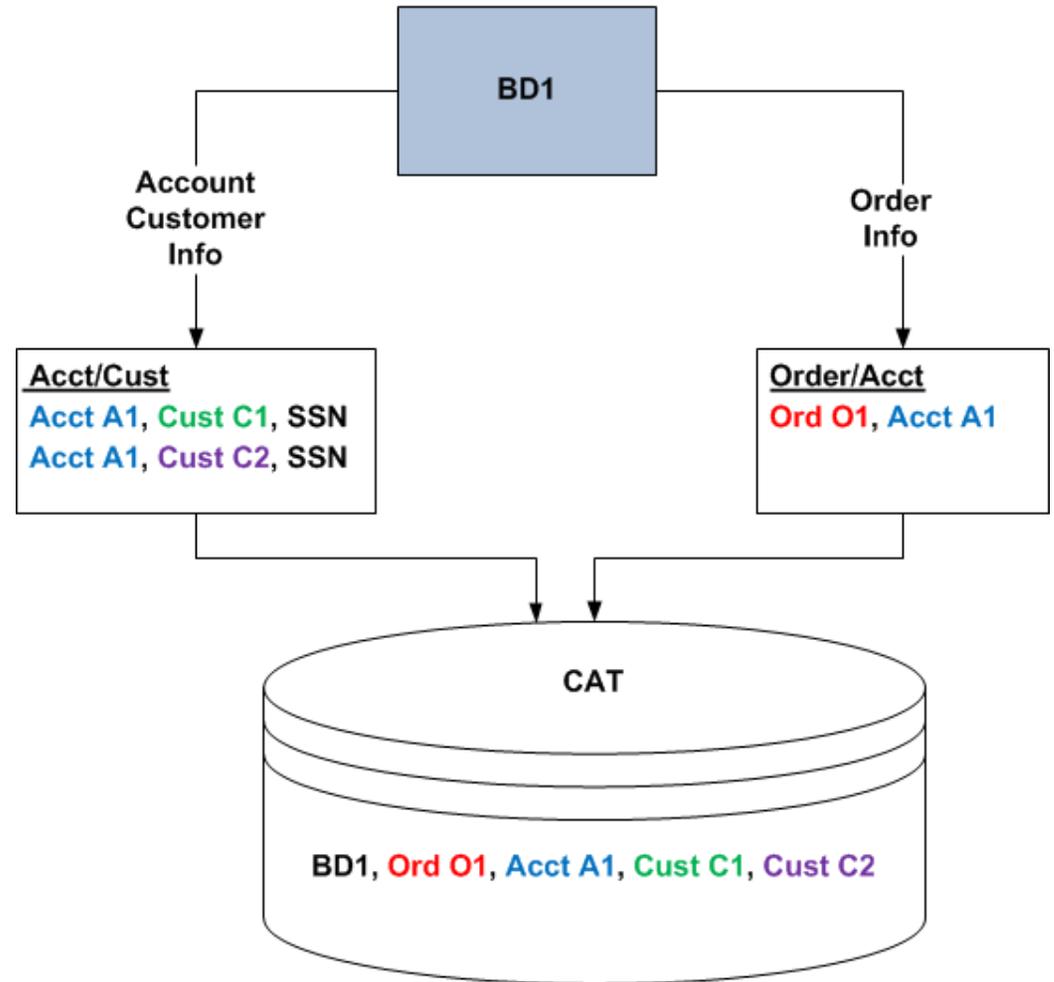
- Broker-dealers would send account information on a daily basis that would include the identity of each customer (as defined by Rule 613) for each account
- Broker-dealers would need to ensure uniqueness of account numbers across the firm
- SSN, ITIN, LEI and possibly other identifiers would be used by the CAT to uniquely identify customers across accounts and broker-dealers

Upon receipt of the daily account and customer information, the CAT would assign and store internally a unique Customer-ID for each unique SSN, ITIN, or other unique identifier. Key points of this approach are:

- The CAT-assigned Customer-ID would not be returned to CAT Reporters
- CAT Reporters would only report the account number on order reports and the CAT would use the account number to obtain the CAT-assigned Customer-ID
- Tax identifiers such as SSN would be stored in a highly secured manner

# Customer-ID: Account Number Approach

- BD1 submits all account information to the CAT, including Account 1. Account 1 has two customers ( Cust C1 and Cust C2). Using the detailed information provided by BD1 about Cust C1 and Cust C2, the CAT assigns a unique CAT-Customer-ID for each customer that will be used to uniquely identify each customer across all CAT Reporters.
- When reporting the receipt of the order to the CAT, BD1 provides the account number A1, but does not include information about Cust C1 and Cust C2.
- Upon receipt of the order by the CAT, the CAT associates Account A1 with Cust C1 and Cust C2 using the CAT-assigned Customer-ID for use by SROs and the SEC.



# CAT-Order-ID

Rule 613 defines CAT-Order-ID as “a unique order identifier or series of unique order identifiers that allows the central repository to efficiently and accurately link all reportable events for an order, and all orders that result from the aggregation or disaggregation of such order.”

The CAT-Order-ID framework must:

- Allow for the accurate and efficient linkage of related order events within a single firm and between CAT Reporters, regardless of where the order was routed or executed
- Guarantee a unique link between all related order events without relying on any form of “fuzzy” matching
- Prevent information leakage and reduce the possibility of “reverse engineering” to identify large orders or other similar material market information

The SROs are considering two approaches for CAT-Order-ID:

1. Single Order ID Approach
2. Daisy Chain Approach

The approach ultimately selected must accommodate all types of order routing scenarios including, but not limited to, agency orders, orders executed in a riskless principal capacity, orders routed between exchanges and orders executed through average price accounts.

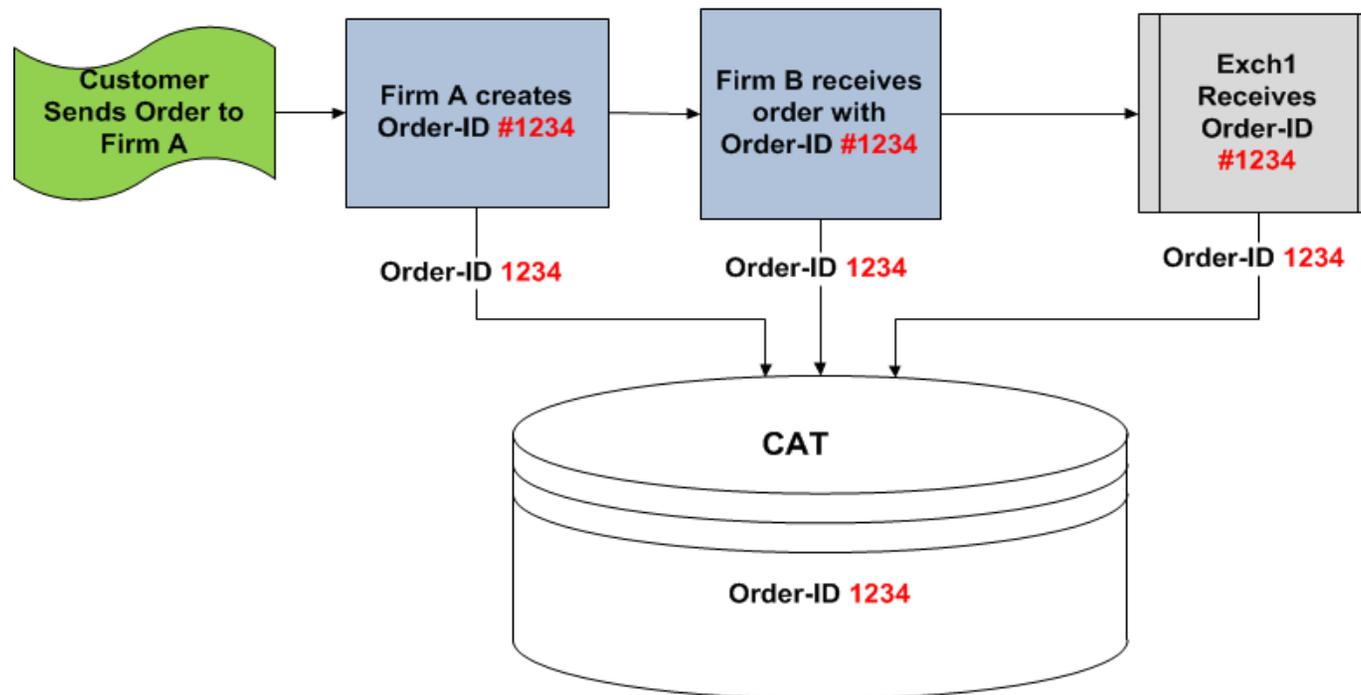
An example applying both approaches to a basic agency route scenario is contained in the following slides. In addition, examples for a riskless principal execution, an exchange to exchange route and an average price execution are also included so that broker-dealers and potential technology providers can analyze how each of the approaches could be applied to those scenarios.

# CAT-Order-ID: Single Order ID Approach

A single, unique CAT-Order-ID would be used throughout the life of the order. Each CAT Reporter involved in the life of the order would need to capture and pass the CAT-Order-ID assigned by the original CAT Reporter. Implementation of a single order ID approach would need to incorporate a mechanism to prevent information leakage.

## A basic agency route scenario:

- Firm A receives order from a customer and routes it as agent to Firm B
- Firm B receives the order from Firm A and routes it as agent to an exchange for execution

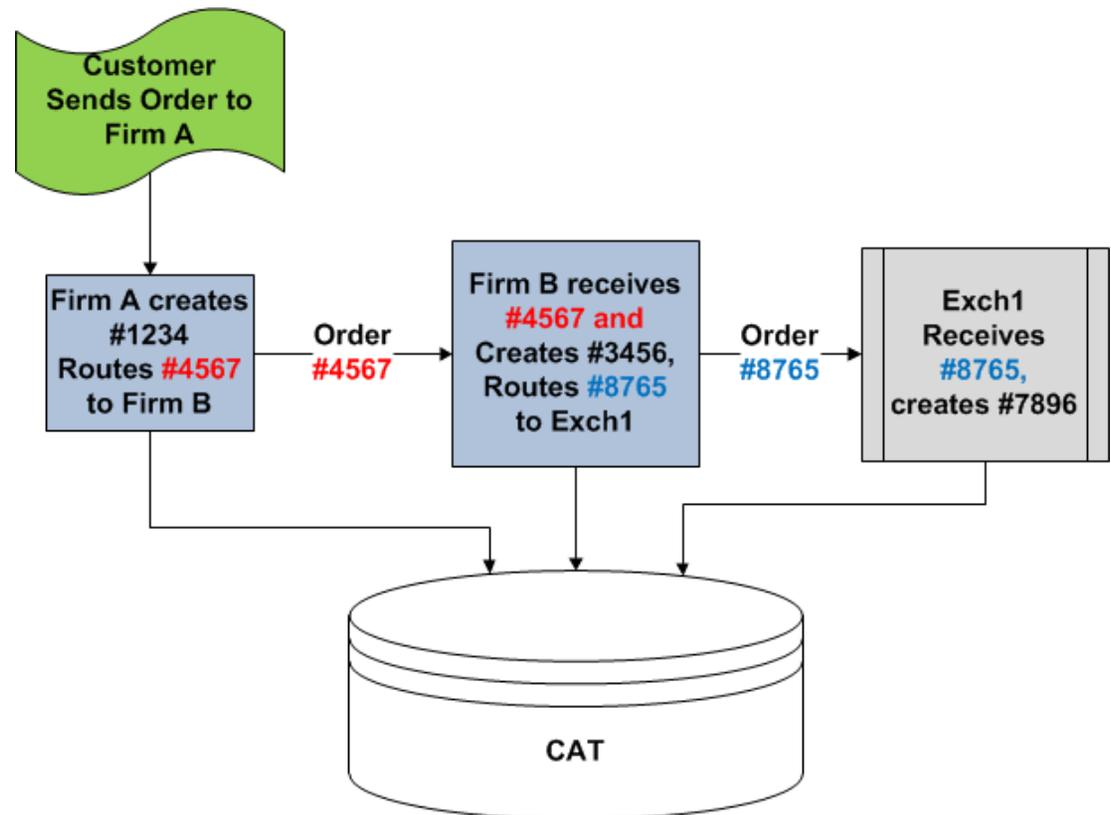


# CAT-Order-ID: Daisy Chain Approach

A series of unique order identifiers assigned by CAT Reporters are linked together by the CAT to create the lifecycle of an order and assigned a single CAT-Order-ID for the lifecycle. Each CAT Reporter would generate its own unique Order ID but could pass a different identifier as the order is routed and the CAT would link related order events from all CAT Reporters involved in the life of the order.

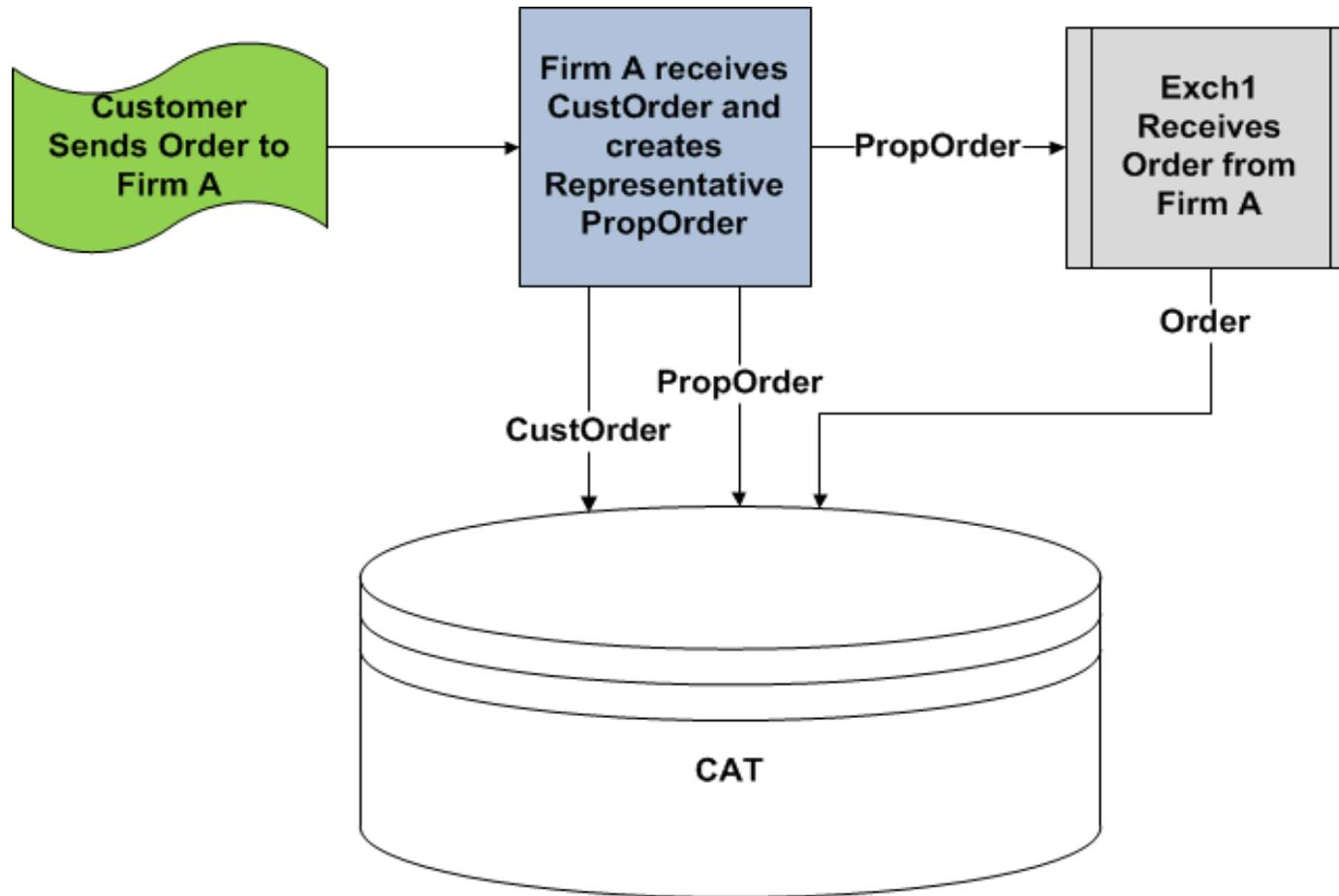
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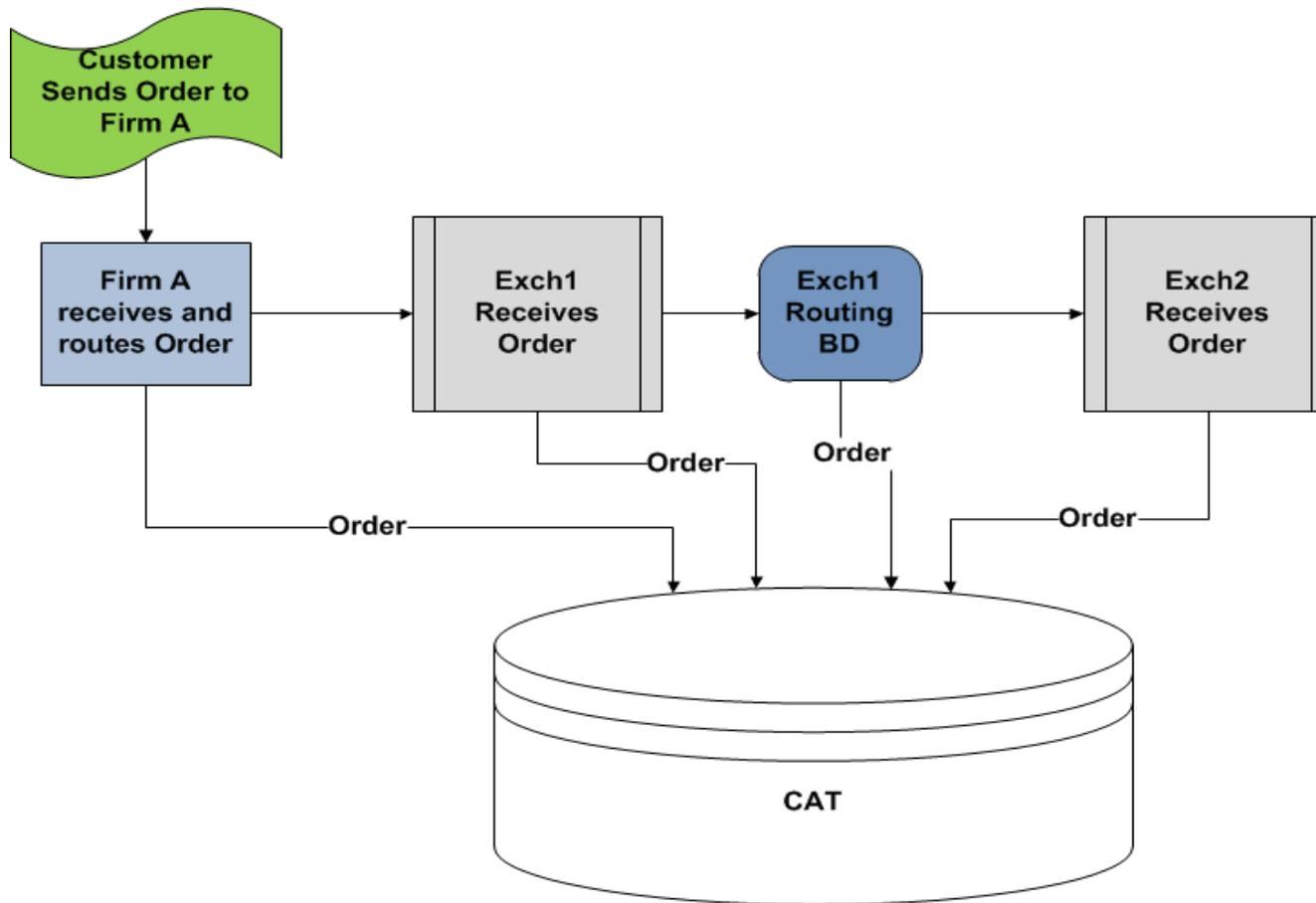
# CAT-Order-ID: Order Handled on a Riskless Principal Basis

This diagram is for consideration on how the single order ID and daisy chain approaches can be applied to orders handled on a riskless principal basis.



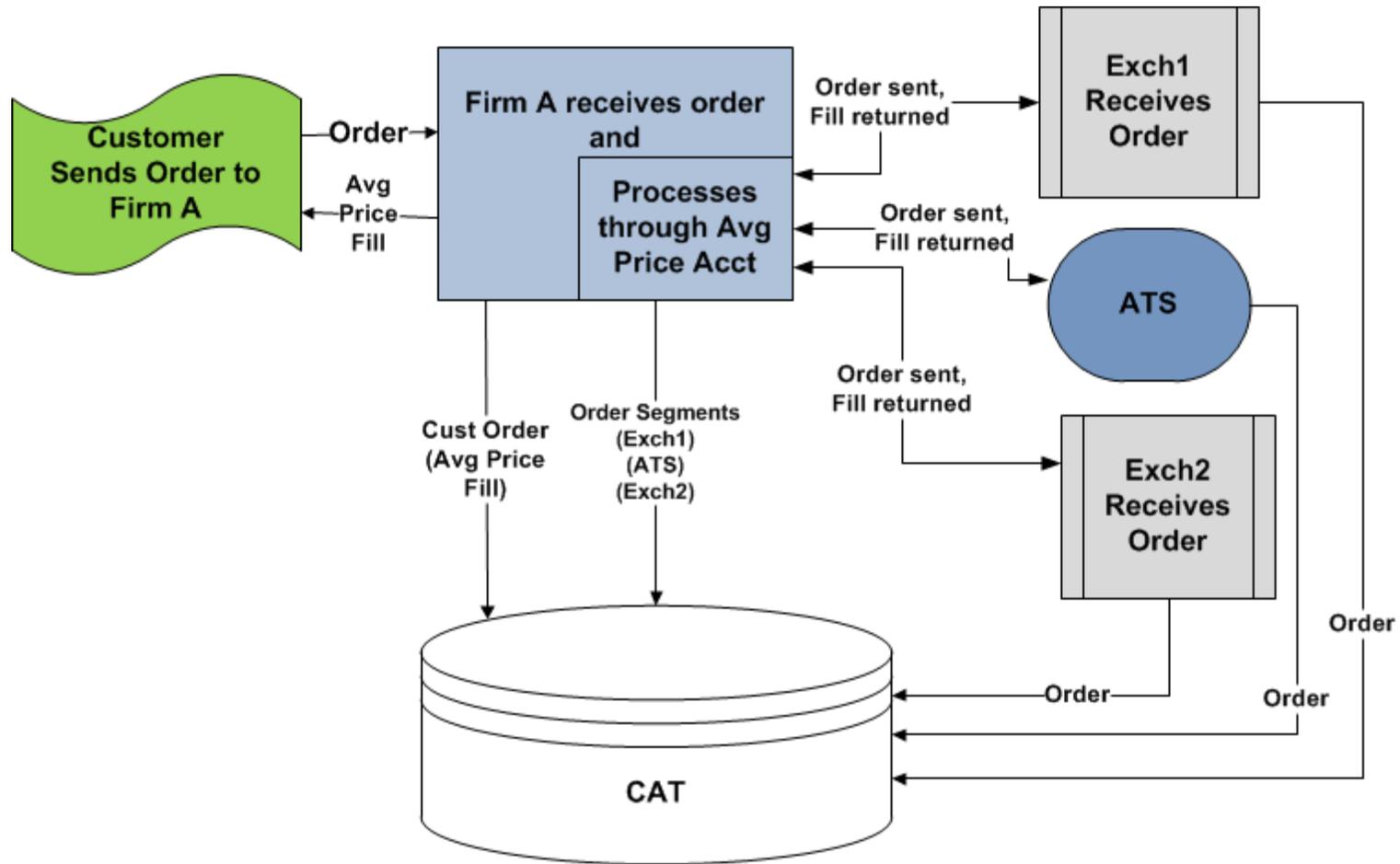
# CAT-Order-ID: Order Routed Between Exchanges

This diagram is for consideration on how the single order ID and daisy chain approaches can be applied to orders which are routed between exchanges.



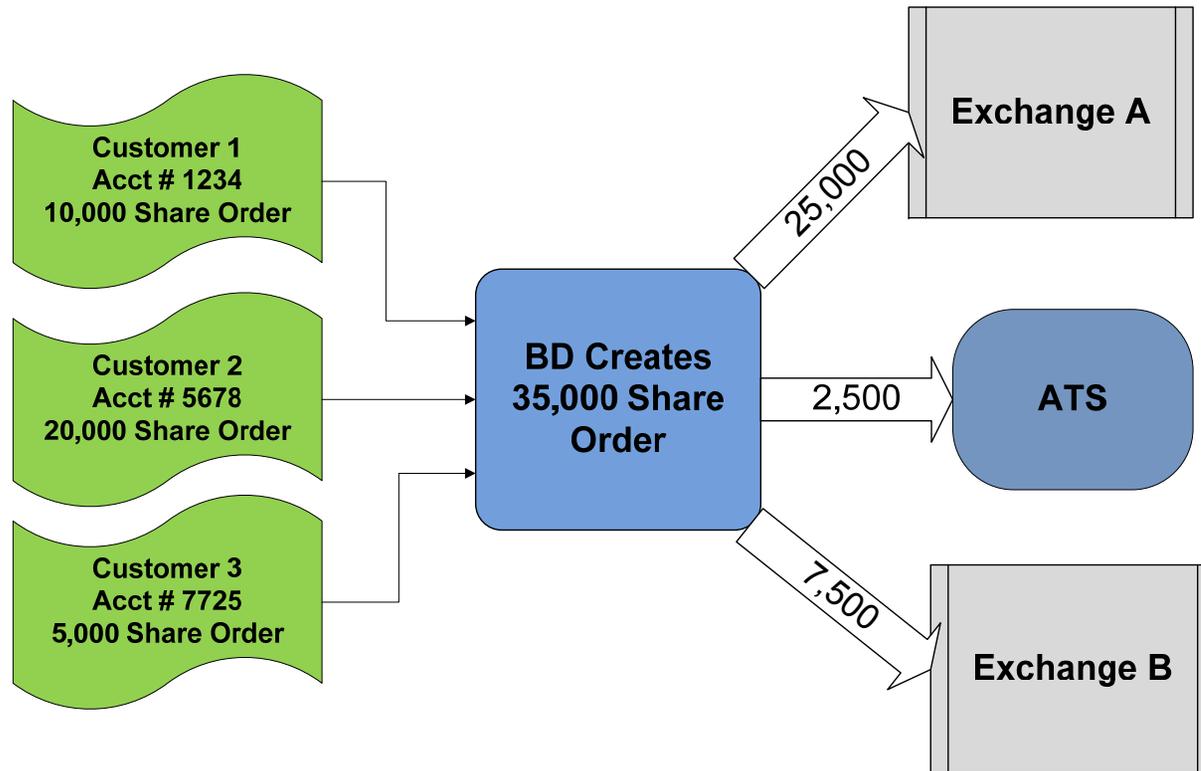
# CAT-Order-ID: Order Executed on an Average Price Basis

This diagram is for consideration on how the single order ID and daisy chain approaches can be applied to orders which are executed on an average price basis.



# CAT-Order-ID: Aggregation/Disaggregation

The solution selected must be able to handle complex order aggregation and disaggregation scenarios. For example:



In this order aggregation/disaggregation scenario, the individual customer orders must be linked to the aggregated order, which must be linked to each outbound route and ultimately to the related execution(s) at each executing market center.

**FEEDBACK**

# Feedback and Communication

- The SROs are soliciting public comment on all of the concepts and proposed requirements contained in this document. The comments received will help inform the final RFP and are needed by no later than January 18, 2013.
- The SROs have established a dedicated email address to receive feedback. Feedback on the RFP concept document should be submitted to: [feedback@catnmsplan.com](mailto:feedback@catnmsplan.com). Please note all comments received will be published on the catnmsplan.com website.
- Periodic updates will be made and posted to the catnmsplan.com website, as requirements and decisions are made. Notifications of updates will be distributed via email.

# APPENDIX

## Appendix: Glossary

Term	Definition
CAT Reportable Event	CAT reportable events, including but not limited to, new orders, quotes, modifications, cancels, order transmittals and executions.
CAT Reporter	A national securities exchange, national securities association or a member of a national securities exchange or a national securities association.
CAT-Order-ID	A unique order identifier or series of unique order identifiers that allows the central repository to efficiently and accurately link all reportable events for an order, and all orders that result from the aggregation or disaggregation of such order.
CAT-Reporter-ID	With respect to each national securities exchange, national securities association, and member of a national securities exchange or national securities association, a code that uniquely and consistently identifies such person for purposes of providing data to the central repository.
Consolidated Audit Trail (CAT)	The CAT will be a comprehensive audit trail of orders that will allow regulators to efficiently and accurately track all activity in NMS securities throughout the U.S. markets.
Customer	The account holder(s) of the account at a registered broker-dealer originating the order; and any person from whom the broker-dealer is authorized to accept trading instructions for such account, if different from the account holder(s).
Customer Account Information	Customer account information shall include, but not be limited to, account number, account type, customer type, date account opened, and large trader identifier (if applicable).

## Appendix: Glossary (cont'd)

Term	Definition
Error Rate	The error rate shall mean the percentage of reportable events collected by the central repository in which the data reported does not fully and accurately reflect the order event that occurred in the market.
ITIN	Individual Taxpayer Identification Number
LEI	Legal Entity Identifier
Market Reconstruction	As per the final rule, the term “market reconstruction” is used to refer to the efforts by SROs and SEC staff to collect and process detailed trade and order data, often from multiple and varied data sources (e.g., market participants, trading venues, and other SROs) to recreate the sequence of events and market conditions that existed over a given period of time.
Material Terms of the Order	Material terms of the order shall include, but not be limited to, the NMS security symbol; security type; price (if applicable); size (displayed and non-displayed); side (buy/sell); order type; if a sell order, whether the order is long, short, short exempt; open/close indicator; time in force (if applicable); if the order is for a listed option, option type (put/call), option symbol or root symbol, underlying symbol, strike price, expiration date, and open/close; and any special handling instructions.
NMS	National Market System

## Appendix: Glossary (cont'd)

Term	Definition
NMS Securities	Any security or class of securities for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan, or an effective national market system plan for reporting transactions in listed options.
Order	Any order received by a member of a national securities exchange or national securities association from any person; any order originated by a member of a national securities exchange or national securities association; or any bid or offer.
SIP	Securities Information Processor
SRO	Self Regulatory Organization
SSN	Social Security Number