



International Securities Exchange®

Away Market Routing via Linkage

Business Requirements



Product Management Group
Confidential

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About This Document

This document specifies the business requirements for supporting Away Market Routing via Linkage.

Document Audience

The audience for this document includes ISE employees who are responsible for delivering trading applications and supporting the day to day trading and surveillance:

- Product Management
- Development
- Software Quality Management
- Technology Member Services
- Market Operations
- Business Development
- Legal

Revision History

The following table provides document revision history.

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Chapter 1 Introduction

This chapter provides an introduction to the AMR via Linkage BRD.

1.1 Background

The PrecISE front end provides its users with various Away Market Routing features via intermediate routers Citibank, Susquehanna and Barclays – Citibank being the most preferred router amongst the PrecISE users. However, Citibank wants out of this routing contract with the ISE by May 2014. Due to this event, PrecISE is now looking to transfer Citibank's role to keep the AMR offering still available to its clients.

1.2 Scope

The high level scope of this requirement is to support

- (a) Linkage for non-customer orders and
 - (b) AMR order types in the core by leveraging away market routing capability available via Linkage Handlers.
-

1.3 Planned Benefits

Proposed changes facilitate linkage for non-customer orders, continued AMR service on PrecISE and seamless PTA capability for AMR orders.

1.4 Delivery Requirements

Requested delivery is R10.0.

1.5 Priority

The priority is high.

1.6 Key Definitions, Acronyms, and Abbreviations

Acronym	Details
IRD	Intermediate Routing Destination
AMB Lock	Away Market Better Lock
LOR	Linkage Order Router (Application)
LH	Linkage Handler
IBBO	The ISE Best Bid Offer.
ABBO	Away Best Bid Offer, the away market best bid offer, which is the National Best Bid Offer excluding ISE data.
NBBO	National Best Bid Offer, all exchanges Best bid Offer.
TOB Sweep	Top Of Book Sweep A Sweep algorithm that attempts to sweep the Top of Book of all exchanges, Book the balance at ISE (if Day).
NBBO Sweep	National Best Bid Offer Sweep A Sweep algorithm that attempts to sweep all exchanges at National Best Bid Offer, Book the balance at ISE (if Day).
CMTA	Clearing Member Transfer Agreement
DOB Sweep	Depth of Book Sweep ISE's Linkage algorithm that attempts to maximize the executions at ISE at each price level, before routing away.
IRD Sweep	PreciSE terminology that identifies a sweep order to AMR destinations via an IRD
Home Sweep	PreciSE terminology that identifies a sweep order to ISE or Gemini via the core

1.7 Related Documents

- Sweep & Cross BRD – Phase 1
- Sweep & Cross BRD – Phase 2
- Linkage Order Router BRD/DFS
- DTI Manual
- Competitors' Linkage Rules

1.8 Assumptions

- AMR order types supported in the core qualify as linkage orders from an SEC perspective. ISO orders can be routed to multiple away exchanges to sweep their Top of Book.
- The current linkage trade reporting mechanism can be used for trade reporting AMR orders
 - i.e. these trades will not be reported to OPRA.
 - AMR order types that qualify as linkage orders are eligible for the Section 31 Fee waiver and will be marked as such when the trades are reported to the OCC.
- Linkage Handlers will support routing for non-customer client categories.

1.9 Roll Out

Please refer to the reference data section of the document for details on the tables and views.

However, in order to enable routing for non-customer regular orders the parameters in Table 1 should be set as indicated and in order to enable routing for Sweep Orders the parameters in Table 2 should be set as indicated.

Table 1: Regular Orders – Non customer Linkage

Sweep Type	Away Market Handling Flash	Away Market Handling CC Allowed	Do Not Flash CC Allowed	AMB Lock CC Allowed
Regular	Optional	All Allowed	Non Customer Only Allowed	All Allowed

Table 2: Sweep Orders

Sweep Type	Away Market Handling Flash	Away Market Handling CC Allowed	Do Not Flash CC Allowed	AMB Lock CC Allowed
Sweep Order	Optional	All Allowed	All Allowed	All Allowed

Chapter 2 Overview

This chapter provides an overview of the AMR process for the ISE exchange. The rules for the AMR process are the same for the ISE Gemini exchange. Should any exceptions arise in the future; this document will be updated accordingly.

2.1 Current Behavior

In addition to routing orders to ISE and ISE Gemini, PrecISE clients can route orders to non-ISE exchanges as well. Such orders that can be routed to one or more ISE or non-ISE exchanges are called Away Market Routing (AMR) orders.

AMR orders are currently sent from the PrecISE front end to an “Intermediate Routing Destination (IRD)” outside of the ISE/ISE Gemini Exchange. The IRD forwards this AMR order to the appropriate destination exchange. An IRD maintains membership with ISE and non-ISE exchanges in order to route AMR orders to those exchanges as their orders.

Each PrecISE member must sign a contract with the IRD that they wish to use for Away Market Routing. The IRD in turn maintains CMTA accounts for each member that signs up with them.

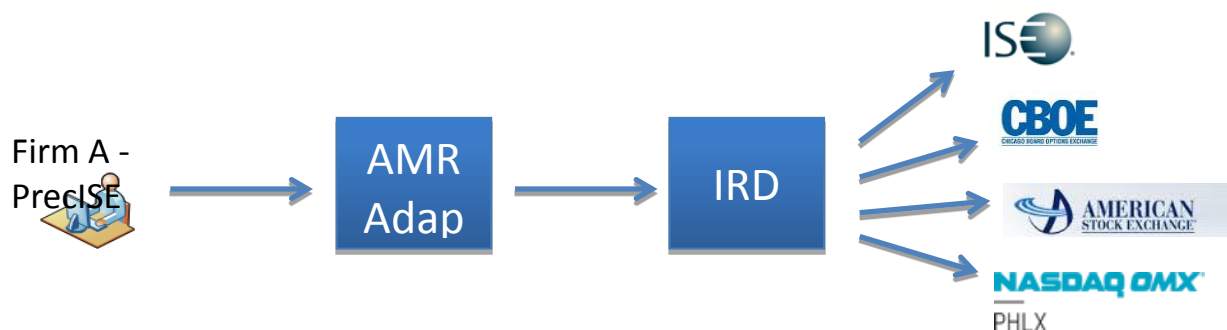
PrecISE currently offers Away Market Routing for single leg orders only. Spread AMR was developed but is currently not live in production. AMR is offered for both ISE listed and non-ISE listed series.

- **Intermediate Routing Destinations**

PrecISE clients can currently choose between Citibank, Susquehanna or Barclays as IRD for AMR orders.

- **Broad Message Flow / AMR Architecture:**

AMR orders are sent to the IRD directly, without routing the orders to the ISE/ISE Gemini exchange.



- **AMR Order Types**

The following order types are currently supported for AMR in PrecISE:

1.	Exchange Order	This order is routed in its entirety to an away exchange without interacting with the ISE book first. The orders are limit, can be Day or IOC and any client category. AON orders are supported.
2.	Regular Order - NBBO Sweep	This order sweeps all away exchanges at the NBBO price and rests the balance at ISE if the order is Day. An IOC order will cancel after the NBBO Sweep. The orders are limit, any client category and cannot be AON.
3.	Regular Order – ISO Clear	This order sweeps the Top Of Book of all exchanges and rests the balance at the ISE if the order is Day. An IOC order will cancel after the TOB Sweep. The orders are limit, any client category and cannot be AON.
4.	Sweep & Cross – ISO Clear	<p>This order attempts to clear the Top Of Book of all exchanges including ISE and the balance, if any, is auctioned at the ISE. These are usually large orders looking for liquidity and desire execution even at the expense of breaking the cross.</p> <p>If the balance quantity that is to be auctioned at the ISE is less than the minimum size required for a Facilitation auction then, the order is sent to the ISE as a PIM auction, else it is sent to the ISE as a Facilitation auction.</p>
5.	Sweep & Cross – ISO No ISE	<p>This order attempts to clear the Top Of Book of all exchanges excluding ISE and the auction balance if any, at the ISE. This qualifier is generally used by members who are looking to sweep only the quantity that they are obliged to clear from a linkage perspective before the auction.</p> <p>If the balance quantity that is to be auctioned at the ISE is less than the minimum size required for a Facilitation auction then, the order is sent to the ISE as an ISO PIM auction, else it is sent as an ISO Facilitation auction.</p>

PrecISE currently allows Sweep for single leg orders in the “Regular Order” Ticket. Members can select between NBBO Sweep, ISO Clear and ISO No ISE from the “Exchange” Drop down on this ticket.

Currently, PORTS / AMR Adapter send the Sweep portion of a “Sweep & Cross” order to the IRD and wait up to a configurable maximum time set in SweepTimeoutMs in the PortsServerConfiguration (currently at 3 seconds) for fills and/or cancels/rejects on the routed quantity. After this maximum time, PORTS / AMR Adapter aggregates the un-executed balance quantity of the order including the quantity routed out for which responses have not yet been received and sends an ISO PIM /FAC to the core via the DTI.

- **Post Trade Allocation (PTA)**

Members currently use the “Change Clearing” window for AMR PTA. This window currently does not allow “Give Up” PTA for AMR orders (greyed out).

- **Order Maintenance**

While PrecISE does not guarantee that an order modification or cancel will be honored, it forwards modification and cancellation requests to the IRD. There on, the result of the request is not controlled by PrecISE.

- **Trade Reporting / Post Trade Allocation**

AMR trades do not get reported on the ISE audit trail and are not sent to OCC or on OPRA via ISE. They are reported to OPRA and OCC on the destination exchange only. Hence, PTA for AMR trades must be performed on the destination exchange.

IRDs do not offer seamless Post Trade Allocation capability on away exchanges to PrecISE Members.

Give Up	PrecISE members must indicate that they will Give Up the trade upon order entry; they cannot do so on a Post Trade basis.
CMTA	Members currently use the “Change Clearing” window for AMR PTA. This window currently does not allow “Give Up” PTA for AMR orders (greyed out). Members can CMTA their orders post trade; however they must provide the words ‘PTA’ upon order entry. At the end of Day, PrecISE produces a CMTA-PTA file for the IRD. In this case, the IRD must hold this position in its account until the CMTA occurs. This poses risk for the IRDs.

- **Trade Busts / Adjustments**

When a trade bust or adjustment is sent by an away market, IRDs manually intervene before forwarding the adjustment to PrecISE members. Such messages received from the IRD are honored by PrecISE members.

- **Audit Trail / Drop Copy**

AMR adapter writes to PrecISE’s AT database. Audit trail messages are visible in the SDA Console and Ops Dashboard. It also sends AMR Trade Drop Copies to IORS DCA.

2.2 Overview of New Functionality

PrecISE will support multiple mechanisms for Away Market Routing.

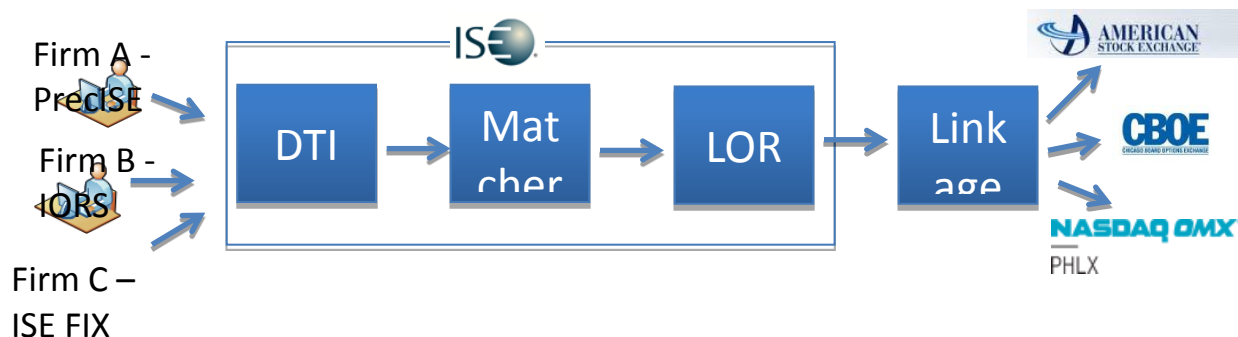
- Susquehanna (GEB) will continue to be available to its clients for routing AMR orders using the current AMR mechanics described in the previous section for end to end processing of AMR orders.
- CITI will be de-commissioned as an IRD. CITI clients will be migrated to use ISE's linkage mechanism for routing AMR orders.
- Barclays will be de-commissioned as an IRD since Barclays is currently not used by any client for away market routing.

PrecISE will consolidate its AMR offering to support a single sweep algorithm via the "Sweep" order type and a single "Sweep & Cross" order type for both GEB & CITI clients. AMR for Non-listed series, AMR for Spread orders and Exchange orders will not be supported in this Phase of *AMR via Linkage*.

An overview of the **new AMR process for CITI clients and the new AMR offering for DTI & IORS clients** is given below:

- **New Message Flow / AMR Architecture:**

AMR orders will be sent to the ISE exchange via the DTI.



- **AMR Order Types**

- ISE will offer the new "Sweep" order type to PrecISE, IORS and DTI clients. This order will sweep the ISE depth and Away market Top of Book Prices as much as it can (like a regular order does for linkage currently) before canceling the balance.
- PrecISE front end will simulate a "Sweep & Cross" order type by sending the "Sweep" order to the ISE followed by an ISO PIM or an ISO FAC.

- **Order Maintenance**

CITI clients using ISE's linkage mechanism will be able to send Modification and cancellation requests for "Sweep" orders, just like members would send them for regular orders sent to the ISE. Such requests will be handled the same way as order maintenance requests for locked orders.

Since PrecISE will simulate the Sweep & Cross by sending a "Sweep" order to the core followed by an ISO PIM / ISO FAC, independent order maintenance will automatically be supported by the core for the

“Sweep” portion. Order maintenance requests for the ISO PIM/ ISO FAC will be treated the same way as order maintenance requests for regular PIMs and FACs in the core today.

- **Trade Reporting / Post Trade Allocation**

The trade reporting mechanism for AMR trades will be the same as linkage i.e. trades will be sent to the OCC (with the Section 31 indicator) but not to OPRA. All orders sent to the ISE can be Post Trade Allocated on the ISE itself using the standard PTA mechanics.

- **Audit Trail / Drop Copy**

Linkage orders are audit trailed by both the Matching Engine and the LOR applications. This will continue.

Members will be able to received drop copy for AMR orders/trades via the DTI’s drop copy mechanism.

Chapter 3 Functional Requirements

This section contains detailed functional requirements for the impacted areas.

3.1 Interfaces

3.1.1 DTI

- **Sweep Order**

A Sweep order can be entered for simple instruments, only. An order is marked "Sweep" by setting "RoutingInst" (Tag 9303) = 1 (Sweep).

If Tag 9303 is set to Sweep then a Regular order will be rejected if any of the following conditions are not met:

- The member is not entitled to enter "Sweep order" via reference data entitlements.
- A sweep order will not flash. AuctionInst (Tag 8601) must be set =1 (Do not Flash -DNF)
- A sweep only order will not rest on the book. The only allowed validity time is IOC (TimeInForce = 3).
- The only allowed order type is Limit (OrdType = 2 - Limit).
- All client categories are allowed.
- A sweep order cannot be marked "ISO" or "IAM".
- A sweep order cannot be marked "DNR".
- A sweep order cannot be MEQ, AON, UPC, Directed, Stop, Reserve, ALO

- **Regular Non-Customer Order**

Existing regular non-customer orders will be routed away for linkage after the flash going forward. However, members should be able to opt out of away market routing by marking their orders DNR.

- **Private Order Broadcast**

Changes should be made to return Sweep order attributes on the POB.

Additionally, a new field "Linked Exchange" (Tag 448 = Away exchange code, Tag 452 = 94) i.e. the OPRA code of the away exchange where the order was routed and traded should be supplied to the members for both AMR and non-AMR orders.

- **Trade Item Broadcast**

“Linked Exchange” (Tag 448 = Away exchange code, Tag 452 = 94) i.e. the OPRA code of the away exchange where the order was routed and traded should be supplied to the members for both AMR and non-AMR orders.

Note IORS will map these attributes to Tag 30 = Last Mkt.

3.1.2 IORS

Members will be able to enter “Sweep” orders via IORS. This ability is controlled through reference data entitlements.

A Sweep order can be entered for NewOrderSingle only. No new validations will be needed. DTI will validate the Sweep order upon entry and send IORS any rejections if necessary.

To send a Sweep order, IORS users will send the message to the DTI as per the DTI format described in the DTI section. The RoutingInst (tag 9303) tag in the DTI will be a new, optional and custom field in IORS. Since Sweep orders will not flash, the user will have to set AuctionInst (Tag 8601) = 1 (Do not Flash - DNF) on the Sweep order. There is an existing DoNotFlash ORA configuration on the session level. If the AuctionInst tag is set on the order, it will override the session configuration. The message sent to the DTI will be as per DTI format as described in the DTI section. Sweep orders can be sent to ISE or Gemini by indicating the exchange on SecurityExchange (tag 207). The default will be ISE. Execution Reports will reflect member-entered values.

Trade reports will contain the “Linked Exchange”. This new field on the POB identifies the exchange(s) the sweep order traded at. IORS will map the “Linked Exchange” (Tag 448 = Away exchange code, Tag 452 = 94) i.e. the OPRA code of the away exchange where the order was routed and traded should be supplied to the members for both AMR and non-AMR orders to LastMkt (tag 30). The LastMkt values for options exchanges will be in the OPRA code. These OPRA codes will be listed in the FIX manual. Currently, stock venues in LastMkt are represented in a numerical value.

The existing ORA and DCA session level parameter *addLastMarketToOptionsTradeReports* controls whether or not members on a particular session receive the LastMkt field on their execution reports for option trades. The default setting is False. This configuration does not apply to stock trades; LastMkt is not configurable for stock trades. The FIX community will receive an announcement about new OPRA codes as possible LastMkt values. The announcement will be sufficient for ORA and DCA subscribers to accommodate the OPRA codes and gives them an opportunity to change their configuration.

DoNotRoute (DNR) instructions are not applicable to Sweep orders. If the DNR instruction is set in IORS on the order level, IORS will pass this instruction to the core. The core will validate and pass IORS a reject if DNR is set on a Sweep order.

Order Cancel Replace Requests are not applicable for a Sweep order. The core will reject modifications. This is the current behavior for locked orders.

Cancel requests can be sent on open Sweep orders. The core will process these cancel requests as it does today for locked orders.

3.1.3 PrecISE

See Current Behavior section for PrecISE's current behavior.

3.1.3.1 Common Business Rules

- **Sweep Orders**

There will be two configurations that allow a user access to sweep order types:

1. **IRD Sweep** (Sweep order to an IRD): The Exchange drop down options on the Regular order ticket will be controlled by configuration, and typically will have the following values: "NBBO Sweep", "ISO Clear", "ISOnoISE", and individual away exchanges (e.g. PHLX, CBOE, ARCA, etc.). Selecting any of these values will route the sweep order to the IRD.
 - a. The TimeInForce options in the "Validity" field will have Day, IOC, FOK, and AON.
 - b. Current AMR entitlement in RSA ClearTrust will not change for IRD sweeps.
2. **Home Sweep** (Sweep order to a home exchange via the core): The Exchange drop down options on the Regular order ticket will be controlled by configuration, and will have the following values: "ISE Sweep" and "GMNI Sweep". Selecting any of these values will route the sweep order to the core – "ISE Sweep" will send the sweep order to ISE, and "GMNI Sweep" will send the sweep order to ISE Gemini.
 - a. The message sent to the DTI will be as per DTI format as described in the DTI section.
 - b. The TimeInForce option in the "Validity" field will have only IOC.
 - c. The "Awy Mkt" field is not applicable for a home sweep order and will be hidden.
 - d. The Do Not Flash (DNF) instruction will be set on home sweep orders.
 - e. The sweep order types the user is configured for will be accessible by right-clicking on the Call/Put NBBO and Call/Put ABBO sections on the Regular Orderbook panel (current behavior). The Regular order ticket's Exchange field will be pre-populated with the selected sweep option. The right-click should display what the user is configured for, i.e.
 - i. if user is configured for both IRD and Home Sweeps then he/she sees all destinations configured for IRD and Home Sweeps, such as: ISE Sweep Order, GMNI Sweep Order, NBBO Sweep, ISO Clear Order, ISO no ISE Order, Sweep & Cross
 - ii. if user is configured for IRD Sweeps then he/she sees all destinations configured for IRD Sweep, such as: NBBO Sweep, ISO Clear Order, ISO no ISE Order, Sweep & Cross
 - iii. if user is configured for Home Sweeps then he/she sees all destinations configured for Home Sweep, such as: ISE Sweep Order, GMNI Sweep Order, Sweep & Cross
 - f. For Home Sweep orders sent to the core via the DTI, execution reports will be received via the standard POB channels. A new "Linked Exchange" field will be received on the POB with the OPRA Code of the linked exchange indicating the away exchange where execution occurred.
 - g. PrecISE will translate the OPRA code from the POB's linked exchange field to the full name of the Exchange we display today.

- h. To enter a home sweep order to the core, there will be two new entitlements:
 - i. An entitlement per BU in Reference Data. PrecISE will rely on the Gateway to check core level entitlements. There will be no user level entitlement.
 - ii. A single BU entitlement in the Web Tier to control home sweep access by the PrecISE user. There will be an optional exception list that can turn off home sweep for one or several BUs.
 - iii. There is an existing RSA ClearTrust entitlement that checks if the individual PrecISE user is allowed to trade on a home exchange (e.g. ISE, Gemini). This means that when a home sweep order arrives, this entitlement will be checked to determine if the trade is allowed on the exchange where the home sweep is configured to be sent.
- i. There will be the ability to turn off home sweep for all PrecISE users in a single action via an on/off switch for ISE and Gemini home sweep. The switch controls the availability of each destination (ISE home sweep and Gemini home sweep) across the board.

A user could be configured on the BU level for both IRD and home sweep configurations. If that is the case, the user's Exchange drop down options will be a combination of the two.

Combo orders are not allowed to sweep in this phase.

There will be a new field called "Linked Exch" in the trade views (Order Status right-hand side of My/Desk Orders, Order Status left-hand side of My/Desk Trades, Trades and Statistics). The value for this field is provided by the POB. It will be ignored by the front-end version 5.8 or older.

	"Exch" Field – trades view	"Linked Exch" Field – trades view
IRD Sweep	<user selection on order tkt's Exchange field>	N/A [blank]
Core / Home Sweep	<Home sweep selected on order tkt's Exchange field>	Execution venue/away exchange N/A [blank] for ISE trades
Done Away	<user selection on order tkt's Exchange field>	N/A [blank]

The "Exch" field in the Order Status My/Desk Orders view will continue to display the type of sweep order. There will be no "Linked Exch" field in the orders view:

	"Exch" Field – order view
IRD Sweep	<user selection on order tkt's Exchange field>
Core / Home Sweep	<Home sweep selected on order tkt's Exchange field>

Done Away	<user selection on order tkt's Exchange field>
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The Exchange values on the Done Away ticket will display both home and IRD sweep values. The configuration for home and IRD sweep does not need to apply to Done Away orders. PrecISE will continue to support the “Done Away” functionality and market data display for non-listed ISE series.

PrecISE, as part of a custom client category project enhancement, will only display relevant client categories per order type. The core can accept all client categories for home sweeps; IRDs can accept the client categories specified in the IRD FIX specification

PrecISE backend should be able to handle un-solicited modification broadcasts from the DTI reducing the size of the Sweep order to represent the quantity outstanding at the away exchange.

Execution reports will flow back to the front-end as they occur.

While the existing AMR Drop Copy setup will continue to be available for IRD clients, Citi clients can avail drop copies via the DTI Drop Copy setup.

Since PrecISE currently supports AMR orders for non-ISE listed series, it will continue to allow members to send AMR orders for non-listed series – with the understanding that the DTI will reject these orders for Citi clients while IRD clients will continue to have support for AMR order on non-ISE listed series.

- **Sweep & Cross Orders**

There will be two configurations that allow a user access to sweep order types for the sweep portion of a Sweep & Cross:

1. **IRD sweep:** The Exchange drop down options on the Sweep & Cross order ticket will be controlled by configuration, and will have the following values: “ISO Clear” and “ISOnoISE”. Selecting any of these values will route the sweep order to the IRD. “ISO Clear” will be the default for a user configured only for IRD sweeps.
 - a. For behavior and additional details on the current Sweep and Cross via IRD sweeps, see *ER#3317 – Sweep & Cross v1g – basic.doc* located in J:\Product Management\PrecISE\Business Requirements\Release 4.2 Sweep & Cross
 - b. The “Awy Mkt” drop down field is greyed out with the value “ISO”.
 - c. The following existing checks will continue to be performed on the front-end before the order is sent:
 - i. Away markets offer more quantity than the order quantity; then the user may choose not to send the order.
 - ii. Away markets have no quantity; then the user is offered to cross. We alert them with the current message: “No offerings in the AMR market. Do you want to submit

<insert cross order based on order qty: Facilitation or PIM> order with quantity (<insert order qty>) instead?"

The above checks are not applicable for home sweeps.

- d. If PrecISE does not receive a response from the IRD by the time the SweepTimeoutMs timer in the PortsServerConfiguration is reached, current behavior will resume – PrecISE will send a cross order for the unexecuted quantity.
2. **Home sweep:** The Exchange drop down option on the Sweep & Cross order ticket will be controlled by configuration, and will have the following values: "ISE Sweep" and "GMNI Sweep". Selecting any of these values will route the sweep order to the core – "ISE Sweep" will send the sweep order to ISE, and "GMNI Sweep" will send the sweep order to ISE Gemini. "ISE Sweep" is the default for a user configured only for home sweeps. If we choose to add additional sweep types in the future, the availability of each sweep type is configurable per BU.
- a. The message sent to the DTI will be as per DTI format as described in the [DTI section](#).
 - b. The TimeInForce option in the "Validity" field will have only IOC.
 - c. PrecISE will send the full quantity of the Sweep and Cross order to the core as described in the [DTI section](#).
 - d. The "Awy Mkt" field is not applicable and will be hidden.
 - e. The sweep order will be sent to the core with the following pricing logic:
 - i. For buy orders: the sweep price = limit price on order – 1 tick
 - ii. For sell orders: the sweep price = limit price on order + 1 tick
 - f. Today, the core supports ISO Facilitation orders. This is a double-sided auction order with the ISO indicator and a minimum quantity of 50 contracts, and can trade in half ticks. If PrecISE receives an unexecuted balance of 50 contracts or more, the cross will be a Facilitation with the ISO indicator sent to the core.
 - g. The core currently does not support ISO PIM orders. PIM orders are double-sided auction orders with a minimum quantity of 1 contract, and can trade in pennies. There is a SEC rule filing pending approval that will allow the core to support ISO PIM orders. When approved, if PrecISE receives an unexecuted balance of less than 50 contracts, the cross will be a PIM with the ISO indicator sent to the core.
 - h. PrecISE will wait for the completed order status from the core before sending the cross order. Once PrecISE receives the completed order status without remaining open quantity, the cross order will be created and sent with the unexecuted quantity, which is the cancelled quantity on the sweep order from the core. The cross price will be the original limit price on the order. However, if the Sweep & Cross order was entered in half ticks and the cross quantity ends up being a PIM, PrecISE will submit the PIM at a half tick better so that the price is in a whole penny increment, and at a better price. Examples:
 - i. User sends a Buy S&C at \$1.025 and cross quantity ends up being 49 contracts or less. PrecISE will submit a PIM at \$1.02.
 - ii. User sends a Sell S&C at \$1.025 and cross quantity ends up being 49 contracts or less. PrecISE will submit a PIM at \$1.03.

- i. If the home sweep order has not been completed by the time the SweepTimeoutMs timer in the PortsServerConfiguration is reached, the cross order will not happen. The user's order status will be notified of the current status (e.g. Part. Fill), traded, open, and canceled quantities. PrecISE will alert the user via a pop-up message to contact Market Operations, and that the cross portion of the Sweep and Cross order will not happen. Pop-up text – applicable for home sweep orders only:

There is an issue with your Sweep and Cross order. The cross will not happen.
Please call Market Operations at 877-473-9989.

Your current order status is:
<# of contracts> contracts pending
<# of contracts> contracts traded
<# of contracts> contracts cancelled

A user could be configured on the BU level for both home and IRD sweep configurations. If that is the case, the user's Exchange drop down options will be a combination of the two and the default for the Exchange field will be "ISE Sweep".

The SweepTimeoutMs configuration in the PortsServerConfiguration will continue to have the current production setting of 3 seconds.

Execution reports will flow back to the front-end as they occur. The sweep portion will have the linked exchange on the POB. See the Linked Exch / Exch table in the Sweep Order section above for the Order Status order and trade views display requirements.

PrecISE, as part of a custom client category project enhancement, will only display relevant client categories per order type. The core can accept all client categories for home sweeps.

The Sweep and Cross order ticket will have the ability to set a default Exchange option. If configured for home sweeps, the initial default Exchange option will be "ISE Sweep". If configured for only IRD sweeps, the initial default Exchange option will be "ISO Clear". The initial default can be overridden by the order ticket's "Set/Save Defaults" feature.

- PTA

Members will access the "Change Clearing" window for PTA. The PTA view will be based on where the trade originated from, i.e. for home sweep orders, PTA will be allowed for Give Up, CMTA, Client Category, Sub Account, Info, Info 2, Branch Sequence Number, and Position.

- No Direct Access

PrecISE will display the Exchange values the user is configured for – home sweep and/or IRD sweep values. Orders with home sweep destinations will be rejected upon entry.

3.1.3.2 Functional Areas and Use Case Summary

This section contains functional area break down, corresponding use cases, and the detailed business rules and functional flows for each use case.

Order Creation:

1. Home sweep
2. IRD sweep
3. Sweep and Cross order

Route Order:

4. Route a sweep order to another PrecISE user

Order Alter:

5. Alter a home sweep order
6. Alter an IRD sweep order

Order Cancel:

7. Cancel a home sweep order
8. Cancel an IRD sweep order

PTA:

9. PTA a home or IRD sweep order

3.1.3.3 Regular Home Sweep Order to ISE or Gemini

Use Case	Regular home sweep order to ISE or Gemini
Description	Home sweep orders entered via the Regular order ticket will be sent to ISE or ISE Gemini via the core.
User(s)/ Actor(s)	PrecISE Users that are entitled to send home sweep orders
Detailed Business Rule(s)	<p><u>Front-End:</u></p> <ol style="list-style-type: none"> 1. The “Exchange”, “Validity”, and “Awy Mkt” fields on the Regular order ticket will behave as described in the Sweep Order / Home Sweep section of the <u>Common Business Rules</u>. 2. ISO flag will not be on the Sweep order. 3. The following fields are grayed out (marked as inactive/not applicable), as per current behavior: Mkt, Inactv, Reserve, Directed 4. Since the POB will contain the OPRA code for the Linked Exchange information, PrecISE will map the OPRA code to the full exchange name that we display today. See the Linked Exch / Exch table in the <u>Common Business Rules</u> for the Order Status order and trade views display requirements. 5. The front-end will have the option for a user to create a hot button to access the Regular order ticket with the “ISE Sweep” exchange already pre-selected. <p><u>Processing:</u></p> <ol style="list-style-type: none"> 6. Entitlements to send home sweep orders are described in the <u>Common Business Rules</u>. 7. PrecISE will send the sweep order to the DTI as described in the <u>DTI section</u>. 8. PrecISE will display the TIF the order was submitted with. 9. Sweep orders without the Do Not Flash (DNF) instruction will be rejected by the core. Therefore, Sweep orders will be set to DNF by the adapter before reaching the DTI. Since the Awy Mkt field will be hidden for a Sweep order, the DNF option cannot be toggled by the user. 10. ISO flag will not be on a sweep order. 11. Sweep orders with Do Not Route (DNR) will be rejected by the core. Since the Awy Mkt field will be hidden for a Sweep order, DNR will not be an option to users who are entitled to use DNR. 12. Execution reports will flow back to the front-end as they occur. 13. Trade reports back to PrecISE will have the linked exchange in the DTI fields described in the <u>DTI section</u>.

Basic Flow (sequential)	<ol style="list-style-type: none"> 1. User selects a home sweep via the Regular order ticket, e.g. ISE Sweep or GMNI Sweep. 2. Away Mkt field will be hidden. 3. Validity will populate as IOC as the selected and only TIF option. 4. All relevant client categories will be displayed. 5. New sweep order is submitted and validated against business rules. 6. For negative ACKs only, any rejects from the core or the IRD will be displayed to the PrecISE front-end in user-friendly language. The user is prompted of the error and has a chance to correct and resubmit the order without the order ticket closing. The ticket will close after processing an ACK. 7. When validation passes, the Sweep order is sent to the core.
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. Users will be entitled in RSA ClearTrust on the user level to trade at a home exchange (e.g. ISE, Gemini). This is current behavior. 3. Users will be entitled for the sweep functionality in the core on the BU level. 4. Users will be configured on the BU level to indicate the AMR order will be sent to the core.
Post-conditions	<p>Upon successful creation and submission, the Sweep order is displayed in the Order Status with the most current order status and information. Any rejects will be communicated back to the front-end user.</p> <p>If a trade occurs, the trade will be displayed with trade details in the multiple available trade views (My Trades, Desk Trades, Fills, Trades and Statistics).</p>
Non-Functional Requirements	N/A
Open Issues	N/A

3.1.3.4 IRD Sweep Order

Use Case	IRD Sweep Order
Description	Current clients of an IRD will continue to use the existing AMR Adapter for IRD sweep orders.
User(s)/ Actor(s)	PrecISE Users that are entitled to send IRD sweep orders
Detailed Business Rule(s)	<p><u>Front-end:</u></p> <ol style="list-style-type: none"> 1. The Exchange drop down on the Regular order ticket will behave as described in the Sweep Order / IRD Sweep section of the <u>Common Business Rules</u>. 2. See the Linked Exch / Exch table in the <u>Common Business Rules</u> for the Order Status order and trade views display requirements. 3. The following fields are grayed out (marked as inactive/not applicable), as per current behavior: Mkt, Inactv, Reserve, Directed, Preferenced 4. The following Validity options are available: Day, IOC, FOK, Day AON 5. The "Awy Mkt" field currently only has the value "Consider" and can continue with this behavior. <p><u>Processing:</u></p> <ol style="list-style-type: none"> 6. No change to the current IRD entitlements. An entitled user in RSA can create and send simple instrument AMR orders for simple instruments. Combo orders are not applicable for AMR. 7. The current AMR logic that uses/routes to the AMR Adapter will remain for clients configured for IRD sweeps.
Basic Flow (sequential)	<ol style="list-style-type: none"> 1. The user selects an IRD sweep order in the Regular order ticket. 2. The order will get routed to the IRD via the AMR Adapter. The order is not processed by the core in this flow. 3. All relevant client categories will be displayed. 4. For negative ACKs only, any rejects from the core or the IRD will be displayed to the PrecISE front-end in user-friendly language. The user is prompted of the error and has a chance to correct and resubmit the order without the order ticket closing. The ticket will close after processing an ACK.
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. Users will be entitled in RSA ClearTrust for the sweep functionality. This is current behavior. 3. Users will be configured on the BU level to indicate the AMR order will

	be sent to the IRD.
Post-conditions	Upon successful creation and submission, the AMR order is displayed in the Order Status with the most current order status and information. If a trade occurs, the trade will be displayed with trade details in the multiple available trade views (My Trades, Desk Trades, Fills, Trades and Statistics).
Non-Functional Requirements	N/A
Open Issues	N/A

3.1.3.5 Sweep and Cross Order

Use Case	Sweep and Cross Order
Description	Create Sweep and Cross order
User(s)/ Actor(s)	PrecISE Users that are entitled to send home and/or IRD sweep orders
Detailed Business Rule(s)	<p><u>Front-end:</u></p> <ol style="list-style-type: none"> 1. The Exchange drop down on the Regular order ticket will behave as described in the Sweep & Cross Order / Home and IRD Sweep sections of the <u>Common Business Rules</u>. 2. See the Linked Exch / Exch table in the <u>Common Business Rules</u> for the Order Status order and trade views display requirements for the sweep portion of the Sweep and Cross order. <p><u>Processing:</u></p> <ol style="list-style-type: none"> 3. An entitled user on the BU level can create and send Sweep and Cross orders for simple instruments – this is the existing entitlement; no change to entitling. 4. Home and/or IRD sweep options will be available based on entitlements and configuration for a BU. 5. For IRD sweeps, the existing AMR logic that uses/routes to the AMR Adapter, including time-outs, will apply and as described in the Sweep and Cross <u>Common Business Rules</u>. 6. For home sweeps, the entire order quantity will be sent to the DTI as described in the <u>DTI section</u>. The order behavior, including time-outs, will be as described in the Sweep and Cross <u>Common Business Rules</u>.
Basic Flow (sequential)	<ol style="list-style-type: none"> 1. On the PrecISE front end, user accesses a “Sweep and Cross” order ticket. 2. Options in the “Exchange” drop down field will depend on the user’s configuration. 3. Sweep and Cross order is submitted and validated against business rules. 4. For negative ACKs only, any rejects from the core or the IRD will be displayed to the PrecISE front-end in user-friendly language. The user is prompted of the error and has a chance to correct and resubmit the order without the order ticket closing. The ticket will close after processing an ACK.
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. Home and/or IRD sweep options are based on the entitlements described in the Common Business Rules.

	<ol style="list-style-type: none">3. Users will be configured on the BU level to indicate the AMR order will be sent to the core.4. The time set in SweepTimeoutMs in the PortsServerConfiguration (currently at 3 seconds) has not passed.
Post-conditions	<p>Upon successful creation and submission, the Sweep order is displayed in the Order Status with the most current order status and information. Any rejects will be communicated back to the front-end user.</p> <p>If a trade occurs, the trade will be displayed with trade details in the multiple available trade views (My Trades, Desk Trades, Fills, Trades and Statistics).</p>
Non-Functional Requirements	N/A
Open Issues	N/A

3.1.3.6 Route a Sweep Order to Another PrecISE User

Use Case	Route a Sweep Order to Another PrecISE User
Description	Route a home or IRD sweep order to another PrecISE user
User(s)/ Actor(s)	PrecISE users entitled to route orders.
Detailed Business Rule(s)	When the routed order reaches the destination BU, and the BU is not configured to send home or IRD sweep orders, then the Exchange drop down options will be different based on the destination BU's entitlements. Default it to ISE if the destination BU is not entitled for AMR/Sweep.
Basic Flow (sequential)	
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. Home and/or IRD sweep options are based on the entitlements described in the Common Business Rules. 3. Users will be entitled for the Routing functionality. 4. Users will be configured on the BU level to indicate the AMR order will be sent to the core.
Post-conditions	<p>Upon successful creation and submission, the Routed order is displayed in the Order Status with the most current order status and information. Any rejects will be communicated back to the front-end user.</p> <p>Execution reports will flow back to the front-end as they occur.</p> <p>If a trade occurs, the trade will be displayed with trade details in the multiple available trade views (My Trades, Desk Trades, Fills, Trades and Statistics) for both the source and destination BUs.</p>
Non-Functional Requirements	N/A
Open Issues	N/A

3.1.3.7 Modify a Home Sweep Order

Use Case	Modify a Home Sweep Order
Description	Home sweep order modification by the PrecISE user
User(s)/ Actor(s)	N/A
Detailed Business Rule(s)	PrecISE users can send modifications for a home sweep order. However, the core will reject modifications. This is the current core behavior for locked orders.
Basic Flow (sequential)	<ol style="list-style-type: none">1. User sends home sweep order2. While the home sweep order is being worked on the core, the use sends in a modify request3. The user will receive a modify reject from the core.
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none">1. Users must have access to the PrecISE front-end trading application.2. Home sweep options are based on the entitlements described in the Common Business Rules.
Post-conditions	N/A
Non-Functional Requirements	Note: Modification for sweep orders will be allowed once we support Day Sweep orders in the future.
Open Issues	N/A

3.1.3.8 Modify an IRD Sweep Order

Use Case	Modify an IRD Sweep Order
Description	IRD sweep order modification by the PrecISE user
User(s)/ Actor(s)	PrecISE users
Detailed Business Rule(s)	Current AMR Adapter logic for AMR orders will remain unchanged. Today, PrecISE can send a cancel/replace request to the IRD. The IRD will provide PrecISE a response – whether acknowledged, pending, or rejected – to the cancel/replace request. This response will be communicated back to the front-end.
Basic Flow (sequential)	<ol style="list-style-type: none"> 1. Modify an open AMR order from the Order Status. 2. AMR adapter will forward the cancel/replace request to the IRD. 3. AMR adapter will process the response from the IRD and forward it to the front-end.
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. IRD sweep options are based on the entitlements described in the Common Business Rules.
Post-conditions	N/A
Non-Functional Requirements	N/A
Open Issues	N/A

3.1.3.9 Cancel a Home Sweep Order

Use Case	Cancel a Home Sweep Order
Description	Order cancel request by the PrecISE user for a sweep order that goes to the core
User(s)/ Actor(s)	PrecISE users
Detailed Business Rule(s)	If the user sends a cancel while the sweep order is being worked on (locked) by the core, then the user will receive a Pending Cancel order status in the front-end. As the order is worked through in the core, the cancellation will be applied to every release quantity. See the Matching Engine Sweep Mechanism and Order Maintenance sections for additional detailed ME behavior.
Basic Flow (sequential)	<ol style="list-style-type: none"> 1. User sends home sweep order 2. While the home sweep order is being worked on the core, the use sends in a cancel 3. The user receives a pending cancel on the order
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. Home sweep options are based on the entitlements described in the Common Business Rules.
Post-conditions	N/A
Non-Functional Requirements	Note: Cancellation for sweep orders will be allowed once we support Day Sweep orders in the future.
Open Issues	N/A

3.1.3.10 Cancel an IRD Sweep Order

Use Case	Cancel an IRD Sweep Order
Description	PrecISE user cancels a sweep order that goes to the IRD
User(s)/ Actor(s)	PrecISE users
Detailed Business Rule(s)	Current AMR Adapter logic for AMR orders will remain unchanged. Today, PrecISE can send a cancel request to the IRD. The IRD will provide PrecISE a response – whether acknowledged, pending, or rejected – to the cancel request. This response will be communicated back to the front-end.
Basic Flow (sequential)	<ol style="list-style-type: none"> 1. Cancel an open AMR order from the Order Status. 2. AMR adapter will forward the cancel request to the IRD. 3. AMR adapter will process the response from the IRD and forward it to the front-end.
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. IRD sweep options are based on the entitlements described in the Common Business Rules.
Post-conditions	N/A
Non-Functional Requirements	N/A
Open Issues	N/A

3.1.3.11 PTA a Home or IRD Sweep Order

Use Case	PTA a Home or IRD Sweep Order via the Core
Description	PTA either the home or IRD sweep order
User(s)/ Actor(s)	PrecISE users
Detailed Business Rule(s)	<ol style="list-style-type: none"> 1. Sweep orders can be PTA'd via the Change Clearing window. 2. PTA view will be based on where the trade originated from, as described in the <u>Common Business Rules</u>. 3. "PTA" no longer has to be entered in the CMTA field during order entry for home sweep orders. 4. "PTA" will still be required on the CMTA field during order entry for IRD sweep orders. 5. PrecISE will process the PTA responses from the core or IRD and show the user the latest update on the trade.
Basic Flow (sequential)	<ol style="list-style-type: none"> 1. Right click on a Filled sweep order in any of the order or trade views, and select "Change Clearing". 2. The user can change the values in any of the modifiable fields described in the business rules above. 3. Upon successful PTA submission, the Trades views and Change Clearing views will update with the modified value(s).
Alternate Flows	N/A
Pre-conditions	<ol style="list-style-type: none"> 1. Users must have access to the PrecISE front-end trading application. 2. Home and/or IRD sweep options are based on the entitlements described in the Common Business Rules.
Post-conditions	N/A
Non-Functional Requirements	N/A
Open Issues	N/A

3.1.4 Market Data Interface

"Sweep" orders do not rest on the ISE book – they cancel immediately after the sweep. Hence they will not be sent on the Order on Book Feed, TOB or depth feeds.

3.2 Core

3.2.1 Reference Data

Two new tables must be added to Reference Data, along with a new entitlement resource and several new Maker Taker scenarios.

3.2.1.1 New RDS table: Sweep Type Parameters

A new table must be created to configure settings related to sweep only orders. Although the current plan is to launch with only one type of sweep only order, this table will provide the flexibility to list several sweep order types in the future if necessary.

The following linkage related fields will be moved from the Market Model table to the new Sweep Type Parameters table:

- Away Market Handling Flash
- Away Market Handling CC Allowed
- AMB Lock CC Allowed
- Do Not Flash CC Allowed

The table will contain the following additional fields as well:

- ID
- Name
- Description
- Sweep Type – Identifier included on incoming order to indicate the sweep type. This will be set to 0 by the DTI for incoming non-sweep orders. This field can be repeated, however the sweep type/market model assignment relationship must be unique. This field will be maintained by Market Operations, however the values must match what the core is expecting. Similar to the Auction Type value in the Auction Type table.

Example:

Sweep Type Parameters Table

ID	Name	Description	Sweep Type	Away Market Handling Flash	Away Market Handling CC Allowed	AMB Lock CC Allowed	Do Not Flash CC Allowed
1	Regular Orders	Regular Non Sweep Orders	0	FLASH_OPTIONAL	ALL ALLOWED	All Customers Only Allowed	Non Customer Only Allowed
2	Top of Book Sweep ISE	Top Of Book Sweep for ISE	1	FLASH_OPTIONAL	ALL ALLOWED	All Customers Only Allowed	All Customers Only Allowed
3	Top of Book Sweep Gemini	Top Of Book Sweep for Gemini	1	FLASH_MANDATORY	All Customers Only Allowed	All Customers Only Allowed	All Customers Only Allowed
4	Depth of	Depth of Book	2	FLASH_MANDATORY	ALL ALLOWED	ALL ALLOWED	ALL

	Book Sweep	Sweep for All Orders				ALLOWED
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Using the example from above, if a member wishes to execute a top of book sweep for AAPL on Gemini or ISE, they would send in the order with a sweep type indicator of 1, regardless of the exchange. Depending on the Market Model assigned to the instrument on the order, the matcher should determine which sweep type parameters record to use.

*A key advantage of using this set up, if at some point down the road we wanted to differentiate how Depth of Book sweep was configured for a specific market model (complex vs simple for instance), members would not need to specify a new Sweep Type Indicator for the complex depth of book sweep type. They can continue sending '2' for Depth of Book Sweep, and the matcher would identify the correct set of parameters to use based on the instrument on the order.

3.2.1.2 New Many to Many Association – Sweep Type Market Model Assignment

Sweep Type Parameter records will be assigned to market models in Reference Data, similar to how auction and cross types are assigned to market models today. This will allow for sweep types to be enabled or disabled on a market/instrument type level.

The combination of Sweep Type (not sweep type parameters ID) and Market Model should be unique in this many to many association.

The matching engine can determine which sweep type parameter set is being used by identifying the sweep type specified on the order and market model for the instrument included on the order (i.e. AAPL + Simple Instrument = ISEClassicPennyLH). This is why it is important that the sweep type parameters record – market model assignment is unique per 'Sweep Type'.

Allowing for multiple Sweep Type Parameters records with the same 'Sweep Type' will allow a different set of parameters to be used for each market or instrument type (if desired), while allowing external users to specify the same Sweep Type Indicator.

Sweep Type – Market Model Assignment Table

ID	Sweep Type Parameters ID	Sweep Type Name	Sweep Type*	Market Model ID	Market Model Name
1	1	Regular Orders	0	202	ISEClassicPennyAII LH
2	1	Regular Orders	0	213	GeminiClassicPennyAII LH
3	2	Top of Book Sweep ISE	1	202	ISEClassicPennyAII LH
4	3	Top of Book Sweep Gemini	1	213	GeminiClassicPennyAII LH
5	4	Depth of Book Sweep	2	202	ISEClassicPennyAII LH
6	4	Depth of Book Sweep	2	213	GeminiClassicPennyAII LH

*Note: Sweep type is referenced from the Sweep Type Parameters table, it is displayed here only to show the relationship between sweep type and Market Model.

3.2.1.3 New Entitlement Resource

A new entitlement for "Sweep Order"s will be added to allow/disallow members to enter "Sweep Only" AMR orders.

3.2.1.4 New Maker Taker Scenarios

The following new Maker Taker Scenarios and liquidity codes must be added to reference data:

Scenario Description	Scenario	Liquidity Code
Sweep order with AMB Lock (that are Routed Away) and trade reported ISO No OPRA Report	MTSweepRouted	Sweep Routed Out
Linkage Handler Trade Report (Executes Locked and Routed Order - ISO Do Not Report)	MTSweepExecuteOrder	Sweep Trade Report

3.2.2 Reference Data Access

Key fields from the two new tables described in section 3.2.1 should be added to the matcher view to allow the core components to access the reference data.

3.2.2.1 New View: MatcherSweepTypeParameters view – data should be sourced from the Sweep Type Parameters table described in section 3.2.1.1

Fields to be present in this view:

1. SweepTypeParametersID
2. SweepTypeName
3. Away Market Handling Flash
4. Away Market Handling CC Allowed
5. AMB Lock CC Allowed
6. Do Not Flash CC Allowed

*The Away Market Handling Flash field should be removed from the matcherMarketModelParameters view, and the Away Market Handling CC Allowed, AMB Lock CC Allowed, and Do Not Flash CC Allowed fields should be removed from the matcherProductParameters view.

3.2.2.2 New View: SweepTypeMarketModelAssignment view - data should be sourced from the Sweep Type – Market Model Assignment Table described in section 3.2.1.2

Fields to be present in this view:

1. SweepTypeParametersID
2. SweepType
3. MarketModel
4. stMarketModelAllowed – this should be derived using a method similar to the atMarketModelAllowed field auction type – market model view. If a Sweep Type – Market Model assignment exists, this should be populated with a 1, otherwise it should be 0.

3.2.3 Reference Data Front End (RDFE)

RDFE should support normal maintenance of the Sweep Type Parameters table (add, modify, delete).

Additionally, RDFE should support maintenance of the Sweep Type – Market Model association using the following methods:

1. A many to many view allowing RDFE users to add or delete rows manually.
2. A new managed view (Sweep Type) on the market model view, allowing an RDFE user to select a market model, and assign the selected market model one or more sweep types.

3.2.4 Matching Engine

A Sweep Order is used to trade with orders/quotes on multiple markets with the help of a single request. There are various algorithms that can be requested to sweep multiple markets depending upon the intention of the investor. Some popular sweep algorithms are:

- Depth of Book Sweep (trading order book depth)
- Top of Book Sweep (trading the top order/quote at every exchanges)
- NBBO Sweep (trading the exchanges that are at the national best price)

In this Phase of AMR via Linkage, the matcher will support the “Standard Sweep” algorithm i.e. the Sweep Order will trade one or more price levels at the ISE like a regular order up to and including an away exchange price. When the Sweep Order cannot trade at the ISE due to away market restrictions, this order will be subject to ISE’s linkage process. Unlike other regular orders, Sweep orders must not be flashed before linkage is performed.

- **Order Characteristics**

A Sweep Order is a regular limit order with no special price or quantity conditions. A Sweep Order cannot be Market, Stop, Reserve, MEQ, AON or UPC. Since the intent of a Sweep Order is to route to multiple markets, it cannot be marked ISO or IAM. Sweep Orders can be Preferred but not directed. A Sweep order by nature is for routing to away markets. Hence, it cannot be marked DNR.

In order to indicate a Standard Sweep Order, a new attribute on the order “Sweep Type” should be set to “Standard Sweep”.

In this Phase of AMR via Linkage, Sweep Orders must cancel immediately after the sweep. They will not rest on the book. They are unlike Day orders in that they do not rest. They are also unlike IOC orders in that IOC orders do not route. A new Time in Force “Sweep only” must be supplied on a Sweep Order to indicate that the balance quantity of the order must cancel after the sweep.

Like regular orders, the following parameters will be used to configure the handling of Sweep orders with regard to the away market:

- *awayMarketHandlingFlash*
- *AwayMarketHandlingCCAllowed*
- *DoNotFlashCCAllowed*
- *AMBLockCCAllowed*.

However, these fields will now be configured separately for regular orders and sweep orders. Additionally it will be possible to configure these parameters independently for each sweep type as well. Please refer to the reference data section of this document for the matcher views. For a detailed description of the usage of these fields please refer to the Matcher DTS Part A.

Currently Market Makers are only allowed to enter IOC orders and they are protected against trading with their own quotes. Sweep Orders will be allowed for market makers and unlike MM IOC orders, MM Sweep orders can trade with their own quote.

The price of a "Sweep" order must be on a valid tick as configured for the product. It should be less than or equal to the "Maximum order price" as configured for the system. The price reasonability check should be performed for incoming "Sweep" orders. The Three-tick check should also be performed for incoming "Sweep" orders. When the three-tick condition occurs, instead of locking the inbound order to the PMM, the balance quantity of the order should be cancelled.

The minimum and maximum quantity checks performed for a "Sweep" order should be the same as other regular orders of the product.

"Sweep" Orders can be marked Persistent; however, note that when the Time In Force is "Sweep Only" this indication does not have any functional impact, since they will be cancelled immediately upon recovery anyway – similar to IOC orders marked Persistent.

- **Sweep mechanism**

A Sweep Order (regardless of the Time in Force value of the order) can only be entered when the instrument is in a continuous trading state ("Regular" or "Fast").

After trading with the ISE book upon entry, a Sweep Order will be locked to a Linkage Handler for away market routing or linkage. Linkage orders are assigned to linkage handlers alternately in ratio proportion today. Sweep Orders must be counted as linkage orders for the purpose of assigning orders to linkage handlers.

The Locked Order Broadcast generated for the Sweep Order must indicate the "Sweep Type" to the LOR in order for the LOR to apply the requested sweep algorithm and the associated behavior. Please refer to the LOR requirements in this document for the detailed behavior.

The LOR might release all or part of a locked order once it has attempted to sweep the away markets. This released quantity should attempt to trade with the ISE book. Any un-executed balance should either lock back to the LOR for linkage (i.e. order was released with a release price) or cancel (order was released without a release price)-since the order must not rest on the book (TIF = Sweep Only). When trading with the ISE book, if the released quantity encounters the three tick condition occurs, the released quantity of the order should cancel. When some part of an order is still locked for linkage, the released quantity cannot result in a full cancel of the order. In such a case, the matcher will reduce the

size of the order to reflect the cancelled quantity. In such cases, the matcher will produce un-solicited Private Order Broadcasts (POBs) to reflect the order modification.

- **Order Maintenance**

Members can send modification and cancellation requests for Sweep Orders. They will be processed the same way as modification and cancellation requests for other locked orders i.e. while the order is locked, modification requests will be rejected and cancellation requests will be put in pending state. Once the order is released, the pending cancellation will be applied first and the released quantity of the order will not trade with the book and it will also not lock back to the linkage handler for routing.

A request to modify a Sweep Order to a Regular Order or vice versa will be rejected with an appropriate reason code.

- **Trades**

When a Sweep Order trades with order/quotes on the ISE book, its trades should trigger other activities that ISE trades trigger – for instance, stop orders, early termination of PIM orders, early termination of Flash orders etc. Note however, a Sweep Order marked “Sweep Only”, does not early terminate an auction for reasons of “Improving the ISE BBO” since it does not rest on the book and instead cancels immediately after the sweep.

The portion of the Sweep Order that is routed away and traded on an away exchange is trade reported on the ISE like linkage orders i.e. the Sweep Order is printed at the ISE with the Linkage Handler on the opposite side. The trades are marked “ISO No OPRA Report”. Away trades reported on ISE should continue to trigger stop orders just like linkage trade reports today.

When Sweep orders trade with the ISE book, the Maker-Taker scenarios that apply to regular orders trading with the ISE book should be applied to Sweep trades on the ISE book as well. However, when trade reporting a sweep trade that occurred on an away exchange, the following new Maker-Taker scenarios should be applied:

Scenario Description	Scenario
Sweep order with AMB Lock (that are Routed Away) and trade reported ISO No OPRA Report	MTSweepRouted
Linkage Handler Trade Report (Executes Locked and Routed Order - ISO Do Not Report)	MTSweepExecuteOrder

Going forward, OPRA Code of the “Linked Exchange” i.e. OPRA Code of the away exchange where the order was routed and the trade occurred must be supplied on the Private Order Broadcast to members. Currently, the “Linked Exchange” is not supplied on the POB for linkage orders. Going forward, the POB must carry the “Linked Exchange” for both Sweep Orders and regular Linkage trades.

- **Impacts to other transactions**

The matcher currently supports a Time in Force filter in the Delete All Orders – MOPs Request. The Sweep Only TIF should also be available in that filter. The response for these orders should be the same as for other locked orders.

3.2.5 Linkage Order Router

Currently the LOR does not route non-customer orders to its linkage handlers. New configurations should be added for each new client category/clearing type combination that can be routed away for linkage for each linkage handler.

The LOR should be updated to process the new “Sweep Type” instruction on the Locked Order Broadcast. When the Sweep Type = Standard Sweep, the LOR should:

- Use the current away market routing algorithm as defined for linkage for routing Standard Sweep Orders
- Should perform linkage without regard to the tick protections i.e. the order should continue to trade at all prices as permitted by its limit price
- It should be possible to configure via config client separate BBO Refresh Timers (i.e. the time for which an Away BBO Snapshot is valid and after which a new snapshot is taken) one for Sweep Orders (hereafter referred to as Sweep BBO Refresh Timer) and another for Regular orders (hereafter referred to as BBO Refresh Timer). The Sweep BBO Refresh Timer should invoke the same functionality for Sweep Orders as the BBO Refresh Timer does for Regular Orders. For a detailed description of the functionality associated with the BBO Refresh Timer please refer to the LOR Master BRD.

Existing Linkage Handlers: BAML & WEX:

The Origin Code for non-customer orders routed to the LH by the LOR should be marked as indicated below:

Origin Code / Clearing Type of order entered at ISE	Origin Code sent by LH destination Away Exchange	Tag 204 values to be sent by LOR to WEX	Tag 1 values to be sent by LOR to BAML
BD – Clearing Customer	BD Customer	3	TBD
BD – Clearing Firm	Firm	2	TBD
ISEMM	On-Exchange Market Maker (of destination exchange)	4	TBD
FARMM	Away MM	5	TBD

Prop-Clearing Customer	BD	3	TBD
Prop – Clearing Firm	Firm	2	TBD

Just like Customer and Customer Professional orders it should be possible to configure different values for different linkage handlers for above Origin Code / Clearing Type combinations in config client.

Customer and customer professional Sweep orders should be trade reported at the ISE just like customer and customer professional linkage orders. For non-customer orders the trade reported side must echo the client category and clearing type of the order that was routed. i.e. If the order that was routed had Client category= Proprietary and a Clearing type of Firm, the trade reported side must also be marked with a Proprietary Client Category with a clearing type of Firm.

All existing e-mails that contain order details or an order dump should be upgraded to include the Sweep Type, the Clearing Type and the Client Category of the locked order.

New LH - MGS

While all tag/value details for messages should be referenced from MGS's FIX spec available in the T7 folder for R10.0, the following additional tags/values should be sent:

- Orders should be sent as IOC
- Orders should be marked ISO (Tag 18, Value "f")
- Tag 15001 should be set to Pipe (note this is case sensitive)

Orders sent to MGS should be marked with respect to their client categories as follows:

Origin Code / Clearing Type of order entered at ISE	Tag 12950 values to be sent by LOR to MGS
Customer	0
Customer Professional	2
BD – Clearing Customer	3
BD – Clearing Firm	4
ISEMM	5
FARMM	6
Prop-Clearing Customer	3
Prop – Clearing Firm	1

The LOR should send the following destination exchange codes in Tag 57 to MGS:

- AMEX
- BATS
- BOX
- CBOE
- CTWO
- GEMINI
- ISEX
- MIAX
- NSDQ
- NQBX
- PCSX
- PHLX

Note:

- NSDQ is the code for NASDAQ Options Market
- NQBX is the code for BX Options
- PCSX is the code for ARCA

3.2.6 Trade Manager / OCCTR

No impact expected. The Sweep Order attributes are expected to be in the ETS Broadcast, since the matcher will add them to the Order details which are echoed by the Trade Manager on the ETS Broadcast automatically.

Linkage trades are marked with the “ISO No OPRA Report” and they qualify for the OCC Section 31 fee waiver. The OCCTR marks these trades with the Section 31 indicator before sending them to the OCC. Sweep trades that occur on an away exchange and are trade reported on the ISE will also be marked with the “ISO No OPRA Report” and hence the “OCC Section 31 indicator” automatically. No change is required in the OCCTR to support this function.

The Trade Manager must report the “Linked Exchange” on the Trade Item Broadcast for all routed orders for both the routed order and the trade reported (LH) side.

Trade manager will continue to support PTA requests for these trades via the usual PTA requests.

3.3 Trading Tools

3.3.1 Query Viewer

The new attributes added to a regular order and to the Locked Order Broadcast should be visible in query viewer.

3.3.2 MPT

- “Sweep Only” TIF, “Sweep Type” attributes should be visible in Order Status and Trades by BU views.
- The Delete All Orders – MOPs request should support filtering via the new Time in Force of “Sweep Only”.

3.4 Billing

Phase 5 of Billing must be live to support AMR via Linkage.

3.5 Data Requirements

- Existing AMR reports (daily and monthly) on the [Intranet’s Statistical Reports page](#) should continue to provide IRD specific volume from the PrecISE database. This report will not contain AMR via Linkage volume.
- The new sweep attribute should be available in Cognos. This will provide us with the AMR via Linkage volume; volume traded for Sweep orders on the ISE.
- The existing CMTA-PTA report should continue to be generated for any IRD receiving it today.
- Sweep Types will appear in the TimeInForce column. Therefore, no changes are needed to the OHR / COHR reports for sweep orders.
- The Sweep Volume must not include Regular Order volume.

Appendix A. Examples

This section contains examples of AMR orders and their behavior.

A.1. Depth of Book Sweep

PHLX Offer	ISE Depth – Offer	CBOE Offer	AMEX Offer
<u>10@1.19</u>	<u>5@1.20</u> , <u>15@1.21</u> , <u>25@1.22</u>	15@1.21	10@1.22

Order to Buy 85@1.21 is sent to the LOR to route using ISE & away sizes/prices:

- Route 10@1.19 ISO to PHLX
- Release 75@1.21 ISO at ISE (Trades 5@1.20, 15@1.21, Locks 55 back to LOR)
- Routes 15@1.21 ISO to CBOE
- Releases 40@1.22 ISO at ISE (Trades 25@1.22, Locks 15 back to LOR)
- Routes 10@1.22 ISO to AMEX, balance 5@1.22 rests on the ISE – ISO.

A.2. Sample trade report for DOB Sweep Order

PHLX Offer	ISE Depth – Offer	CBOE Offer	AMEX Offer
<u>10@1.19</u>	<u>5@1.20</u> , <u>15@1.21</u> , <u>25@1.22</u>	15@1.21	10@1.22

OSP Sweep Order to Buy 85@1.21 is sent to BAML for routing to PHLX.

- Order sent by LOR to BAML
Buy 15@**1.19** ISO at PHLX
- Prints at PHLX (on OPRA, on OCC):
BAML (Buy) v/s CDL (PHLX Market Maker's quote) (Sell) - ISO

- Prints at ISE (only OCC):

OXF (Buy) v/s BAML (Sell) – Trade Condition = ISO No OPRA Report, Linked Exchange = **PHLX**

In the above example:

- Trades printed at ISE and Away are marked ISO to ensure that ISE does not appear to have traded through CBOE.
- BAML Buys @ ISE and Sells @ Away Exchange – same qty/price – trades off-set each other.
- Trades printed at ISE as “ISO No OPRA Report” are Section 31 OCC fee eligible.
- OXF can Give Up the trade to GLD at ISE since the trades printed away are in BAML’s name.

Chapter 4 Non-Functional Requirements

4.1 Security

There are no explicit security requirements for this function.

4.2 Operational Deployment

There are not explicit operational deployment requirements for this function.

4.3 Maintainability

It should be possible to control the launch of Sweep Orders.

4.4 Reliability

There are no explicit reliability requirements for this function.

4.5 Availability

There are no explicit availability requirements for this function.

4.6 Auditability

All AMR orders should be in the audit trail (Matching Engine and LOR) and viewable by downstream applications.

4.7 Documentation

There are no explicit documentation requirements for this function.

4.8 Acceptance Criteria

No specific acceptance criteria.

4.9 Member Impacts

The following changes will impact members.

- Linkage for non-customer orders
-

- Sweep order attributes on POB
- Linked Exchange on POB and TIB for trade reports
- Un-solicited order modifications for Regular non-customer orders that will undergo linkage
- PrecISE F.E. support for AMR orders
- Members currently achieve CMTA –PTA in PrecISE by setting up a customer client category for the same. PrecISE members will be educated to deprecate the use of customer client category for this purpose.

For details, please refer to the detailed functional requirements section of this BRD.

4.10 Rules

Rule changes required for:

- Linkage for Non-customer orders
- Sweep Orders
- ISO PIM

Chapter 5 Open Items

- Is it ok to decommission Exchange orders for GEB clients? – No. We will keep AMR orders to specific exchanges for GEB clients.
- Should Sweep orders allow “attributable” order details, Agreement Details? – Yes, same as regular orders.
- Will PrecISE members select the DNF instruction from their “Away Market” Dropdown or will PrecISE backend populate it for the members by default? – PrecISE backend will populate it for the members for a sweep order.
- Sweep orders would wait forever for responses from away exchanges like linkage orders. However for Sweep & Cross, PrecISE times out on the sweep portion 3 seconds later and sends the cross. If the matcher now responds for the sweep we will have an over fill and no one to eat the extra fill. To resolve this issue, should PrecISE cancel the cross qty back to the PrecISE front end after this 3 second time, if the matcher has not responded for the routed qty. In this case the only open qty on the order will be the qty with the away exchange pending a fill/cancel. At the very least, members will have a timely response. – This behavior was discussed with the team and is documented in the PrecISE section above.
- For PrecISE GEB clients, the Sweep portion will continue to be routed to GEB while for CITI clients, the Sweep portion will be routed to the DTI instead. Do we need a config for this? – Yes, this was discussed with the team and is documented in the PrecISE section above
- Do we need a config to allow “Give Up” PTA for AMR orders (currently greyed out) in the “Change Clearing” window in PrecISE for CITI clients while continuing to disallow it for GEB clients? – this is accounted for based on the user’s configs for home vs. IRD sweep
- Determine list of attributes on a Sweep order that are modifiable/not modifiable. – Not required since modification requests for locked orders are rejected. And modification of Regular to Sweep Orders and vice versa will be rejected.
- Test Impacts for Billing. No BRD update required. SQM to include in Regression test.
- Can a Regular Order be modified to a Sweep Order? – No. The modification of a Sweep Order to a Regular Order and vice versa will be rejected by the matching engine.

Chapter 6 Future Enhancements

- Day orders for sweep order types
- Non-ISE listed series
- Spread AMR
- NBBO Sweep
- Sweep & Cross – ISO No ISE
- Sweep & Cross – PIM / Facilitation / Solicitation
- Sweep & Cross – Customer to Customer

Chapter 7 Appendix

7.1 Away Market Codes

OPRA Code	Away Exchange
A	NYSE AMEX
B	BOX
C	CBOE
H	ISE Gemini
I	ISE
M	Miami
N	NYSE ARCA
Q	NASDAQ
T	NASDAQ BX
W	C2
X	NASDAQ PHLX
Z	BATS