ETD Clearing Setup Guide
Exchange-Traded Derivatives
Version 5.0.2

April 2017 — Fifth Edition

This document describes the setup of Calypso in order to process exchange-traded derivatives (ETD) clearing activity for clearing brokers on their behalf or on behalf of their clients.

[NOTE: The Calypso License to use this Calypso Integration Module does not include a license for any third-party data services to which this module can interface. Clients are responsible for contracting with the appropriate third-party data service(s) prior to using this Calypso Integration Module]

Revision date	Comments
September 2015	First edition of ETD Clearing.
November 2015	Second edition – Added counterparty-facing margin call contracts.
July 2016	Third edition for ETD Clearing version 4.1.4.
December 2016	Fourth edition for ETD Clearing version 4.2.0
April 2017	Fifth Edition for ETD Clearing version 5.0.2

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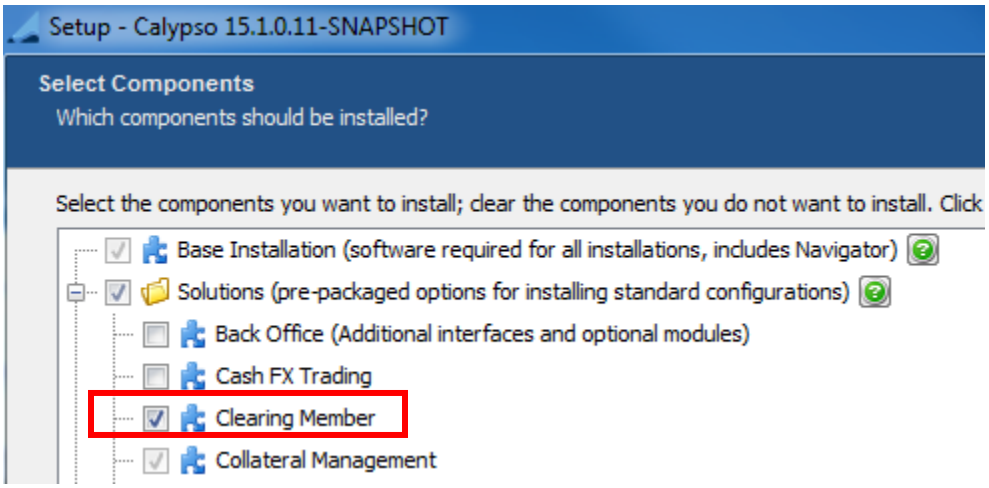
Section 1. Installation

The components of the ETD Clearing module are installed as part of the Calypso Installer when you select the "Clearing Member" solution.



You also need to select the interfaces "ATEO LISA middleware" and "FOW Trade Data".

- **CMF OTC Clearing** – Back office processing – Valuation of open trades – Generation of client statements.
- **Collateral** – Allocation of margin calls.
- **Data Uploader** – Upload of trades received by the ATEO into Calypso.
- **ATEO LISA Middleware -** Import of Listed Derivatives Trades
- **FOW Trade Data -** Import of Listed Derivatives contracts

Please refer to the *Calypso Installation Guide* for details on the Calypso Installer.

If you are installing a CUP (Calypso Upgrade Package) instead, the instructions are also in the Calypso Installation Guide.

Database Upgrade

When you run Execute SQL as part of your installation, the data files will be already loaded.

Please refer to Calypso Collateral Management release notes for upgrade information, if any.

Section 2. Overview

Calypso's ETD clearing solution combines Calypso's Back Office, Connectivity and Collateral to offer a complete solution for entities offering ETD clearing services to their internal trading desks as well as to external clients. The primary activities that the clearing member will be relying on Calypso for are:

- The automated creation of standardized Listed Derivatives contracts,
- The use of connectivity and STP workflow to automatically import cleared Listed Derivatives trades into clearing accounts,
- The automatic generation of fees and commissions on incoming trades,
- The calculation of Variation and Initial Margin on open positions
- Management of cash and collateral related to the clearing activities, and
- Generating client statements for their clients to summarize the day's activity.

In order to support these activities, Calypso provides an interface to ATEO's LISA to import cleared trades. These trades will flow into the system in real-time throughout the day. At the end of the day, the system will process the open positions. The processing results in the generation of Calypso trade objects which will facilitate the settlement of cashflows, and contain the valuation of the open positions.

The Collateral Management module will then take over to manage any Margin Calls resulting from the day's activity for each account. This includes not only cashflows related to the cleared trades, but payments made to or from each clearing account as part of routine business.

As a last step, Calypso will aggregate all of the information stored in the system from the activity of each account, and generate a client statement which will be sent to the account holders as a record of their activity.

2.1 Clearing House and Product Coverage

Calypso's ETD clearing member solution includes "out-of-the-box" support for connectivity and integration with the clearing houses served by ATEO's LISA.

Calypso's ETD clearing member solution supports Futures, Future Option, and ETO trades.

2.2 Realtime Trade Connectivity

Out-of-the-box, the trades are imported in real-time from ATEO's LISA. They can be imported from other sources as needed or they can be manually entered.

The counterparty of the trades is the clearing house or the executing broker.

The trades navigate the Calypso workflow based on their clearing status, using straight-through processing and exceptions monitoring. Once the trades are cleared, they are liquidated as applicable and update the accounts positions.

2.3 EOD Processing

The key aspects of the EOD processing are as follows:

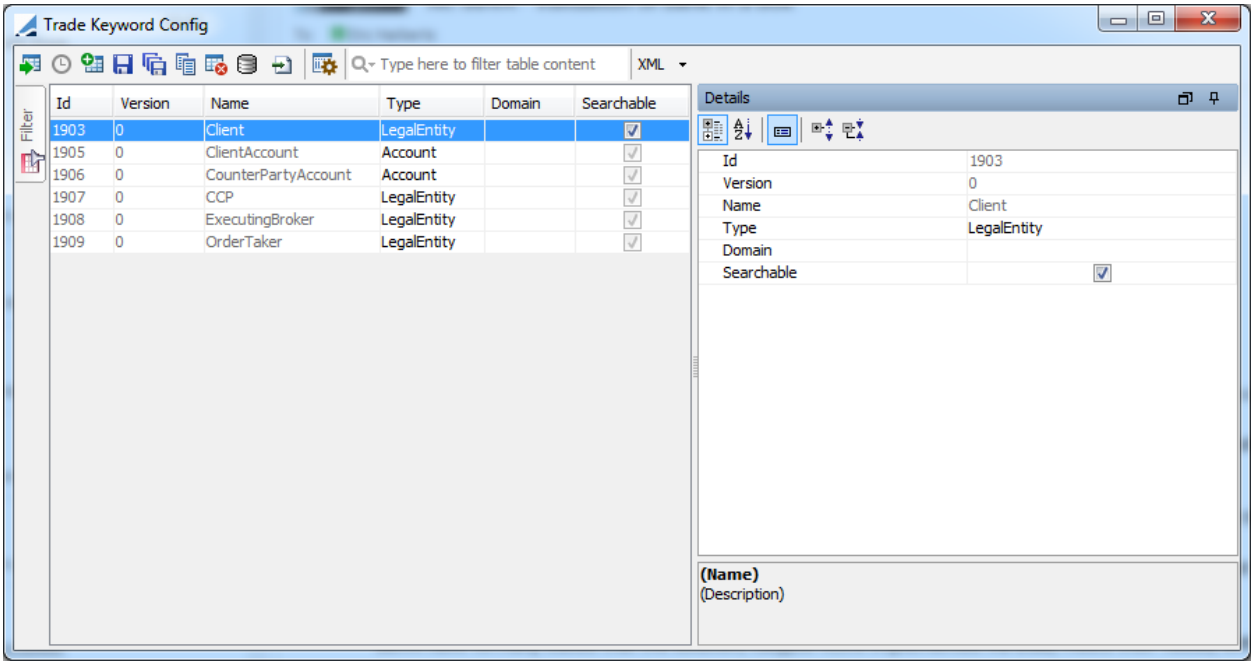
- Management of settlement activity flowing from this processing
- Position Management – Trade offsetting and lifecycle activity
- Import and storage of settlement prices
- Open positions processing – Generation of the variation margin and initial margin requirements related to trade activity and open positions
- Collateral Management process
- Statement Generation
- Roll to next business date

Section 3. Before you Begin

Before you begin, you need to define the following reference data.

3.1 Trade Keyword Configuration

The Trade Keyword Config should be set up as follows:



3.2 Domain Values

Make sure that the following domain values are specified.

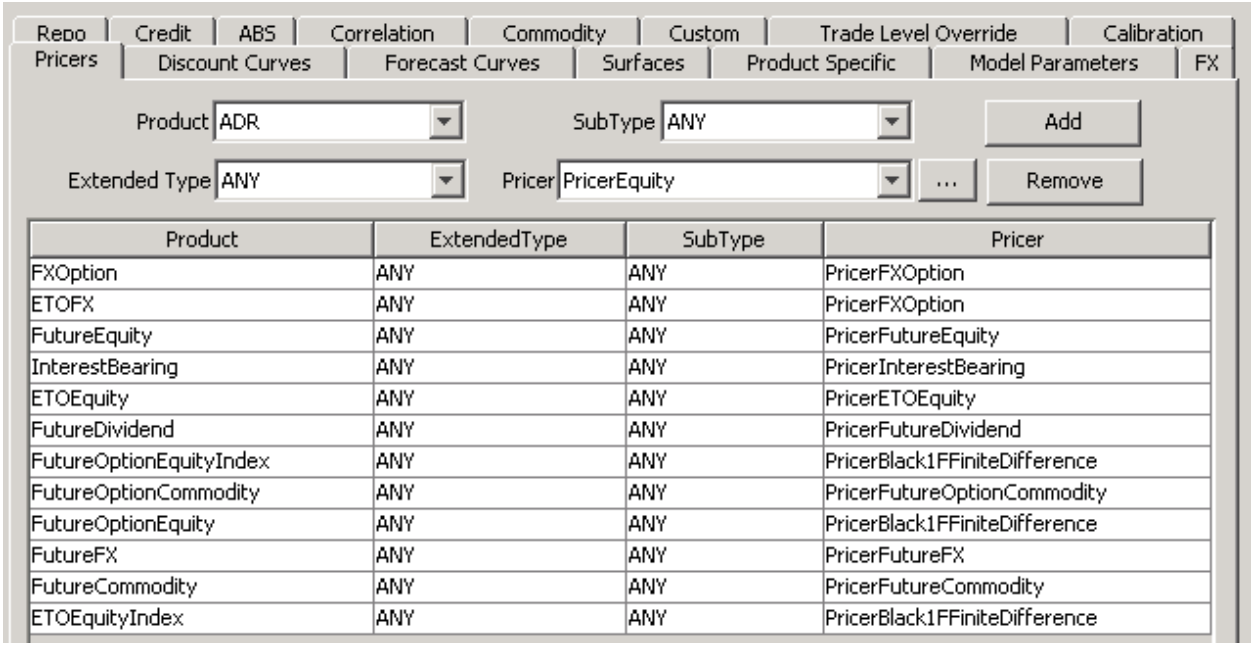
Domain Names	Values
DefaultETDPosSpec	Value = name of the Position Specification which is configured as per this document. We call it "ETD Pos Spec" This domain provides the default Position Specification which is to be used in processes where positions and liquidations are required. The value of this domain should be equal to the name of the Position Specification which uses the Liquidation Aggregation of ClientAccount and CounterPartyAccount.
Liquidation.BookingDateStrategy	Value = Accounting Value = LastStatementDate Value = POAttribute
ProcessingConfig	Value = ETDClearing.ClearingAccountTransferGeneration Comment = true Activates the generation/suppression of transfers as required by the ETD solution. Value = ETDClearing.IsActive

Domain Names	Values
	Comment = true Activates additional fields in the Fee Definition and Account Definition. Value = ETDClearing.SecurityTransferGeneration Comment = false Suppress the generation of the SECURITY transfer for an ETD transaction. The clearing solution only uses transfers to reflect the cash impact of transactions. Positions on contracts/products is shown in Position Keeper. Value = BookingDateManager Comment = tk.bo.bookingdate.POAttributeStrategy Ensures Booking Date is used when creating Transfers and Trades Value = LegacyProductDesc Comment = false Activates the custom product description which best suits listed products Value = LegacyQuoteName Comment = true Uses the standard (v14) quote name creation Value = ExchangeNameInProductyDesc Comment = false Value = ExchangeNameInQuoteName Comment = false
engineParam	Value = LIQUIDATION_CONFIG Value = XFER_NEXT_EVENT Value = XFER_PAST_GENERATION Value = XFER_POS_AGGREGATION_NAME Value = XFER_USE_POS_AGGREGATION_ONLY Refer to section 3.8.2 Transfer Engine
feeDefinitionAttributes	Value = Duplicate Fee Transfer Value = ETD.InventoryBucket Value = MarginCall Value = MarginCall.Category These attributes are used to control the behavior of fees, commissions and technical fees in the system.
feeDefinitionAttributes.ETD.InventoryBucket	Value = Commissions

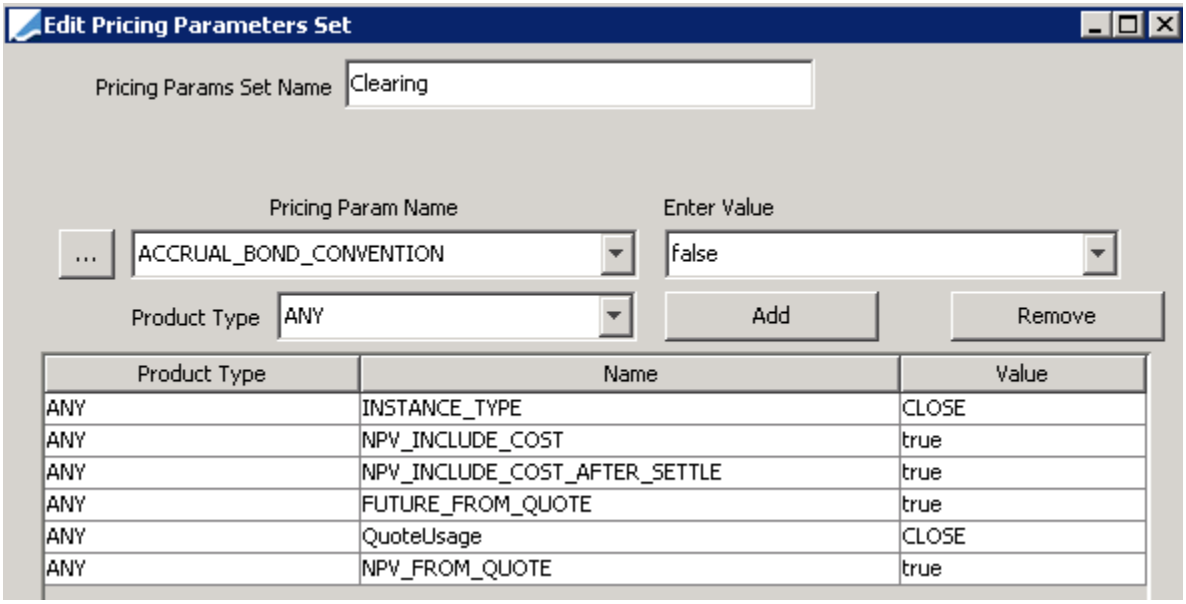
Domain Names	Values
	Value = Fees The two allowable Fee Inventory Buckets into which any fee or commission can be assigned.
feeDefinitionAttributes.MarginCall	Value = Account Level Value = Always Value = Never These attributes are used to control the behavior of fee, commissions and technical fees in the system.
liquidationKeyword	Value = ClientAccount Value = CounterPartyAccount
XferPosAggregation	Value = ClientAccount Value = CounterPartyAccount Should match the name of the Liquidation/Position Key set to liquidate by Client and Counterparty Accounts
InventoryCashBucketFactory	Value = ETD Activates the ETD inventory buckets.
Clearing.ExternalData.locations	Value: file://C:/<some location>/clearing Identifies the location for the local storage of the risk array and settlement price files.

3.3 Pricing Environment

You need a pricing environment to price Futures and Options from quotes when using the Calypso native pricers in reports like the Position Keeper and Trade Browser. The calculation of VM through the EOD process does not rely on a pricer or pricing environment parameters – its logic is written in the scheduled task to match the market standard valuation and rounding specifications.



The following pricing parameters should be set.



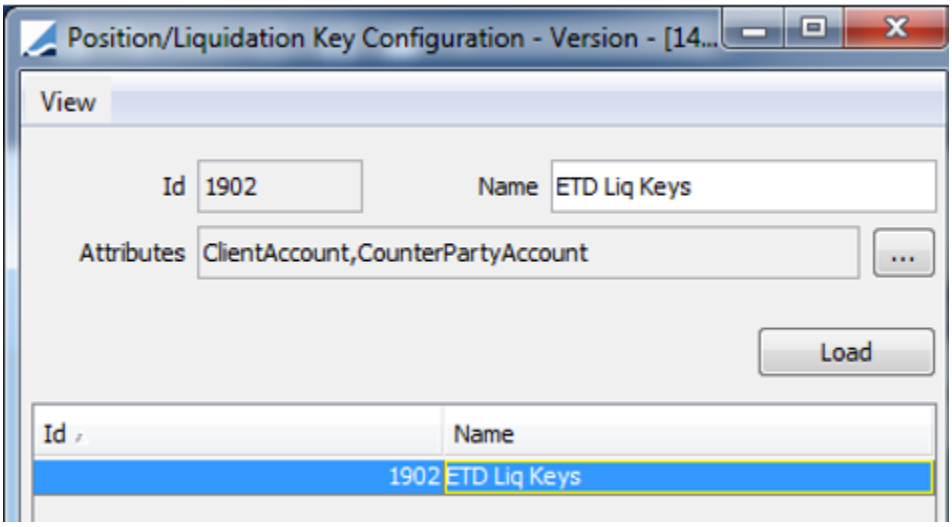
3.4 Position Configuration

Once the trades are imported, positions are computed by the liquidation engine.

3.4.1 Position/Liquidation Key Configuration

Positions in the listed clearing solution are only expected to be offset if both the Client and the CounterParty Accounts match, along with the book and product which are checked by default. This means that close outs will only occur when a trade on a specific product is in the same account on the client side as well as the counterparty side, otherwise the buys and sells will remain open.

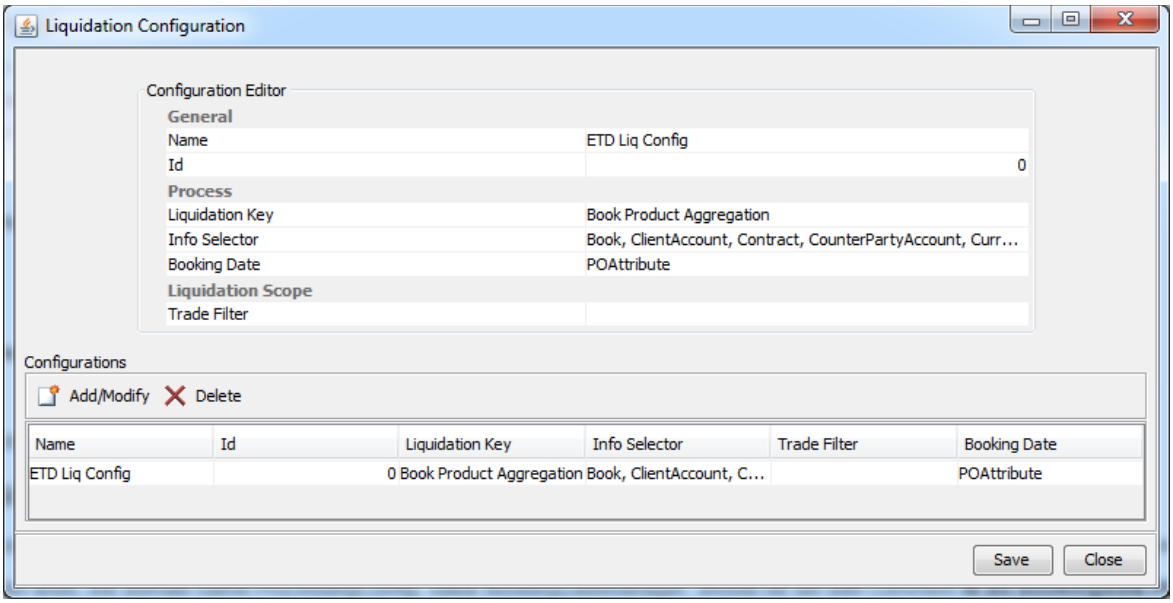
To achieve this, create a Position/Liquidation Key Configuration which uses the trade attributes ClientAccount and CounterPartyAccount as the additional liquidation criteria, as shown below.



3.4.2 Liquidation Configuration

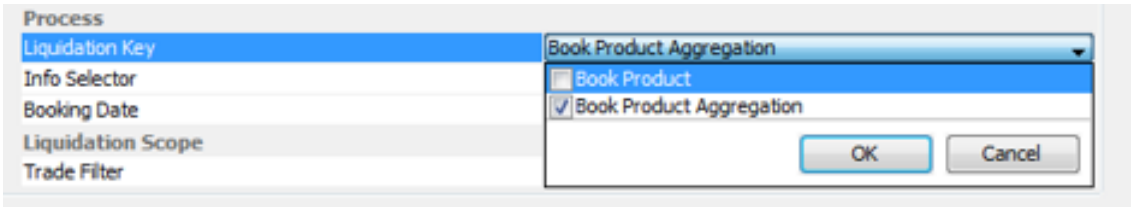
The liquidation configuration dictates how position-based products are liquidated (aka offset or closed out) and there is a standard configuration expected to process listed derivatives in Calypso. The liquidation configuration described below should be chosen in the Liquidation Info used in the listed clearing solution.

There are 3 key fields in the Liquidation Configuration window which drive the logic, as described below.



3.4.3 Liquidation Key

Calypso requires that the two transactions be on the same product and in the same trade book in order to be liquidated. This field allows the user to add one additional set of criteria called 'aggregation' to use for determining the eligibility of liquidation.

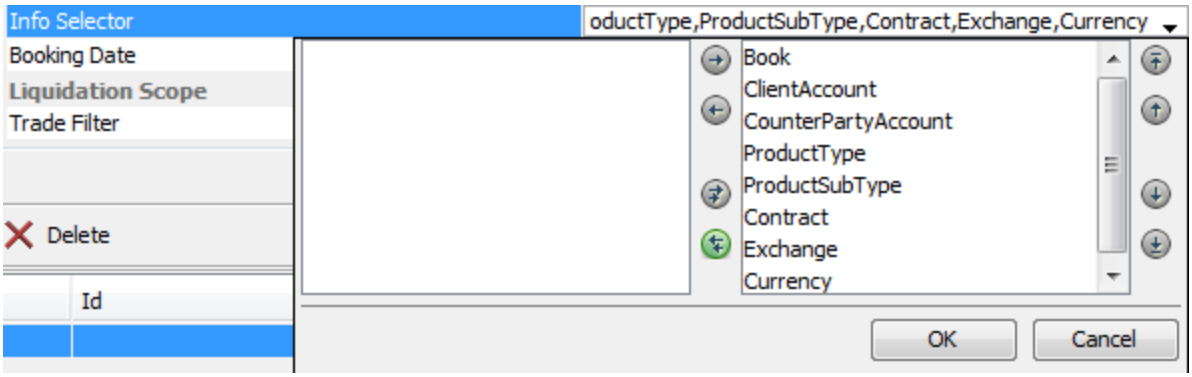


Selecting "Book Product Aggregation" will allow us to point to the additional trade criteria of Client Account and Counterparty Account in order to ensure only trades in the same client and counterparty account can be closed out.

We do not want to select "Book Product" as an additional Liquidation Key since that will store positions in 2 simultaneous versions which can decrease performance and add confusion.

3.4.4 Info Selector

This field allows the user to include additional criteria of the position by which to define the liquidation rules at a more granular level. The position criteria available to select are shown in the panel on the right.



3.4.5 Liquidation Info

Selecting these categories simply make them available to use when we configure the liquidation rules in the Liquidation Info window. By providing more criteria, we can set rules for a specific exchange, currency, contract etc.

Note: The hierarchy of the selection of a rule is dependent on the order in which the fields appear in the Info Selector window above. So, in the screenshot above, "Book" would be the first priority, followed by ClientAccount, CounterPartyAccount, ProductType and so on.

Once selected in the Info Selector field of the Liquidation Config, these fields will be available in the Liquidation Info panel as shown below.

The Liquidation Configuration described earlier in this document must be chosen in the Liq Info.

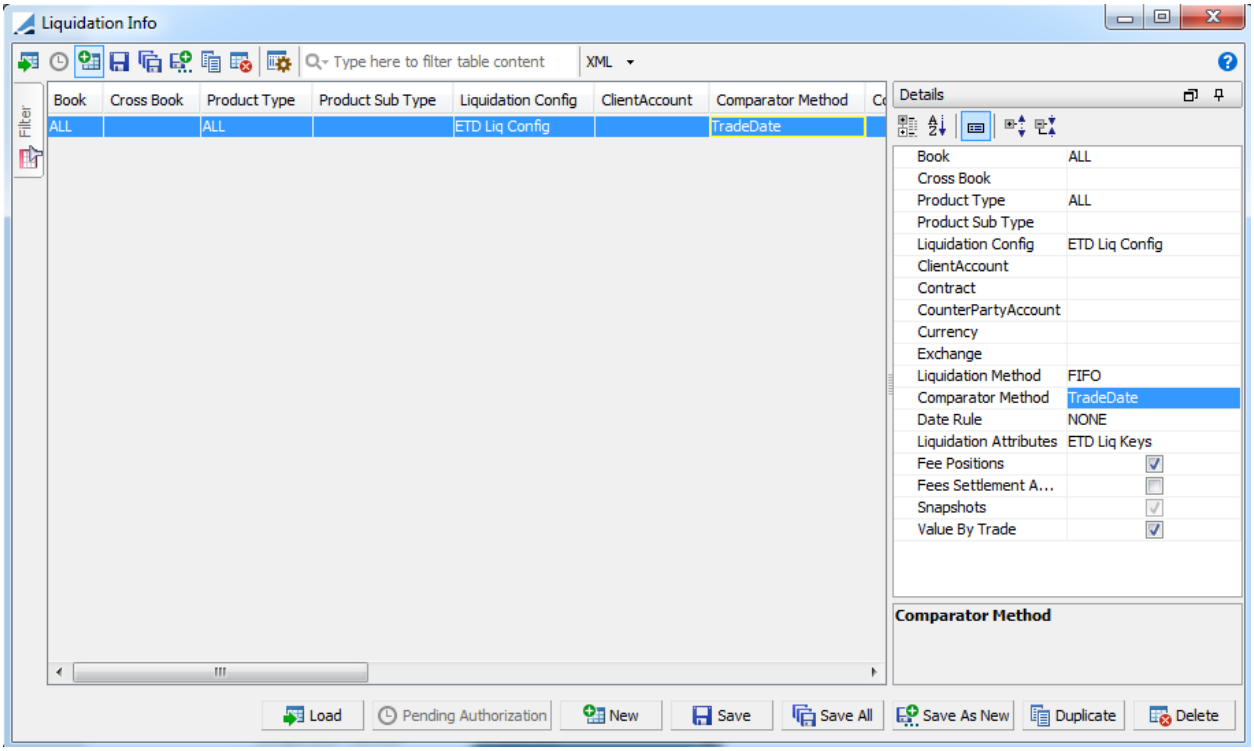
A liquidation method, such as LIFO, FIFO, and MFIFO can be assigned to each configured set of criteria in the Liquidation Info based on the users' requirements.

A comparator method of "TradeDate" is the standard choice for any out of the box liquidation methods, but the user can also choose a Dynamic Comparator which allows more complex comparison of trades based on price, trade time and quantity.

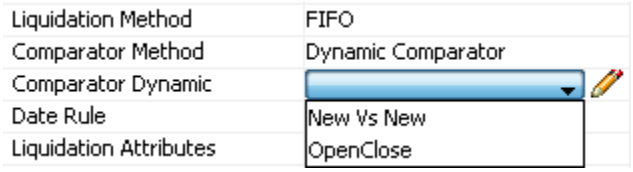
"Value by Trade" should be checked/true to allow positions to be valued based on the individual transaction prices rather than based on the average price of the position. Valuation by trade is the market standard used by clearinghouses and brokers.

3.4.6 Dynamic Comparator

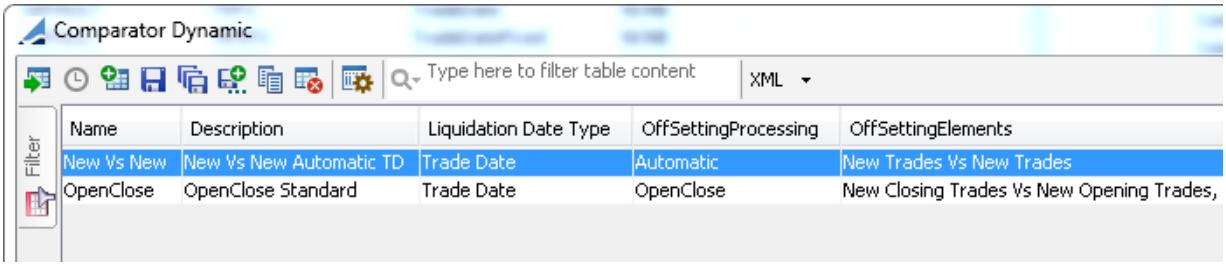
The comparator method, "Dynamic Comparator" must be used only with Liquidation Method FIFO or LIFO and the LiquidationEngine in Batch Mode (Environment Property LIQUIDATION_TIMEOUT = -4).



Dynamic Comparator is available in the Comparator Method list.

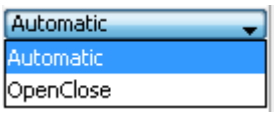
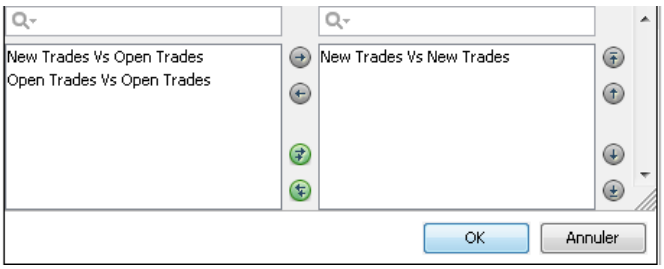


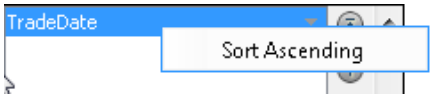
When selected, a Comparator Dynamic has to be chosen or created by clicking on  to open the Comparator Dynamic Window.



The following fields should be set:

Fields	Description
Name	Name of the Comparator Dynamic Will be displayed in the Liquidation Info Window

Fields	Description
Description	Description of the Comparator Dynamic
Liquidation Date Type	 Date used to compute the Liquidation Date: • Trade Date • Settle Date • EOD Trade Date: based on Book EOD • Fixed Trade Date: based on Book Attribute LiquidationTime • Start of Day Trade Date
OffSettingProcessing	 Liquidation Processing Type: • Automatic: Liquidation is automatically performed • OpenClose: Liquidation is automatically performed only when a Closing Trade is input
OffSettingElements	 Comparator Elements used for Liquidation in decreasing priority. For OffSettingProcessing = Automatic • New Trades Vs New Trades: New Buy Trades are liquidated with New Sell Trades • New Trades Vs Open Trades: New Trades are liquidated with Open Trades • Open Trades Vs Open Trades: Open Trades are liquidated with Open Trades For OffSettingProcessing = OpenClose • New Closing Trades Vs New Opening Trades: New Closing Trades are liquidated with New Opening Trades • New Closing Trades Vs Open Trades: New Trades are liquidated with Open Trades The Closing Trades are identified by the Trade Attribute OpenClose = C

Fields	Description
	Example: OffSettingProcessing = Automatic Offsetting Elements = Open Trades Vs Open Trades, New Trades Vs New Trades, New Trades Vs Open Trades Liquidation Method = FIFO *Trades:* • T1: Open Trade 50 • T2: Open Trade 10 • T3: New Trade 40 • T4: New Trade -30 • T5: New Trade -30 *Process and results:* • Open Trades Vs Open Trades: no Liquidation as two Buy Open Trades only – T1: Open Trade 50 – T2: Open Trade 10 – T3: New Trade 40 – T4: New Trade -30 – T5: New Trade -30 • New Trades Vs New Trades: T4 fully liquidated by T3, T5 partially liquidated by T3 – T1: Open Trade 50 – T2: Open Trade 10 – T5: New Trade -20 • New Trades Vs Open Trades: T5 fully liquidated by T1 – T1: Open Trade 30 – T2: Open Trade 10
Ordering Criteria	 Criteria used for comparison in decreasing priority Each criteria can be sorted in Ascending or Descending Order using a Right click.  **Example:** OffSettingProcessing = Automatic Offsetting Elements = New Trades Vs New Trades Ordering Criteria = Trade Date (Asc) / Price (Asc) / Quantity (Desc)

Fields	Description
	Liquidation Method = FIFO *Trades: All Trades are New Trades* • • T1: TD: 17/11 Price: 100 Quantity: 50 • • T2: TD: 17/11 Price: 102 Quantity: 50 • • T3: TD: 17/11 Price: 101 Quantity: -40 • • T4: TD: 17/11 Price: 101 Quantity: -10 • • T5: TD: 17/11 Price: 103 Quantity: -10 • • T6: TD: 17/11 Price: 102 Quantity: 70 • • T7: TD: 14/11 Price: 107 Quantity: 10 *Process and results:* • Buy Trades after ordering – T7: +10 – T1: +50 – T6: +70 – T2: +50 • Sell Trades after ordering – T4: -10 – T3: -40 – T5: -10 • Trade Open Quantities after Liquidation – T6: +70 – T2: +50

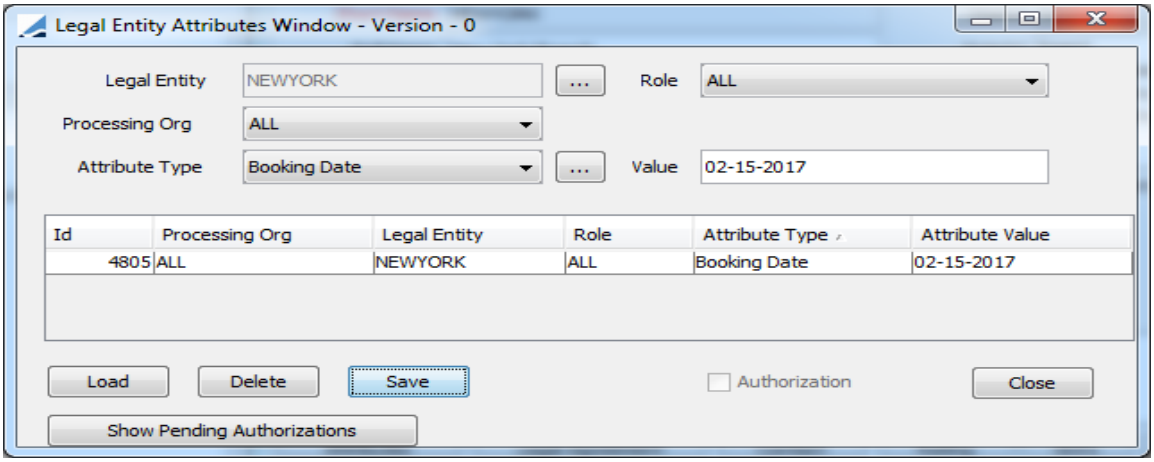
3.5 Booking Date

In order to support the processing of transactions and activity for a specific clearing date without changing the activity in the past or including any activity on T+1, Calypso associates a processing date to each Processing Organization. All clearing activity is 'stamped' with this date to tell the system when to include the activity in the end of day and in the client statement.

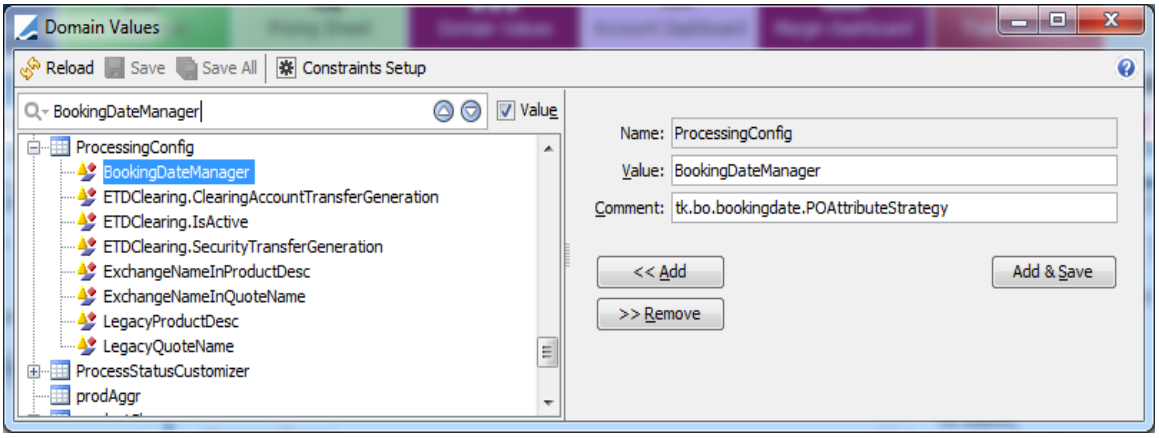
This concept applies to cleared transactions and all of the related transfers that impact the account balance. The processing date is rolled forward when all of the EOD activity is completed for a given day and shouldn't change until the next day's activity is complete. The date should never be rolled backwards.

3.5.1 Set the Legal Entity Attribute 'Booking Date'

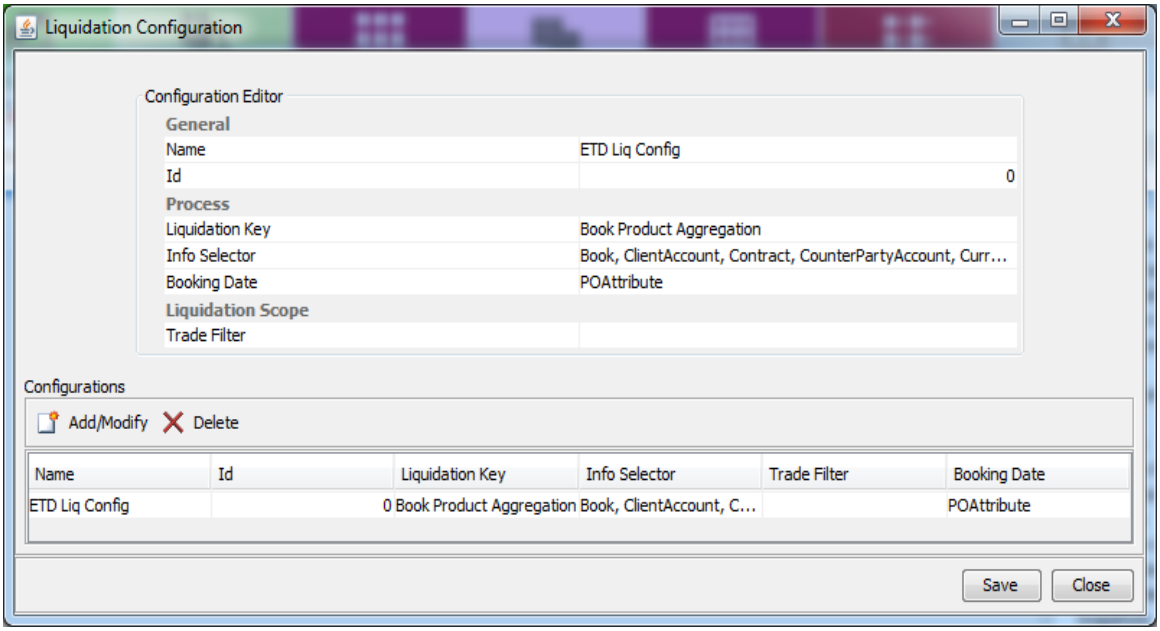
To set the processing date of the system for each Processing Organization, set the PO's LE Attribute 'Booking Date' to the desired processing date using the format mm-dd-yyyy as shown below.



In addition, we need to set the BookingDateManager domain value (found under the ProcessingConfig node) to a value of "tk.bo.bookingdate.POAttributeStrategy".

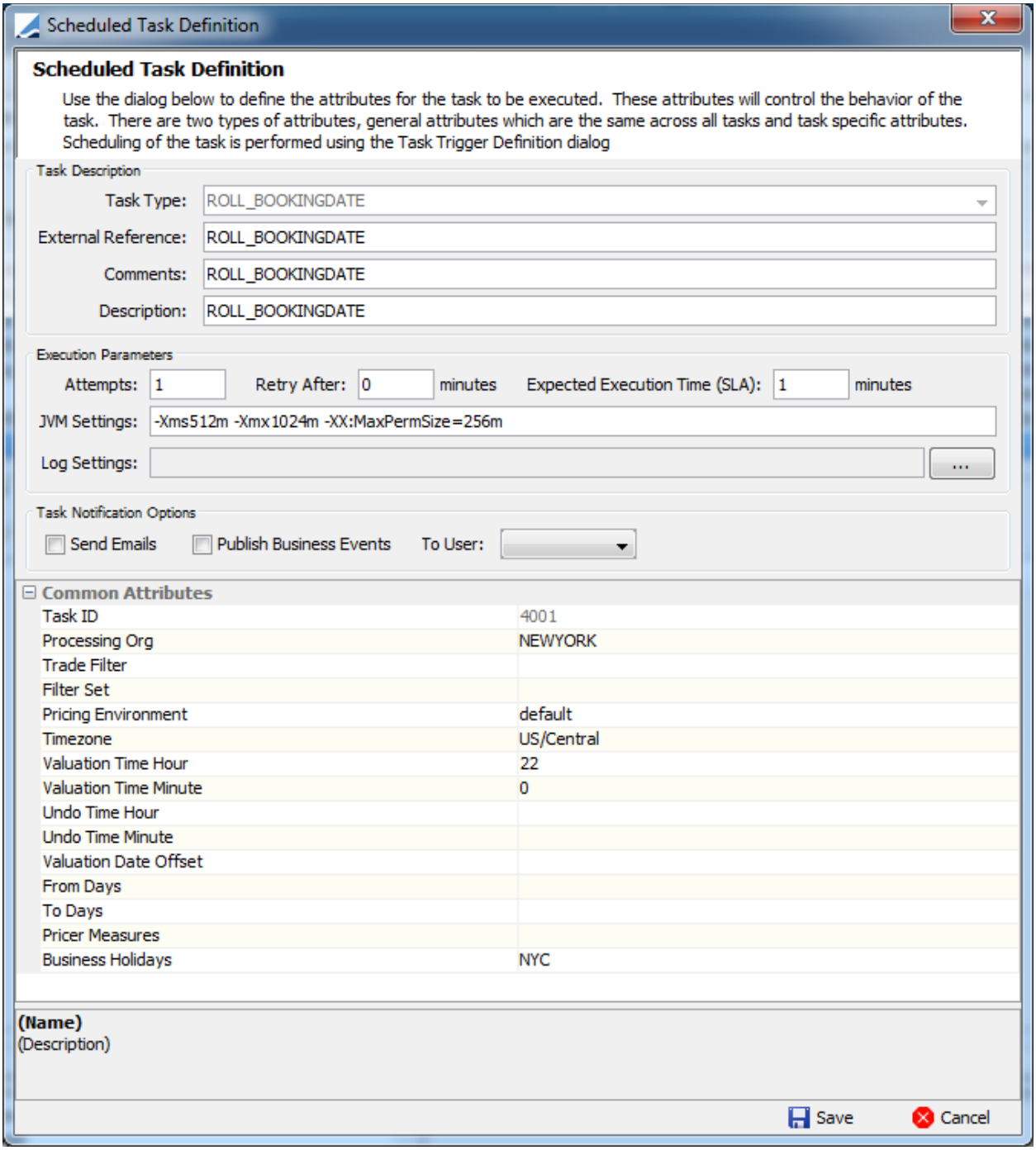


In the Liquidation Configuration set the Booking Date field to a value of "POAttribute" so that positions and 'trade open quantities' are also built using the concept of Booking Date. This ensures that T+1 transactions are not impacting open positions on T and are therefore not included in the offsetting process, IM/VM calculation, lifecycle or transaction confirmation reporting in the EOD.



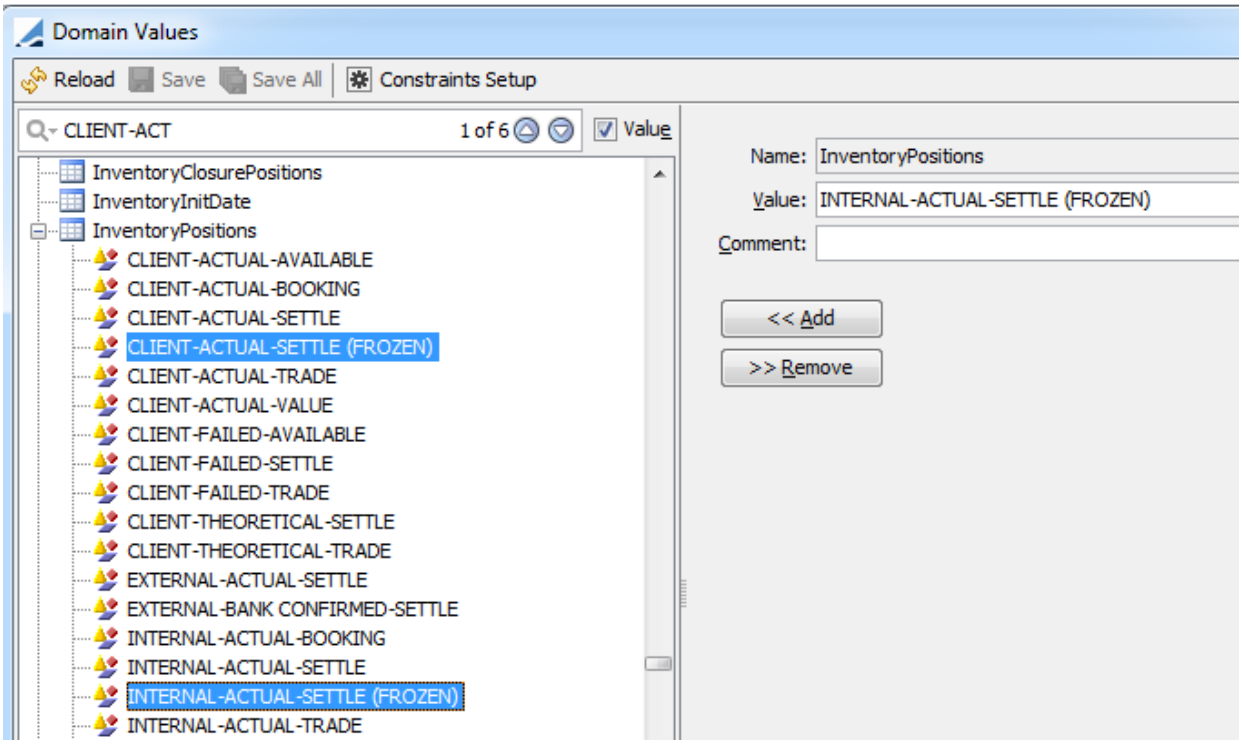
3.5.2 Rolling the Booking Date Forward

The Booking Date can be moved forward by manually editing the LE Attribute value or can be rolled using the ROLL_BOOKINGDATE Scheduled Task which will roll the date forward one day according to the calendar set in the 'Business Holidays' Scheduled Task attribute. The date should not be rolled backwards, as once the EOD processing is completed all corrections will happen on the next day – we don't expect to run past days.

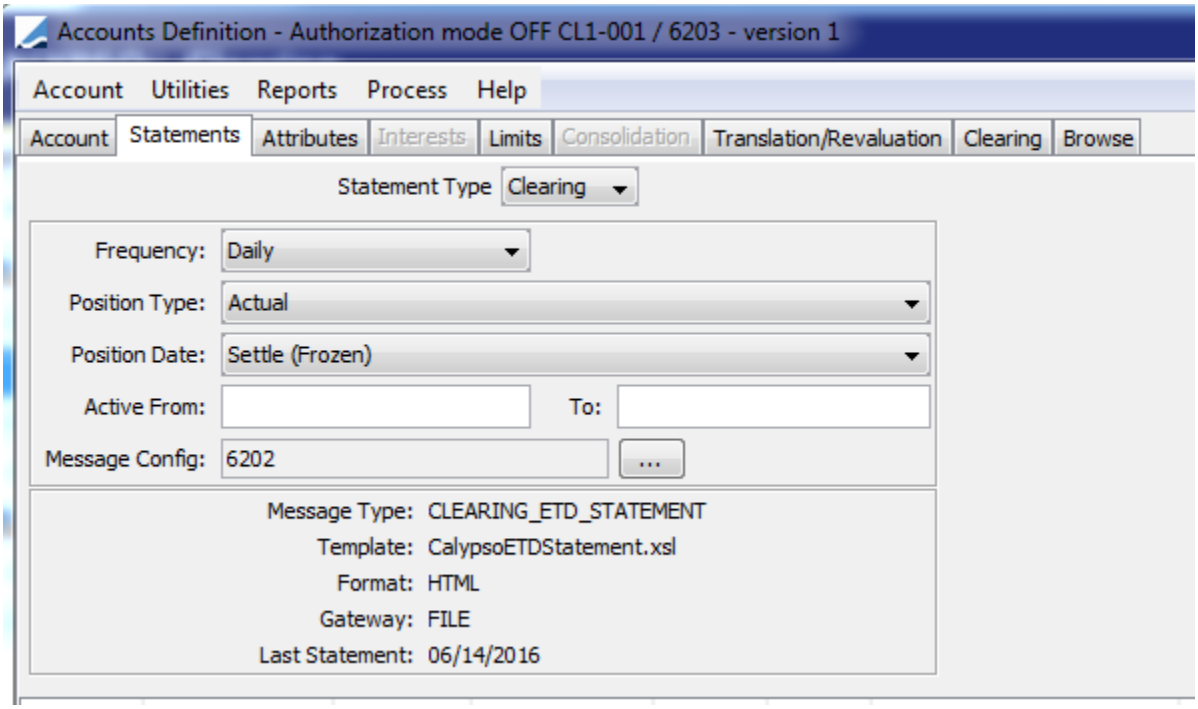


Whenever we're looking at cash positions we want to use a Position Date of "Settle (Frozen)" which returns the later of the transfer's Settle Date and Booking Date. This way a transfer will never impact the balance prior to the processing date on which it's booked (since Booking Date will always be set to the Processing Date) and any forward settling activity will only impact the account when the settle date is reached.

Settle (Frozen) is used to report balances in the Client Statement, so to match these balances when generating cash and security inventory reports, the user should add the domain values as shown below, which makes them available for selection in the Inventory Cash position report.



Statement Configuration should also be set to use Settle (Frozen) Position Date.



3.5.3 Transfer Engine and Workflow

To make sure the transfers behave as expected in this model, we want to set up the system so that we can cancel transfers which are generated intraday if needed, because they have not yet been reported as part of the EOD statement. However, we require that transfers from past days will be reversed by posting a credit/debit on the current processing date, since we don't want to impact the balances that were reported on past statements and have already been distributed to clients.

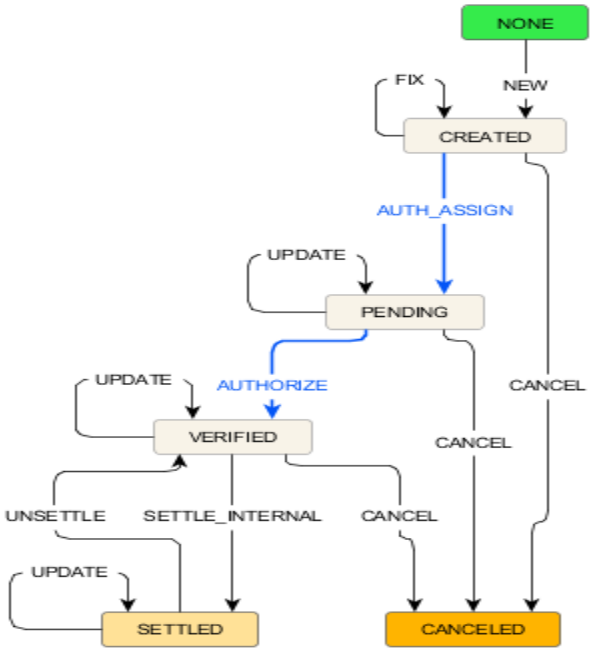
Refer to 3.8.2 Transfer Engine for the configuration required to support this model.

Transfer Workflow

The transfer workflow for all transfers other than those related to external payments between client and PO (typically only found on Margin Call trades) will always expect perfect settlement, but we will stop the STP path in VERIFIED status so that if they get updated or cancelled intraday, we can still cancel them. We use an action of SETTLE_INTERNAL to move them to SETTLED as part of the EOD process, and can use the PROCESS_TRANSFERS scheduled task with an action of SETTLE_INTERNAL to isolate only these internal transfers.

External payments will be settled through a SETTLE workflow action, which can be triggered by a separate scheduled task or manually triggered.

Note that there is no CANCEL action from the SETTLED status. This ensures that any transfer which has been settled will be reversed out instead of cancelled.



Screenshot of the PROCESS_TRANSFER scheduled task used to move internal transfers to SETTLED status once all processing is done, but prior to generating the statement.

Task Attributes	
Process	Apply Action
Status	VERIFIED
Action to Apply	SETTLE_INTERNAL
Agent	
SD Filter	

3.5.4 Behavior of Transactions in the Statement

One of the benefits of using the Accounting Booking Date is that transactions can now be classified as new, backdated, corrected and cancelled by comparing the transactions Settle Date (the date it was cleared) and the Booking Date (the date that the PO was set to when the trade was accepted into the system. This classification is used in the Trade Confirmation section of the client statement is given below, including a description of the enhanced Trade Open Quantity and Liquidation Tables. Note that the statement period is considered to be from the day after the last statement until the processing date on which the statement is being run, so it could include more than one calendar day.

3.5.5 Trade Open Quantity (TOQ) Table

Trades which contribute to open positions are stored in Calypso in the Trade Open Quantity (TOQ) table. The structure of the TOQ gives us all of the information we need to know about the

TOQ Id	Trade Id	Trade Date	Settle Date	Quantity	Price	Booking Date	History	Status	Open Quantity
1	1000	30-Sep	30-Sep	10	99	30-Sep	New	Eligible	4
2	1001	30-Sep	30-Sep	-6	101	30-Sep	New	Eligible	0

trade economic details, when it was entered, when it was cleared and when/if it has been amended or cancelled. The columns in this table are referenced throughout the next sections as a way to determine which transactions to include in each statement section and subsection.

3.5.6 Liquidation Table and Liquidation Deletion Tables

Similarly, the history of the offsets of buys and sells are stored in two tables, the Liquidation Table and The Liquidation Deletion Table. Through the combination of these two tables, we can determine what to include in the P&S section of the statement and characterize them appropriately as new offsets or cancelled offsets. The structure of the two tables is shown below and is referenced in the inclusion logic in the next section.

Liquidation Table

Trade 1	Trade 2	Liquidation Date	Quantity	Realized	Booking Date
1000	1001	30-Sep	6	24000	30-Sep

Liquidation Deletion Table

Trade 1	Trade 2	Liquidation Date	Quantity	Realized	Booking Date	Deleted Date
1000	1001	30-Sep	6	24000	30-Sep	2-Oct

3.5.7 Trade Confirmation Section – Subheadings and Inclusion Logic

The trade confirmation section will have subsections which identify new (business as usual), cancelled, backdated and amended trades. The logic of which trades to include is described below and depends on the updated Trade Open Quantity (TOQ) table.

New Trades

Top Day trades will be included underneath the subheading "NEW TRADES".

Include trades from TOQ where all of the following criteria are met

Status = Eligible

History = New

Last Statement Date<Later of the Settle and Booking Dates<=Statement Date

LiquidableWith keyword is not populated (trade is not a technical close out trade)

Amended Trades

Amended trades will be included underneath the subheading "AMENDED TRADES".

Include trades from TOQ where all of the following criteria are met

Status = Eligible

History = Amend

Last Statement Date<Booking Date<=Statement Date

Settle Date<=Statement Date

LiquidableWith keyword is not populated (trade is not a technical close out trade)

Backdated Trades

Top Day trades will be included underneath the subheading "BACKDATED TRADES".

Include trades from TOQ where all of the following criteria are met

Status = Eligible

History = New

Last Statement Date<Booking Date<=Statement Date

Settle Date<=Last Statement Date

LiquidableWith keyword is not populated (trade is not a technical close out trade)

This criteria implies that any trade which is put into a new Account is the result of a cancel and replace action. Otherwise, a trade where the Client Account is amended would get picked up in the Amended trade section since the value in the 'History' field would be "Amend".

Cancelled Trades

Top Day trades will be included underneath the subheading "CANCELLED TRADES".

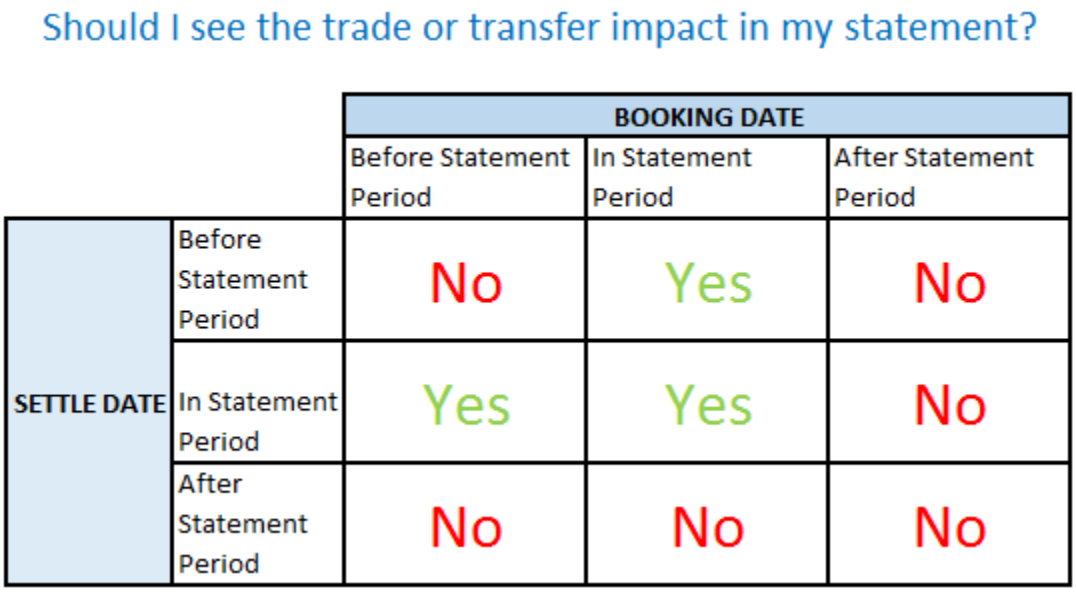
Include trades from TOQ where all of the following criteria are met

Status = Canceled

Last Statement Date<Booking Date<=Statement Date

LiquidableWith keyword is not populated (trade is not a technical close out trade)

Here's a table to help visualize the rules for trade inclusion



3.6 Fees Setup

A number of fees need to be setup for the following trades:

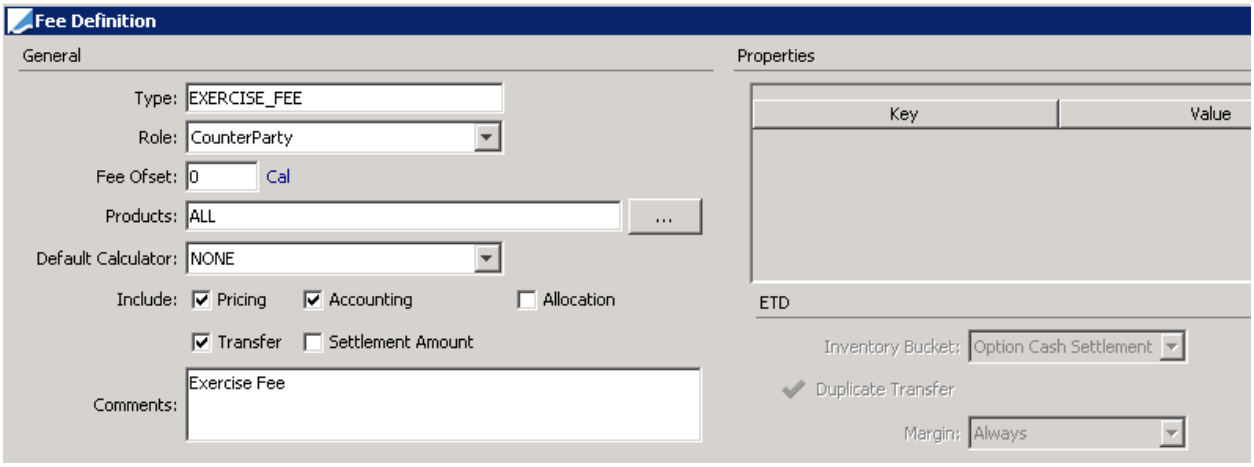
- Future and Future Option trades – Exchange/Clearing Fees and Commissions (optional)
- Clearing Transfer and Collateral Exposure trades – NOV, NOV_REV, NPV, NPV_REV, OTE, OTE_REV, DISC_FWD_OTE, DISC_FWD_OTE_REV
- Trade Exercise – EXERCISE_FEE

Fees and Commissions

These optional fees can be defined by the user, but they must be classified in the Inventory Bucket of "Fees" or "Commissions" in order to be properly aggregated in the cash balance and client statement level.

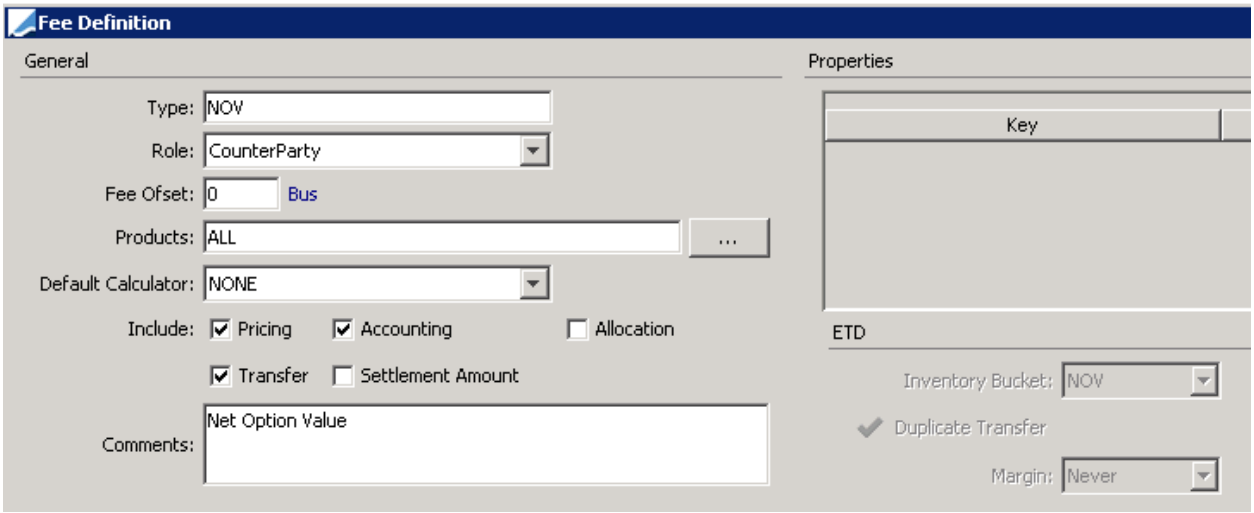
EXERCISE_FEE

Calculated upon exercise.



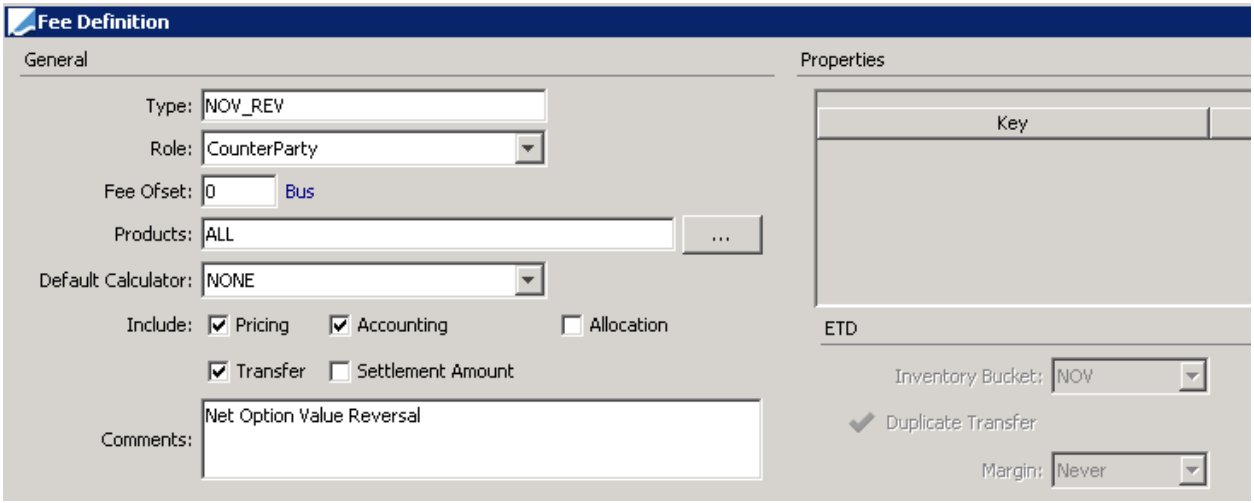
NOV (Net Option Value)

Calculated by the scheduled tasks CLEARING_VM_CALC and CLEARING_IM_CALC.



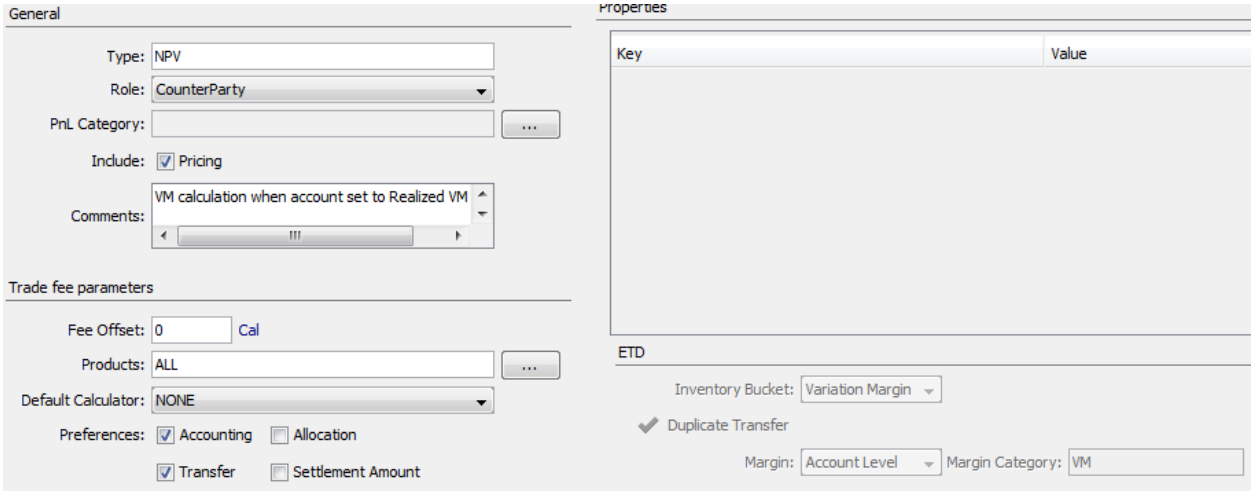
NOV_REV

Calculated by the scheduled tasks CLEARING_VM_CALC and CLEARING_IM_CALC.



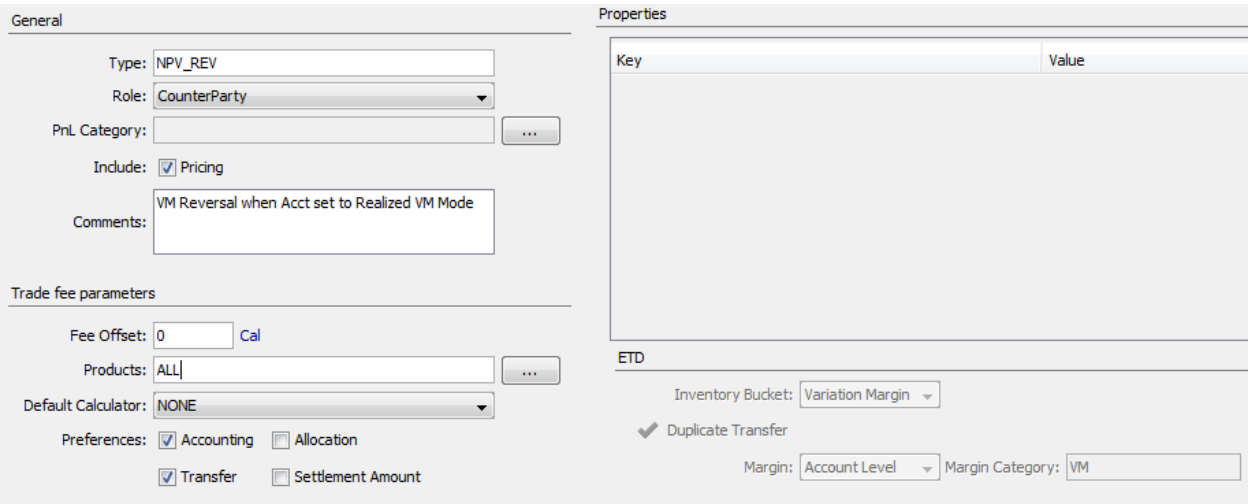
NPV

Calculated by the scheduled tasks CLEARING_VM_CALC.



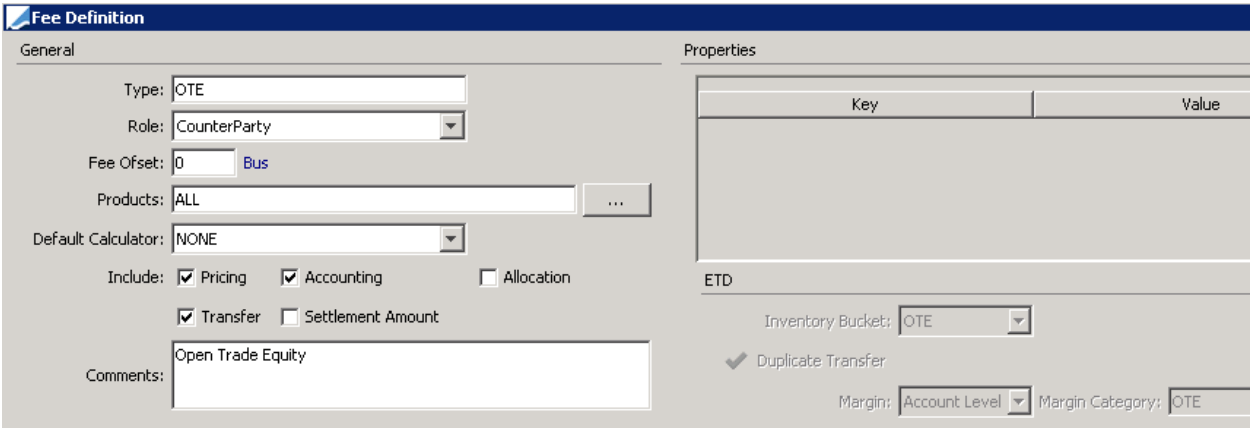
NPV_REV

Calculated by the scheduled tasks CLEARING_VM_CALC.



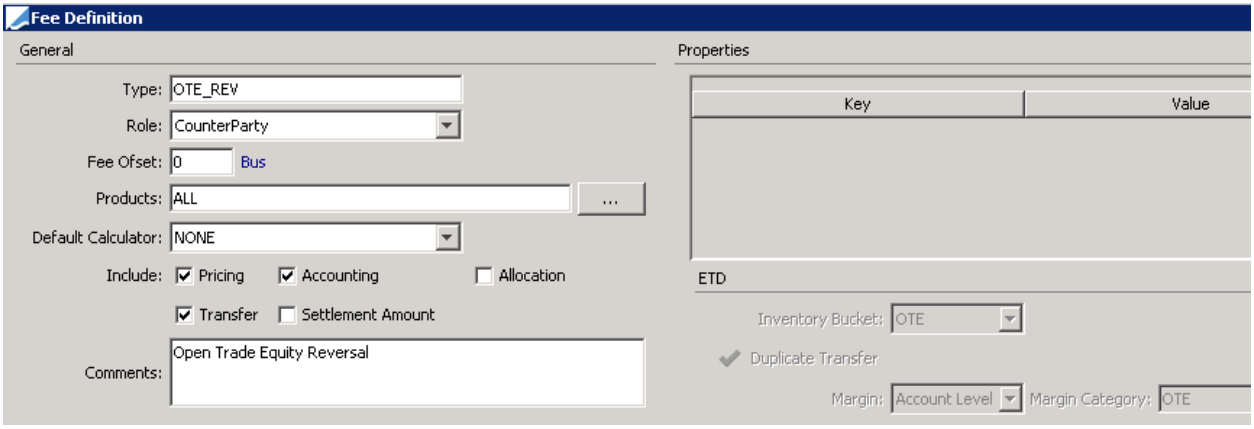
OTE (Open Trade Equity)

Calculated by the scheduled tasks CLEARING_VM_CALC.



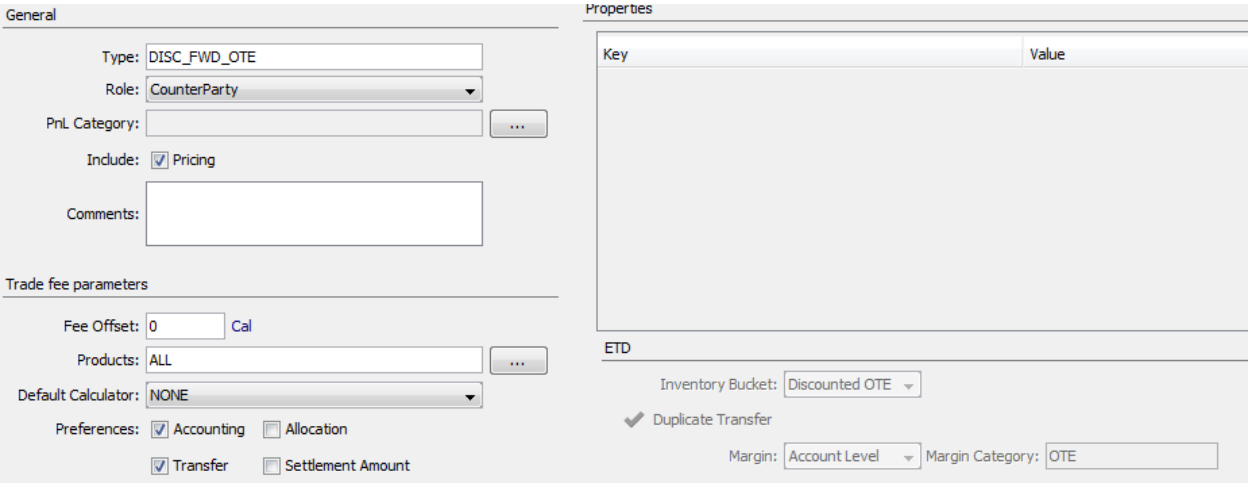
OTE_REV

Calculated by the scheduled tasks CLEARING_VM_CALC.



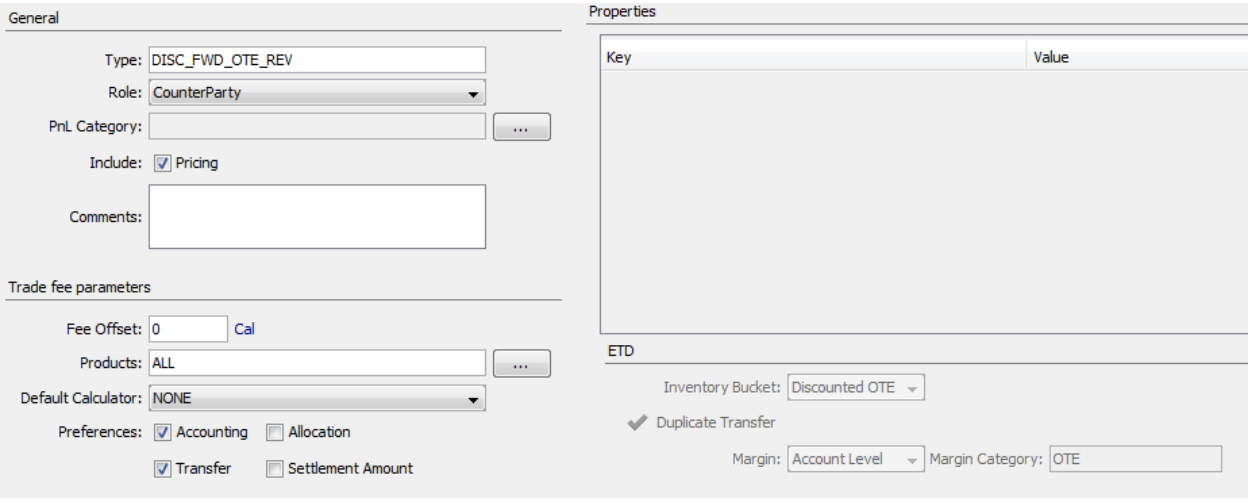
DISC_FWD_OTE

Calculated by the CLEARING_VM_CALC scheduled task it represents any discounted forward contract value. Discounted OTE is calculated only for Future product types when the contract's exchange is an LE whose MIC Attribute value equals "LME". This is hard coded in v15.



DISC_FWD_OTE_REV

Calculated by the CLEARING_VM_CALC scheduled task it represents the reversal of the previous day's discounted forward contract value. Discounted OTE is calculated only for Future product types when the contract's exchange is an LE whose MIC Attribute value equals "LME". This is hard coded in v15.



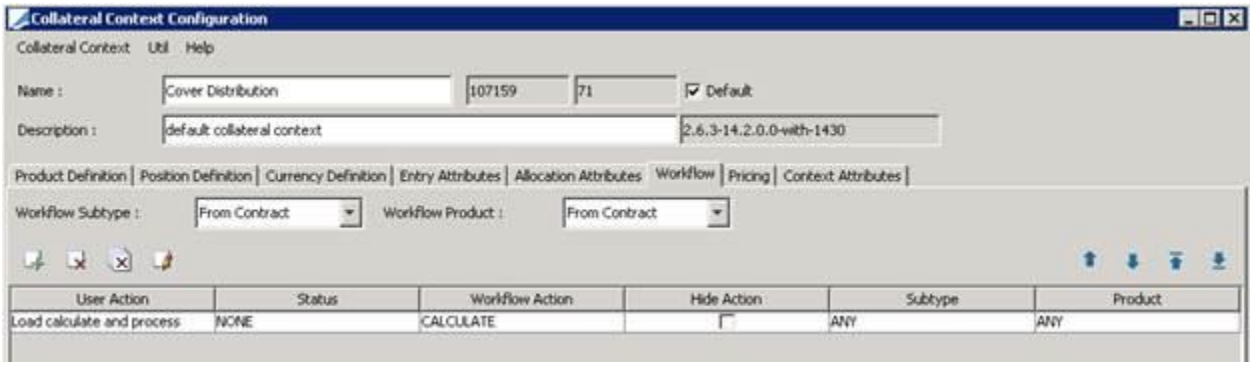
3.7 Collateral Setup

The workflow below supports collateral processing for ETD Clearing.

Note that Cover Distribution should be executed by selecting the "Load, Calculate and Process" action and then the contracts are moved through the workflow STP based on the Collateral Context.

Id	Orig Status	Action	Resulting Status	Different User	Use STP	Priority	Log	Subtype	Product Type	Rules	Processing
332508	CALCULATED	CALCULATE	CALCULATED	☐	☐	0	☐	ALL	ALL		ALL
332129	CALCULATED	PROCESS	PROCESSED	☐	☑	0	☐	ALL	ALL		ALL
335425	CALCULATED	REFRESH	NONE	☐	☐	0	☐	ALL	ALL		ALL
335423	EXECUTED	CALCULATE	CALCULATED	☐	☐	0	☐	ALL	ALL		ALL
335424	EXECUTED	PROCESS	PROCESSED	☐	☐	0	☐	ALL	ALL		ALL
335426	EXECUTED	REFRESH	NONE	☐	☐	0	☐	ALL	ALL		ALL
332128	NONE	CALCULATE	CALCULATED	☐	☐	0	☐	ALL	ALL		ALL
332507	NONE	PROCESS	PROCESSED	☐	☐	0	☐	ALL	ALL		ALL
332510	PROCESSED	CALCULATE	CALCULATED	☐	☐	0	☐	ALL	ALL		ALL
332130	PROCESSED	EXECUTE	EXECUTED	☐	☑	0	☐	ALL	ALL	Execute	ALL
332509	PROCESSED	PROCESS	PROCESSED	☐	☐	0	☐	ALL	ALL		ALL
335427	PROCESSED	REFRESH	NONE	☐	☐	0	☐	ALL	ALL		ALL
335428	NONE	PRICE	PRICED_RECEIVE	☐	☐	0	☐	ALL	ALL	CheckReceive	ALL
335429	PRICED_RECEIVE	ALLOCATE	ALLOCATED	☐	☑	0	☐	ALL	ALL	AutoAdjust	ALL
335430	ALLOCATED	EXECUTE	EXECUTED	☐	☐	0	☐	ALL	ALL	Execute	ALL
335431	NONE	PRICE	PRICED_PAY	☐	☐	0	☐	ALL	ALL	CheckPay	ALL
335433	NONE	PRICE	PRICED_NO_CALL	☐	☐	0	☐	ALL	ALL	CheckNoCall	ALL
335434	PRICED_NO_CALL	ALLOCATE	ALLOCATED	☐	☑	0	☐	ALL	ALL	AutoAdjust	ALL
335435	PRICED_PAY	ALLOCATE	ALLOCATED	☐	☑	0	☐	ALL	ALL	AutoAdjust	ALL

The Collateral Context maps the "Load Calculate and Process" action with the workflow to move it to executed STP.



3.8 Engines Configuration

Engines are configured using the Engine Manager in Web Admin.

3.8.1 Liquidation Engine

Use the filter LiquidationEngineEventFilter.

3.8.2 Transfer Engine

The Transfer engine must subscribe to PSEventAggLiquidatedPosition events.

It should also use the VerifiedEventFilter.

The following engine parameters must be set:

- LIQUIDATION_CONFIG = ETD Liq Config
- XFER_NEXT_EVENT = true

- XFER_PAST_GENERATION = true
- XFER_POS_AGGREGATION_NAME = ETD Liq Keys
- XFER_USE_POS_AGGREGATION_ONLY = true
- XFER_USE_REVERSE = true

3.8.3 Margin Call Position Engine

Use the filter MarginCallEventFilter.

3.8.1 Accounting/CRE Engine

The Accounting engine must subscribe to PSEventAggLiquidatedPosition events.

Section 4. Legal Entities Configuration

4.1 Processing Organizations

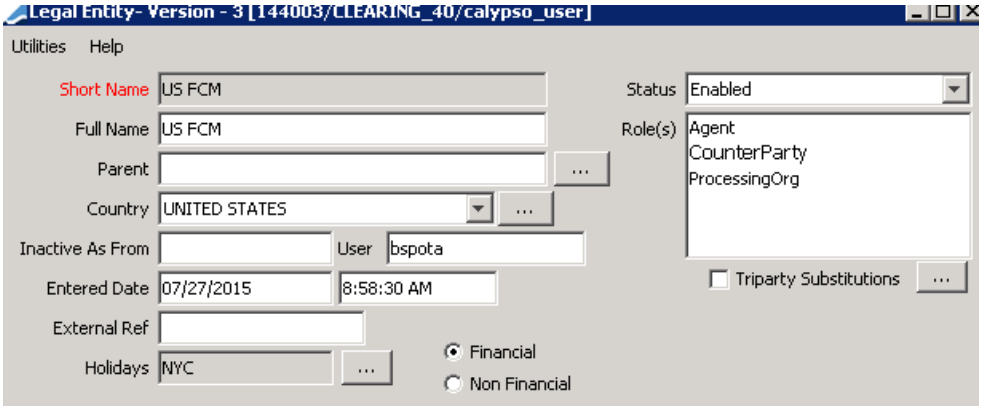
Summary

The primary information required for clearing processing on the Legal Entities is captured through the LE Attributes.

Note that attributes can be applied globally for all POs or can be set to different values per PO. For instance, I could set the DefaultCounterpartyAccount attribute on the Eurex legal entity to be 'X' for PO1 and 'Y' for PO2.

The Processing Organization represents the Clearing Broker operating the system.

The roles **Agent** and **ProcessingOrg** are mandatory.



It is mandatory to define at least one contact for settlement instructions.

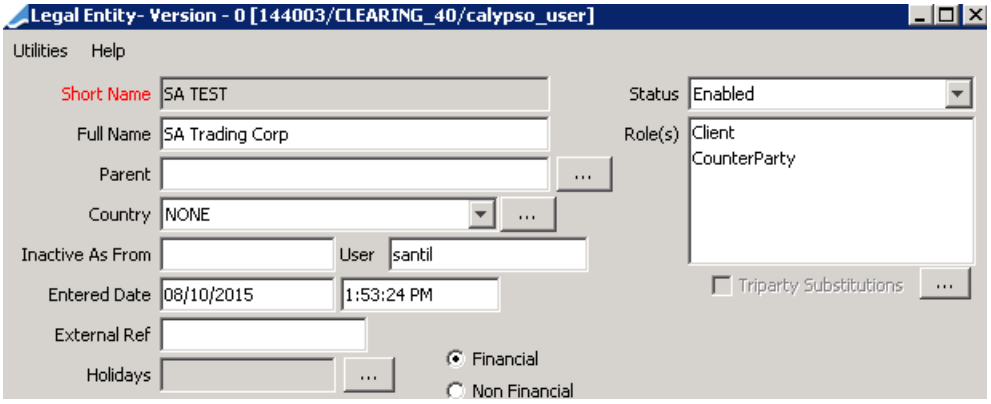
Processing Org Attributes

Attribute Name	Purpose/Impact
Client Clearing Book	Sets the Book on Trades based on the CCPOriginCode of the related Client Account.
House Clearing Book	Sets the Book on Trades based on the CCPOriginCode of the related Client Account.
Client Execution Book	Sets the Book on Cleared Trades based on the ServiceLevel keyword of the transaction for Client activity.
House Execution Book	Sets the Book on Cleared Trades based on the ServiceLevel keyword of the transaction for House activity
ClientErrorAccount	References the Account into which any trade which is entered or imported with an invalid account will be created.
Booking Date	The current processing date, set in format of mm-dd-yyyy. This date can be set manually and can also be rolled forward using the ROLL_BOOKINGDATE scheduled task

4.2 Client

The Client represents either the external (client) or proprietary (house) entity clearing through the PO.

The roles **Client** and **CounterParty** are mandatory.



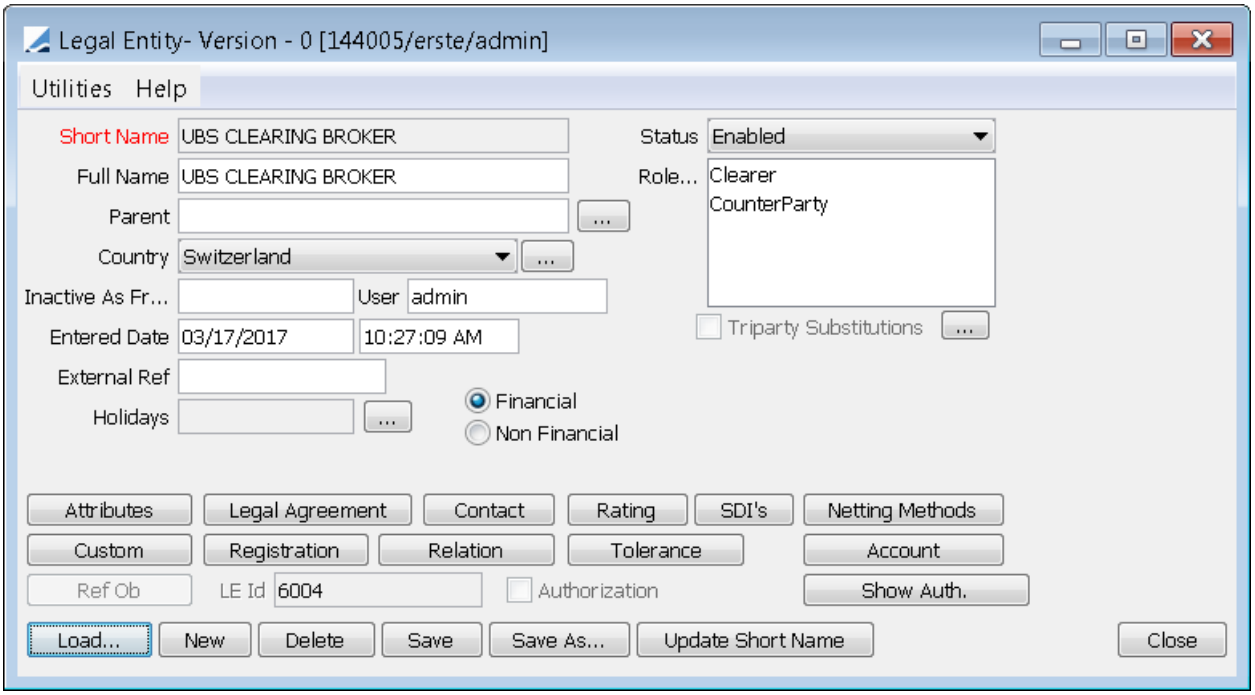
It is mandatory to define at least one contact for settlement instructions.

There are no mandatory client attributes, since most client specific information is captured by the account definition.

4.3 Counterparty

The Counterparty represents the clearing house or Third Party Broker through which the PO clears and/or executes its client trades.

The roles **CounterParty** and **Clearer** are mandatory.



It is mandatory to define at least one contact for settlement instructions.

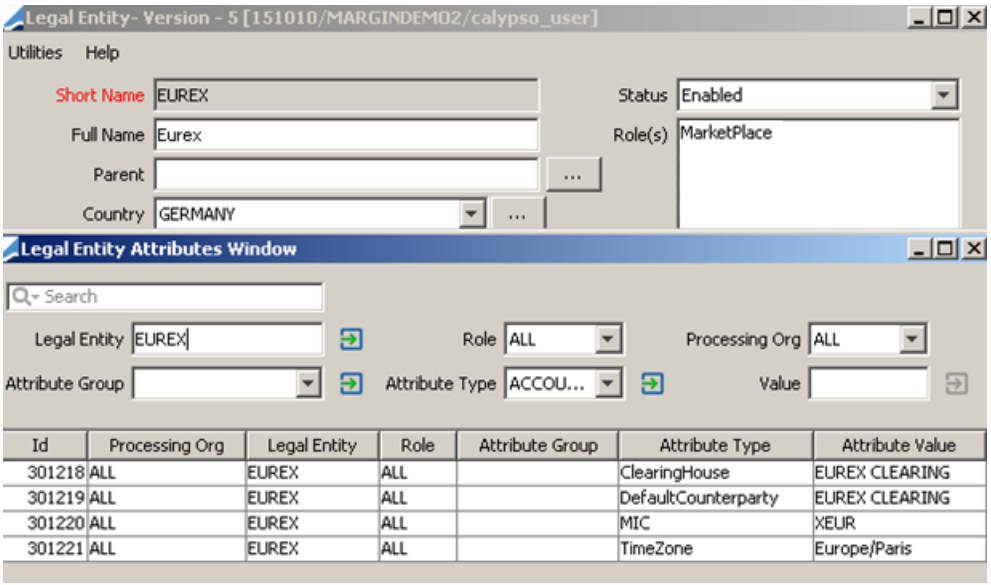
Counterparty Attributes

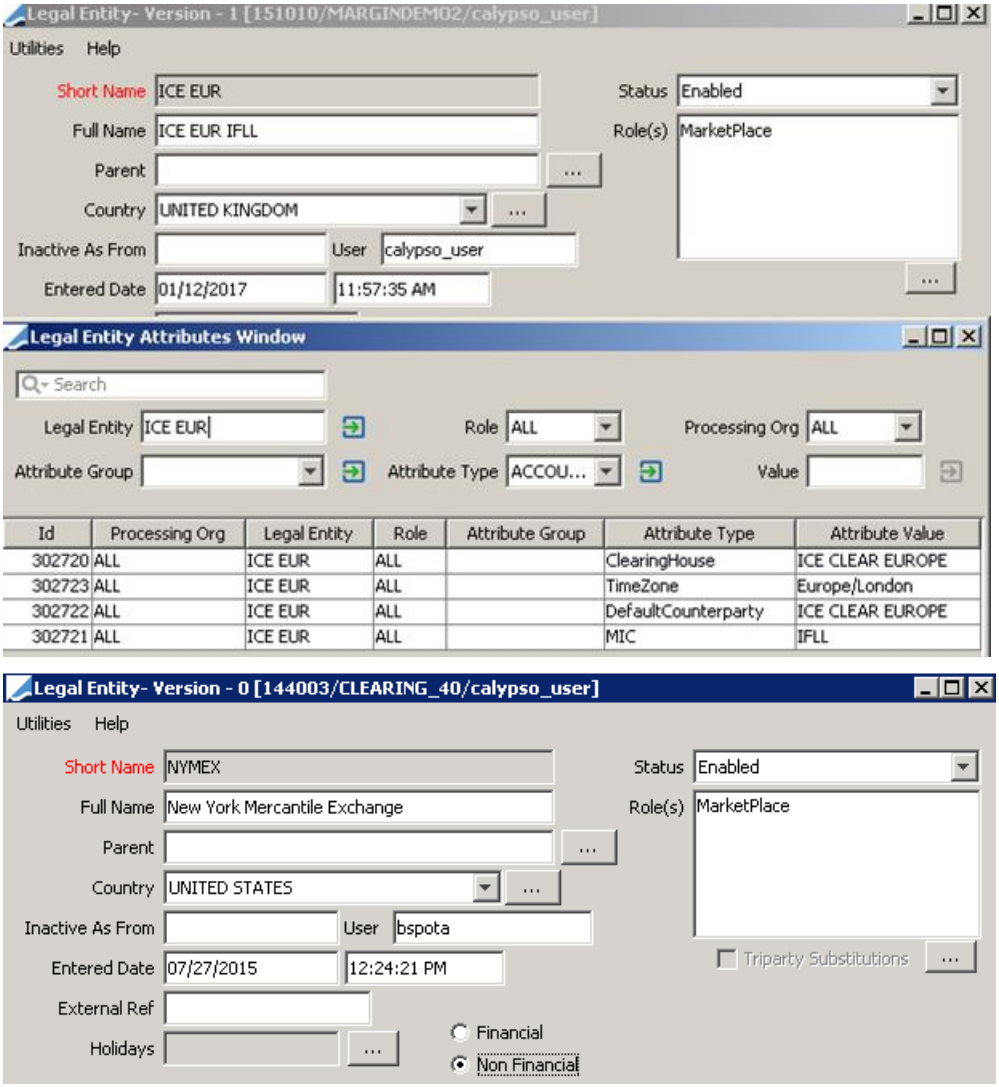
Attribute Name	Purpose/Impact
DefaultHouseAccount	Sets the Counterparty Account to be used for a trade cleared by a House account, when the Counterparty Account is not provided on the trade capture. The value must match a valid Counterparty Account with the LE as the Account owner.
DefaultClientAccount	Sets the Counterparty Account to be used for a trade cleared by a Client account, when the Counterparty Account is not provided on the trade capture. The value must match a valid Counterparty Account with the LE as the Account owner.
DefaultExecutionAccount	Sets the Counterparty Account to be used for an execution only trade executed by the PO. The value must match a valid Counterparty Account with the LE as the Account owner.

4.4 Exchange

The Exchange represents the entity that facilitates the trading of the products cleared by the PO.

The role **MarketPlace** is mandatory.





Exchange Attributes

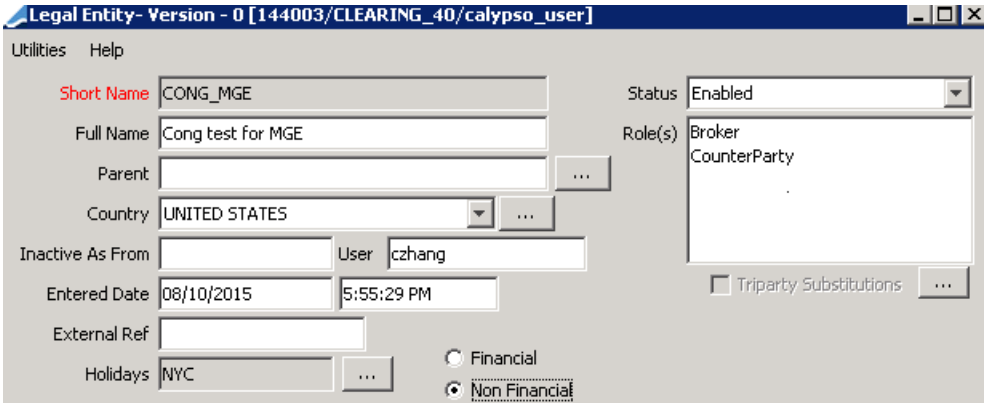
Attribute Name	Purpose/Impact
ClearingHouse	Indicates the Clearinghouse on which this exchange's products are cleared. The value should be the LE Short Name of a valid Counterparty.
MarginMethod	Sets the Initial Margin Calculation method for the exchange. This is set on the exchange rather than the Clearinghouse because some clearinghouses use different methodologies for different exchanges when they clear multiple exchanges. This attribute can be left blank, in which case it will default to the primary supported exchange methodology. The use can instruct the IM calculation to be done using simple strategy margining by entering a value of "Strategy" here See Initial Margin Calculation for details.
DefaultCounterparty	Indicates the Counterparty through which products on this exchange will be cleared for the indicated Processing Org. This allows the Counterparty of the cleared trade to be set if it's not provided in the trade capture process. This attribute allows the PO to indicate whether the

Attribute Name	Purpose/Impact
	products on this exchange are cleared directly on the Clearinghouse, or through a 3rd Party Broker.
MIC	The official Market Identification Code for this LE. This allows us to uniquely identify this exchange despite the users' choice of long or short name and is used to uniquely identify the exchange for our FOW interface and for SPAN calculations.
TimeZone	The Time Zone in which the exchange operates. Used for Last Trading Time.

Note that the attributes can be defined as associated to ALL Processing Orgs or to a specific PO. This is important, since in a multi-PO environment we expect all POs to use the same Exchange and Counterparty Legal Entities, but we also understand that some POs will clear a particular market on the clearinghouse, while others may set the DefaultCounteparty to a 3rd part broker. We should be able to define these attributes per PO and have the processing logic look for the specific PO name first, then look for the attribute associated to ALL POs.Executing Broker

The Executing Broker represents an entity that may execute transactions for the PO's clients, with the intent of giving the up to the PO to clear. The PO may also execute trades.

The roles **Broker** and **CounterParty** are mandatory.



Section 5. Collateral Configuration

Collateral contracts hold the configuration that drives the calculation of margin excess/deficit and the generation of predictive margin calls facing clients and counterparties. Facing the client, we expect a single Deposit "clearing member config" contract which is compatible with the Cover Distribution Model to hold all of the cash and collateral that is not allocated to cover a margin requirement. Margin requirements are held in a separate child contract, and assets are moved between the two in order to attempt to meet the margin requirements.

This section will not go into deep detail of the configuration, as that is already documented in the Collateral documentation. This document will simply highlight the configurations that are critical to the clearing model.

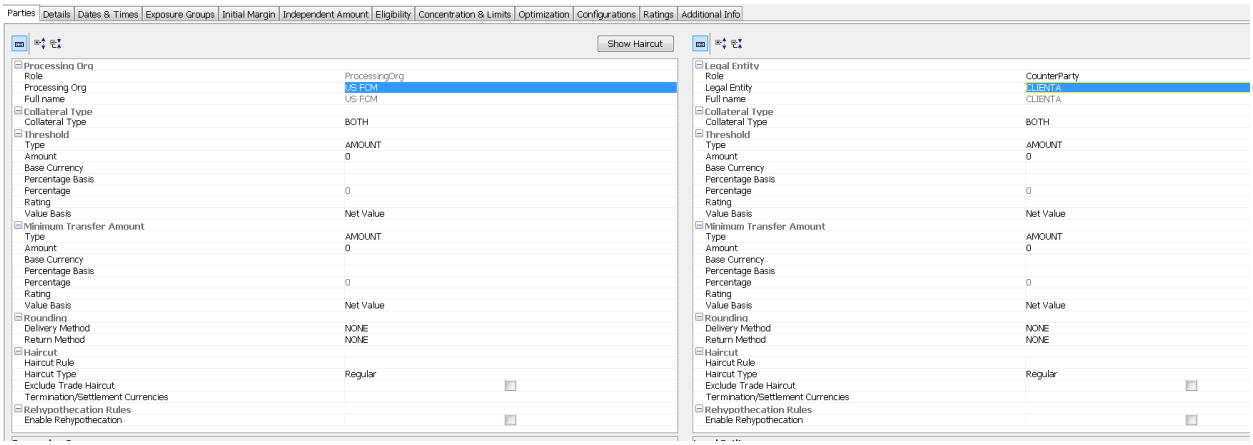
5.1 Client Collateral – "Deposit Contract" for VM Settlement in Original Currency

To be able to settle the variation margin in the original trade currency we rely on the concept of a **Master margin call contract with Exposure Groups** per currency (or child contracts). Each transfer will be enriched with the contract id of the Exposure Group associated with the transfer currency. Each exposure group is a subset/child margin call contract. The Master is only defined to link these children contracts and is used as the Deposit Contract in the Clearing tab of the Client or Counterparty Account. This allows the system to link collateral information with the clearing account activity.

To define a Deposit Collateral Contract, go to the menu Margin Call and Choose the SubType Master. Then follow the steps below:

Parties Tab

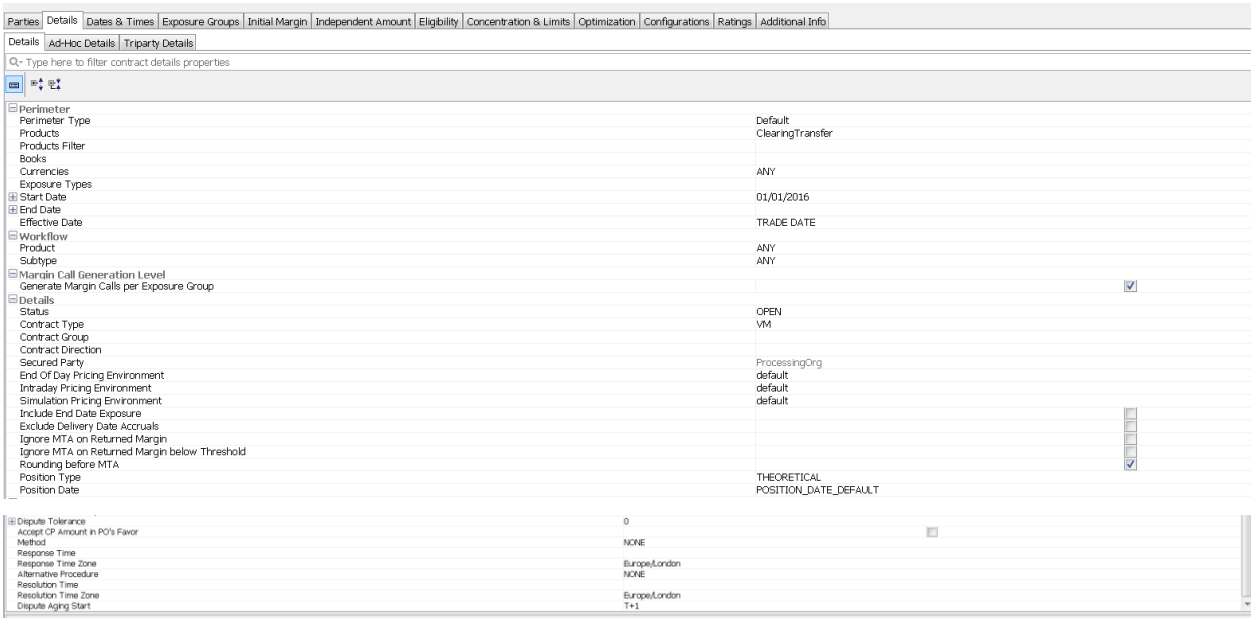
Field Name	Purpose/Impact
Processing Org	The PO Legal Entity that is managing the Client Account.
LE Role	Set this to '**Counterparty**'.



Details Tab

Field Name	Purpose/Impact
Products	ClearingTransfer.
Books	Should be set to the Book in which the client's trades are captured. The ETD model does not recommend multiple Books, especially not for a single client, so this should just be a single value.
Currencies	Any.

Field Name	Purpose/Impact
Start Date	This is used as the Trade Date of the Collateral Exposure trade generated from the contract. Set to a date in the past.
Position Type	THEORETICAL
Position Date	POSITION_DATE_DEFAULT
Contract Direction	NET-BILATERAL
End of Day/Intraday Pricing Environment	Set to the PE used for clearing activity.
Generate a Call	This is set to 'True' if you want to generate a Margin Call

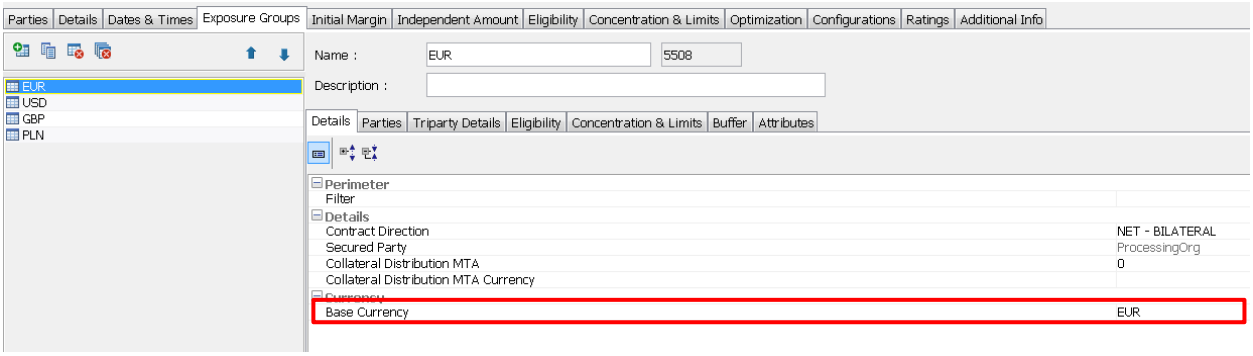


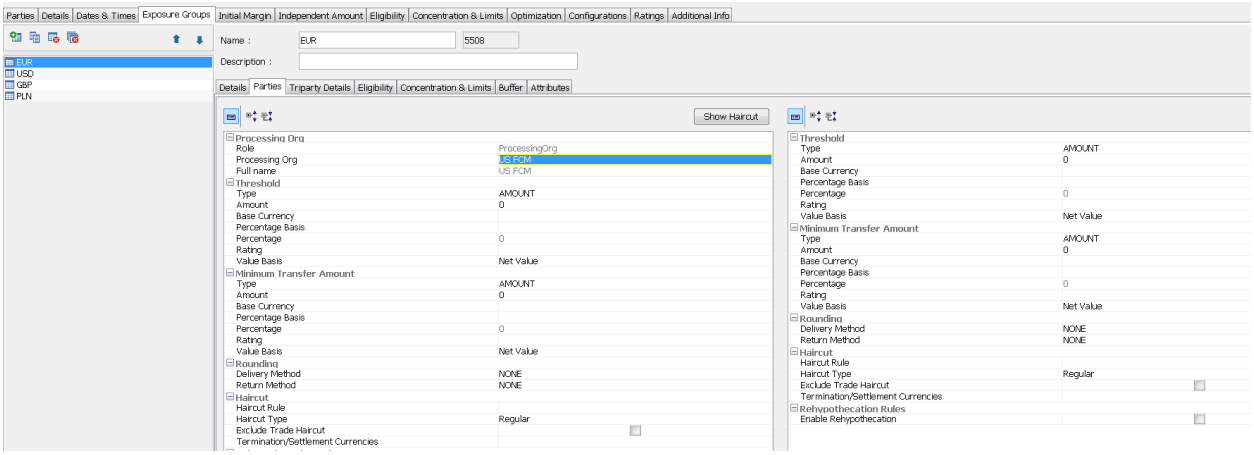
Dates & Times Tab

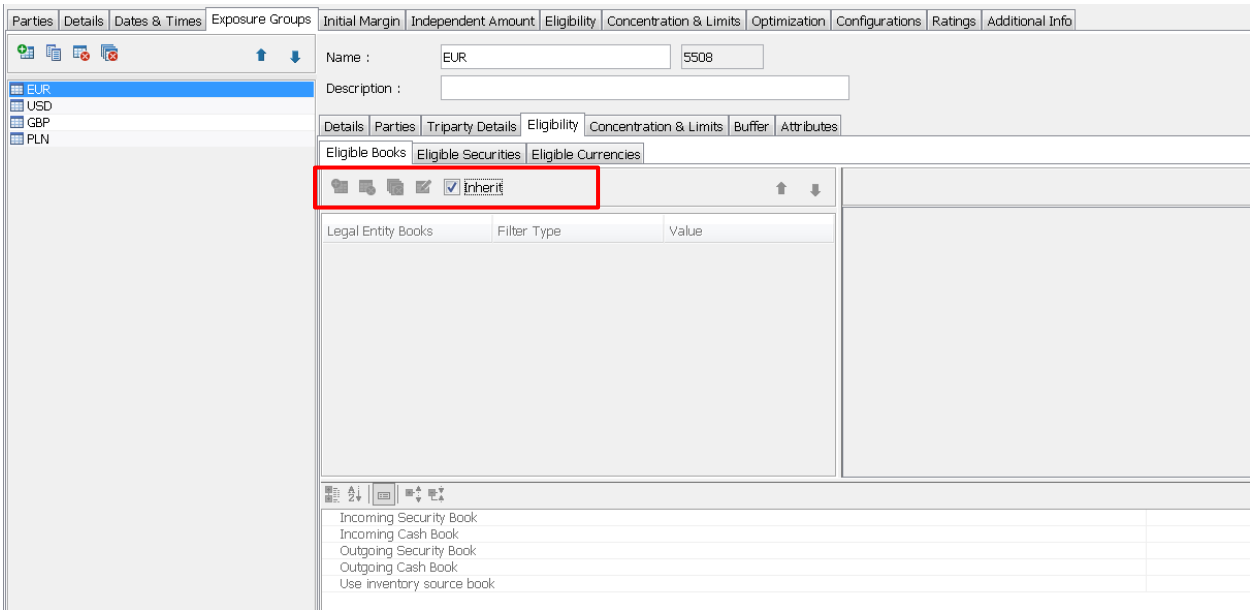
Field Name	Purpose/Impact
Value Date Frequency	COL_MIGR_DAILY_BUS – A date rule which sets the processing date to business dates on the configured calendar.
Valuation Time Offset	COL_MIGR_VAL_REL - A date rule which is relative to the rule above and falls one business day prior. This sets the Collateral processing so that the process date is always T+1 based on end of day balances on T, and generates a Margin Call which is settled on T+1.
Valuation Time	Set to the same time as the Book EOD time.
Valuation Time Zone	Set to the same time zone as the Book.

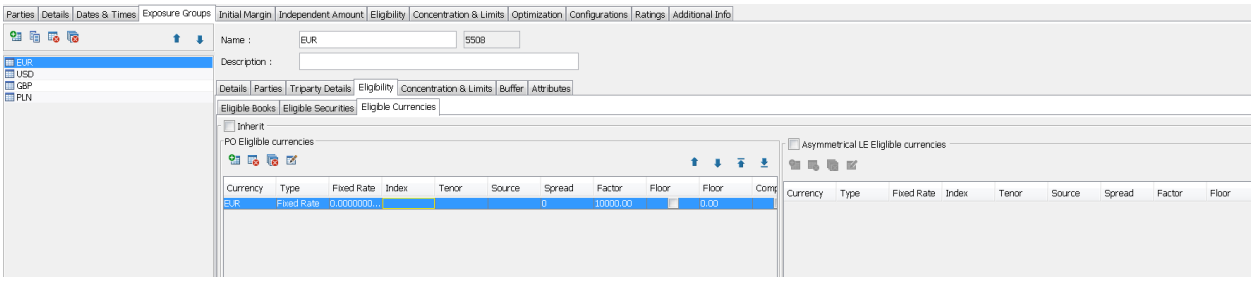
Exposure Groups Tab

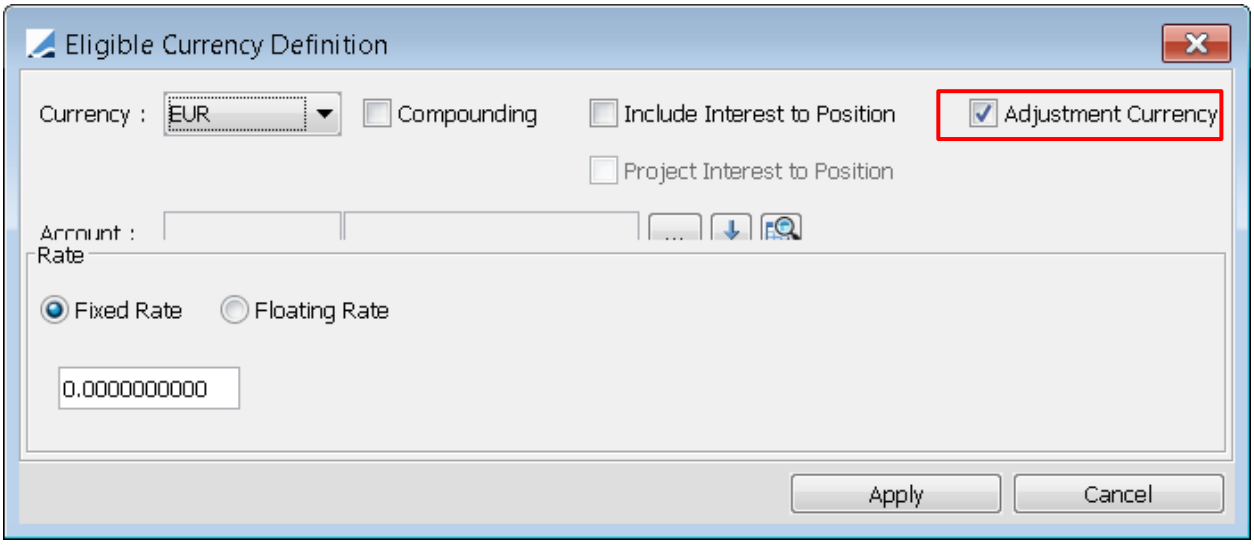
Field Name	Purpose/Impact
Details/Base Currency	Define an Exposure Group per Currency cleared on this client account and define the Base Currency as Exposure Group Currency. In the screenshot below, we define an Exposure Group for EUR and Define Base Currency = EUR. We need to do the same for each currency that the client account is clearing in order to generate a margin call per cleared currency.
Eligibility/Eligible Books	Inherit from the Master contract
Eligibility/Eligible Currencies	Add the Exposure Group Currency as eligible currency and define it as Adjustment Currency. Do the same for each Exposure Group you define per currency
Attributes	Define MARGIN_TYPE = VM and PRODUCT_TYPE = ETD
No other specificity to define at Exposure Group level for standard VM settled in the original trade currency. All elements not defined at the exposure group level are inherited from the Master	

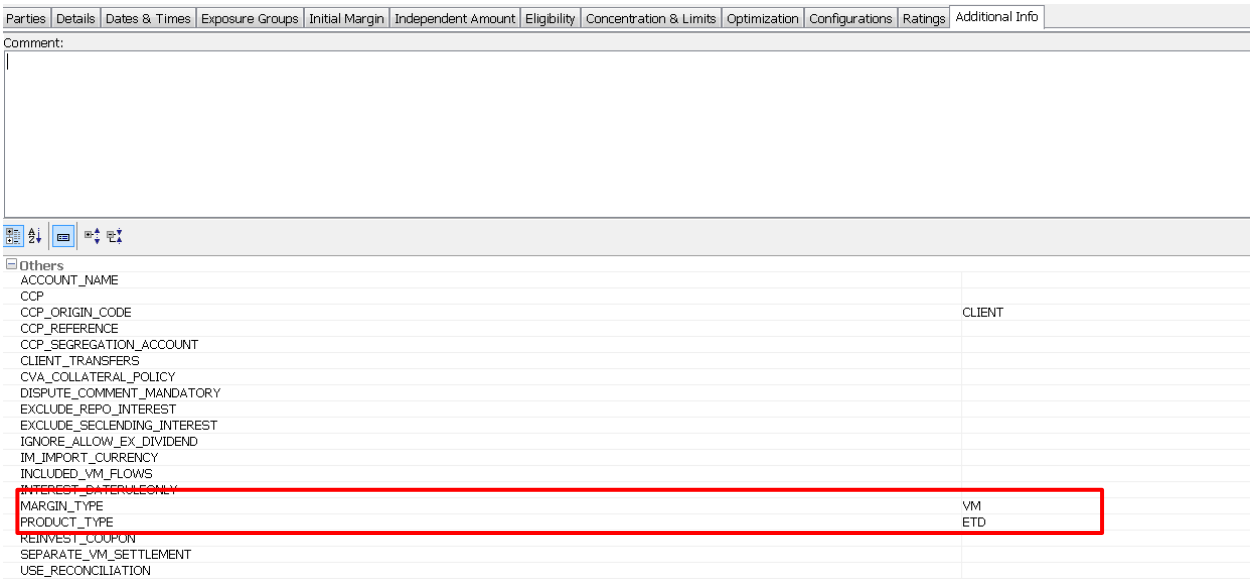












Eligibility Tab – Eligible Books Sub-Tab

Enter incoming/ougoing Cash and Security Books for that PO.

Eligibility Tab – Eligible Currencies Sub-Tab

Field Name	Purpose/Impact
Base Currency	Equal to the Base Currency of the Account. This currency is not used when contract is defined with Exposure Group per currency.
Cash MarginCall Account	True.
Security MarginCall Account	True.
Orderer Role	Set this to '**Client**' as this will trigger the generation of a second transfer on the Margin Call trade that will credit the internal client account when a client makes a payment.
Eligible Currencies	Leave it empty when using Exposure Group per Currency.

Additional Info Tab

Field Name	Purpose/Impact
CCP_ORIGIN_CODE	Set to "HOUSE" or "CLIENT" (note caps) based on account status.
MARGIN_TYPE	Set to "**VM**" for the Deposit Contract.
PRODUCT_TYPE	Set to "**ETD**" for ETD accounts.

You will then have to attach the Master VM contract to the Clearing tab on the Client Account as a Deposit Account (See Client Account section).

5.2 Client Collateral - Liability or IM Contract

The liability contract does not refer to exposure group as initial margin is settled in a unique/consolidated currency. The Eligible currency is therefore defined at the contract level as adjustment currency.

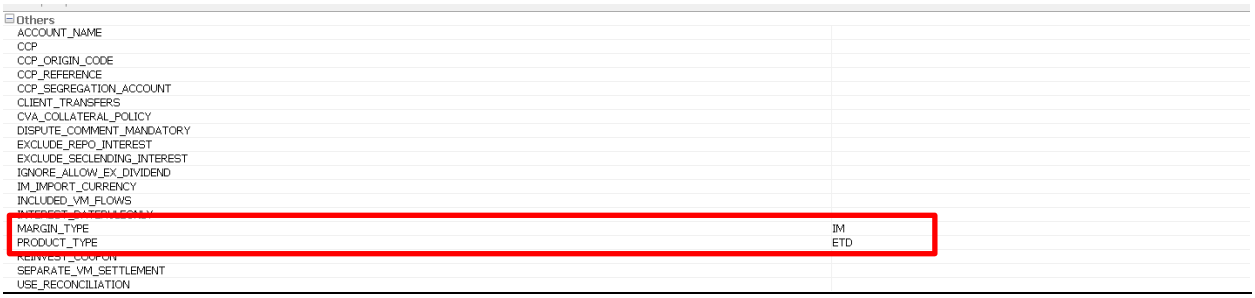
We only outline below the differences between the Deposit and Liability contract definition.

Details Tab

Field Name	Purpose/Impact
Exposure Types	Initial Margin, Variation Margin. This ensures that collateral exposures that represent actual IM as well as those that represent OTE will be collected by the contract.
Products	CollateralExposure.

Additional Info Tab

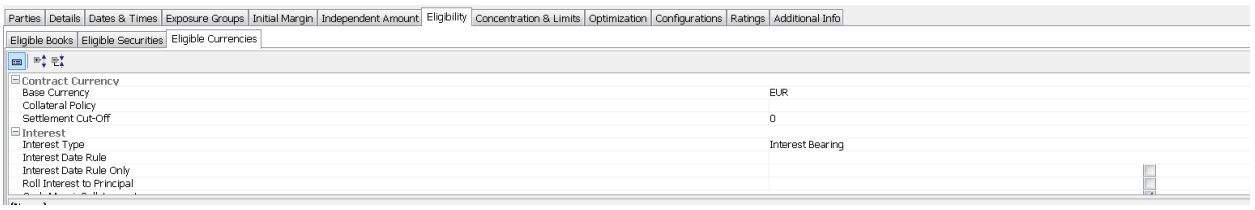
Field Name	Purpose/Impact
PRODUCT_TYPE	Still set to '**ETD'**
MARGIN_TYPE	Set to "**IM**" for the Liability Contract.

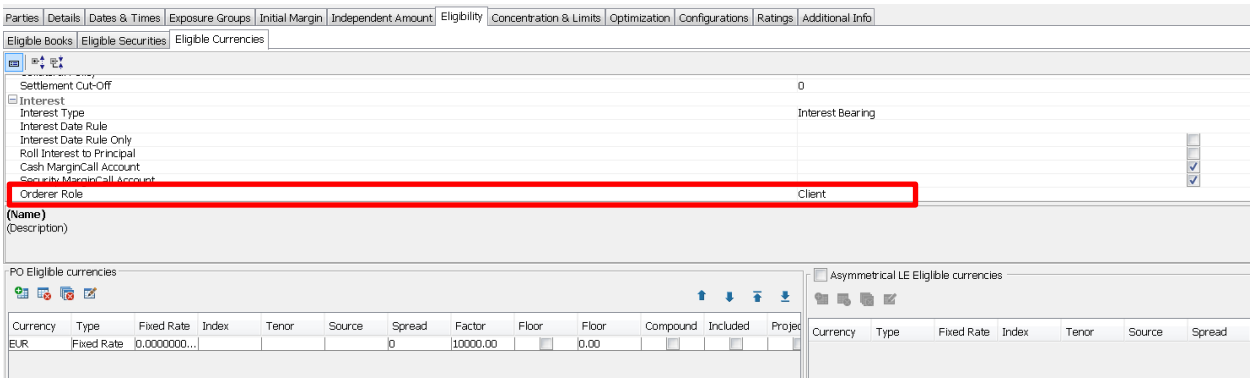


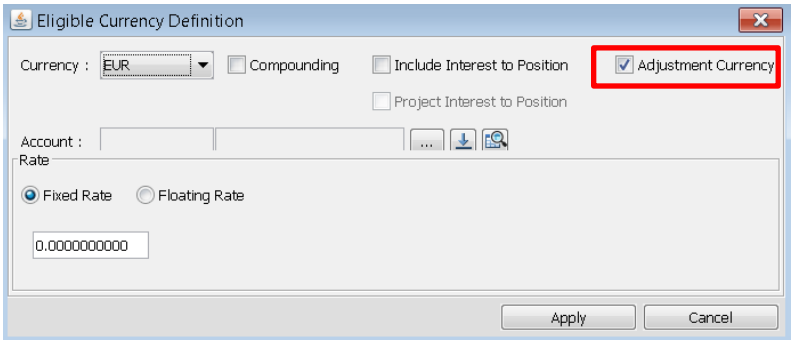
Eligibility Tab - Eligible Currency Sub-Tab

We do not refer to Exposure group and define the IM payment currency as the unique eligible currency in the Eligible currency part of the IM contract. This currency is also defined as Adjustment Currency for that contract

Field Name	Purpose/Impact
Base Currency	Set the IM Settlement Currency
Orderer Role	Set Role '**Client**' as this will trigger the generation of a second transfer on the Margin Call trade that will credit the internal clearing account when a client makes a payment.
Eligible Currency	Set the IM Settlement Currency and define that currency as Adjustment Currency







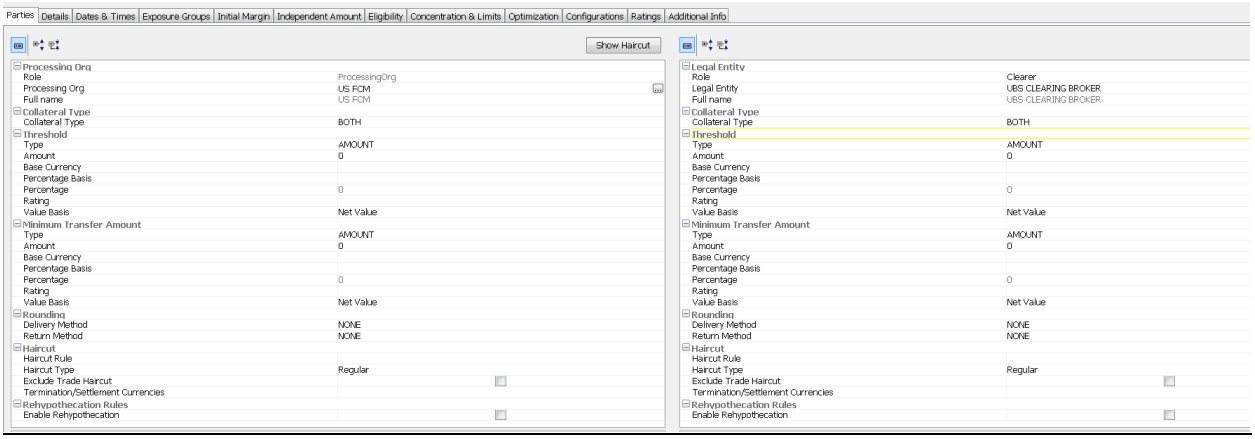
You will then have to attach the IM contract to the Clearing tab on the Client Account as a Liability Account (See Client Account section).

5.3 Counterparty Collateral – Variation Margin Contract

The counterparty VM contract is defined using Master Contract and Exposure Group, similarly to what we do on the client side. Only the Role used in the parties and eligibility tab are different. See details below.

Parties Tab

Field Name	Purpose/Impact
Processing Org	The PO Legal Entity that is clearing through the Counterparty Account.
Legal Entity	The Clearer (clearinghouse or carry broker).
LE Role	Set this to '**Clearer**'.



Details Tab

Field Name	Purpose/Impact
Products	ClearingTransfer.
Books	Should be set to the Book in which trades are captured. The ETD model does not recommend multiple Books, especially not for a single client, so this should just be a single value.
Currencies	Any.
Contract Type	VM
Status	OPEN
Contract Direction	NET-BILATERAL
Position Type	THEORETICAL
Position Date	POSITION_DATE_DEFAULT
End of Day/Intraday Pricing Environment	Set to the PE used for clearing activity.
Generate a Call	This is set to 'True' if you want to generate a Margin Call

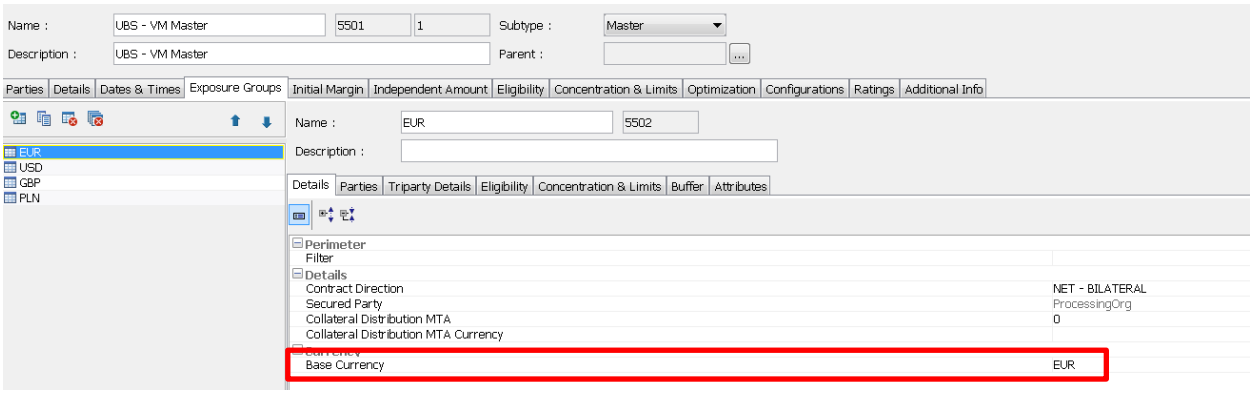
Dates & Times Tab

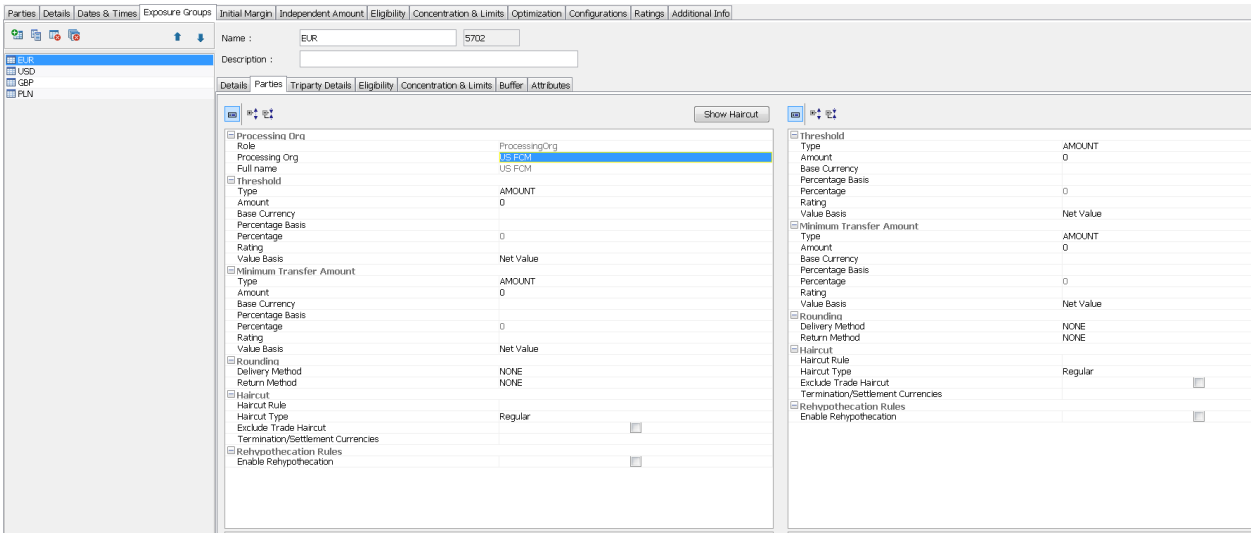
Field Name	Purpose/Impact
Value Date Frequency	COL_MIGR_DAILY_BUS – A date rule which sets the processing date to business dates on the configured calendar.
Valuation Time Offset	COL_MIGR_VAL_REL - A date rule which is relative to the rule above and falls one business day prior. This sets the Collateral processing so that the process date is always T+1 based on end of day balances on T, and generates a Margin Call which is settled on T+1.
Valuation Time	Set to the same time as the Book EOD time.
Valuation Time Zone	Set to the same time zone as the Book.

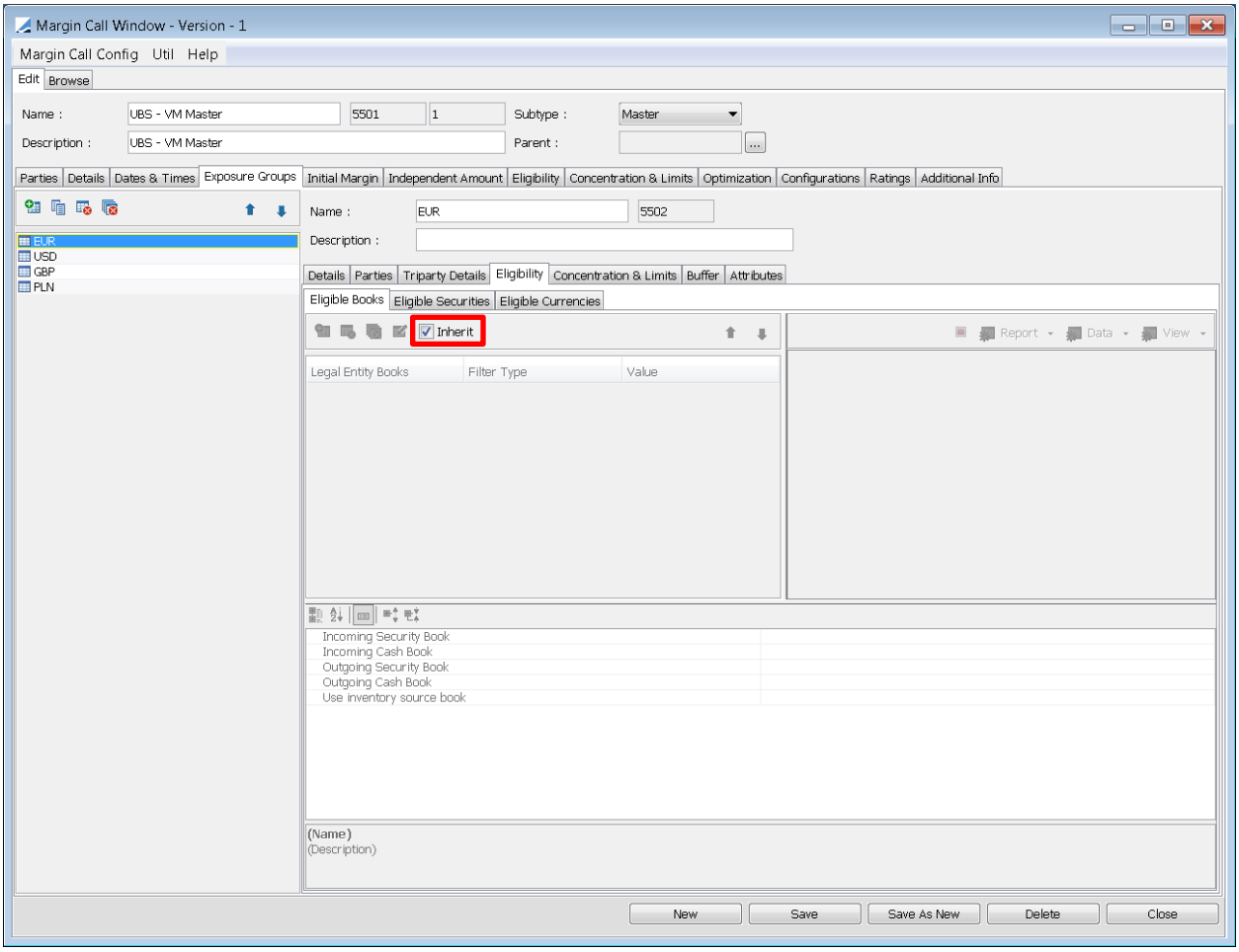
Exposure Groups Tab

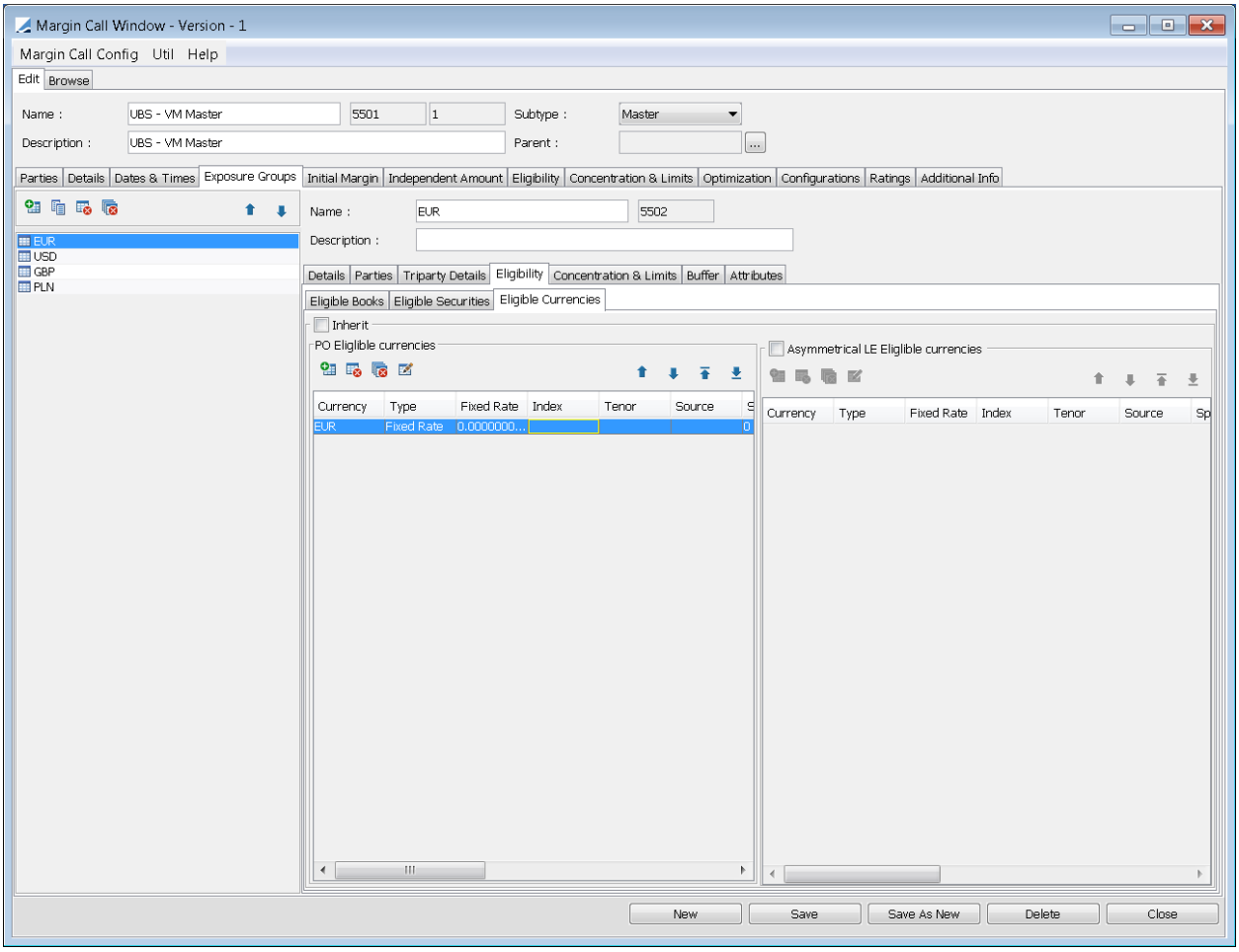
Field Name	Purpose/Impact
Details/Base Currency	Define an Exposure Group per Currency cleared on this CCP/Clearer account and define the Base Currency as Exposure Group Currency. In the screenshot below, we define an Exposure Group for EUR and Define Base Currency = EUR. We need to do the same for each currency that the CCP/Clearer account is clearing in order to generate a margin call per cleared currency.
Eligibility/Eligible Books	Inherit from the Master contract

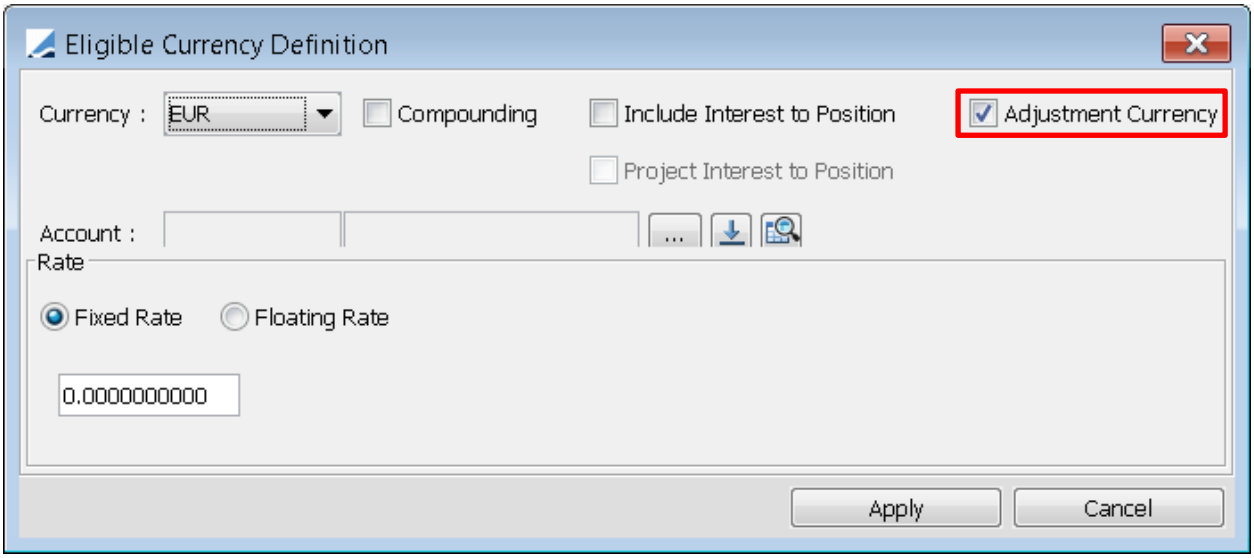
Field Name	Purpose/Impact
Eligibility/Eligible Currencies	Add the Exposure Group Currency as eligible currency and define it as Adjustment Currency. Do the same for each Exposure Group you define per currency
Attributes	Define MARGIN_TYPE = VM and PRODUCT_TYPE = ETD
CCP ORIGIN CODE	CLIENT/HOUSE
No other specificity to define at Exposure Group level for standard VM settled in the original trade currency. All elements not defined at the exposure group level are inherited from the Master	








Margin Call Window - Version - 1
Margin Call Config Util Help
Edit Browse
Name : UBS - VM Master 5501 1 Subtype : Master
Description : UBS - VM Master Parent :
Parties Details Dates & Times Exposure Groups Initial Margin Independent Amount Eligibility Concentration & Limits Optimization Configurations Ratings Additional Info
EUR
USD
GBP
PLN
Name : EUR 5502
Description :
Details Parties Triparty Details Eligibility Concentration & Limits Buffer Attributes
Eligible Books Eligible Securities Eligible Currencies
Inherit
PO Eligible currencies
Asymmetrical LE Eligible currencies
Currency Type Fixed Rate Index Tenor Source
EUR Fixed Rate 0.0000000...
New Save Save As New Delete Close

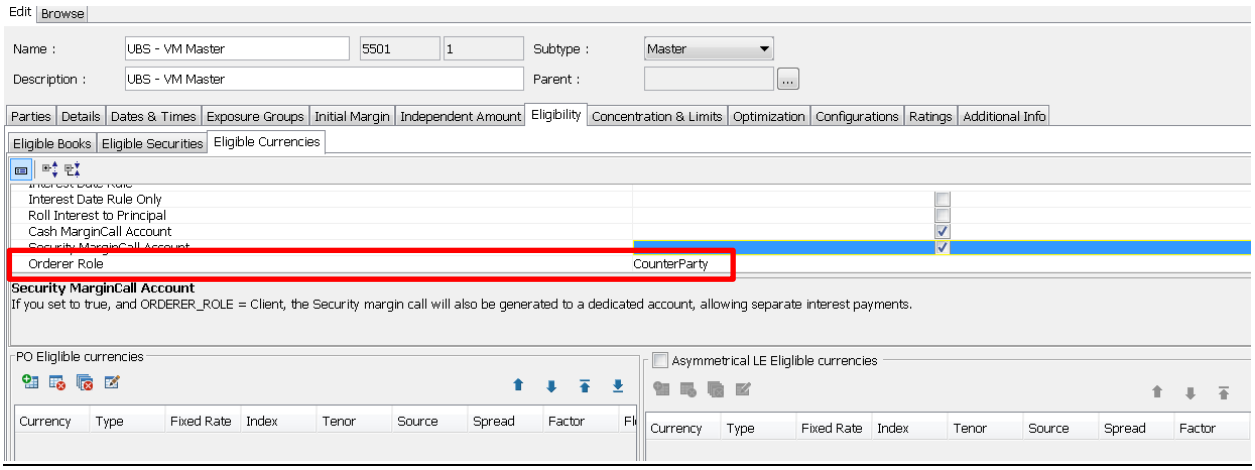

Eligible Currency Definition
Currency : EUR
Compounding
Include Interest to Position
Adjustment Currency
Project Interest to Position
Account :
Rate
Fixed Rate
Floating Rate
0.0000000000
Apply
Cancel

Eligibility Tab – Eligible Books Sub-Tab

Enter incoming/ougoing Cash and Security Books for that PO.

Eligibility Tab – Eligible Currency Sub-Tab

Field Name	Purpose/Impact
Base Currency	Equal to the Base Currency of the Account. This currency is not used when contract is defined with Exposure Group per currency.
Cash MarginCall Account	True.
Security MarginCall Account	True.
Orderer Role	Set this to '**CounterParty**' as this will trigger the generation of a second transfer on the Margin Call trade that will credit the internal clearer account when a client makes a payment.
Eligible Currencies	Leave it empty when using Exposure Group per Currency.



Additional Info Tab

Field Name	Purpose/Impact
MARGIN_TYPE	VM
PRODUCT_TYPE	ETD
CCP_ORIGIN_CODE	HOUSE/CLIENT

5.4 Counterparty Collateral – Initial Margin Contract

Facing the Counterparty, we will use the same bilateral collateral model than facing the client. We will specify the Margin Call contract in the setup of the Counterparty Account.

Parties Tab

Field Name	Purpose/Impact
Processing Org	The PO Legal Entity that is clearing through the Counterparty Account.
Legal Entity	The Clearer (clearinghouse or carry broker)
LE Role	Set this to '**Clearer**'.

Details Tab

Field Name	Purpose/Impact
Products	CollateralExposure.
Books	Should be set to the Book in which the trades are captured. The ETD model does not recommend multiple Books, especially not for a single client, so this should just be a single value.
Currencies	Any.
Start Date	This is used as the Trade Date of the Collateral Exposure trade generated from the contract. Set to a date in the past.
End of Day/Intraday Pricing Environment	Set to the PE used for clearing activity.
Contract Type	IM
Contract Direction	NET-BILATERAL

Dates & Times Tab

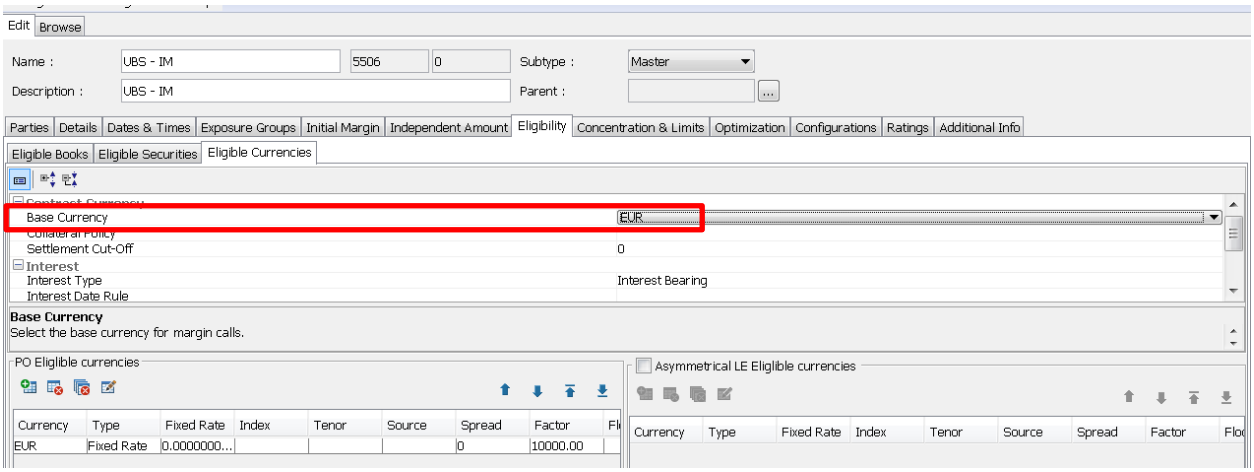
Field Name	Purpose/Impact
Value Date Frequency	COL_MIGR_DAILY_BUS – A date rule which sets the processing date to business dates on the configured calendar.

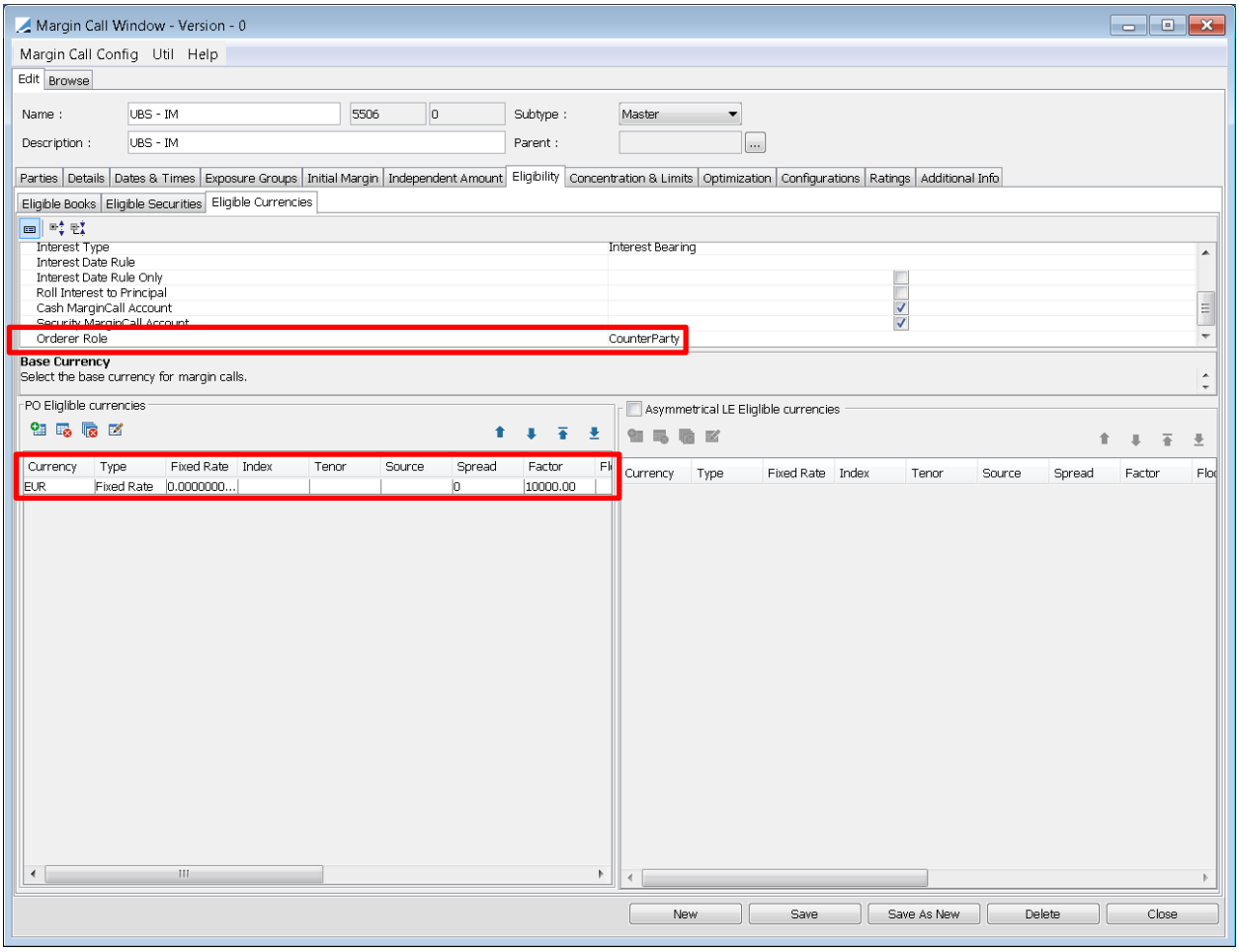
Field Name	Purpose/Impact
Valuation Time Offset	COL_MIGR_VAL_REL - A date rule which is relative to the rule above and falls one business day prior. This sets the Collateral processing so that the process date is always T+1 based on end of day balances on T, and generates a Margin Call which is settled on T+1.
Valuation Time	Set to the same time as the Book EOD time.
Valuation Time Zone	Set to the same time zone as the Book.

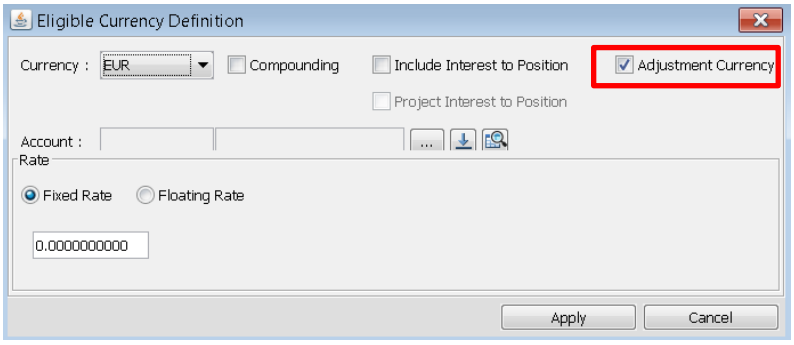
Eligibility Tab - Eligible Currency Sub-Tab

We do not refer to Exposure group and define the IM payment currency as the unique eligible currency in the Eligible currency part of the IM contract. This currency is also defined as Adjustment Currency for that contract.

Field Name	Purpose/Impact
Base Currency	Set the IM Settlement Currency
Orderer Role	Set Role '**CounterParty**' as this will trigger the generation of a second transfer on the Margin Call trade that will credit the internal clearing account when a client makes a payment.
Eligible Currency	Set the IM Settlement Currency and define that currency as Adjustment Currency.

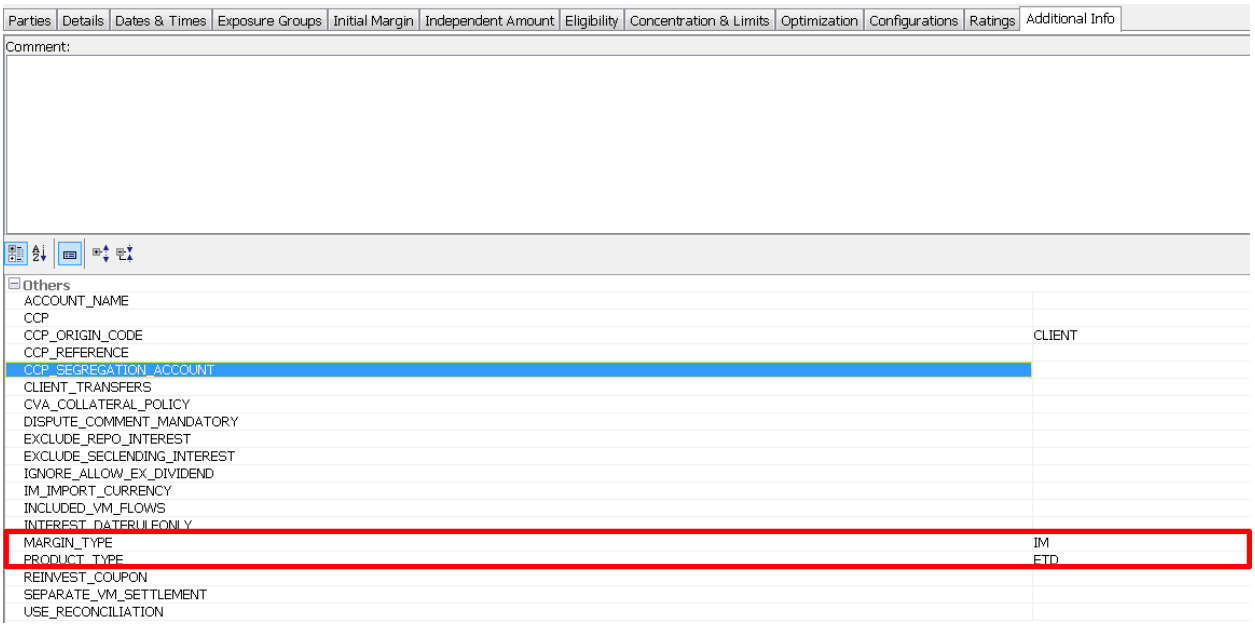






Additional Info Tab

Field Name	Purpose/Impact
MARGIN_TYPE	IM
PRODUCT_TYPE	ETD



You will then have to attach the IM contract to the Clearing tab on the CounterParty Account as a Liability Account (See Client Account section).

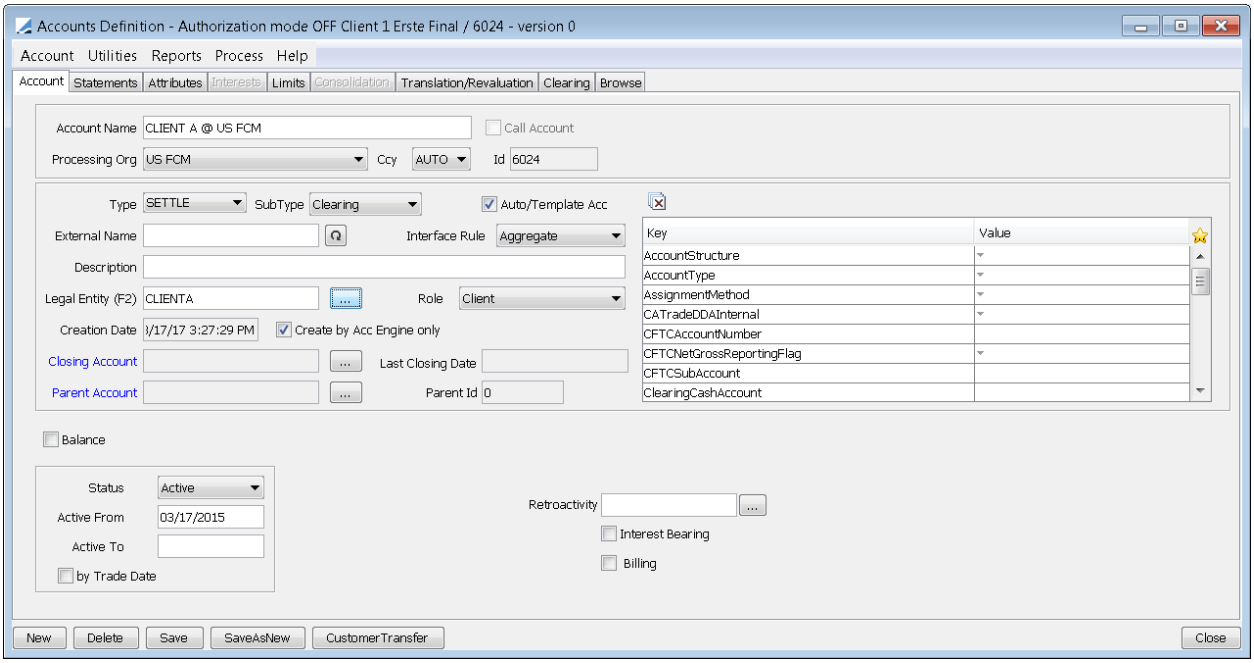
Section 6. Account Configuration

6.1 Client Account Configuration

6.1.1 Standard Client Account

A standard client account is a single account designed to manage all of the activity, positions and balances for a client LE. This is the simplest account, with no family structure involved.

"Account" Tab

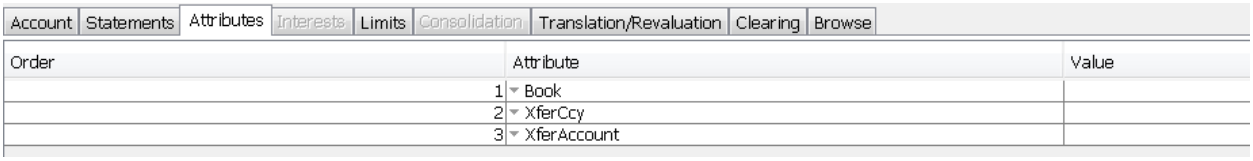


Field Name	Purpose/Impact
Account Name	The unique identifier of the Account in the Books and Records. User Entered using whatever naming convention the user prefers.
Processing Org	The PO who is managing this account.
Ccy	Set to AUTO. Note, "Auto/Template Acc" must be checked for AUTO to appear in the Ccy menu.
Type	Set to SETTLE.
SubType	Set to Clearing for a Client Account. This activates the Clearing tab of the Account.
Auto/Template Acc	Check this field to create automatic accounts in each settlement currency.
External Name	Optional field which can be used to provide a secondary name to the account for reporting and display.

Field Name	Purpose/Impact
Description	Optional field which can be used to provide additional information for reporting and display.
Legal Entity	The Client LE who this account is opened on behalf of.
Role	Set to **Client**.
Create by Acc Engine only	Check this field to suppress the automatic accounts from being searchable.
Status	Displays the status of an account. Processing and reporting can use this field to include or exclude an account from processing events. Only accounts in active status are eligible to be seen in the pricing sheet. Status must be set to Active to be able to select the account for clearing activity.

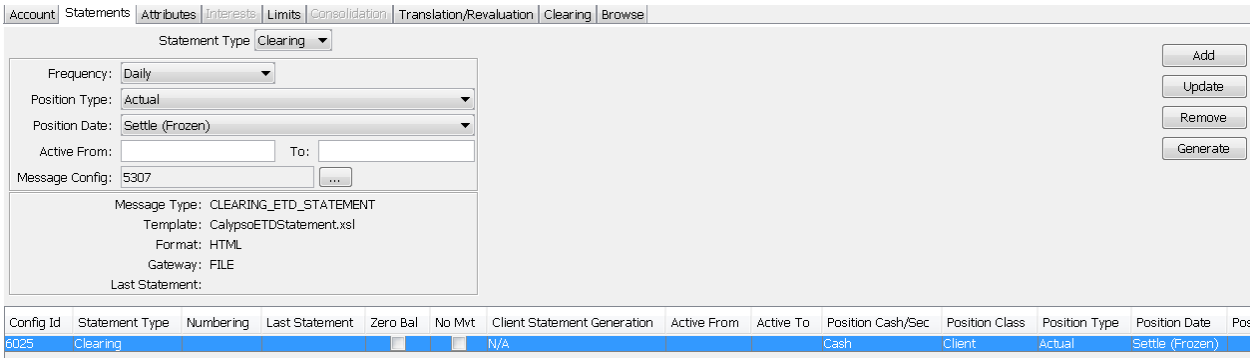
"Attributes" Tab

This is a user configurable tab which sets the naming convention of the automatically created accounts (created since 'Auto/Template Acc' is checked). It is mandatory to have some configuration here. Define your attributes based on the naming convention you want to use when generating your settlement postings.

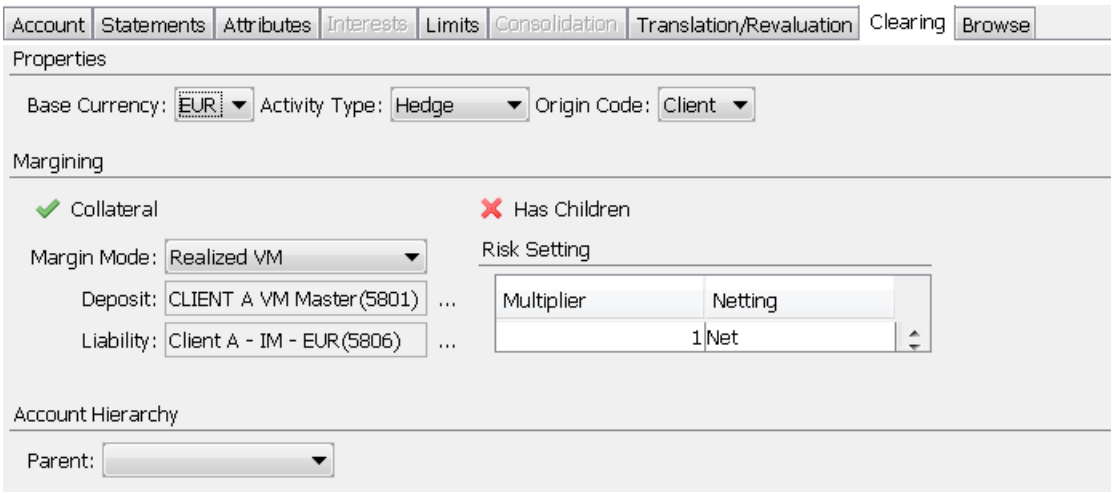


"Statement" Tab

Daily Statement using Settle (Frozen) position date to include back dated changes management and CLEARING_ETD_STATEMENT message configuration.



"Clearing" Tab



Field Name	Purpose/Impact
Base Currency	Represents the base currency for the account, used to convert balances in the client statement to a single currency.
Activity Type	Select either hedge or speculator. This field can impact the way initial margin is calculated for the account.
Origin Code	For a client account select "Client", and for house/proprietary accounts select "House".
Collateral	Checked to true for Standard Client Account since this is the account through which margin payments will be settled.
Child Account Indicator	Checked to false for Standard Client Account. By definition, this account type will not have any children.
Margin Mode	Select between "OTE" (open trade equity) and "Realized VM" modes to drive how unrealized PL is treated in the account, statement and margin call calculation.
Deposit Contract	References the Deposit ('VM') Contract configured for this LE to aggregate the assets and balances used in the margin calculation. Attach the Master collateral contract to the account. This contract is used to link the clearing account activity to each exposure group/child contract for the settlement of the variation margin in the original currency.
Liability Contract	References the Liability ('IM') Contract configured for this LE to aggregate their margin requirements. Attach the unique IM contract to the account. This contract is used to create the collateral exposure trades for this account.
Risk Setting – Multiplier	User entered value which can be used to mark up the Margin Requirement calculation. Default value is 1.0 which implies no markup (multiply calculated margin by 1). Value can be greater than or less than 1.
Risk Setting - Netting	Indicates how to calculate risk on the positions in this account: • 'Net' will calculate risk on all positions in the account taking into account any risk offsetting available in the methodology. • 'Gross' will calculate risk on each position in the account individually.
Parent	Empty for Standard Client Account

Field Name	Purpose/Impact
Status	Status must be set to Active to be able to select the account for clearing activity.

6.1.2 Parent Client Account

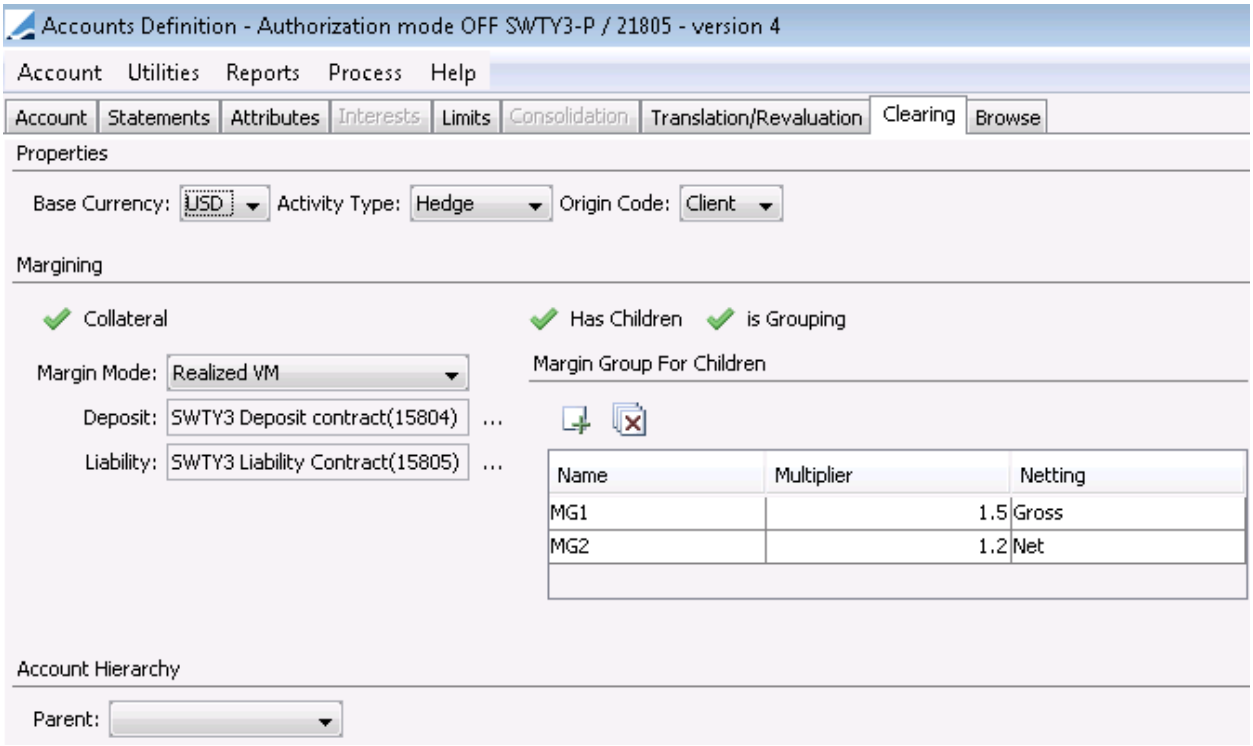
"Account" Tab

The fields on the Account tab for a Parent Account follow the same rules as a Standard Account.

"Attributes" Tab

The fields on the Attributes tab for a Parent Account follow the same rules as a Standard Account.

"Clearing" Tab



Field Name	Purpose/Impact
Base Currency	Represents the base currency for the account, used to convert balances in the client statement to a single currency.
Activity Type	Select either hedge or speculator. This field can impact the way initial margin is calculated for the account.
Origin Code	For a client account select "Client", and for house/proprietary accounts select "House".
Collateral	Checked to true for Parent Account since this is the account through which margin payments will be settled.

Field Name	Purpose/Impact
Child Account Indicator	Checked to true for Parent Account. By definition, this account type will have one or more associated child accounts.
Child Account Grouping Indicator	If set to false, the child accounts underneath this parent will all behave independent of each other in terms of margin calculation. If set to true, this field allows the PO to create a child account grouping structure which could allow margin to be calculated across one or more child accounts. When set to true, the Risk Setting panel is exposed for the user to configure the appropriate grouping.
Margin Mode	Select between "OTE" (open trade equity) and "Realized VM" modes to drive how unrealized PL is treated in the account, statement and margin call calculation.
Deposit Contract	References the Deposit Contract configured for this LE to aggregate the assets and balances used in the margin calculation across all child accounts.
Liability Contract	References the Liability Contract configured for this LE to aggregate their margin requirements across all margin groups.
Risk Setting - Name	When child account grouping is activated, this field represents the name of a Margin Group into which a child account can be placed. For a single parent account with multiple margin groups, all margin group names must be unique.
Risk Setting – Multiplier	User entered value which can be used to mark up the Margin Requirement calculation for each defined Margin Group. Default value is 1.0 which implies no markup (multiply calculated margin by 1). Value can be greater than or less than 1.
Risk Setting - Netting	Indicates how to calculate risk on the positions in each Margin Group: • 'Net' will calculate risk on all positions across all child account belonging to the Margin Group, taking into account any risk offsetting available in the methodology. • 'Gross' will calculate risk on each position in the accounts belonging to the Margin Group individually.
Parent	Empty for Parent Account.
Status	Status must be set to Active to be able to select the account for clearing activity.

6.1.3 Child Client Account

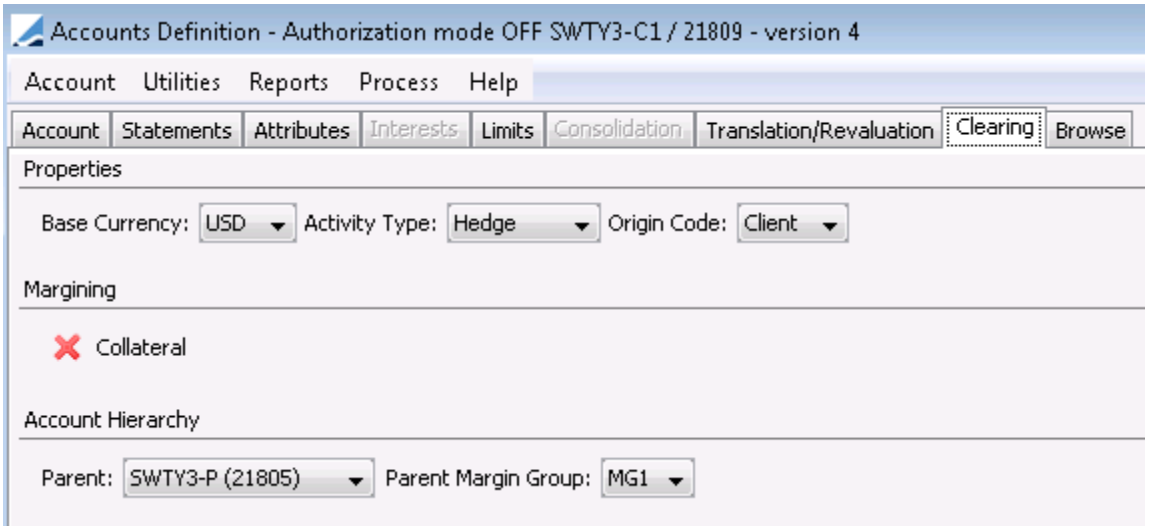
"Account" Tab

The fields on the Account tab for a Parent Account follow the same rules as a Standard Account.

"Attributes" Tab

The fields on the Attributes tab for a Parent Account follow the same rules as a Standard Account.

"Clearing" Tab

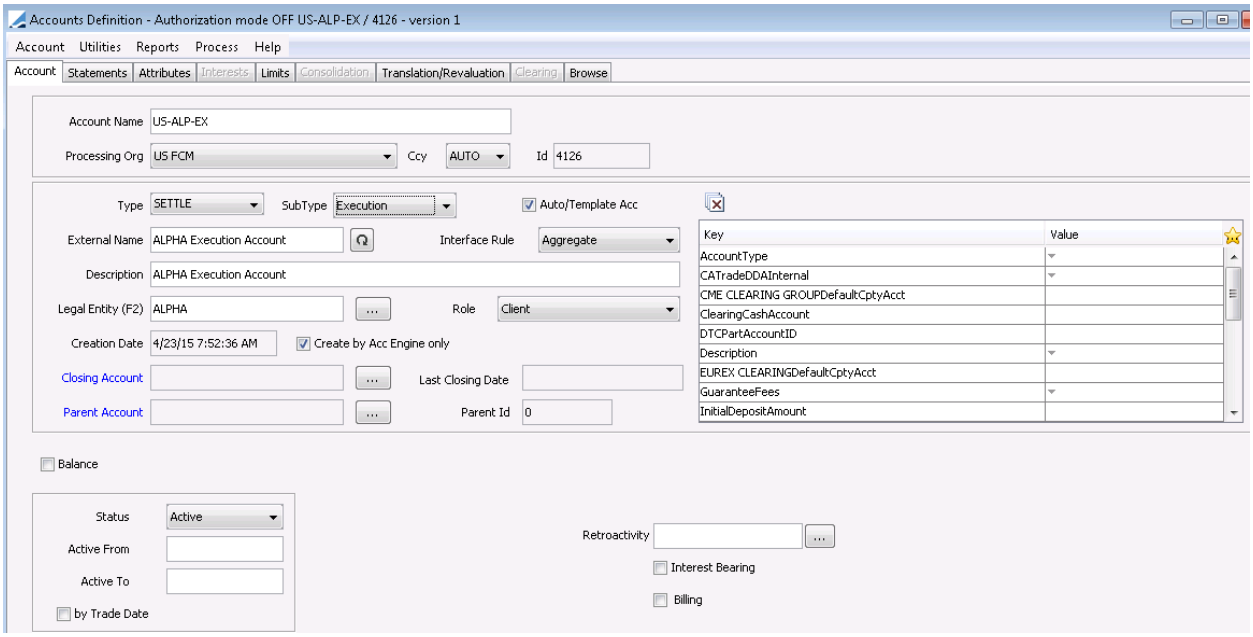


Field Name	Purpose/Impact
Base Currency	Represents the base currency for the account, used to convert balances in the client statement to a single currency.
Activity Type	Select either hedge or speculator. This field can impact the way initial margin is calculated for the account.
Origin Code	For a client account select "Client", and for house/proprietary accounts select "House".
Collateral	Checked to false for a Child Account, since only positions will be managed at this level.
Parent	Mandatory field which references the Parent Account to which the account is associated. Restricted to Parents Accounts with the same LE and PO.
Parent Margin Group	References the Margin Group to which the account belongs. Restricted to Margin Groups defined on the selected Parent Account. This field is mandatory only if the Parent Account 'Child Grouping' setting is set to true.
Status	Status must be set to Active to be able to select the account for clearing activity.

6.2 Client Execution Account

This account manages trades which the PO executes then gives up to another clearing broker. By selecting a subtype of 'Execution' the Clearing tab is not activated so there is no configuration allowed/required on that tab.

"Account" Tab



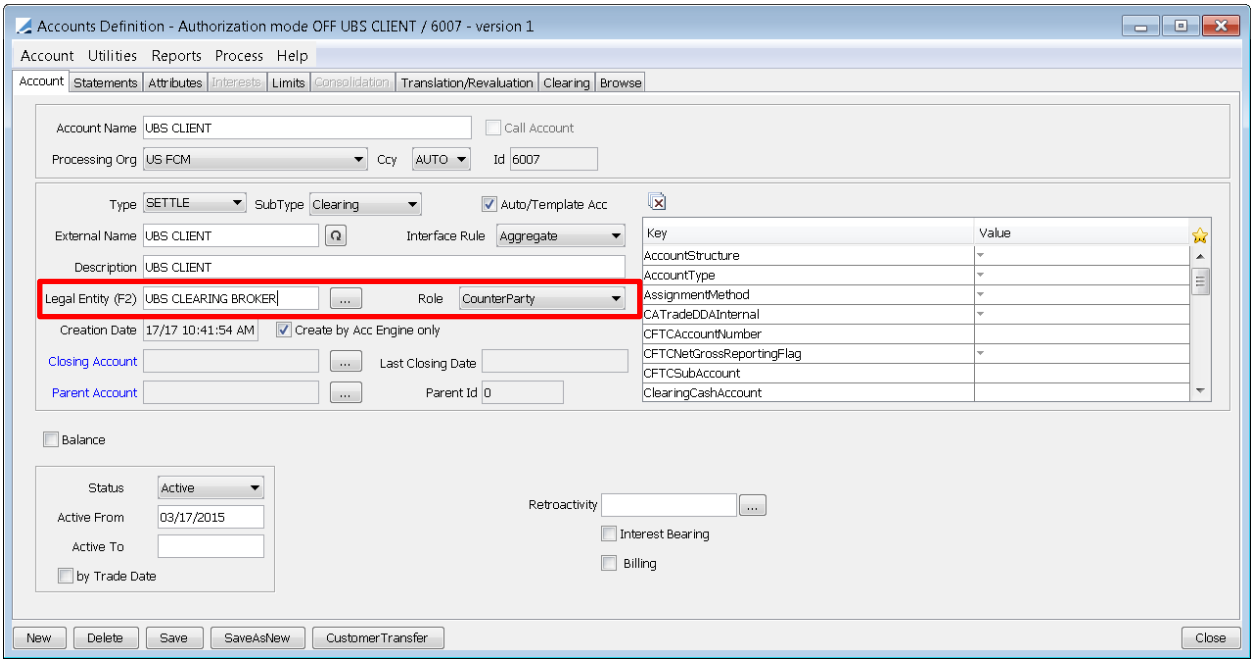
Field Name	Purpose/Impact
Account Name	The unique identifier of the Account in the Books and Records. User Entered using whatever naming convention the user prefers.
Processing Org	The PO who is managing this account.
Ccy	Set to AUTO. Note, "Auto/Template Acc" must be checked for AUTO to appear in the Ccy menu.
Type	Set to SETTLE.
SubType	Set to Execution. This will not activate the Clearing tab of the Account and this account will not participate in EOD processing.
Auto/Template Acc	Check this field to create automatic accounts in each settlement currency.
External Name	Optional field which can be used to provide a secondary name to the account for reporting and display.
Description	Optional field which can be used to provide additional information for reporting and display.
Legal Entity	The Client LE who this account is opened on behalf of.
Role	Set to Client
Create by Acc Engine only	Check this field to suppress the automatic accounts from being searchable.
Status	Displays the status of an account. Processing and reporting can use this field to include or exclude an account from processing events. Status must be set to Active to be able to select the account for clearing activity.

6.3 Counterparty Account Configuration

Counterparty accounts represent the accounts managed by the central counterparty into which the clearing member is sending their clients' trades. These entities can be actual clearinghouses or may be other clearing brokers acting as 3rd party clearers. The configuration of the accounts is identical in either case.

6.3.1 Standard Counterparty Account

"Account" Tab Fields



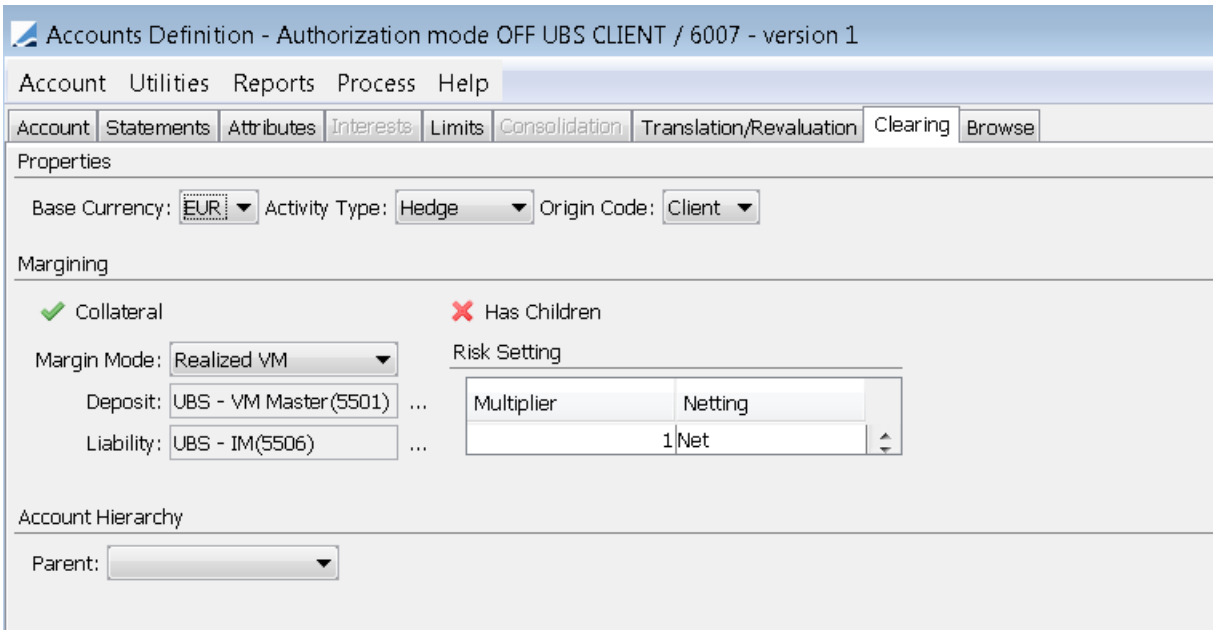
Field Name	Purpose/Impact
Account Name	The unique identifier of the Account in the Books and Records, typically set to match the name of the account at the CCP.
Processing Org	The PO to whom this account is created at the CCP or Clearing Broker
Ccy	Set to AUTO. Note, "Auto/Template Acc" must be checked for AUTO to appear in the Ccy menu.
Type	Set to SETTLE.
SubType	Set to Clearing for a Counterparty Account. This activates the Clearing tab of the Account.
Auto/Template Acc	Check this field to create automatic accounts in each settlement currency.
External Name	Optional field which can be used to provide a secondary name to the account for reporting and display.
Description	Optional field which can be used to provide additional information for reporting and display.
Legal Entity	The Counterparty LE who this account is opened on behalf of.

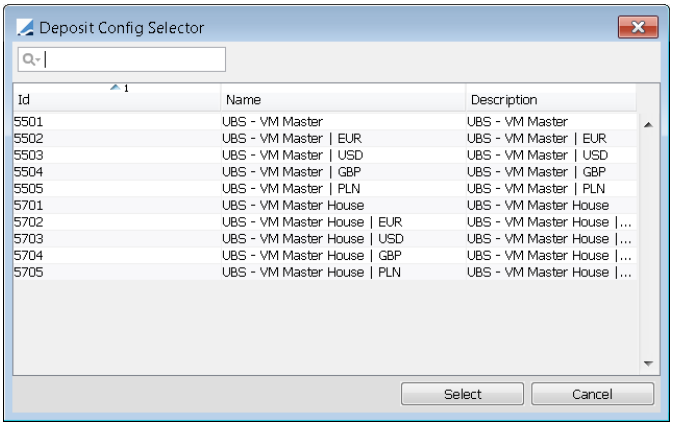
Field Name	Purpose/Impact
Role	Set to **CounterParty**.
Create by Acc Engine only	Check this field to suppress the automatic accounts from being searchable.
Status	Displays the status of an account. Processing and reporting can use this field to include or exclude an account from processing events. Status must be set to Active

"Attributes" Tab

The fields on the Attributes tab for a CounterParty Account follow the same rules as a Client Account.

"Clearing" Tab





Field Name	Purpose/Impact
Base Currency	Represents the base currency for the account.
Activity Type	Always set this to Hedge for CounterParty Accounts.
Origin Code	For a counterparty account containing client positions select "Client", and for one containing house/proprietary positions select "House".
Collateral	Checked to true for Standard Counterparty Account since this is the account through which margin payments will be settled.
Child Account Indicator	Checked to false for Standard Counterparty Account. By definition, this account type will not have any children.
Margin Mode	Should always be set to "Realized VM" for counterparty accounts.
Deposit Contract	References the Deposit ('VM') Contract configured for this LE to aggregate the assets and balances used in the margin calculation. Attach the Master collateral contract to the account. This contract is used to link the clearing account activity to each exposure group/child contract for the settlement of the variation margin in the original currency.
Liability Contract	References the Liability ('IM') Contract configured for this LE to aggregate their margin requirements. Attach the unique IM contract to the account. This contract is used to create the collateral exposure trades for this account.
Risk Setting – Multiplier	Always set to 1 for Counterparty Accounts
Risk Setting - Netting	Indicates how to calculate risk on the positions in this account: • 'Net' will calculate risk on all positions in the account taking into account any risk offsetting available in the methodology. • 'Gross' will calculate risk on each position in the account individually. • 'Disclosed' will calculate risk based on the client account position groupings. This setting allows the CCP to calculate risk on omnibus accounts with the understanding that some of the positions belong to the same end client and should get the benefit of risk offsetting.
Parent	Empty for Standard Counterparty Account.
Status	Displays the status of an account. Status must be set to Active to be able to select the account for clearing activity.

6.3.2 Parent Counterparty Account

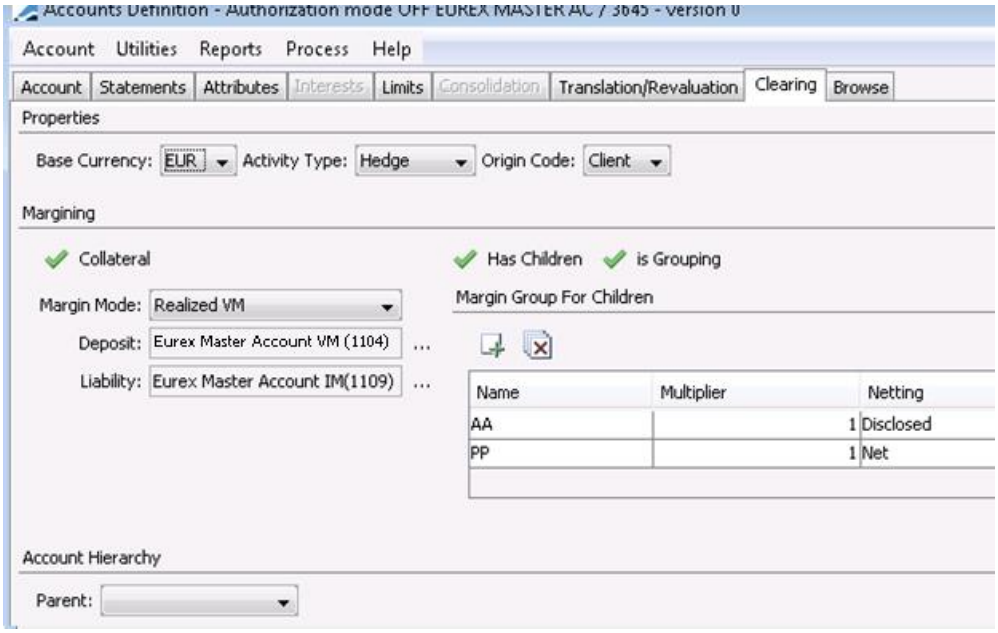
"Account" Tab

The fields on the Account tab for a Parent Account follow the same rules as a Standard Account

"Attributes" Tab

The fields on the Attributes tab for a Parent Account follow the same rules as a Standard Account

"Clearing" Tab



Field Name	Purpose/Impact
Base Currency	Represents the base currency for the account.
Activity Type	Always set this to Hedge for CounterParty Accounts.
Origin Code	For a counterparty account containing client positions select "Client", and for one containing house/proprietary positions select "House".
Collateral	Checked to true for Parent Account since this is the account through which margin payments will be settled.
Child Account Indicator	Checked to true for Parent Account. By definition, this account type will have one or more associated child accounts.
Child Account Grouping Indicator	If set to false, the child accounts underneath this parent will all behave independent of each other in terms of margin calculation. If set to true, this field allows the PO to create a child account grouping structure which could allow margin to be calculated across one or more child accounts. When set to true, the Risk Setting panel is exposed for the user to configure the appropriate grouping.
Margin Mode	Should always be set to "Realized VM" for counterparty accounts because they do not differentiate between realized and unrealized PL.
Deposit Contract	References the Deposit ('VM') Contract configured for this LE to aggregate the assets and balances used in the margin calculation. Attach the Master collateral contract to the account. This contract is used to link the clearing account activity to each exposure group/child contract for the settlement of the variation margin in the original currency.
Liability Contract	References the Liability ('IM') Contract configured for this LE to aggregate their margin requirements. Attach the unique IM contract to the account. This contract is used to create the collateral exposure trades for this account.

Field Name	Purpose/Impact
Risk Setting - Name	When child account grouping is activated, this field represents the name of a Margin Group into which a child account can be placed. For a single parent account with multiple margin groups, all margin group names must be unique.
Risk Setting – Multiplier	Always set to 1 for Counterparty Accounts.
Risk Setting - Netting	Indicates how to calculate risk on the positions in this account. • 'Net' will calculate risk on all positions in the account taking into account any risk offsetting available in the methodology. • 'Gross' will calculate risk on each position in the account individually. • 'Disclosed' will calculate risk based on the client account position groupings. This setting allows the CCP to calculate risk on omnibus accounts with the understanding that some of the positions belong to the same end client and should get the benefit of risk offsetting.
Parent	Empty for Parent Account.
Status	Displays the status of an account. Status must be set to Active to be able to select the account for clearing activity.

6.3.3 Child Counterparty Account

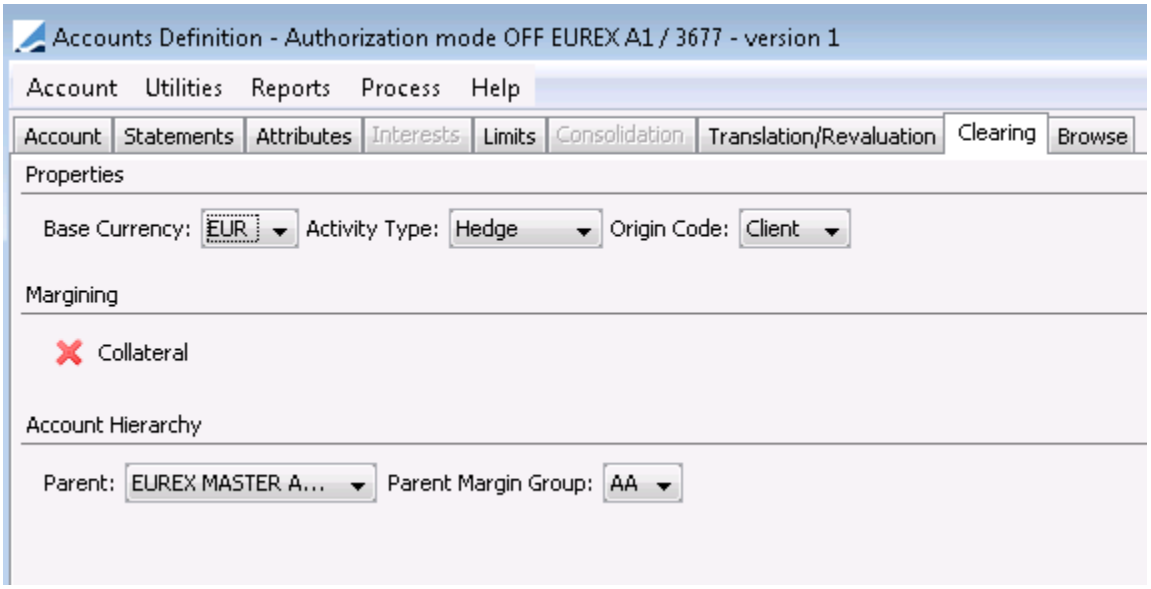
"Account" Tab

The fields on the Account tab for a Child Account follow the same rules as a Standard Account.

"Attributes" Tab

The fields on the Attributes tab for a Child Account follow the same rules as a Standard Account.

"Clearing" Tab



Field Name	Purpose/Impact
Base Currency	Represents the base currency for the account.
Activity Type	Always set this to Hedge for CounterParty Accounts.
Origin Code	For a counterparty account containing client positions select “Client”, and for one containing house/proprietary positions select “House”.
Collateral	Checked to false for a Child Account, since only positions will be managed at this level.
Parent	Mandatory field which references the Parent Account to which the account is associated. Restricted to Parents Accounts with the same LE and PO.
Parent Margin Group	References the Margin Group to which the account belongs. Restricted to Margin Groups defined on the selected Parent Account. This field is mandatory only if the Parent Account ‘Child Grouping’ setting is set to true.

Section 7. Settlement Instructions Configuration

Settlement Instructions are required to route both internal and external transfers.

Diagram 1 – SDI between the Client and PO for Internal Settlement (clearing activity from transactions, fees, clearing transfers) and margin calls (external SDI).

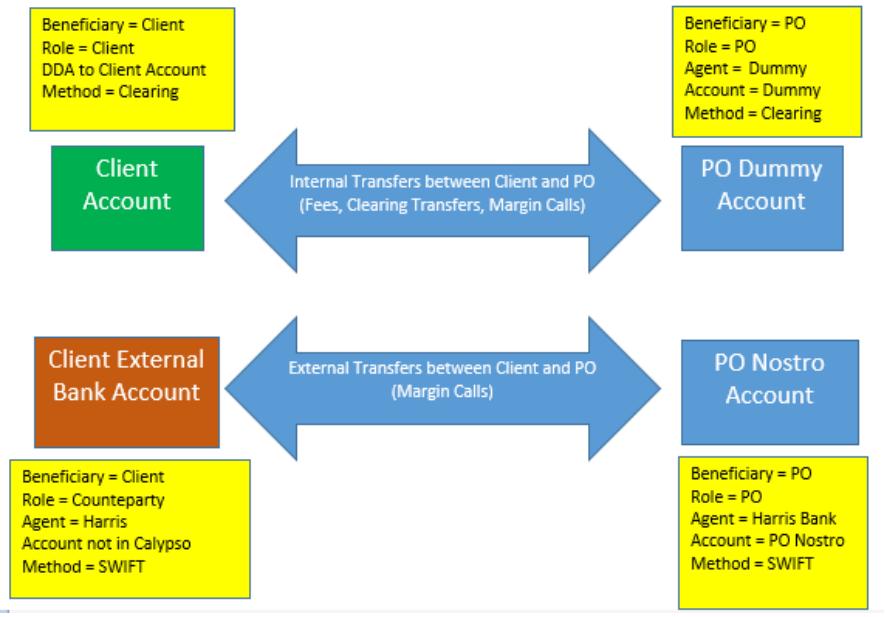
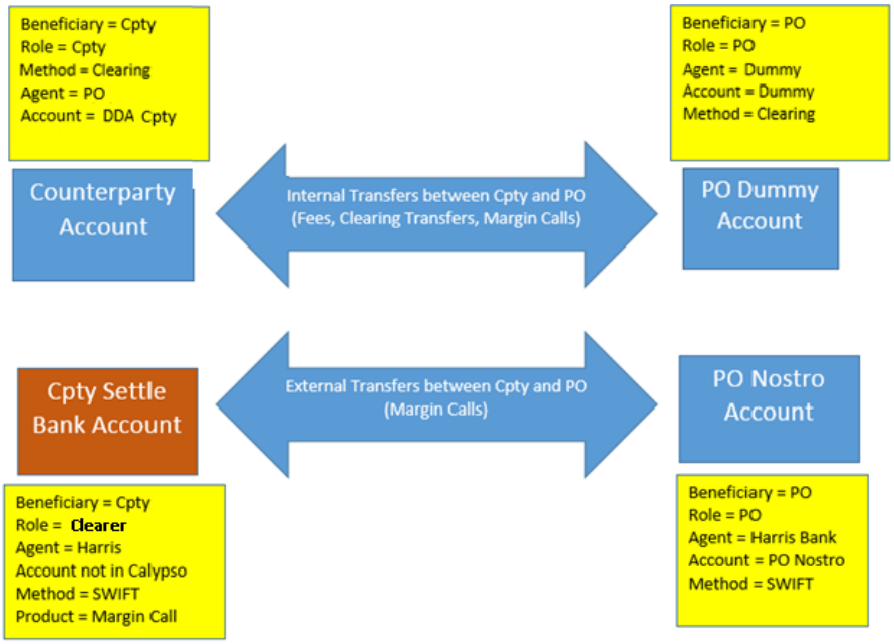


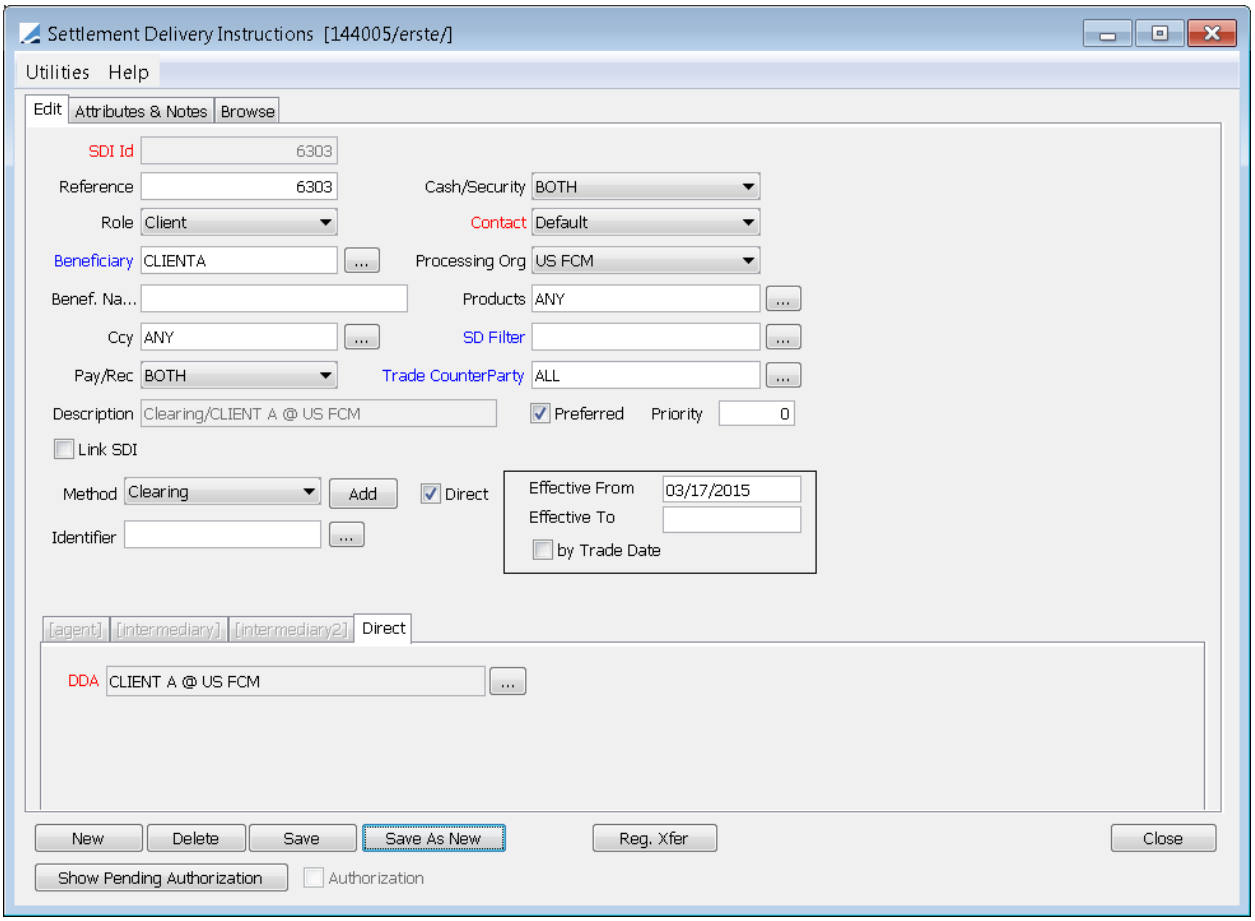
Diagram 2 – SDI between the CounterParty (CCP or Clearer) and PO for Internal Settlement (clearing activity from transactions, fees, clearing transfers) and external settlements (margin calls…).



7.1 Client SDIs

Client SDI for Internal Account Balances

Settlement Instructions should be configured to settle internal flows to the Client Collateral Account when the LE role is "Client". We use the Method 'CLEARING' to match these SDI's to the PO SDI with the same Method.

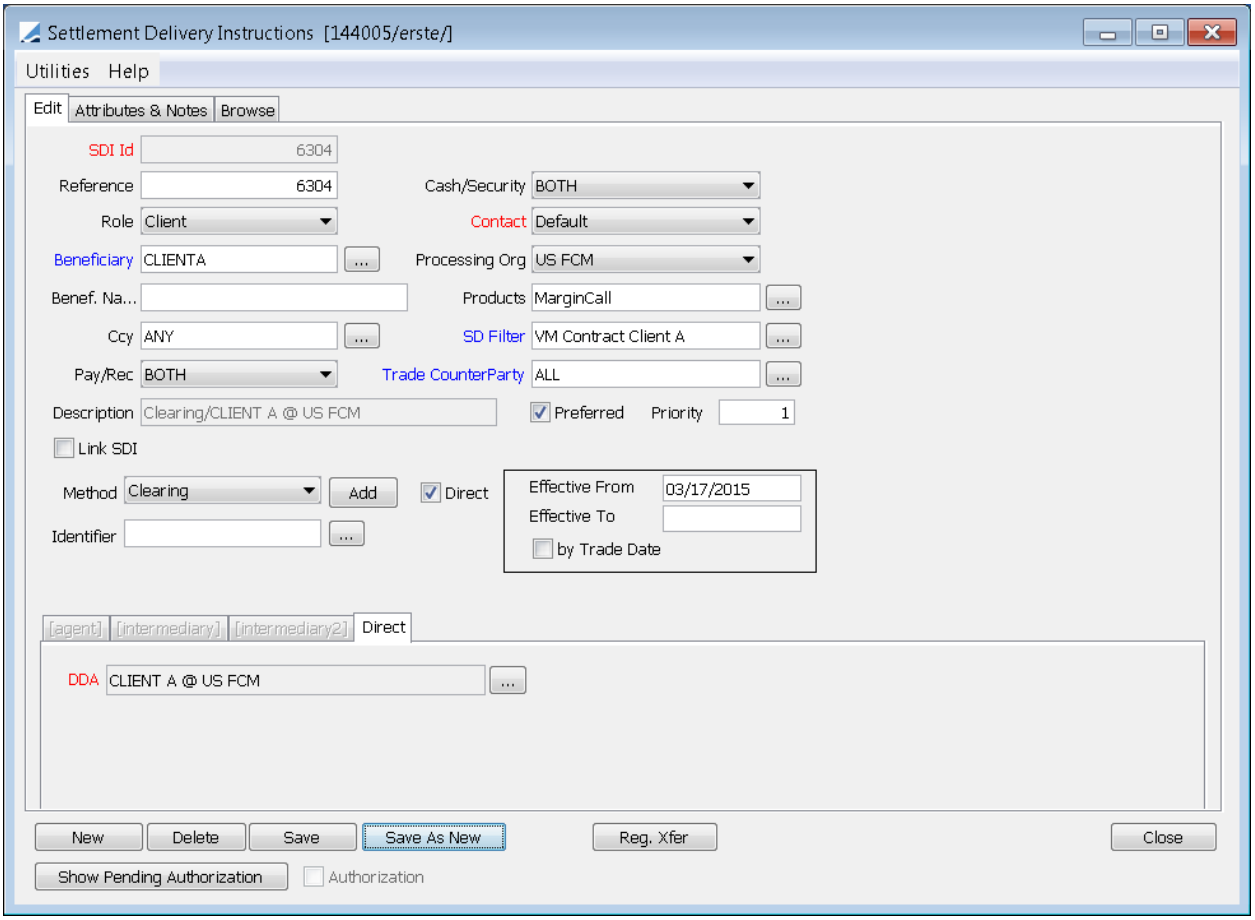


Field Name	Purpose/Impact
Reference	System populated with SDI Id.
Cash/Security	Set to BOTH.
Role	Role must be Client for Client Account SDI.
Contact	Default.
Beneficiary	The LE Short Name of the Client.
Processing Org	The LE Short Name of the PO managing this account.
Benef. Name	Optional field.
Products	Set to ANY.

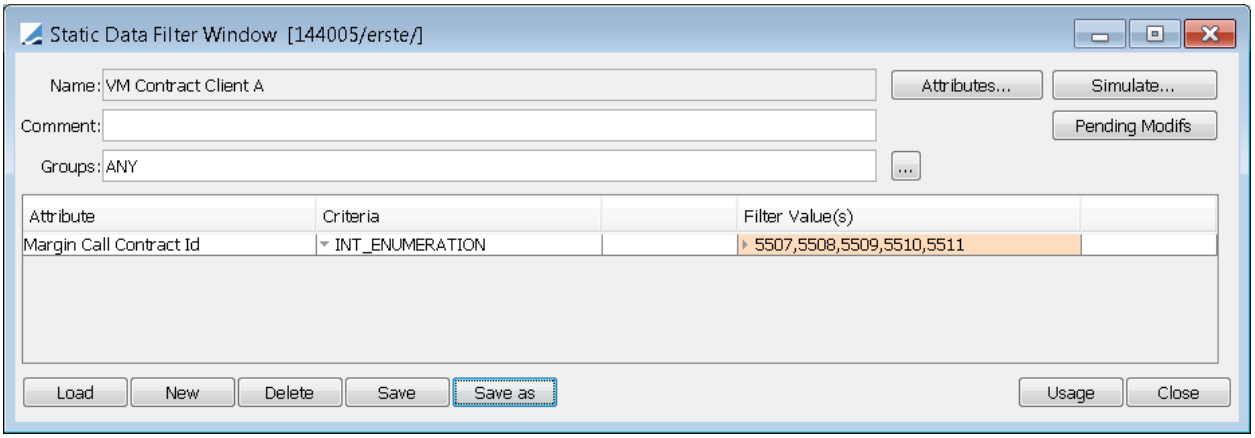
Field Name	Purpose/Impact
Ccy	Set to ANY.
SD Filter	Can be used to filter specific transfers, but main SDI will leave this field blank for simple account configuration. Note you need to define a specific CLEARING SDI for Role = Client and SD Filter using MarginCall Id for Product Type = Margin Call when the client has more than one clearing account to allow appropriate SDI selection for the Margin Call trade.
Pay/Rec	Set to BOTH.
Trade CounterParty	Set to ALL.
Preferred	Check this Box so that this is the first SDI attempted to be used.
Priority	Set to 0 so that this is the first SDI attempted to be used.
Method	Set to CLEARING. This Method must matche the same method on the matching PO SDI for internal flows.
Direct	Check this Box.
DDA	Enter the Client Standard or Parent Account. We will also refer to this account as the "Collateral Account" since it has the Collateral flag set to true.

For client internal transfers, the SDI selection is driven by the trade attribute ClientAccount set at the transaction level except for Margin Call which follows the standard SDI selection (this attribute is not propagated on Margin Call trade).

When the client has more than one clearing account (*ie*. more than one Deposit Collateral Contract) you will have to define, in addition to the standard Client SDI presented above, specific Client SDIs for the Role = Client and Product = Margin Call with SD Filter referring to the Margin Call Contract Id = Client Master and Children Contract Id. This will force the system to select the appropriate SDI for the Margin Call trade for the Role = Client. An example is presented below. No need to define this extra-SDI if the client has only one clearing account.

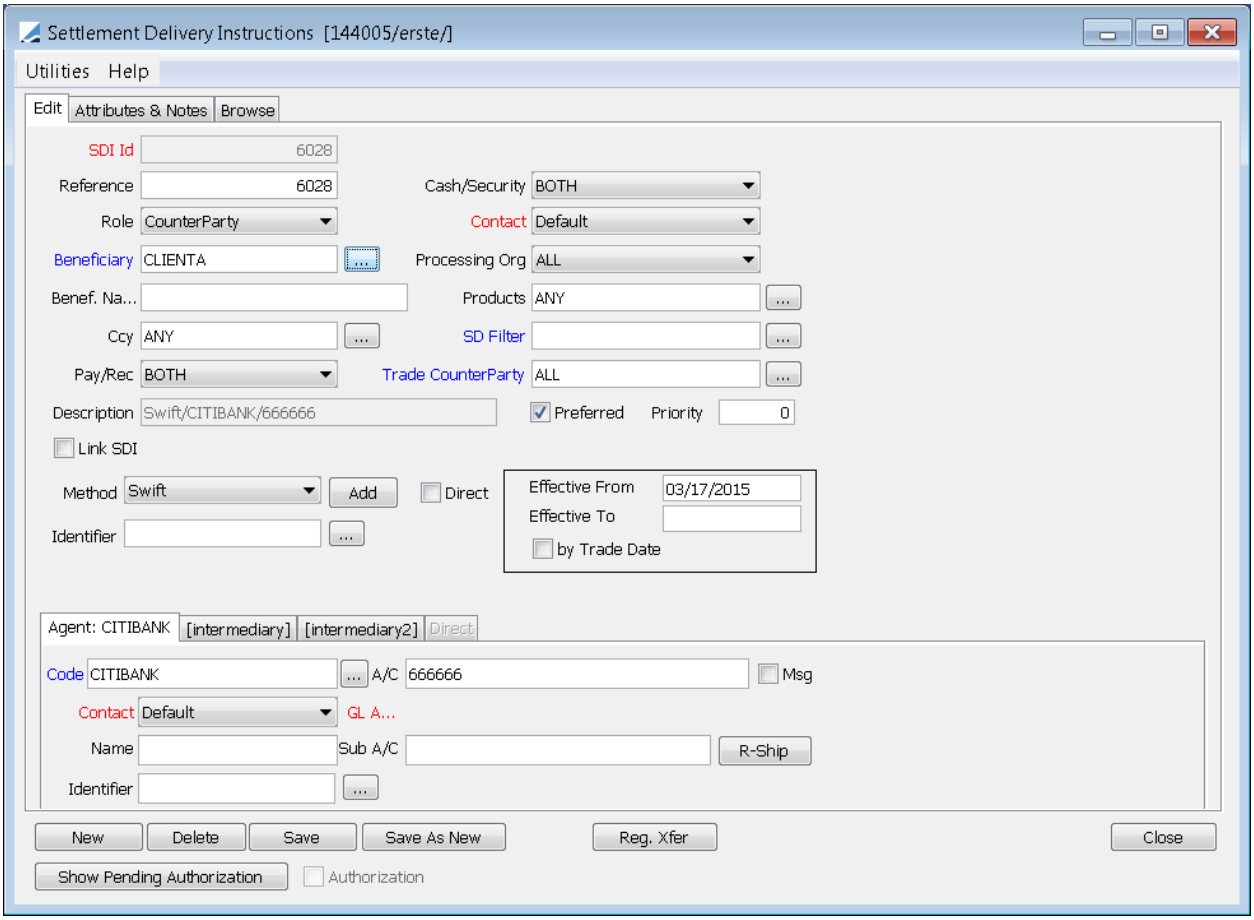


SD Filter must list all margin call contracts for the Margin Call Trade, *ie. Master and Children or Exposure Groups*



External Client SDI

These are the settlement instructions for the actual settled payments between the client and FCM. This SDI is needed to reflect the cash management impact of the margin call (and potentially other cash adjustment flows) process between the FCM and its clients.



Field Name	Purpose/Impact
Reference	System populated with SDI Id.
Cash/Security	Set to BOTH.
Role	Role must be CounterParty for external settlements. This SDI will only be used when the Client is treated as a CounterParty on a transfer.
Contact	Default.
Beneficiary	The LE Short Name of the Client.
Processing Org	The LE Short Name of the PO managing this account or ALL. External SDI is usually not linked to a specific PO.
Benef. Name	Optional field.
Products	Set to ANY.
Ccy	Set to ANY.
SD Filter	Can be used to filter specific transfers, but main SDI will leave this field blank for simple account configuration.

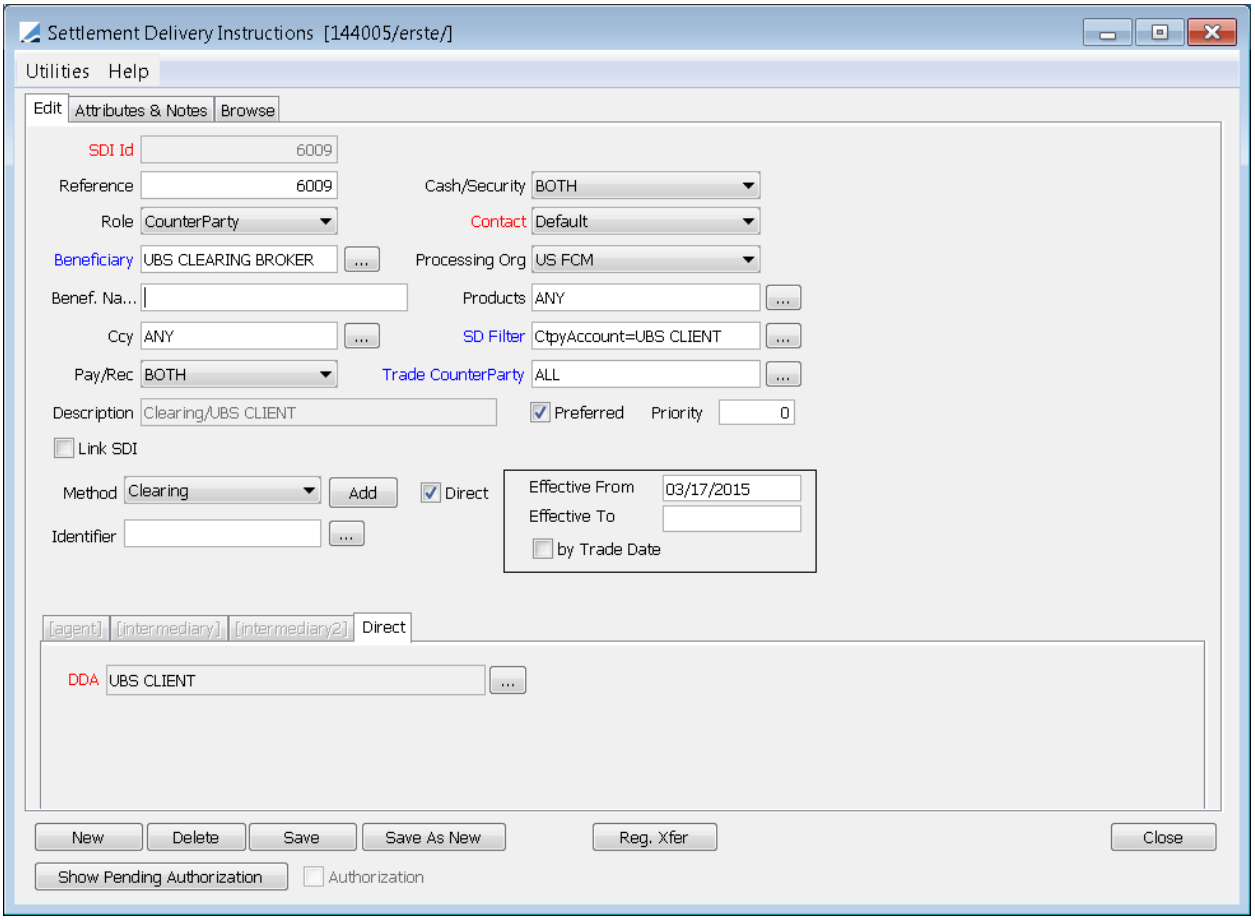
Field Name	Purpose/Impact
Pay/Rec	Set to BOTH.
Trade CounterParty	Set to ALL.
Preferred	Check this Box so that this is the first SDI attempted to be used.
Priority	Set to 0 so that this is the first SDI attempted to be used.
Method	Set to SWIFT. This Method could be set to any value, as long as it matches the same method on the matching PO SDI for external settlements.
Direct	Leave this unchecked since this SDI will be used for external settlements.
Code	The Agent used by the Client.
A/C	Free text description of Client's Account.
Contact	Set to the contact type that will be used to confirm settlement with Client.

7.2 Counterparty SDIs

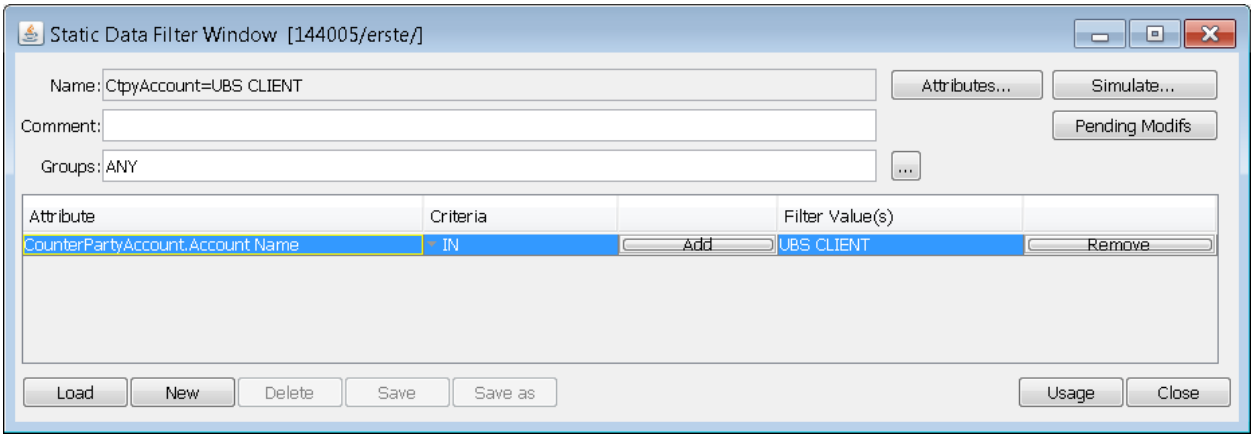
Counterparty Internal Settlement Instructions

Counterparty SDI's will route transfers to the "mirror view" of the clearing account of the PO. This will be achieved by defining an 'internal' or clearing SDI for the Role Counterparty with the PO/FCM and attach the Account with Role = CounterParty to that CounterParty SDI. An example is presented below.

The SDI selection for the Counterparty is standard. This means that as soon as you have several Clearing Accounts for a CCP or Broker you will have to enrich the CounterParty Clearing SDI with a SD Filter referring to the trade attribute CounterPartyAccount.



SD Filter must refer to the Trade Attribute CounterpartyAccount



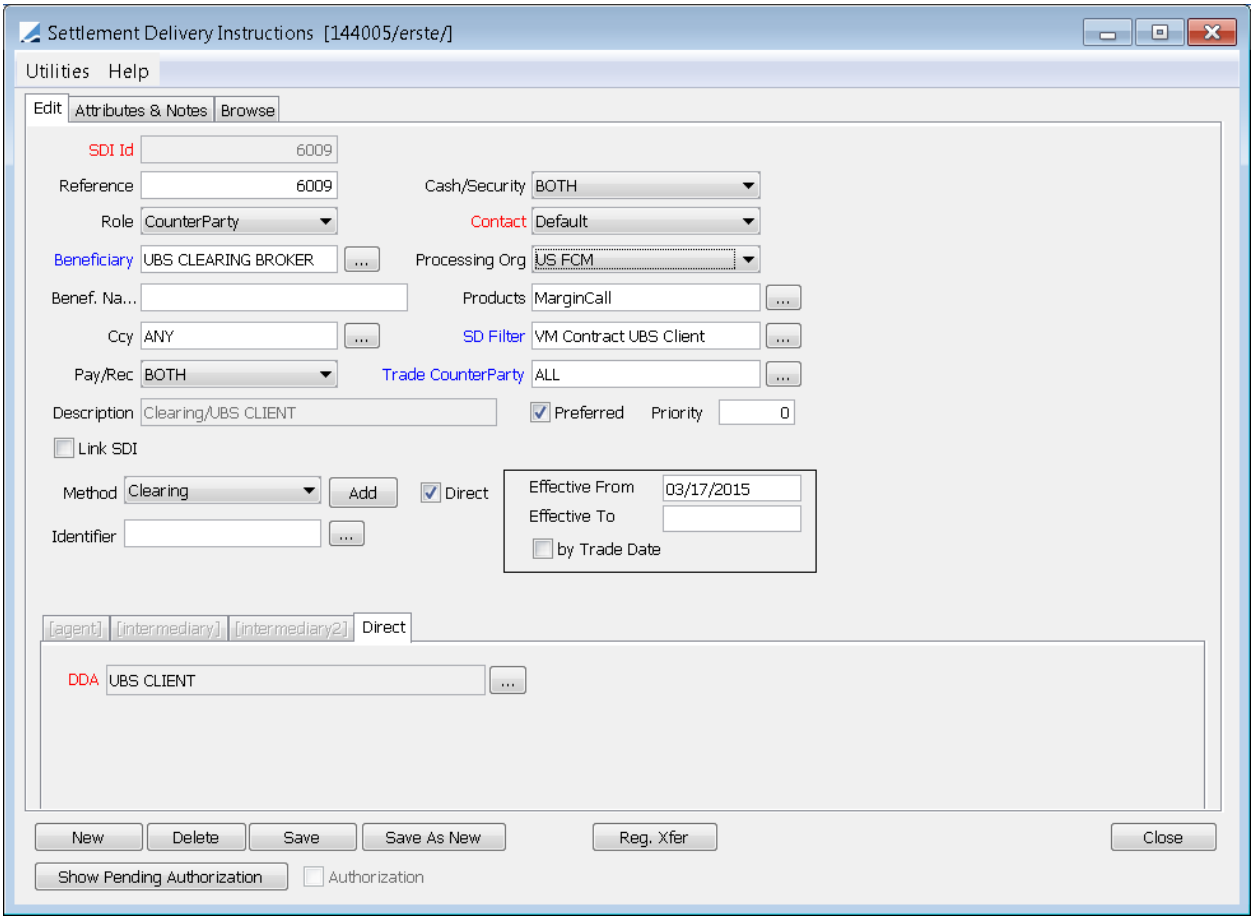
Field Name	Purpose/Impact
Reference	System populated with SDI Id.
Cash/Security	Set to BOTH.
Role	Role must be **CounterParty**.

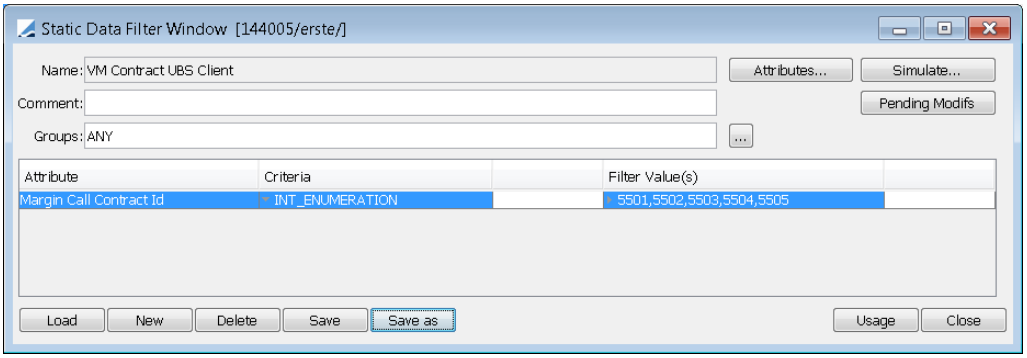
Field Name	Purpose/Impact
Contact	Default.
Beneficiary	The LE Short Name of the CounterParty.
Processing Org	The LE Short Name of the PO managing this account.
Benef. Name	Optional field.
Products	Set to ANY.
Ccy	Set to ANY.
SD Filter	When the Counterparty has only one account, you can leave this field blank. When the Counterparty has more than one clearing account, you will have to define a SDFilter referring to the trade attribute CounterPartyAccount in order to select that appropriate Internal/Clearing SDI. This SDI will apply for all trade types except Margin Call where the SDI selection will not use these trade attributes. Thus, as soon as the CounterParty has more than one clearing account, you will also need to define a specific CLEARING SDI for Role = CounterParty and SD Filter using Margin Call Contract Id for Product Type = Margin Call. This will allow selecting the appropriate SDI selection for the Margin Call trade.
Pay/Rec	Set to BOTH.
Trade CounterParty	Set to ALL.
Preferred	Check this Box so that this is the first SDI attempted to be used.
Priority	Set to 0 so that this is the first SDI attempted to be used.
Method	Set to CLEARING. This Method must match the same method on the matching PO SDI for internal flows.
Direct	Check this Box.
DDA	Enter the CounterParty account. We will also refer to this account as the "Collateral Account" since it has the Collateral flag set to true
Contact	Set to the contact type that will be used to confirm settlement with Client.

For counterparty "internal" transfers, the SDI selection remains standard but must be driven for most flows by the trade attribute CounterPartyAccount set at the transaction level (using SD Filter to refer to that attribute).

As we do not propagate the CounterPartyAccount on margin call trade, we also need – as soon as the PO has more than one Counterparty account – to define specific SDI for Margin Call referring to the proper contract id.

When the PO has more than one clearing counterparty account (*ie*. more than one Deposit Collateral Contract) you will have to define, in addition to the standard Counterparty SDI presented above, specific Counterparty SDIs for the Role CounterParty and Product = Margin Call with SD Filter referring to the Margin Call Contract Id = List of Master and Children contracts. This will force the system to select the appropriate SDI for the Margin Call trade for the Role = CounterParty. An example is presented below. No need to define these extra-SDI if the PO has only one CounterParty account with this CCP or Clearer.

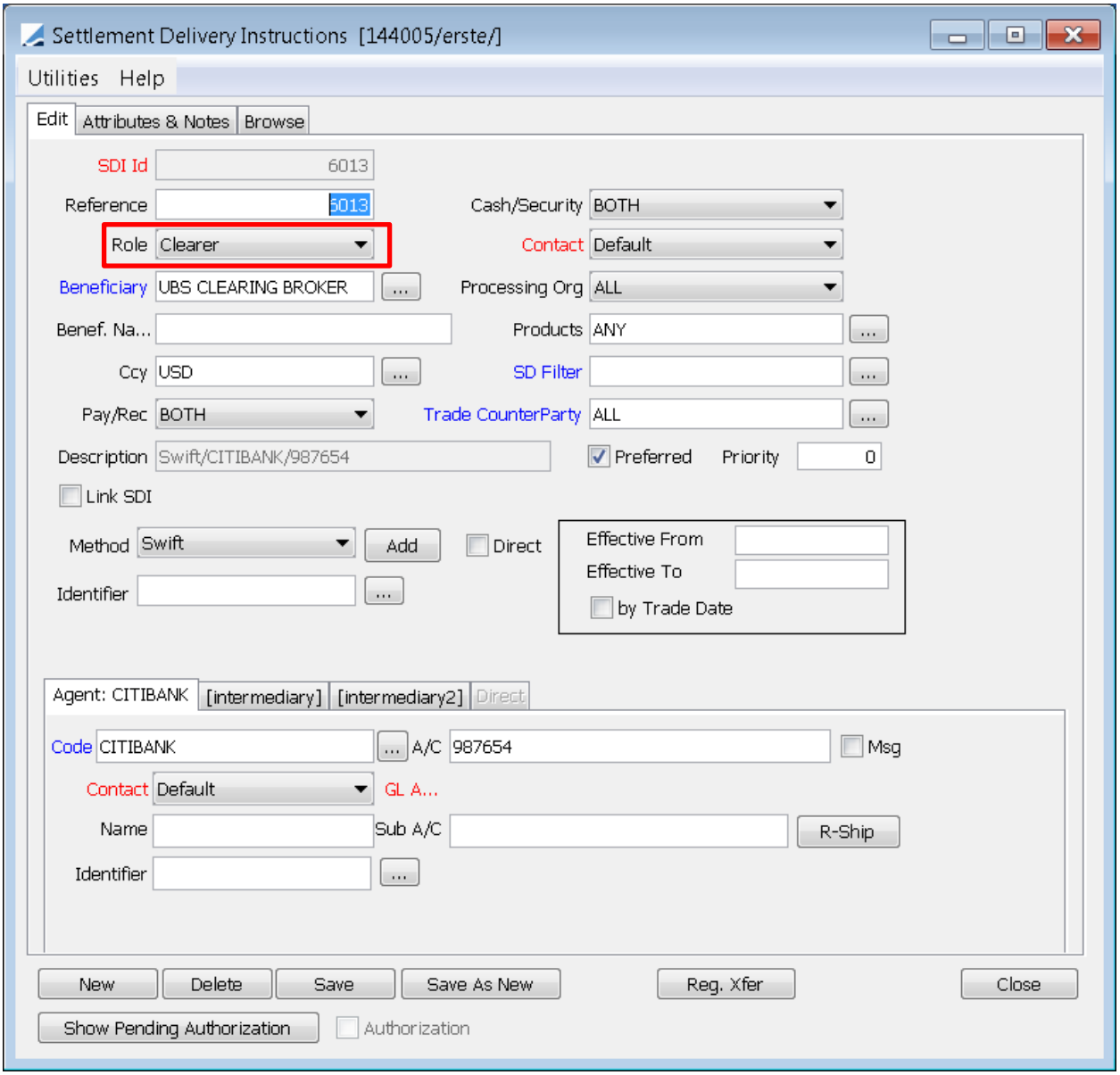




Counterparty External Settlement Instructions

These SDI are used to generate the external transfers for the settlements to the CCP or Clearer.

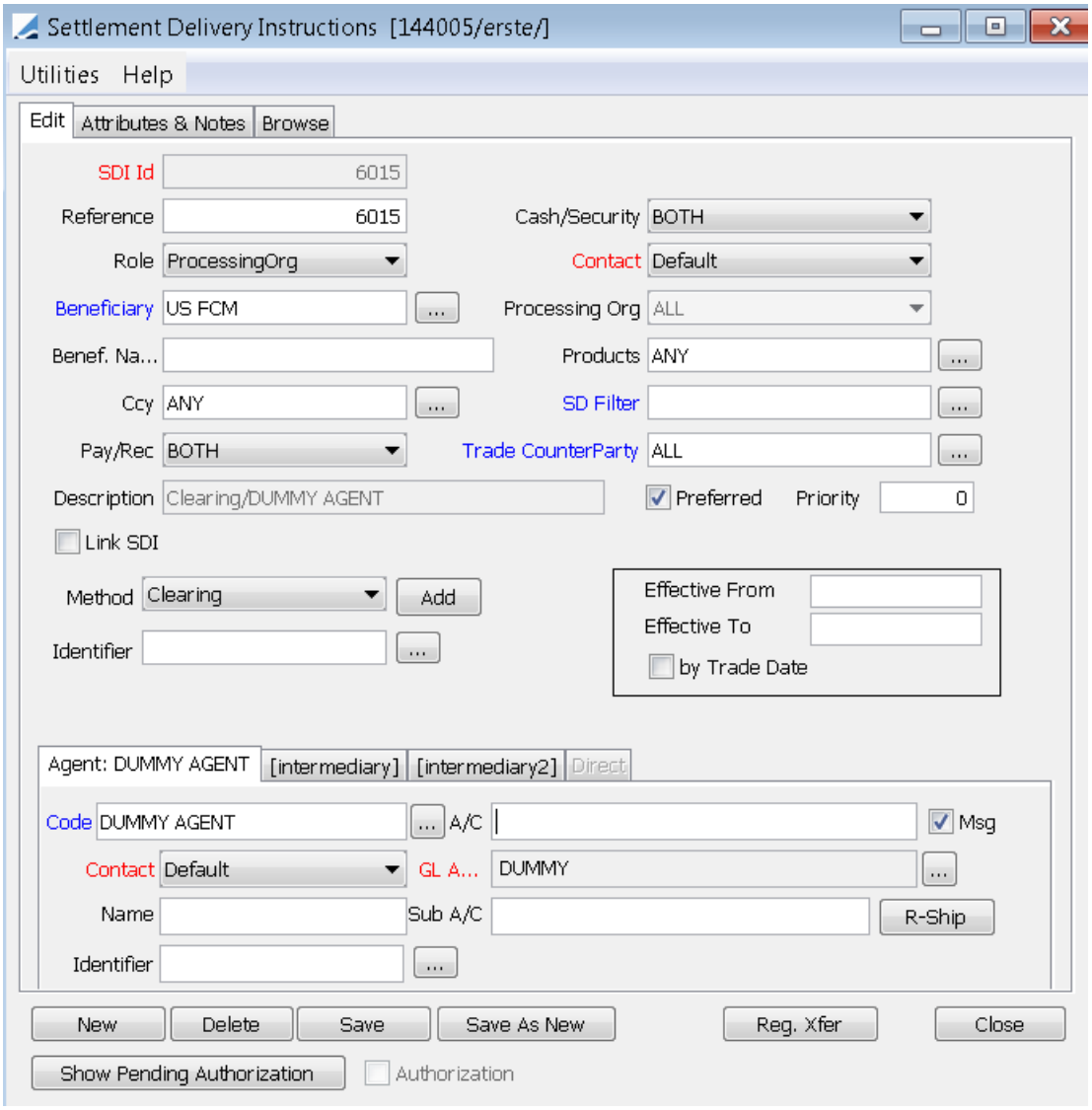
Note the Role must be set to **Clearer** to link to the Orderer Role of our Margin Call contract.



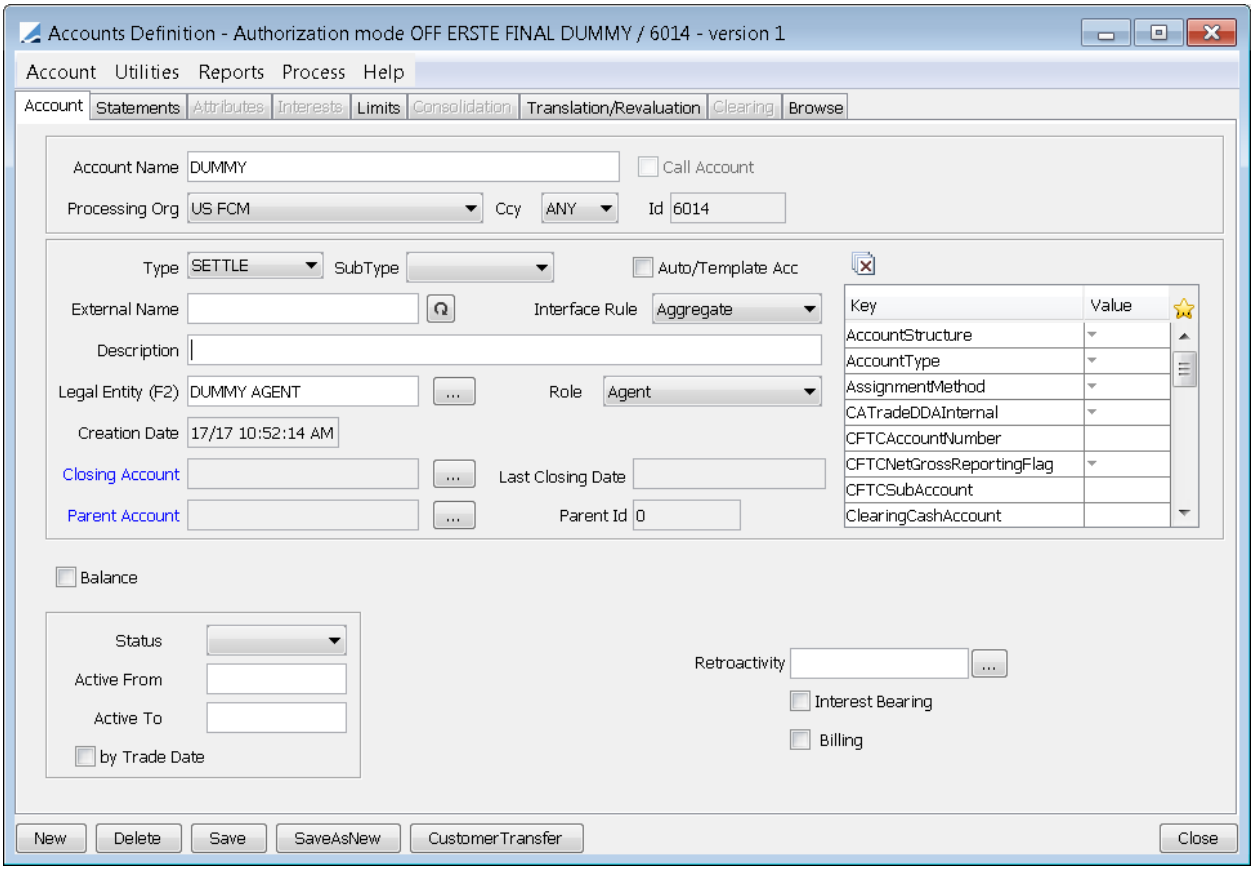
7.3 Processing Org SDIs

PO Internal Settlement Instructions

The PO internal SDI is a technical SDI used to match on one side the Client transfer that will be created with GL Account = Client Account and, on the other side, the CounterParty transfer that will be created with GL Account = CounterParty Account. The same unique PO SDI with Method = Clearing will be used to match both sides and create the expected internal transfers.

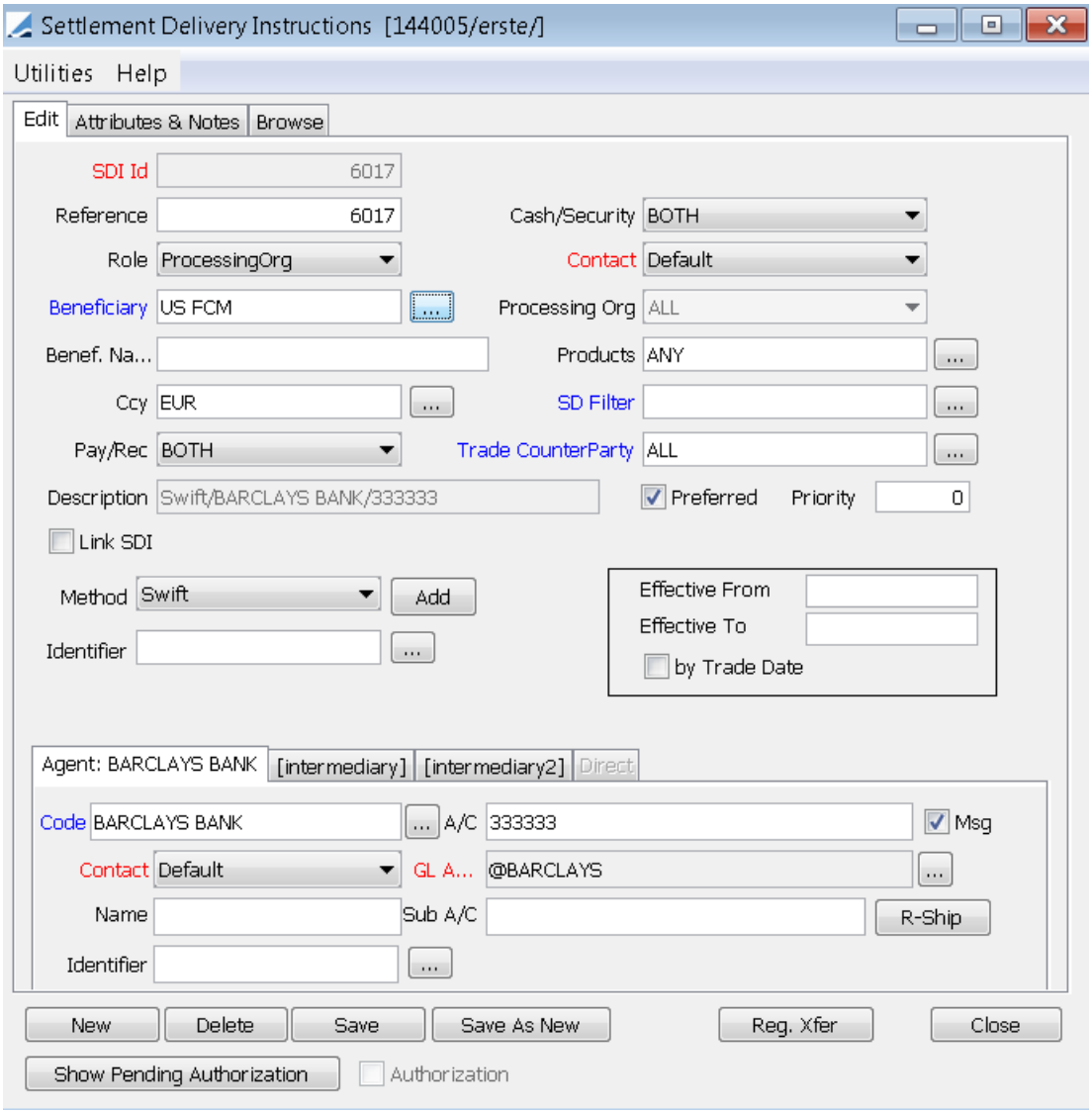


Note the GL Account set on the Clearing Processing Org. SDI must be created as a SETTLE Account with Ccy = ANY and Subtype = blank. See below:



PO External Settlement Instructions

For external settlement to CCP or Clearer, we need to define standard Processing Org. SDI with the cash account credited/debited on the PO side. This allows managing the cash impact of all external movements. An example is presented below.



Section 8. Importing and Capturing Trades

Out-of-the-box, the trades can be imported in real-time from ATEO's LISA.

The counterparty of the trades is the clearing house or the clearing broker.

The trades navigate the Calypso workflow based on their clearing status, using straight-through processing and exceptions monitoring. Once the trades are cleared, they are liquidated as applicable and update the accounts positions.

Please refer to the Calypso ATEO LISA Integration Guide for complete details.

The trades can also be imported from other sources or they can be manually entered using the Listed Derivatives Trade windows or using the Pricing Sheet.

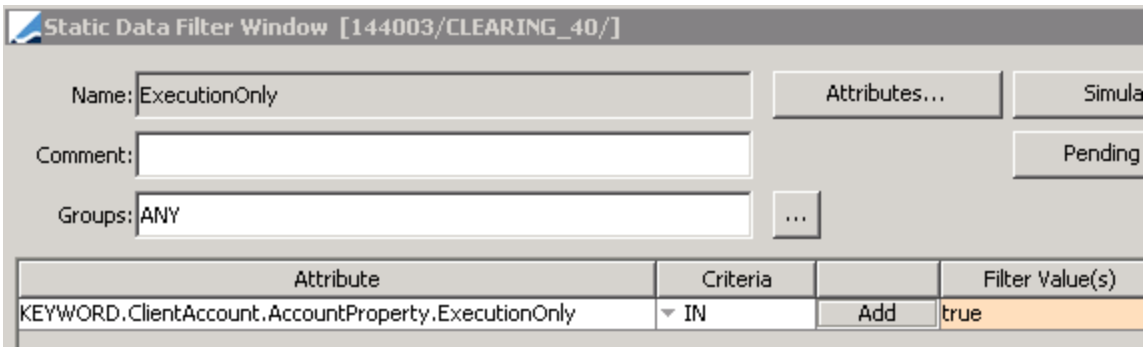
8.1 Trade Workflow

Processing Org = ALL

Product Type = G.ETD
The workflow presented below is an example to outline the control on fees. This is for information only. Additional controls will have to be put in place when using the automatic feed from LISA, G-API or a Broker File. This workflow does not include Undo Action (to undo exercise, etc.) and will need to be enriched.

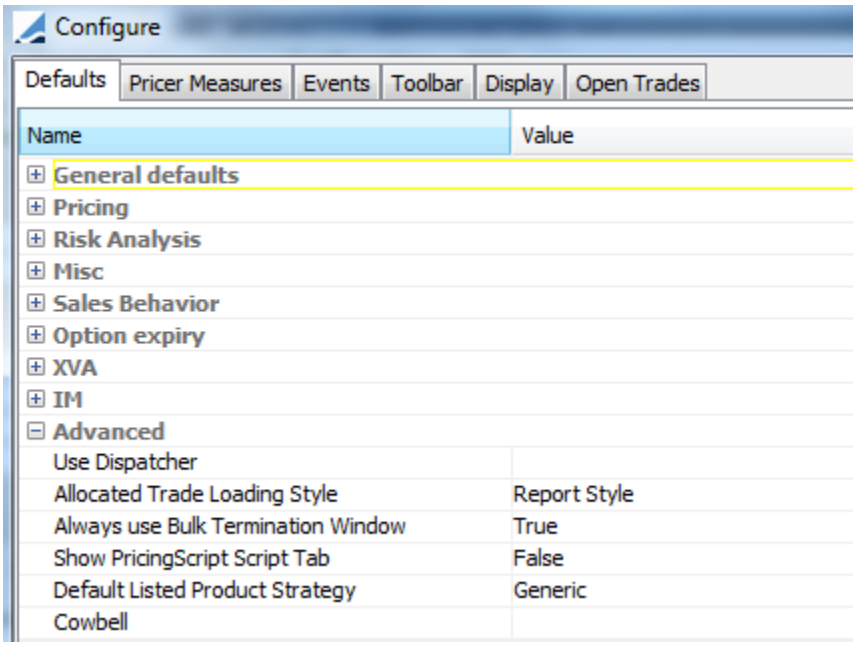
Orig Status	Action	Resulting Status	STP	Rules	Task	SDF	Pref
EXECUTIONONLY	AMEND	EXECUTIONONLY	false	AutomaticFees CheckSDI	false		true
EXECUTIONONLY	CANCEL	CANCELED	false		false		false
NONE	NEW	PENDING	false		false		false
PENDING	EXECUTE	EXECUTIONONLY	true	CheckSDI Automatic Fees	false	ExecutionOnly	false
PENDING	AUTHORIZE	ZERO_COMM	true	CheckSDI Automatic Fees	false	NotExecutionOnly	false
PENDING	CANCEL	CANCELED	false		false		false
PENDING	AMEND	PENDING	false		false		false
PENDING	UPDATE	PENDING	true		false		true
ZERO_COMM	EXECUTE	VERIFIED	true	ETDCheckFee	false		true
ZERO_COMM	BYPASS_FEES	VERIFIED	false		false		true
ZERO_COMM	AMEND	PENDING	false		false		true
ZERO_COMM	UPDATE	PENDING	false		false		true
VERIFIED	AMEND	PENDING	false	AutomaticFees	false		true
VERIFIED	CANCEL	CANCELED	false		false		false
VERIFIED	UPDATE	PENDING	false		false		false

Static Data Filter "ExecutionOnly". Not ExecutionOnly is the opposite filter. Please note your will have to filter the EXECUTIONONLY status from the Liquidation and Transfer Engine using the engine parameters.



8.2 Sample Trades

In the Pricing Sheet, you need to set the following in the User Preferences:



Default Listed Product Strategy = Generic

To capture trades, you need to use the strategies Future (for Future trades) or Option (for Future Option and ETO trades).

Find Property...	1
Strategy Name	**Future**
Price	**Price**
Save	**Save**
Solve	**Don't Solve**
Trade Id	7704
Trade Date	09/03/2015
Trade Time	9:57:45 AM
Book	US FCM Client Clearing
Status	VERIFIED
Action	AMEND
Client Account	EUROCORP-ACC-ST0001 (38...
Counterparty Account	CME Client Omnibus Account ...
Counterparty	CME CLEARING GROUP
Exchange	CBOT
⊞ Contract	CBOT1
Contract Date	Sep 15
⊞ Settle Type	Physical
Settle Ccy	USD
Expiry Date	09/14/2015
Buy/Sell	Buy
Quantity	1
⊞ Price	200.0000
Price Format	PriceC
⊞ Market Price	0.0000

Name	Value
BusinessFlow	FCM
CCP	▼ CME CLEARING GROUP
CCPClearedDatetime	2015-09-03T11:57:45.000-05:00
CCPOriginCode	▼ CLIENT
CCPStatus	Cleared
CCPTradeID	100003
Client	▼ EUROCORP
ClientAccount	▼ EUROCORP-ACC-ST0001 (3804)
ContractSymbol	C
CounterPartyAccount	▼ CME Client Omnibus Account (3743)
ExecutingBroker	▼ US FCM
ExecutionType	Allocation,Execution
ExecutionTypeCode	3
FutOpt	FUT
NegotiatedCurrency	USD
OrderId	9517
OrderQuantity	0
PSStrategyName	Future
RateSide	Choice
RelatedProductType	ETD
SecondaryTradeType	1
SecondaryTradeTypeCode	1
Service	ATEO
ServiceLevel	▼ Full Service
TradeSource	ATEO

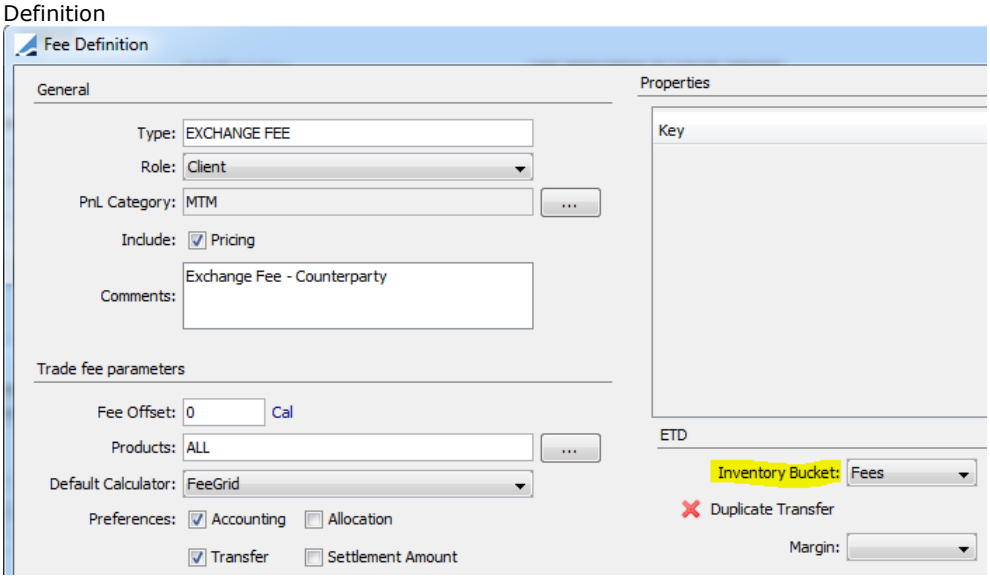
Strategy Name	**Option**
Price	**Price**
Save	**Save**
Solve	**Don't Solve**
Trade Id	7601
Trade Date	09/02/2015
Trade Time	11:35:29 AM
Book	US FCM Client Clearing
Status	VERIFIED
Action	AMEND
Client Account	EUROCORP-ACC-ST0001 (...
Counterparty Account	EUREX A1 (3677)
Counterparty	EUREX CLEARING
Exchange	EUREX
⊞ Contract	EUREX5040
Contract Date	Sep 15
⊞ Settle Type	Physical
Settle Ccy	EUR
Expiry Date	09/18/2015
⊞ Strike	1
Put/Call	Call
Buy/Sell	Buy
Quantity	5

Name	Value
CabinetType	▼ Fixed
CCP	▼ EUREX CLEARING
CCPOriginCode	▼ CLIENT
CCPStatus	Cleared
Client	▼ EUROCORP
ClientAccount	▼ EUROCORP-ACC-ST0001
ContractSymbol	5ABL
CounterPartyAccount	▼ EUREX A1 (3677)
FutOpt	OPT
PSStrategyName	Option
RateSide	Choice
RegCode	04 - Non regulated
RelatedProductType	ETD
ServiceLevel	▼ Full Service
TradeSource	Manually Entered

8.3 Inventory Position

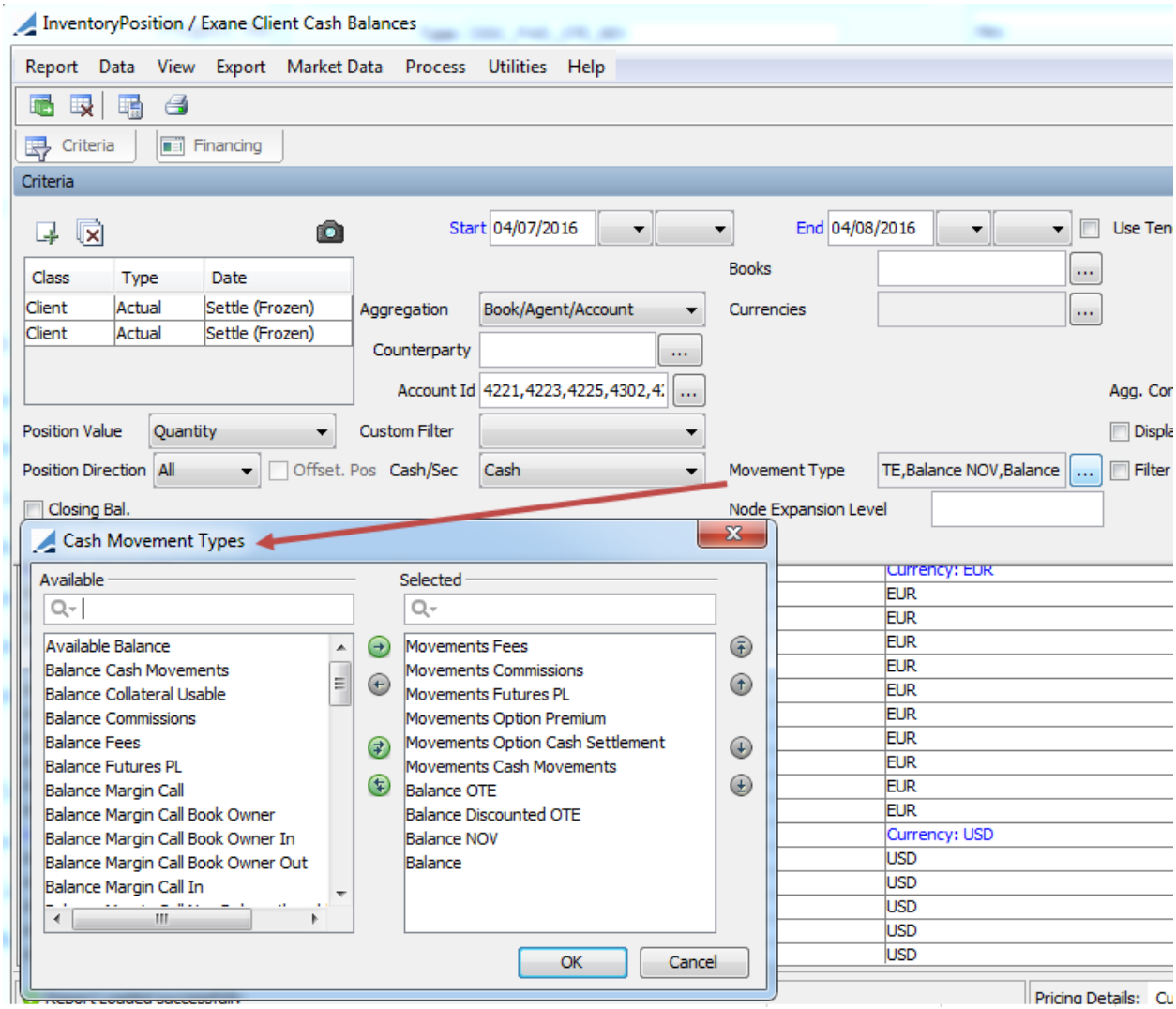
The concept of cash inventory "buckets" has been implemented to help classify activity in a given account by its source. This is used in our clearing solution to allow us to separate account balances and movements into business categories. The bucketing logic is triggered based on the transfer type of the transfer hitting the account and is designed to work either as a hardcoded rule or based on the users' determination of the bucket to be used for manually defined fees and commissions.

The bucket names, and the rules by which they are impacted, are defined in the table below

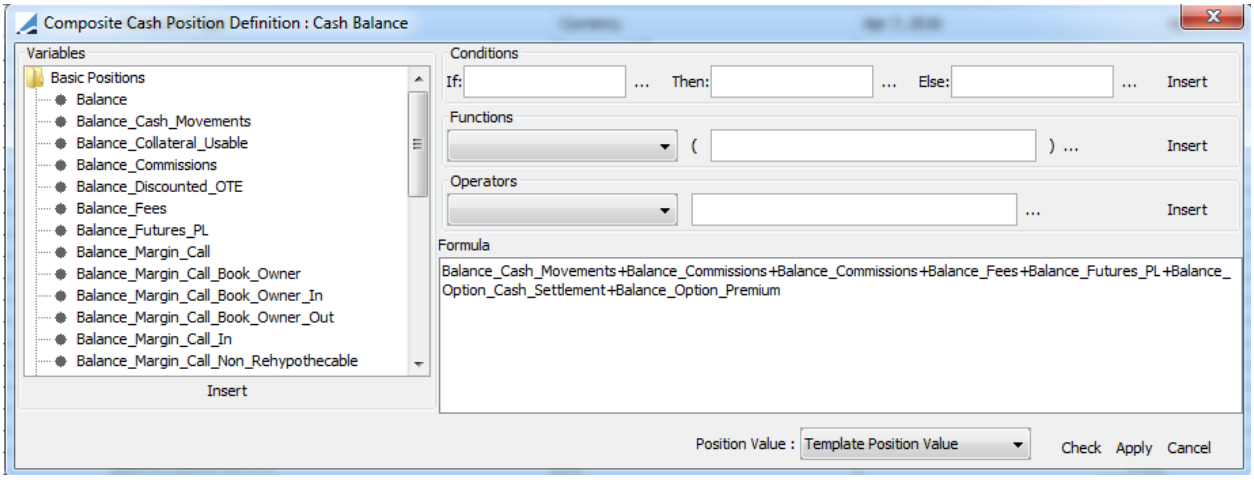
Bucket Name	**Logic Description**
Fees	Any manually defined fee which is designated as belonging to the "Fees" bucket in the Fee Definition 
Commissions	Any manually defined fee which is designated as belonging to the "Commissions" bucket in the Fee Definition
Futures PL	Transfers of type REALIZED_PL
Option Premium	Transfers of type PREMIUM
Option Cash Settlement	Transfers of type EXERCISE_FEE and OPT_CASH_ADJ
Variation Margin	Transfers of type NPV and NPV_REV
NOV	Transfers of type NOV and NOV_REV
OTE	Transfers of type OTE and OTE_REV
Discounted OTE	Transfers of type DISC_FWD_OTE and DISC_FWD_OTE_REV
Cash Movements	Any transfer which doesn't fall into one of the buckets in the list above.

The same buckets are used as the basis of the Financial Summary of the Client Statement, based on a position date of "Settle (Frozen)" which uses the later of the Settle Date and the Booking Date of the transfer as the date on which it impacts the bucket.

Using the Movement Type field in the criteria panel of the Inventory Position report, you can select any of the buckets as a movement (daily change) and/or balance (cumulative total) to be displayed in the report.

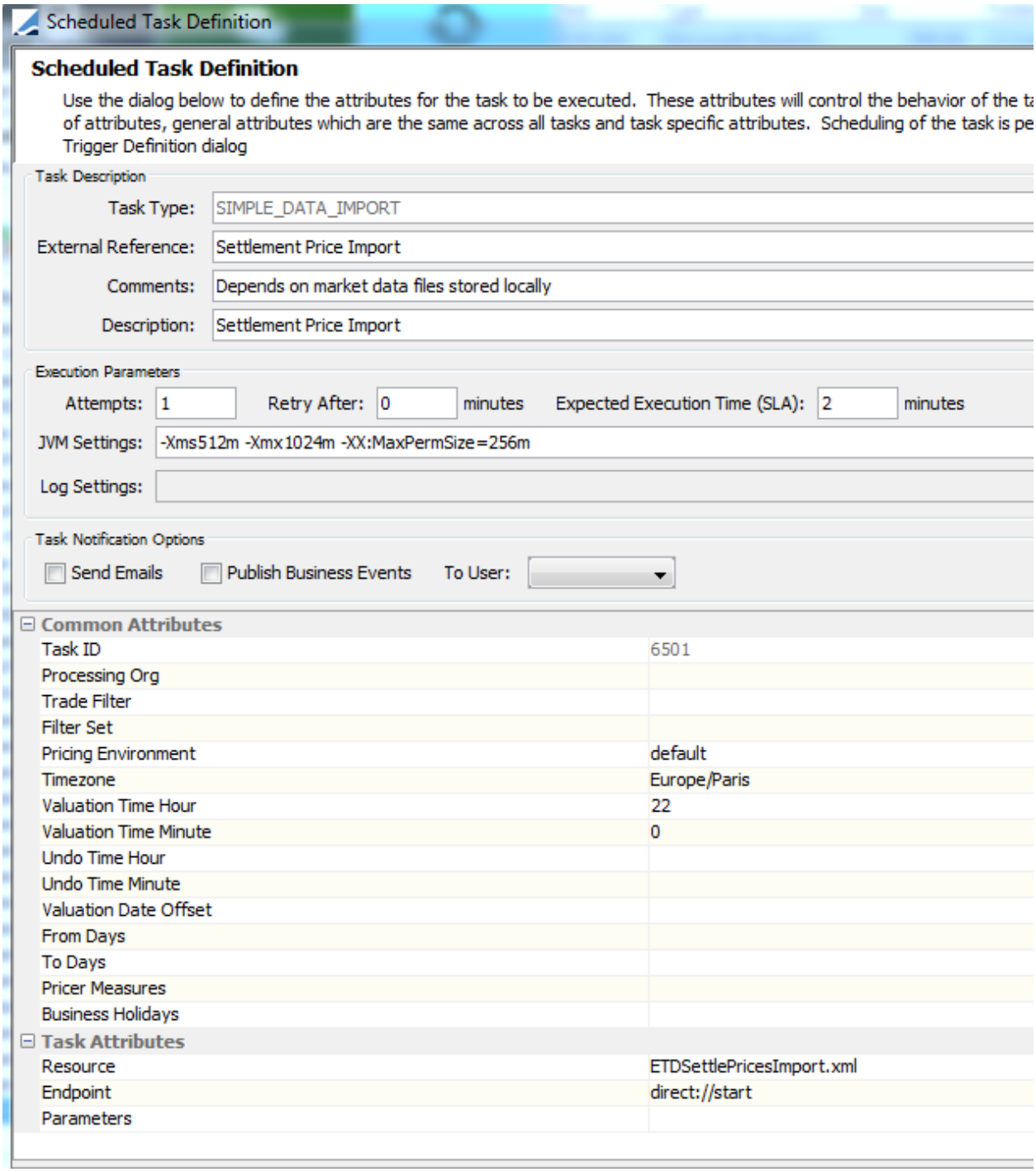


The user can also go to the Process menu of the Cash Inventory Report and create new balance or movement types using formulas based on available buckets. Once the balance or movement is created and the formula defined, it will be available for use in the report.



Section 9. Importing Market Data

The scheduled task SIMPLE_DATA_IMPORT is used to import end of day settle prices (for variation margin calculation) and FX quotes.



Attribute Name	Purpose/Impact
Task Type	SIMPLE_DATA_IMPORT
Processing Org	The name of the Clearing Broker running the EOD process.
Pricing Environment	The name of the PE from which to source the Closing Prices.
Timezone	The Time Zone in which the Clearing Broker operates.

The market data import process uses the same files as the risk calculation, and relies on the folder structure described in Section 3.1 of this document.

Section 10. Variation Margin Calculation

10.1 Overview

The Variation Margin is defined as the change in valuation of a portfolio due to new trade activity, lifecycle events, and the daily changes in the settlement prices of futures and options across all exchanges in their settlement currencies. In market terminology, a portfolio's Open Trade Equity (OTE) represents the current valuation of all open positions based on their traded price and the most recent market closing price in each of the individual instruments. In addition, options are commonly valued using Net Option Value (NOV) which represents the options current value, long or short, based on closing prices but ignoring the initial traded price.

Realized gains or losses due to closing out of open positions, payment of option premium, fees, commissions and cash or physical settlement of future and option positions also contributes to the daily variation margin calculation, impacting the cash balance of the account.

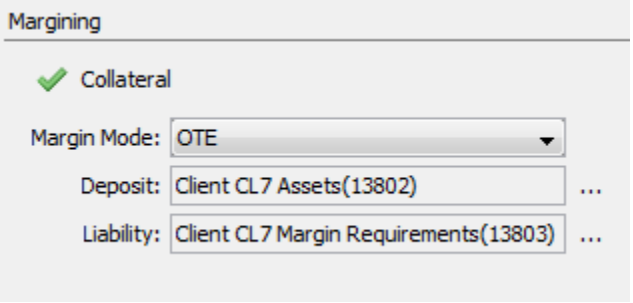
The sum of OTE, NOV and Realized Cash at the end of each day results in that account's closing Cash Net Liquidating Value (NLV), with securities deposited as collateral making up the rest of the account's Total NLV.

The execution of the scheduled task CLEARING_VM_CALC will generate the daily OTE and NOV, and present it in a way that the account balances are updated only with the day-to-day change in the account value.

Account Setting - Margin Mode

The PO must configure all client and counterparty collateral accounts to use one of two available VM Margin Modes – "OTE" or "Realized VM" - in order to specify how the unrealized profit or loss of their open positions behave.

- **OTE Mode** treats unrealized PL as a credit or debit to the account balance which can be used to cover Initial Margin Requirements, but cannot be withdrawn from the account as cash. In other words, if an account accumulates a large positive OTE without ever realizing the profit by closing out the position, "OTE" margin mode would not make that amount available in the cash balance to transfer back to the client, however it would allow that amount to be used to cover the Initial Margin Requirements, likely eliminating the need for the client to post additional collateral.

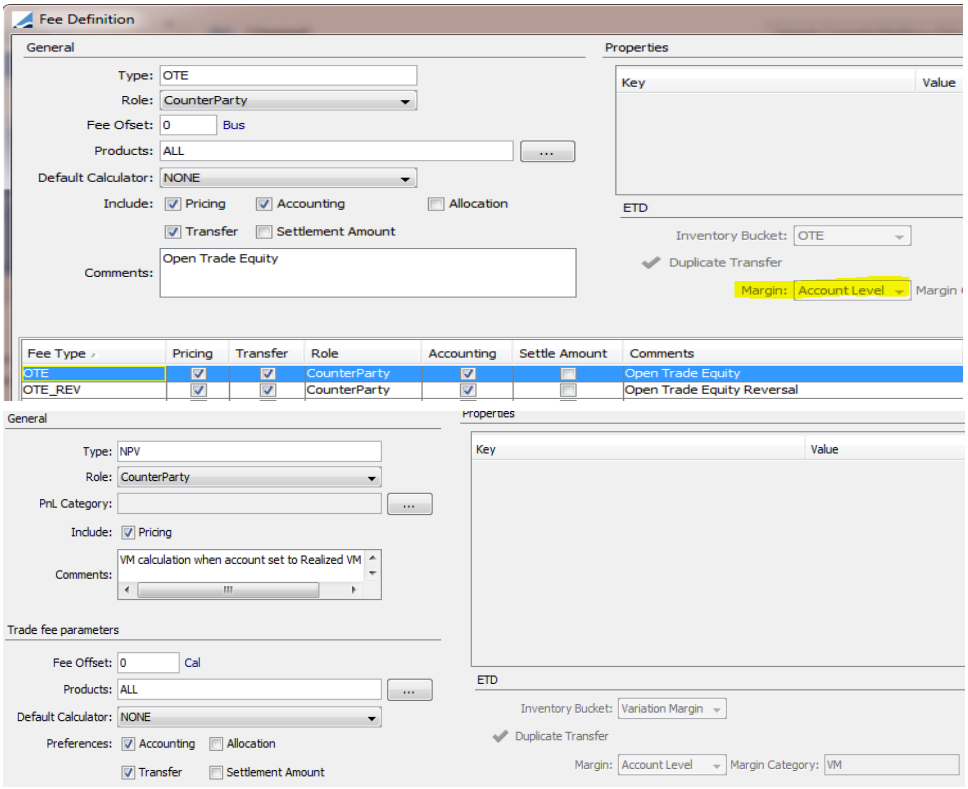


We model OTE Mode by calculating the VM in the standard way, creating a Clearing Transfer trade with OTE and NOV amounts, but we also generate a VM Collateral Exposure which captures the OTE amount as a pricer measure. The Collateral Exposure trade gets associated to the account's Liability Contract, and the negative or positive OTE amount is summed up with the true IM Requirements, increasing or decreasing them respectively. In OTE mode, the OTE and OTE_REV transfers from the Clearing Transfer trade do not get linked to the account's Deposit (VM) Collateral Contract, so while they do appear in the account's inventory balance, they are not consider assets by the Margin Call calculation process that could be used to cover margin shortfalls or withdrawn as cash. Since they offset IMR in the Liability Contract, we do not want to double count them.

- **Realized PL Mode** treats unrealized PL the same as realized, and is essentially the equivalent of closing out all open positions each night at the settlement price, and reopening them the next day as a new position at the previous day's price. The unrealized can be used as a cash equivalent to cover IMR or to withdraw if the account is in excess.

  This mode is triggered by selecting 'Realized VM' as the margin mode on the collateral account, and works by generating NPV and NPV_REV transfers on the Clearing Transfer trade that get updated with the account's associated VM Collateral Contract, and therefore treated as cash assets.

  The behavior of the OTE or NPV is driven in part by the Fee definition. The highlighted 'Margin' field is set to "Account Level" in the standard system configuration, meaning that based on the setting of the Margin Mode on each account, the fee transfer may or may not get tagged with the MarginCall XferAttribute that is required for it to be considered as an asset in the Deposit contract.



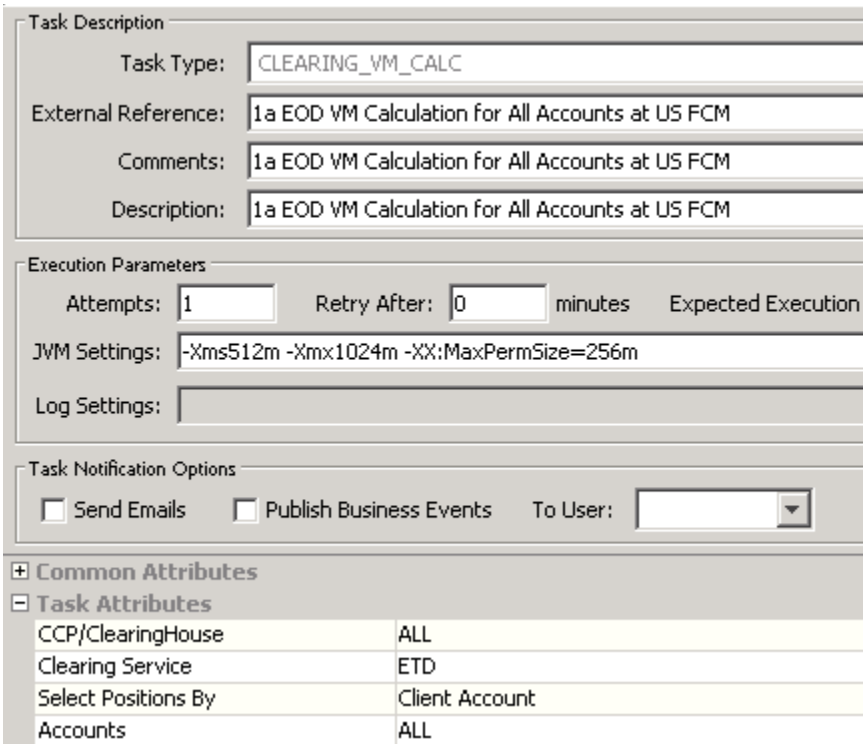
Account Setting – Family Accounts

Variation Margin is calculated on open positions at the level of each account that is eligible to hold positions – what we refer to as Standard Accounts and Child Accounts. When an account is a child, the OTE/NPV and NOV transfers generated at the child account level are duplicated to the parent account so that both accounts are equally impacted. This holds true for other transfer types as well, such as Premium, Realized PL and Option Cash Settlement. What this means is that for a parent child structure, the total VM at the parent level is the sum of all flows across all child accounts.

Settle Prices

To calculate the Variation Margin, the system requires that each instrument in the portfolio has a closing price saved under the CLOSE instance on the process date.

10.2 Scheduled Task CLEARING_VM_CALC



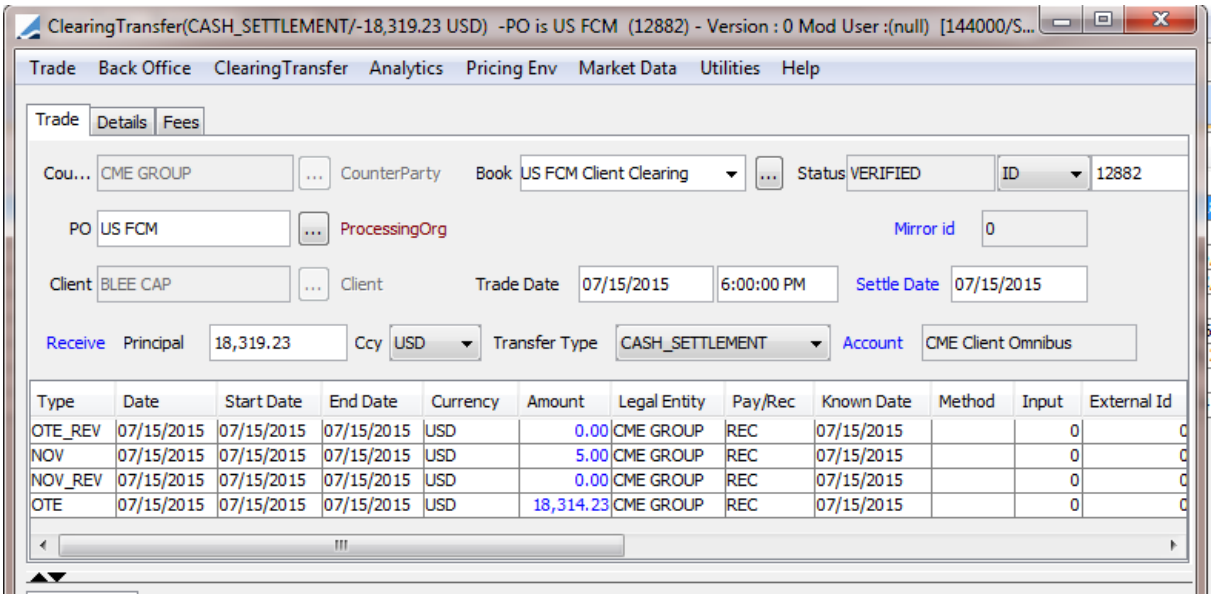
Attribute Name	Purpose/Impact
Task Type	CLEARING_VM_CALC
Processing Org	The name of the Clearing Broker running the EOD process.
Pricing Environment	The name of the PE from which to source the Closing Prices.
Timezone	The Time Zone in which the Clearing Broker operates.
Valuation Time Hour/Minute	The Valuation Time of the scheduled task can be set to ensure that each time the task is run, it is run at the same Valuation Time regardless of the Execution Time. The ST should be run at a time in the specified Time Zone which is before the Book EOD time of all Books which hold positions for the accounts included in the run. If the scheduled task valuation time is after the Book EOD time on date 'T', the task will be run as if it is running for EOD on T+1.
CCP/ClearingHouse	This field indicates the list of markets to process. Allows the user to select a list from any Legal Entity with Role 'CounterParty', or to simply select 'ALL' to process all markets.
Clearing Service	Always set to ETD for Listed Market processing. This uses the 'RelatedProductType' attribute of the trade to locate trades and positions related to ETD processing.
Select Positions By	Allows the user to determine the Account Types that they may want to filter on in the next field.

Attribute Name	Purpose/Impact
Accounts	Allows the user to select from a list of Standard and Child Accounts of the type selected in the previous field. Can be used to isolate specific accounts for processing, or can be set to 'ALL' to process all accounts.

10.2.1 Clearing Transfer Trades

The VM flows generated through the task are stored on a Calypso product called a Clearing Transfer trade. Storing these calculated amounts on a trade allows us to leverage the robust support for trade workflow, transfer generation, settlement routing and reporting that is supported across all Calypso products. We simply use the Clearing Transfer product as a convenient container for the VM transfers.

Once the trade level valuations are complete, the results will be consolidated into a single OTE/NPV and a single NOV amount for each unique combination of CCP, Clearing Service, Client Account, Counterparty Account and Currency. Clearing Transfer Trades will then be formed to contain these flows and generate BO transfers. The current design removes the existing design of CT trade mirroring, and instead generates a single CT trade with fees and transfers facing both the client and counterparty.



The Clearing Transfer trade is created with the following logic:

Trade Element	Population Logic
Counterparty	The LE on the Counterparty Account associated to the trade.
Role	Hardcoded to Counterparty.
PO	The PO specified in the executed Scheduled Task.
Book	The default Client or House Clearing Book specified on the PO, based on the Origin of the Account to which the Margin Group is associated.
Trade Date	The Process Date of the Scheduled Task.
Settle Date	The Process Date of the Scheduled Task. Our Inventory balances will be built using Settle Date logic, and we need the CT trades generated on the processing date to impact the balances for that date.

Trade Element	Population Logic
Currency	The Currency of the CT trade will be taken from the currency of the aggregated transaction valuations.
Principal	The sum of the amounts of all of the counterparty flows included in the trade. We do not include all flows, because by definition these would always sum to zero.
Pay/Rec	This should be set based upon the sign of the Principal flow. A positive principal results in a setting of Receive and a negative principal amount results in a setting of Pay
Transfer Type	Hard coded to 'CASH_SETTLEMENT'
Client Account	The Client Account on the aggregated transaction valuations.
Counterparty Account	The Counterparty Account on the aggregated transaction valuations.
Trade Keywords	**CCP** - Taken from the CCP keyword of the trades whose valuation is contributing to the CT Trade. This is included because of the users' ability to run the task for a subset of all CCPs. If we did not uniquely identify the CT trade by CCP, the execution of the ST for one CCP would overwrite the flows for another previously executed CCP, and our finalization process would fail. **CCPOriginCode** - The Origin of the Client Account specified – House or Client. **RelatedProductType** - ETD.

OTE Cashflow

For Accounts in MarginMode = OTE, generate an OTE flow as follows.

For the selected trade, if the product is a Future, or an Option with the PremiumPaymentConvention attribute = 'VariationMargined':

- Flow type = "OTE"
- SettleCurrency = The settle currency defined on the product
- Flow Amount = Sum of {Round*(Market Price * Tick Size * Tick Value) – Round(Traded Price * Tick Size * Tick Value)}* *Quantity*} for the open quantity of each transaction that comprises the open position, where the sign of the Quantity follows these rules

If the product is an option with the PremiumPaymentConvention attribute not equal to 'VariationMargined':

- Flow type = "OTE"
- SettleCurrency = The settle currency defined on the product
- Amount = 0

OTE_REV Cashflow

For accounts in Margin Mode of OTE or Realized VM, generate as follows:

Will be equal but opposite direction to the OTE amount on the previous day's CT trade with the equivalent trade attributes. If no CT trade is found, the amount will equal 0.

The previous day is the preceding business day subject to the holiday calendar designated on the PO under the ClearingBusinessCalendar attribute.

NPV Cashflow

For Accounts in MarginMode = Realized VM, generate an NPV flow as follows.

For the selected trade, if the product is a Future, or an Option with the PremiumPaymentConvention attribute = 'VariationMargined':

- Flow type = "NPV"
- SettleCurrency = The settle currency defined on the product
- Flow Amount = Sum of {Round*(Market Price * Tick Size * Tick Value) – Round(Traded Price * Tick Size * Tick Value)}* Quantity*} for the open quantity of each transaction that comprises the open position, where the sign of the Quantity follows these rules

If the product is an option with the PremiumPaymentConvention attribute not equal to 'VariationMargined':

- Flow type = "NPV"
- SettleCurrency = The settle currency defined on the product
- Amount = 0

NPV_REV Cashflow

For accounts in Margin Mode of OTE or Realized VM, generate as follows:

Will be equal but opposite direction to the NPV amount on the previous day's CT trade with the equivalent trade attributes. If no CT trade is found, the amount will equal 0.

The previous day is the preceding business day subject to the holiday calendar designated on the PO under the ClearingBusinessCalendar attribute.

NOV Cashflow

For the selected trade, if the product is a Future, or an Option with the PremiumPaymentConvention attribute = 'VariationMargined':

- Flow type = "NOV"
- SettleCurrency = The settle currency defined on the product
- Amount = 0

If the product is an option with the PremiumPaymentConvention attribute not equal to 'VariationMargined':

- Flow type = "NOV"
- SettleCurrency = The settle currency defined on the product
- Amount = Sum of { *Market Price * Tick Size * Tick Value * Quantity*} for the open quantity of each individual transaction that comprises the open position, where the sign of the Quantity follows these rules

NOV_REV Cashflow

Will be equal but opposite direction to the NOV amount on the previous day's CT trade with the equivalent trade attributes. If no CT trade is found, the amount will equal 0.

The previous day is the preceding business day subject to the holiday calendar designated on the PO under the ClearingBusinessCalendar attribute.

FWD_DISC_OTE Cashflow

For Accounts in MarginMode = OTE, generate an OTE flow as follows.

For the selected trade, if the product is a Future with the PremiumPaymentConvention attribute = 'VariationMargined' and the Exchange set to a LE with a MIC value of "LME":

- Flow type = "OTE"
- SettleCurrency = The settle currency defined on the product

- Flow Amount = Sum of {Round*(Market Price * Tick Size * Tick Value) – Round(Traded Price * Tick Size * Tick Value)}* Quantity}* for the open quantity of each transaction that comprises the open position, where the sign of the Quantity follows these rules

If the product is an option with the PremiumPaymentConvention attribute not equal to 'VariationMargined':

- Flow type = "OTE"
- SettleCurrency = The settle currency defined on the product
- Amount = 0

FWD_DISC_OTE_REV Cashflow

For accounts in Margin Mode of OTE or Realized VM, generate as follows:

Will be equal but opposite direction to the OTE amount on the previous day's CT trade with the equivalent trade attributes. If no CT trade is found, the amount will equal 0.

The previous day is the preceding business day subject to the holiday calendar designated on the PO under the ClearingBusinessCalendar attribute.

10.2.2 VM Collateral Exposure Trades (OTE Model Only)

When an account is set to OTE Mode, we generate Collateral Exposure trades to apply towards the Initial Margin calculation amounts, instead of treating the OTE as cash. The logic to generate those trades is below. Note that the OTE measure on the Collateral Exposure will be the total OTE across all position accounts associated to a single Collateral (Parent) Account for each unique settlement currency in the account.

The Collateral Exposure will be created according to the following logic:

Trade Element	Population Logic
Counterparty	The LE on the Collateral Account to which the trade/position is associated
Book	The default Client or House Clearing Book specified on the PO, based on the Origin of the Account to which the Margin Group is associated
Contract Id	The ID of the Liability Contract stored in the "Liability" attribute of the Account to which the Collateral Account is associated.
Instrument	Hard coded to Initial Margin
Currency	The Currency of the calculated OTE amount. Only one currency is allowed per Collateral Exposure, but Collateral Exposures in multiple currencies can be produced for a single Margin Group.
Trade Keywords	**CCP** - The CCP on which the products being included in the margin calculation output are cleared. Portfolios are organized by CCP and Clearing Service. **Account** - The Collateral Account to which the trade/position is associated. **CCPOriginCode** - The value of the CCPOriginCode populated on the Collateral Account. **RelatedProductType** - The Clearing Service on which the products being included in the margin calculation output are cleared. Portfolios are organized by CCP and Clearing Service.
Pricer Measures	OTE MARGIN_CALL

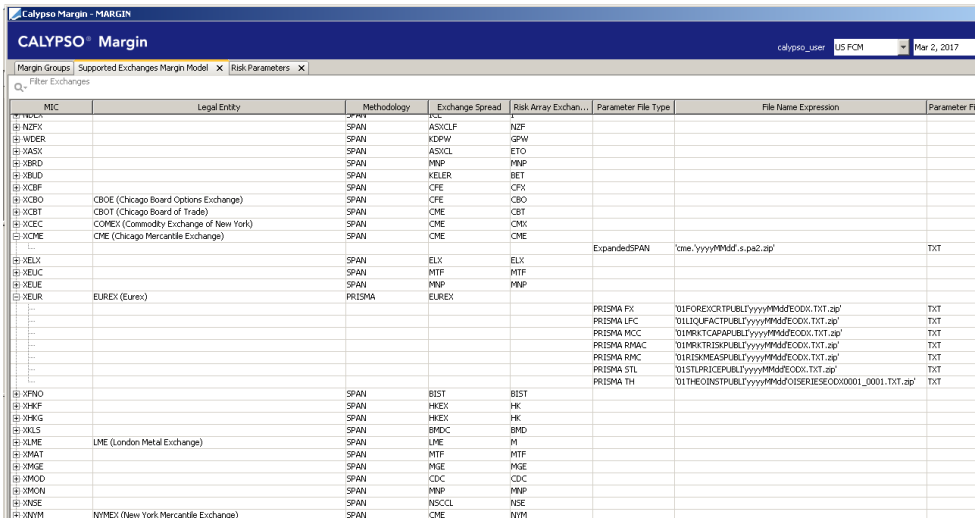
Section 11. Initial Margin Calculation

11.1 Risk Files

11.1.1 Required risk files

- For each initial margin methodologies, risk files are required for the margin calculation.

The required risk files are documented in the Calypso Margin Dashboard:



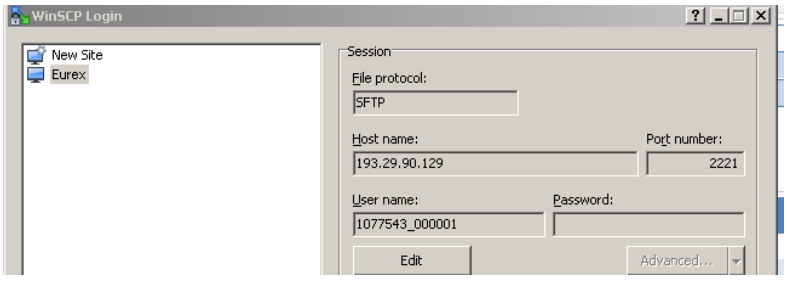
For example, for the SPAN methodologies, one single risk file is required (risk array file).
For EUREX PRISMA, 8 risk files are required.

The risk files are posted by the exchanges:

- **SPAN Risk Array files (for all methodologies currently supported, except PRISMA):**

ftp://ftp.cmegroup.com/pub/span/data/cme/2017/

- **PRISMA risk and market data files:**



PRISMA files descriptions:

File Name	Abbreviation	Purpose
Theoretical Prices and Instrument Configuration	File TH	VaR for market risk component Compression error adjustment Correlation break adjustment Liquidity risk component
Settlement Prices	File SP	VaR for market risk component
Risk Measure Aggregation Configuration	File RMAC	Aggregation of VaRs for market risk component Aggregation of market risk components Aggregation of VaRs for liquidity risk component
Risk Measure Configuration	File RMC	VaR for market risk component VaR for liquidity risk component Correlation break adjustment
FX Rates Configuration	File FX	VaR for market risk component VaR for liquidity risk component Correlation break adjustment Liquidity risk component
Market Capacity Configuration	File MCC	Liquidity risk component
Liquidity Factor Configuration	File LFC	Liquidity risk component

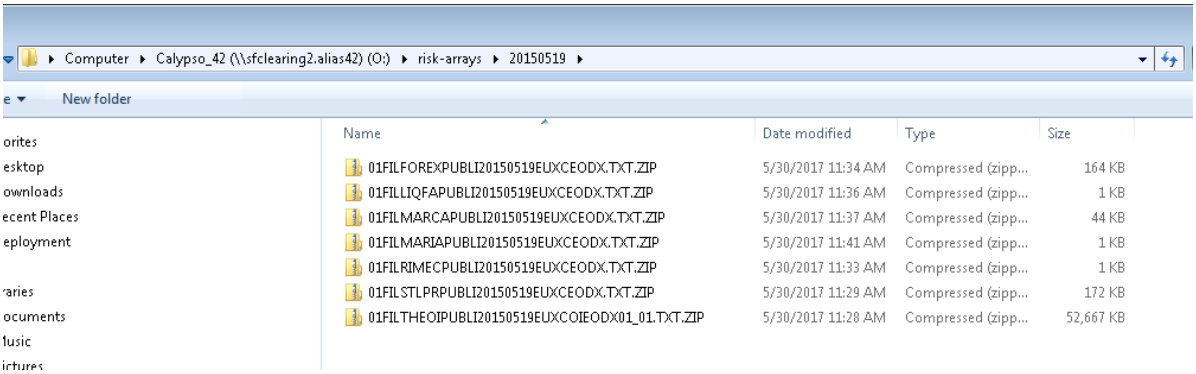
Important note:

Eurex PRISMA file names will change on June 12- the delivered software is based on the new file names, which can be retrieved from the Eurex sftp test files server:

	Current values / conventions	Future values / conventions
File short name	THEOINST	THEOI

		Current values / conventions	Future values / conventions
File short name	**Risk Measure Configuration**	RISKMEAS	RIMEC
	Risk Measure Aggregation	MRKTRISK	MARIA
	FX Rates	FOREXCRT	FOREX
	Market Capacity	MRKTCAPA	MARCA
	Liquidity Factor	LIQUFACT	LIQFA
	Settlement Price	STLPRICE	STLPR
	Materiality Parameter	MTRLPARM	MATPA
	FI & MM Priority	FIMMPRIO	FIMMP
	Maturity Bucket	MATRTBKT	MATBU

Example:



11.1.2 Risk files location

- The risk array files should be stored in a risk file folder, using the following syntax:

<Calypso user folder>/risk-arrays/yyyymmdd

<Calypso user folder>/clearing/yyyymmdd

Risk files will be organized by risk file dates, ie risk file as of "yyyymmdd" should be stored in the corresponding date folder.

- **The default behavior is to use:**

<Calypso user folder>/risk-arrays

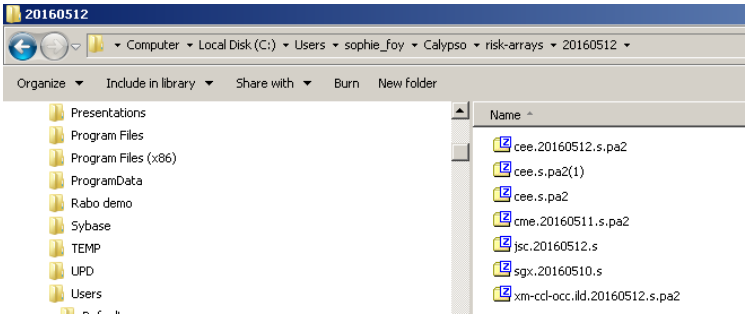
<Calypso user folder>/clearing as caching folder

  - When running margin from the CLEARING_IM_CALC_ST, this Calypso user folder should be defined on **the machine where the scheduler is running.**
  - When running the margin dashboard, or the clearing dashboard trying to obtain FOW files, the Calypso user folder will be defined **on the users' machine.**

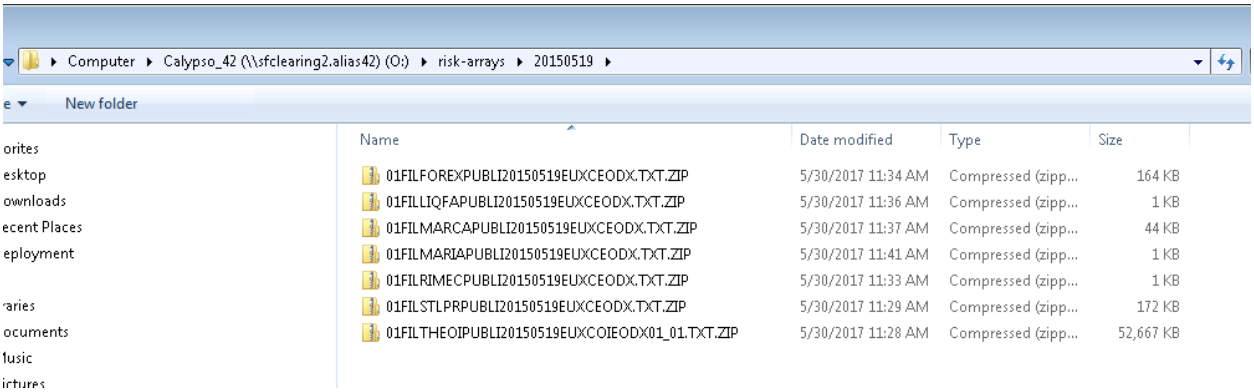
To change the default behavior, the configuration file can be updated in:

client/resources/clearing-data-manager.yml file. Sample file below:

Example of SPAN risk file storage:



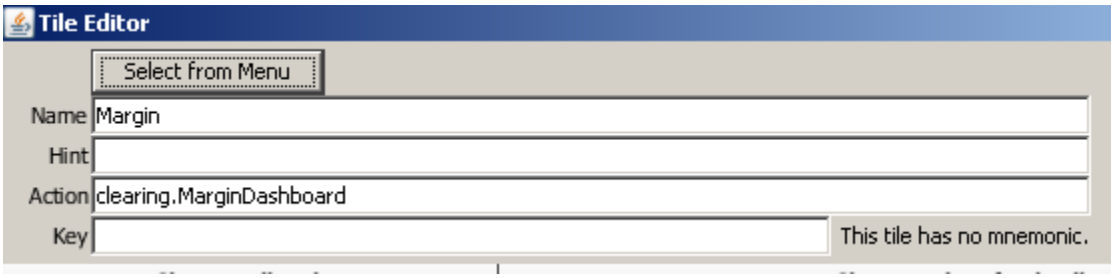
Example of EUREX PRISMA file storage:



11.2 Navigator

Add the following menu items if not already available:

- Margin Dashboard (menu action `clearing.MarginDashboard`)



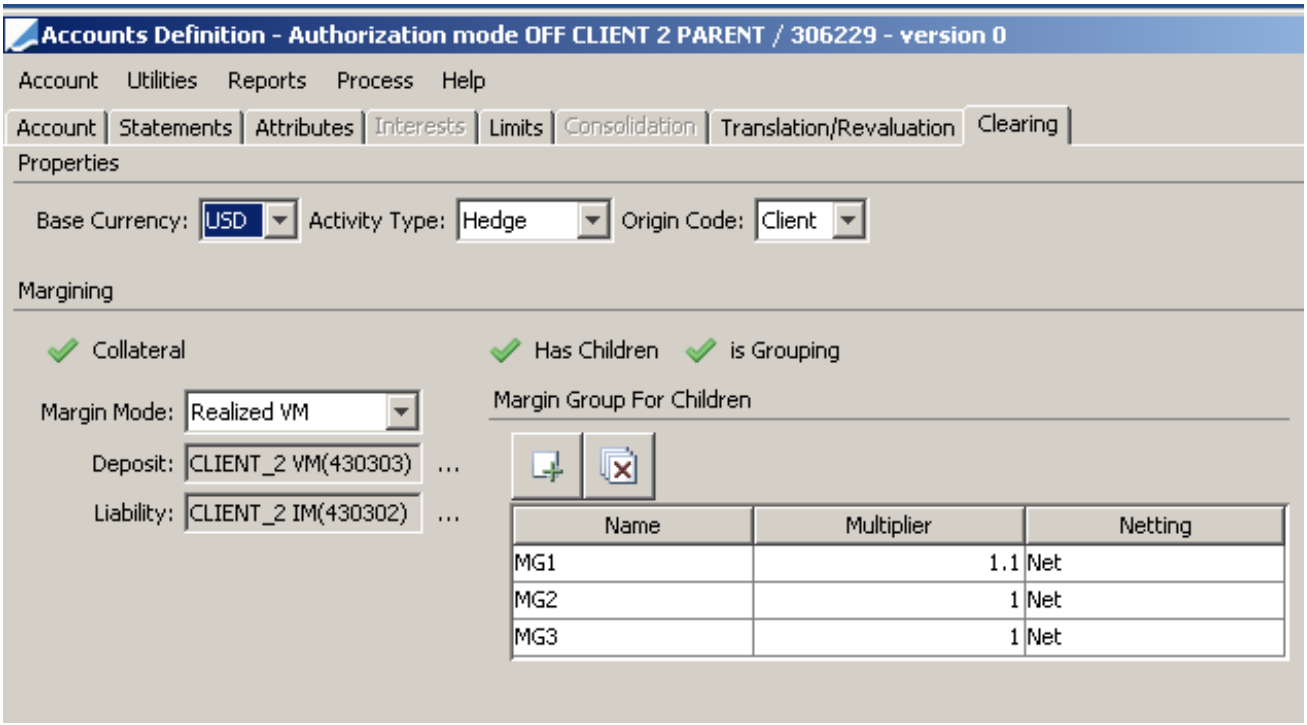
11.3 Account Setup

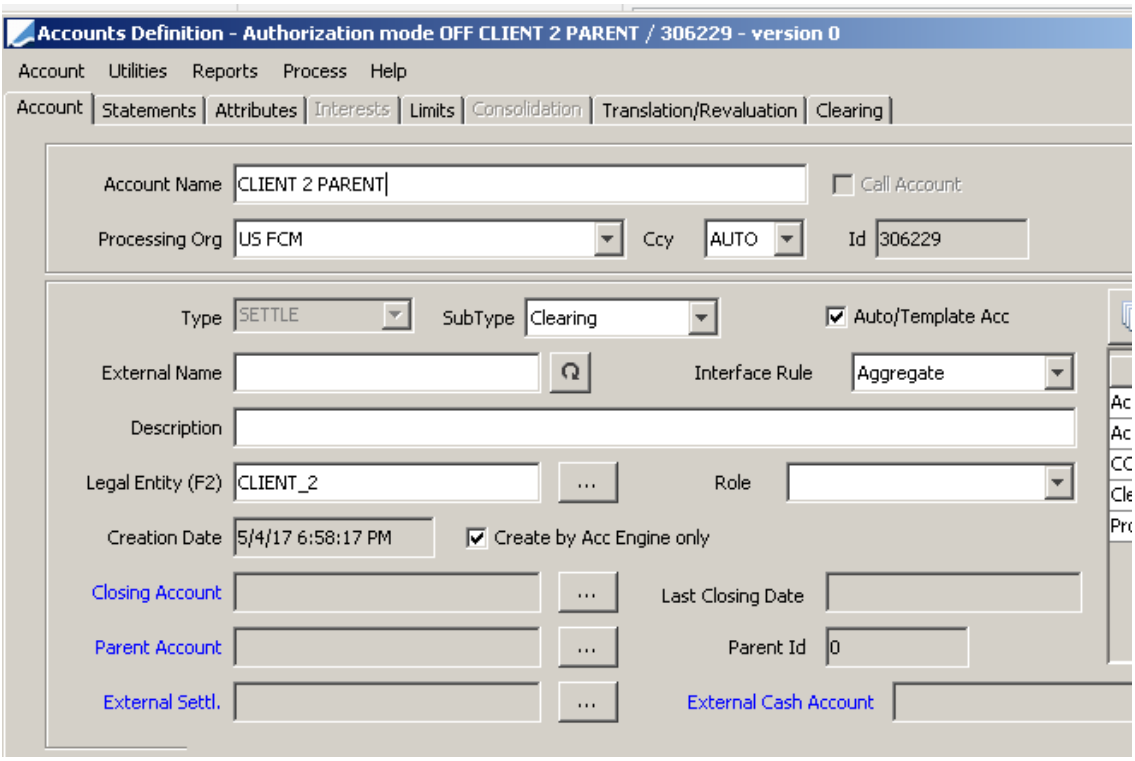
Example of end to end account setup (including collateral accounts, clearing account, and margin groups).

Parent Account

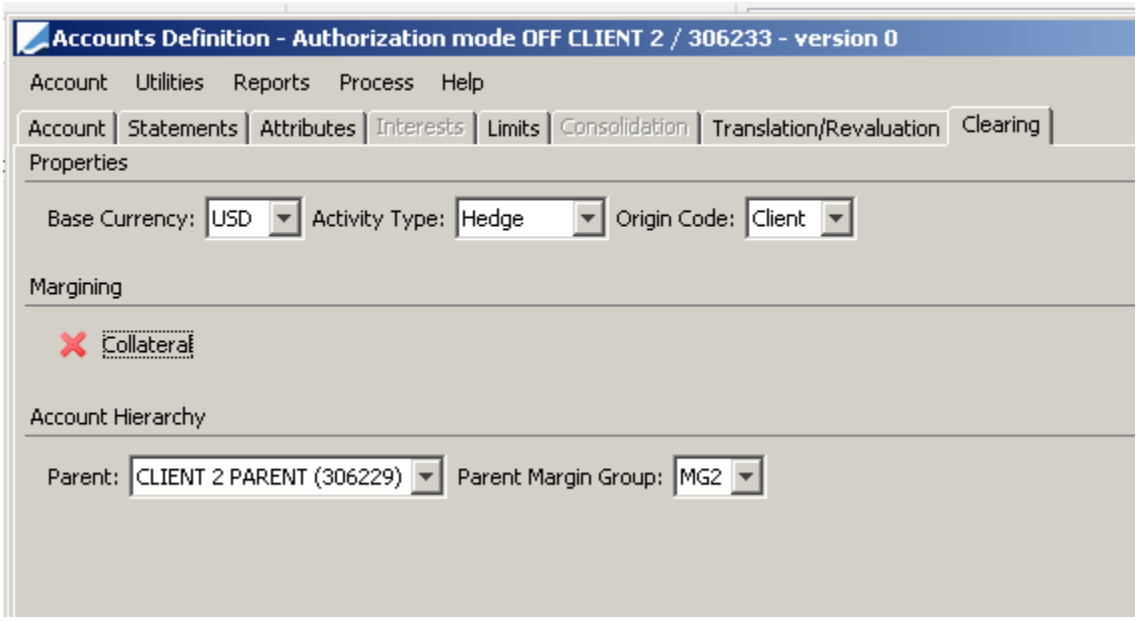
The Parent Account is linked to collateral Bilateral Contracts

Margin Groups are defined at the Parent Account level





Client Accounts are linked to a Parent Account:



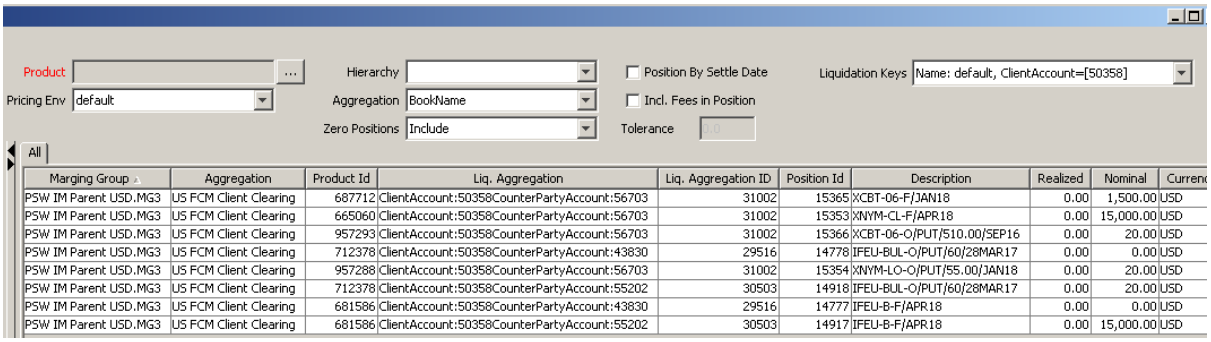
Important note: Several clients can be part of the same margin group.

It means that the position aggregation required to calculate margin is done at the margin group level, and not at the client account level.

11.4 Positions

11.4.1 Position Keeper Report

Position by margin groups – used for the Initial Margin calculation- can be viewed in the position keeper.



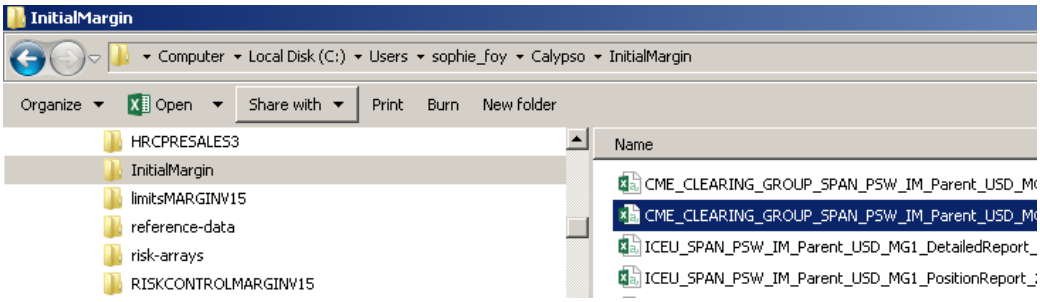
Marging Group	Aggregation	Product Id	Liq. Aggregation	Liq. Aggregation ID	Position Id	Description	Realized	Nominal	Currenc
PSW IM Parent USD.MG3	US FCM Client Clearing	687712	ClientAccount:50358CounterPartyAccount:56703	31002	15365	XCBT-06-F/JAN18	0.00	1,500.00	USD
PSW IM Parent USD.MG3	US FCM Client Clearing	665060	ClientAccount:50358CounterPartyAccount:56703	31002	15353	XNYM-CL-F/APR18	0.00	15,000.00	USD
PSW IM Parent USD.MG3	US FCM Client Clearing	957293	ClientAccount:50358CounterPartyAccount:56703	31002	15366	XCBT-06-O/PUT/510.00/SEP16	0.00	20.00	USD
PSW IM Parent USD.MG3	US FCM Client Clearing	712378	ClientAccount:50358CounterPartyAccount:43830	29516	14778	IFEU-BUL-O/PUT/60/28MAR17	0.00	0.00	USD
PSW IM Parent USD.MG3	US FCM Client Clearing	957288	ClientAccount:50358CounterPartyAccount:56703	31002	15354	XNYM-LO-O/PUT/55.00/JAN18	0.00	20.00	USD
PSW IM Parent USD.MG3	US FCM Client Clearing	712378	ClientAccount:50358CounterPartyAccount:55202	30503	14918	IFEU-BUL-O/PUT/60/28MAR17	0.00	20.00	USD
PSW IM Parent USD.MG3	US FCM Client Clearing	681586	ClientAccount:50358CounterPartyAccount:43830	29516	14777	IFEU-B-F/APR18	0.00	0.00	USD
PSW IM Parent USD.MG3	US FCM Client Clearing	681586	ClientAccount:50358CounterPartyAccount:55202	30503	14917	IFEU-B-F/APR18	0.00	15,000.00	USD

11.4.2 Position CSV File

Position by margin groups – used for the Initial Margin calculation- are exported in a csv file:

A	B	C	D	E	F	G
Exchange	Currency	Product C	Contract T	Strike Pri	Expiry Da	Quantity
I	USD	B	F		201804	15
I	USD	BUL	P	60	201703	20

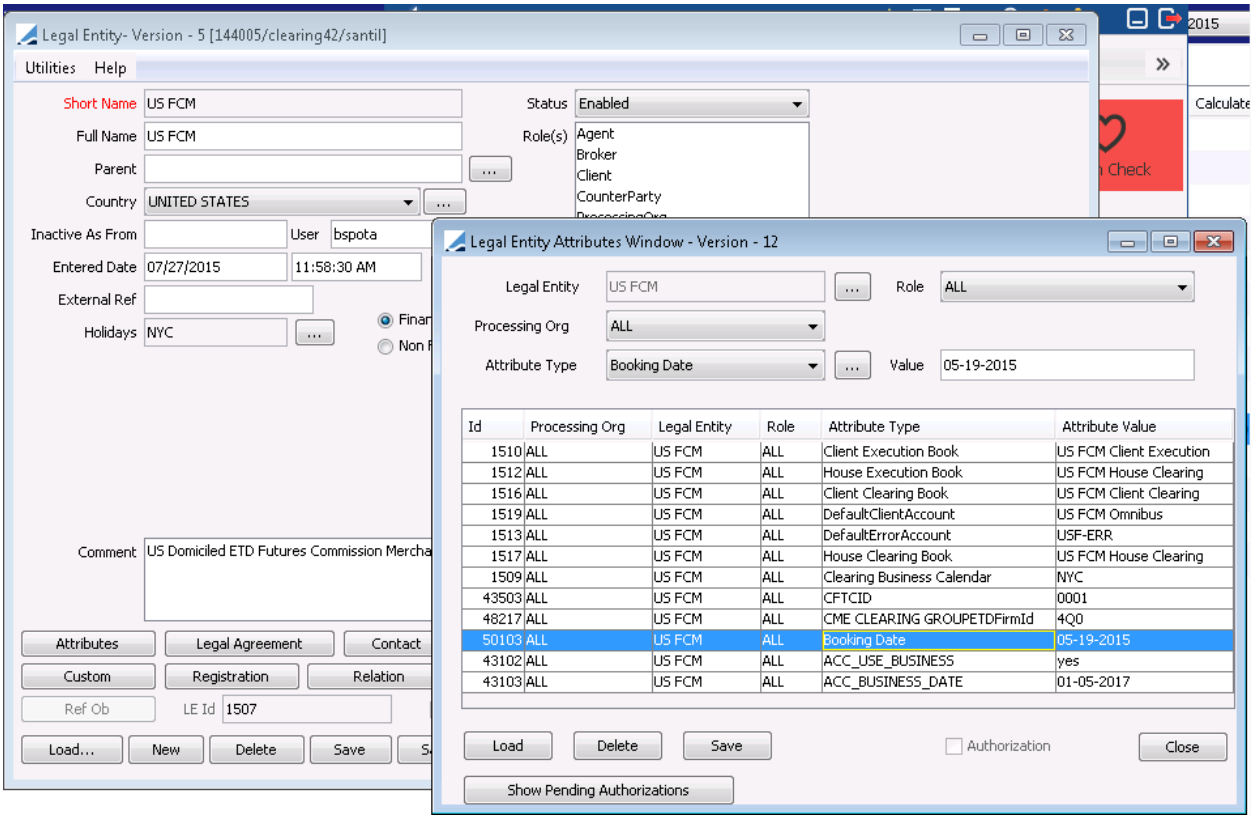
Path to access the position and detailed report files:



11.5 Booking date

Trades are included in the position as long as the trade settlement date is prior or equal to the booking date. The booking date allows for late trade booking.

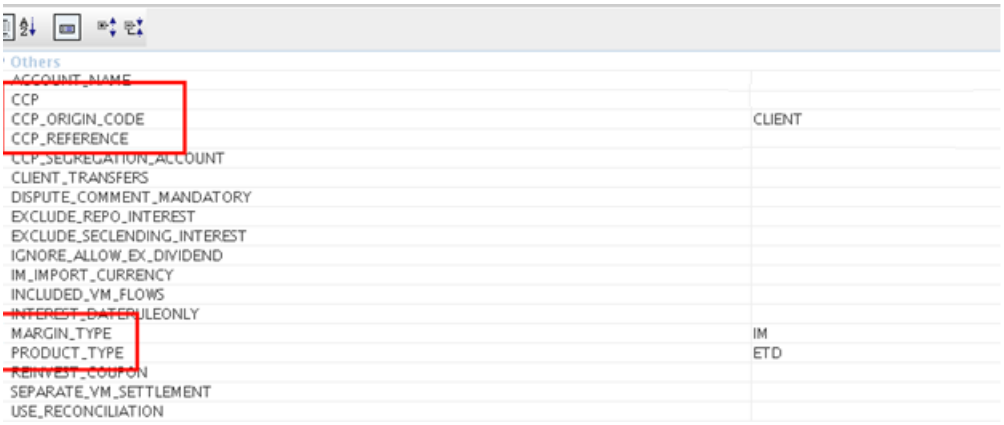
The booking date needs to be updated once all trades have been booked for a selected business date. It is controlled by the following Legal Entity Attribute:



11.6 Collateral Contracts

Please ensure that your Collateral Contracts are defined as described in the Calypso ETD Clearing Setup Guide.

Example of bilateral CCP Facing Contract:



11.7 IM Calculation and Reporting

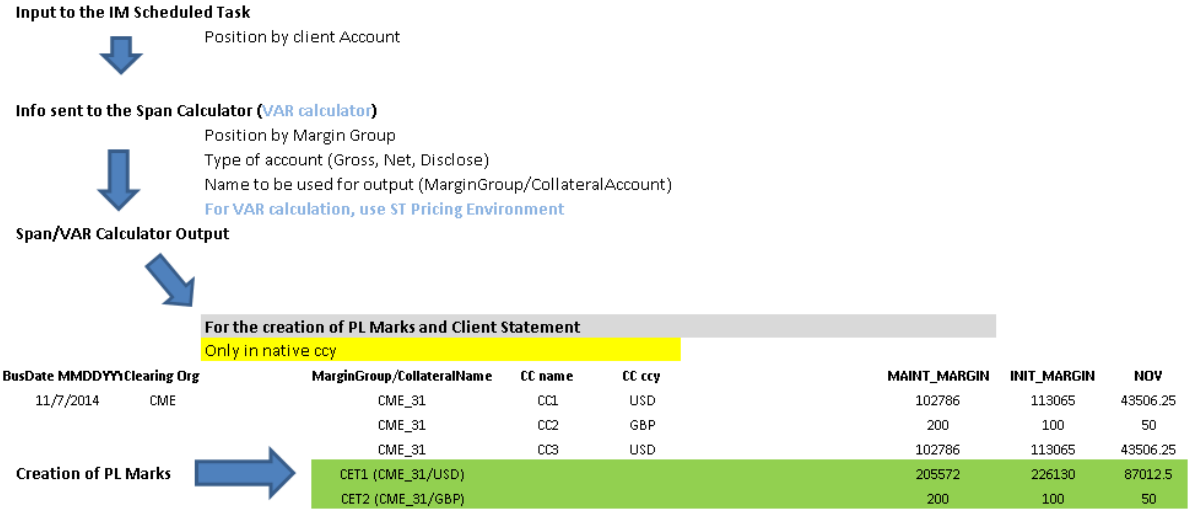
The margin can be run using the scheduled task CLEARING_IM_CALC, or from the Margin Dashboard.

The margin output will be available:

- In the margin dashboard
- In a csv file
- In the form of PL Mark to be used by the collateral manager

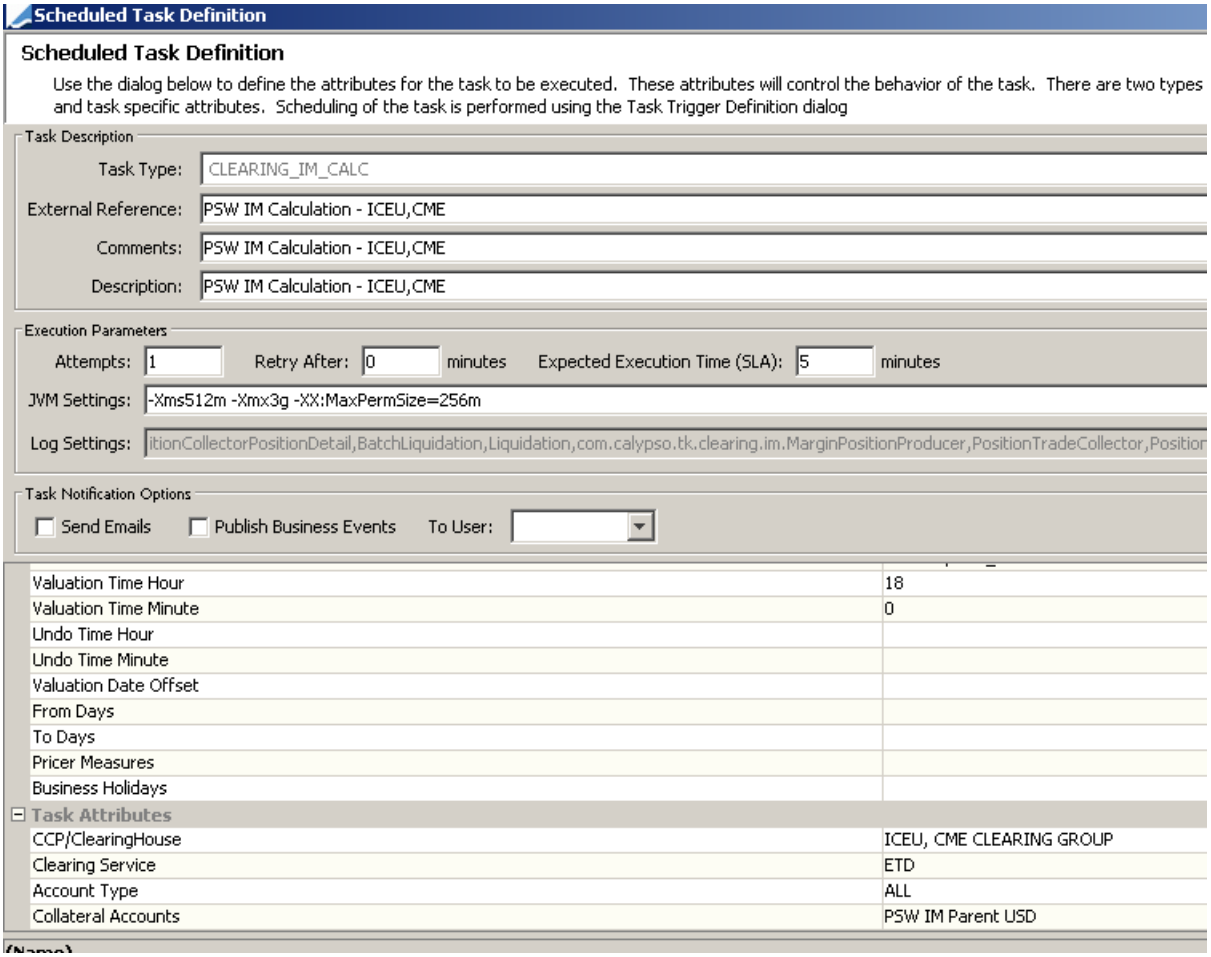
- In the client statement

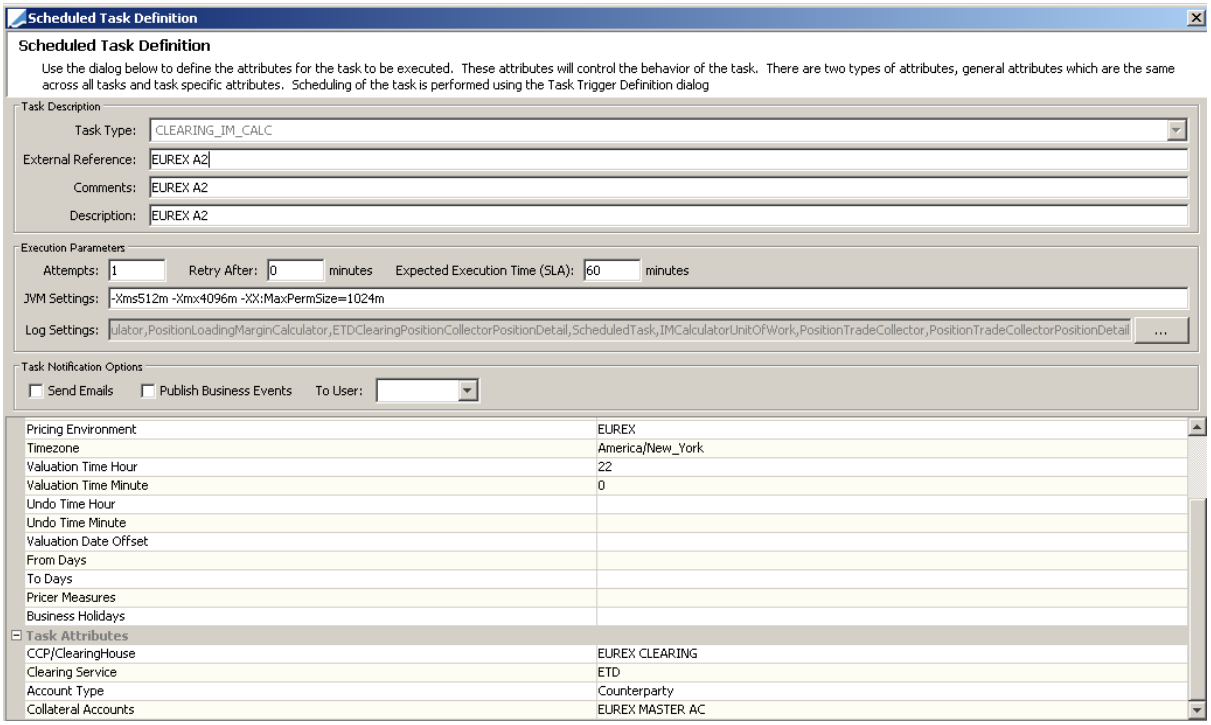
11.8 Process from Positions to Initial Margin



11.9 Running the Scheduled Task CLEARING_IM_CALC

	External Reference	ID	Type	Trade Filter	Processing Org	SLA
	CALC IM EUREX COUNTERPA...	122121	CLEARING_IM_CALC		US FCM	5
	CALC IM EUREX	121120	CLEARING_IM_CALC		US FCM	5
	IM CALC CME	122122	CLEARING_IM_CALC		US FCM	5
	IM CALC CME AA123	120120	CLEARING_IM_CALC		US FCM	5
	CRS LCH @ HSBC	123122	CLEARING_RISK_SERVICE	AMLCH@HSBC	FCM	15
	Calculate IM and VM	116120	CLEARING_RISK_SERVICE	AMCME@HSBC	FCM	15
	Calculate IM and VM - CME	117120	CLEARING_RISK_SERVICE	Client1	FCM	15

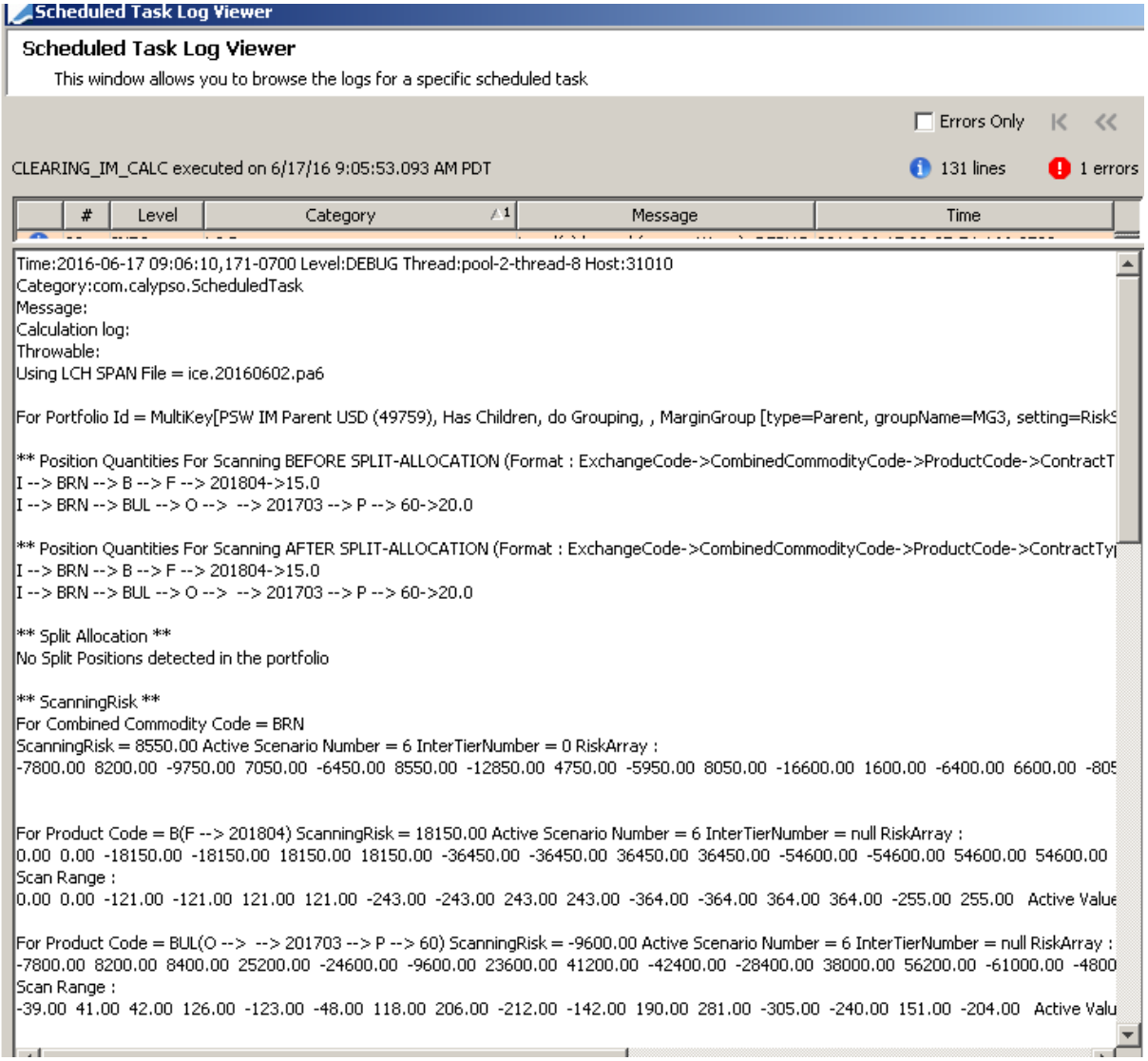

Scheduled Task Definition
Scheduled Task Definition
Use the dialog below to define the attributes for the task to be executed. These attributes will control the behavior of the task. There are two types and task specific attributes. Scheduling of the task is performed using the Task Trigger Definition dialog
Task Description
Task Type: CLEARING_IM_CALC
External Reference: PSW IM Calculation - ICEU,CME
Comments: PSW IM Calculation - ICEU,CME
Description: PSW IM Calculation - ICEU,CME
Execution Parameters
Attempts: 1 Retry After: 0 minutes Expected Execution Time (SLA): 5 minutes
JVM Settings: -Xms512m -Xmx3g -XX:MaxPermSize=256m
Log Settings: itionCollectorPositionDetail,BatchLiquidation,Liquidation,com.calypso.tk.clearing.im.MarginPositionProducer,PositionTradeCollector,Positior
Task Notification Options
Send Emails Publish Business Events To User:
Valuation Time Hour 18
Valuation Time Minute 0
Undo Time Hour
Undo Time Minute
Valuation Date Offset
From Days
To Days
Pricer Measures
Business Holidays
Task Attributes
CCP/ClearingHouse ICEU, CME CLEARING GROUP
Clearing Service ETD
Account Type ALL
Collateral Accounts PSW IM Parent USD


Scheduled Task Definition
Scheduled Task Definition
Use the dialog below to define the attributes for the task to be executed. These attributes will control the behavior of the task. There are two types of attributes, general attributes which are the same across all tasks and task specific attributes. Scheduling of the task is performed using the Task Trigger Definition dialog
Task Description
Task Type: CLEARING_IM_CALC
External Reference: EUREX A2
Comments: EUREX A2
Description: EUREX A2
Execution Parameters
Attempts: 1 Retry After: 0 minutes Expected Execution Time (SLA): 60 minutes
JVM Settings: -Xms512m -Xmx4096m -XX:MaxPermSize=1024m
Log Settings: ulator,PositionLoadingMarginCalculator,ETDClearingPositionCollectorPositionDetail,ScheduledTask,IMCalculatorUnitOfWork,PositionTradeCollector,PositionTradeCollectorPositionDetail
Task Notification Options
Send Emails Publish Business Events To User:
Pricing Environment EUREX
Timezone America/New_York
Valuation Time Hour 22
Valuation Time Minute 0
Undo Time Hour
Undo Time Minute
Valuation Date Offset
From Days
To Days
Pricer Measures
Business Holidays
Task Attributes
CCP/ClearingHouse EUREX CLEARING
Clearing Service ETD
Account Type Counterparty
Collateral Accounts EUREX MASTER AC

11.9.1 Logs to track the possible errors, and calculation details

FOR SPAN and EUREX PRISMA CALCULATION:

The following log is available from the Scheduled Task menu, or from the Margin Dashboard (Click on the Icon in the "Detail" column)



11.9.2 Additional log info for EUREX PRISMA calculation

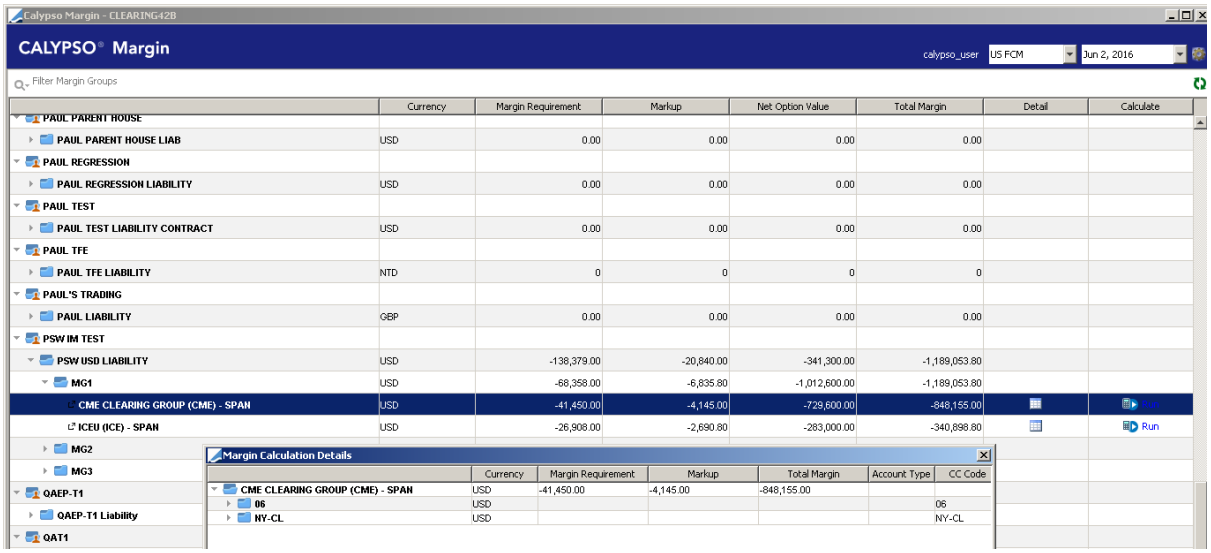
Additional logs are available as cvs files, detailing the PL Vectors used for the calculation of Initial Margin.

Examples:

scenarioSubSample_Stress_FX.csv scenarioSubSample_Stress.csv scenarioSubSample_Historical.csv PnLVectorsStress.csv PnLVectorsHistorical.csv

11.10 Calculating the Initial Margin from the Margin Dashboard

It is also possible to run the margin interactively from the margin dashboard: Select "Run" button on the right side of the screen:



11.11 Definition of PL Marks

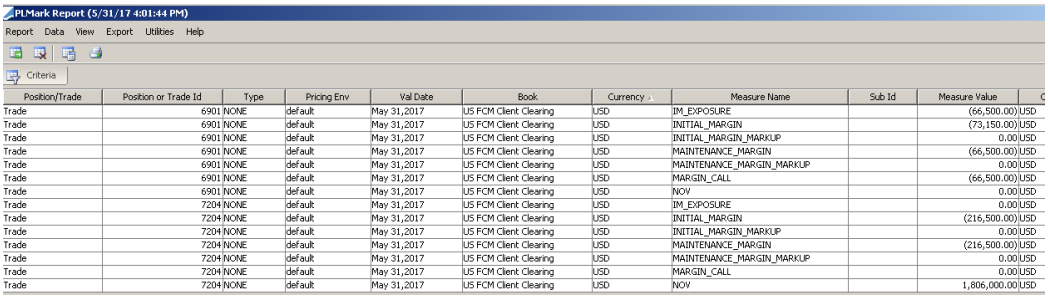
The following measures are calculated as defined below:

PL MARK	IM Dashboard	Definition
MAINTENANCE_MARGIN	MARGIN	Core margin computed by calculator= MAX(Commodity Risk Charge; Short Option Minimum) * Risk Maintenance Performance Bond Adjustment Factor where Risk Charge = Scanning Risk + Intra-Commodity Spread Charge + Delivery Month (Spot) Charge - Inter-Commodity Spread Credit
NOV	NOV	Net Option Value
MAINTENANCE_MARGIN_MARKUP	MARK-UP	MAINTENANCE_MARGIN * (Multiplier)
MARGIN_CALL	TOTAL MARGIN	For Client Accounts, Min[(MAINTENANCE_MARGIN + NOV) *(1+Multiplier), 0)] For Counterparty Accounts, Max[(MAINTENANCE_MARGIN + NOV) * (1+Multiplier), 0)]
Multiplier		Calypso Multiplier defined at MG for each acct

ALL MARGIN NUMBERS ARE EXPRESSED IN THE MARGIN CURRENCY, WHERE MARGIN CURRENCY IS DEFINED AS:
(1) Combined Commodities currency for SPAN methodologies
(2) VAR base currency for EUREX

FOR EACH CURRENCY and EACH MARGIN GROUP, a PL MARK will be saved, in the margin currency

Example of output:


PLMark Report (5/31/17 4:01:44 PM)

Report Data View Export Utilities Help

Criteria

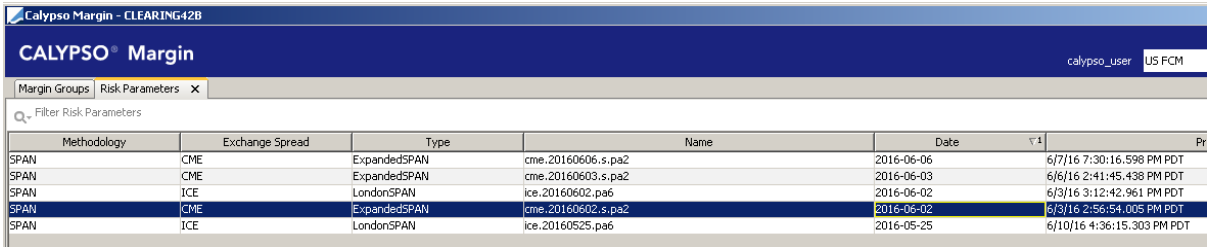
Position/Trade	Position or Trade Id	Type	Pricing Env	Val Date	Book	Currency	Measure Name	Sub Id	Measure Value	C
Trade	6901	NONE	default	May 31,2017	US FCM Client Clearing	USD	IM_EXPOSURE		(66,500.00)	USD
Trade	6901	NONE	default	May 31,2017	US FCM Client Clearing	USD	INITIAL_MARGIN		(73,150.00)	USD
Trade	6901	NONE	default	May 31,2017	US FCM Client Clearing	USD	INITIAL_MARGIN_MARKUP		0.00	USD
Trade	6901	NONE	default	May 31,2017	US FCM Client Clearing	USD	MAINTENANCE_MARGIN		(66,500.00)	USD
Trade	6901	NONE	default	May 31,2017	US FCM Client Clearing	USD	MAINTENANCE_MARGIN_MARKUP		0.00	USD
Trade	6901	NONE	default	May 31,2017	US FCM Client Clearing	USD	MARGIN_CALL		(66,500.00)	USD
Trade	6901	NONE	default	May 31,2017	US FCM Client Clearing	USD	NOV		0.00	USD
Trade	7204	NONE	default	May 31,2017	US FCM Client Clearing	USD	IM_EXPOSURE		0.00	USD
Trade	7204	NONE	default	May 31,2017	US FCM Client Clearing	USD	INITIAL_MARGIN		(216,500.00)	USD
Trade	7204	NONE	default	May 31,2017	US FCM Client Clearing	USD	INITIAL_MARGIN_MARKUP		0.00	USD
Trade	7204	NONE	default	May 31,2017	US FCM Client Clearing	USD	MAINTENANCE_MARGIN		(216,500.00)	USD
Trade	7204	NONE	default	May 31,2017	US FCM Client Clearing	USD	MAINTENANCE_MARGIN_MARKUP		0.00	USD
Trade	7204	NONE	default	May 31,2017	US FCM Client Clearing	USD	MARGIN_CALL		0.00	USD
Trade	7204	NONE	default	May 31,2017	US FCM Client Clearing	USD	NOV		1,806,000.00	USD

11.12 Initial Margin Reporting Tools

11.12.1 Margin Dashboard

Information about supported exchanges and available risk array files:

(***click on the wheel to open the panel***)


Calypso Margin - CLEARING42B

CALYPSO® Margin

calypso_user US FCM

Margin Groups | Risk Parameters

Filter Risk Parameters

Methodology	Exchange Spread	Type	Name	Date	Pr
SPAN	CME	ExpandedSPAN	cme.20160606.s.pa2	2016-06-06	6/7/16 7:30:16.598 PM PDT
SPAN	CME	ExpandedSPAN	cme.20160603.s.pa2	2016-06-03	6/6/16 2:41:45.438 PM PDT
SPAN	ICE	LondonSPAN	ice.20160602.pa6	2016-06-02	6/3/16 3:12:42.961 PM PDT
SPAN	CME	ExpandedSPAN	cme.20160602.s.pa2	2016-06-02	6/3/16 2:56:54.005 PM PDT
SPAN	ICE	LondonSPAN	ice.20160525.pa6	2016-05-25	6/10/16 4:36:15.303 PM PDT

Calypso Margin - CLEARING42B

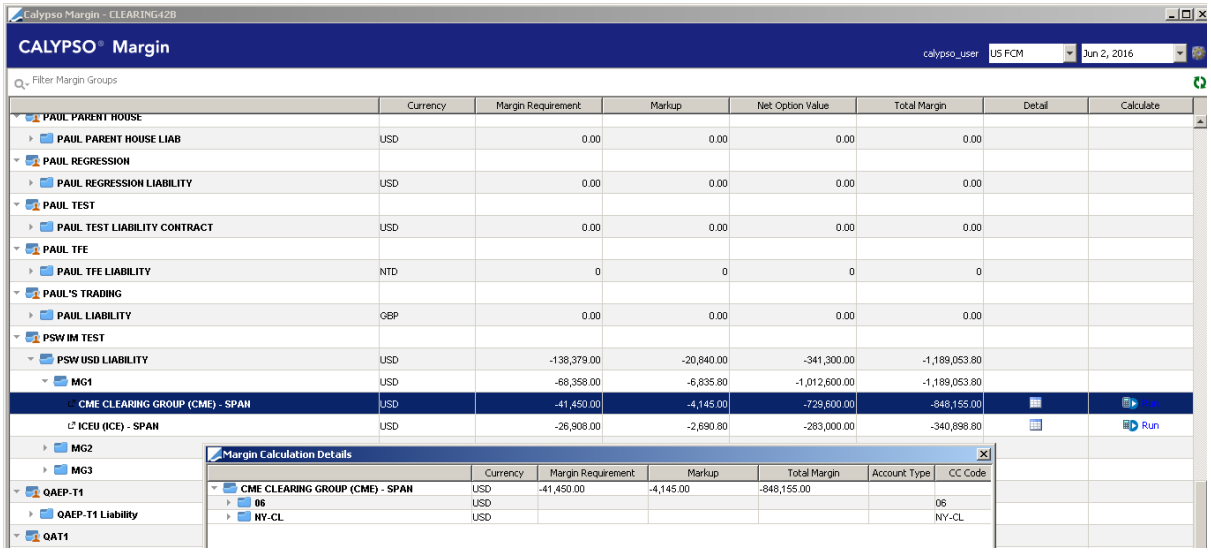
CALYPSO® Margin

Margin Groups | Risk Parameters | Supported Exchanges Margin Model

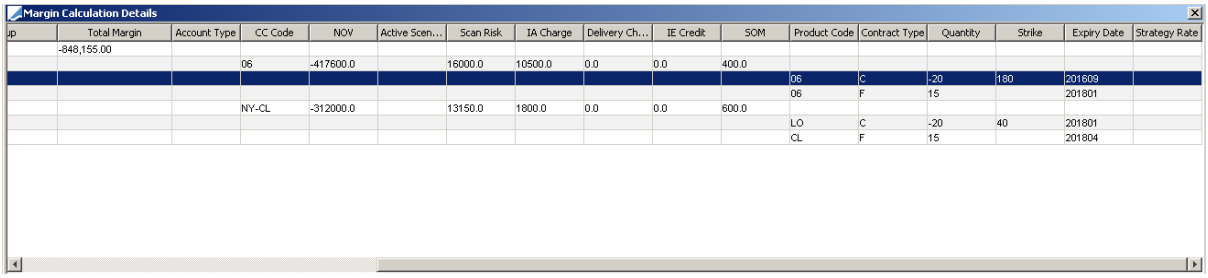
Filter Exchanges

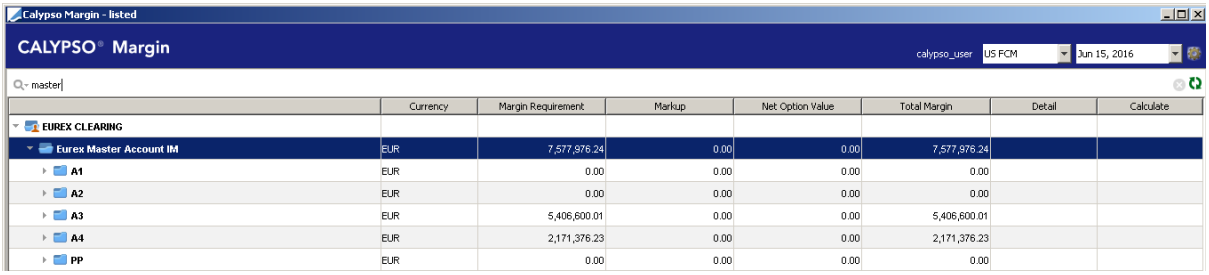
MIC	Legal Entity	Methodology	Exchange Spread	Risk Array Exchang...
CMED	CMEEUR (CME Europe)	SPAN	CEE	CEE
DGCX		SPAN	DCCC	DGCX
DUMX		SPAN	CME	NYM
ENCL	ENCLEAR (LCH EnClear)	SPAN	EDX	E
ERIS		SPAN	CME	CME
IFCA	IFCA (ICE Futures Canada)	SPAN	WCE	C
IFED	IFED (ICE Futures Energy Division)	SPAN	ICE	I
IFEU	IFEU (ICE Futures Europe)	SPAN	ICE	I
IFLL	IFLL (ICE Financial Products Division)	SPAN	LIFFE	L
IFLO	IFLO (ICE Equity Products Division)	SPAN	LIFFE	O
IFLX	IFLX (ICE Agricultural Product Division)	SPAN	LIFFE	X
IFSG	IFSG (ICE Future Singapore)	SPAN	ISG	G
IFUS	IFUS (ICE Futures U.S.)	SPAN	NYB	N
MFOX	ENX-PT (Euronext Derivatives Lisbon)	SPAN	MNP	MNP
NDEX		SPAN	ICE	I
NZFX	NZF (New Zealand Fut. & Option Exchange)	SPAN	ASXCLF	NZF
WDER	GPW (Warsaw Stock Exchange)	SPAN	KDPW	GPW
XASX	ETO (ETO)	SPAN	ASXCL	ETO
XBRD	ENX-BE (Euronext Derivatives Brussels)	SPAN	MNP	MNP
XBUD	BET (Budapest Stock Exchange)	SPAN	KELER	BET
XCBF		SPAN	CFE	CFX
XCBO	CBOE (Chicago Board Options Exchange)	SPAN	CFE	CBO
XCBT	CBOT (Chicago Board of Trade)	SPAN	CME	CBT
XCEC	COMEX (New York Mercantile Exchange - Comex Division)	SPAN	CME	CMX
XCME	CME (CME)	SPAN	CME	CME
XELX		SPAN	ELX	ELX
XEUC	ENX-EUC (Euronext Commodities Amsterdam)	SPAN	MTF	MTF
XEUE	ENX-EUE (Euronext Derivatives Amsterdam)	SPAN	MNP	MNP
XEUR	EUREX (Eurex)	PRISMA	EUREX	
XFNO		SPAN	BIST	BIST
XHKF	HKF (Hong Kong Futures Exchange LTD)	SPAN	HKEX	HK
XHKG	HKG (Hong Kong Exchanges & Clearing)	SPAN	HKEX	HK
XKLS		SPAN	BMDC	BMD
XLME	LME (London Metal Exchange)	SPAN	LME	M
XMAT	ENX-MAT (Euronext Derivatives Paris)	SPAN	MTF	MTF
XMGE	MGE (Minneapolis Grain Exchange)	SPAN	MGE	MGE

Margin Dashboard Main View



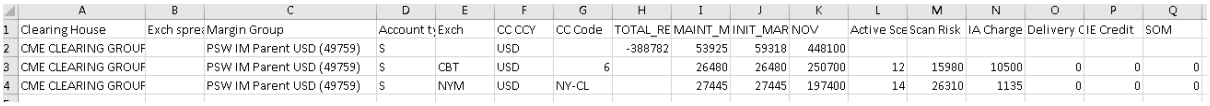
Dashboard drill-down





11.12.2 CSV Output

Available in user/Calypso/InitialMargin



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Clearing House	Exch spre	Margin Group	Account ty	Exch	CC CCY	CC Code	TOTAL_RE	MAINT_M	INIT_MAR	NOV	Active Sce	Scan Risk	IA Charge	Delivery C	IE Credit	SOM
2	CME CLEARING GROUF		PSW IM Parent USD (49759)	S		USD		-388782	53925	59318	448100						
3	CME CLEARING GROUF		PSW IM Parent USD (49759)	S	CBT	USD	6		26480	26480	250700	12	15980	10500	0	0	0
4	CME CLEARING GROUF		PSW IM Parent USD (49759)	S	NYM	USD	NY-CL		27445	27445	197400	14	26310	1135	0	0	0

11.13 Covered Short Options

Calypso ETD solution will suppress the IM calculated for short equity option trades for a client account when the trades have been flagged as 'Covered'. To flag a trade as 'Covered' the user needs to set the trade attribute 'CoveredETDTrade' to True.

For 'Covered' trades the system will exclude these from the client accounts IM portfolio which is passed to the IM module resulting in zero IM for the client for these trades. The IM for the counterparty (CCP or the Carry Broker) will still be calculated as per the exchange's IM algorithm.

11.13.1 CoveredETDTrade trade keyword attribute

Trade attribute called 'CoveredETDTrade' of type Boolean (true/false).

This attribute can be set manually, via the Pricing Sheet, or by the Data Uploader trade file importer.

11.13.2 Initial Margining

'Covered' open quantity trades will be **excluded** from the client accounts portfolio that is passed to the IM module.

- IM will be zero for these trades for the client

'Covered' open quantity trades will be **included** in counterparty accounts portfolio that is passed to the IM module.

- IM will be calculated for these trades for the counterparty

11.13.3 Initial Margin Reports & Logs

The IM summary and detailed reports and logs will not include the 'Covered' trade because these will not have been passed to the IM module, which produces the reports.

Section 12. Client Statement

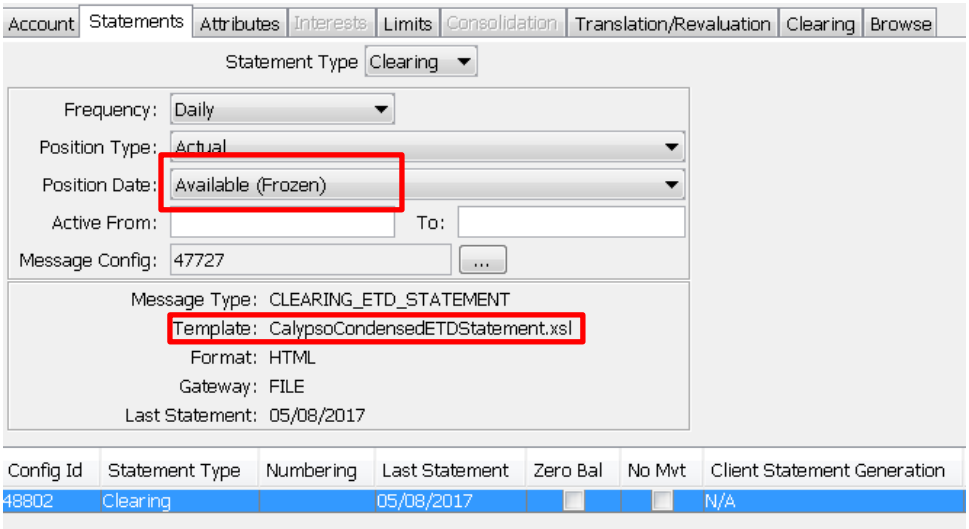
The scheduled task ACCOUNT_STATEMENT is used to generate client statements as part of the EOD process.

This section describes the process for generating a daily Client Statement from the Back Office clearing solution as well as information about the content of our supported statement template.

The current version of the Client Statement supports reporting for transactions, offsetting, lifecycle, cash and security movements and account balances based on the state of the system at the end of the processing day. Backdated transactions/activity and account corrections are not currently supported.

12.1 Account Configuration

A client clearing account can be configured to generate a statement by adding one or more statement configurations to the "Statement" tab of the account, making sure it gets added and saved with a unique config id.

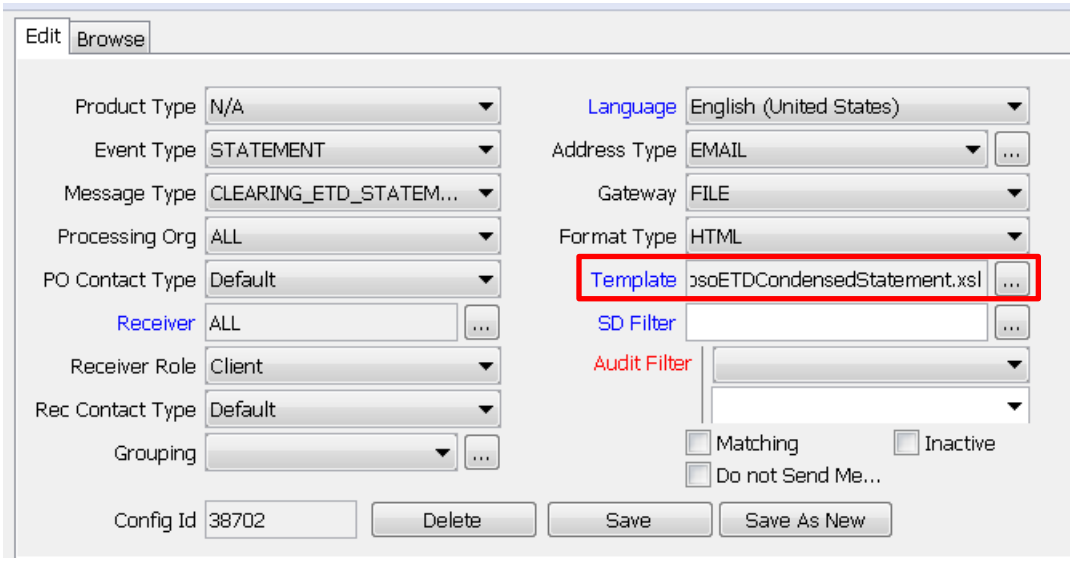


The fields in the statement config are described below.

Field Name	Expected Value	Description
Statement Type	"Clearing"	
Frequency	"Daily"	Identifies this statement config as eligible to be run on a daily basis. Does not control the format or content of the output, just the timing.
Position Type	"Actual" "Theoretical"	The field controls how the account balances are displayed in the statement, based on the status of the inventory transfers. Actual is the standard value, but is configurable based on the user's business logic.
Position Date	Available (Frozen)	The field controls how the account balances are displayed in the statement, based on the status of the inventory transfers. It takes into account retro-active movements in the next statement.
Template	CalypsoCondensedETDStatement.xsl	Template used on the Message Setup for Receiver = Client
Active From/To	Dates	Allows the statement configuration to be active for a set period of time. When the user triggers the statement

Field Name	Expected Value	Description
		run for a processing date outside of this range, no statement will be generated.
Message Config	Message Config ID	Select the message configuration which is applicable to the account. The screenshot below shows the setup of the standard message config for the ETD statement.

12.2 Message Configuration

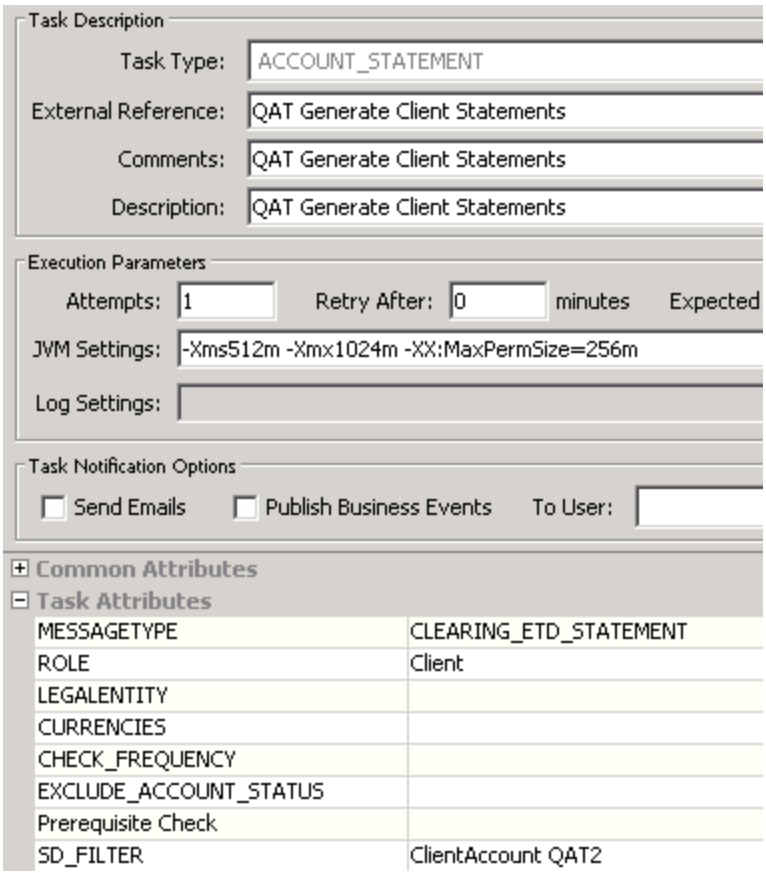


12.3 Scheduled Task ACCOUNT_STATEMENT

Official client statements are generated by running the ACCOUNT_STATEMENT scheduled task with a message type of 'CLEARING_ETD_STATEMENT'. This task checks all of the account statement configurations and generates official statements for valid configurations.

The task must be configured to generate statements for Legal Entities with a role of 'Client' by selecting 'Client' in the ST Role Attribute. Additional filtering can be added in the SD_FILTER attribute to single out specific accounts or LEs.

The ACCOUNT_STATEMENT valuation date and time should correspond to be just before the PO's Book EOD time (when comparing both in the same time zone) on the business date for which the statements are being generated.



Financial Summary

Each section other than the Converted Total is expected to have values in a single currency that fall under a single Regulatory Code, so there is no FX conversion required other than the conversion of the Net Liquidating Value. The Converted Total section is the sum of the values of each item from all of the individual sections, after each row has been converted into the statement currency using the FX Conversion rate displayed at the bottom of the section.

There are 2 'modes' of Financial Summary layout to choose from – RealizedVM and OTE – and the layout for each is shown below, followed by a description of each section, the source data and how they differ slightly in some of the sections dependent on the mode.

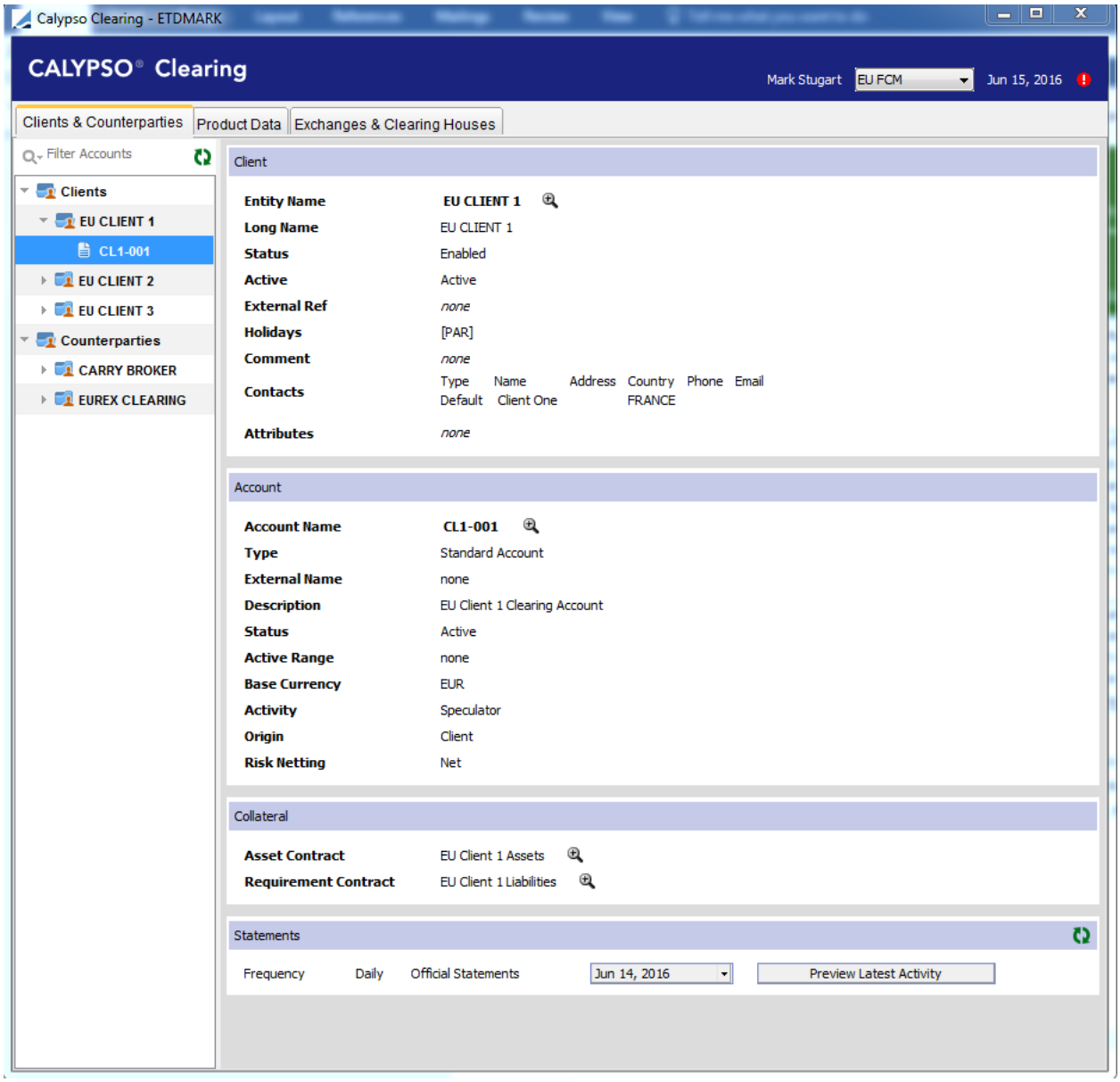
RealizedVM Mode	OTE Mode
Opening Balance	**Opening Balance**
Commissions	Commissions
Fees	Fees
Realized PL	Realized PL
Premium	Premium
Option Cash Settlements	Option Cash Settlements
Cash Movements	Cash Movements
Daily Variation Margin Change	**Closing Balance**
Closing Balance	
	Variation Margin (OTE)
Net Option Value	Net Option Value
Account Liquidating Value	**Account Liquidating Value**
Initial Margin	Initial Margin
Securities on Deposit	Securities on Deposit
Daily Initial Margin Change	Daily Initial Margin Change
Variation Margin (OTE)	Daily Variation Margin Change

Row Label	Description	Source Data
Opening Balance	The beginning cash balance of the Account at the start of day on the statement date.	The sum of the Opening Balances of the Commissions, Fees, Future PL, Option Premium, Option Cash Settlement and Cash Movements inventory buckets from the Inventory Position Report for the relevant Account on the statement date (and additionally Daily Variation Margin Change for RealizedVM Mode)
Commissions	The total Commissions related to activity on the statement date.	The total movements in the Commissions Inventory Bucket on the statement date for the relevant Account
Fees	The total Fees related to activity on the statement date.	The total movements in the Fees Inventory Bucket on the statement date for the relevant Account
Realized PL	The total realized cash related to positions which were closed out on the statement date.	The total movements in the Futures PL and on the statement date for the relevant Account.
Premium	The total option premium paid and received on the statement date.	The total movements in the Option Premium Inventory Bucket on the statement date for the relevant Account.
Option Cash Settlement	The total of exercise fee and cash option adjustment following cash exercise and corporate action	The total movements in the Option Cash Settlement Bucket on the statement date for the relevant Account.
Cash Movements	Total amount of cash credits and debits to the account on the statement date.	The total movements in the Cash Movements Inventory Bucket on the statement date for the relevant Account.
Closing Balance	The ending cash balance of the Account at the end of day on the statement date. This will equal the Opening Balance plus the balance impact of the Commissions, Fees, Realized PL, Premium and Cash Movements which occurred on the statement date (and additionally Daily Variation Margin Change for RealizedVM Mode).	The sum of the Closing Balances of the Commissions, Fees, Future PL, Option Premium, Option Cash Settlement and Cash Movements inventory buckets from the Inventory Position Report for the relevant Account and Reg Category on the statement date (and additionally Daily Variation Margin Change for RealizedVM Mode). This could be defined as a composite Inventory Bucket called "Closing"
Variation Margin (OTE)	The total unrealized (MTM) PL of the open future and future-style options positions in the account, valued using the exchange closing prices on the statement date.	**RealizedVM Mode:** The Closing balance of the NPV Inventory bucket on the statement date for the relevant account. **OTE Mode:** The Closing balance of the OTE Inventory bucket on the statement date for the relevant account
Net Option Value	The total value of the open premium-paid option positions in the account, valued using the exchange closing prices on the statement date.	The Closing balance of the NOV Inventory bucket on the statement date for the relevant account = Balance SOV + LOV – (SOV_REV + LOV_REV)

Row Label	Description	Source Data
Account Liquidating Value	The total value of the account if all positions were liquidated at the closing prices on the statement date.	**RealizedVM Mode:** The sum of the Closing Balance and NOV inventory buckets from the Inventory Position Report for the relevant Account on the statement date. **OTE Mode:** The sum of the Closing Balance, OTE and NOV inventory buckets from the Inventory Position Report for the relevant Account on the statement date. This could be defined as a composite Inventory Bucket called "Liquidation Value".
Initial Margin	The total Maintenance Margin Requirement, including the impact of NOV and any FCM markups for the account.	The sum of the MARGIN_CALL pricer measure across all Collateral Exposures in the Liability Contract of the account. The included Collateral Exposures will have a Type of "Initial Margin" on the product.
Securities on Deposit	The total value of all non-cash collateral allocated to the relevant account including FCM defined haircuts	The total "All-In Value" in the currency of the securities across both the Deposit and Liability Contracts for this account.
Daily Initial Margin Change	The daily difference in Initial Margin from the previous day.	The difference between Initial Margin & Initial Margin (Previous Day)
Daily Variation Margin Change	The daily difference in Variation Margin from the previous day.	**RealizedM Mode:** The difference between Inventory Buckets Balance NPV and NPV_REV, sum of NPVFUT, NPVOPT and their reversal **OTE Mode:** The difference between Inventory Buckets Balance OTE and OTE_REV, sum of OTEFUT, OTEOPT and their reversal
FX Conversion to Base currency	The FX rate used to convert the balances in the relevant Reg Category into the statement currency.	The quote for the FX currency pair comprised of the statement currency, taken from the statement pricing environment.
Converted Net Liquidating Value	The Account Liquidation Value converted into the statement currency using the FX Rate above.	The Account Liquidation Value amount converted into the statement currency using the FX Conversion Rate, and standard logic for currency conversion.

12.4 Clearing Static Data Dashboard

The Clearing Static Data Dashboard (menu action `clearing.ClearingDashboard`) allows viewing information about Clients and Counterparties, their associated accounts and collateral configuration, and statements. It also allows viewing listed derivatives products and the LE information of the Exchanges and Clearinghouses configured in the system.



On the left-hand side, you can navigate the accounts. LE, Account and Collateral Contract details are displayed on the right-hand side. From each section, you can drill-down to more details.

You can view the future and option contracts in the "Product Data" tab of the dashboard

You can view static data associated to Exchanges and Clearinghouses in the "Exchanges & Clearinghouses" tab

Statements Section

From the Statements section, ad-hoc statements can be generated at any time and official statements can be viewed. To execute either of these actions, choose an account from the panel on the left-hand side of the dashboard with a valid statement configuration. The dropdown on the left holds the last 10 official statements which can be selected by the statement date. By default, the most recent statement date will be populated.

Clicking "Preview Latest Activity" will generate an ad hoc statement that is not saved in the system, but can be viewed to get an advanced look at what the statement would look like if generated with the system in its current state.

Section 13. Listed Derivatives Contracts

From the Calypso Navigator, navigate to **Configuration > Listed Derivatives > Future Contracts** (menu action `refdata.FutureDefinitionWindow`) for creating future contracts, and future products.

From the Calypso Navigator, navigate to **Configuration > Listed Derivatives > Future Option Contracts** (menu action `refdata.FutureOptionDefinitionWindow`) for creating future option contracts, and future option products.

From the Calypso Navigator, navigate to **Configuration > Listed Derivatives > Option Contracts** (menu action `refdata.ETOContractWindow`) for creating ETO contracts, and ETO products.

You can also access contract information from the **Clearing Dashboard > Product Data** tab.

13.1 Contract Attributes

To be included in the 3 type domain names:

FutureContractAttributes
FutureOptionContractAttributes
ETOContractAttributes

The following contract attributes are used for processing future and options:

Attribute Name	Purpose/Impact
CascadeFrom	After the creation of the shorter-duration contracts, this attribute will reference the 'ContractName' of the longer-duration contract the contract cascading from. Since there can be a "one to many" ratio of the longer to the shorter duration contracts, it makes sense to place the reference on the latter. Note that in the case that a quarterly product is created from the cascading of an annual contract, and will cascade itself into a monthly contract, that quarterly contract would reference the annual contract in the 'CascadeFrom' attribute, while the monthly contract would reference the quarterly contract name. *Mandatory*
ClearingExchangeTicker	Provides the market standard contract symbol used by the exchange and trade interface.
CascadeTo	In the cascading process, this is an attribute stored on a long duration contract that references the shorter duration contract that will get cascaded to. *Mandatory*
ContractStrategyMargin	A specific margin strategy stored on unique contracts that differ from the contract's exchange margin methodology. *Mandatory for unique contracts.*
CascadePriceType	For longer duration contracts, this attribute dictates how the prices of the trades created during the cascade process will be set. When the attribute is set to 'Closing', the trade price of the close out trade and the newly generated opening trade in the shorter duration product(s) will be set to the closing price of the parent product on the cascade date. This price is taken from the Instance Type (Close, Last, etc.) set in the Quote Set from the Pricing Environment selected on the Scheduled Task.

Attribute Name	Purpose/Impact
	When the attribute is set to 'Trade', the trade price of the close out trade and the newly generated opening trade in the shorter duration product(s) will be set to the traded price of the parent trades that form the open position. This implies that the cascade process could generate multiple trades in the same product with different traded prices. If this field is empty or has an unrecognizable value, the process will run with a default value of 'Trade'.
CascadeDateLag	A positive integer value that represents the number of business days, according to the calendar in the 'Holidays' field on the contract, prior to the product's First Delivery Date that the cascading event will occur. The business days will be according to the calendar set on the Contract definition. An empty value in this field will be considered a lag of zero by default.
ContractCode	Populated by FOW. The short name code for the contract.
ContractLongName	Populated by the FOW. Contract's full name as listed by the FOW. *Optional*
ContractStrategyRate	When calculating Initial Margin for a position in this contract using the 'Strategy' method, this attribute will set the IM requirement amount per lot in the contract settlement currency. If the attribute is empty, we will use the default value of 1,000.
CabinetPrice	Lowest tradeable value for a specific option contract. Only is used to close out option positions that are very deep out of the money. *Optional*
SettlementDateLag	Number of business days, according to the calendar(s) in the Holidays field of the contract, after the expiration date that the future or option settles.
ProductMarginCode	Identifies the contract symbol used in the risk array files when calculating Initial Margin. Required when the symbol used in the risk file is different than the ClearingExchangeSymbol.
PremiumPaymentConvention	When PremiumPaymentConvention = VariationMargined, Premium flows are only generated when the optoin is closed out, not at the opening of the position When PremiumPaymentConvention = Conventional or not set, the liquidation generates PREMIUM with each transaction, settled on the cleared date

Please refer to *Calypso Futures and Future Options Trading* documentation for details on setting up future and future option contracts.

Please refer to *Calypso Equity Derivatives Trading* documentation for details on setting up ETO contracts.

13.2 Flex Options

Exchanges such as Eurex offer "Flex" future and option contracts which allow members to submit specifications for bespoke products to be traded on the exchange and cleared on the clearinghouse. These contracts need to adhere to the general guidelines of the contract framework – contract size, underlying asset, contract symbol – but the parties involved in the trade are able to choose their own 'flexible' expiration date, delivery type (physical/cash) and exercise type (American/European). Importantly, this means that it is a valid use case to have a single ETO or future option contract with multiple expiries in the same month.

To defined Flex Options, you need to set the Contract Date Format to 'Daily', triggering the display of the contract date in the trade capture screen and the generation of the quote name to include the day, month and year when describing the product.

The user also has to set the formatting of the contract date in the trade capture screen by populating the "DateFormat" contract attribute with a java-compatible format value. Recommended approach is to use the value of "dd MMM yyyy".

13.3 Import

Listed Derivatives Contracts can be imported using the FOW Trade Data interface through the scheduled task FOW_REFERENCE_DATA_IMPORT.

Please refer to the *Calypso FOW Integration Guide* for complete details.

[IMPORTANT NOTE: Once the contracts are created, you need to generate the actual products that will be traded]

Section 14. Cascading Process

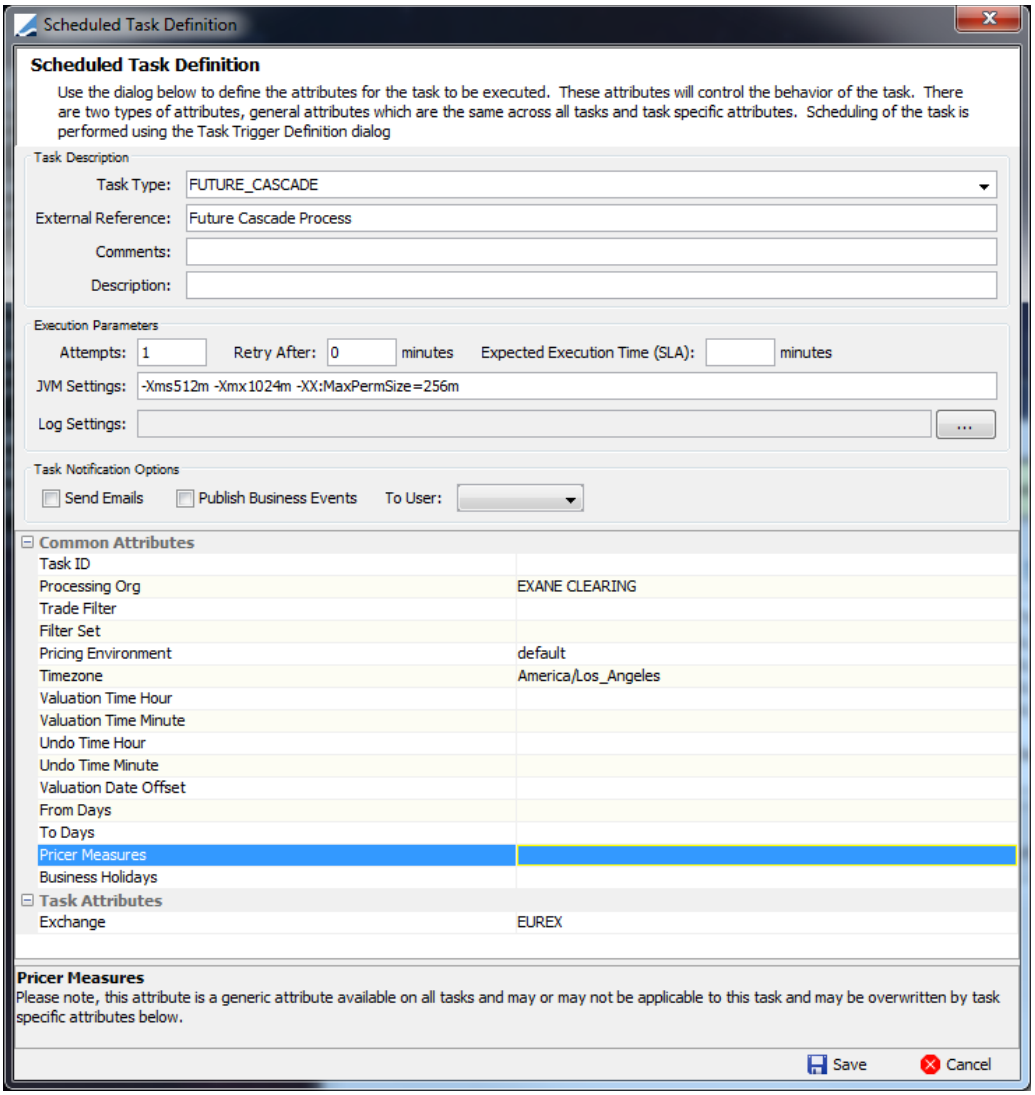
Important: In order to properly execute the cascading process, we require that the shorter-duration contracts are created in the database and the underlying futures are saved as products prior to the execution of the cascading process.

14.1 Triggering the Cascade Process

The cascade process will be run each day through the execution of a scheduled task called FUTURE_CASCADE. This task should be run at EOD after all offsetting is run, but before IM and VM calculation and statements are generated. Products which are eligible for cascading are determined by the list of values of the CascadeFrom attribute across all contracts. The cascade process will be triggered only on the open positions in these products where the First Delivery Date adjusted by the CascadeDateLag and the ST process date are equal.

The cascading process only needs to be applied to open positions in cascading products. If transactions in a cascading contract have been cleared, and have since all been closed out, the cascading process does not need to be triggered.

Although it is not expected, this task can be run backdated. If the cascade process has already been run, by definition all positions will be closed, so there will be no impact of running it on a date for which it has already been run.



Attribute Name	Purpose/Impact
Processing Org	Processing Org in order to indicate which entities positions should be considered
Pricing Environment	Pricing Environment to source the closing price of the cascaded contract
Exchange	Exchange Attribute field which can be used to select one, several or all exchanges on which to run the process. This will be useful to run the process in a "follow the sun" mode. The pick list should be limited to LE's with a Role of 'MarketPlace'

14.2 Results of the Cascade Process

Running the cascade scheduled task on a day when open positions exist in a product which is linked to one or more other contracts by their CascadeFrom attribute will result in 1) the close out of the open position at either the closing price that day or the original trade price and 2) the generation of open positions in all of the existing products on the contracts which were pointing to the original position. If a contract exists, but the underlying future products have not been saved, new positions will not be generated.

Section 15. Trade Merge Process

Merging is when the user wishes to combine numerous trades where the key elements are identical into a single trade, there are a number of reasons why they do this e.g. many fills of a large order come down the cleared trade interface so they want to re-form the order, so statement just shows the single merged trade.

For example

Contract	IFLL I (Future)
Contract Value	10.00

Executions				
Product	**B/S**	**Qty**	**Price**	**Trade Value**
IFLL I SEP15	B	11	99.90	10,989.00
IFLL I SEP15	B	12	99.90	11,988.00
IFLL I SEP15	B	9	99.90	8,991.00
		32	99.90	31,968.00

Trade booking - before merge					
Product	**B/S**	**Qty**	**Price**	**Trade Value**	**Account**
IFLL I SEP15	B	11	99.90	10,989.00	ACT1
IFLL I SEP15	B	12	99.90	11,988.00	ACT1
IFLL I SEP15	B	9	99.90	8,991.00	ACT1

Trade booking - after merge					
Product	**B/S**	**Qty**	**Price**	**Trade Value**	**Account**
IFLL I SEP15	B	32	99.90	31,968.00	ACT1

* final merged trade that shows on the client statement and back-office reports

15.1 Merging trade eligibility

Trades can only be merged that

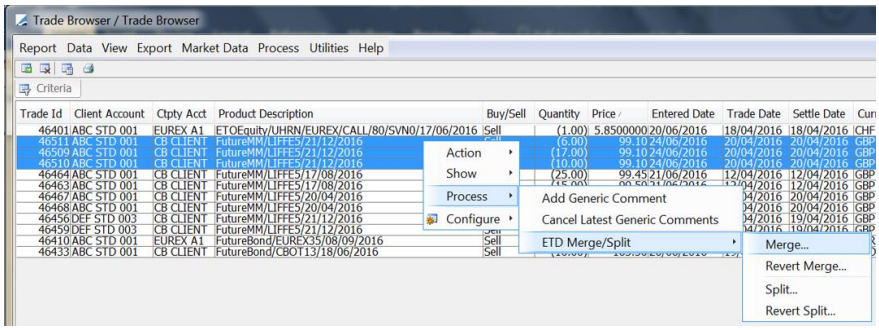
1. Top-day (booking date = trade date)
2. Fully open (no liquidations have been performed on them)

3. Same Position Aggregation (ClientAccount, CounterPartyAccount, Position)
4. All buys (long) or all sells (short)
5. ServiceLevel match – e.g. do not allow Full Service and Cleared Only trades to match
6. Order Taker and Executing Broker match
7. Trade hasn't already been merged

15.2 Selecting trades to Merge

In the Trade Browser and Trade Open Quantity reports the user needs to select more than one trade that are eligible for merging (see Merging trade eligibility).

Right-click > Process > ETD Merge/Split > Merge…



Merge confirmation screen will appear where the user needs to select:

Fee Processing Mode – these two modes can produce different results when the underlying fee configurations use 'Volume based tiered calculations'

Client; for all fees where the Legal Entity has role = Client

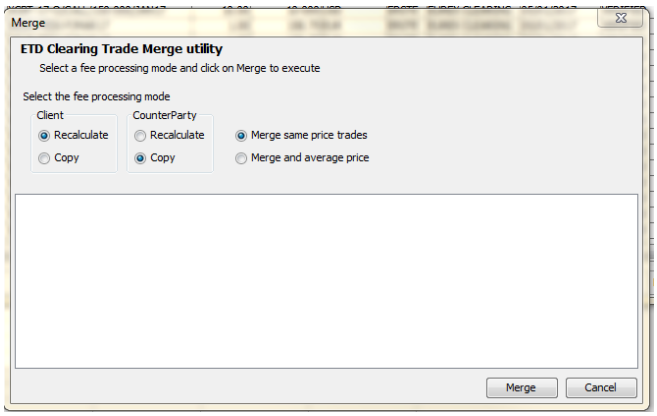
- Recalculate = recalculate fees for the new merged quantity
- Copy = take original trades calculated fees, sum each Fee Type and apply to the new merged trade

Counterparty; for all fees where the Legal Entity has role <> Client e.g. Counterparty

- Recalculate = recalculate fees for the new merged quantity
- Copy = take original trades calculated fees, sum each Fee Type and apply to the new merged trade

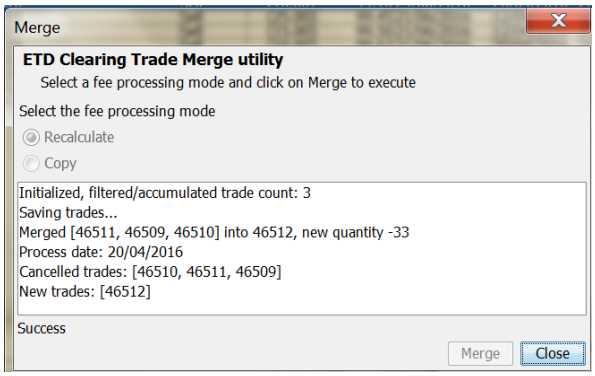
Confirmation if merging same priced trades or different prices that will be averaged

- Merge same price trades
- Merge and average price

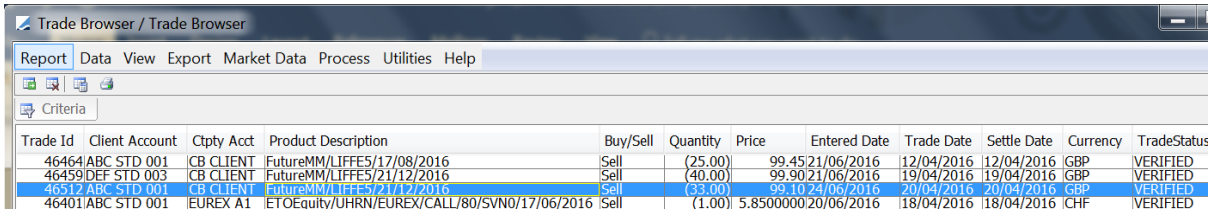


Once the Merge has been confirmed, screen will explain the actions with the Trade Ids

- Total Quantity of the trades to be merged
- Cancel these trades
- New trade generated with new Total Quantity



On 'Close' the Trade Browser, Trade Open Quantity reports will auto refresh to display the newly merged trade



15.3 Merge and Average Price

For selected trades with different trade prices and the 'Merge and average price' option selected.

The system will calculate the weighted average price.

For example

Trade Date	Client Acct	Counter-party Acct	Ccy	Exchange	Contract	Expiry	Qty	Trade Price

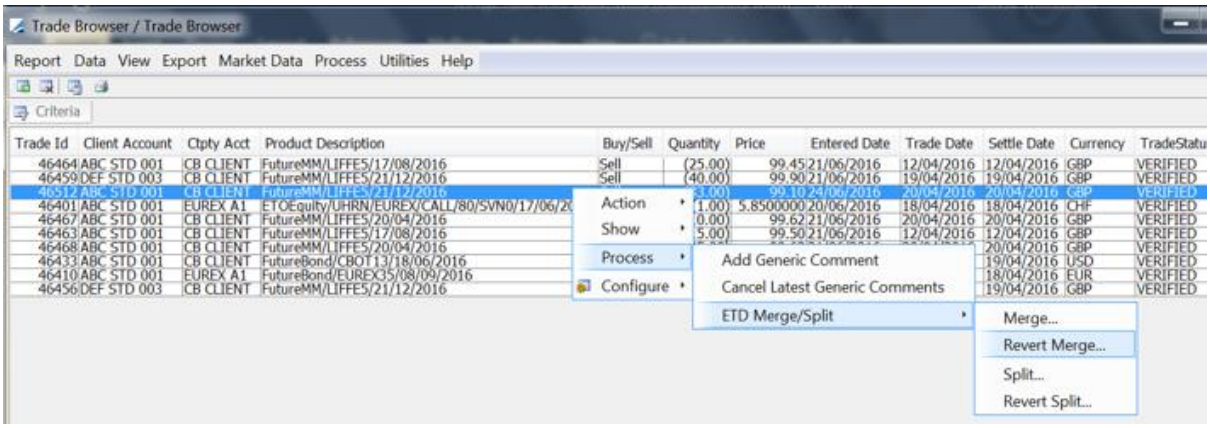
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-95	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-100	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-100	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-68	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-32	166.310000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-14	166.310000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-86	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-100	166.320000
Total Quantity							-595	

Trade Date	Client Account	Counter-party Acct	Ccy	Exchange	Contract	Expiry	Qty	Trade Price
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-595	166.319227
Total Quantity							-595	

15.4 Revert Merge

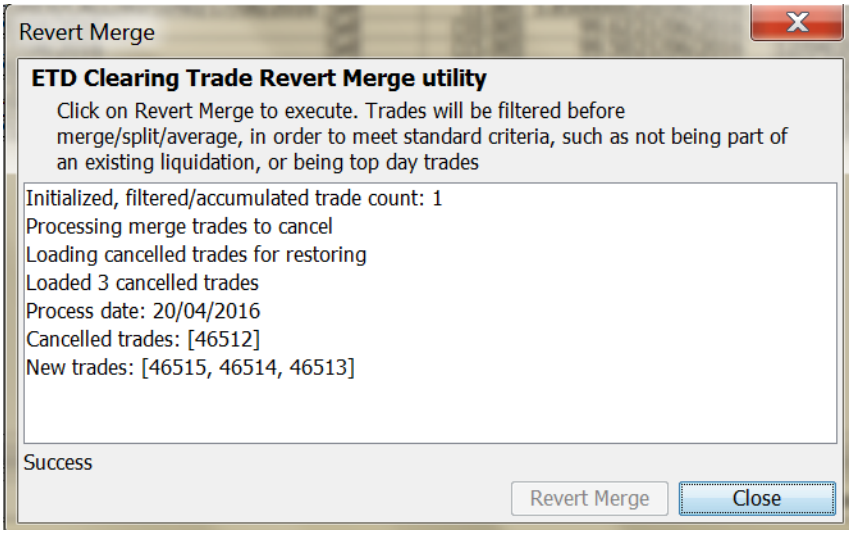
In the Trade Browser and Trade Open Quantity reports the user can revert a previously performed merge (only allowed on same business day).

Right-click > Process > ETD Merge/Split > Revert Merge…

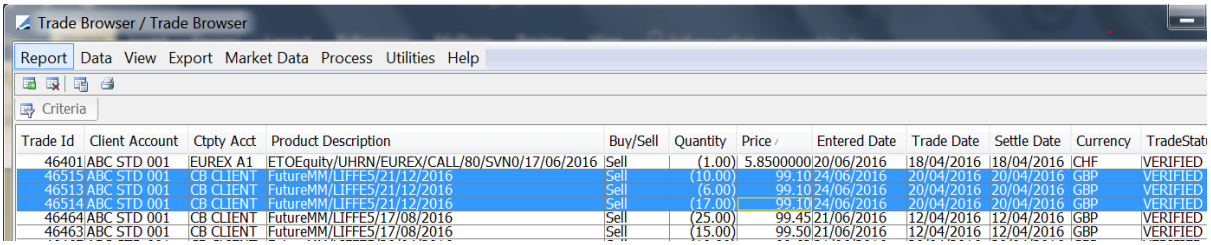


Once the Revert Merge has been confirmed, screen will explain the actions with the Trade Ids

- Cancel the merged trade
- Book as New the original trades



On 'Close' the Trade Browser / Trade Open Quantity reports will auto refresh to display the original 'un-merged' trades



15.5 Merge Schedule Task

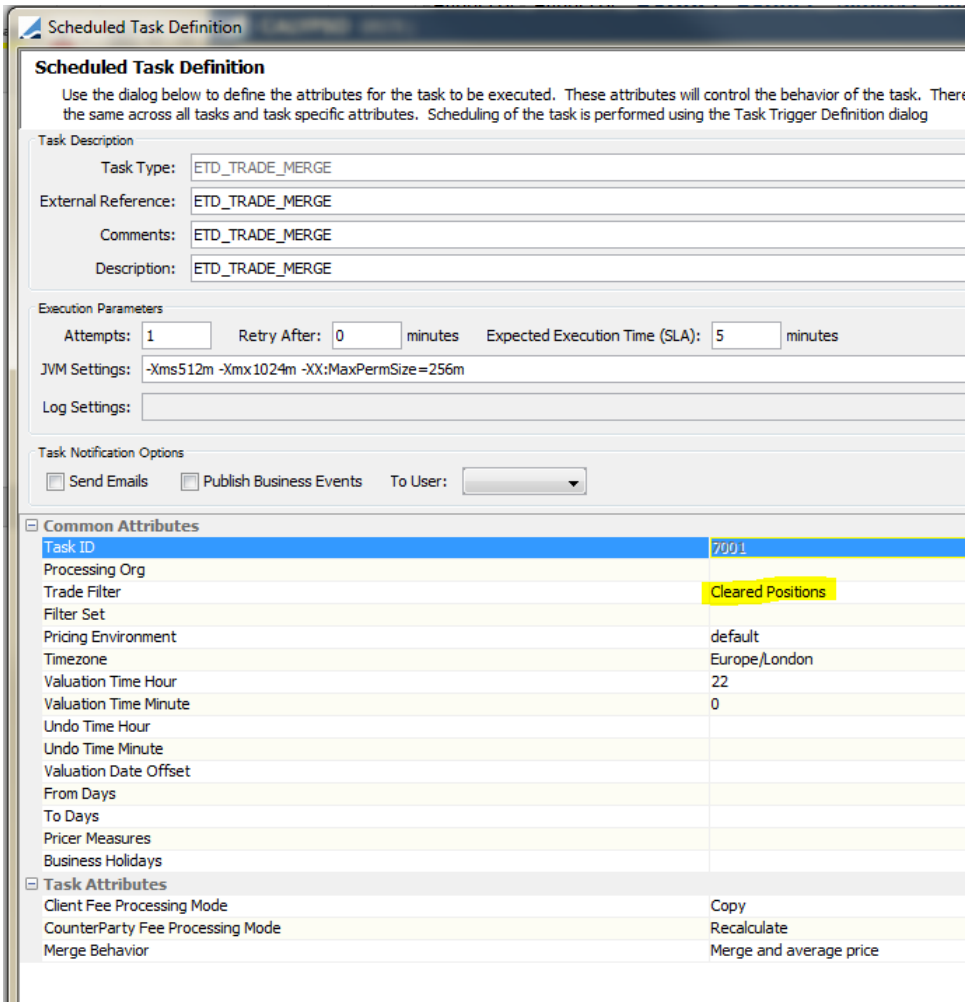
Merging can be performed as a Scheduled Task.

Trade selection is controlled by a standard Trade Filter

Task Attribute:

- Client Fee processing mode (Recalculate or Copy)
- Counterparty Fee processing mode (Recalculate or Copy)
- Merge Behaviour (Merge same price trades or Merge and average price)

ETD_TRADE_MERGE Scheduled Task definition



This Schedule Task for valuation date=today (e.g. 04-07-2016) should perform the exact same merges as in a Trade Browser set with the same Trade Filter

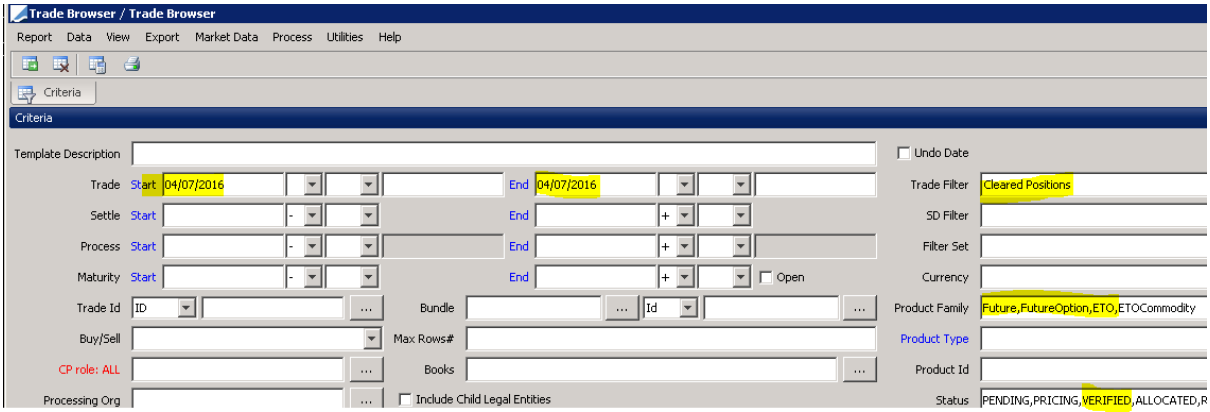
Trade Start = 04-07-2016

Trade End = 04-07-2016

Trade Filter = Cleared Positions (matching the Scheduled Task's trade filter)

With all trades selected and Merge + Fee processing mode=Recalculate selected

e.g.



15.6 Merge Trade Keywords

New trade keywords have beed introduced for audit and investigation purposes.

Example of merging two trades

Original trades

Trade Id	Quantity	Status	MergeAs	OriginalMergedTrade
0001	100	VERIFED		
0002	300	VERIFED		

After merging

Trade Id	Quantity	Status	MergeAs	OriginalMergedTrade
0001	100	CANCELED	0003	
0002	300	CANCELED	0003	
0003	400	VERIFED		

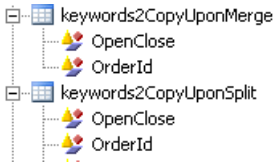
After reverting the merge

Trade Id	Quantity	Status	MergeAs	OriginalMergedTrade
0001	100	CANCELED	0003	
0002	300	CANCELED	0003	
0003	400	CANCELED		
0004	100	VERIFED		0001
0005	300	VERIFED		0002

15.7 Optional keywords to ‘copy’ from original trades - Merging

keywords2CopyUponMerge Domain Name controls which optional keywords to ‘copy’ from original trades to the new merged trade.

For example



Example of merging two trades

Original trades

Trade Id	Quantity	Status	OpenClose	OrderId
0001	100	VERIFED	O	12005
0002	300	VERIFED	O	12005

After merging

Trade Id	Quantity	Status	OpenClose	OrderId
0001	100	CANCELED	O	12005
0002	300	CANCELED	O	12005
0003	400	VERIFED	O	12005

Section 16. Client Statement

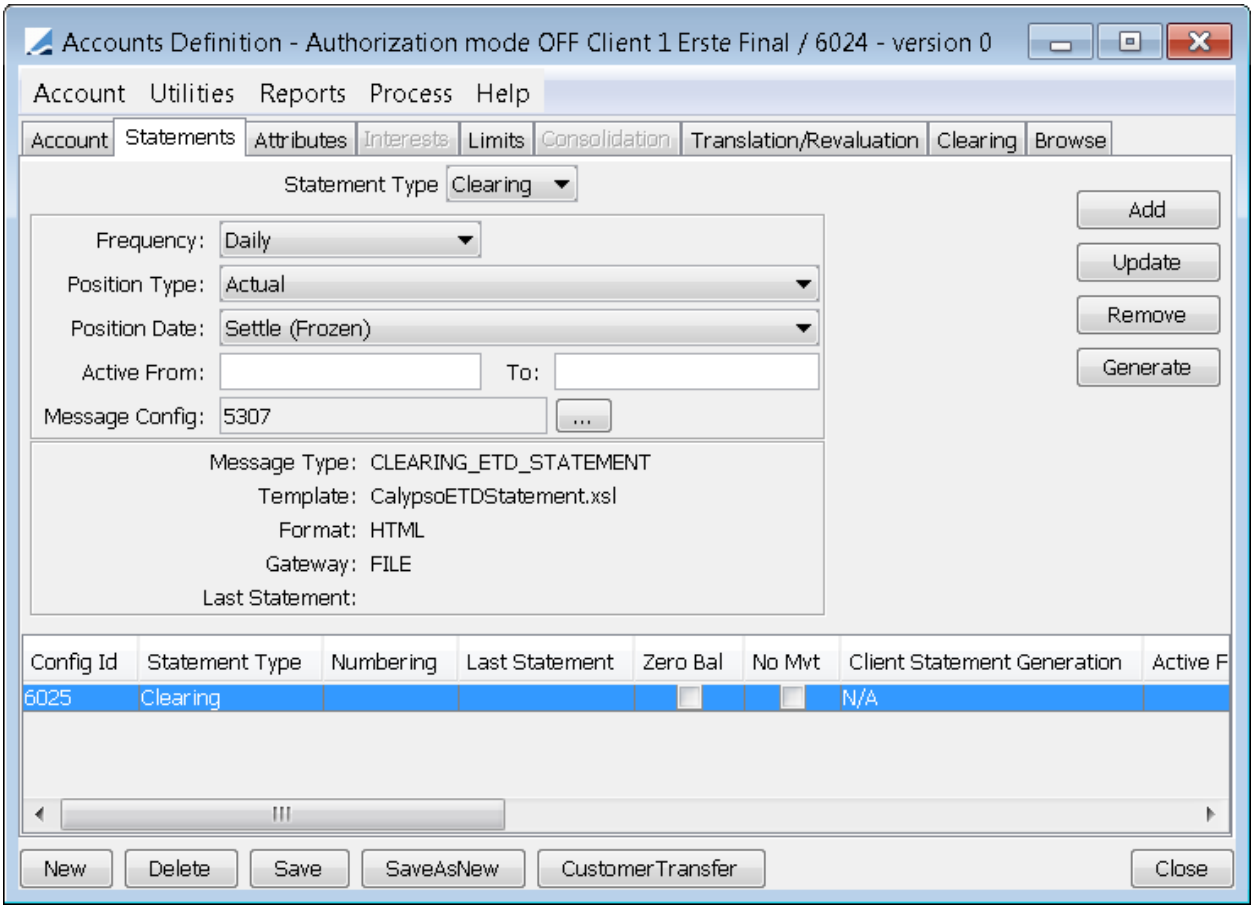
The scheduled task ACCOUNT_STATEMENT is used to generate client statements as part of the EOD process.

This section describes the process for generating a daily Client Statement from the Back Office clearing solution as well as information about the content of our supported statement template.

The current version of the Client Statement supports reporting for transactions, offsetting, lifecycle, cash and security movements and account balances based on the state of the system at the end of the processing day. Backdated transactions/activity and account corrections are not currently supported.

16.1 Account Configuration

A client clearing account can be configured to generate a statement by adding one or more statement configurations to the "Statement" tab of the account, making sure it gets added and saved with a unique config id.

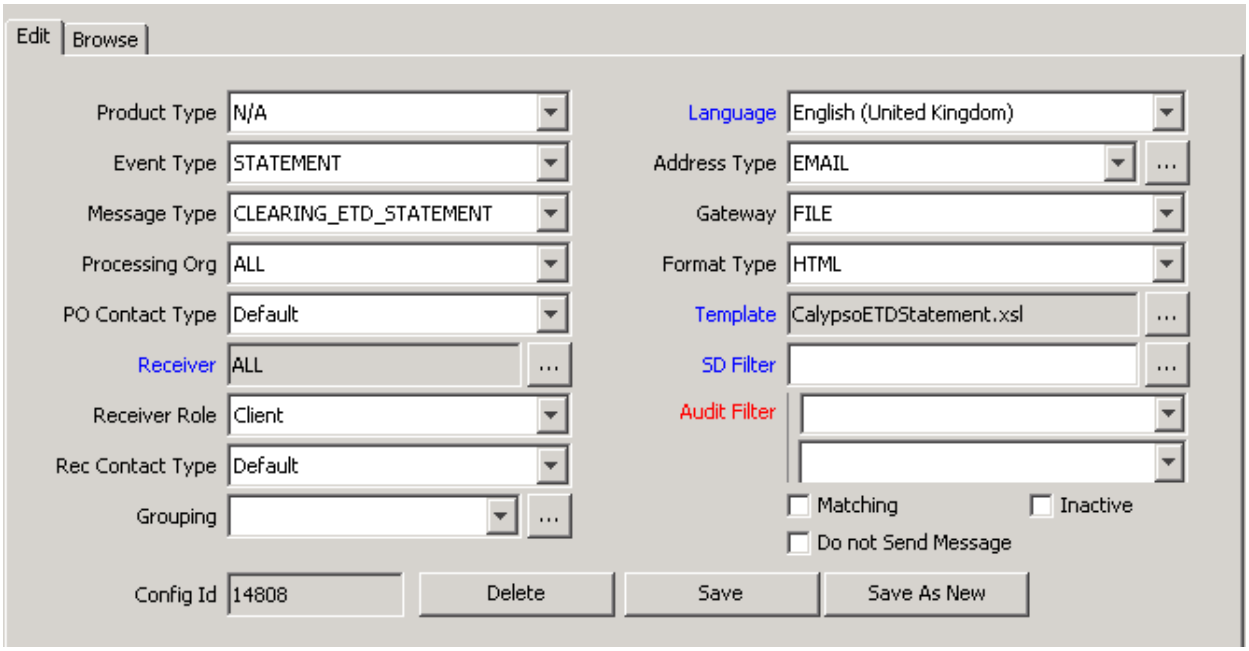


The fields in the statement config are described below.

Field Name	Expected Value	Description
Statement Type	"Clearing"	
Frequency	"Daily"	Identifies this statement config as eligible to be run on a daily basis. Does not control the format or content of the output, just the timing.
Position Type	"Actual" "Theoretical"	The field controls how the account balances are displayed in the statement, based on the status of the inventory transfers. Actual is the standard value, but is configurable based on the user's business logic.

Field Name	Expected Value	Description
Position Date	Settle (Frozen)	The field controls how the account balances are displayed in the statement, based on the status of the inventory transfers. It takes into account retro-active movements in the next statement.
Active From/To	Dates	Allows the statement configuration to be active for a set period of time. When the user triggers the statement run for a processing date outside of this range, no statement will be generated.
Message Config	Message Config ID	Select the message configuration which is applicable to the account. The screenshot below shows the setup of the standard message config for the ETD statement.

16.2 Message Configuration

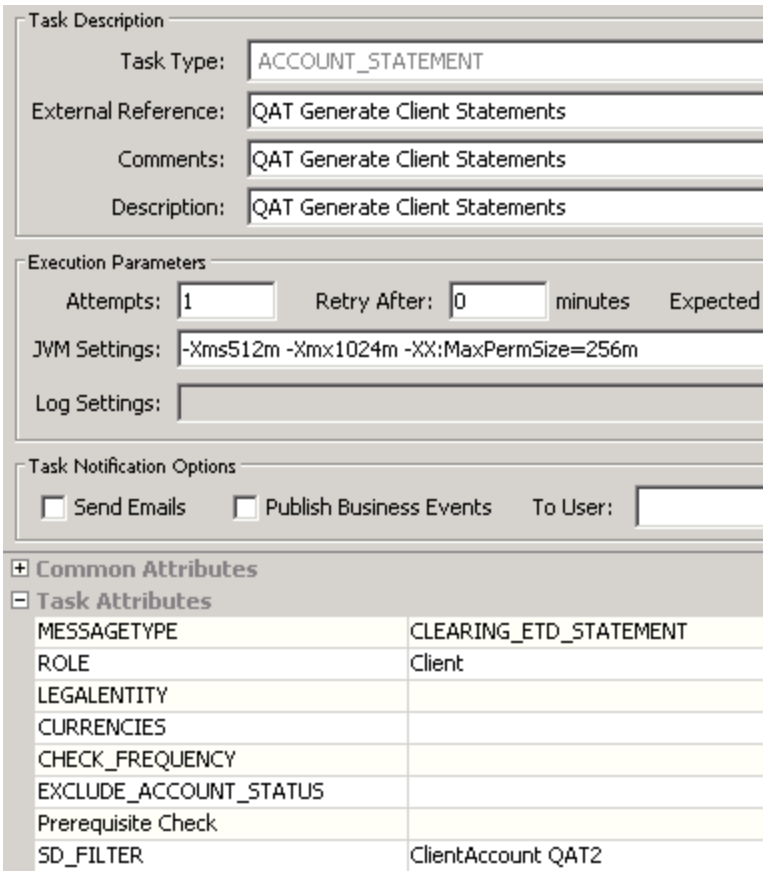


16.3 Scheduled Task ACCOUNT_STATEMENT

Official client statements are generated by running the ACCOUNT_STATEMENT scheduled task with a message type of 'CLEARING_ETD_STATEMENT'. This task checks all of the account statement configurations and generates official statements for valid configurations.

The task must be configured to generate statements for Legal Entities with a role of 'Client' by selecting 'Client' in the ST Role Attribute. Additional filtering can be added in the SD_FILTER attribute to single out specific accounts or LEs.

The ACCOUNT_STATEMENT valuation date and time should correspond to be just before the PO's Book EOD time (when comparing both in the same time zone) on the business date for which the statements are being generated.



Sample Financial Summary

A sample of the summary layout is shown below, followed by a description of the source for each piece of data.

Reg Code 01 - USD Segregated	
Opening Balance	402,984.23
Commissions	(50.50)
Fees	(230.75)
Realized PL	31,308.50
Premium	(100,391.00)
Cash Movements	0.00
Closing Balance	333,620.48
Open Trade Equity	(201,398.42)
Total Equity	132,222.06
Net Option Value	234,882.15
Securities on Deposit	0.00
Account Liquidation Value	132,222.06
Total Margin Requirement	1,000,000.00
Margin Excess/Deficit	(867,777.94)
FX Conversion to USD	1
Converted Net Liquidating Value	(867,777.94)

Reg Code 03 - Euro 30.7 Secured	
Opening Balance	2,082.22
Commissions	(20.00)
Fees	(50.00)
Realized PL	(38,000.00)
Premium	0.00
Cash Movements	5,000.00
Closing Balance	(30,987.78)
Open Trade Equity	95,033.20
Total Equity	64,045.42
Net Option Value	(45,200.00)
Securities on Deposit	0.00
Account Liquidation Value	64,045.42
Total Margin Requirement	300,000.00
Margin Excess/Deficit	(235,954.58)
FX Conversion to USD	1.105
Converted Net Liquidating Value	(260,729.81)

Converted Total	
Opening Balance	405,285.08
Commissions	(72.60)
Fees	(286.00)
Realized PL	(10,681.50)
Premium	(100,391.00)
Cash Movements	5,525.00
Closing Balance	299,378.98
Open Trade Equity	(96,386.73)
Total Equity	202,992.25
Net Option Value	184,936.15
Securities on Deposit	0.00
Account Liquidation Value	202,992.25
Total Margin Requirement	1,331,500.00
Margin Excess/Deficit	(1,128,507.75)
FX Conversion to USD	1
Converted Net Liquidating Value	(1,128,507.75)

Each section other than the Converted Total is expected to have values in a single currency that fall under a single Regulatory Code, so there is no FX conversion required other than the conversion of the Net Liquidating Value. The Converted Total section is the sum of the values of each item from all of the individual sections, after each row has been converted into the statement currency using the FX Conversion rate displayed at the bottom of the section.

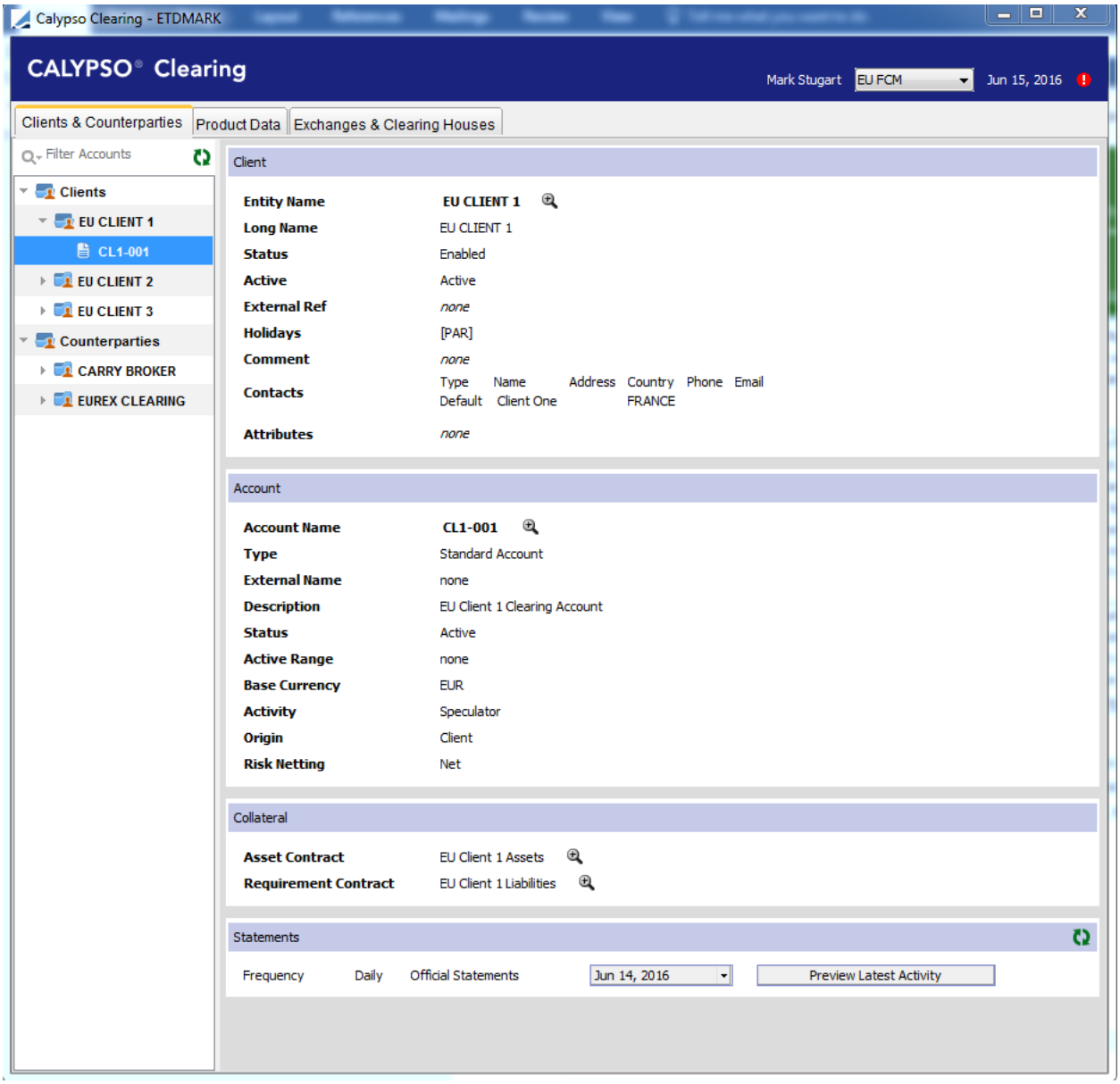
Row Label	Description	Source Data
Opening Balance	The beginning cash balance of the Account at the start of day on the statement date.	The sum of the Opening Balances of the Commissions, Fees, Future PL, Option Premium, Option Cash Settlement and Cash Movements inventory buckets from the Inventory Position Report for the relevant

Row Label	Description	Source Data
		Account and Reg Category on the statement date. This could be defined as a composite Inventory Bucket called "Opening"
Commissions	The total Commissions related to activity in the relevant Reg Category on the statement date.	The total movements in the Commissions Inventory Bucket on the statement date for the relevant Account and Reg Category.
Fees	The total Fees related to activity in the relevant Reg Category on the statement date.	The total movements in the Fees Inventory Bucket on the statement date for the relevant Account and Reg Category.
Realized PL	The total realized cash related to positions in the relevant Reg Category which were closed out on the statement date.	The total movements in the Futures PL and Option Cash Settlement Inventory Buckets on the statement date for the relevant Account and Reg Category.
Premium	The total option premium paid and received in the relevant Reg Category on the statement date.	The total movements in the Option Premium Inventory Bucket on the statement date for the relevant Account and Reg Category.
Cash Movements	Total amount of cash credits and debits to the account in the relevant Reg Category on the statement date.	The total movements in the Commissions Inventory Bucket on the statement date for the relevant Account and Reg Category.
Closing Balance	The ending cash balance of the Account at the end of day on the statement date. This will equal the Opening Balance plus the balance impact of the Commissions, Fees, Realized PL, Premium and Cash Movements which occurred on the statement date.	The sum of the Closing Balances of the Commissions, Fees, Future PL, Option Premium, Option Cash Settlement and Cash Movements inventory buckets from the Inventory Position Report for the relevant Account and Reg Category on the statement date. This could be defined as a composite Inventory Bucket called "Closing"
Open Trade Equity	The total unrealized (MTM) PL of the open future and future-style options positions in the account for the relevant Regulatory Category, valued using the exchange closing prices on the statement date.	The Closing balance of the OTE Inventory bucket on the statement date for the relevant account and Reg Category
Open Trade Equity (Discounted)	The total unrealized (MTM) PL of the open forward positions which are discounted back to the statement date since the PL cannot be realized until the expiration of the position.	The Closing balance of the Discounted OTE Inventory bucket on the statement date for the relevant account and Reg Category
Total Equity	The combined value of the Account cash balance and Open Trade Equity for the relevant Reg Category.	The sum of the Closing Balances of the Commissions, Fees, Future PL, Option Premium, Option Cash Settlement, Cash Movements, OTE and Discounted OTE inventory buckets from the Inventory Position Report for the relevant Account and Reg Category on the statement date. This could be defined as a composite Inventory Bucket called "Total Equity"

Row Label	Description	Source Data
Net Option Value	The total value of the open premium-paid option positions in the account for the relevant Regulatory Category, valued using the exchange closing prices on the statement date.	The Closing balance of the NOV Inventory bucket on the statement date for the relevant account and Reg Category
Securities on Deposit	The total value of all non-cash collateral allocated to the relevant Reg Category, including FCM defined haircuts	The total "All-In Value" in the currency of the Reg Category of the securities across both the Deposit and Liability Contracts for this account.
Account Liquidation Value	The total value of the account if all positions in the relevant Reg Category were liquidated at the closing prices on the statement date.	The sum of the Closing Balances of the Total Equity and NOV inventory buckets from the Inventory Position Report for the relevant Account and Reg Category on the statement date. This could be defined as a composite Inventory Bucket called "Liquidation Value".
Total Margin Requirement	The total Maintenance Margin Requirement, including the impact of NOV and any FCM markups, for the relevant Reg Category for the account.	The sum of the MARGIN_CALL pricer measure across all Collateral Exposures in the Liability Contract of the account, excluding any Collateral Exposures generated for OTE. The included Collateral Exposures will have a Type of "Initial Margin" on the product.
Margin Excess/Deficit	The difference between the Total Equity and the amount of Maintenance Margin which is greater than the Securities on Deposit. If the securities value is greater than or equal to the MMR, this is equal to the Total Equity.	Equal to the Minimum value of the Total Equity and the Total Equity + Securities on Deposit – Total Margin Requirement
FX Conversion to Base currency	The FX rate used to convert the balances in the relevant Reg Category into the statement currency.	The quote for the FX currency pair comprised of the statement currency and the Reg Category currency, taken from the statement pricing environment. If the Reg Category currency is equal to the statement currency, this value is set to 1.
Converted Net Liquidating Value	The Account Liquidation Value converted into the statement currency using the FX Rate above.	The Account Liquidation Value amount converted into the statement currency using the FX Conversion Rate, and standard logic for currency conversion.

16.4 Clearing Static Data Dashboard

The Clearing Static Data Dashboard (menu action `clearing.ClearingDashboard`) allows viewing information about Clients and Counterparties, their associated accounts and collateral configuration, and statements. It also allows viewing listed derivatives products and the LE information of the Exchanges and Clearinghouses configured in the system.



On the left-hand side, you can navigate the accounts. LE, Account and Collateral Contract details are displayed on the right-hand side. From each section, you can drill-down to more details.

You can view the future and option contracts in the "Product Data" tab of the dashboard

You can view static data associated to Exchanges and Clearinghouses in the "Exchanges & Clearinghouses" tab.

Statements Section

From the Statements section, ad-hoc statements can be generated at any time and official statements can be viewed. To execute either of these actions, choose an account from the panel on the left-hand side of the dashboard with a valid statement configuration. The dropdown on the left holds the last 10 official statements which can be selected by the statement date. By default, the most recent statement date will be populated.

Clicking "Preview Latest Activity" will generate an ad hoc statement that is not saved in the system, but can be viewed to get an advanced look at what the statement would look like if generated with the system in its current state.

Section 17. Listed Derivatives Contracts

From the Calypso Navigator, navigate to **Configuration > Listed Derivatives > Future Contracts** (menu action `refdata.FutureDefinitionWindow`) for creating future contracts, and future products.

From the Calypso Navigator, navigate to **Configuration > Listed Derivatives > Future Option Contracts** (menu action `refdata.FutureOptionDefinitionWindow`) for creating future option contracts, and future option products.

From the Calypso Navigator, navigate to **Configuration > Listed Derivatives > Option Contracts** (menu action `refdata.ETOContractWindow`) for creating ETO contracts, and ETO products.

You can also access contract information from the **Clearing Dashboard > Product Data** tab.

17.1 Contract Attributes

To be included in the 3 type domain names:

- **FutureContractAttributes**
- **FutureOptionContractAttributes**
- **ETOContractAttributes**

The following contract attributes are used for processing future and options:

Attribute Name	Purpose/Impact
CascadeFrom	After the creation of the shorter-duration contracts, this attribute will reference the 'ContractName' of the longer-duration contract the contract cascading from. Since there can be a "one to many" ratio of the longer to the shorter duration contracts, it makes sense to place the reference on the latter. Note that in the case that a quarterly product is created from the cascading of an annual contract, and will cascade itself into a monthly contract, that quarterly contract would reference the annual contract in the 'CascadeFrom' attribute, while the monthly contract would reference the quarterly contract name. *Mandatory*
ClearingExchangeTicker	Provides the market standard contract symbol used by the exchange and trade interface.
CascadeTo	In the cascading process, this is an attribute stored on a long duration contract that references the shorter duration contract that will get cascaded to. *Mandatory*
ContractStrategyMargin	A specific margin strategy stored on unique contracts that differ from the contract's exchange margin methodology. *Mandatory for unique contracts.*
CascadePriceType	For longer duration contracts, this attribute dictates how the prices of the trades created during the cascade process will be set. When the attribute is set to 'Closing', the trade price of the close out trade and the newly generated opening trade in the shorter duration product(s) will be set to the closing price of the parent product on the cascade date. This price is taken from the Instance Type (Close, Last, etc.) set in the Quote Set from the Pricing Environment selected on the Scheduled Task. When the attribute is set to 'Trade', the trade price of the close out trade and the newly generated opening trade in the shorter duration product(s) will be set to the traded price

Attribute Name	Purpose/Impact
	of the parent trades that form the open position. This implies that the cascade process could generate multiple trades in the same product with different traded prices. If this field is empty or has an unrecognizable value, the process will run with a default value of 'Trade'.
CascadeDateLag	A positive integer value that represents the number of business days, according to the calendar in the 'Holidays' field on the contract, prior to the product's First Delivery Date that the cascading event will occur. The business days will be according to the calendar set on the Contract definition. An empty value in this field will be considered a lag of zero by default.
ContractCode	Populated by FOW. The short name code for the contract.
ContractLongName	Populated by the FOW. Contract's full name as listed by the FOW. *Optional*
ContractStrategyRate	When calculating Initial Margin for a position in this contract using the 'Strategy' method, this attribute will set the IM requirement amount per lot in the contract settlement currency. If the attribute is empty, we will use the default value of 1,000.
CabinetPrice	Lowest tradeable value for a specific option contract. Only is used to close out option positions that are very deep out of the money. *Optional*
SettlementDateLag	Number of business days, according to the calendar(s) in the Holidays field of the contract, after the expiration date that the future or option settles.
ProductMarginCode	Identifies the contract symbol used in the risk array files when calculating Initial Margin. Required when the symbol used in the risk file is different than the ClearingExchangeSymbol.
PremiumPaymentConvention	When PremiumPaymentConvention = VariationMargined, Premium flows are only generated when the optoin is closed out, not at the opening of the position When PremiumPaymentConvention = Conventional or not set, the liquidation generates PREMIUM with each transaction, settled on the cleared date

Please refer to *Calypso Futures and Future Options Trading* documentation for details on setting up future and future option contracts.

Please refer to *Calypso Equity Derivatives Trading* documentation for details on setting up ETO contracts.

17.2 Flex Options

Exchanges such as Eurex offer "Flex" future and option contracts which allow members to submit specifications for bespoke products to be traded on the exchange and cleared on the clearinghouse. These contracts need to adhere to the general guidelines of the contract framework – contract size, underlying asset, contract symbol – but the parties involved in the trade are able to choose their own 'flexible' expiration date, delivery type (physical/cash) and exercise type (American/European). Importantly, this means that it is a valid use case to have a single ETO or future option contract with multiple expiries in the same month.

To defined Flex Options, you need to set the Contract Date Format to 'Daily', triggering the display of the contract date in the trade capture screen and the generation of the quote name to include the day, month and year when describing the product.

The user also has to set the formatting of the contract date in the trade capture screen by populating the "DateFormat" contract attribute with a java-compatible format value. Recommended approach is to use the value of "dd MMM yyyy".

17.3 Import

Listed Derivatives Contracts can be imported using the FOW Trade Data interface through the scheduled task FOW_REFERENCE_DATA_IMPORT.

Please refer to the *Calypso FOW Integration Guide* for complete details.

[IMPORTANT NOTE: Once the contracts are created, you need to generate the actual products that will be traded]

Section 18. Cascading Process

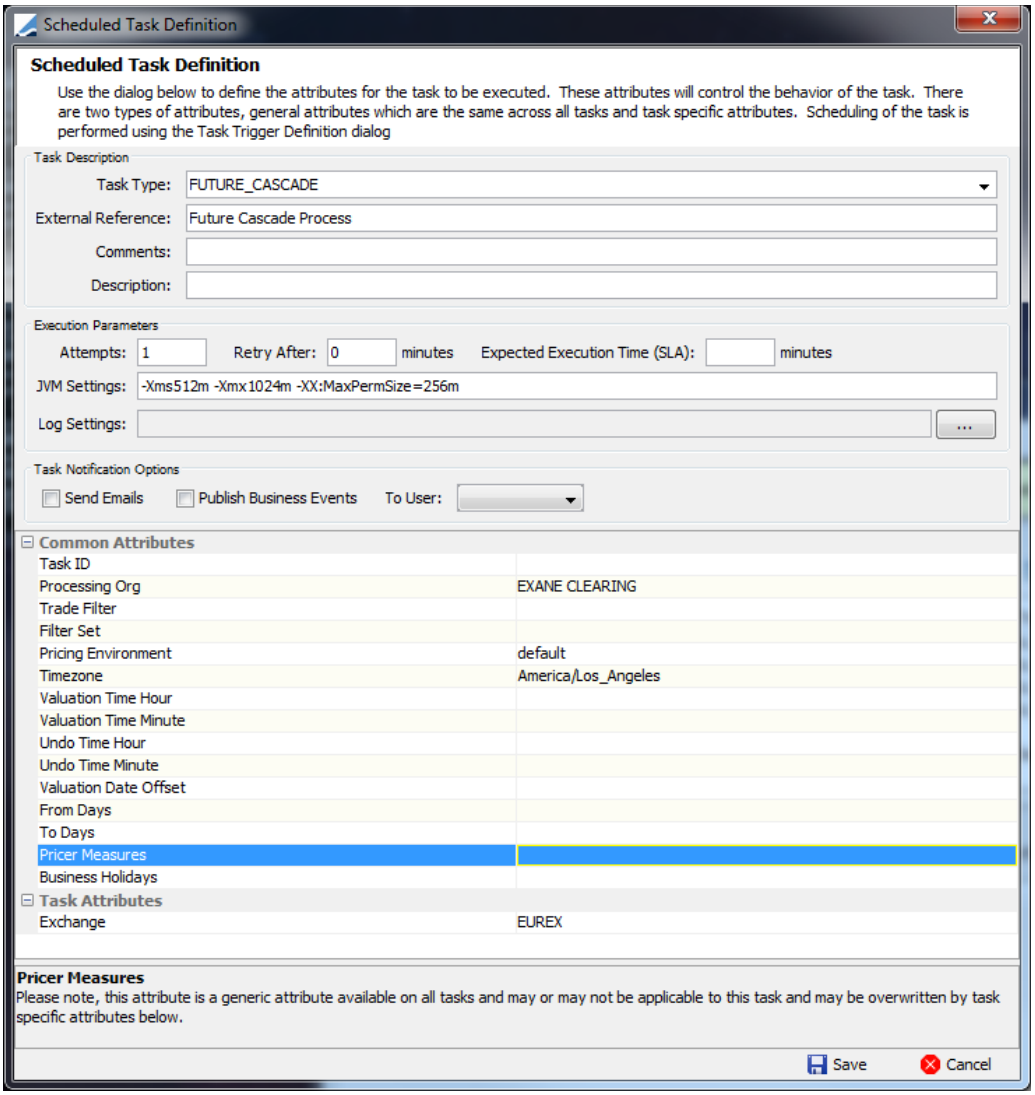
Important: In order to properly execute the cascading process, we require that the shorter-duration contracts are created in the database and the underlying futures are saved as products prior to the execution of the cascading process.

18.1 Triggering the Cascade Process

The cascade process will be run each day through the execution of a scheduled task called FUTURE_CASCADE. This task should be run at EOD after all offsetting is run, but before IM and VM calculation and statements are generated. Products which are eligible for cascading are determined by the list of values of the CascadeFrom attribute across all contracts. The cascade process will be triggered only on the open positions in these products where the First Delivery Date adjusted by the CascadeDateLag and the ST process date are equal.

The cascading process only needs to be applied to open positions in cascading products. If transactions in a cascading contract have been cleared, and have since all been closed out, the cascading process does not need to be triggered.

Although it is not expected, this task can be run backdated. If the cascade process has already been run, by definition all positions will be closed, so there will be no impact of running it on a date for which it has already been run.



Attribute Name	Purpose/Impact
Processing Org	Processing Org in order to indicate which entities positions should be considered
Pricing Environment	Pricing Environment to source the closing price of the cascaded contract
Exchange	Exchange Attribute field which can be used to select one, several or all exchanges on which to run the process. This will be useful to run the process in a "follow the sun" mode. The pick list should be limited to LE's with a Role of 'MarketPlace'

18.2 Results of the Cascade Process

Running the cascade scheduled task on a day when open positions exist in a product which is linked to one or more other contracts by their CascadeFrom attribute will result in 1) the close out of the open position at either the closing price that day or the original trade price and 2) the generation of open positions in all of the existing products on the contracts which were pointing to the original position. If a contract exists, but the underlying future products have not been saved, new positions will not be generated.

Section 19. Trade Merge Process

Merging is when the user wishes to combine numerous trades where the key elements are identical into a single trade, there are a number of reasons why they do this e.g. many fills of a large order come down the cleared trade interface so they want to re-form the order, so statement just shows the single merged trade.

For example

Contract	IFLL I (Future)
Contract Value	10.00

Executions				
Product	**B/S**	**Qty**	**Price**	**Trade Value**
IFLL I SEP15	B	11	99.90	10,989.00
IFLL I SEP15	B	12	99.90	11,988.00
IFLL I SEP15	B	9	99.90	8,991.00
		32	99.90	31,968.00

Trade booking - before merge					
Product	**B/S**	**Qty**	**Price**	**Trade Value**	**Account**
IFLL I SEP15	B	11	99.90	10,989.00	ACT1
IFLL I SEP15	B	12	99.90	11,988.00	ACT1
IFLL I SEP15	B	9	99.90	8,991.00	ACT1

Trade booking - after merge					
Product	**B/S**	**Qty**	**Price**	**Trade Value**	**Account**
IFLL I SEP15	B	32	99.90	31,968.00	ACT1

* final merged trade that shows on the client statement and back-office reports

19.1 Merging Trade Eligibility

Trades can only be merged that

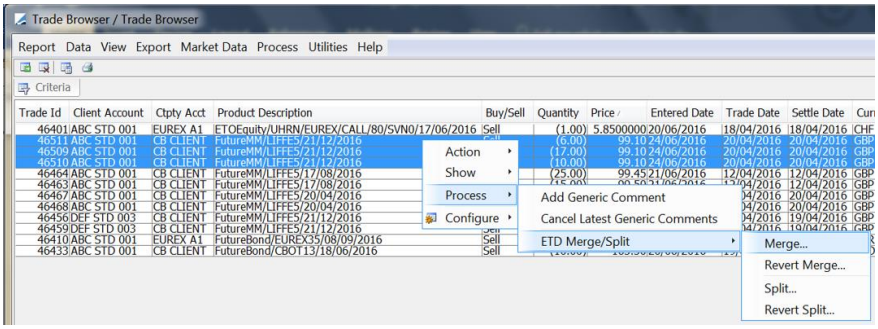
8. Top-day (booking date = trade date)
9. Fully open (no liquidations have been performed on them)
10. Same Position Aggregation (ClientAccount, CounterPartyAccount, Position)
11. All buys (long) or all sells (short)
12. ServiceLevel match – e.g. do not allow Full Service and Cleared Only trades to match

13. Order Taker and Executing Broker match
14. Trade hasn't already been merged

19.2 Selecting Trades to Merge

In the Trade Browser and Trade Open Quantity reports the user needs to select more than one trade that are eligible for merging (see Merging trade eligibility).

Right-click > Process > ETD Merge/Split > Merge…



Merge confirmation screen will appear where the user needs to select:

Fee Processing Mode – these two modes can produce different results when the underlying fee configurations use 'Volume based tiered calculations'

Client; for all fees where the Legal Entity has role = Client

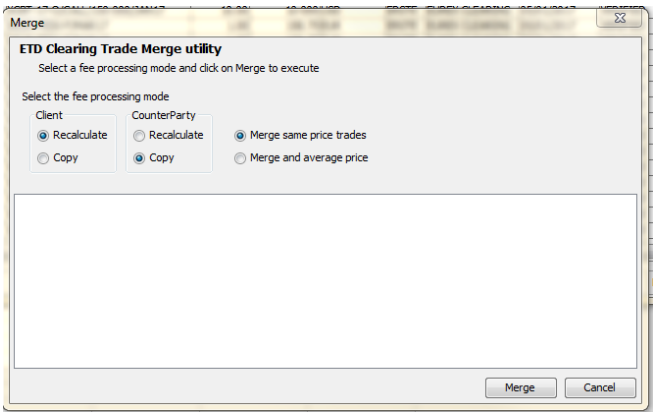
- Recalculate = recalculate fees for the new merged quantity
- Copy = take original trades calculated fees, sum each Fee Type and apply to the new merged trade

Counterparty; for all fees where the Legal Entity has role <> Client e.g. Counterparty

- Recalculate = recalculate fees for the new merged quantity
- Copy = take original trades calculated fees, sum each Fee Type and apply to the new merged trade

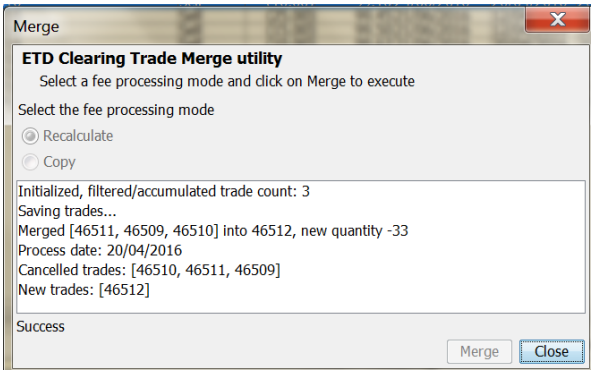
Confirmation if merging same priced trades or different prices that will be averaged

- Merge same price trades
- Merge and average price

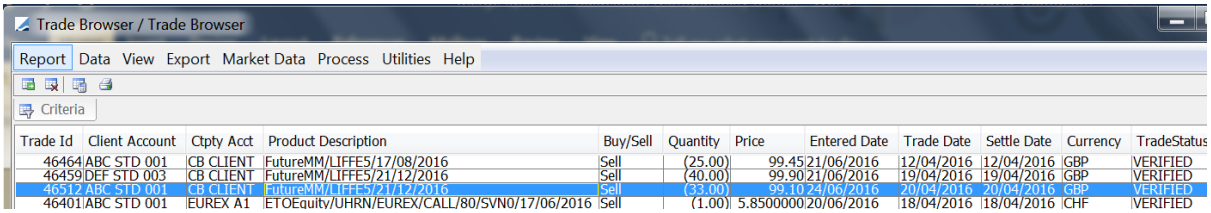


Once the Merge has been confirmed, screen will explain the actions with the Trade Ids

- Total Quantity of the trades to be merged
- Cancel these trades
- New trade generated with new Total Quantity



On 'Close' the Trade Browser, Trade Open Quantity reports will auto refresh to display the newly merged trade



19.3 Merge and Average Price

For selected trades with different trade prices and the 'Merge and average price' option selected.

The system will calculate the weighted average price.

For example

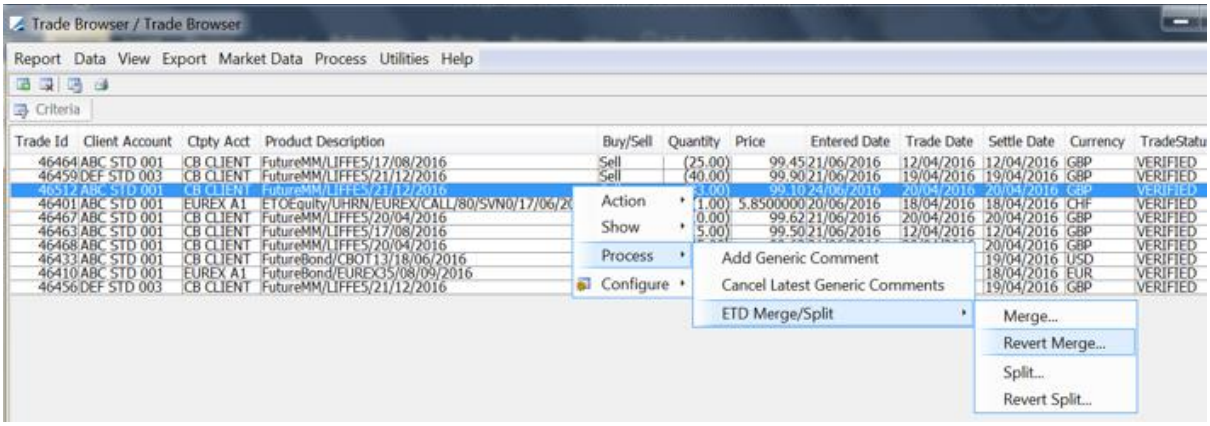
Trade Date	Client Acct	Counter-party Acct	Ccy	Exchange	Contract	Expiry	Qty	Trade Price
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-95	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-100	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-100	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-68	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-32	166.310000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-14	166.310000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-86	166.320000
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-100	166.320000

Trade Date	Client Acct	Counter-party Acct	Ccy	Exchange	Contract	Expiry	Qty	Trade Price
20-Jul-16	ClientAcct	ERXAGT	EUR	EURX	FGBL	08-Sep-16	-595	166.319227
						Total Quantity	-595	

19.4 Revert Merge

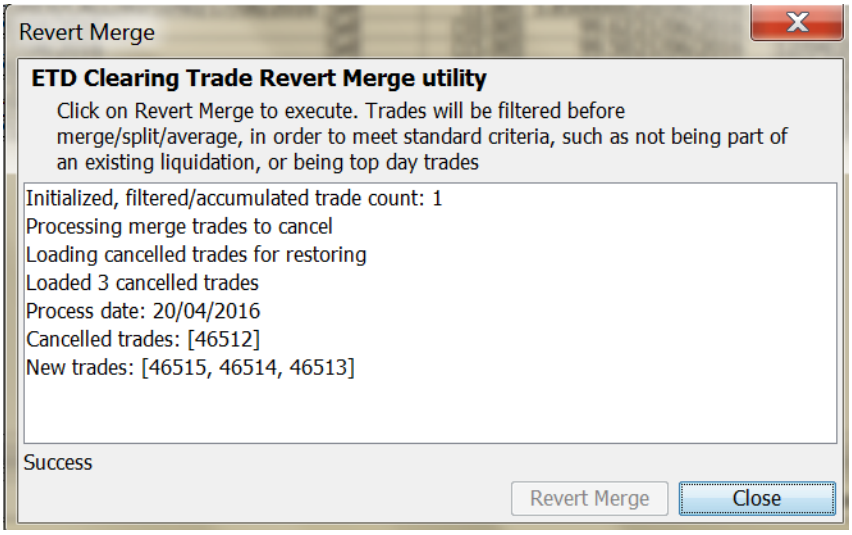
In the Trade Browser and Trade Open Quantity reports the user can revert a previously performed merge (only allowed on same business day).

Right-click > Process > ETD Merge/Split > Revert Merge…

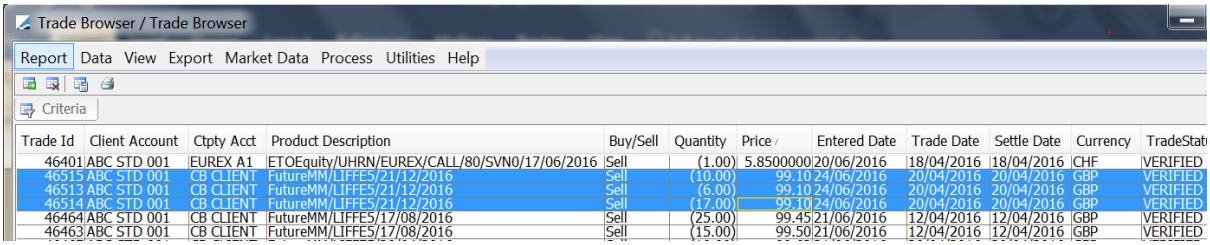


Once the Revert Merge has been confirmed, screen will explain the actions with the Trade Ids

- Cancel the merged trade
- Book as New the original trades



On 'Close' the Trade Browser / Trade Open Quantity reports will auto refresh to display the original 'un-merged' trades



19.5 Merge Schedule Task

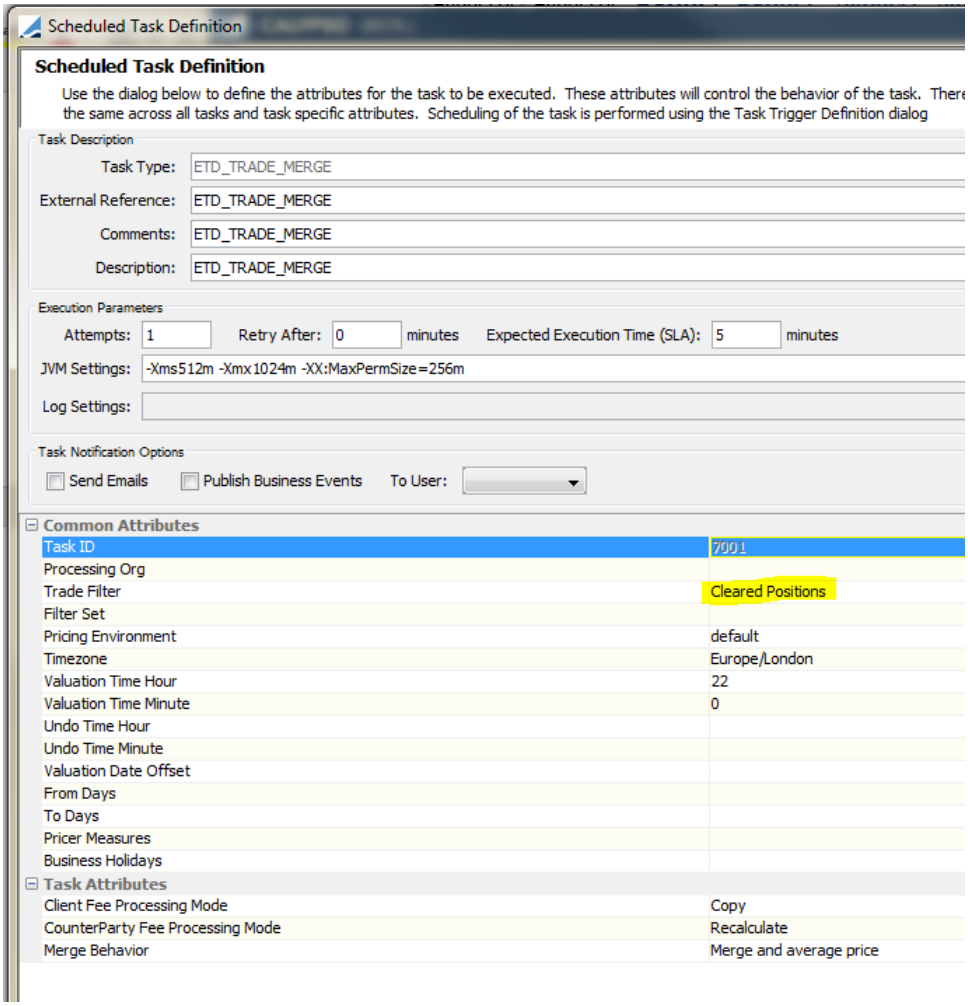
Merging can be performed as a Scheduled Task.

Trade selection is controlled by a standard Trade Filter

Task Attribute:

- Client Fee processing mode (Recalculate or Copy)
- Counterparty Fee processing mode (Recalculate or Copy)
- Merge Behaviour (Merge same price trades or Merge and average price)

ETD_TRADE_MERGE Scheduled Task definition



This Schedule Task for valuation date=today (e.g. 04-07-2016) should perform the exact same merges as in a Trade Browser set with the same Trade Filter

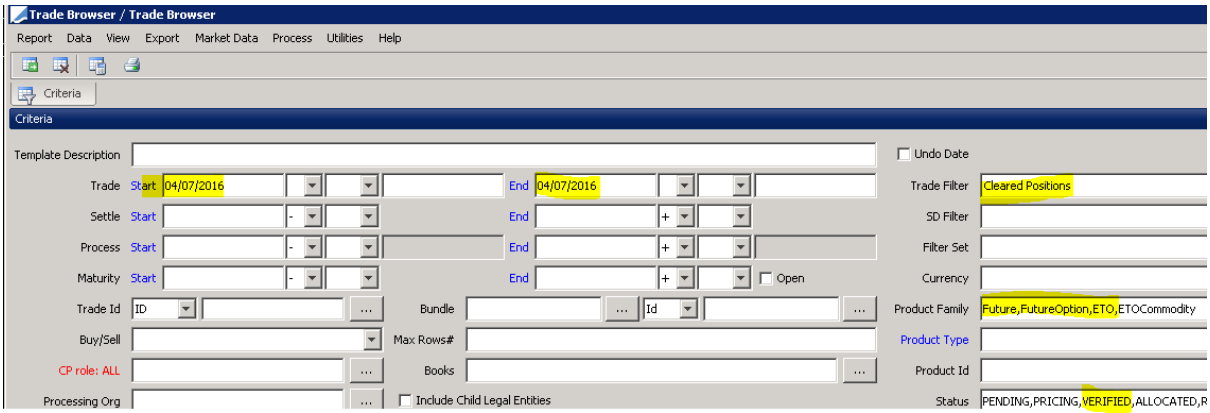
Trade Start = 04-07-2016

Trade End = 04-07-2016

Trade Filter = Cleared Positions (matching the Scheduled Task's trade filter)

With all trades selected and Merge + Fee processing mode=Recalculate selected

e.g.



19.6 Merge Trade Keywords

New trade keywords have beed introduced for audit and investigation purposes.

Example of merging two trades

Original trades

Trade Id	Quantity	Status	MergeAs	OriginalMergedTrade
0001	100	VERIFED		
0002	300	VERIFED		

After merging

Trade Id	Quantity	Status	MergeAs	OriginalMergedTrade
0001	100	CANCELED	0003	
0002	300	CANCELED	0003	
0003	400	VERIFED		

After reverting the merge

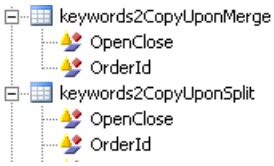
Trade Id	Quantity	Status	MergeAs	OriginalMergedTrade
0001	100	CANCELED	0003	

0002	300	CANCELED	0003	
0003	400	CANCELED		
0004	100	VERIFED		0001
0005	300	VERIFED		0002

19.7 Optional Keywords to 'copy' from Original Trades - Merging

keywords2CopyUponMerge Domain Name controls which optional keywords to 'copy' from original trades to the new merged trade.

For example



Example of merging two trades

Original trades

Trade Id	Quantity	Status	OpenClose	OrderId
0001	100	VERIFED	O	12005
0002	300	VERIFED	O	12005

After merging

Trade Id	Quantity	Status	OpenClose	OrderId
0001	100	CANCELED	O	12005
0002	300	CANCELED	O	12005
0003	400	VERIFED	O	12005

Section 20. Trade Split Process

Splitting is when the user wishes to allocate a single executed trade across numerous (sub) accounts. Typically fund managers do this so each individual fund account has a portion of the actual executed trade.

For example

Contract	IFLL I (Future)
Contract Value	10.00

Executions				
Product	**B/S**	**Qty**	**Price**	**Trade Value**
IFLL I SEP15	B	32	99.90	31,968.00

Trade booking – before split					
Product	**B/S**	**Qty**	**Price**	**Trade Value**	**Account**
IFLL I SEP15	B	32	99.90	31,968.00	ACT1

Trade booking – after split					
Product	**B/S**	**Qty**	**Price**	**Trade Value**	**Account**
IFLL I SEP15	B	11	99.90	10,989.00	ACT1
IFLL I SEP15	B	12	99.90	11,988.00	ACT2
IFLL I SEP15	B	9	99.90	8,991.00	ACT3

* final split trades that shows on the client statement and back-office reports

20.1 Splitting Criteria

Split to only client accounts belonging to the same Client Legal Entity as the account the pre-split trade is booked to.

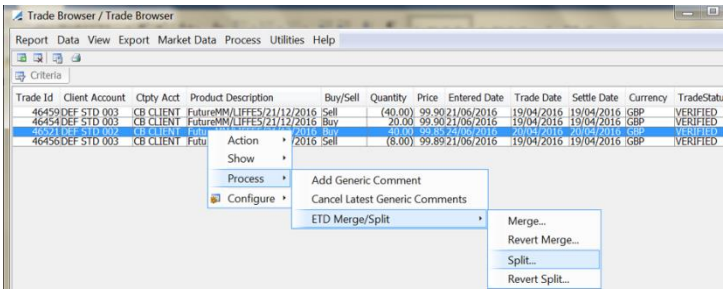
Only allow trades to be split that

1. Top-day (booking date = trade date)
2. Fully open (no liquidations have been performed on it)

20.2 Selecting Trade to Split

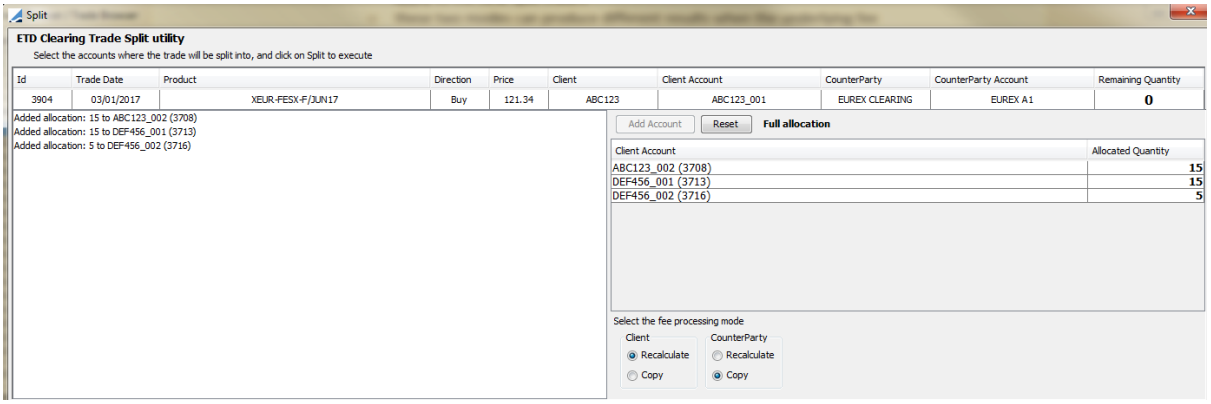
In the Trade Browser and Trade Open Quantity reports the user needs to select one trade that is eligible for splittinging (see Splitting Criteria).

Right-click > Process > ETD Merge/Split > Split…



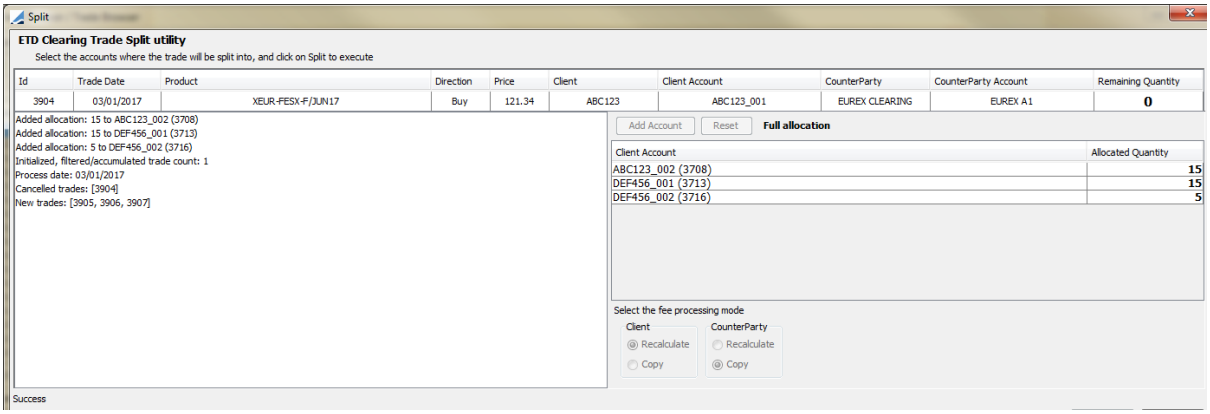
Split screen will appear where the user needs to select the client account(s) and quantity of the split allocation, and the fee processing mode.

- Add Account
  - User to select from the list of additional client accounts of the Client Legal Entity of the original trade
  - User to enter Quantity for this split allocation, must be less than 'Remaining Quantity'
  - Repeat if splitting to multiple accounts
- Select fee processing mode for Client and Counterparty fees
  - Recalculate = recalculate fees for the new split quantities
  - Copy = take original trades calculated fee, pro-rata according to quantities and apply to the new split trades
  - these two modes can produce different results when the underlying fee configurations use 'Volume based tiered calculations'
- Split button to process



Once the Split has been confirmed, screen will explain the actions with the relevant Trade Ids

- Cancel of original trade
- New trades

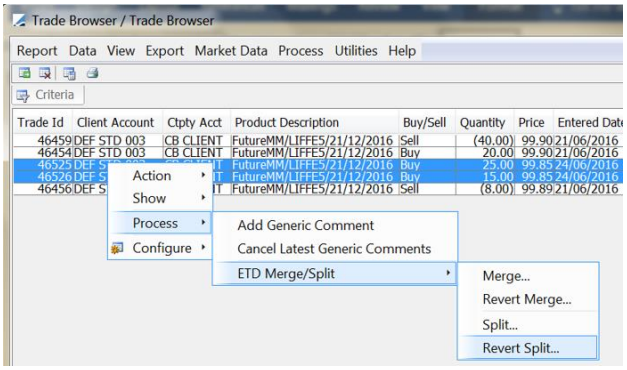


On 'Close' the Trade Browser, Trade Open Quantity reports will auto refresh to display the newly split trades, with keyword populated – see Trade Split Keywords section

20.3 Revert Split

In the Trade Browser and Trade Open Quantity reports the user can revert a previously performed merge (only allowed on same business day)

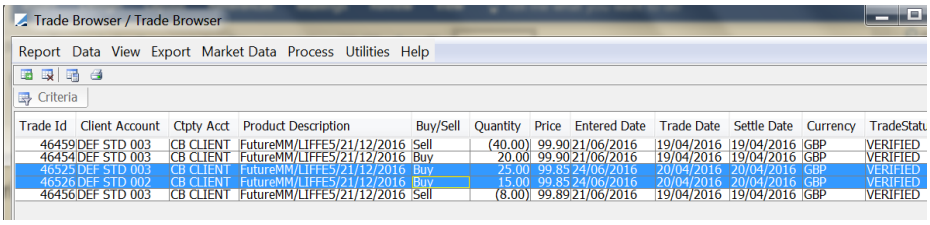
Right-click > Process > ETD Merge/Split > Revert Split…



Once the Revert Split has been confirmed, screen will explain the actions with the relevant Trade Ids

- Cancel of the split trades
- Book as New the original trade

On 'Close' the Trade Browser / Trade Open Quantity reports will auto refresh to display the original 'un-split' trades



20.4 Split Trade Keywords

Expected split keywords

Example of splitting into two trades

Original trades

Trade Id	Quantity	Status	SplitFrom	OriginalSplitTrade
0010	700	VERIFED		

After splitting

Trade Id	Quantity	Status	SplitFrom	OriginalSplitTrade
0010	700	CANCELED		
0011	200	VERIFED	0010	
0012	500	VERIFED	0010	

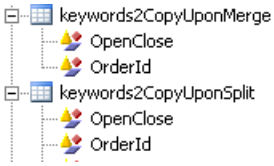
After reverting the split

Trade Id	Quantity	Status	SplitFrom	OriginalSplitTrade
0010	700	CANCELED		

0011	200	CANCELED	0010	
0012	500	CANCELED	0010	
0013	700	VERIFED		0010
0005	300	VERIFED		0002

20.5 Optional Keywords to ‘copy’ from Original Trades - Splitting

keywords2CopyUponSplit Domain Name controls which optional keywords to ‘copy’ from original trade to the new split trades.



Example of splitting into two trades

Original trades

Trade Id	Quantity	Status	OpenClose	OrderId
0010	700	VERIFED	O	13900

After splitting

Trade Id	Quantity	Status	OpenClose	OrderId
0010	700	CANCELED	O	13900
0011	200	VERIFED	O	13900
0012	500	VERIFED	O	13900

Section 21. Listed Derivatives Fees & Commissions

This section recommends the market standard configuration that a Clearing Broker could use for their daily activities. Of course, the system is configurable and can be adapted to any client or user to best meet their needs.

There are 2 supported charging strategies for ETD products – "Trade Fees" for daily billing and also detailed on the client statement and "Billing Fee" for period to date billing, typically accrued for the calendar month and billed a set number of days into the next month.

21.1 Inventory Buckets

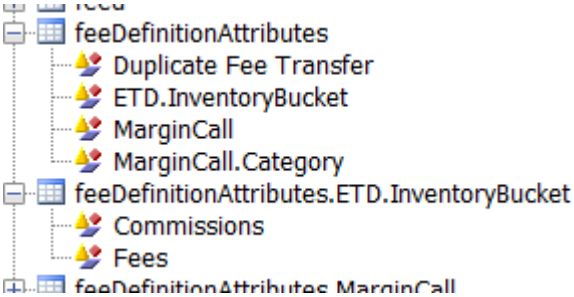
Inventory Buckets are used aggregating different fee types into balance buckets for viewing and reporting in the system via the Inventory Position Report and also for reporting on the client statement. The following two buckets are recommended

- Domain Value
  - feeDefinitionAttributes

    ETD.InventoryBucket – to enable the user to configure which buckets the different fee types can be grouped together
  - feeDefinitionAttributes.ETD.InventoryBucket

    Commissions – for the FCM's add-on charge for its services

    Fees – for the pass-through charges of an exchange or 3rd party broker, which the FCM will need to pay out



21.2 Fee Definition

Configuration > Fees, Haircuts & Margin Calls > Fee Definition

The following Fee Definitions are recommended

Fee Type	Role	Calculator	Inventory Bucket	Notes
COMMISSION	Client	FeeGrid	Commission	Client Commission
EXCHANGE_FEE	Counterparty	FeeGrid	Fees	Exchange fee payable to counterparty
EXCHANGE FEE	Client	FeeGrid	Fees	Exchange fee passed onto the client
CLEARING_FEE	Counterparty	FeeGrid	Fees	Clearing house fee payable to counterparty
CLEARING FEE	Client	FeeGrid	Fees	Clearing house fee passed onto the client
EXECUTION_FEE	ExecutingBroker	FeeGrid	Fees	Execution fee (Cleared Only / Give Ins) to pay to the Executing Broker
EXECUTION FEE	Client	FeeGrid	Fees	Execution fee (Cleared Only / Give In) passed onto the client

Fee Type	Role	Calculator	Inventory Bucket	Notes
EXECUTION BROKERAGE	Counterparty	FeeGrid	Fees	Execution fee (Execution Only / Give Ups) to receive from the clearing broker counterparty
FLOOR_BROKERAGE	Counterparty	FeeGrid	Fees	Floor brokerage payable to the counterparty
FLOOR BROKERAGE	Client	FeeGrid	Fees	Floor brokerage passed onto the client
NFA_FEE	NFA	FeeGrid	Fees	NFA fee payable to the National Futures Association
NFA FEE	Client	FeeGrid	Fees	NFA fee passed onto the client

21.3 Fee Grid

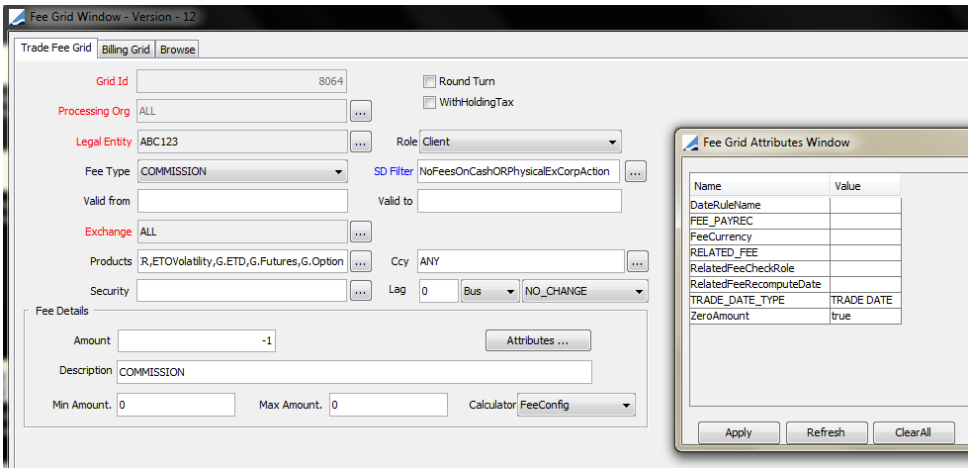
Configuration > Fees, Haircuts & Margin Calls > Fee Grid

The following Fee Grid configurations are recommended

21.3.1 Client Commission Example

COMMISSION

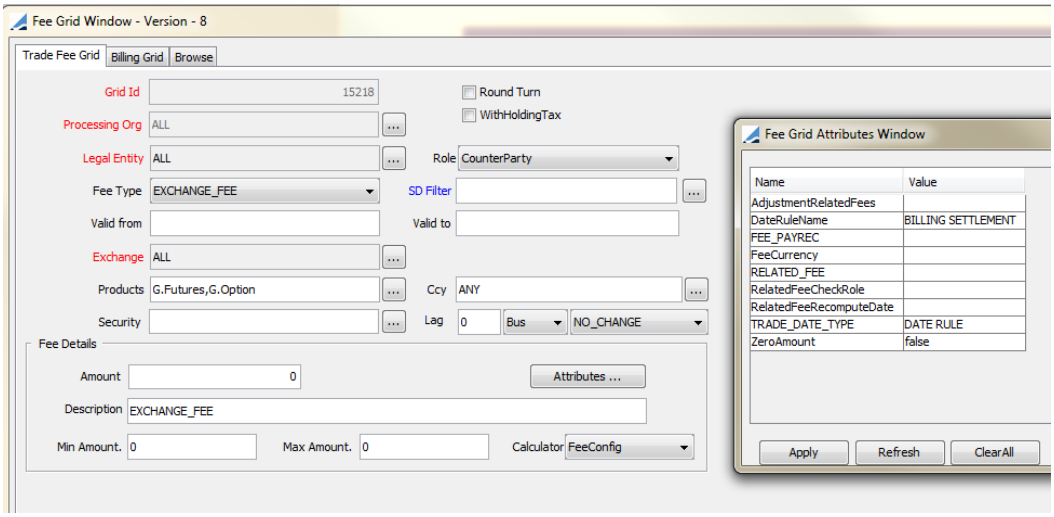
- Attribute: TRADE_DATE_TYPE = TRADE DATE
  - fee settle date will be the booking date, typically for daily settled comm & fees



21.3.2 Counterparty Fees Example

EXCHANGE_FEE & CLEARING_FEE

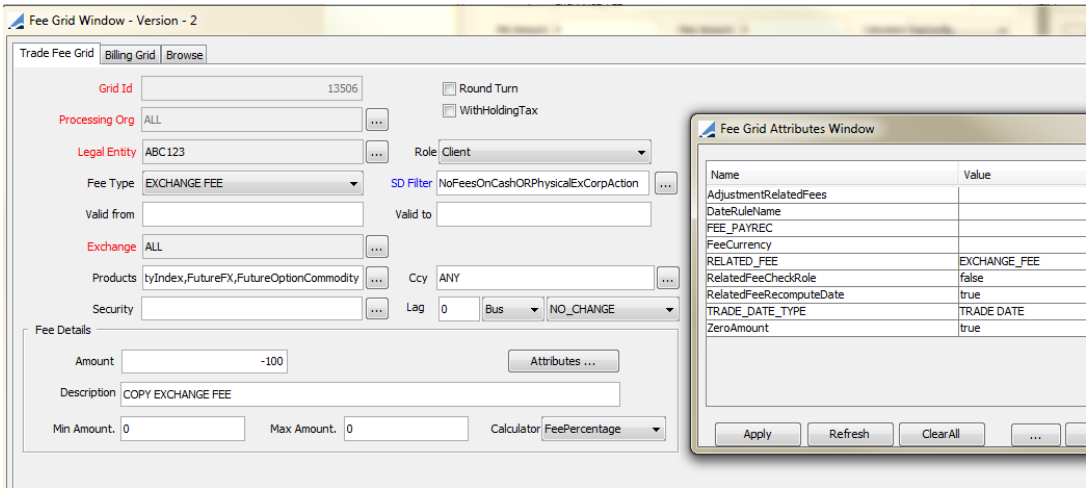
- Associated FeeConfigs required (EXCHANGE_FEE & CLEARING_FEE)
  - To set exchange, product, formula and rates
  - Attribute: TRADE_DATE_TYPE = DATE RULE + DateRuleName
    - fee settle date will be set by the date rule, typically for End of Month settled fees



21.3.3 Client Fees (Copied from the Counterparty) Example

EXCHANGE FEE & CLEARING FEE

- No FeeConfigs required, as taken from the Counterparty FeeConfig (above)
- Attributes
  - RELATED_FEE = Fee Type to copy
  - RelatedFeeCheckRole = false, allows to copy from a different role (from Counterparty to Client)
  - RelatedFeeRecomputeDate = true, tells the system to rework the fee dates after the copy
  - TRADE_DATE_TYPE = TRADE DATE, changing from the End of Month (CtPty) to Daily (Client)



21.3.4 Recommended Fee Grid

Grid Type: T = Trade Fee, B = Billing Fee

Fee Type	Grid Type	Legal Entity	Role	Attributes	Calculator	SD Filter
COMMISSION	T	One per clearing client LE	Client	TRADE_DATE_TYPE = TRADE DATE ZeroAmount = true	FeeConfig	

Fee Type	Grid Type	Legal Entity	Role	Attributes	Calculator	SD Filter
EXCHANGE_FEE	T	ALL	Counterparty	DateRuleName = BILLING SETTLEMENT TRADE_DATE_TYPE = DATE RULE ZeroAmount = true	FeeConfig	
EXCHANGE FEE	T	One per clearing client LE	Client	RELATED_FEE = EXCHANGE_FEE RelatedFeeCheckRole = false RelatedFeeRecomputeDate = true TRADE_DATE_TYPE = TRADE DATE	FeePercentage @ -100	
CLEARING_FEE	T	ALL	Counterparty	DateRuleName = BILLING SETTLEMENT TRADE_DATE_TYPE = DATE RULE ZeroAmount = true	FeeConfig	
CLEARING FEE	T	One per clearing client LE	Client	RELATED_FEE = CLEARING_FEE RelatedFeeCheckRole = false RelatedFeeRecomputeDate = true TRADE_DATE_TYPE = TRADE DATE	FeePercentage @ -100	
EXECUTION_FEE	T	One per Executing Broker LE	ExecutingBroker	DateRuleName = BILLING SETTLEMENT TRADE_DATE_TYPE = DATE RULE ZeroAmount = true	FeeConfig	
EXECUTION FEE	T	One per clearing client LE	Client	RELATED_FEE = EXECUTION_FEE RelatedFeeCheckRole = false RelatedFeeRecomputeDate = true TRADE_DATE_TYPE = TRADE DATE	FeePercentage @ -100	
EXECUTION BROKERAGE	B	One per Giveup Clearing Broker	Counterparty		FeeGrid	Fees
FLOOR_BROKERAGE			Counterparty		FeeGrid	Fees
FLOOR BROKERAGE			Client		FeeGrid	Fees
NFA_FEE	T	NFA	NFA	DateRuleName = BILLING SETTLEMENT TRADE_DATE_TYPE = DATE RULE	FeeConfig	Fees

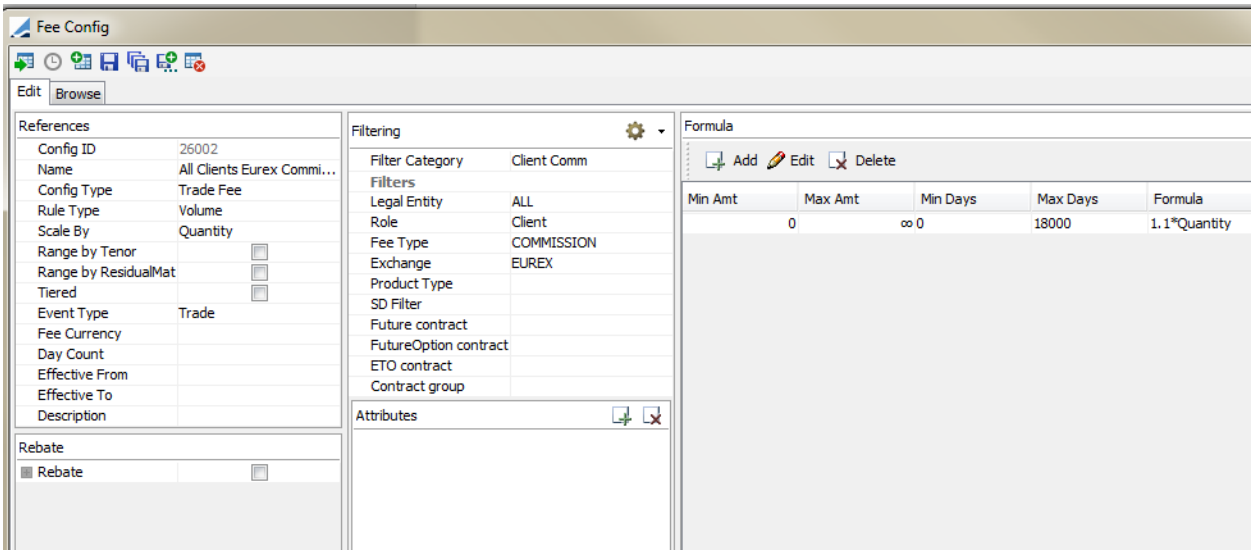
Fee Type	Grid Type	Legal Entity	Role	Attributes	Calculator	SD Filter
				ZeroAmount = true		
NFA FEE	T	One per clearing client LE	Client	RELATED_FEE = NFA_FEE RelatedFeeCheckRole = false RelatedFeeRecomputeDate = true TRADE_DATE_TYPE = TRADE DATE	FeePercentage @ -100	Fees

21.4 Fee Config

Configuration > Fees, Haircuts & Margin Calls > Fee Configuration

Example 1

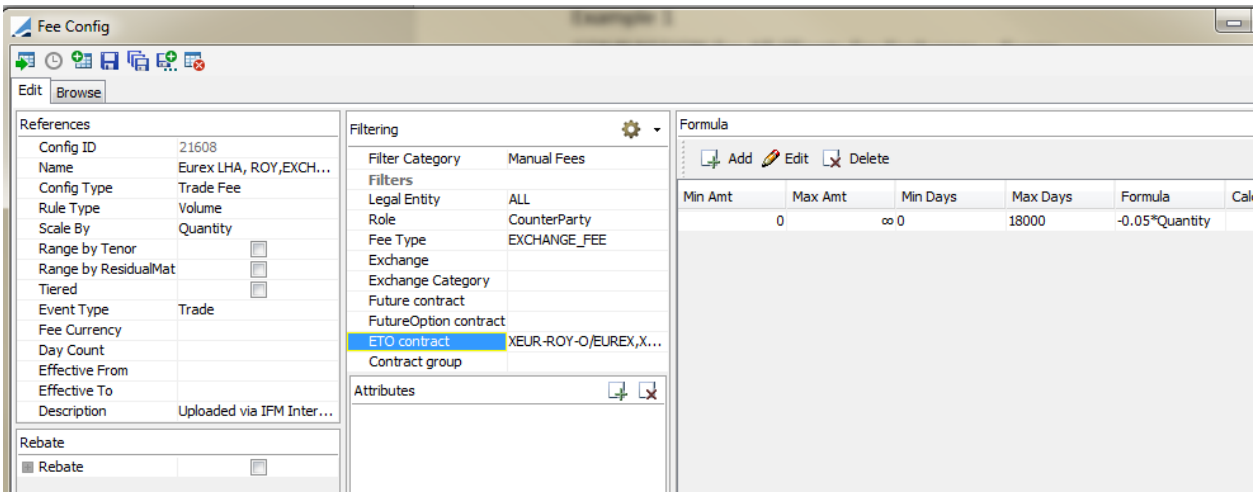
COMMISSION for All Clients for Exchange = Eurex



For subsets of clients, SD Filter is required

Example 2

EXCHANGE_FEE for All Counterparty for a specific ETO contracts



21.5 Advanced Fee Methodology – Overall Minimum Total Fee

In addition to standard fees, an Overall Minimum fee can be calculated.
The system will check for any other additional fees that have been applied to that Legal Entity and check if the Overall Minimum Total has been exceeded.
If not, then the Fee Type (COMMISSION) is recalculated so the Overall Minimum Total is met.

Use Fee Config formula ***Variables*** – 'RelatedFeesAmount' to define the formula & rate of the Overall Minimum Fee.

Use Fee Grid attribute 'AdjustmentRelatedFees' > fee types, comma separated

- E.g. AdjustmentRelatedFees = EXCHANGE FEE, CLEARING FEE
- If empty, then no adjustment needed

Calculation logic example:

Applicable fees for this trade are COMMISSION (client), EXCHANGE_FEE (counterparty), EXCHANGE FEE (client – copied from EXCHANGE_FEE)

Fee config COMMISSION (client)

- 3.10 * Quantity
- Overall Minimum Total = 3.50 * Quantity
- Formula would be
  - Max(3.10*Quantity + RelatedFeesAmount, 3.50*Quantity) - RelatedFeesAmount

Fee config EXCHANGE_FEE (counterparty)

- 0.20 * Quantity

21.6 Automatic Fees Override

When viewing automatic fees, you can override the fee amount.

» Select an automatic fee and enter the modified amount in the Amount field. Then click **Modify.**

» The 'Manual Amount' column will appear checked.

» To prevent the fee from being automatically recomputed upon saving the trade, clear the Override column.

» Save the trade.

21.7 Check Fees Workflow Rule

Workflow rule 'ETDCheckFees' will block a trade in the workflow and raise a task station exception when one of the Legal Entities on the trade doesn't have at least one fee generated.

To control this workflow the following are required

Domain Value: ETD.Fee Roles

- tells the system which LE to check for fees
- default settings are

Legal Entity Attribute

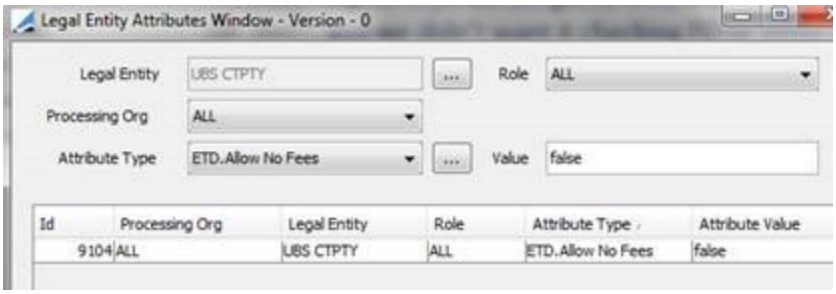
ETD.Allow No Fees <true/false>

If this LE attribute is missing or 'false' and the trade has no fees for this LE then the trade will be blocked

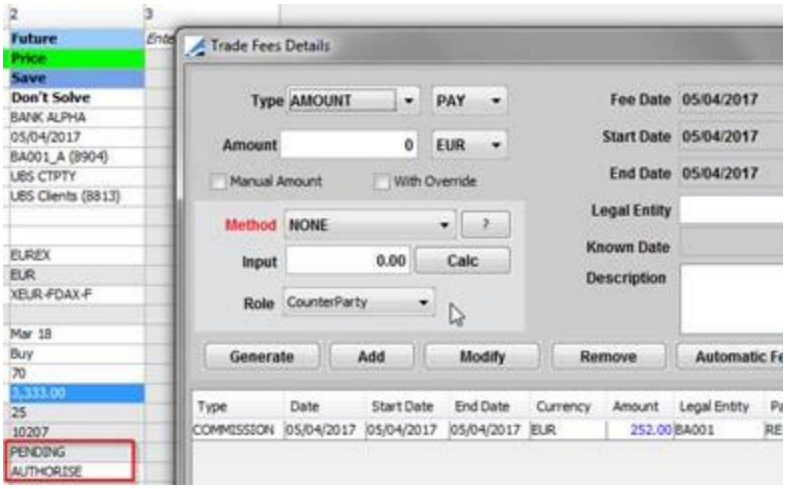
If this LE attribute is 'true' and the trade has no fees for this LE then the trade will NOT be blocked

Example #1

Counterparty LE has ETD.Allow No Fees = false



Trade entered and Trade Fees shows fees only for the Client, none for the Counterparty

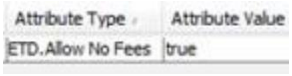


Trade is blocked as PENDING

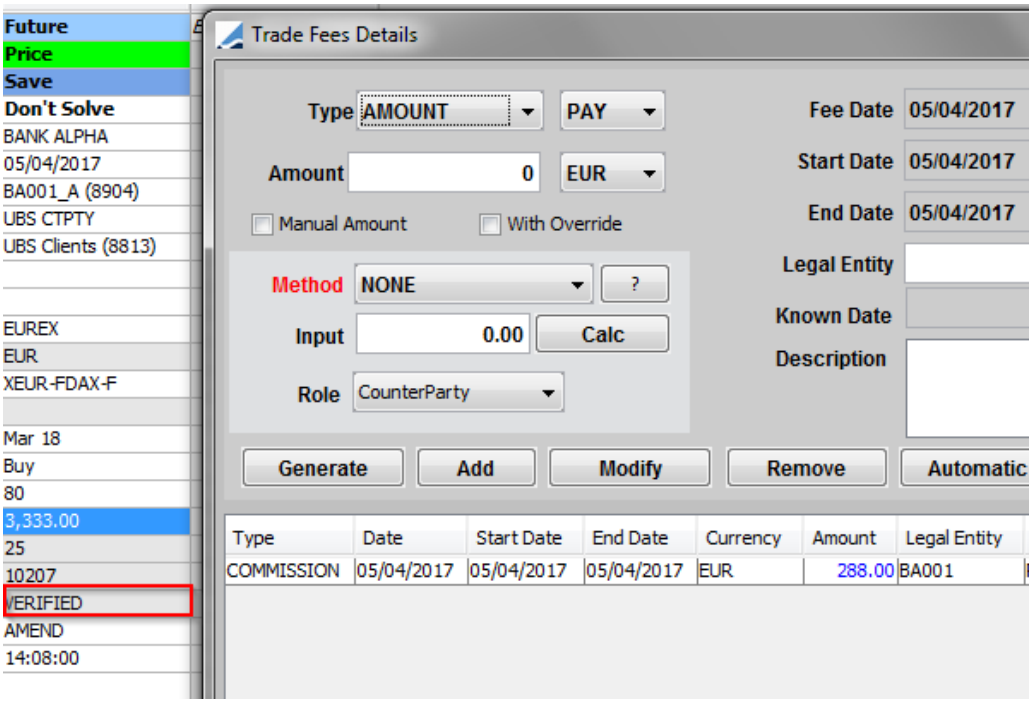
Task Station exception raised

Example #2

Counterparty LE has ETD.Allow No Fees = true



Now allow the trade to go to VERIFED even though no Counterparty fees



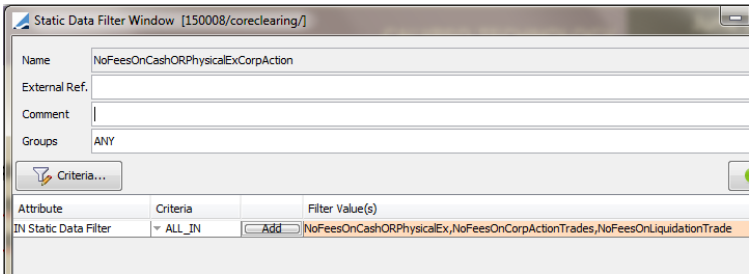
21.8 Static Data Filters

Filters required to suppress the specific Fee Grid being triggered by the AutomaticFees workflow rule for the following

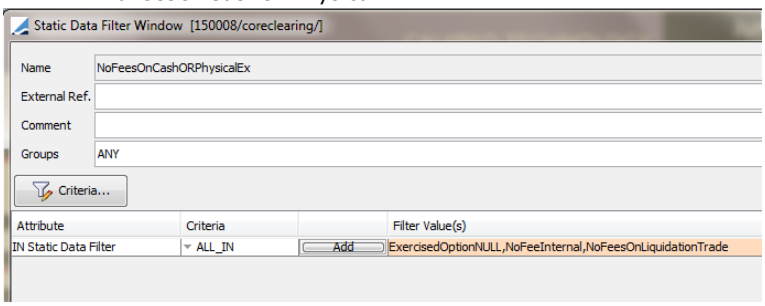
- 'Closeout' trade for an Option exercise, assignment or expiry
- 'Closeout' trade for a Futures expiry
- 'Closeout' trade used in the Corporate Action process to close the old trades, which are replaced by the new transformed trades
- Internal "cross" trades

SD Filters needed, see screenshots on configuration details

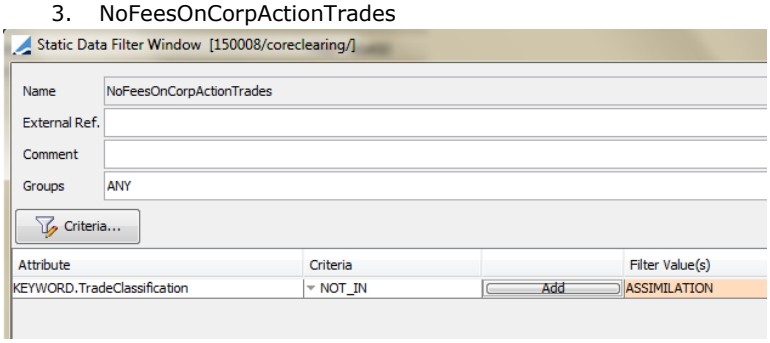
1. NoFeesOnCashORPhysicalExCorpAction



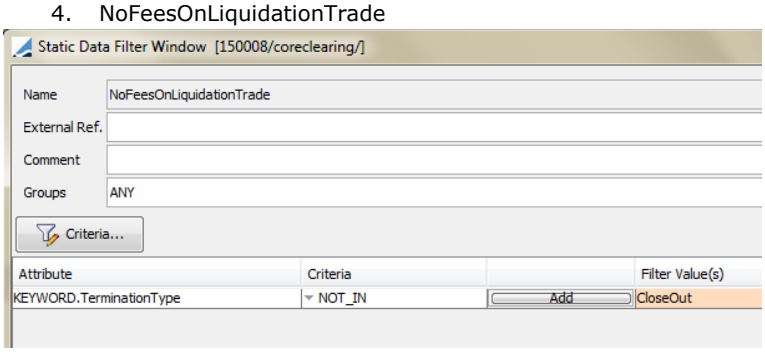
2. NoFeesOnCashORPhysicalEx



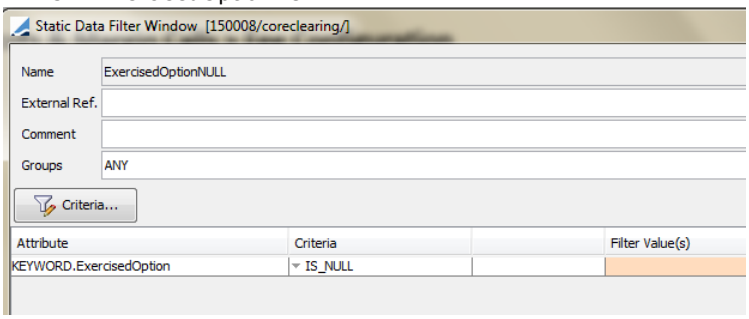
3. NoFeesOnCorpActionTrades



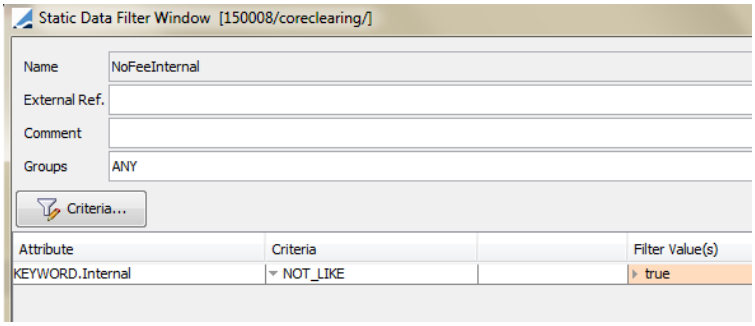
4. NoFeesOnLiquidationTrade



5. ExercisedOptionNULL

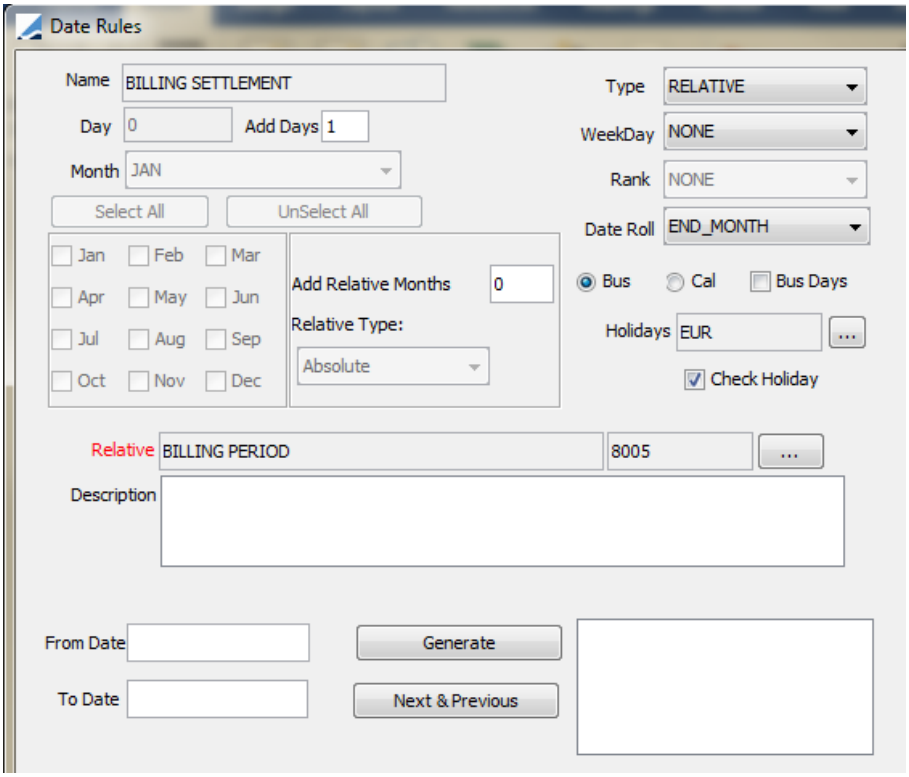


6. NoFeeInternal



21.9 Billing Date Rule

Example End of Month billing rule

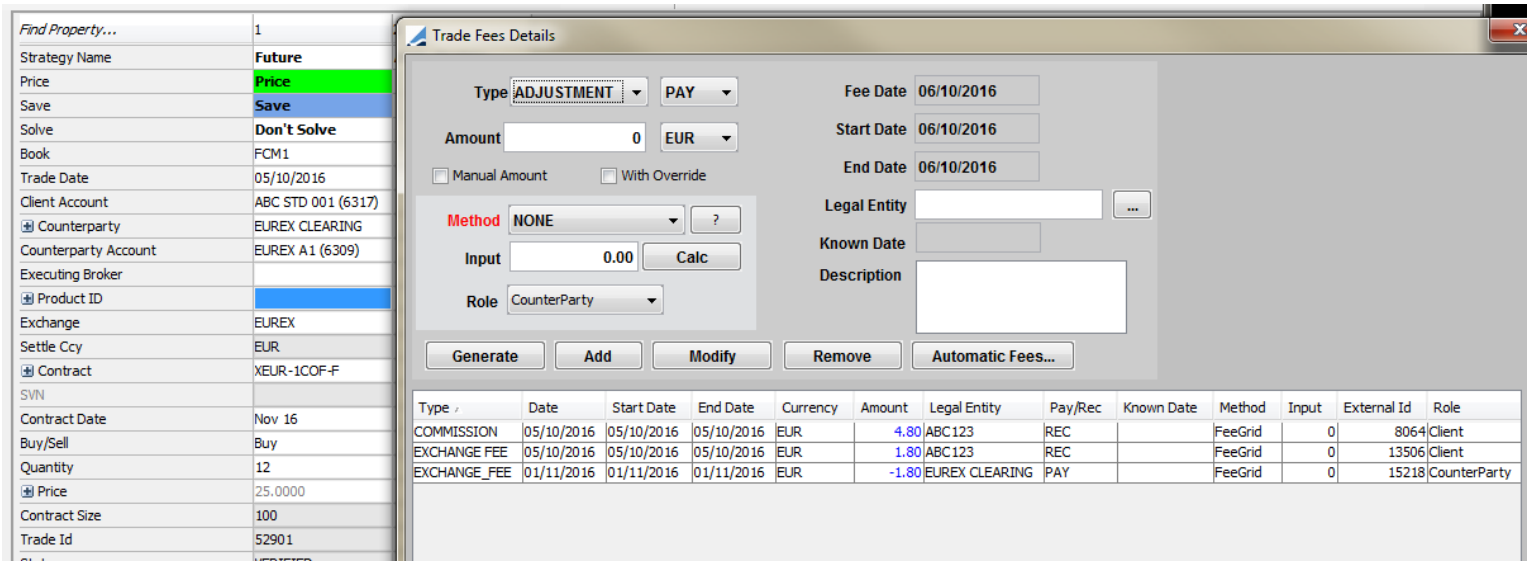


21.10 Trade + Fees Examples

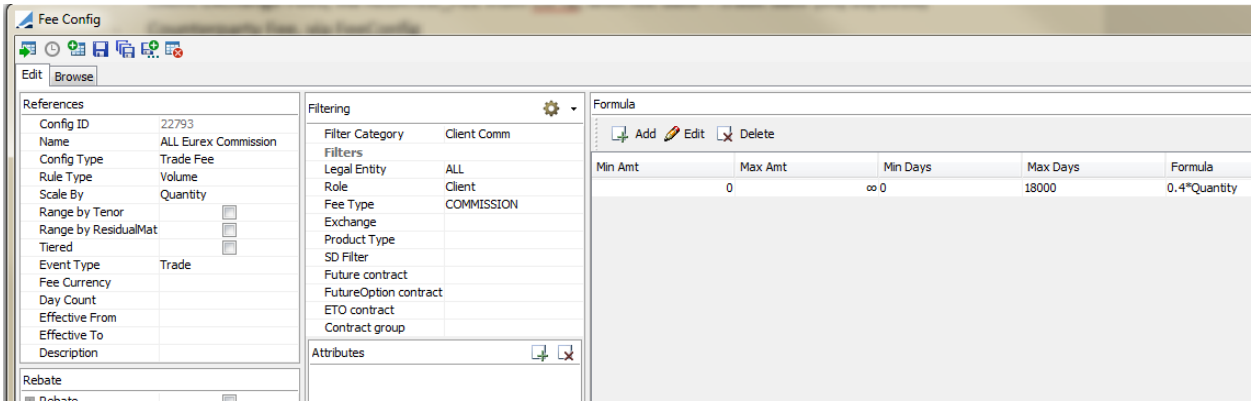
Example of set-up and results

Trade with

- Client Commission, via FeeConfig
- Client Exchange Fees, via RELATED_FEE from CtPty, with fee date = trade date (05/10/2016)
- Counterparty Fee, via FeeConfig, with fee date = end of month (01/11/2016)

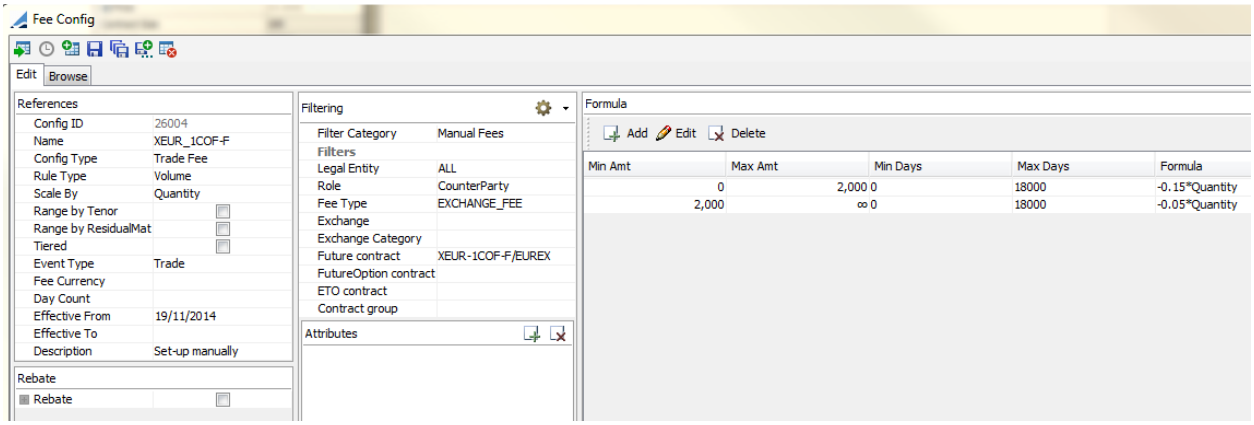


Client COMMISSION FeeConfig



Trade Quantity = 12 @ 0.4 = 4.8, to 'REC' receive from the client.

Counterparty EXCHANGE_FEE FeeConfig (replicating the Eurex Fee Structure)



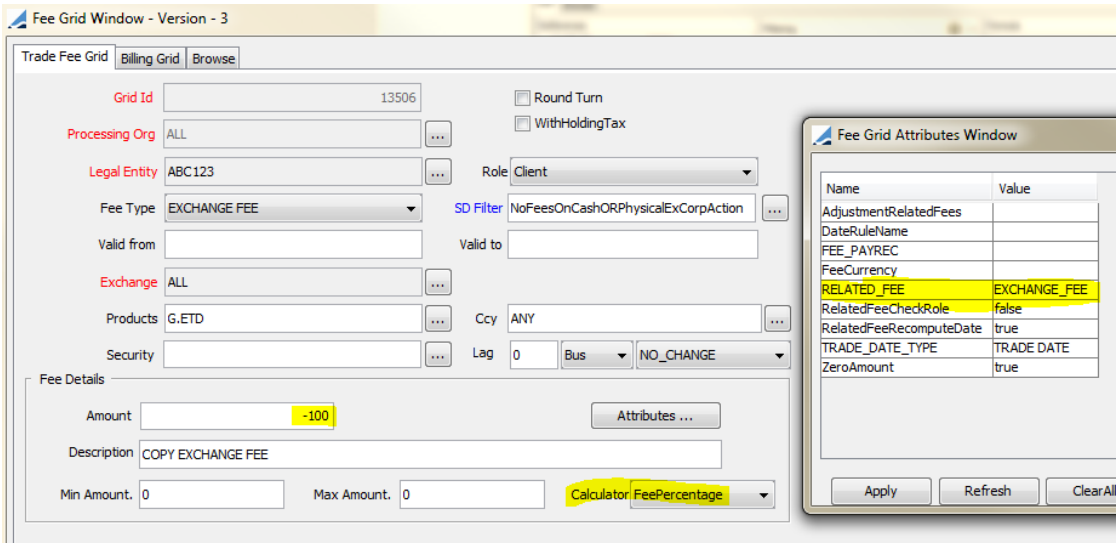
Trade Quantity = 12 (Tier 1, quantity less than 2000)

Trade Quantity = 12 @ 0.15 = 1.8, to 'PAY' to the Counterparty

Client EXCHANGE FEE

No FeeConfig, Fee Grid with RELATED_FEE to the Counterparty EXCHANGE_FEE

With Calculator = FeePercentage, Amount = -100 to reverse the REC/PAY



1.8 to REC from Client

For additional information on fee configuration, please refer to the general ***Calypso Fee User Guide***.

Section 22. Exercise and Assignment Process

22.1 New Product Selector Field

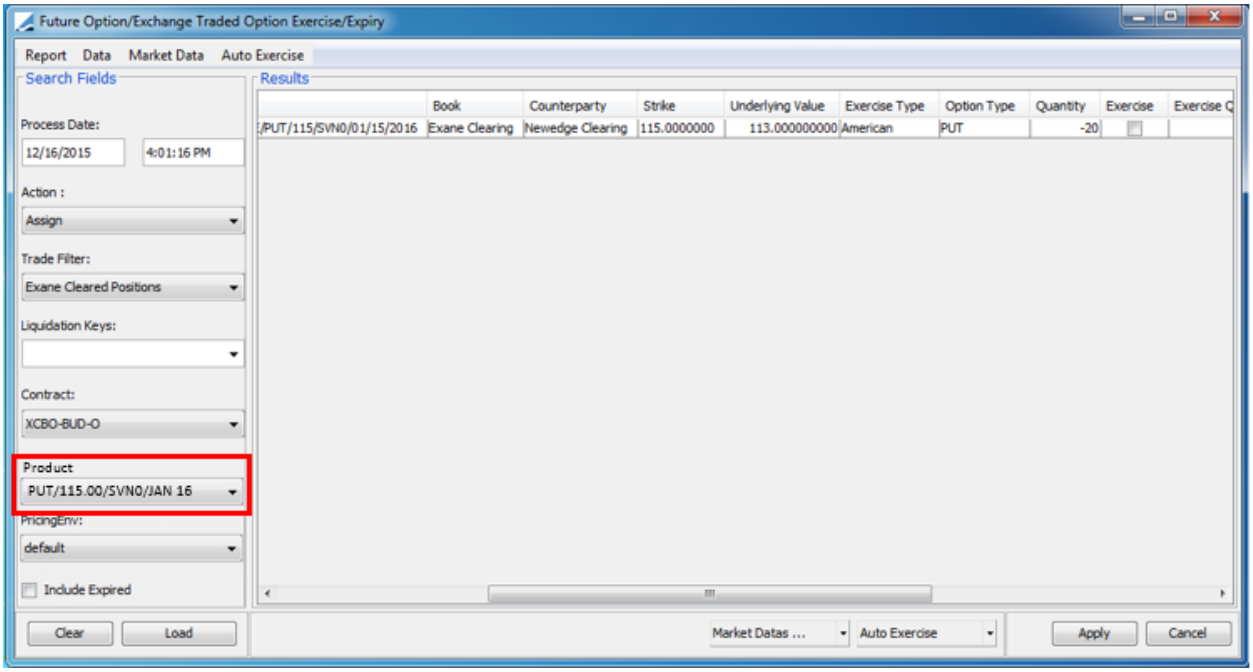
Allows user to select a specific product by choosing the Put/Call indicator, Strike, SVN and Expiration for an option which is listed under the contract selected in the Contract field.

A contract must be selected first, only products under that contract can be selected.

The selector should give the user a list of products based on the options that are saved in the database.

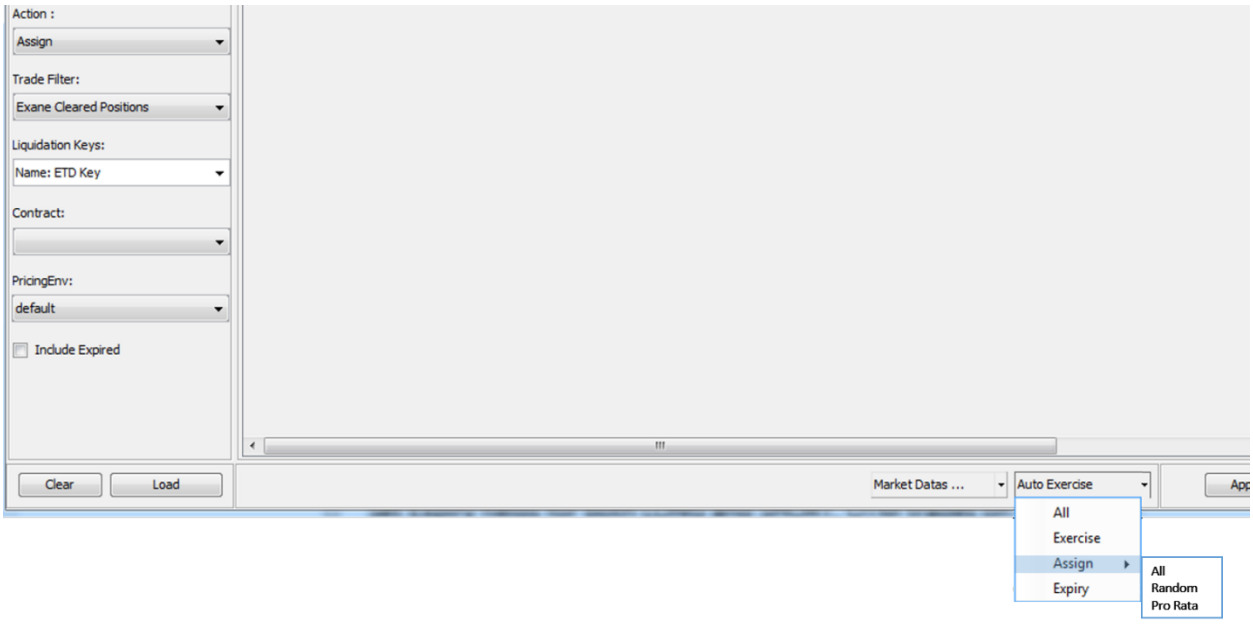
The list should be displayed in a format that shows "Put Call indicator/Strike/SVN/Contract Month" as shown below.

- The strike is displayed in the format and to the decimal precision of the ETO contract or to the underlying Future Contract for a Future Option
- The SVN is displayed by putting the SVN after "SVN", for instance SVN0, SVN1, etc
- The Contract Month is shown as a 3 letter month and 2 digit year based on the naming convention of the product

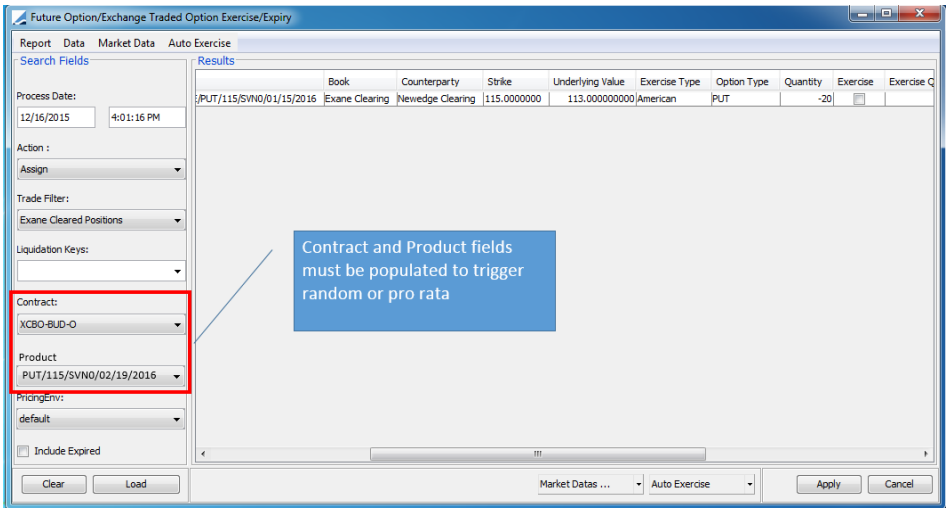


22.2 Select Assign - Random or Pro Rata in the Auto Exercise feature

The Assignment menu is nested, so that All, Random and Pro Rata are second level choices under the Assign menu choice.



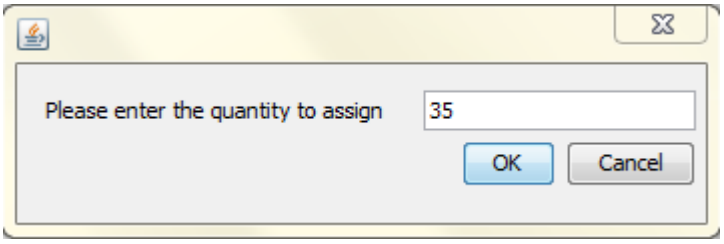
- Assign Random Processing
  - Can only be chosen if a single product is selected in the Product Field, since you will be required to give an assignment quantity per product. A product is a specific option contract, strike, put/call indicator, SVN and expiry. If a product is not selected, pop up a message saying "You must select a product on which to apply the assignment process."



  - Pop up window prompting the user to enter the quantity to randomly assign across the short positions/trades that have been loaded. Once a quantity is loaded the user will click 'OK' to process.

    The Quantity must be equal to or less than the total quantity of all short positions loaded in the window. If the quantity is greater, the user should be prompted to enter a different quantity with a message that says "The entered assignment quantity exceeds the available lots to exercise. Please enter a valid quantity."

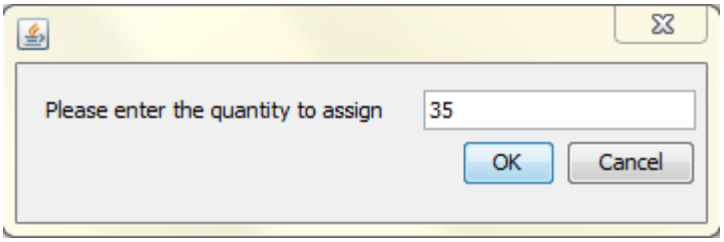
    If the quantity is equal to or less than the total quantity of all short positions loaded in the window proceed to assign the quantity according to the random assignment algorithm logic described later in this document.



- Assign Pro Rata
  - Can only be chosen if a single product is selected in the Product Field, since you will be required to give an assignment quantity per product. A product is a specific option contract, strike, put/call indicator, SVN and expiry. If a product is not selected, pop up a message saying "You must select a product on which to apply the assignment process."
  - Pop up window prompting the user to enter the quantity to pro rata assign across the short positions/trades that have been loaded. Once a quantity is loaded the user will click 'OK' to process.

    The Quantity must be equal to or less than the total quantity of all short positions loaded in the window. If the quantity is greater, the user should be prompted to enter a different quantity with a message that says "The entered assignment quantity exceeds the available lots to exercise. Please enter a valid quantity."

    If the quantity is equal to or less than the total quantity of all short positions loaded in the window proceed to assign the quantity according to the pro rata assignment algorithm logic described later in this document.



22.3 Eurex Random Assignment Algorithm

A single random algorithm, based on the official EUREX one, will be used in all Calypso random assignment processes (G-API Eurex Interface, Broker file Interface and Exercise/Assignment screen).

For each assignment instruction received, we need to:

- Identify the scope of end accounts potentially impacted with Sell Open positions
- Count for that scope of accounts the number of open contracts of all the short positions.
- Sort Open contracts per account id and give to each a number between 0 and [number of open contract -1]
- Calculate the Assignment Interval: Number of open contract / Quantity to be assigned
- Determinate the first contract to Assign:
  - Generate a random number between 0 and 1 (bigger than 0 and smaller than 1)
  - Multiply this number by the Assignment Interval
  - First contract place is given by the integer part of this number. This contract is assigned
  - Store the number (with decimal) to a pointer
- Process the remaining Assignments:
  - The pointer each time is increased by the value of Assignment Interval
  - Next contract place is then given by the integer part of this pointer
  - Repeat until all assignments are processed

Example:

We receive an assignment, with a quantity of 11 on a specific product and counterparty account. For that counterparty account, we have 6 end-client accounts with the following short positions that we must sort to give a number to each contract:

Client Act	Nb of Short Contracts (Qty Short)	Contract Places	
		From	To
ACT1	3	0	2
ACT2	5	3	7
ACT3	10	8	17
ACT4	8	18	25
ACT5	20	26	45
ACT6	11	46	56
Total	57		

- The Assignment interval is: 57/11=5.181818...
- We generate a random number: 0.778177764
- Based on that, the pointer is: 5.181818*0.778177764 = 4,032375689
- First contract place is 4 (ACT2 is assigned for 1)
- Then we add Assignment interval, obtain the new pointer and new place, and so on...

Assignment steps:

Remaining Qty	Step	Pointer	Place	Client Act
11	First	4,032376	4	ACT2
10	Next	9,214194	9	ACT3
9	Next	14,39601	14	ACT3
8	Next	19,57783	19	ACT4
7	Next	24,75965	24	ACT4
6	Next	29,94147	29	ACT5
5	Next	35,12328	35	ACT5
4	Next	40,3051	40	ACT5
3	Next	45,48692	45	ACT5
2	Next	50,66874	50	ACT6

1	Next	55,85056	55	ACT6

And which gives the following assignment result:

Client Act	Nb of Short Contracts (Qty Short)	Contract Places		Qty Assigned
		From	To	
ACT1	3	0	2	0
ACT2	5	3	7	1
ACT3	10	8	17	2
ACT4	8	18	25	2
ACT5	20	26	45	4
ACT6	11	46	56	2
Total	57			11

Once the EUREX algorithm has computed the quantity to assign per client account, we rely on our standard process to create the "Close Out" transactions per open trades constituting the short client account balance to assign.

A detailed explanation is presented below.

Client Act	Nb of Short Contracts (Qty Short) Before Assign
ACT1	3
ACT2	5
ACT3	10
ACT4	8
ACT5	20
ACT6	11
Total	57

Act	Nb of Short Contracts (Qty Short)	Contract Places		Qty Assigned
		From	To	
ACT1	3	0	2	0
ACT2	5	3	7	1
ACT3	10	8	17	2
ACT4	8	18	25	2
ACT5	20	26	45	4
ACT6	11	46	56	2
Total	57			11

Before Assign			CloseOutTrade			After Assing	
ACT1	Toq	Trade Id	Trade Id	Qty	ExercisedOption	Toq	Trade Id
	1	1				1	1
	2	2				2	2
Total Qty	3					3	
ACT2	Toq	Trade Id	Trade Id	Qty	ExercisedOption	Toq	Trade Id
	2	3	15	1	3	1	3
	3	4				3	4
Total Qty	5					4	
ACT3	Toq	Trade Id	Trade Id	Qty	ExercisedOption	Toq	Trade Id
	1	5	16	1	5	0	5
	5	6	17	1	6	4	6
	4	7				4	7
Total Qty	10					8	
ACT4	Toq	Trade Id	Trade Id	Qty	ExercisedOption	Toq	Trade Id
	1	8	18	1	8	0	8
	7	9	19	1	9	6	9
Total Qty	8					6	
ACT5	Toq	Trade Id	Trade Id	Qty	ExercisedOption	Toq	Trade Id
	14	10	20	4	10	10	10
	6	11				6	11
Total Qty	20					16	
ACT6	Toq	Trade Id	Trade Id	Qty	ExercisedOption	Toq	Trade Id
	1	12	21	1	12	0	12
	1	13	22	1	13	0	13
	9	14				9	14
Total Qty	11					9	
	57		11			46	

22.4 Pro Rata Assignment Algorithm

Pro Rata assigns options across Client Accounts in proportion to the quantity of each Account's open short position, with Accounts holding the largest positions receiving the highest proportion of assignments. If this algorithm is run before buys and sells are liquidated, it will take all open short trades into account even if there are offsetting option purchases in that account, so it is recommended to run the liquidation process prior to assigning the options.

The Pro Rata logic works as follows:

1. Determine the set of trades which are eligible for assignment based on the settings of the Assignment UI.
2. Determine the number of lots to be assigned, which we'll call the *Total Assignment Qty.*
3. Aggregate the open trade quantities of these transactions by Client Account to get the *Client Account Open Qty* for each Client Account.
4. Sum all of the open trade quantities across all accounts to get the *Total Open Qty*
5. Calculate the *Client Account Assignment Qty* for each account with the formula

   Client Account Assignment Qty = Total Assignment Qty * (Client Account Open Qty/Total Open Qty)

6. Round the calculated quantities to the nearest integer and sum the rounded quantities
   - If the sum of the rounded quantities is equal to the Total Assignment Qty go to Step 7
   - If the sum of the rounded quantities is less than the Total Assignment Qty, calculate the difference "D". Then increment the quantity of "D" accounts by 1, starting with the Account with the highest Client Account Open Qty, then going to the account with the second highest, then third highest…and end with the "D^{th}" Account. Store the incremented Client Account Assignment Qty's and go to Step 7.
   - If the sum of the rounded quantities is more than the Total Assignment Qty, calculate the difference "D". Then decrement the quantity of "D" accounts by 1, starting with the Account with the highest Client Account Open Qty, then going to the account with the second highest, then third highest…and end with the "D^{th}" Account. Store the decremented Client Account Assignment Qty's and go to Step 7.
7. For each Client Account, we will assign the number of lots equal to the Client Account Assignment Qty calculated in Step 6 on a trade by trade basis starting with the trade with the lowest trade id.
   - If the Client Account Assignment Qty is less than or equal to the Open Trade Quantity of the trade with the lowest trade id, populate the Assignment Quantity field for that trade with the Client Account Assignment Qty value, check the Assign box for that trade and move to the next account.
   - If the Client Account Assignment Qty is greater than the Open Trade Quantity of the trade with the lowest trade id
     i. populate the Assignment Quantity field for that trade with the Open Trade Quantity and check the Assign checkbox
     ii. calculate the Remaining Client Account Assignment Qty by subtracting that trade's Open Trade Quantity from the initial Client Account Assignment Qty
     iii. repeat Step 7 for the same account using the Remaining Client Account Assignment Qty and the next lowest trade id for the account.
     iv. Repeat this process until the sum of the Assignment Quantities across all eligible trades in this account is equal to the original Client Account Assignment Qty, then move to the next account.
8. Once all of the Assignment Quantities have been assigned for all accounts, the user can then click the Apply button to execute.
   - At this point we require that the Assign checkbox is only checked for trades with an Assignment Quantity value populated, and that the sum of the Assignment Quantity values across all trades is equal to the Total Assignment Qty entered by the user.
   - If the user selects a different assignment method from the menu before clicking 'Apply', the assignment quantities will be reset and recalculated according to that method's logic.