Nasdaq Calypso

End-User Clearing User Guide

Version 16.1 – Version 18

Revision 4.0
February 2024
Approved

Document History

Revision	Published	Summary of Changes
1.0	June 2019	First edition for Version 16.1
2.0	August 2020	Second edition for Version 16.1 monthly release
3.0	February 2022	Third edition for version 17
4.0	August 2024	Fourth edition for version 18 – Added FX NDF Standard Netting, FX NDF Price Blending Methodology and IRD Coupon Blending Methodology.

This document describes the setup and usage of the End-User Clearing functions in Calypso from trade capture to trade processing:

- **Trade booking, affirmation and novation process**
- **Trade and clearing workflows**
- **Collateral Exposure trades and Clearing Transfers**
- **Import of clearing, settlement and accounting information from the clearing broker statement**
- **Settlement process**
- **Accounting process and samples of accounting rules configuration**
- **Import of PL Marks for reconciliation purposes**

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Overview

1.1 End-User Clearing Functions

The End User Clearing functions utilize Calypso modules relevant to clearing and data formats supported by the Data Uploader framework (i.e. broker independent format):

- **Trades** are booked directly in Calypso or via an affirmation platform.

  The clearing eligibility check is done at the affirmation platform level, when submitting the trade for clearing.
- **The clearing workflows** are driven by the interaction with specific affirmation platforms.
- **Clearing activity** is modelled by performing trade novation.
- **Clearing information** (i.e. CCP trade reference, USI, clearing broker) are stored with keywords at the Trade level.
- **To create clearing settlements,** the Clearing Broker file is transformed to the broker-independent Calypso format. Using this file, the Data Uploader creates the following:
  - Clearing Transfers trades for VM and Fees.
  - PL Marks for Collateral Exposure trades for IM.
- **Accounting** is done at two levels:
  - Trade level for all P&L and revaluation items.
  - Clearing Account level for the settlement flows.
- **For accounting by fee type and to track trade valuation**, the Clearing Broker file is also used to generate the following data:
  - VM subcomponents at the Clearing Transfer level, i.e. Fees, PAI, Coupon, MTM changes.
  - PL Marks at the trade level, i.e. NPV_ADJ, COUPON, PAI.

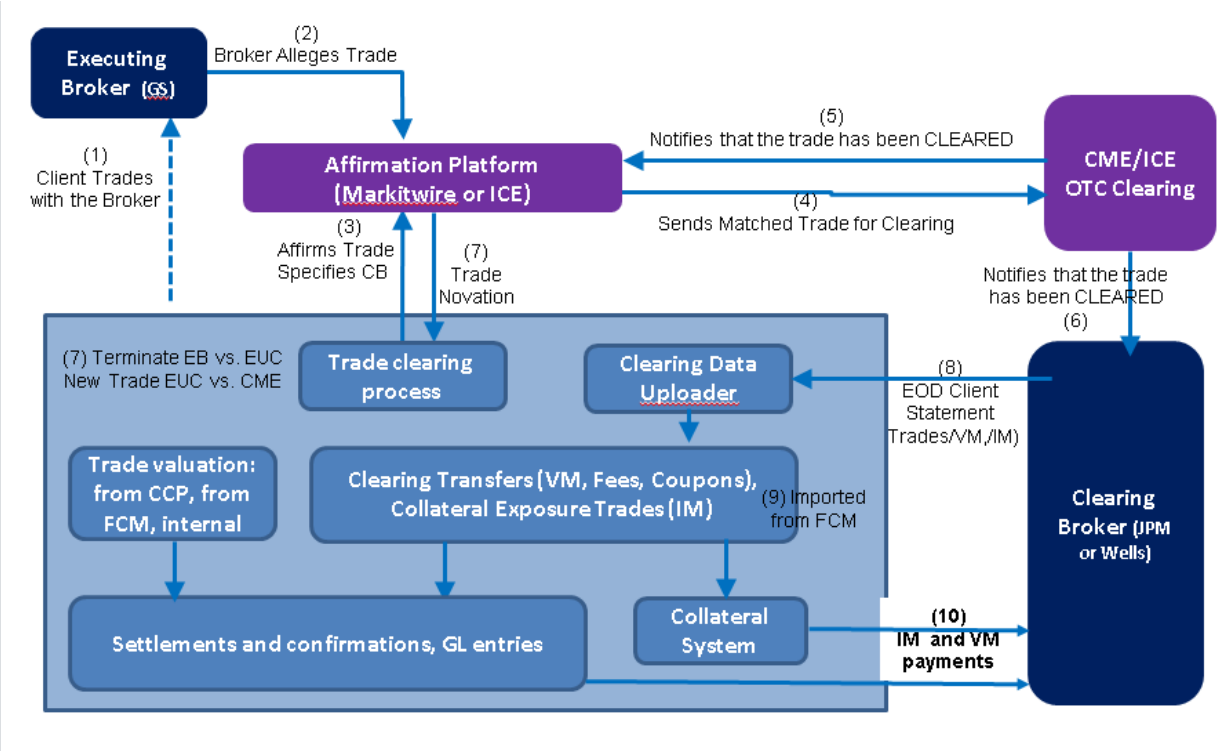
In the case of single currency VM, the theoretical VM settlement will be calculated in the Collateral Manager.

1.2 Glossary

Acronym / Abbreviation	Long Name
CCP	Central Counterparty Clearing House
CMF	Clearing Member Firm
CSA	Credit Support Annex
DCO	Derivatives Clearing Organization
DFA	Dodd–Frank Act
IM	Initial Margin
LEI	Legal Entity Identifier
PAI	Price Alignment interest
SDR	Swap Data Repository
SEF	Swap Execution Facility
SOR	System Of Records
VM	Variation Margin

1.3 Clearing Flows

From a big picture perspective, the clearing flows can be represented by the following diagram. This document will detail each of these steps:



Note: This flow chart corresponds to Markitwire. In ICE (Traiana), the Clearing Broker gets the message at step 4, and then only after the Clearing Broker accepts it, is the trade sent to the CCP. In ICE, the CCP does not have back-channel to the Clearing Broker, all communication is via the Affirmation Platform. The back-channel is used only for EOD files.

Note: The flows apply to non SEF trading - SEF trading is detailed below.

1.4 Products and Affirmation Platforms

End User Clearing functions are supported for the following scope in terms of products and affirmation platforms.

Products

- CME and LCH: Vanilla IRS, OIS, Zero Coupon Swaps, FRA, Basis Swaps.
- ICE: CDS and CDX.

OTC Clearing

- All OTC cleared trades need to be booked via Markitwire or ICE Link.
- Traders can combine a mix of OTC cleared and bilateral trades in a single trading book.
- For OTC cleared trades, pricing, settlement and accounting will follow a separate path, as will be described in the document.
- The treatment of non-cleared trades remains unchanged.

Affirmation Platforms

Markitwire (IRD), ICE Link (CDS, CDX)

- Trades can be booked using the bi-directional interface (i.e. trades booked in Calypso) or directly booked on the affirmation platform.

> **Note: The bi-directional interface is only available for Dealers.**

Details about Markitwire can be found in the *Calypso Markitwire Integration Guide*, and *Calypso MarkitWire Bidirectional Integration Guide*.

Details about ICE Link can be found in the *Calypso ICE Link Integration Guide*.

Trade Lifecycle

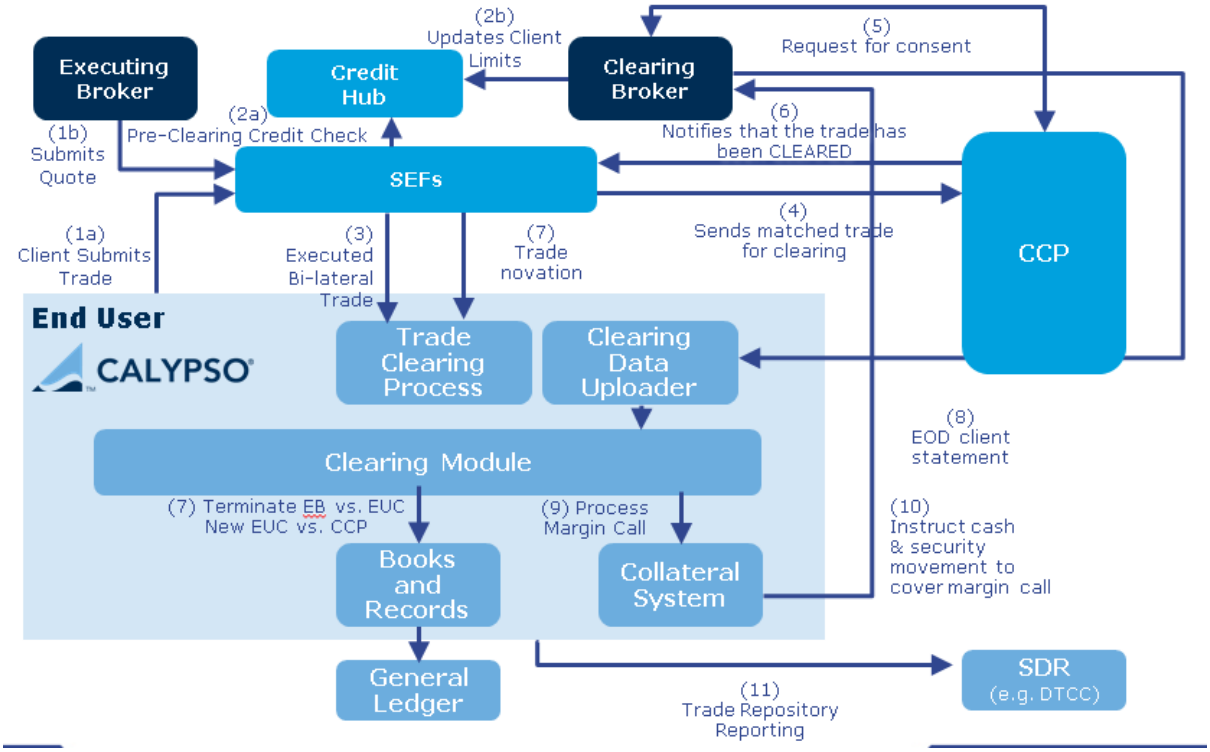
- CME: NEW trade lifecycle / No Compression
- LCH: NEW trade lifecycle / No Compression
- ICE: NEW trade lifecycle and Compression. As per latest update from ICE, ICE Link may not support compression messages for End User (Buy Side). This is being discussed with ICE support.

Any other Trade Lifecycle Event will require an offsetting trade:

- A termination for a CME cleared trade will require the booking of a trade in the opposite direction, the termination fees will be modeled as upfront fees.
- A cancellation will require the booking of an offsetting trade.

1.5 SEF Interfaces

In the case of SEF trading, the message and trade flows are the following:



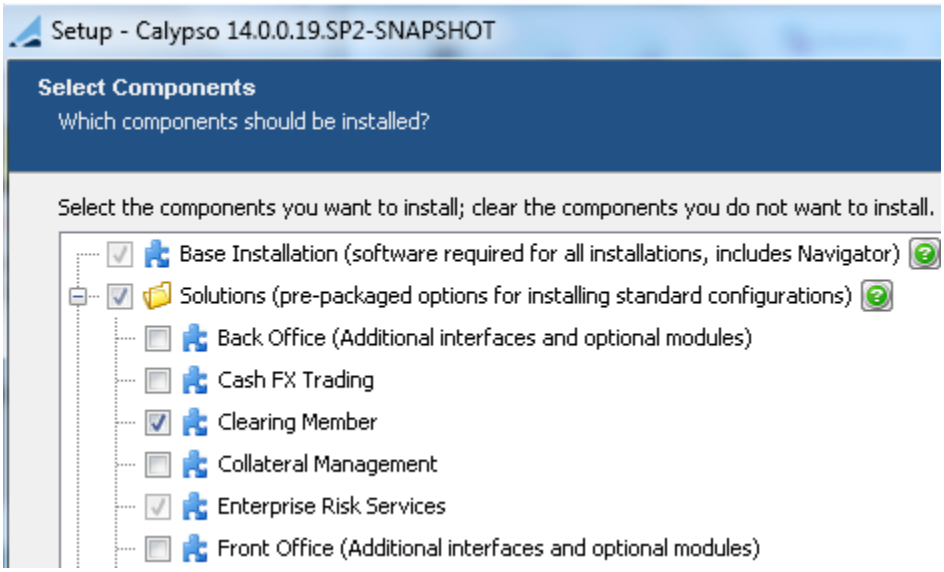
The first application of the SEF Flows is the Calypso Tradeweb interface.

Details about Tradeweb can be found in the Calypso Tradeweb Integration Guide.

Once the clearing novation message has been received from the SEF platform in Calypso, the EUC process is the same as for non SEF cleared trades. The following sections apply to both SEF and non SEF trades.

Installation Requirements

The components of the end-user clearing solution are installed as part of the Calypso Installer when you select the "Clearing Member" solution:



Data Uploader – Upload of EOD files received from the Clearing Member Firm / Executing Broker into Calypso.

CMF OTC Clearing – Clearing Transfer trades, Collateral Exposure trades, scheduled tasks to import market data.

Collateral – Allocation of margin calls (initial margins and variation margins).

You also need to select the interfaces to your affirmation platforms: Markitwire. ICE Link, etc.

▶ 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.

Legal Entities and Accounts Setup

Note: Legal entities must be defined to identify the CCPs, the Agent Bank, the Clearing Member Firm, the Executing Broker, and the End-User Client. They should all have at least one contact.

Note: When defining legal entities, accounts, and books, several attributes will be set as well. Please remember that attributes and their values are case sensitive.

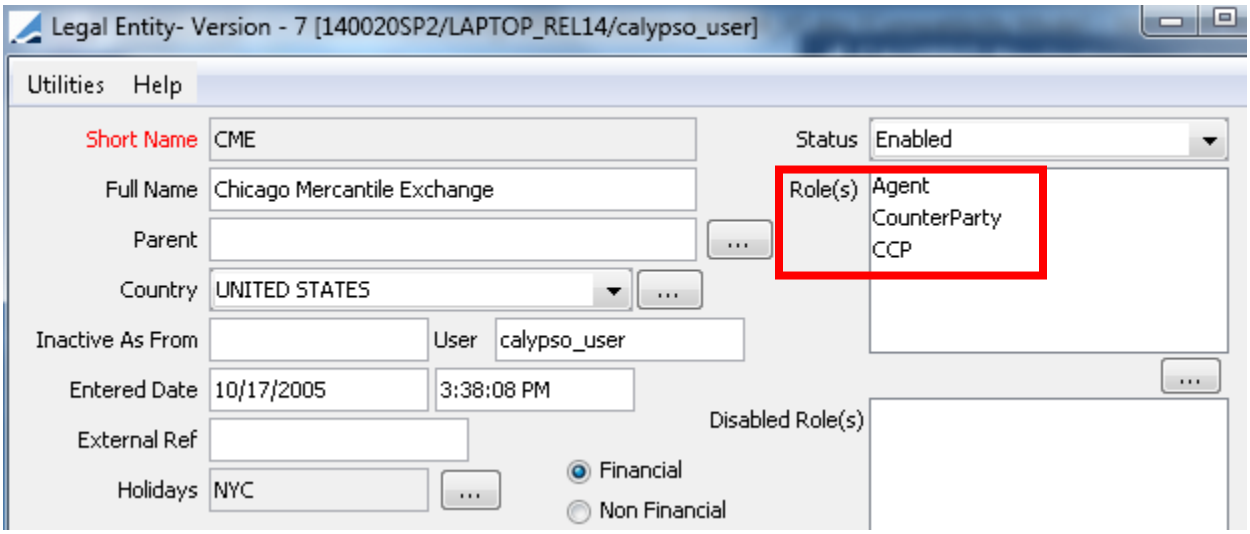
3.1 Defining the Clearing Houses (CCPs)

A clearing house only requires the definition of a legal entity and its contact information.

From the Calypso Navigator, navigate to **Configuration > Legal Data > Entities** to define legal entities.

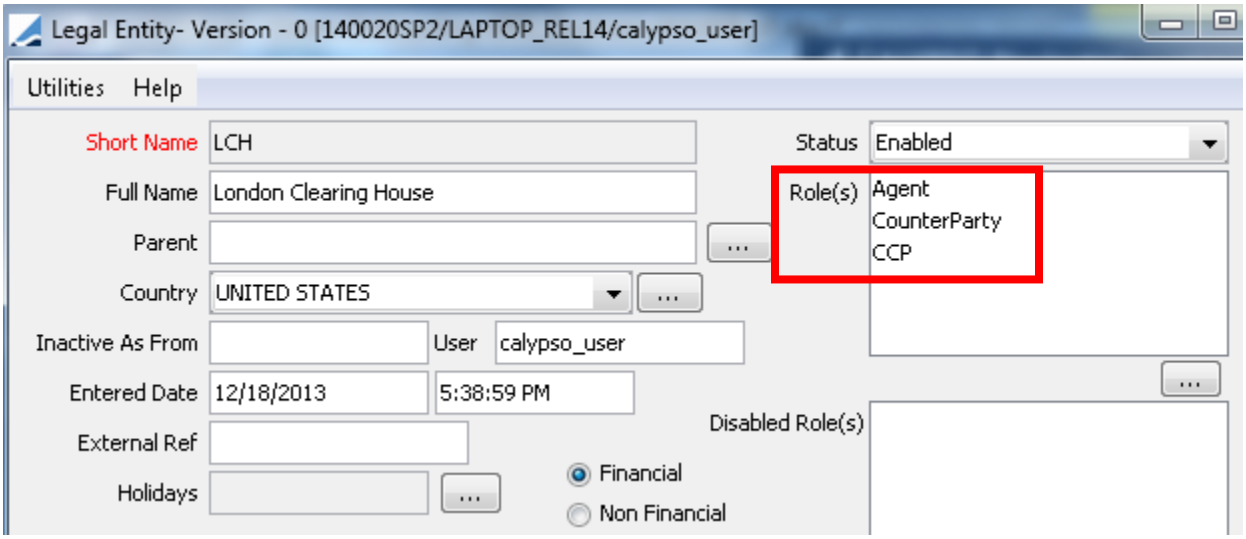
Each clearing house must be defined with at least the roles “CCP, “Agent”, and “CounterParty”.

CME



Click **Contact** to define at least one contact.

LCH



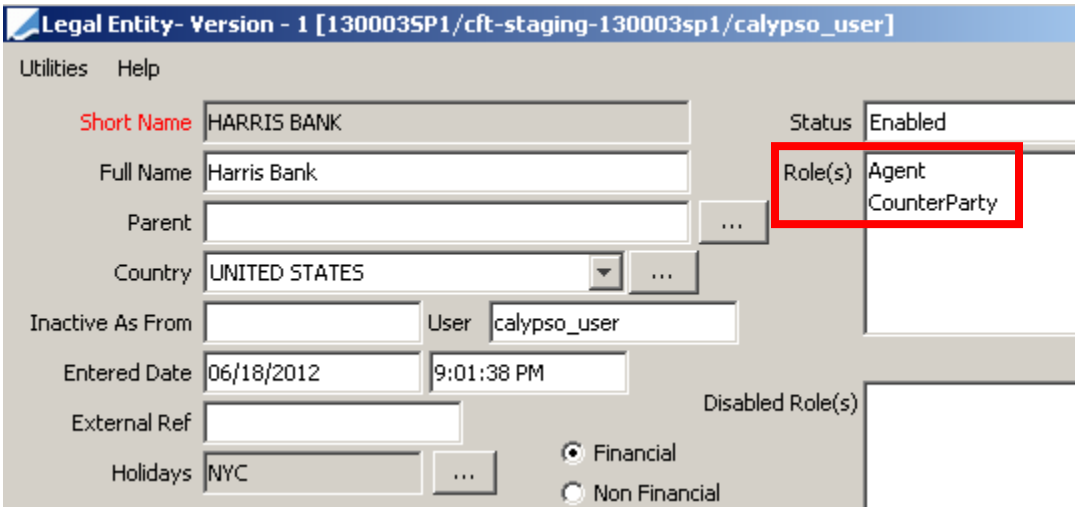
Click **Contact** to define at least one contact.

3.2 Defining the Agent Bank

The Agent Bank for all clearing activity is HARRIS BANK. It requires the setup of a legal entity and its contact information.

From the Calypso Navigator, navigate to **Configuration > Legal Data > Entities** to define legal entities.

It should be defined with the roles “Agent” and CounterParty”.



Click **Contact** to define at least one contact.

3.3 Defining the Clearing Member Firm

The Clearing Member Firm requires the following settings:

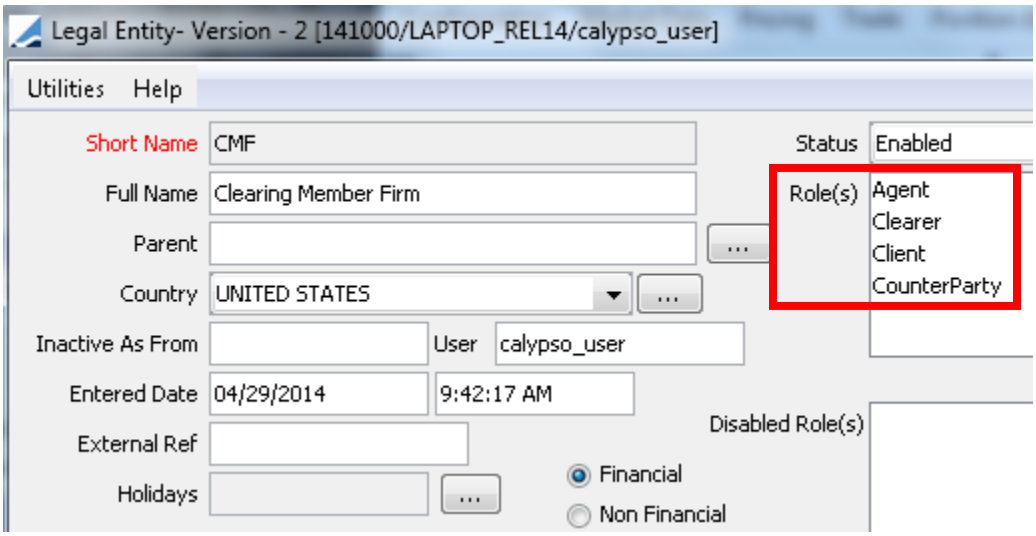
- A legal entity and its contact information
- Settlement instructions

3.3.1 CMF Legal Entity

From the Calypso Navigator, navigate to **Configuration > Legal Data > Entities** to define legal entities.

It should be defined with the roles "Agent", "Client" and "CounterParty".

The "Client" role is used for the margin calls, and the "CounterParty" role is used for the clearing transfers.



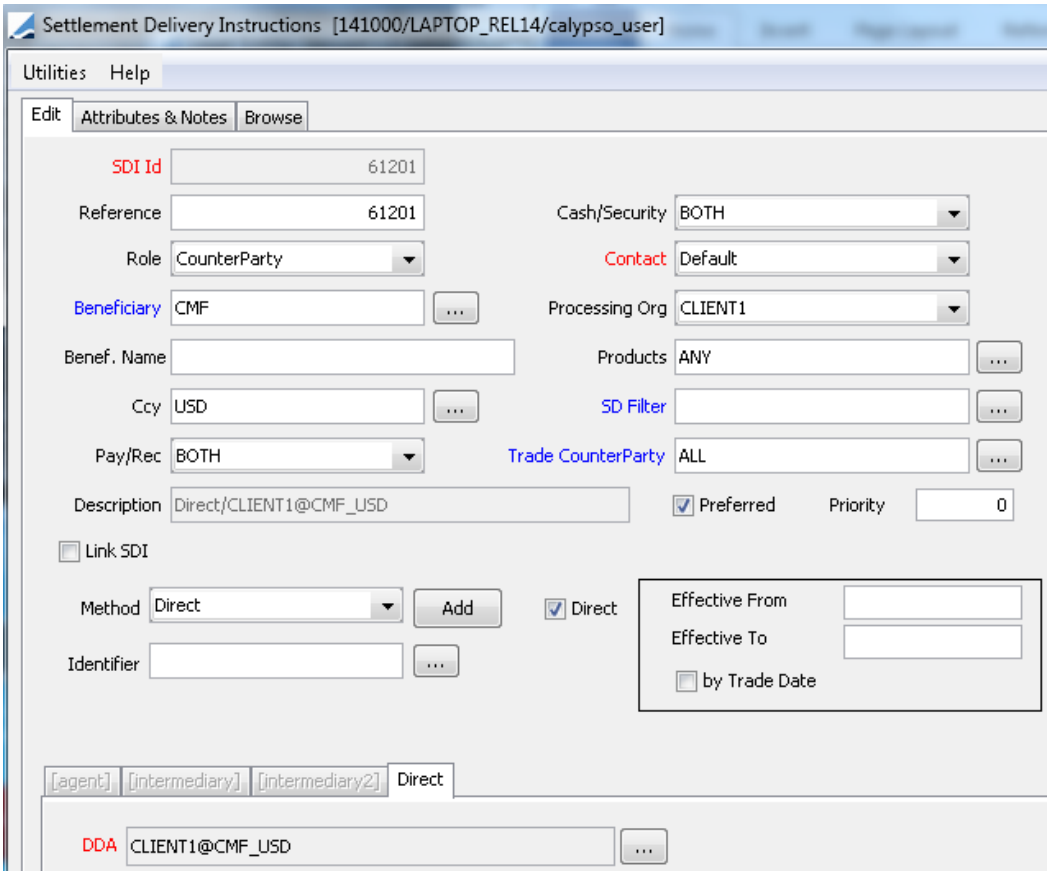
Click **Contact** to define at least one contact.

3.3.2 CMF Settlement Instructions

Clearing Transfers

You need to define settlement and delivery instructions for CMF payments of clearing trades at the end-user client (direct SDIs), for the role "CounterParty".

Example for USD – Repeat for each currency.

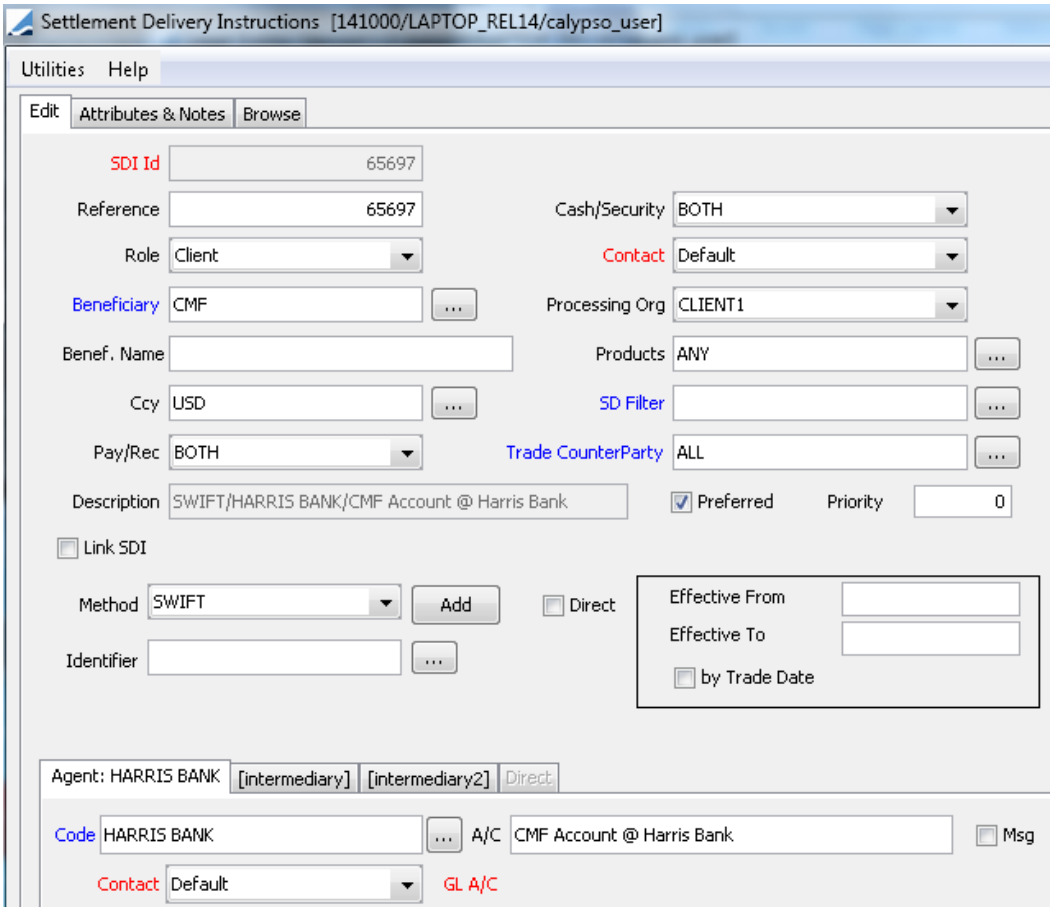


The DDA account of the End-User Client the Clearing Member is defined below.

Margin Calls

You need to define settlement and delivery instructions for CMF payments of margin call trades at Harris Bank.

Example for USD – Repeat for each currency.

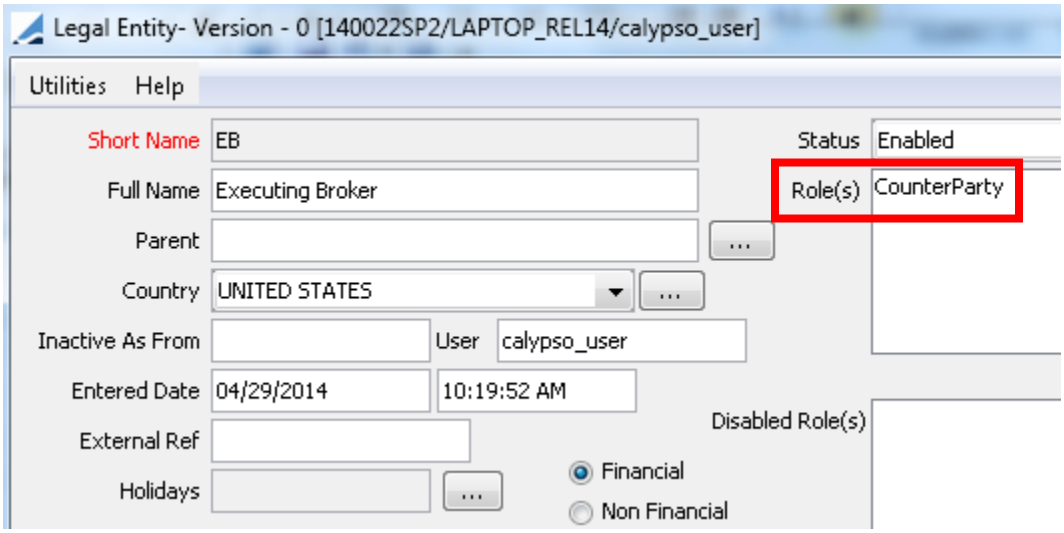


3.4 Executing Broker

The Executing Broker requires the setup of a legal entity and its contact information.

From the Calypso Navigator, navigate to **Configuration > Legal Data > Entities** to define legal entities.

It should be defined with the role “CounterParty”.



Click **Contact** to define at least one contact.

Click **Attributes** to define the following attributes:

Id	Processing Org	Legal Entity	Role	Attribute Type	Attribute Value
61204	ALL	EB	ALL	SwapswireBroker	MEGACALPCC
61205	ALL	EB	ALL	SwapswireParticipant	CALYPXXXX

SwapswireBroker = <Broker's ID on Markitwire platform>
SwapswireParticipant = <Participant's ID on Markitwire platform>

3.5 End-User Client

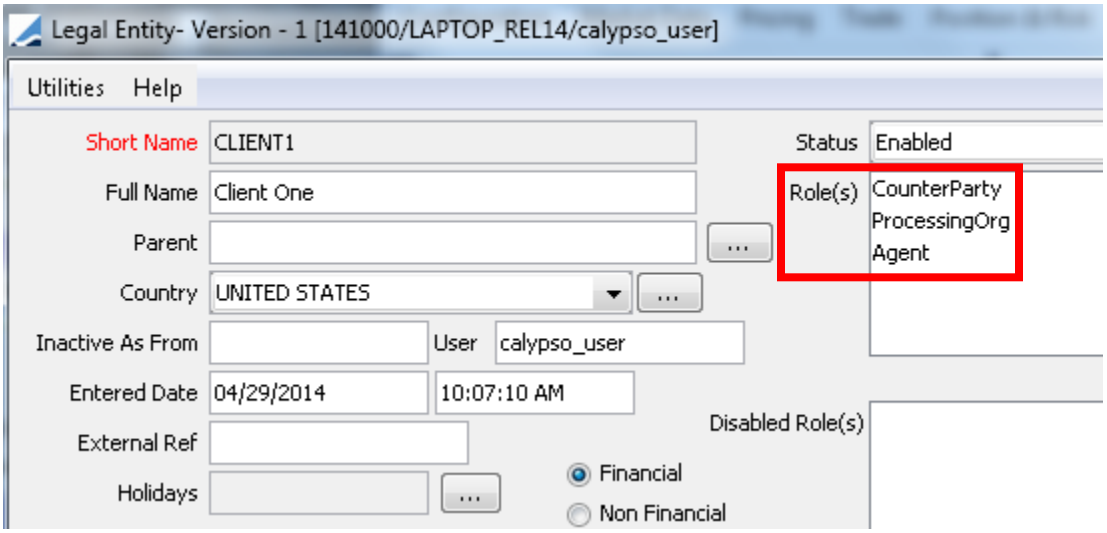
The End-User Client requires the following settings:

A legal entity and its contact information
A book that contains the trades
A Client Cash Account at the clearing member for each currency
A dummy Cash Account for direct SDIs
Settlement instructions

3.5.1 Client Legal Entity

From the Calypso Navigator, navigate to **Configuration > Legal Data > Entities** to define legal entities.

It should be defined with the roles "ProcessingOrg", "CounterParty", and "Agent".



Click **Contact** to define at least one contact.

Click **Attributes** to define the following attribute:

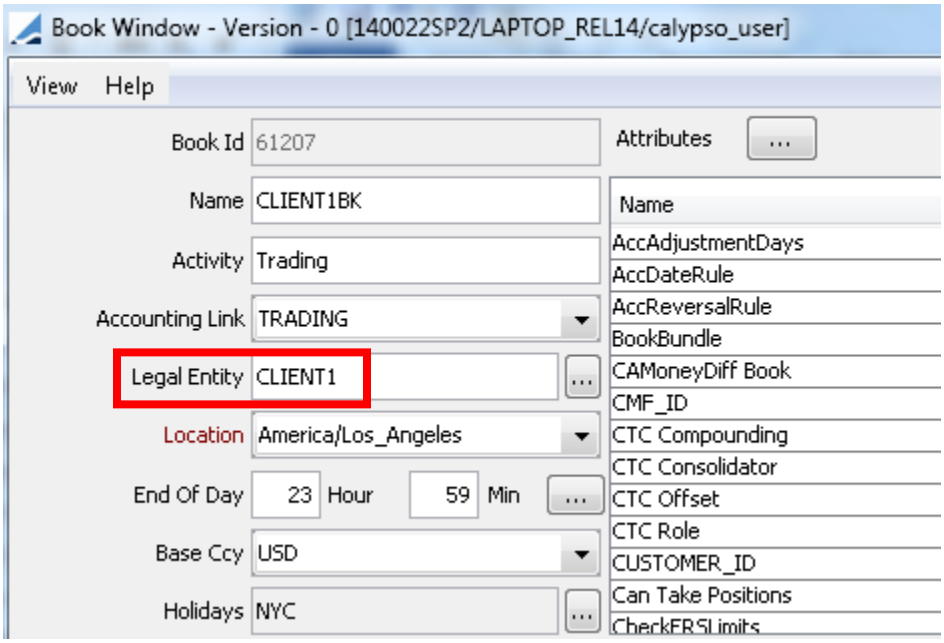
Id	Processing Org	Legal Entity	Role	Attribute Type	Attribute Value
61206	ALL	CLIENT1	ALL	SwapswireParticipant	GIGACALP_FUND1

- SwapswireParticipant = <Participant's ID on Markitwire platform>
- ClearingType = EUC (allows generating IM based fees for FCM facing contracts). It should not be set in case of a Fund Structure (see below for details).

3.5.2 Client Book

Define a book to hold the trades.

From the Calypso Navigator, navigate to **Configuration > Books & Bundles > Trading Book** to define books.



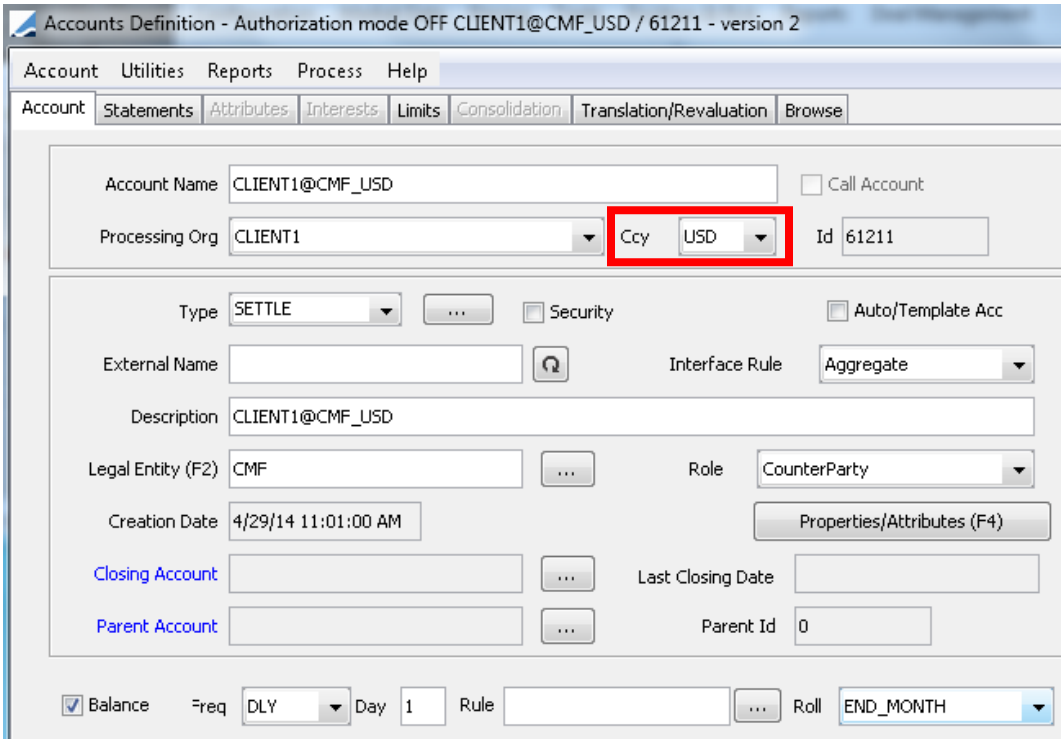
3.5.3 Client Accounts

Client Cash Accounts

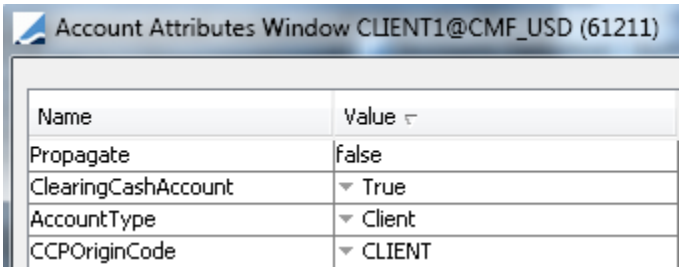
You need to define a Client Cash Account at the Clearing Member for each currency.

Example for USD – Repeat for each currency.

The legal entity is the clearing member with role Counterparty.



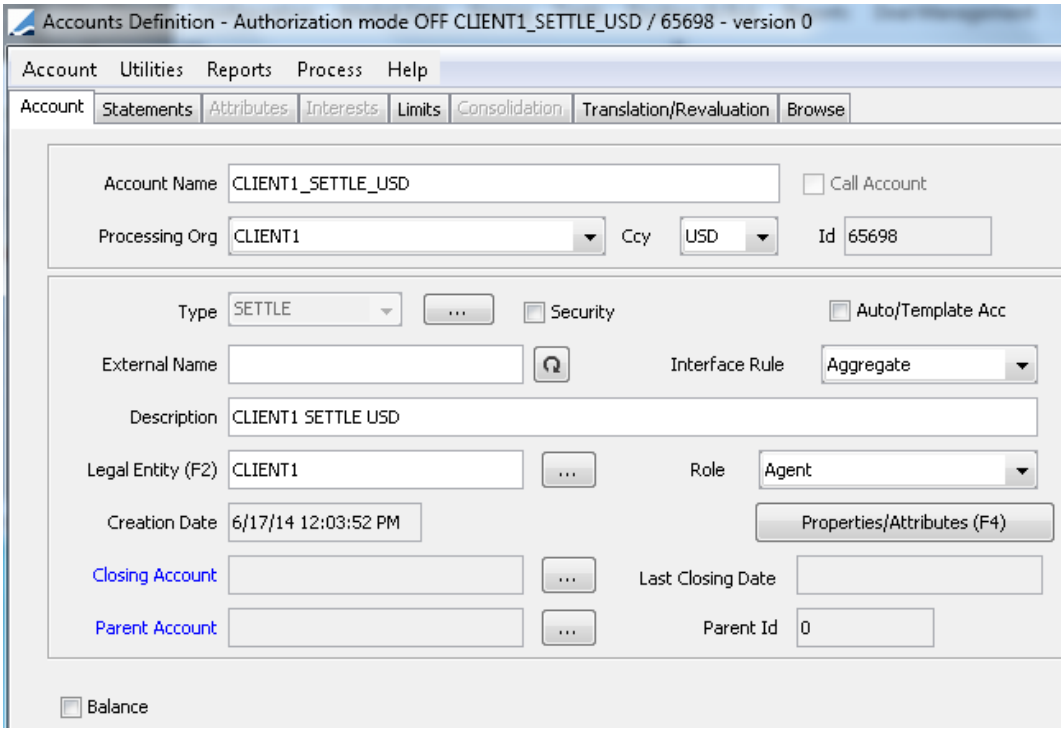
Click **Properties/Attributes (F4)** to set the account attributes.



- Attribute "CCPOriginCode" = CLIENT
- Attribute "ClearingCashAccount" = True

You also need to define a Dummy Cash Account for the direct SDIs.

Example for USD – Repeat for each currency.



Client Clearing Accounts

Client Clearing Accounts are used to store the EUC member ID at a given CCP

It is required to create at least 1 clearing account per FCM. If the EUC clears at a given CCP through multiple FCMs, then multiple clearing accounts need to be set up.

> **Note: If needed, it is also possible to further break down the clearing account by clearing service and CCP. This is for instance needed when the same EUC position account id is used by two different CCPs or if the EUC clears 2 different products (ex: IRD and FX) at the same CCP.**

Clearing account attributes Product_Account_Reference (set for instance to IRD) and CCP_Account_Reference (set for instance to LCH) need to be used accordingly.

Mandatory account attributes include:

- CCPOriginCode set to "Client"
- ClearingCashAccount set to "False".

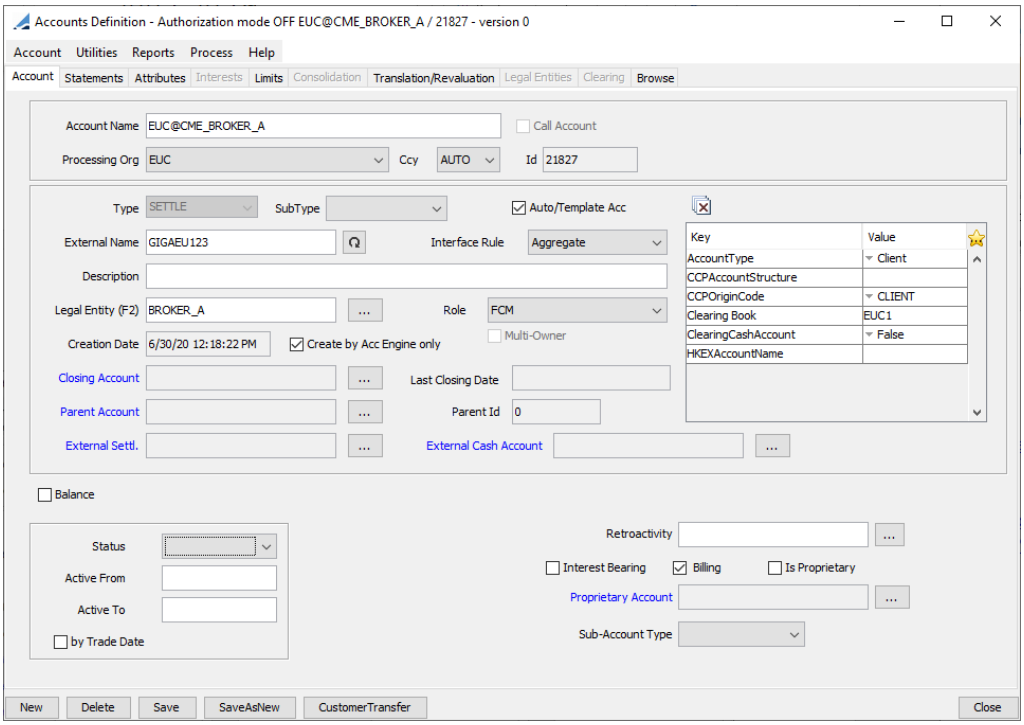
Optionally, it is also possible to set a specific book at Clearing Account level by setting If not set, it is the clearing book defined at PO level that will prevail.

For this the "Clearing Book" attribute needs to set to the required trading book.

Billing flag should be ticked if CCP Clearing Fees are being replicated in Calypso.

Simple Structure

The simple structure is defined if no mirroring is required. The clearing account will only be facing to the FCM.



Fund Structure

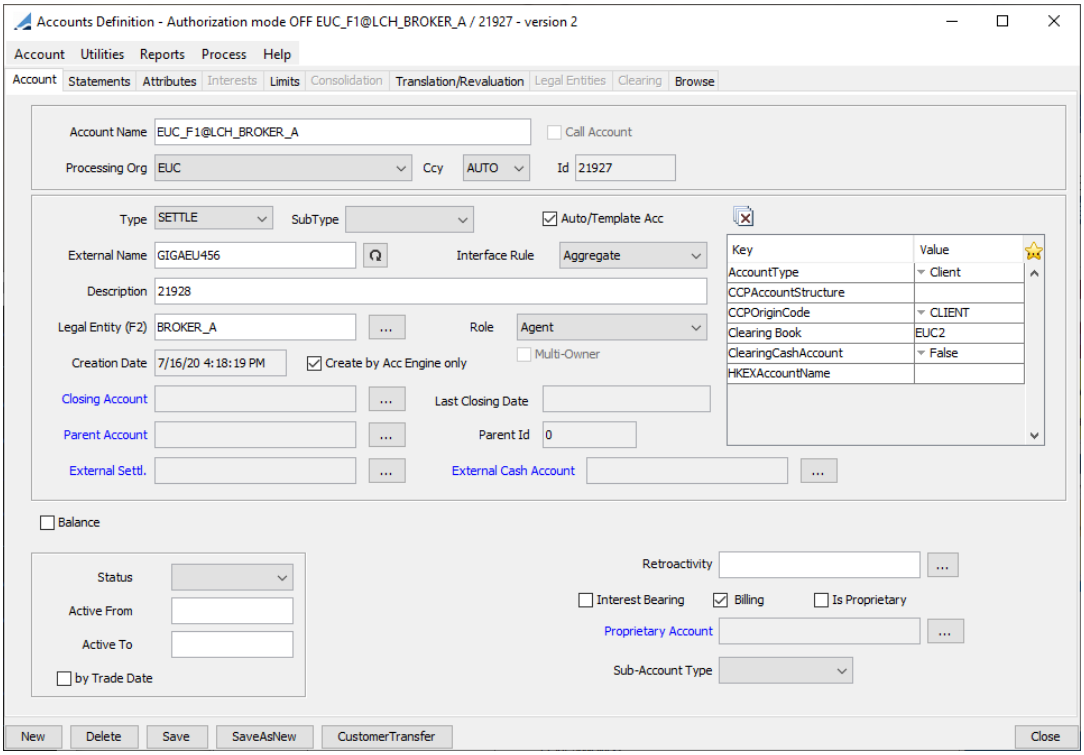
In fund structure, the IM is aggregated at Parent account level, but the portfolio is at fund level, meaning that each fund can clear trades. VM and other cash components are provided at fund level.

Fund structure uses mirroring:

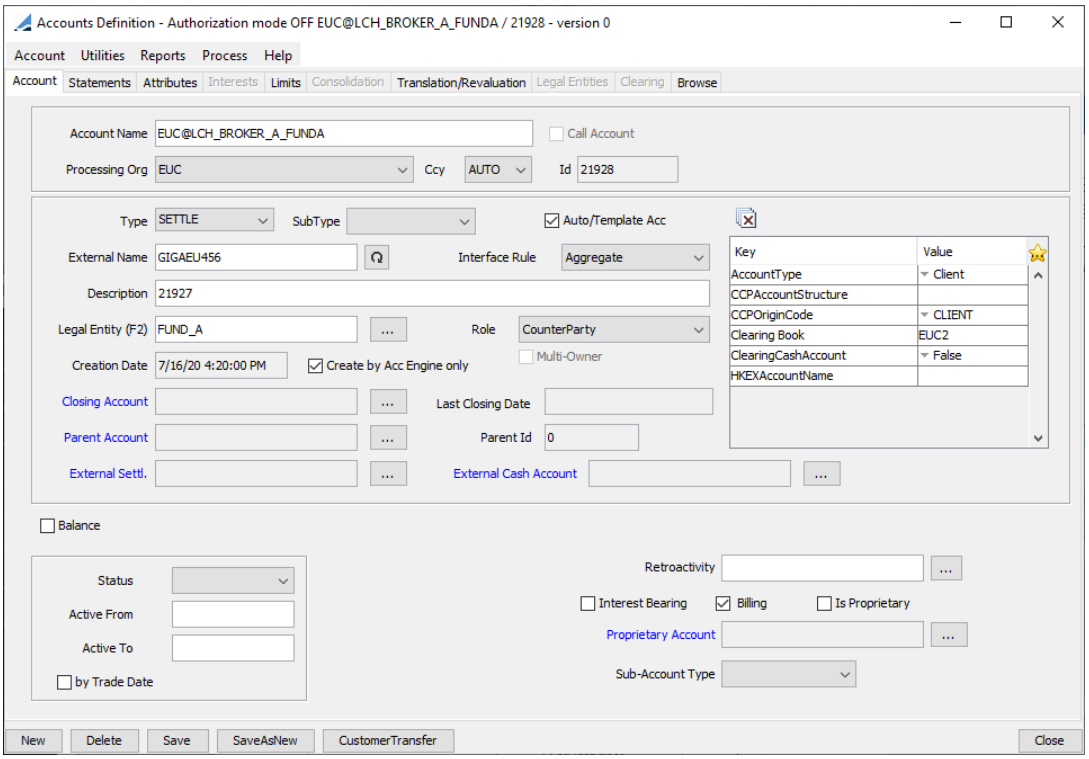
The parent entity will be defined as the PO. 2 clearing accounts need to be defined, 1 facing to the FCM another facing to the fund entity.

> **Note: Clearing accounts are linked to each other via the description field, where the id of the linked account needs to be set.**

Clearing Account facing the FCM



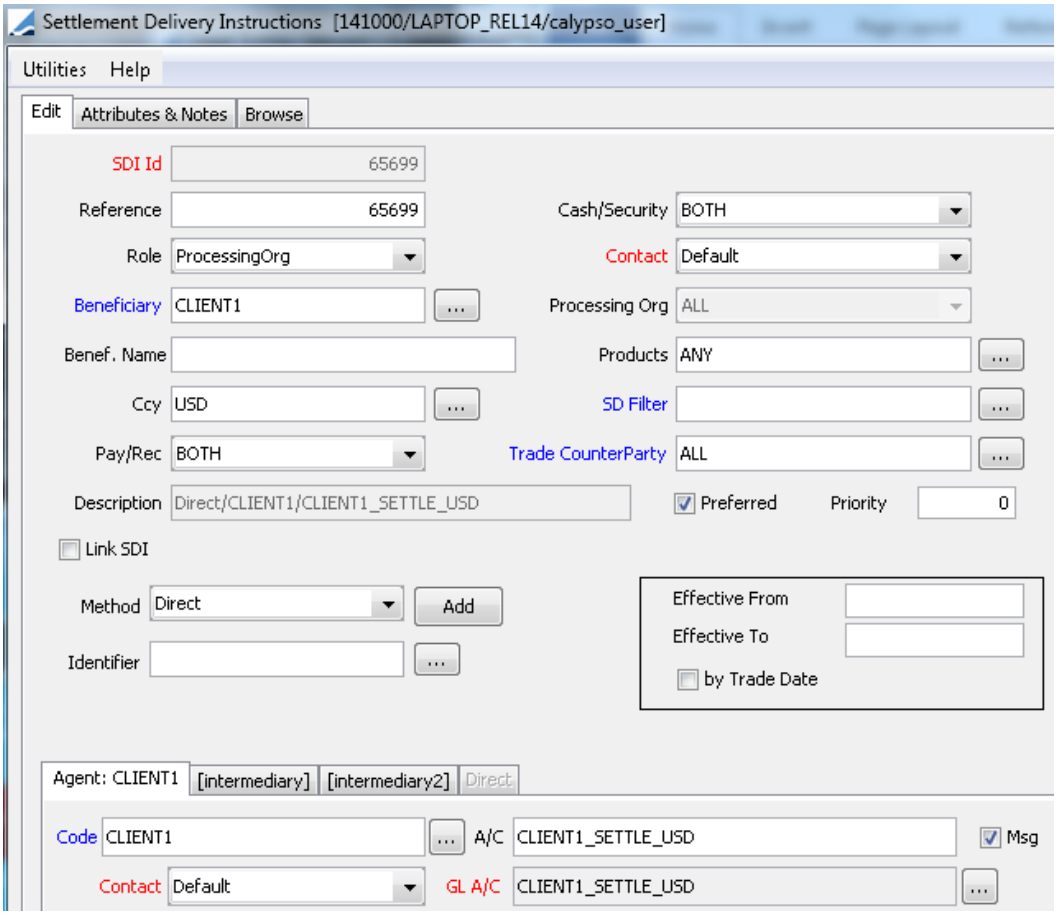
Mirror Clearing Account facing the fund



3.5.4 Client Settlement Instructions

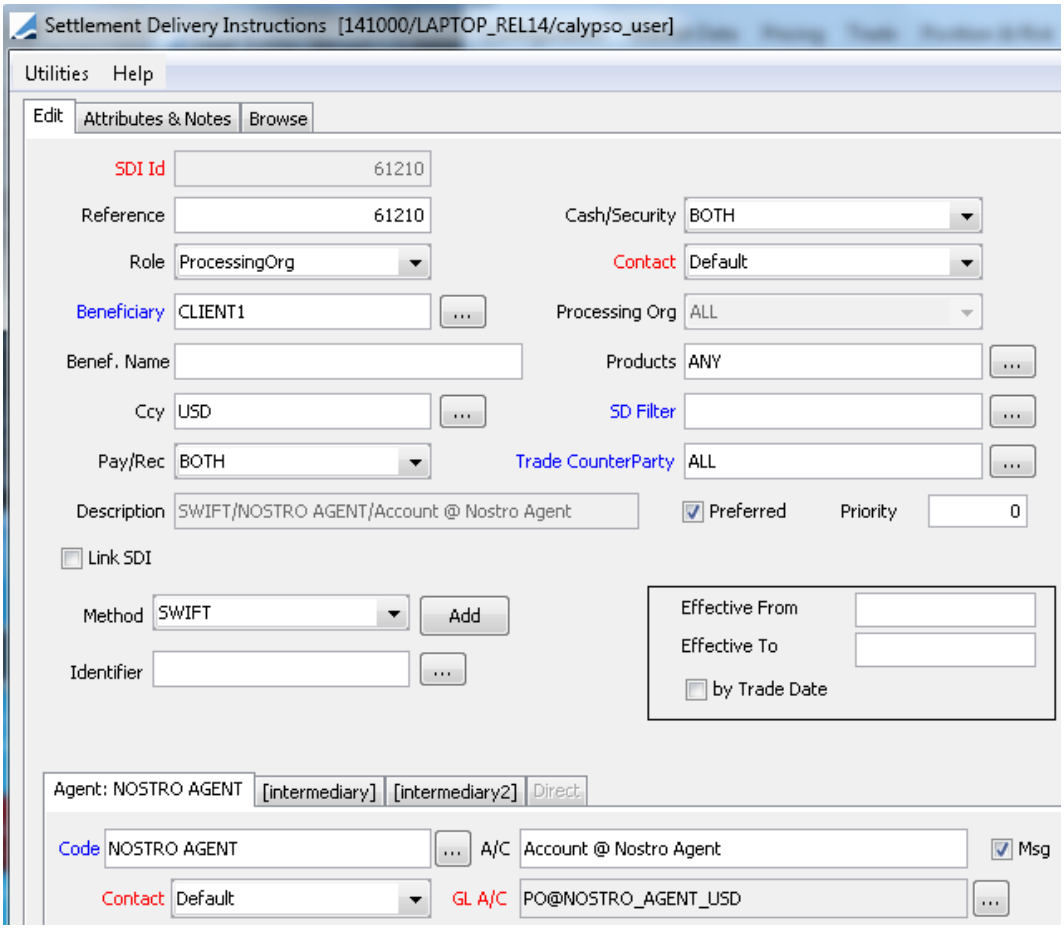
You need to define settlement and delivery instructions for the client's payments of clearing trades at the clearing member.

Example for USD - Repeat for each currency.



GL A/C = <Dummy Cash Account previously created>

You also need to define Swift settlement instructions.


Settlement Delivery Instructions [141000/LAPTOP_REL14/calypso_user]
Utilities
Help
Edit
Attributes & Notes
Browse
SDI Id
61210
Reference
61210
Cash/Security
BOTH
Role
ProcessingOrg
Contact
Default
Beneficiary
CLIENT1
Processing Org
ALL
Benef. Name
Products
ANY
Ccy
USD
SD Filter
Pay/Rec
BOTH
Trade CounterParty
ALL
Description
SWIFT/NOSTRO AGENT/Account @ Nostro Agent
Preferred
Priority
0
Link SDI
Method
SWIFT
Add
Identifier
Effective From
Effective To
by Trade Date
Agent: NOSTRO AGENT
[intermediary]
[intermediary2]
Direct
Code
NOSTRO AGENT
A/C
Account @ Nostro Agent
Msg
Contact
Default
GL A/C
PO@NOSTRO_AGENT_USD

Margin Call Contracts Setup

Margin calls are handled through the Collateral Management module, which allows allocating margin calls on initial margins and variation margins. The actual margin calls are represented by margin call trades. Margin calls on initial margins and variation margins are computed in cash by the COLLATERAL_MANAGEMENT scheduled task. You can then choose how to meet the margin calls: in cash, securities, or both.

Initial Margin

Initial margins (IM) are modeled as Collateral Exposure trades associated with Margin Call Contracts. There is one Collateral Exposure trade per Margin Call Contract.

There is one IM Margin Call Contract per CCP, and service.

The initial margins can be stored in the base currency of the Margin Call Contract, or in the native currency. Margin calls are computed in the corresponding currency and can be substituted to collateral securities.

Variation Margin

Variation margins (VM) are imported into the system as Clearing Transfer trades.

Variation margins can be paid in multiple currencies, or in a single currency, based on the client's choice.

- Multi-currency scenario – There is one VM Margin Call Contract per currency (regardless of CCP and service).

  In this case, there is one variation margin per currency, and the margin calls are computed per currency.

- Single-currency scenario – There is one VM Margin Call Contract.

  In this case, all variation margins are converted to the base currency of the Margin Call Contract. There is one variation margin in base currency, and the margin calls are computed in base currency.

Haircut Rules

You can define haircut rules for foreign currencies and securities as specified by the CCP rules prior to defining IM margin call contracts.

From the Calypso Navigator, navigate to **Configuration > Fees, Haircuts, & Margin Calls > Haircut Rule** to define haircut rules – Help is available from that window.

The client contracts are used to store the initial margin / variation margin on the positions of the client at the clearing member.

Breakdown of Variation Margin Components

This functionality allows generating client VM Margin Calls based on user-defined combinations of fee types. It allows the users to associate transfers that hit a single cash account to multiple VM Margin Call contracts using configuration controlled by the user.

You need to define the following attributes in the Additional Info of the VM contracts:

- INCLUDED_VM_FLOWS (Optional) – Comma-separated list of flow types associated with the margin call contract. If it is not set, all flow types will be associated with the margin call contract (default).

4.1 Defining Margin Call Contracts

From the Calypso Navigator, navigate to **Configuration > Fees, Haircuts, & Margin Calls > Margin Call** to define margin call contracts.

There is one IM Margin Call Contract per CCP, and service.

Single-currency scenario – There is one VM Margin Call Contract.

Multi-currency scenario – There is one VM Margin Call Contract per currency.

If you want to breakdown the VM components, then you need to define a VM Margin Call Contract for each component (set of flow types).

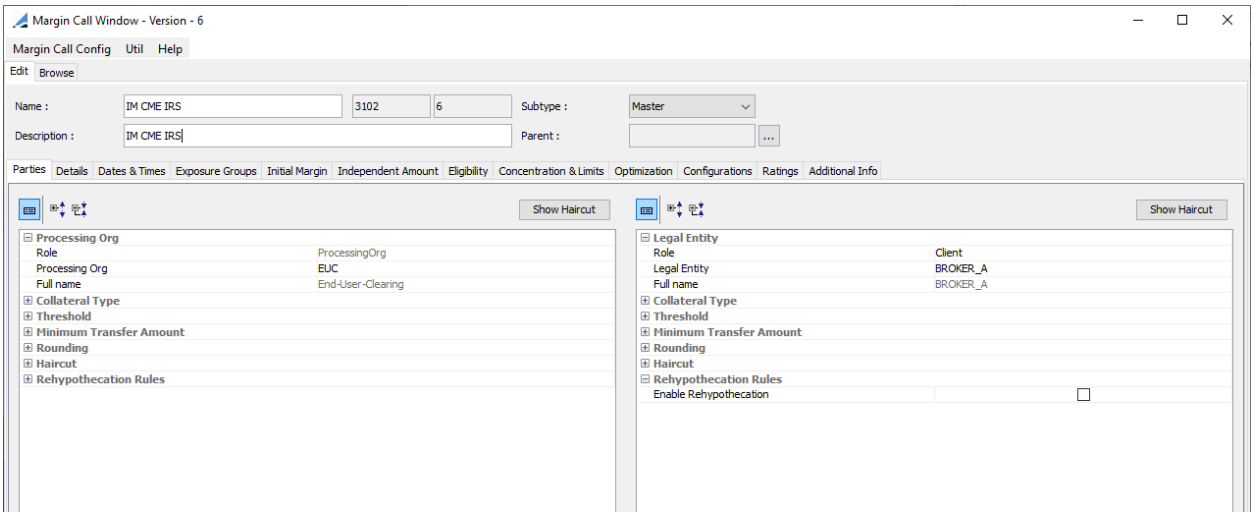
Note: Repeat for each currency for the multi-currency scenario.

Tab: Fields	Client IM – Swaps/FRAs	Client IM – FXNDFs	Client VM – USD*
Parties: Processing Org	<client>	< client>	< client>
Parties: Legal Entity Role	Client	Client	Client
Parties: Legal Entity	<clearing member>	<clearing member>	<clearing member>
Details: Products	CollateralExposure	CollateralExposure	ClearingTransfer
Parties: Currencies	ANY	ANY	USD
Parties: End of Day Pricing Environment	<pricing env>	<pricing env>	<pricing env>
Parties: Intraday Pricing Environment	<pricing env>	<pricing env>	<pricing env>
Parties: Haircut	<haircut rule>	<haircut rule>	<haircut rule>
Dates & Times: Valuation Time Zone	Same as <pricing env> timezone	Same as <pricing env> timezone	Same as <pricing env> timezone

Tab: Fields	Client IM – Swaps/FRAs	Client IM – FXNDFs	Client VM – USD*
Initial Margin: Initial Margin	Checked	Checked	Checked
Initial Margin: Credit Multiplier	<credit multiplier>	<credit multiplier>	
Additional Info: CCP	<CCP>	<CCP>	
Additional Info: CCP_ORIGIN_CODE	CLIENT	CLIENT	CLIENT
Additional Info: CCP_REFERENCE	<account number at CCP>	<account number at CCP>	
Additional Info: PRODUCT_TYPE	IRD	NDF	
Additional Info: MARGIN_TYPE	IM	IM	VM
Additional Info: INCLUDED_VM_FLOWS			
Eligible Books: Set Default Book	Checked	Checked	Checked
Eligible Books: Book	<client book>	<client book>	<client book>
Eligible Securities	<list of eligible securities>	<list of eligible securities>	
Eligible Currencies	<base currency> <list of eligible currencies> <Orderer Role> set to CounterParty	<base currency> <list of eligible currencies> <Orderer Role> set to CounterParty	<base currency> USD <Orderer Role> set to CounterParty

4.2 Sample IM Contract

Repeat for each CCP and for each service.



Parties

- Processing Org = <client>
- Legal Entity Role = CounterParty
- Legal Entity = <clearing member>

Details

- Products = CollateralExposure
- Currencies = ANY
- End of Day Pricing Environment = <Pricing environment name>
- Intraday Pricing Environment = <Pricing environment name>
- Haircut = <Haircut rule name>
- Maximum Adjustment - If left to 0, the contact will only allow margin calls allocations and substitutions for the exact required amount - To allow collateral excess or deficit, you should set the maximum adjustment to a large number, like 1,000,000

Dates & Times

- Valuation Time Zone = Same as <pricing env> timezone

Initial Margin

- "Initial Margin" = Checked.
- Credit Multiplier = <Multiplier> - Multiplier you want to apply to your client - For example "1.1" means the client is applied a 10% offset on the initial margin published by the CCP

Additional Info

- CCP = <CCP short name>
- CCP_ORIGIN_CODE = CLIENT
- CCP_REFERENCE = <account number at CCP>
- PRODUCT_TYPE = <service>
- MARGIN_TYPE = IM

Eligible Books

- Set Default Book = Checked
- Book = <Client's book name>

Eligible Securities

- Define the list of eligible securities to be accepted as collateral

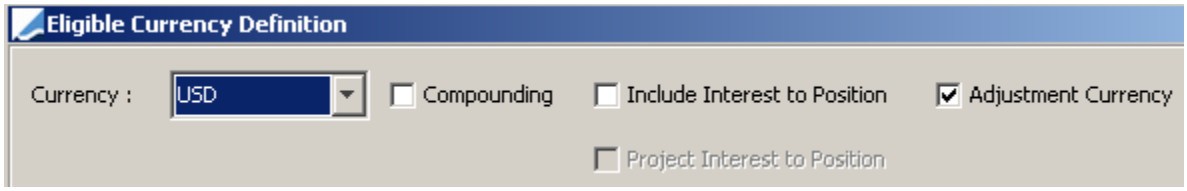
Eligible Currencies

- Set the base currency
- Set the list of eligible currencies – Eligible currencies can be used to pay the margin calls

  If you have multiple eligible currencies, one of them must be set as the "Adjustment Currency" (the default currency for cash margin calls) – This will be typically the same currency as the base currency.

  You must also make sure that you have the workflow rule *AutoAdjust* on the following transitions in the Collateral workflow: PRICED_PAY - AGREE_EXPOSURE - EXPOSURE_AGREED and PRICED_RECEIVE - AGREE_EXPOSURE - EXPOSURE_AGREED.

  Example:



4.3 Sample USD VM Client Contract

For the single-currency scenario, there is only one contract.

For the multi-currency scenario, repeat for each currency.

If you want to breakdown the VM components, then you need to define a VM Margin Call Contract for each component (set of flow types).

Parties

- Processing Org = <client>
- Legal Entity Role = CounterParty
- Legal Entity = <clearing member>

Details

- Products = ClearingTransfer
- Currencies = ANY
- End of Day Pricing Environment = <Pricing environment name>
- Intraday Pricing Environment = <Pricing environment name>
- Haircut = <Haircut rule name>
- Maximum Adjustment - If left to 0, the contact will only allow margin calls allocations and substitutions for the exact required amount - To allow collateral excess or deficit, you should set the maximum adjustment to a large number, like 1,000,000

Dates & Times

- Valuation Time Zone = Same as <pricing env> timezone

Initial Margin

- “Initial Margin” = Checked

Additional Info

- CCP = Not set
- CCP_ORIGIN_CODE = CLIENT
- CCP_REFERENCE = Not set
- PRODUCT_TYPE = Not set
- MARGIN_TYPE = VM
- INCLUDED_VM_FLOWS (Optional) = Not set

Comma-separated list of flow types associated with the margin call contract. If it is not set, all flow types will be associated with the margin call contract (default).

Eligible Books

- Set Default Book = Checked
- Book = <Client's book name>

Eligible Securities

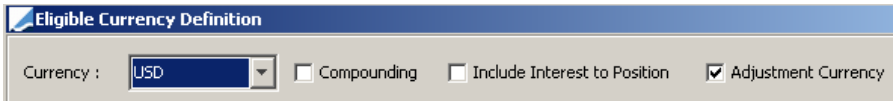
None.

Eligible Currencies

- Set the base currency – Example, "USD"
- Only add the base currency as an eligible currency, and check "Adjustment Currency".
- Orderer Role = CounterParty

  You must also make sure that you have the workflow rule *AutoAdjust* on the following transitions in the Collateral workflow: PRICED_PAY - AGREE_EXPOSURE - EXPOSURE_AGREED and PRICED_RECEIVE - AGREE_EXPOSURE - EXPOSURE_AGREED.

  Example:



Market Data Setup and Import

5.1 Pricing Environments

You need to create the following pricing environments, pricer configurations, quotes sets, and pricing parameter sets.

NOTE: The pricing environment names in this document are only suggestions. Please feel free to assign names according to your business needs.

Pricing Env	Internal	FROMDB	CME_IM	CME_VM	LCH_IM	LCH_VM
Pricer Config	Internal	FROMDB	CME_IM	CME_VM	LCH_IM	LCH_VM
Quote Set	Internal	FROMDB	CME_IMReplication	default	LCH_IMReplication	default
Pricing Parameter Set	Internal	FROMDB	CME	CME	LCH	LCH

5.1.1 Internal Pricing Environment

This pricing environment is used to compute theoretical pricing using internal market data. You can define the pricer configuration and pricing parameter set as you wish.

5.1.2 FROMDB Pricing Environment

The pricing environment FROMDB is used for valuations imported from the CMF. All prices are computed from Marks stored in the database.

Pricer Configuration FROMDB

- Swap product = PricerFromDB
- FRA product = PricerFromDB
- FXNDF product = PricerClearingFromMarks (same as PricerFromDB, but it always uses the settlement ccy of a trade for loading marks).
- ClearingTransfer product = PricerFromDB
- CollateralExposure product = PricerCollateralExposure
- MarginCall = PricerFromDB

Pricing Parameters FROMDB

- USE_MARKS = true

- ADJUST_FX_RATE = false
- ZD_PRICING = false

5.1.3 CME_IM, CME_VM, LCH_IM, LCH_VM Pricing Environments

The pricing environments CME_IM, CME_VM, LCH_IM, LCH_VM are used for valuations based on CCP market data.

Pricer Configurations CME_IM, CME_VM, LCH_IM, LCH_VM

- Swap product = PricerSwap
- FRA product = PricerFRA

Quotes Sets CME_IMReplication and LCH_IMReplication

The quote sets CME_IMReplication and LCH_IMReplication must be defined in the Data Mapping window for InterfaceName = CME/QuoteSet or LCH/QuoteSet, and Interface Value = IMReplication.

5.2 Importing Marks from the CMF

The PL Marks from the CMF can be uploaded via the Data Uploader.

> Note: All the “mandatory fields” listed in the “`CalypsoPLMarks.xls`” file will need to be defined in the transformer.

The Data Uploader offers multiple methods for uploading data.

▶ Please refer to the Calypso Data Uploader Integration Guide for details.

5.3 Importing Curves and Quotes from the CCPs

Importing Variation Margin Curves

CCPs often use different curves to price trades to calculate NPV and Variation Margin than they do to calculate Initial Margin requirements. This is especially true for CME, where the curves used for VM have daily points that go out 50 years. You would NEVER want to try to run a curve with this many points through a Historical Simulation required for IM calculation because it would take too long. The VM curve names vary by CCP, and they are mapped to curve names in Calypso through the Calypso Mapping window. We recommend to users to create pricer configurations called "CME_VM", "LCH_VM", etc. to hold VM curves.

VM curves are imported daily using the scheduled task CLEARING_IMPORT_MARKET_DATA.

Importing Initial Margin Curves

Very similarly to VM cures, IM curves are separate curves that are used in the Pricing Environment for IM calculations: "CME_IM" and "LCH_IM" pricer configurations.

IM curves are imported daily using the scheduled task CLEARING_IMPORT_MARKET_DATA.

Importing Quotes

Rate Index quotes and FX quotes provided by the CCP are imported using the scheduled task CLEARING_MARKET_DATA_IMPORT.

Importing Curve Shifting Scenarios

You can import the set of curve shifting scenarios that can be used to calculate VaR and IM through the CLEARING_IMPORT_SCENARIO_SHIFTS scheduled task. These curves are stored in the ERS Risk tables.

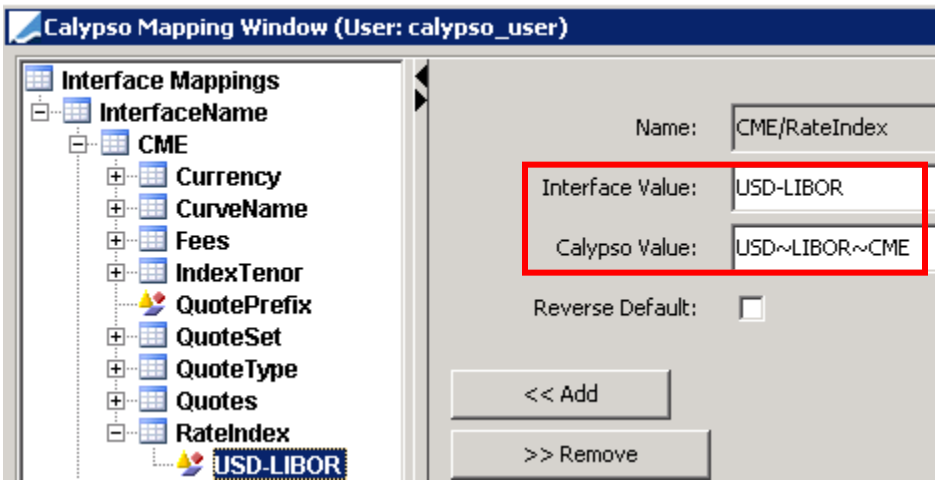
5.3.1 Mapping Configuration

There is additional configuration required within the Calypso Mapping Window (menu action `mapping.CalypsoMappingWindow`).

Rate Indices

The Rate Index Definition is defined using the standard process to generate a quote name for a given index. For our example we will use “MM.USD.LIBOR.*tenor*.CME” as our set of indices.

To map all the tenors, we simply need one mapping for USD LIBOR as shown here:



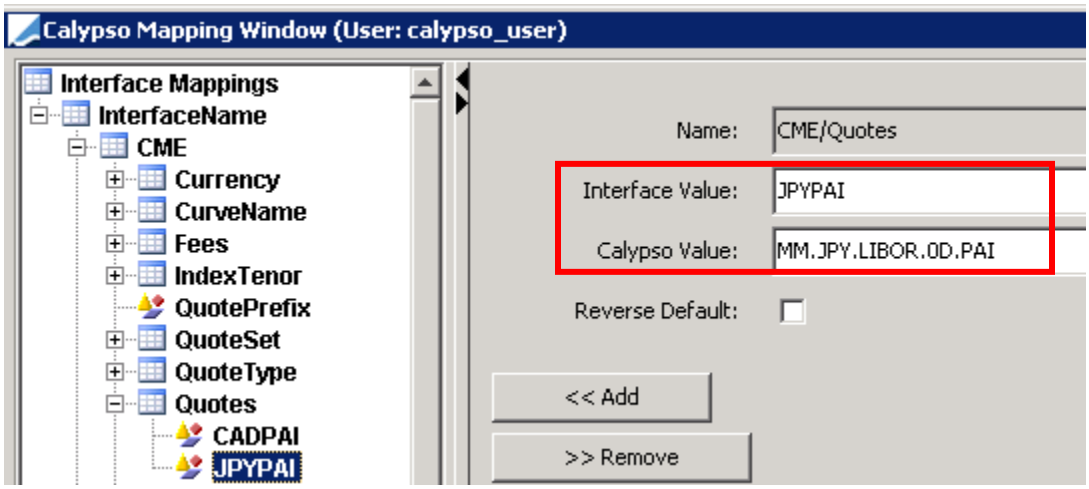
The Calypso Value “USD~LIBOR~CME” has some logic behind it to map the correct tenors of the quote name form “MM.USD.LIBOR.*tenor*.CME”. In other words, all tenors of USD LIBOR will be imported with this one mapping.

CME Quotes

You can define quote mapping under CME > Quotes.

For example, the quotes returned from CME are in the form "JPYPAI", "CADPAI" etc. They come from the file “CMEPAI_$date_stamp.csv”.

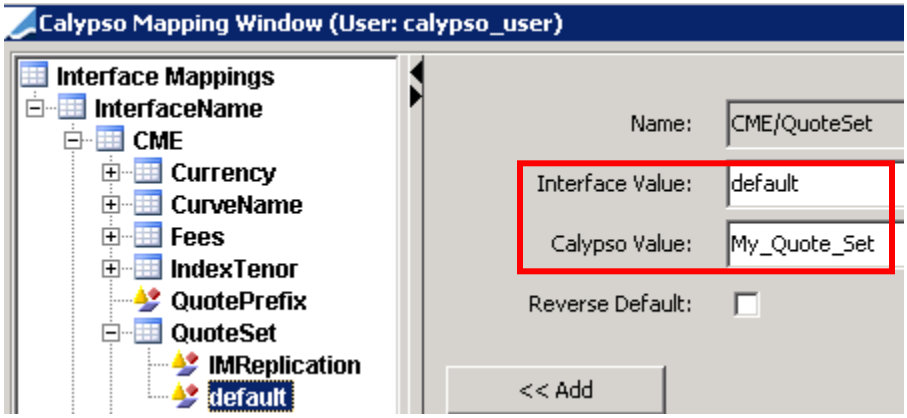
You then define the mapping for the specific interface name. For example, JPYPAI (interface value) can map to MM.JPY.LIBOR.0D.PAI (Calypso value).



Sample rate reset quote mapping:

Note: The Calypso Value depends on the interest rate definition: "MM.<currency>.<rate index>.<tenor>.<source>"

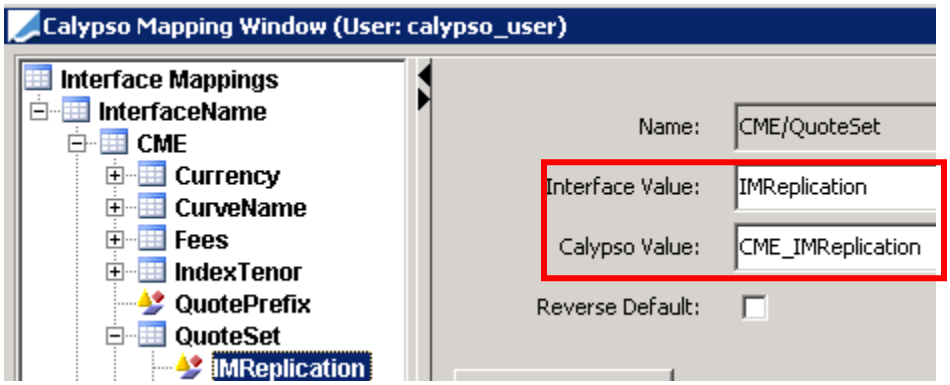
The quotes for the rate indices are stored into the default quote set, unless the user maps the default quote set to another quote set using the mapping below.



The CLEARING_IMPORT_MARKET_DATA scheduled task also imports the FX rates used by CME for IM estimation into a specific quote set (because CME publishes unique FX rates that are specific to Initial Margin calculations).

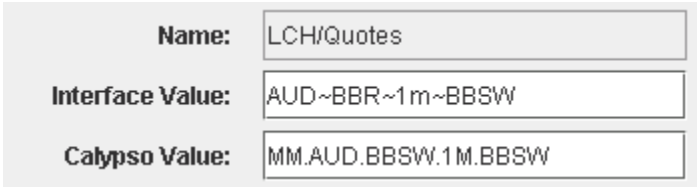
The quote set must be defined in the Data Mapping window for InterfaceName = CME/QuoteSet, and Interface Value = IMReplication.

Example:



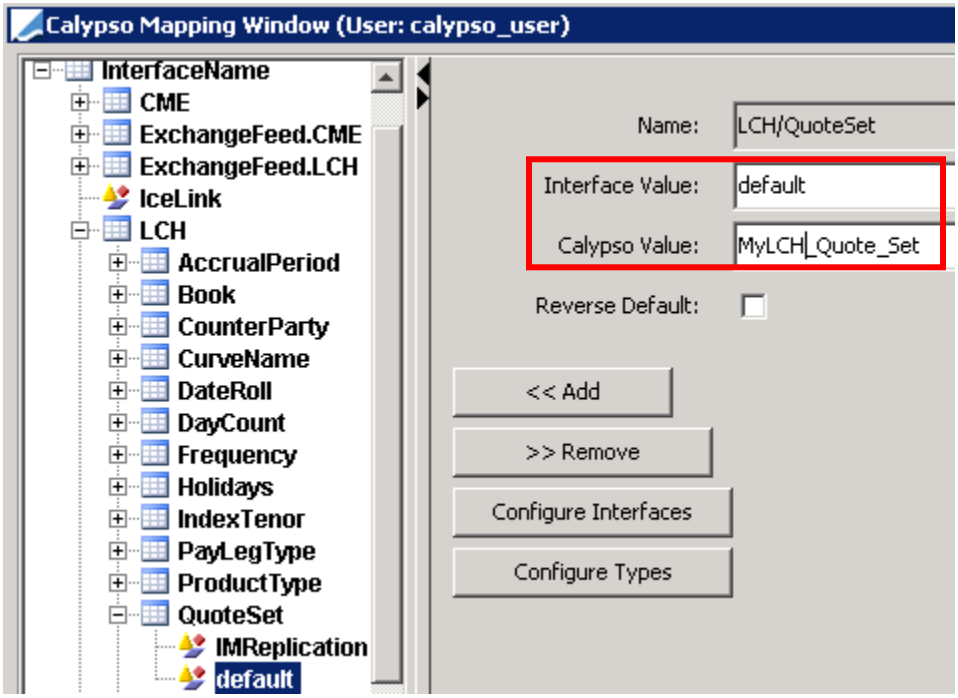
LCH Quotes

Sample rate reset quote mapping:



Note: The Calypso Value depends on the interest rate definition: "MM.<currency>.<rate index>.<tenor>.<source>"

The quotes for the rate indices are stored into the default quote set, unless the user maps the default quote set to another quote set using the mapping below.



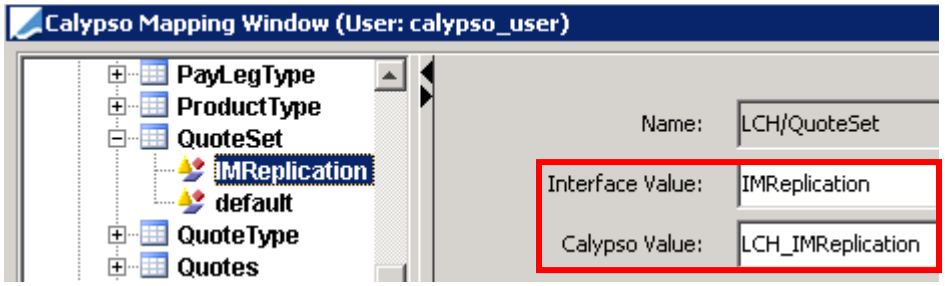
The CLEARING_IMPORT_MARKET_DATA scheduled task also imports the FX rates used by LCH for IM estimation into a specific quote set (because LCH publishes unique FX rates that are specific to Initial Margin calculations).

No Calypso mapping in necessary for FX quotes, as LCH directly provides Quotes in the form “FX.cur1.cur2”.

Note: Both CME and LCH are only providing the "Close" FX quotes – So only Close quotes are saved in the system.

The quote set must be defined in the Data Mapping window for InterfaceName = LCH/QuoteSet, and Interface Value = IMReplication.

Example:



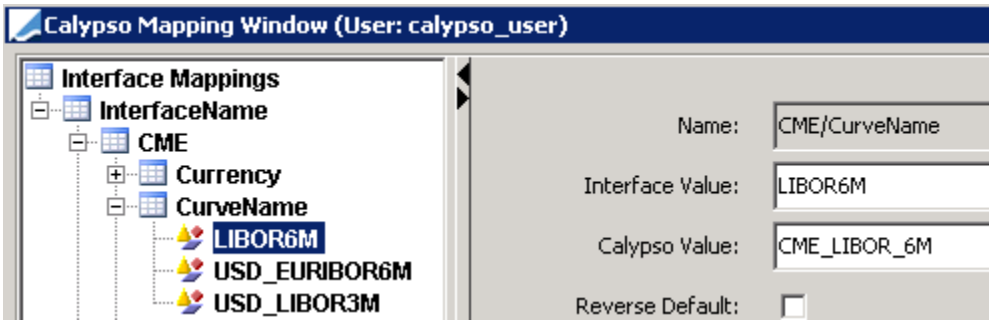
CME Curves

The CME curve files are in the form “IRSDFR_SOMENAME_DATE.csv”. We use "SOMENAME" as both the curve name and curve currency to be used in the Calypso Mapping Window.

In the Calypso Mapping Window, first define a curve under CME > CurveName, with interface value as "SOMENAME", that maps to a Calypso value (example CME_LIBOR_6M). Then under CME > Currency define a value for the currency (example USD).

The curve “CME_LIBOR_6M” in this example, must be defined under **Market Data-> Interest Rate Curves > Zero Yield Curve** using the Calypso Navigator.

The scheduled task will update the points for the curve.



See example below.

LCH Curves

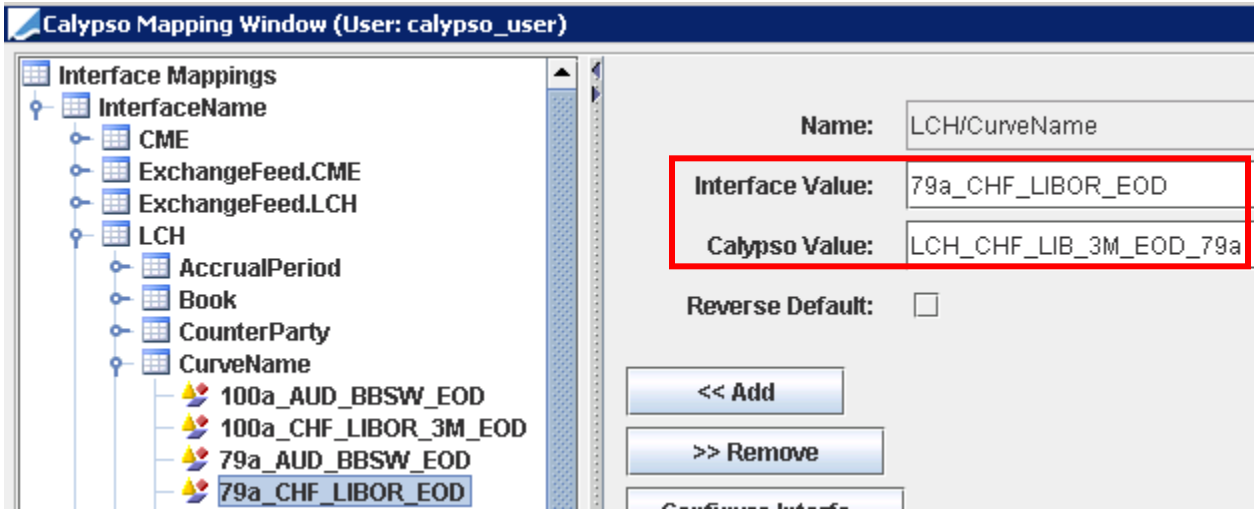
In the Calypso Mapping Window, under the interface LCH > CurveName, specify the value of the interface name. For example, this could be AUD_BBSW_EOD, and map this to a Calypso value (example LCH_AUD_BBSW).

However, there are two LCH reports we use to import these data, REP00079 and REP000100. The same CurveName can exist in both reports but have different values as "79" is for IM and "100" is for VM. To ensure we distinguish the two data from both reports with same name, you should use the following naming convention:

- 79a_CHF_LIBOR_EOD mapped to Calypso value (example LCH_CHF_LIB_3M_EOD_79a)
- 100a_CHF_LIBOR_EOD mapped to Calypso value (example LCH_CHF_LIB_3M_EOD_100a).

The curves "LCH_CHF_LIB_3M_EOD_79a" and "LCH_CHF_LIB_3M_EOD_100a" in this example, must be defined under **Market Data-> Interest Rate Curves > Zero Yield Curve** using the Calypso Navigator.

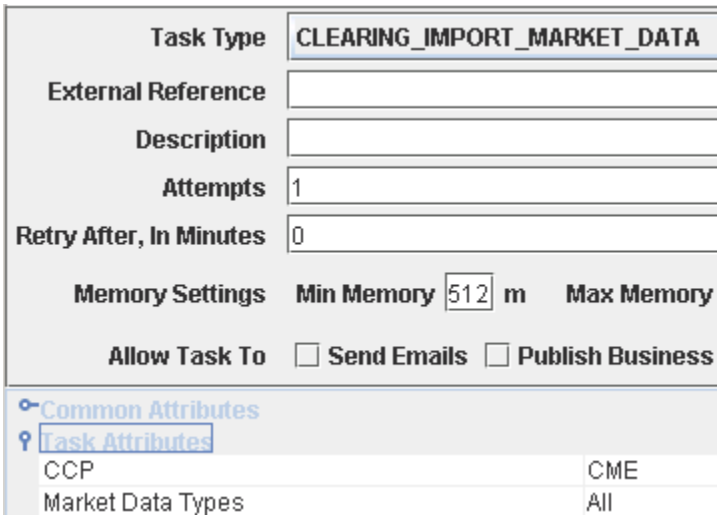
The scheduled task will update the points for the curves.



See example below.

5.3.2 CLEARING_IMPORT_MARKET_DATA

This scheduled task is used to import curves, quotes, and rate resets.



Attributes

» Select a CCP.

» Select the market data types: All, Curves, FX Rates, Holidays, Quotes, QuotesIM, or Rate Reset.

This scheduled task is used to import the market data from the following CCP files:

LCH

- VM and IM Curves - REP00079 and REP00100
- Quotes - DailyExchangeRates REP00018
- Rate Reset – HistoricalIndexRates REP00003 and FX rates REP00016c
- Holidays – Holidays REP00006 - The holiday calendars must be mapped in the Calypso Mapping Window for the interface name LCH/Holidays.

CME

- VM Curves – IRSDFRCurve_* “IRSDFR_*.csv”
- IM Curves - “Base_Curves_*DATE.csv”
- Quotes – CMEPAIQuote “CMEPAI_*.csv”
- Rate Reset - CMEIRSRateReset “IRSRR_*”
- QuotesIM – FX rates “IRSMR3_*.csv”

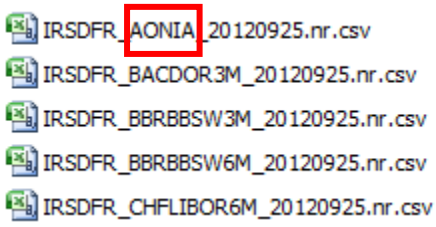
NOTE: The performance can be improved by adding the value CLEARING_IMPORT_MARKET_DATA to the domain “Clearing.ParallelDownloadTasks”. This allows the scheduled task CLEARING_IMPORT_MARKET_DATA to perform parallel download.

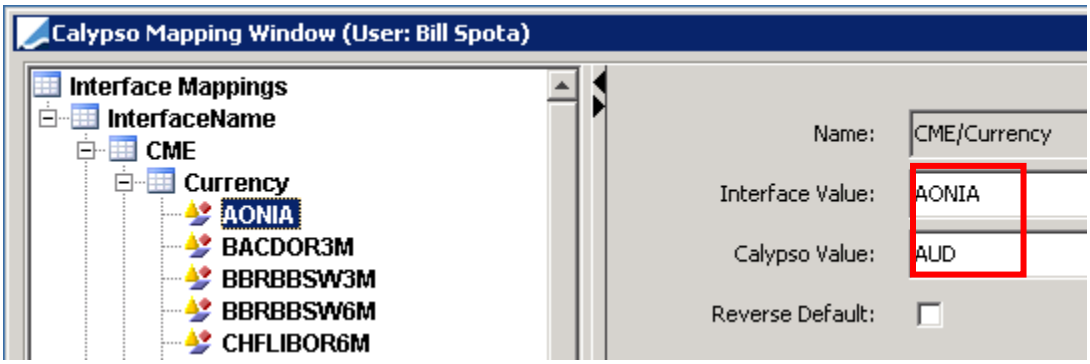
CME Example

Sample CME VM Curves

This scheduled task is used for importing the various IRSDFR curves published by CME so that VM can be reconciled. Sample mapping is shown below, and you will need to create simple shell curves for a date that is before the date you intend to import.

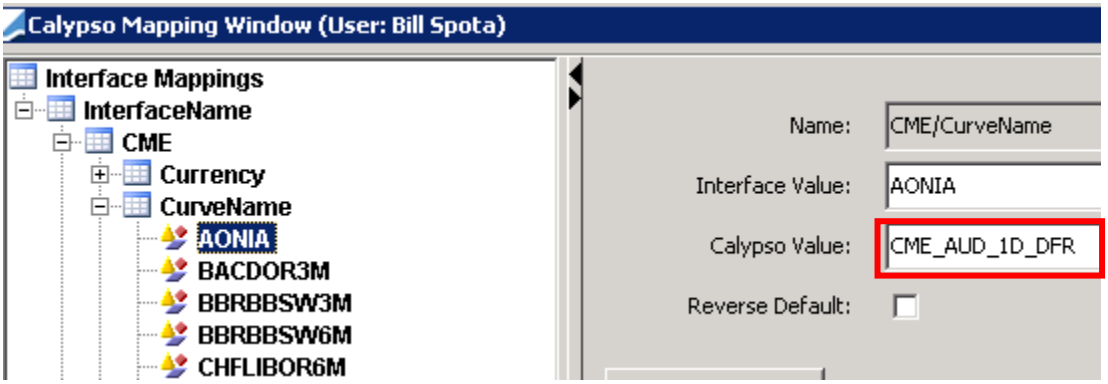
Let's start with the Calypso Mapping Window.

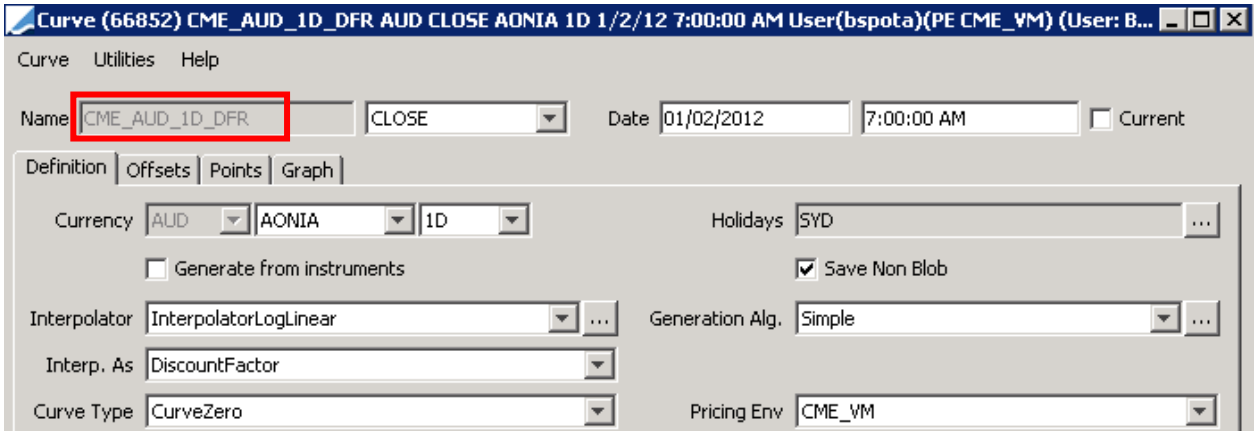




In the above example, you will map the middle section of the IRSDFR file name to a specific currency. This takes some basic knowledge of IRS Clearing to determine what currency is associated with what name. Example AONIA is the discount curve used for VM in AUD whereas BACDOR3M is the forecast curve for CAD.

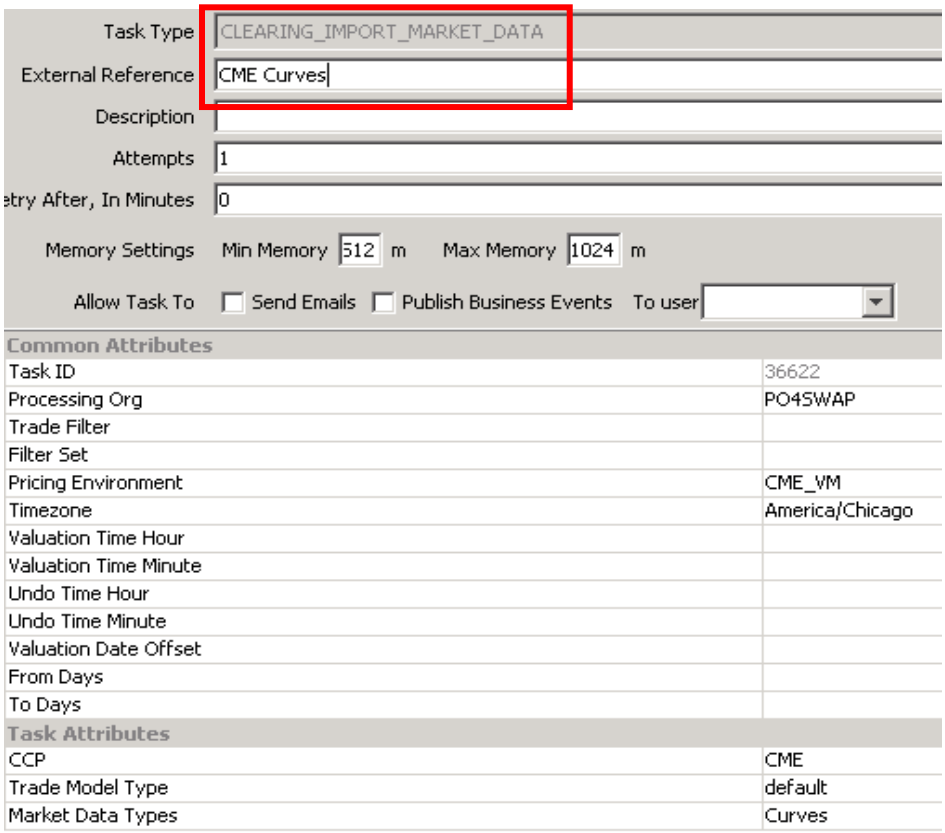
You then need to map that name to an actual curve name in Calypso, a simple discount curve.





Once all the mappings are done for each currency/curve name for discount and forecast curves, you then run the CLEARING_IMPORT_MARKET_DATA scheduled task.

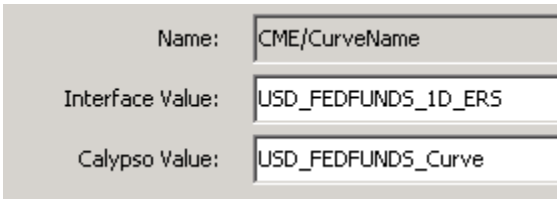
> Note: There is not a discount curve for every currency, and in this case, the forecast curve is used for both discounting and forecasting.

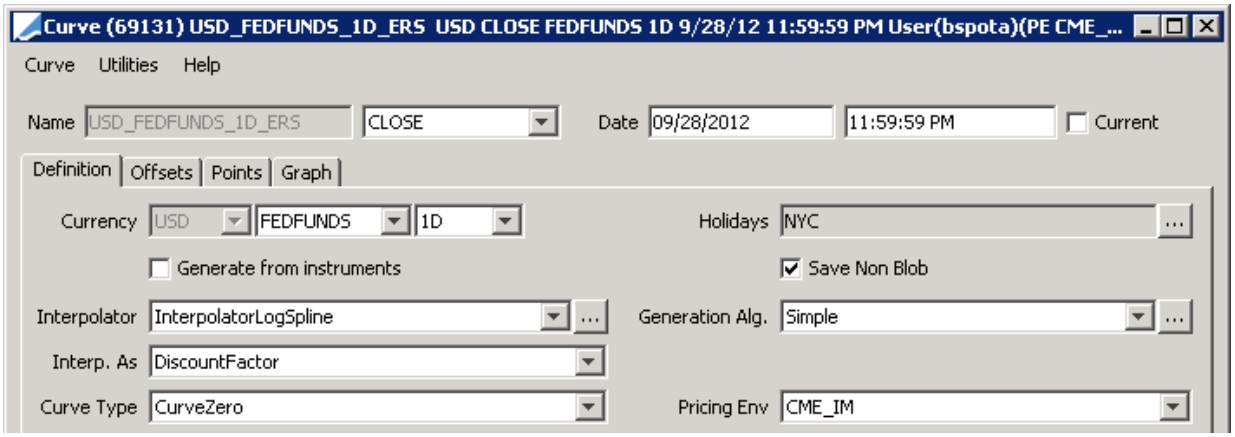


Sample CME IM Curves

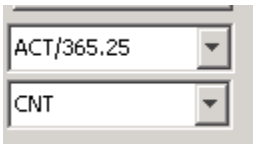
This scheduled task imports the discount curves used for CME IM estimation. You will need to create an empty simple "shell" discount curve with a date before the date you intend to import. The curve should not be derived from instruments. See sample curve below.

You need to map that name to an actual curve name in Calypso, a simple discount curve.





Note: The curve should have “ACT/365.25” Day Count and Continuous compounding frequency on the Points tab.

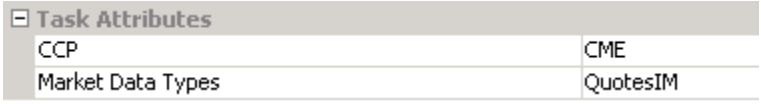


Sample CME QuotesIM

The CLEARING_IMPORT_MARKET_DATA scheduled task also imports the FX rates used by CME for IM estimation. The data comes from the report “IRSMR3_yyyymmdd.csv”.

If the FX rate supplied on this report comes in non-standard market quote convention, there is logic in the scheduled task to use the position pair reference as per each currency pair definition. For example, the report provides USD/JPY quotes, whereas the convention is JPY/USD quotes so the scheduled task will invert the quote in that case.

The configuration of the task requires the user to choose the QuotesIM attribute located under Market Data Types:



By choosing this attribute, the task will look for the CME IRSMR3 report, and will save the FX rates as of the day before.

LCH Example

Sample LCH Curves

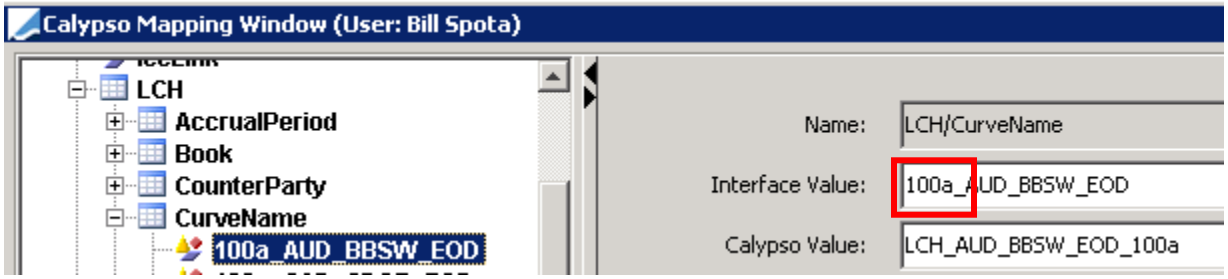
This scheduled task is used for importing the various IM and VM curves published by LCH on reports 79/100 so that both can be reconciled. Additionally, it is used to import the FX and PAI rates.

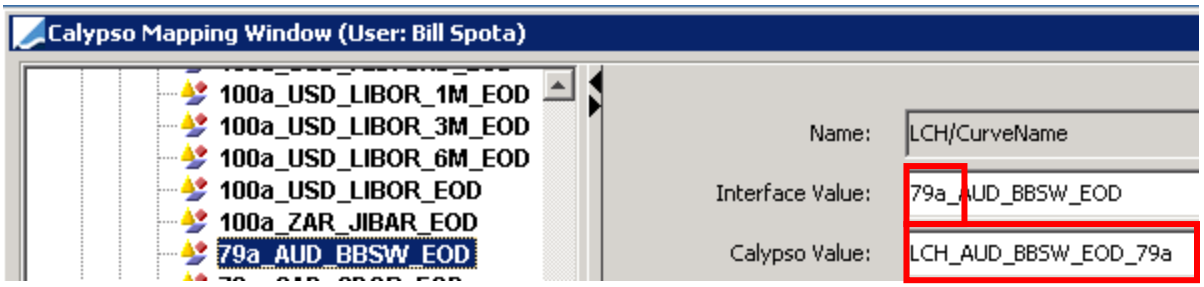
Sample mapping is shown below, and you will need to create simple shell curves for a date that is before the date you intend to import.

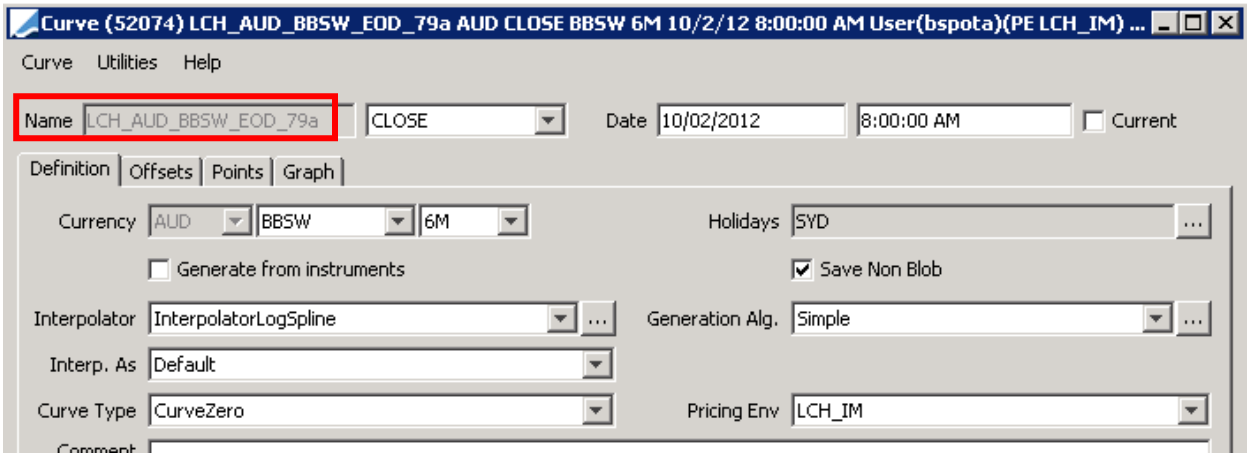
Let's start with the Calypso Mapping Window.

> Note: In some cases, there are identical curve names in reports 79/100 each with different values. To ensure we pull in the data for the curves where the name is identical, we implemented logic to pre-pend the Interface Value name with either 79a_ or 100a_.

You need to map the LCH curve name (pre-pended with 79_ or 100a_) to an actual curve name in Calypso, a simple discount curve.

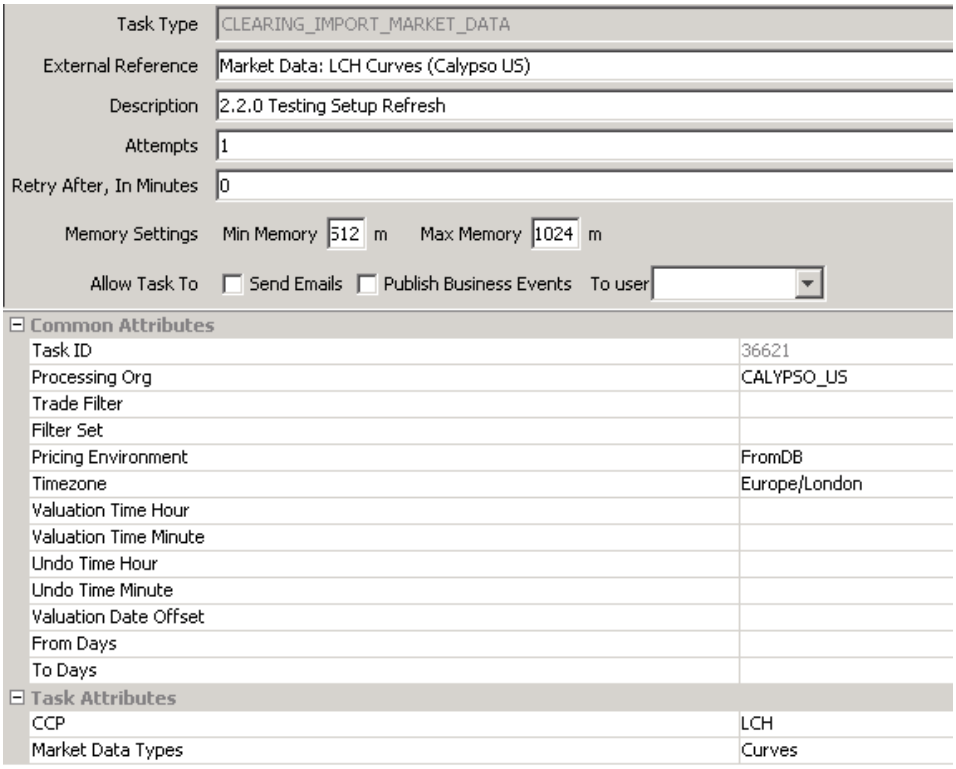






In the above examples you can see that there is a curve named "AUD_BBSW_EOD" in both reports 79 and 100, and that each LCH curve is mapped to a different curve in Calypso.

Once all the mappings are done for each curve name for discount and forecast curves, you then run the CLEARING_IMPORT_MARKET_DATA scheduled task.



Sample LCH Rate Resets and FX Rates

The CLEARING_IMPORT_MARKET_DATA scheduled task also imports the FX rates used by LCH for IM estimation. The data comes from the report “REP00016c”.

If the FX rate supplied on this report comes in non-standard market quote convention, there is logic in the scheduled task to use the position pair reference as per each currency pair definition. For example, the report provides USD/JPY quotes, whereas the convention is JPY/USD quotes so the scheduled task will invert the quote in that case.

The configuration of the task requires the user to choose the Rate Reset attribute located under Market Data Types:

Task Attributes	
CCP	LCH
Market Data Types	Rate Reset

By choosing this attribute, the task will look for the REP00016c report, and will save the FX rates as of the day before.

Reset rates are imported from report REP00003.

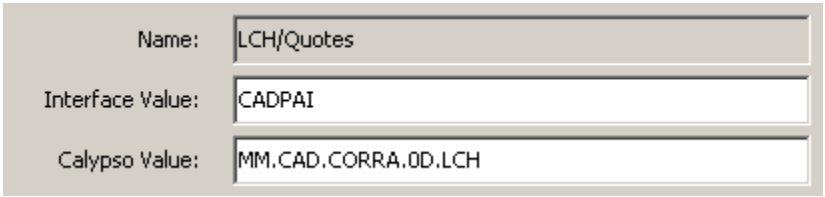
The mapping between the Rate Index and the quote is done for LCH/Quotes in the Calypso Mapping window.

The systems use Valuation Date = Fixing Date to filter the rates to be imported. Then, if rate index attribute USE_EFFECTIVE_DATE = true, the rates are saved with Quote Date= Effective date, otherwise (false or not set) the rates are saved with Quote Date = Fixing Date.

PAI Quotes

PAI quotes are imported from report REP00016c.

For PAI Quotes, the Interface Value in the Calypso Mapping Window should simply be in the format “CCYPAI”, for instance USDPAI, CADPAI, etc. We will associate a single PAI rate per currency.



CLEARING_IMPORT_MARKET_DATA import:

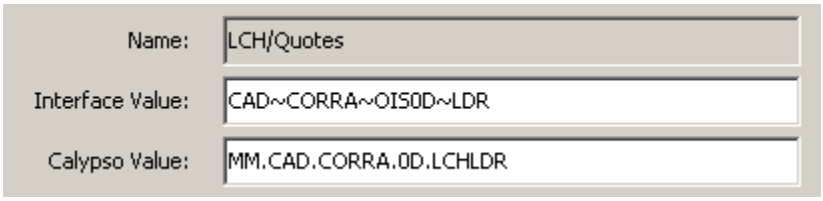
Common Attributes	
Task Attributes	
CCP	LCH
Market Data Types	Quotes

Market Data Types = Quotes

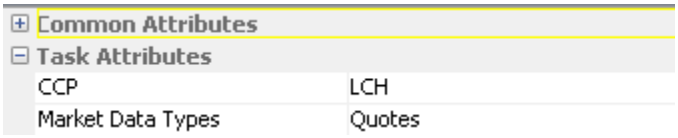
LDR Rates

The LDR rates are imported from report REP00017.

For LDR Rates, the Interface Value should be in the format CCY~INDEX~OIS0D~LDR, for instance DKK~DENTNIN~OIS0D~LDR.



CLEARING_IMPORT_MARKET_DATA import:



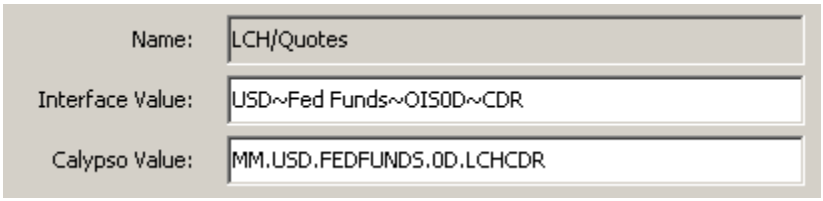
Market Data Types = Quotes

CDR Rates

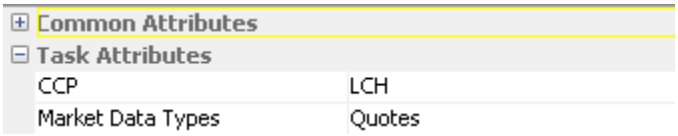
The CDR rates are imported from report REP00017a.

For CDR Rates, the Interface Value should be in the format CCY~INDEX~OIS0D~CDR, for instance GBP~SONIA~OIS0D~CDR.

Obviously, the Calypso Quote names will depend on the Rate Index definition in each environment.



CLEARING_IMPORT_MARKET_DATA import:



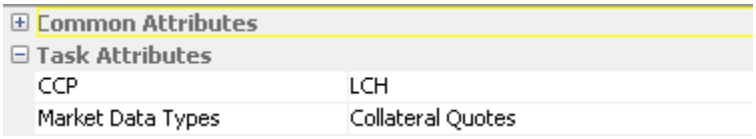
Market Data Types = Quotes

Bond Prices

The bond prices are imported from report REP00034 based on the bonds' ISIN code. No data mapping is required.

NOTE: The prices are imported into the quote set of the pricing environment defined in the scheduled task.

CLEARING_IMPORT_MARKET_DATA import:



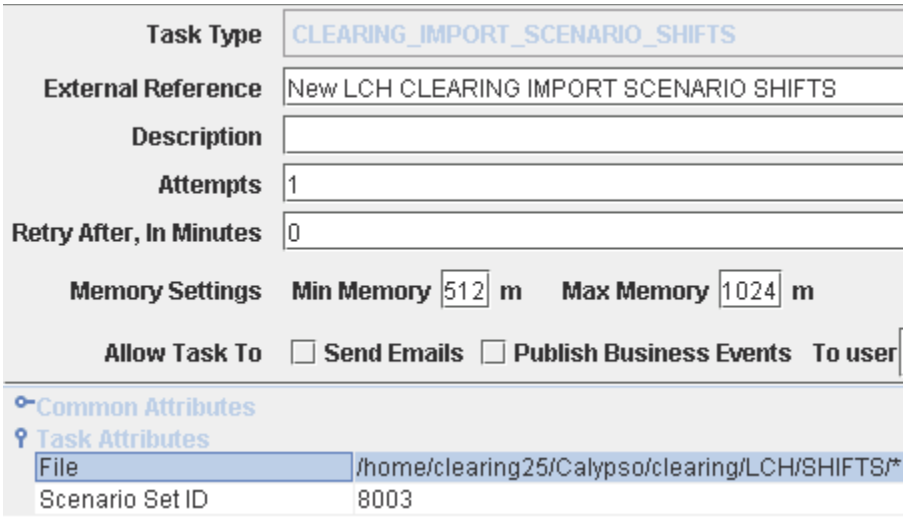
Market Data Types = Collateral Quotes

5.3.3 CLEARING_IMPORT_SCENARIO_SHIFTS

This scheduled task is used to import curve shifting scenarios into ERS Risk. This is used for margin estimation.

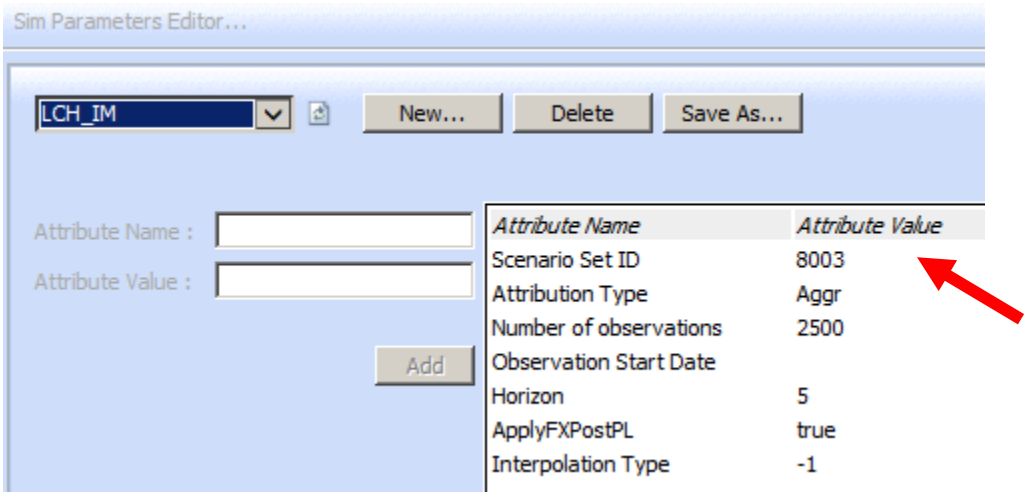
Note: It is recommended to execute this schedule task every day as scenario shifts provided by CCPs are changing every day.

Example for LCH:



Attributes

- Select the file to be imported:
  - LCH - REP00090 – SwapClear Scenario Report
  - CME – Log Return
- Set the scenario set ID to the scenario defined in the parameters of the Sim analysis in ERS Risk.



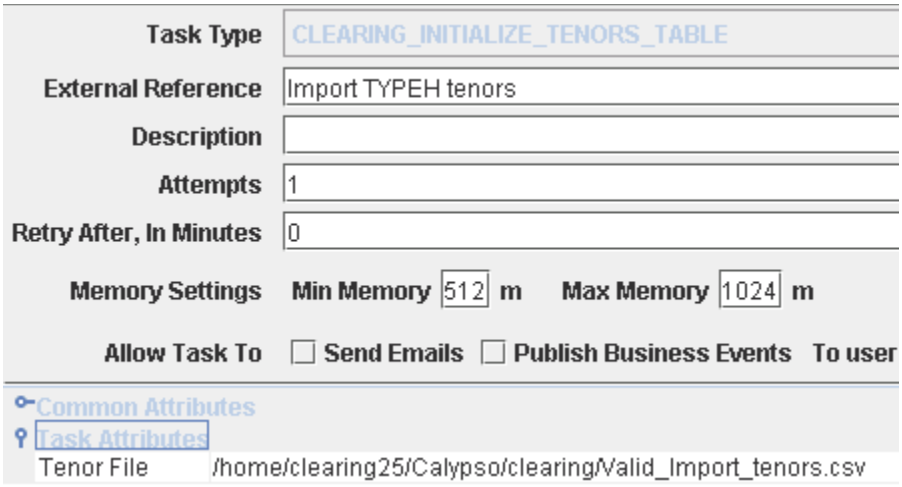
If the TYPEH_TENORS table is empty, the scheduled task fails. You need to run the scheduled task CLEARING_INITIALIZE_TENORS_TABLE to initialize the TYPEH_TENORS table. See below.

If the table exists and some tenors are missing, the scheduled task is successful, and a warning message reports the missing tenors in the table.

If the table exists and the file doesn't have data for all the tenors in the table, the scheduled task is successful, and a warning message reports the missing tenors in the file.

5.3.4 CLEARING_INITIALIZE_TENORS_TABLE

This scheduled task should be run when the scheduled task CLEARING_IMPORT_SCENARIO_SHIFTS fails.



This scheduled task populates the table TYPEH_TENORS with valid tenors only.

Sample file format:

CCY	INDEX	TENOR
AUD	BBSW	O/N
AUD	BBSW	1W
AUD	BBSW	1M

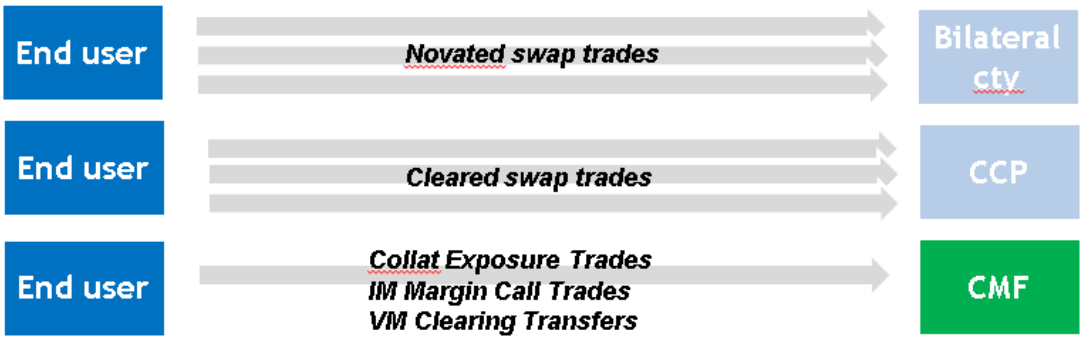
Clearing Trade Processing

6.1 Overview

The Clearing process encompasses four different clearing trades:

- A new swap facing the CCP
- Clearing Transfer trades to represent the VM
- Collateral Exposure trades to represent the IM
- Margin Call trades to settle the IM

Some of those trades will be created via the Markitwire interface (swaps), some will be imported from the Broker EOD files via the Data Uploader (Clearing Transfer trades), and some will be created manually (Collateral Exposure trades).



Trade flows

Transfers sent to dummy accounts except for fees to be settled bilaterally
Accounting MTM based on internal pricing environment

VM

- Clearing transfers
- Fees to model PAI, coupon, Fees, MTM change, Realized P&L
- 1 clearing transfer per trade currency, product type and per FCM

IM

- Collateral Exposure Trade (IM to be paid)
- Margin Call Trades (IM payment, cash or securities
- 1 Margin Call Trade per product type and per FCM
- Margin Call Trades can be used to manage Excess Deposit

6.2 Trade Keywords

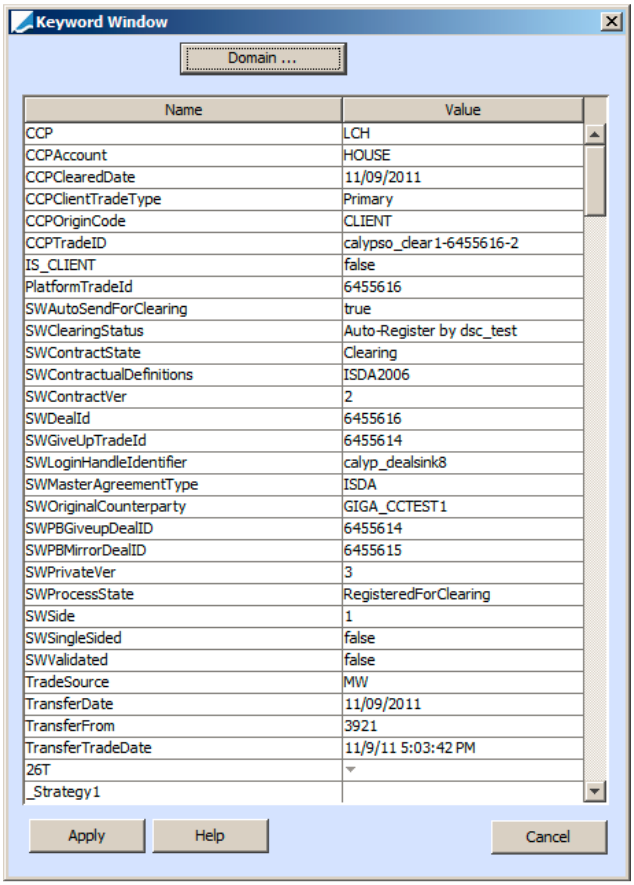
OTC Clearing keywords will automatically be created by the Affirmation Platform interfaces and booked with each trade:

6.2.1 MarkitWire Trade keywords

- SWMasterAgreementType
- SWContractualDefinitions
- SWAutoSendForClearing
- SWEligibleForClearing
- SWSendForClearing
- SWSendForClearingTimeStamp
- SWClearingStatus
- SWOriginalCounterparty

The following Clearing-related keywords are populated by MarkitWire

- CCP — Identifies the Clearing House.
- CCPAccount — Identifies the account type at the CCP (CLIENT or HOUSE).
- CCPClearedDate — Date of clearing registration.
- CCPClientTradeType — Set to “Primary” if the first novated trade resulting from clearing or “Secondary” if a cloned trade in LCH booking model.
- CCPOriginCode — Set to HOUSE for Direct trades and CLIENT for Client Clearing trades
- CCPTradeID — Trade Id at the Clearing House.
- CCPClearingBroker — Clearing broker when present in CME workflow.
- IS_CLIENT — Set to true is trade is related to client activity or false, otherwise.
- CCPStatus — Clearing status of trade sent for clearing.
- CCPMessageTimeStamp — Time stamp of last clearing message.



6.2.2 ICE Link Trade keywords

Keyword Name	Description	Comments
TradeSource	Always set to 'ICELink'	
ICELinkAPIUser	ICELink login id for engine	Used for engine logic behind the scenes
USIPrefix	ICELink RegReporting value	
USIValue	ICELink RegReporting value	
ReportingParty	ICELink RegReporting value	
CCP	LE short name	
CCPClearingBroker	The clearing broker (when available in the trade)	

Keyword Name	Description	Comments
OriginalCounterparty	Bilateral counterparty	Set on the cleared trade, to show the original counterparty before novation
ICELinkTPPartyApprovalStatus		Described above in Workflow section
ICELinkCPtptyapprovalStatus		Described above in Workflow section
Platform	Always set to 'ICELink'	
PlatformStatus	ICELink Deal State	
PlatformTransactionId	ICELink Transaction Id	
PlatformTradeId	ICELink Deal Id	
CCPStatus	Sending, Cleared, Rejected	
CCPClearedDate	GMT timestamp when trade was cleared by CCP	
CCPMessageTimestamp	Message timestamp of last message to/from CCP	
CCPTradeId	CCP assigned deal id	
PriorUSIPrefix	ICELink RegReporting value	
PriorUSIValue	ICELink RegReporting value	
RejectCode	Reject code set by user in ICELink Web GUI	
RejectText	Reject text set by user in ICELink Web GUI	
CCPAccount	Is this trade in a Client or House account at the CCP	In Dealer/IA modes, this keyword isn't set until we can determine whether they are using a CMF for clearing
CCPOriginCode	Did this trade originate due to Client or House activity	In Dealer/IA modes, this keyword isn't set until we can determine whether one side of the trade is using a CMF for clearing

Keyword Name	Description	Comments
CCPAccountReference	Account at the CCP. This is used to map the client/house account at the CCP to the Calypso account	For CMF mode, this will be set to the Client's ICELink entity short code. For Dealer/IA modes this will be set to their ICELink entity short code
IS_CLIENT	Is this the CMF->Client trade or CMF->CCP trade	Only applicable for CMF mode, Cleared trades Always set to false by the interface. The client linked trade created by the Clearing module will have this field set to true
ICELinkTransactionRefId	ID entered ICELink gui as an External Reference to other systems	This is not a mandatory ICELink field [In bi-directional mode this will contain the Calypso trade id]
PlatformOriginalTransactionId	If this transaction resulted from a workflow action on a previous transaction, this will contain the previous transaction ID	When the CMF rejects to the client, ICELink creates a new trade and affirms it on behalf of the dealer Also, when a client allocates across multiple CMF s, ICELink creates one new trade per CMF allocation

6.3 Trade Novation

Trades are booked in Calypso as bi-lateral trades with the Executing Broker (EB). Those trades can be affirmed via ICE Link (CRD) or Markitwire (IRD). They can be booked as follows:

- They can be booked in Calypso and alleged/affirmed in ICE Link or Markitwire via the Calypso bilateral interface.
- They can be booked in Markitwire (IRD) or ICE Link (CRD) and imported into Calypso.

▶ Please refer to the Calypso Markitwire Integration Guide and Calypso ICE Link Integration Guide for information on using these interfaces.

Each trade will appear in Calypso as:

- A bilateral trade with the EB – before being cleared
- A cleared trade with the CCP - after the clearing process

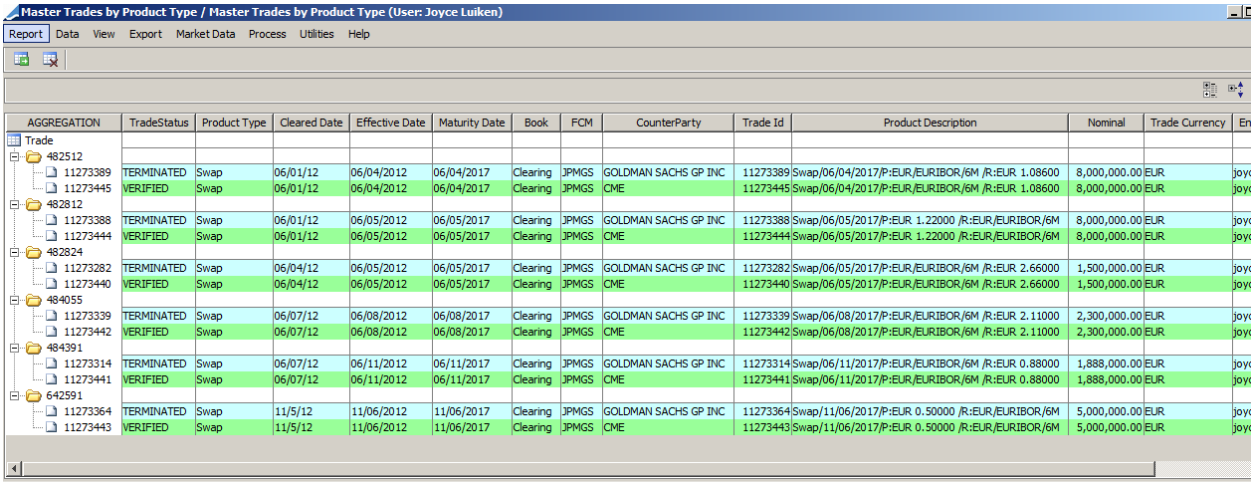
Those cleared trades can be compressed, in which case they are represented as TERMINATED. This termination process is done via the Clearing Broker file upload.

When the Affirmation message is sent by the affirmation platform, the bilateral trade with the EB is novated, and a new cleared trade with the CCP is created.

Unsettled upfront fees and coupons at the time of clearing are settled bilaterally or not, depending on the CCP rules.

- From a CME perspective, any unsettled flow is modified to a T+1 flow, independently of the currency.
- From an LCH perspective, trades with unsettled fees are not accepted for clearing. Only trades with unsettled coupons can be cleared.

View of the trade blotter after the clearing process:



AGGREGATION	TradeStatus	Product Type	Cleared Date	Effective Date	Maturity Date	Book	FCM	CounterParty	Trade Id	Product Description	Nominal	Trade Currency	En
Trade													
482512													
11273389	TERMINATED	Swap	06/01/12	06/04/2012	06/04/2017	Clearing	JPMGS	GOLDMAN SACHS GP INC	11273389	Swap/06/04/2017/P:EUR/EURIBOR/6M /R:EUR 1.08600	8,000,000.00	EUR	joyc
11273445	VERIFIED	Swap	06/01/12	06/04/2012	06/04/2017	Clearing	JPMGS	CME	11273445	Swap/06/04/2017/P:EUR/EURIBOR/6M /R:EUR 1.08600	8,000,000.00	EUR	joyc
482812													
11273388	TERMINATED	Swap	06/01/12	06/05/2012	06/05/2017	Clearing	JPMGS	GOLDMAN SACHS GP INC	11273388	Swap/06/05/2017/P:EUR 1.22000 /R:EUR/EURIBOR/6M	8,000,000.00	EUR	joyc
11273444	VERIFIED	Swap	06/01/12	06/05/2012	06/05/2017	Clearing	JPMGS	CME	11273444	Swap/06/05/2017/P:EUR 1.22000 /R:EUR/EURIBOR/6M	8,000,000.00	EUR	joyc
482824													
11273282	TERMINATED	Swap	06/04/12	06/05/2012	06/05/2017	Clearing	JPMGS	GOLDMAN SACHS GP INC	11273282	Swap/06/05/2017/P:EUR/EURIBOR/6M /R:EUR 2.66000	1,500,000.00	EUR	joyc
11273440	VERIFIED	Swap	06/04/12	06/05/2012	06/05/2017	Clearing	JPMGS	CME	11273440	Swap/06/05/2017/P:EUR/EURIBOR/6M /R:EUR 2.66000	1,500,000.00	EUR	joyc
484055													
11273339	TERMINATED	Swap	06/07/12	06/08/2012	06/08/2017	Clearing	JPMGS	GOLDMAN SACHS GP INC	11273339	Swap/06/08/2017/P:EUR/EURIBOR/6M /R:EUR 2.11000	2,300,000.00	EUR	joyc
11273442	VERIFIED	Swap	06/07/12	06/08/2012	06/08/2017	Clearing	JPMGS	CME	11273442	Swap/06/08/2017/P:EUR/EURIBOR/6M /R:EUR 2.11000	2,300,000.00	EUR	joyc
484391													
11273314	TERMINATED	Swap	06/07/12	06/11/2012	06/11/2017	Clearing	JPMGS	GOLDMAN SACHS GP INC	11273314	Swap/06/11/2017/P:EUR/EURIBOR/6M /R:EUR 0.88000	1,888,000.00	EUR	joyc
11273441	VERIFIED	Swap	06/07/12	06/11/2012	06/11/2017	Clearing	JPMGS	CME	11273441	Swap/06/11/2017/P:EUR/EURIBOR/6M /R:EUR 0.88000	1,888,000.00	EUR	joyc
642591													
11273364	TERMINATED	Swap	11/5/12	11/06/2012	11/06/2017	Clearing	JPMGS	GOLDMAN SACHS GP INC	11273364	Swap/11/06/2017/P:EUR 0.50000 /R:EUR/EURIBOR/6M	5,000,000.00	EUR	joyc
11273443	VERIFIED	Swap	11/5/12	11/06/2012	11/06/2017	Clearing	JPMGS	CME	11273443	Swap/11/06/2017/P:EUR 0.50000 /R:EUR/EURIBOR/6M	5,000,000.00	EUR	joyc

The trade workflow needs to be designed to:

- Allow AMENDs and CANCELLATIONS for bilateral trades but prevent it for cleared trades. This can be achieved by using a combination of workflow rules and static data filters.
- Allow TERMINATION to represent the trade compression of cleared trades but prevent end users from manually terminating a cleared trade (to be done via permission).
- Bilateral trades (submitted for clearing)

  VERIFIED => PENDING_CLEAR => TERMINATED

  VERIFIED => PENDING_CLEAR => REJECTED => VERIFIED

- Cleared trades (once clearing has been approved)

  NEW => VERIFIED

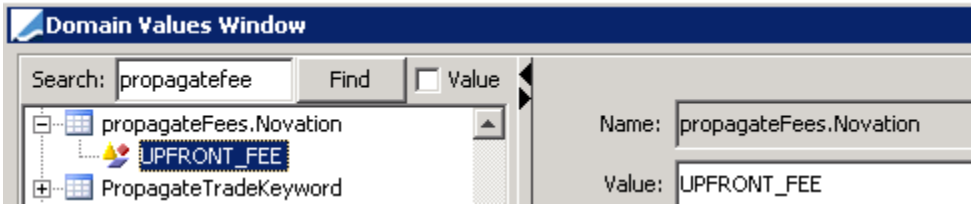
  NEW => TERMINATED (if compressed)

6.4 Trade Compression

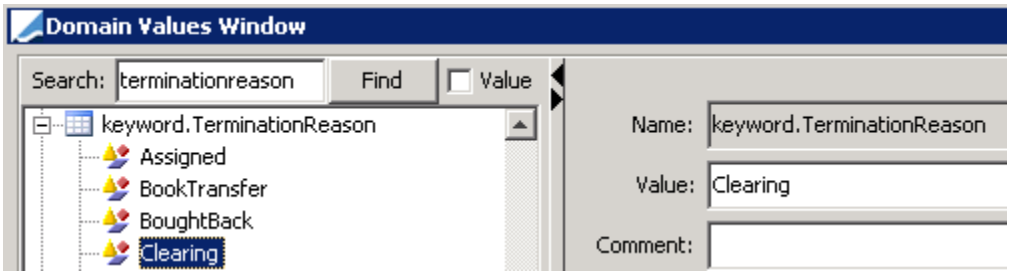
The trade compression can be triggered by the CMF file or by the affirmation platform. In the current implementation, most of the compression will be based on the CMF files. However, over time, for some specific products/CCPs, the compression might be handled by the affirmation platform.

6.4.1 Setup Requirements

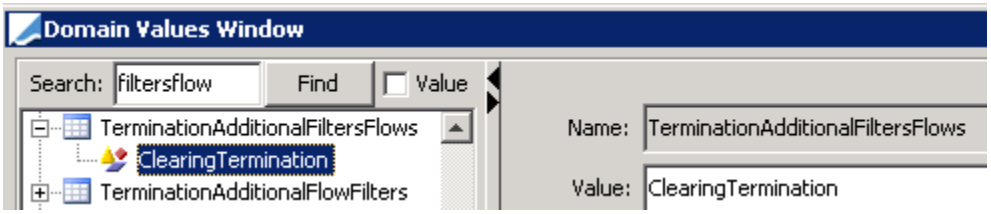
The domain "propagateFees.novation" must contain the fee types that need to be propagated to the new trade resulting from the novation, it contains UPFRONT_FEE by default:



The domain "keyword.TerminationReason" must contain the termination reason "Clearing":



The domain "TerminationAdditionalFiltersFlows" must contain the value "ClearingTermination". This allows removing the fees that have been propagated to the resulting trade from the parent trade.



You can use the logging category ClearingTerminationFilterFlows to monitor the novation process.

6.4.2 Process

The import of the CMF files handles the compression process as follows:

- All the compressed trades will be reported with the TERMINATION action, i.e. considered as terminated.
- For all the compressed trades, a new column will be available, which will contain the USI of the new trade created as the result of the compression. If this column is not available, the compression can still happen but there will be no link between trades.

- For the new created trade, the CMF should provide an FPML message for each new trade so that it can be created.
- The Data Uploader will terminate all the compressed trades using the existing TERMINATION action (termination reason Clearing, termination type Novation).
- The Data Uploader will create a new trade based on received FPML message.
- The same file can be used to generate the trade compression and upload PL Marks for all the trades. But this required a specific process in the Data Uploader (which will process the file twice).
- The mapping in the Data Uploader will be done based on the USI (except for new trades).

	A	B	C	D	E	F	G	H	I	J	K
1											
2			Fields required for compression process								
3			Fields to be used to import PL Marks at trade								
4			Until we can use the Internal Ref, column F needs to be manually updated								
5											
6											
7	Value Date		ACTION	CCP Id (internal reference)	Internal Ref	Terminated into	Upfront payment	NPV	Currency	Effective Date	Maturity Date
8	3/5/2013		TERMINATE	USD3L-20130207-20180207-1	CCY-PDT FAMILY_CCPACCOUNT REF	USD3L-20121120-20171120-1	0	5,449.58	USD	2/7/2013	2/7/2018
9	3/5/2013		TERMINATE	USD3L-20130207-20180208-1	CCY-PDT FAMILY_CCPACCOUNT REF	USD3L-20121120-20171120-1	0	-23,343.19	USD	8/2/2012	8/2/2017
10	3/5/2013		TERMINATE	USD3L-20130207-20180209-1	CCY-PDT FAMILY_CCPACCOUNT REF	USD3L-20121120-20171120-1	0	-9,586.97	USD	11/20/2012	11/20/2017
11	3/5/2013		NEW	USD3L-20121120-20171120-1	CCY-PDT FAMILY_CCPACCOUNT REF		-27,480.58	0.00	USD	11/20/2012	11/20/2017
12	3/5/2013		EXISTING	USD3L-20121123-20171123-1	CCY-PDT FAMILY_CCPACCOUNT REF			-9,444.12	USD	11/23/2012	11/23/2017
13	3/5/2013		EXISTING	USD3L-20121123-20171123-1	CCY-PDT FAMILY_CCPACCOUNT REF			-9,444.12	USD	11/23/2012	11/23/2017
14	3/5/2013		EXISTING	USD3L-20121205-20171205-0.9	CCY-PDT FAMILY_CCPACCOUNT REF			-3,927.61	USD	12/5/2012	12/5/2017

file for compression V2.xlsx

The Data Uploader offers multiple methods for uploading data.

▶ Please refer to the Calypso Data Uploader Integration Guide for details.

6.5 Clearing Transfers

In the case of multi-currency portfolios, there are 2 different possible approaches in terms of VM settlements:

- Multi-currency VM, i.e. there will be a VM settlement for each traded currency.
- Single currency VM, i.e. there is a single VM settlement expressed in a selected base currency, which is independent from the trade currencies.

Clearing Transfers trades are created when importing the CMF files through the Data Uploader, to represent the VM.

6.5.1 Multi-Currency VM

In this solution, there will be one clearing transfer for each position account/service/CCP/currency.

- The principal amount of each clearing transfer represents the net settlement due to/from the broker.
- Clearing Transfers will also be used to model and import Account Level Fees.
- Fees will be created in Calypso to represent the breakdown of the net settlement into its components to enable the client to account for these items separately.

- Each fee will generate a separate transfer; all transfers can be routed with unique SDI's and settled/netted independently.
- No global transfer will be generated at the clearing transfer trade level (required set up: Domain Value SuppressClearingTransferFlow = true)
- The Initial Margin transfer created by the Margin Call trade can also be routed with similar SDI's and settled/netted independently.
- Fees are also defined to produce accounting. Accounting entries for the fees will post to a clearance control account.
- The fee naming convention is the choice of the Client and additional fees can be added as required. Here is a proposed best practice list of fees:

  CMF_UPFRONT: for upfront swap fees

  CMF_COUPON: for swap coupon payments

  CMF_PAI: for PAI

  CMF_VM: for daily variation margin

  CMF_EXECUTION: for execution fees

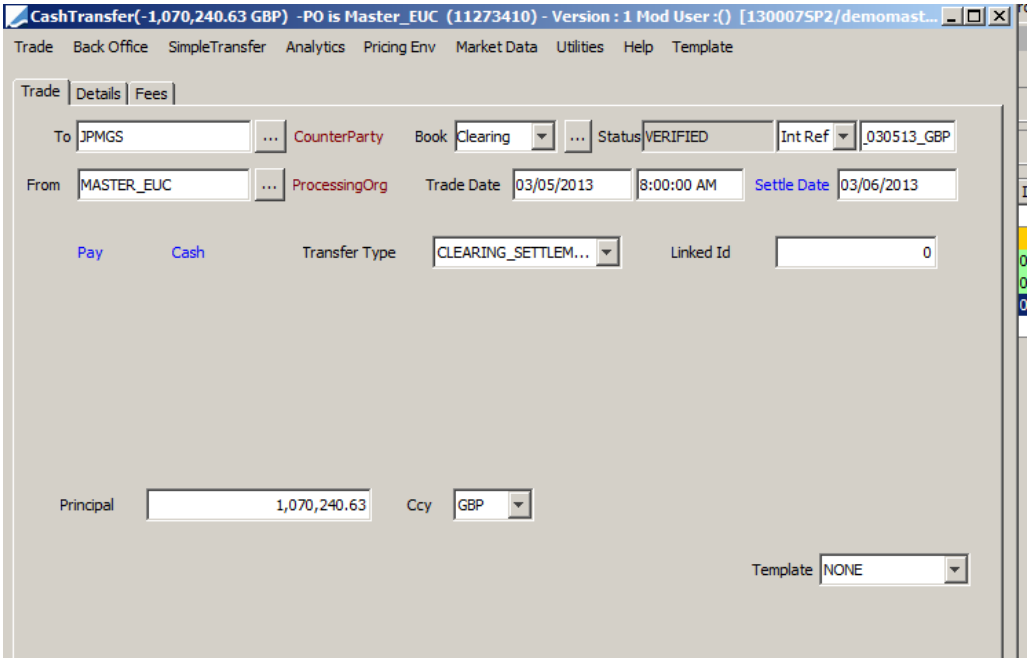
NOTE: Clearing Transfers are created on every business day based on the cleared trades positions per CMF / CCP / Products / Currencies.

The CMF file that details the activity on T is received first thing in the morning on T+1; the clearing end user is expected to meet any margin calls by midday (roughly) that day.

Clearing Transfers Attributes

- Counterparty = <clearing member>
- Book = Trading Book
- Currency = Variation Margin currency – driven by currency of the Clearing Transfers.
- Valuation= based on MARGIN_CALL PL Mark
- Keyword 1 = CCP
- Keyword 2 = CCP Account Reference
- Keyword 3 = CONCATENATE (Ccy, CCPAccountReference and ProductFamily)

Example:



Type	Date	Start Date	End Date	Currency	Amount	Legal Entity	Pay/Rec	Known Date
FCM_UPFRONT	03/06/2013	03/06/2013	03/06/2013	USD	0	JP Morgan Global Securities	REC	03/06/2013
FCM_COUPON	03/06/2013	03/06/2013	03/06/2013	USD	6,210	JP Morgan Global Securities	PAY	03/06/2013
FCM_VM	03/06/2013	03/06/2013	03/06/2013	USD	428,824.35	JP Morgan Global Securities	PAY	03/06/2013
FCM_PAI	03/06/2013	03/06/2013	03/06/2013	USD	159.67	JP Morgan Global Securities	PAY	03/06/2013
FCM_EXECUTION	03/06/2013	03/06/2013	03/06/2013	USD	0	JP Morgan Global Securities	REC	03/06/2013

Clearing transfers will be imported from the CMF statement converted to a csv or xml generic format.

Required fields in the CMF file (please refer to the Data Uploader Schema File “Import ClearingTransfer.xls” and XML template below):

- Currency
- Clearing Transfer Principal Amount
- Principal Amount direction (pay/rcv)
- Settlement date
- For each fee:
- fee type (COUPON, TRADE FEE, MTM CHANGE, PAI, ACCOUNT FEE)
- fee amount
- fee direction
- fee date
- CCP Account Reference
- CCP name
- Keyword 3 = CONCATENATE (Ccy, CCPAccountReference and ProductFamily (service))

- Counterparty

No mapping is required with Calypso existing trades since new Clearing Transfers are created daily.

Sample files can be found in the Data Uploader samples:

ClearingTRansfer_USD.XML

Import Clearing Transfers.xlsx

The Data Uploader offers multiple methods for uploading data.

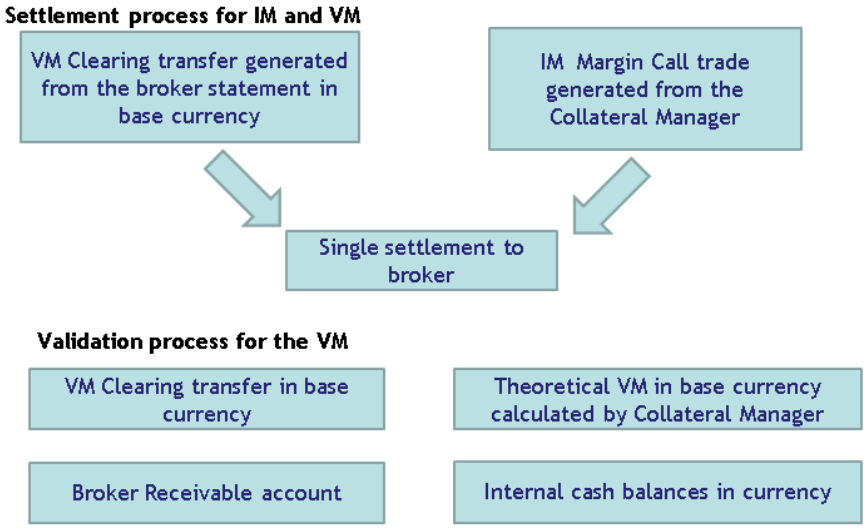
▶ Please refer to the Calypso Data Uploader Integration Guide for details.

6.5.2 Single Currency VM

In this solution, we are going to store 2 types of clearing transfers:

- Clearing transfer in the VM base currency to generate the settlement to the clearing broker.
- Clearing transfers in the trades native currencies to generate corresponding accounting entries, and internal cash positions in the native currency.

This solution will generate a settlement based on the broker statement and, at the same time, the possibility to validate the native currency VM exposure:



Clearing transfer in base currency:

There will be one clearing transfer for each position account/service/CCP.

- The principal amount of this trade represents the net VM settlement due to/from the broker.
- No fees will be associated with the Clearing Transfer in base currency; it is only used to settle the total VM.
- To validate the clearing transfer in base currency, the Collateral Manager can be used to calculate a theoretical VM based on the Clearing Transfers imported in native currency.

Clearing transfers in native currency:

- Clearing Transfers will also be used to model and import Account Level Fees and VM cash position in native currency.
- The Clearing Transfers will be created as described in the previous section.
- The only difference is that no settlement will be generated from the Clearing Transfer in native currency.

6.6 Collateral Exposure Trades

A collateral exposure trade represents the IM exposure toward the CMF. The current IM requirement - updated daily - is the value of this trade and is stored in the PL mark "MARGIN_CALL".

A collateral exposure trade is linked to the IM contract for each CMF/CCP/service.

Collateral exposure trades need to be captured manually as part of the implementation; there will be one trade per CMF per CCP and per service. The Data Uploader will only be used to upload PL Marks for these trades daily.

Additional collateral exposure trades are not expected to be created, unless a new Clearing Brokers is used, or a new service is cleared.

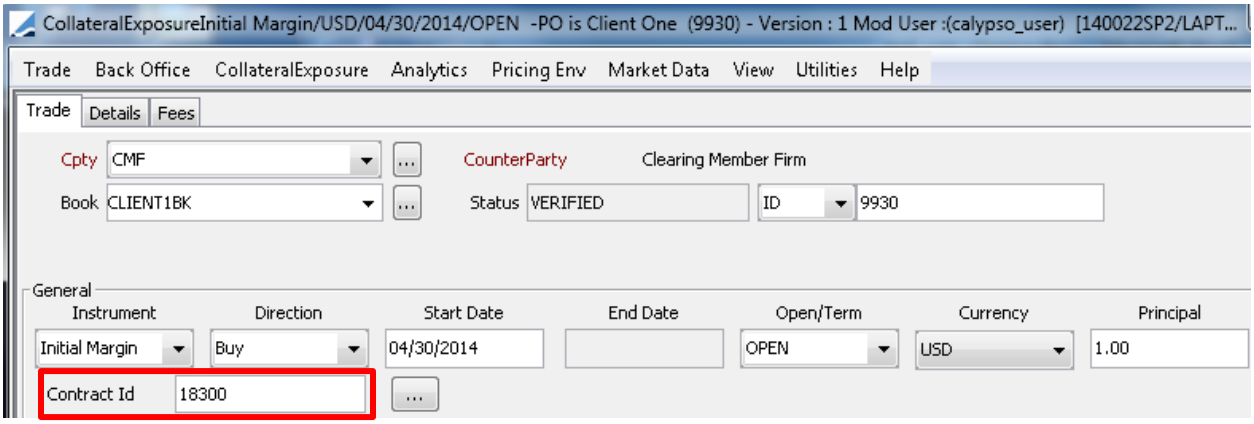
It is expected that the CMF file will include a MARGIN_CALL pricer measure, which will be the initial margin exposure, expressed in the margin call contract currency.

The Data Uploader will create a mapping between an IM Margin Call entry (in the CMF file) and a Collateral Exposure Trade (in Calypso). The mapping will be based on the Int Reference, the Ext Reference, and the CCP Account Reference.

6.6.1 Capturing Collateral Exposure Trades

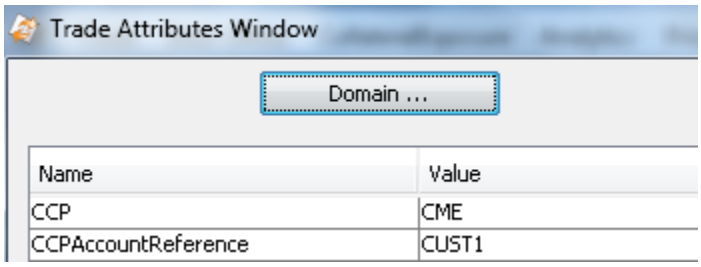
To capture Collateral Exposure trades, you need to add a menu item to the Calypso Navigator for action `trading.TradeCollateralExposureWindow`.

Then bring up the Collateral Exposure trade window and enter a trade for each IM margin call contract that you have defined.

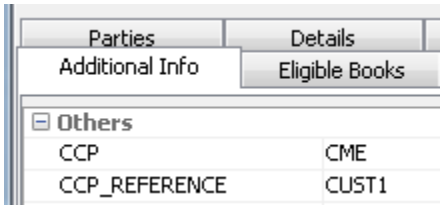


Collateral Exposure trades attributes:

- Counterparty = <CMF>
- Instrument = Initial Margin
- Currency = <Margin Call Contract currency>
- Principal = 1
- Contract Id = <IM margin call contract previously defined>
- Trade keyword CCP = <CCP>
- Trade keyword CCPAccountReference = <Account number at CCP, same as margin call contract attribute CCP_REFERENCE>



Corresponding margin call contract attributes:



Required fields for Collateral Exposure trades in the CMF file:

- Currency = <Margin Call Contract currency>
- Service
- Amount (to be saved into MARGIN_CALL PL mark for this trade)
- CCP Account Reference

6.6.2 Importing PL Marks for Collateral Exposure Trades

MARGIN_CALL PL marks are imported from a file provided by the CMF:

Action	TradeCounterparty	TradeBook	TradeCurrency	MARGIN_CALL	TradeDateTime	ProductType	Instrument	StartDate	EndDate	OpenTerm	ProductFamily	CCPAccount Reference	Internal Ref
NEW	JPMGS	Clearing	USD	27548440.82	20130305	CollateralExposure	Initial Margin	20130306	20130306	OPEN	Rate	123456	Concatenate (Product,Ccy,CCPAccountReference)
NEW	JPMGS	Clearing	JPY	123456	20130305	CollateralExposure	Initial Margin	20130306	20130306	OPEN	FX	123457	Concatenate (Product,Ccy,CCPAccountReference)

See Importing Marks from the CMF for details.

6.7 Clearing Fees

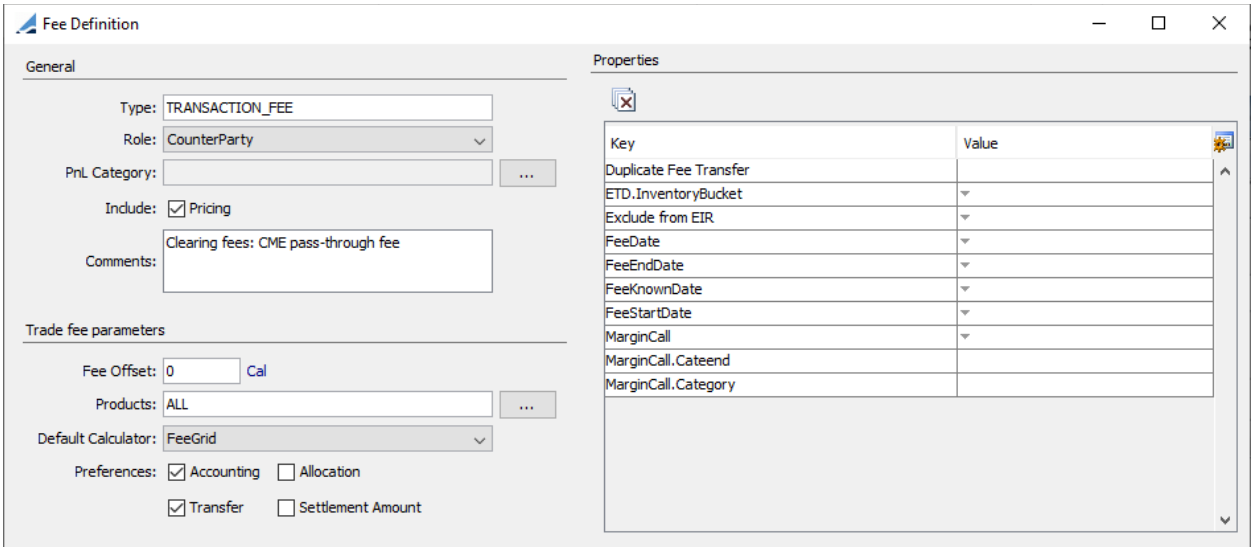
CCPs charge a variety of fees for giving access to Clearing Members and End Users to their infrastructure and services. The CCP will charge the fees to the FCMs and the FCMs will pass these fees down to the EUC.

Calypso replicates most of the CCP fees for both, Standard and high-turnover plans.

6.7.1 Initial Setup

Fee Definition

Before setting up the different fees, go to Main Entry > Configuration > Fees, Haircuts, & Margin Calls > Fee Definition and create a fee name/ fee definition for each applicable fee



Domain Values

Domain Name	Recommended Domain Value	Description
TransactionStartDate	LCH	If set, the system will only consider the CCPClearedDate of a cleared trade to compute the residual maturity and determine which tenor bucket/ fee rate is applicable. In other words, if set the system will apply following formula: Residual Trade Maturity = End Date - CCPClearedDate. If not set the default formula would be: Residual Trade Maturity = End Date - MAX (CCPClearedDate, Start Date)

Domain Name	Recommended Domain Value	Description
TransactionAdjustedEndDate	LCH	If set, the system will consider the adjusted end date of the cleared trade to compute the residual maturity and determine which tenor bucket/ fee rate is applicable. In other words, if set the system will apply following formula: Residual Trade Maturity = Adjusted End Date - Start Date. If not set the default formula would be: Residual Trade Maturity = End Date - Start Date
MaintenanceStartDate	CME LCH	If set, the system will only consider the CCPClearedDate of a cleared trade to determine the anniversary date on which the fee should accrue. If not set it will consider the Max (CCPClearedDate, Start Date)
MaintenanceAdjustedEndDate	LCH	If set, the period during which the Maintenance fee may accrue will reach out until the adjusted end date of the cleared trade. If not set the period will only reach out until the end date (i.e. unadjusted date) of the cleared trade
MaintenanceOriginalClearDate	LCH	If set, the system will look up the trade keyword CCPOriginalClearedDate and if it is present, it will use it over the CCPClearedDate to determine the anniversary date on which the fee should accrue.

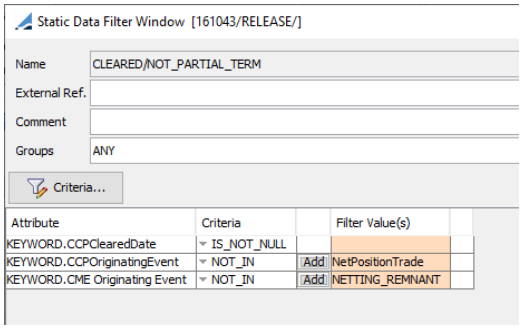
6.7.2 Transaction fees

Transaction fees are a “one-time fee” that are triggered by the cleared trade. There are two 2 types of transaction fee methodologies with either a flat fee per ticket or a fee computed based on the notional amount and the trade maturity date.

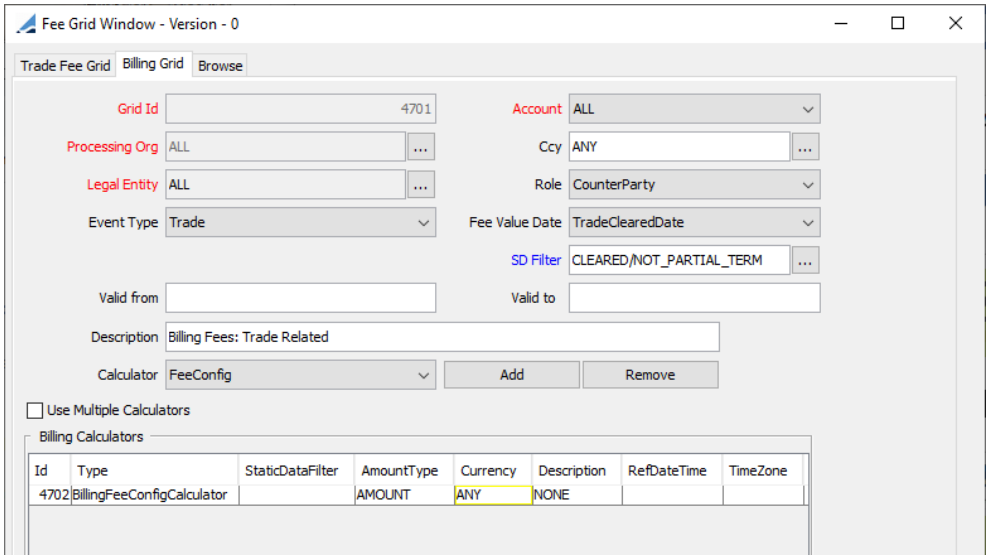
Fee Grid

Choose **Configuration > Fees, Haircuts, & Margin Calls > Fee Grid**

- Event Type = Trade
- Role = CounterParty
- Fee Value Date = TradeClearedDate
- SD Filter = Exclude netting remnant trades



- Calculator = FeeConfig

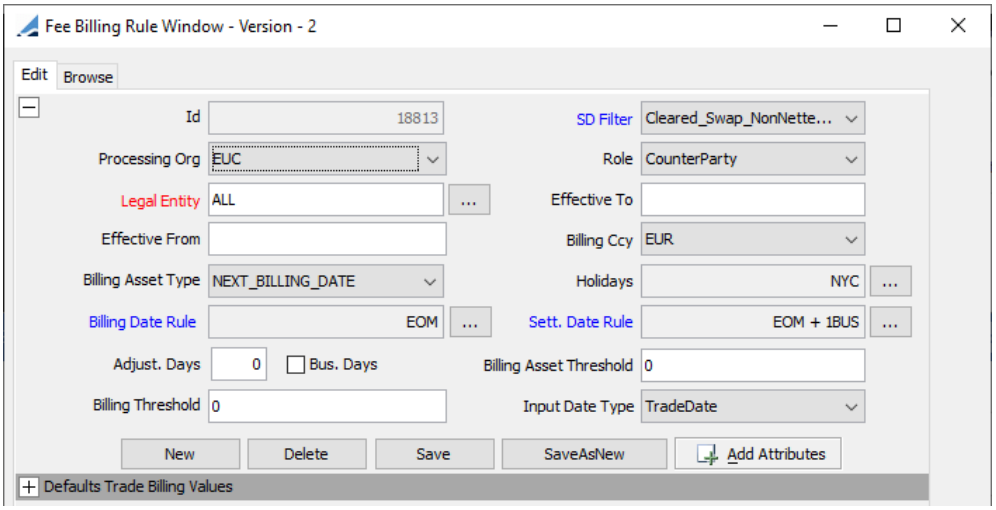


Fee Billing Rule

Choose **Configuration > Fees, Haircuts, & Margin Calls > Fee Billing Rule**

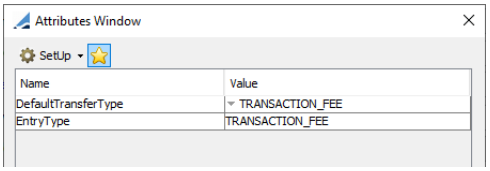
In this window you will define the periodicity and settlement rules of the Billing trade

- Role = CounterParty
- Billing Ccy = Currency set on Billing Trade
- Billing Date Rule = defines how long the fee will accrue, for instance until end of month
- Settl. Date Rule = determines when the Billing Trade will settle, for instance +1 business day after EOM
- Input Date Type = TradeDate



In attributes set:

- EntryType = Fee name as defined in Fee Definition, for instance TRANSACTION_FEE
- DefaultTransferType = Transfer that will be generated on Billing Trade



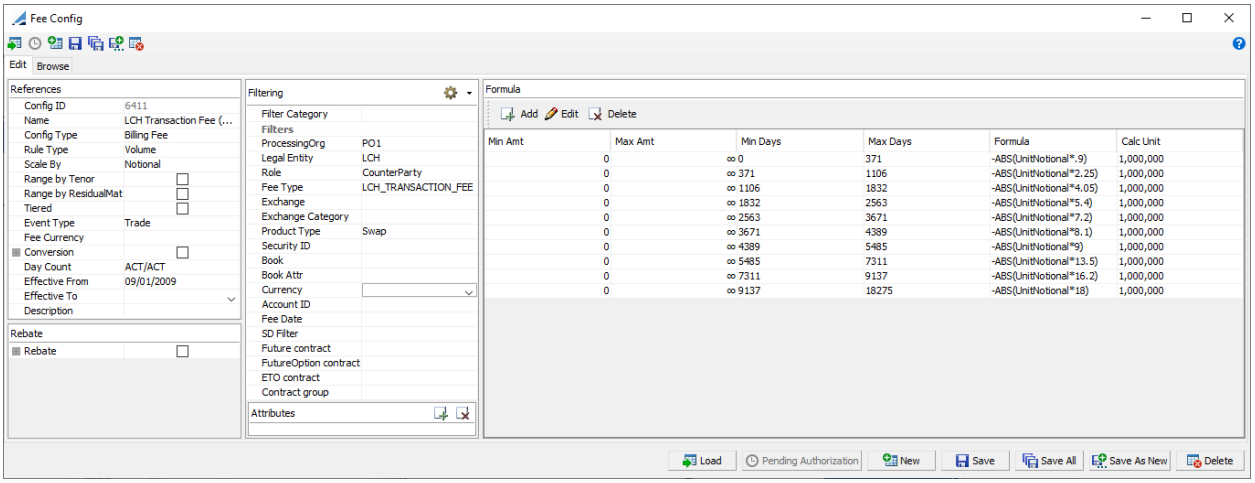
Fee Config

Choose **Configuration > Fees, Haircuts, & Margin Calls > Fee Config**

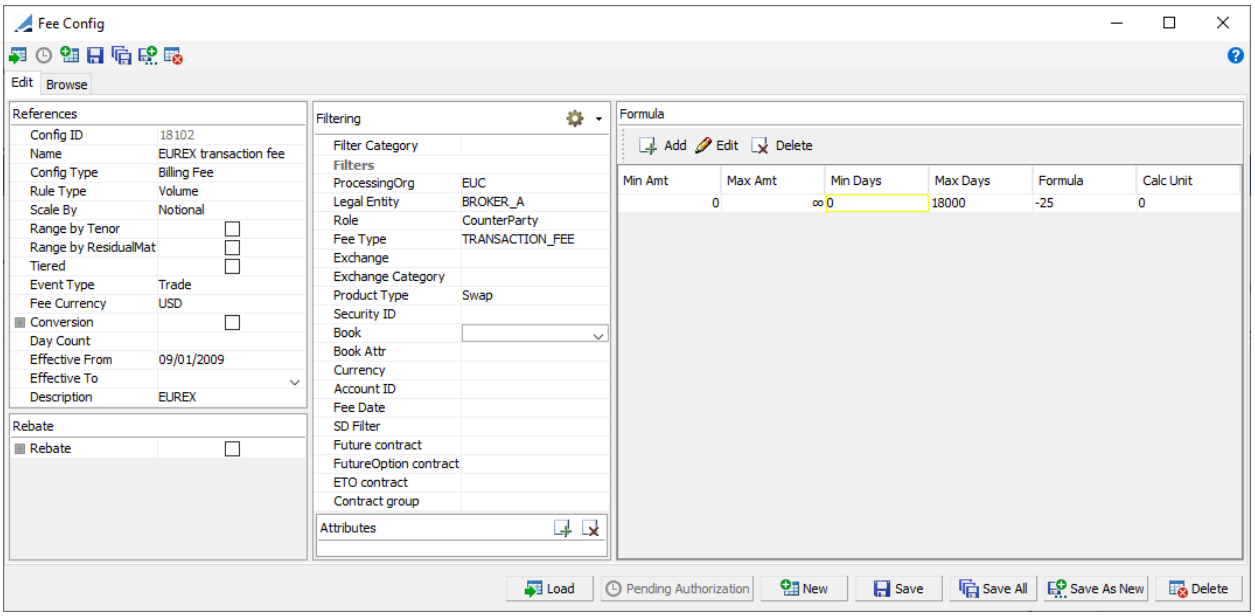
In this window you will define the actual fee schedule

- ConfigType = Billing Fee
- Rule Type = Volume
- Scale by = Notional
- Event Type = Trade
- Role = CounterParty
- Fee Type = Must match the fee defined in Fee Definition and Billing Rule

Fee Schedule per notional / maturity (Standard Plan)



Fixed Fee Schedule (High Turnover Plan)



6.7.3 Maintenance Fees (Standard Plan)

To generate maintenance fee trades for rule type “Maintenance” with event = MaintenanceTrade, you need to set PO attribute “ClearingType” = EUC. The scheduled task ACCOUNT_BILLING will retrieve all non-cancelled trades where Trade Party Short Name matches the value stored in Account Attribute “CCP” (and trade keyword CCPAccountReference contains the External name of the Account). For each trade, it will look for a fee configuration using the legal entity and role of the account.

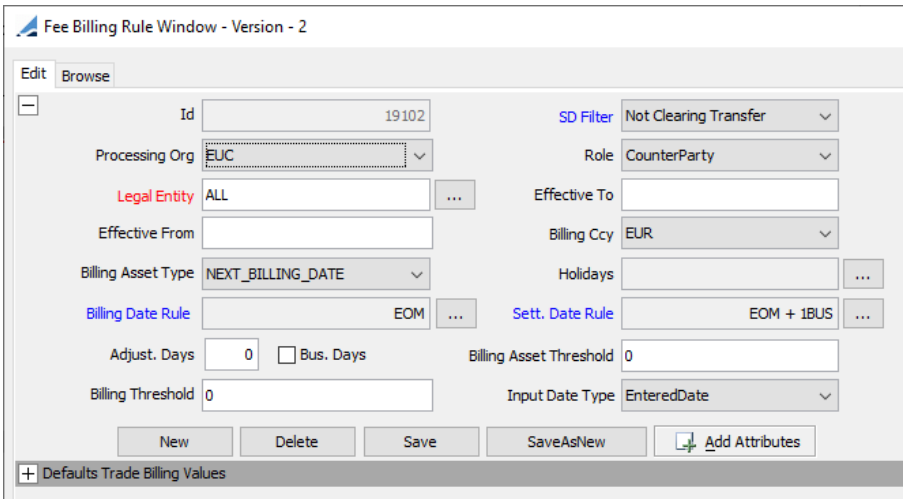
The Standard Plan Maintenance Fee is a recurring notional based Fee that is charged on a yearly basis based on trade anniversary date.

Fee Billing Rule

Choose **Configuration > Fees, Haircuts, & Margin Calls > Fee Billing Rule**

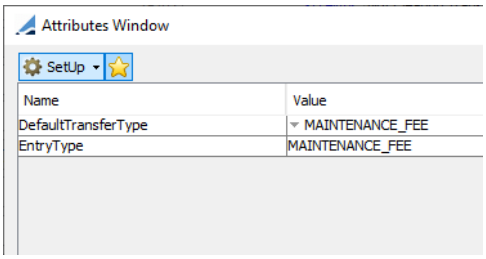
In this window you will define the periodicity and settlement rules of the Billing trade

- Role = CounterParty
- Billing Ccy = Currency set on Billing Trade
- Billing Date Rule = defines how long the fee will accrue, for instance until end of month
- Settl. Date Rule = determines when the Billing Trade will settle, for instance +1 business day after EOM
- Input Date Type = EnteredDate



In attributes set:

- EntryType = Fee name as defined in Fee Definition, for instance MAINTENANCE_FEE
- DefaultTransferType = Transfer that will be generated on Billing Trade



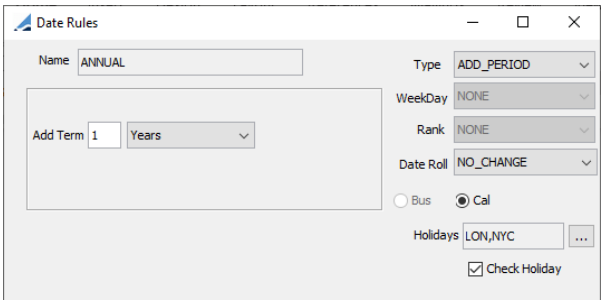
Fee Config

Choose **Configuration > Fees, Haircuts, & Margin Calls > Fee Config**

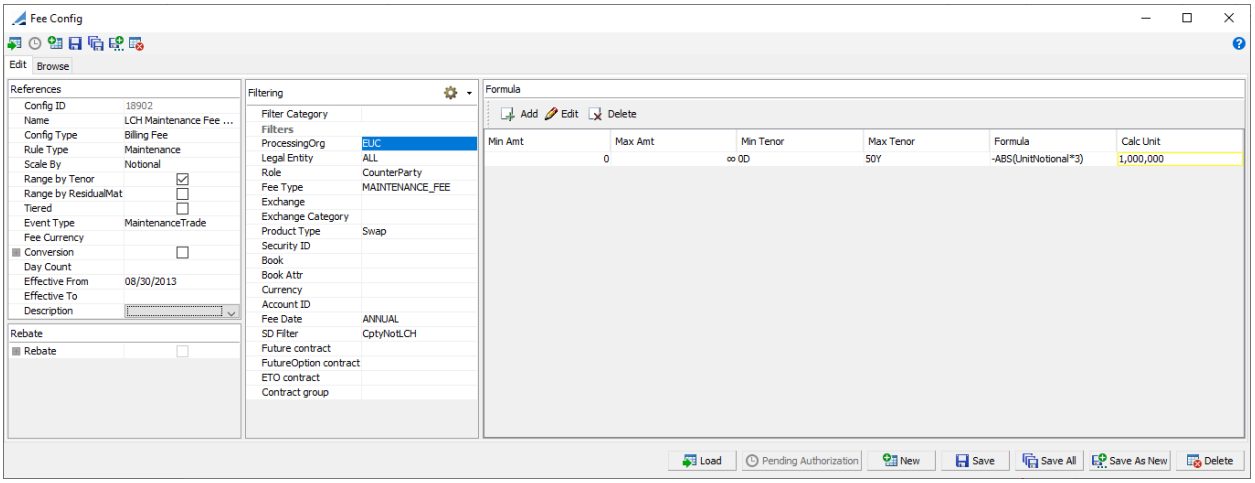
In this window you will define the actual fee schedule

- ConfigType = Billing Fe

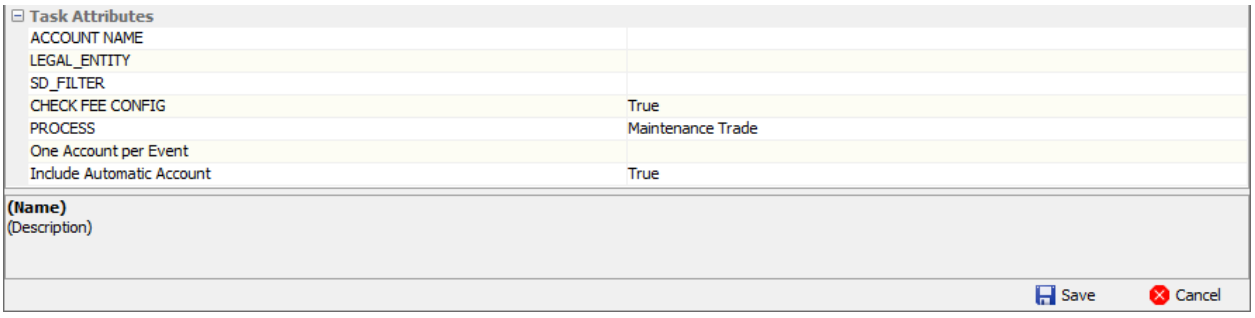
- Rule Type = Maintenance
- Scale by = Notional
- Event Type = MaintenanceTrade
- Role = CounterParty
- Fee Type = Must match the fee defined in Fee Definition and Billing Rule
- Fee Date = Usually Annual date rule



Fee Schedule per notional / maturity (Standard Plan)



Scheduled Task ACCOUNT_BILLING



6.7.4 Maintenance Fees/ IM Based Fee (High-Turnover Plan)

Fee Grid

Choose **Configuration > Fees, Haircuts, & Margin Calls > Fee Grid**, and select the Billing Grid panel to define billing grids.

The FCMs w may charge fees on the initial margin requirements.

Billing events are generated by the scheduled task CLEARING_BILLING based on account positions. The Billing engine subscribes to the billing events to generate the fees (billing trades) based on billing grids and fee billing rules.

There are two sort of initial margin fees:

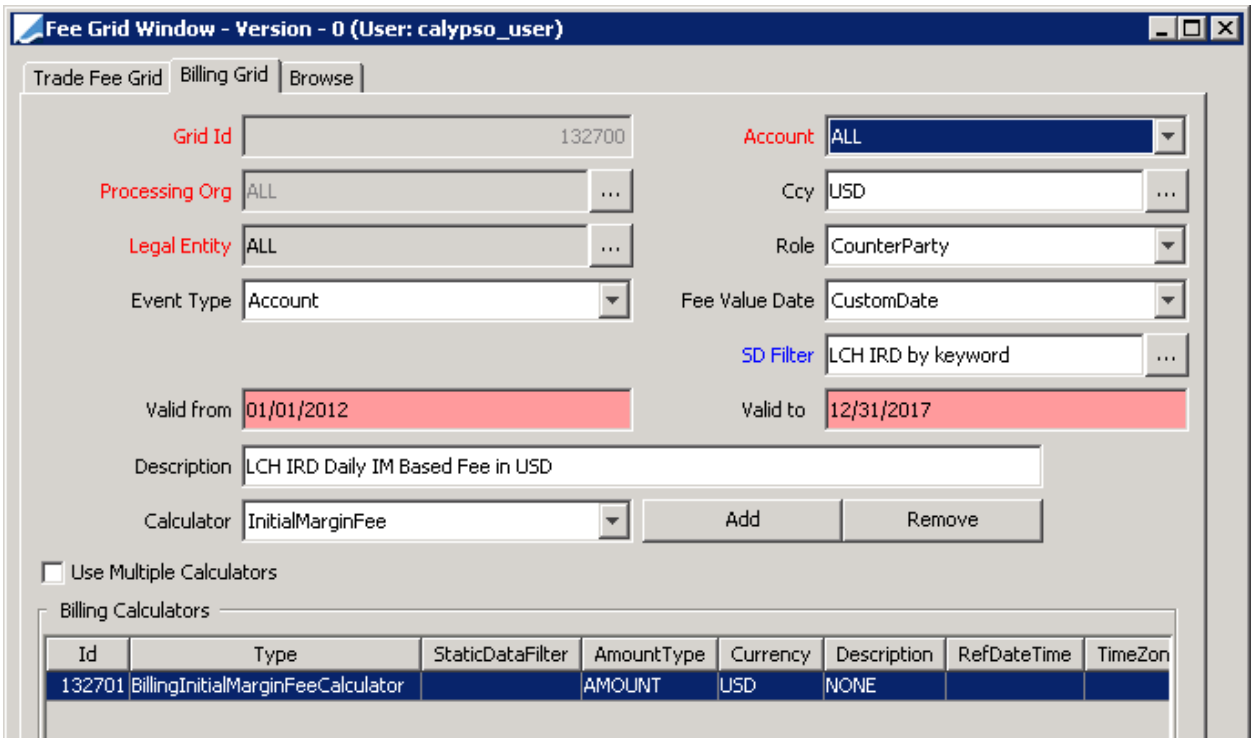
The Billing Grid calculator "InitialMarginFee" computes fees of type IM_BASED_FEE, on a periodic basis, using the scheduled task CLEARING_BILLING and the Billing engine.

The scheduled task CLEARING_BILLING will only process accounts for which the Billing checkbox is checked.

Make sure that you add IM_BASED_FEE to the domain "BillingFeeType".

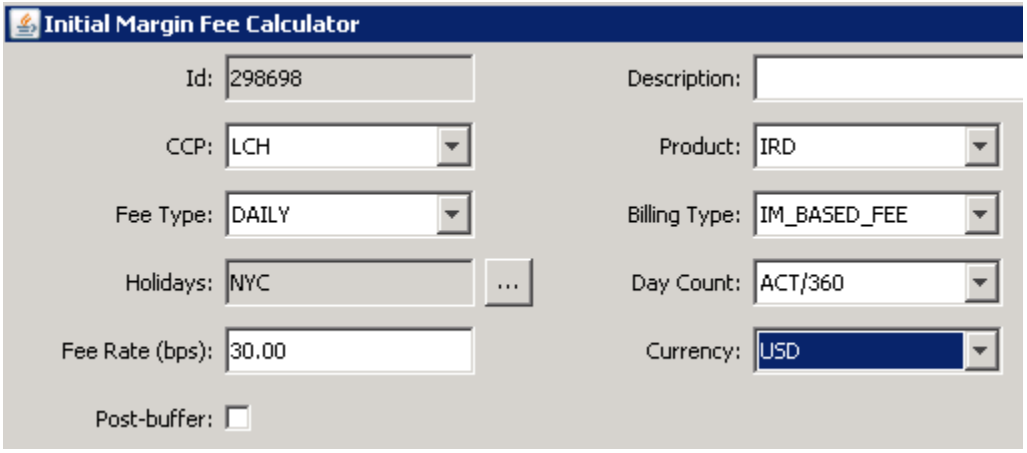
You also need to add BillingInitialMarginFeeCalculator to the domain "billingCalculator".

Setup details are described in the following sections.



Enter the criteria as needed.

Select the calculator BillingInitialMarginFeeCalculator and click **Add**.



The Daily fee type uses the previous day's IM Requirement to calculate each day's Fee and carries the calculation forward to include the non-business days that immediately follow a given date. For example, the Fee calculated for a Friday will be generated for 3 days to cover Friday, Saturday and Sunday.

The Daily fee type inserts a unique Fee into the Billing Trade for each day that the scheduled task is run. The sum of these Daily Fees will be the Monthly Total. The Fee currency for the Daily Fee is expected to be in the currency of the Requirement, so there is no FX Conversion logic.

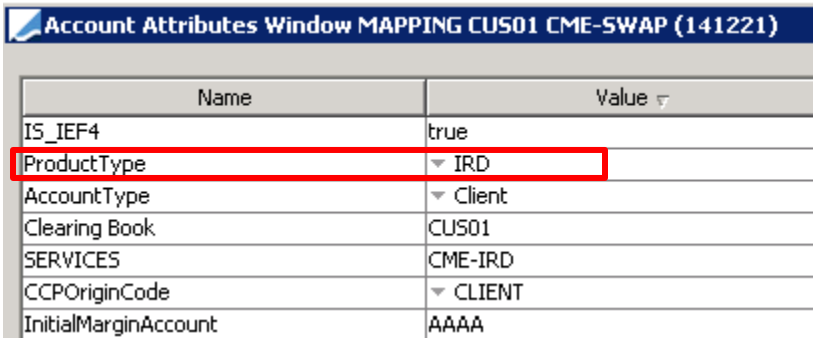
You can also select the currency as needed to define different IM requirements by currency.

If you check “Post-Buffer” the base amount to compute the fee is the Net Balance of the margin call contract (which takes the buffers into account). Otherwise, it is the pricer measure MARGIN_CALL.

Billing Account Segregation by Clearing Service

You can setup the account attribute ProductType on the billing account to segregate the billing fee by clearing service.

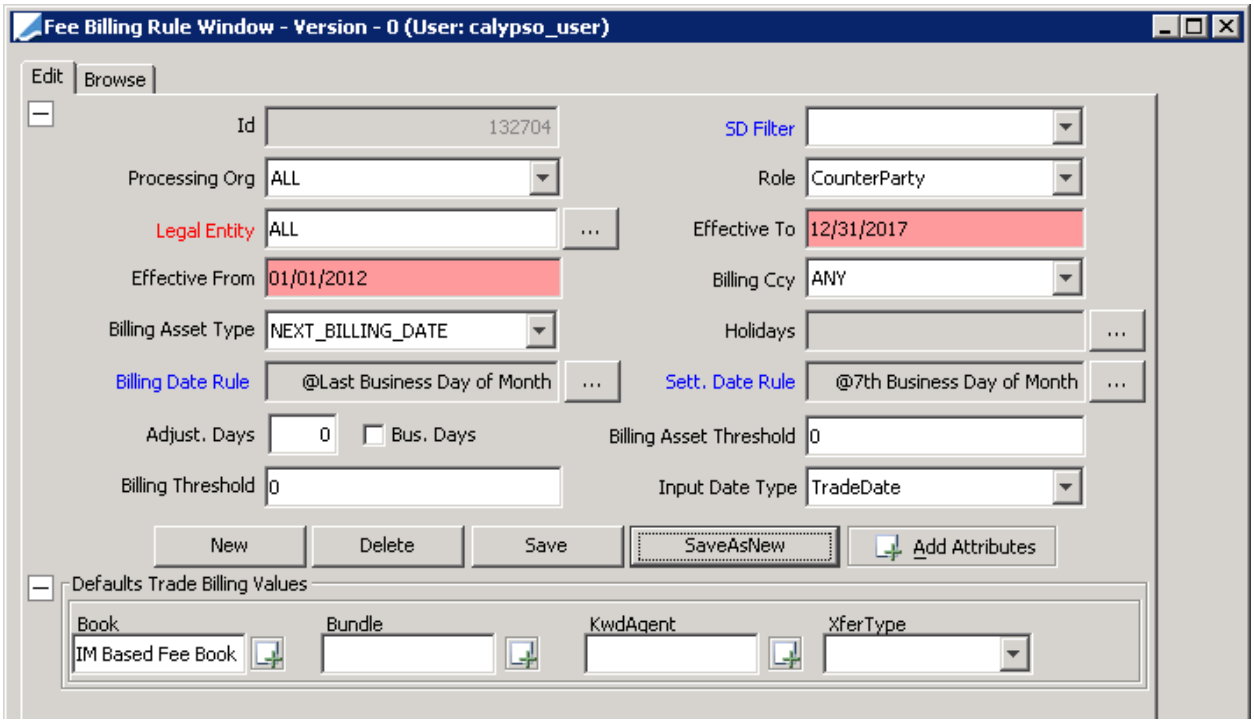
The ProductType attributes needs to match the “Product” field specified for the BillingInitialMarginFeeCalculator.



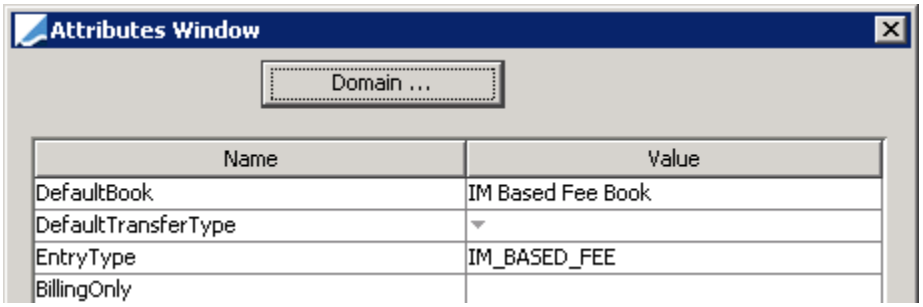
Fee Billing Rule

The billing rule allows defining the billing frequency, and a billing threshold if needed.

Define the billing rule using **Configuration > Fees, Haircuts & Margin Calls > Fee Billing Rule** (menu action `refdata.FeeBillingRuleWindow`).



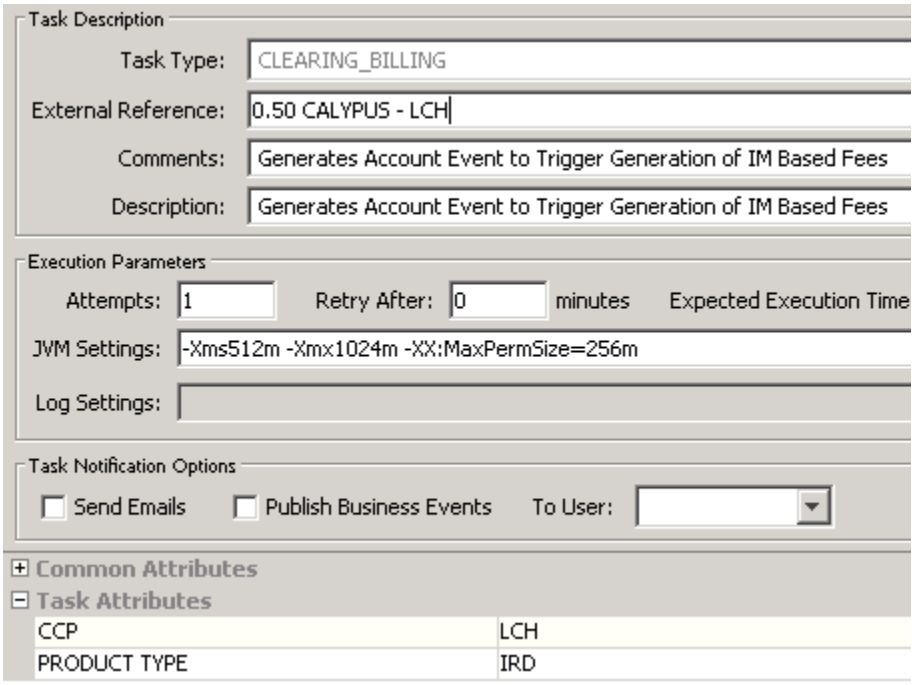
» Click **Add Attributes** to add the EntryType attribute.



Set EntryType = User-defined fee, “IM_BASED_FEE” in this example.

Scheduled Task CLEARING_BILLING

Configure the CLEARING_BILLING scheduled task.



» Select the CCP for which you want to generate the fees.

» Select the product type as needed.

Note: For the CME IM fee, the scheduled task should be run only at the end of the month.

If the business holidays are set, and the valuation date is a holiday, the scheduled task fails. You can monitor the exception in the Task Station:

- Add EX_CLEARING_BILLING to the domain “eventType”.
- Add CLEARING_BILLING to the domain “exceptionType”.

You need to set PO (end user) attribute ClearingType = EUC and the FCMs should be defined with role FCM. In this case, the scheduled task looks for legal entities having the FCM role and uses the end user’s FCM facing clearing account to generate IM based fees for the associated IM Margin Call Contract.

The scheduled task generates PSEventAccountBilling events based on the billing grid.

The Billing engine subscribes to PSEventAccountBilling events and generates billing trades based on the billing rule.

6.7.5 Account Fee

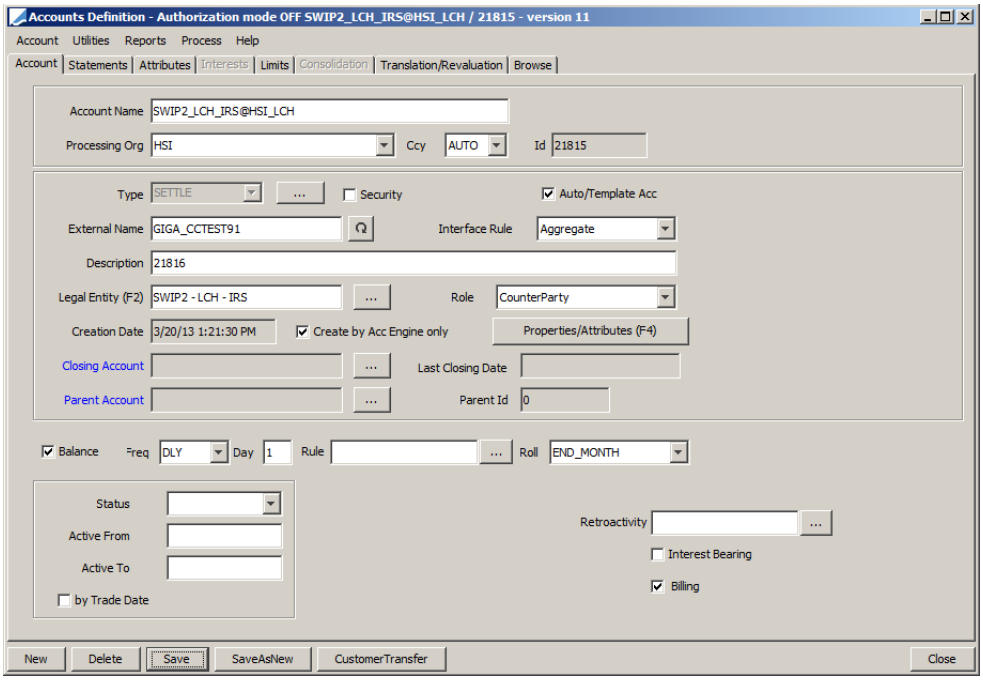
It is possible to set up a recurring fee based on a Clearing Account

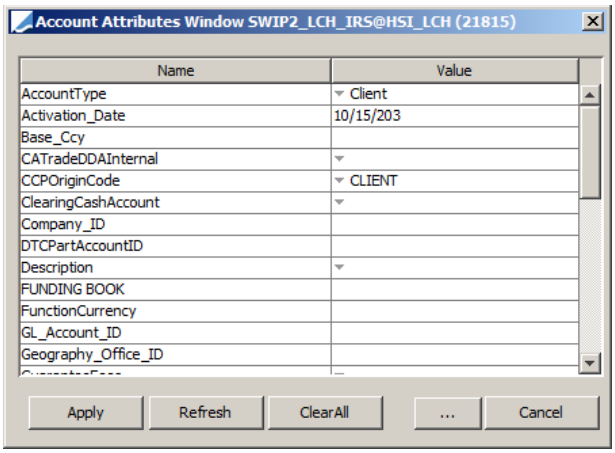
Account Setup

A new account attribute 'Activation_Date' is required on the clearing account level that will determine the anniversary date of the fee.

> Note: The expected date format is MM/DD/YYYY.

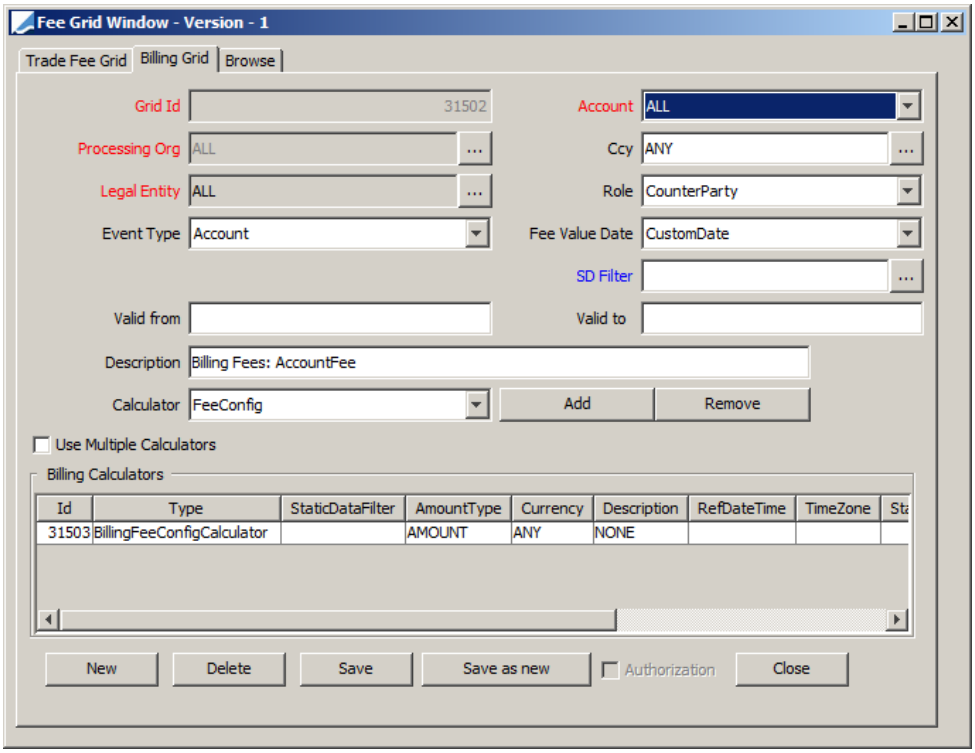
This attribute works together with the ADD_PERIOD type of Date Rule. If 'Activation_Date' is left empty, then a recurring date rule can be set up (for instance Monthly). The billing flag on the account should be ticked to true so it is processed by the scheduledtask.





Fee Billing Grid

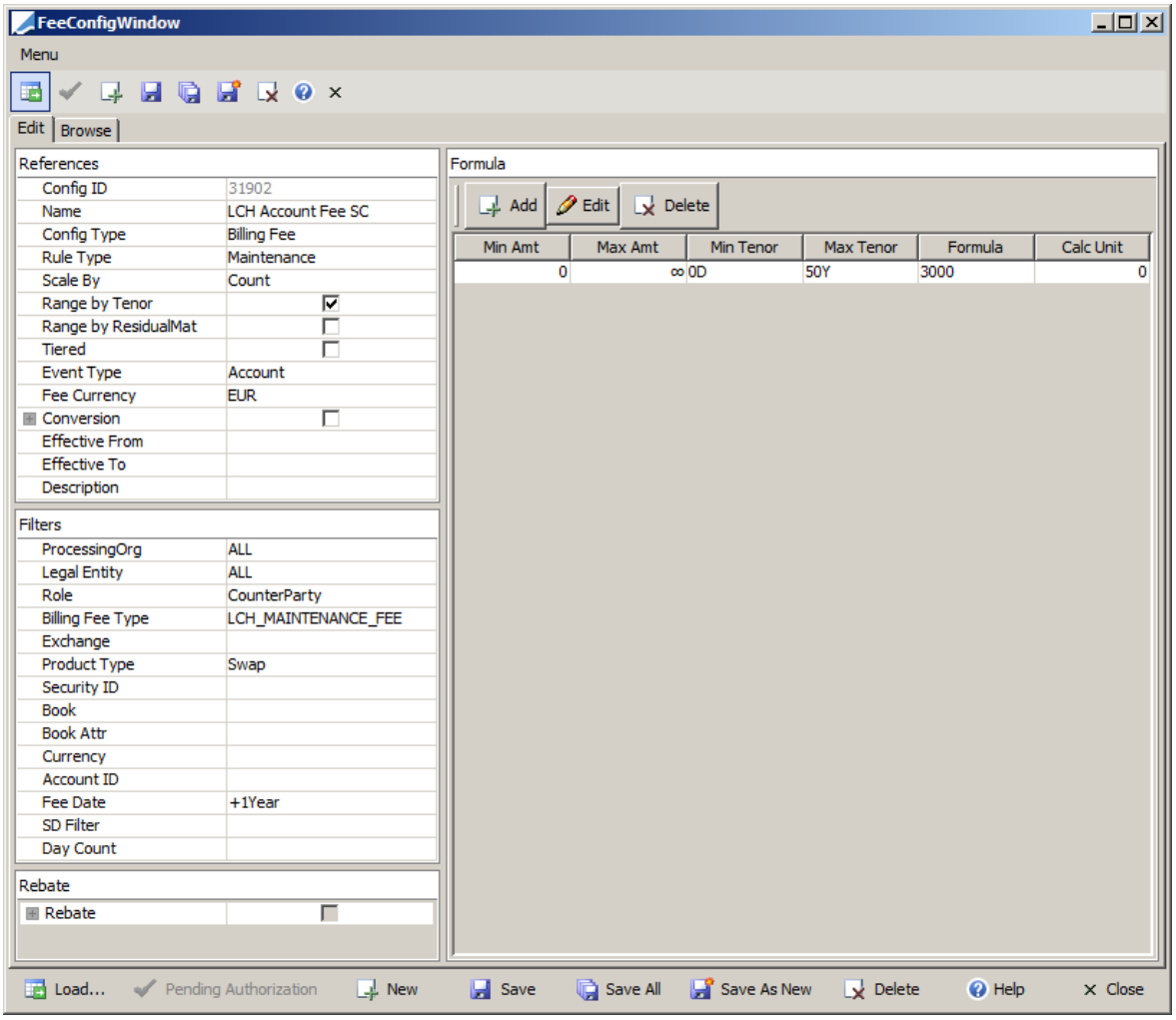
- Event Type=Account
- Fee Value Date=CustomDate
- Calculator=FeeConfig



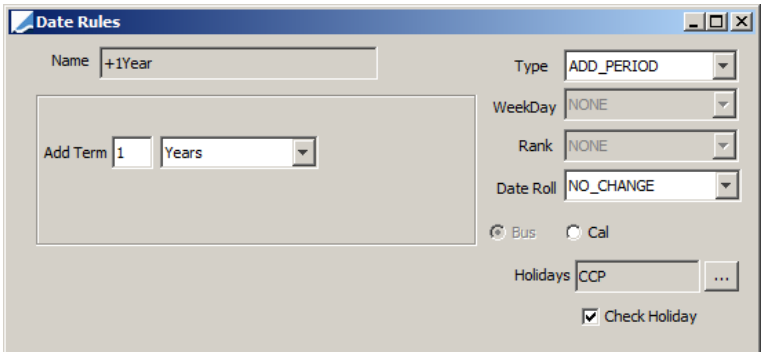
Fee Config

Fee generated at Account's anniversary date

- ConfigType = Billing
- RuleType = Maintenance
- Scale by = Count (required to generate the flat fee)
- EventType = Account
- FeeDate = Set a 'ADD_PERIOD' Date Rule, for instance +1Year

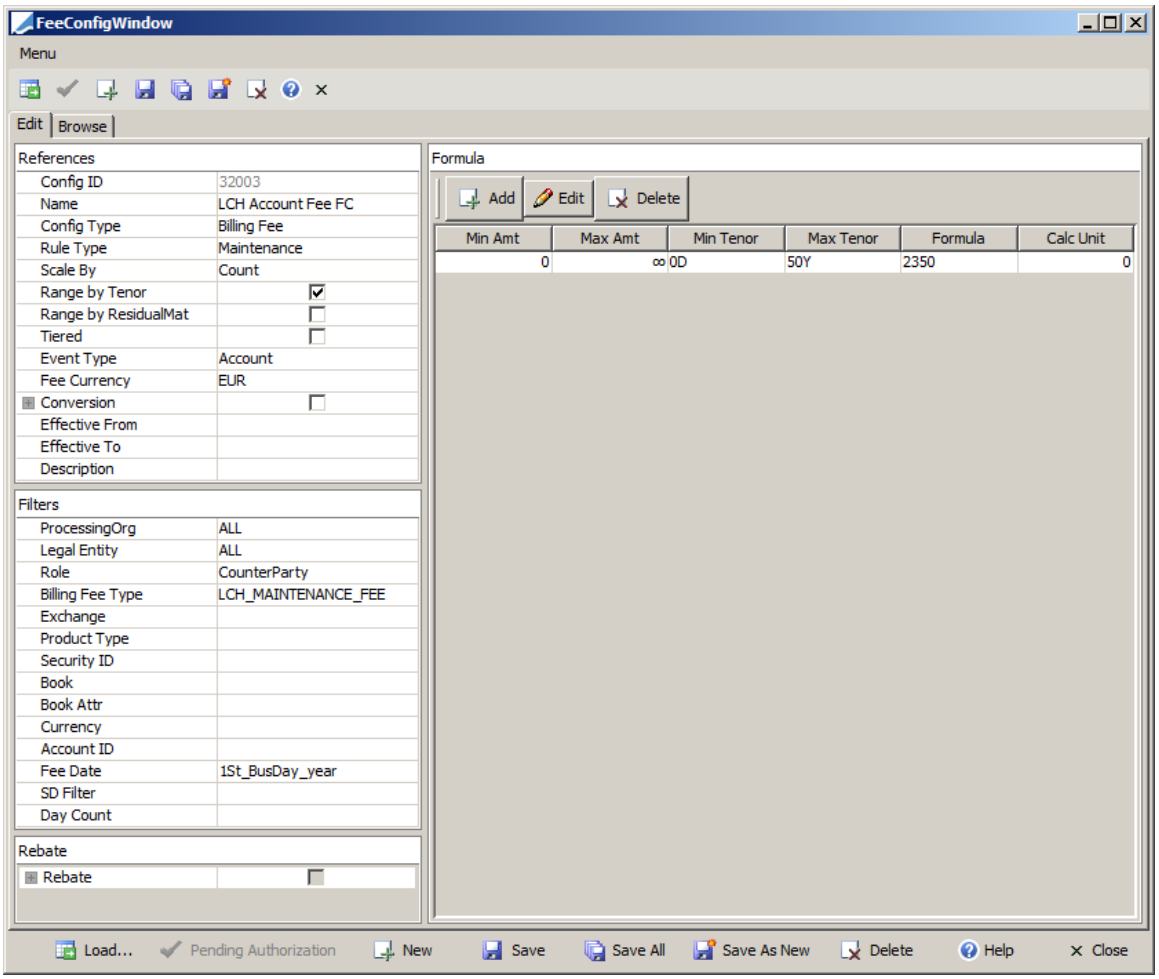


Date rule +1Year (example)

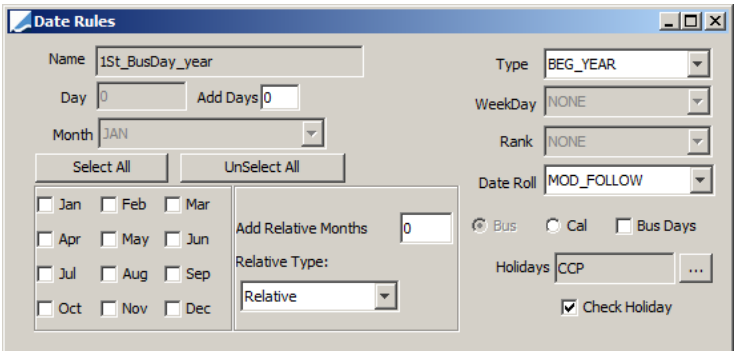


Cyclic Fee, for instance generated at beginning of each year

- ConfigType = Billing
- RuleType = Maintenance
- Scale by = Count (required to generate the flat fee)
- EventType = Account
- FeeDate = Set a Recurring Date Rule, for instance 1 business day of the year etc.

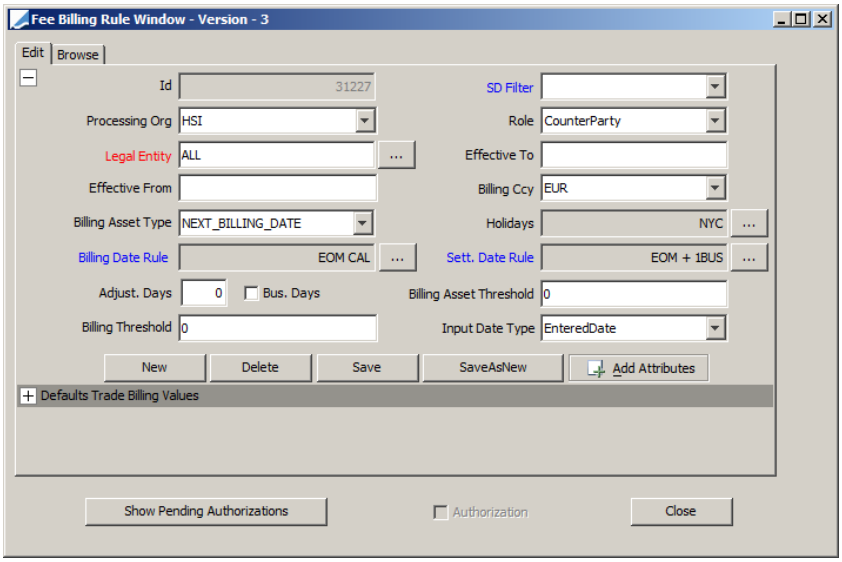


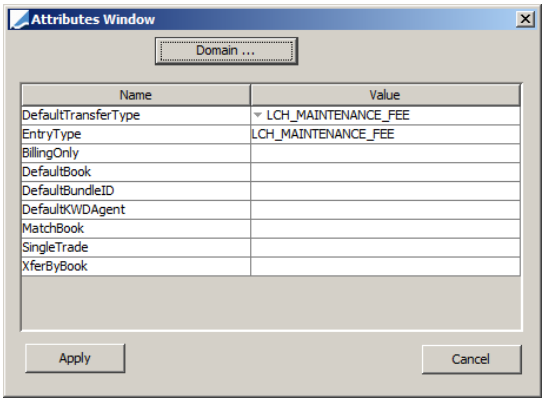
Date rule 1st business day of the year (example)



Fee Billing Rule

Fee Billing Rule Example

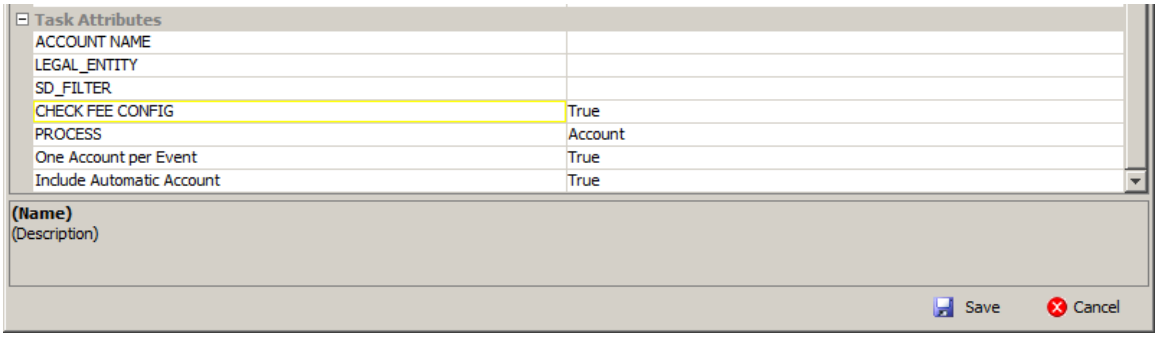




Scheduled Task ACCOUNT_BILLING

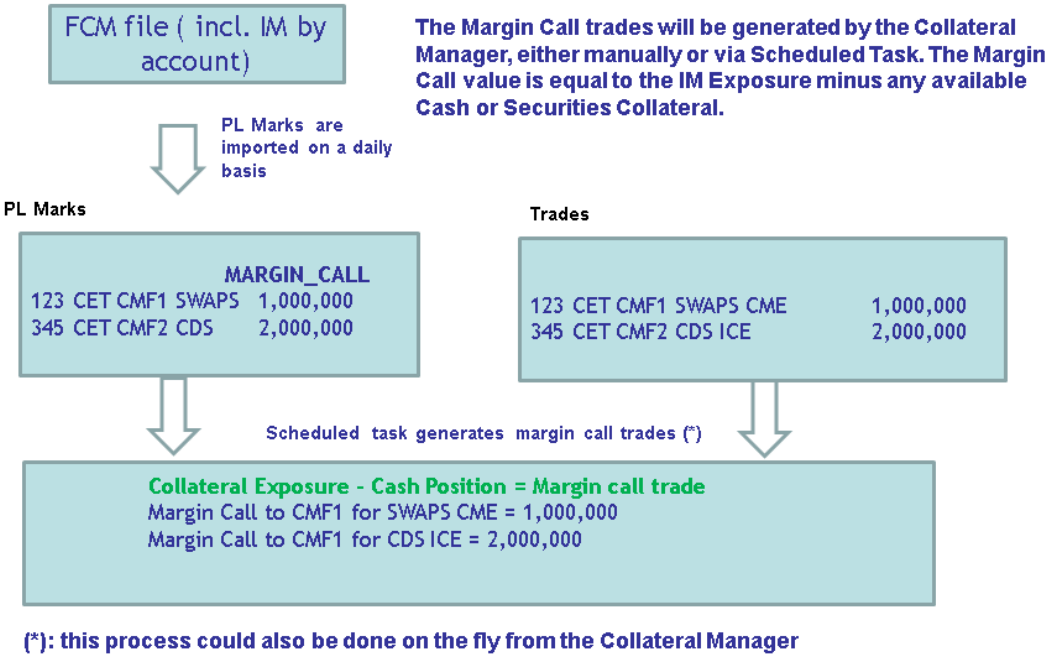
The scheduled task ACCOUNT_BILLING should run daily to trigger the account related fees

- CHECK_FEE_CONFIG = True
- PROCESS=Account
- One Account per Event = True
- Include Automatic Account = True



6.8 Margin Call Trades

The Initial Margin settlement is modeled as a Margin Call trade. The Margin Call generation is the following:



You can first generate cash margin calls using the scheduled task COLLATERAL_MANAGEMENT, then allocate the margin calls using the Collateral manager, or directly generate the margin calls using the Collateral Manager.

Generating the Margin Call Trades via Scheduled Task

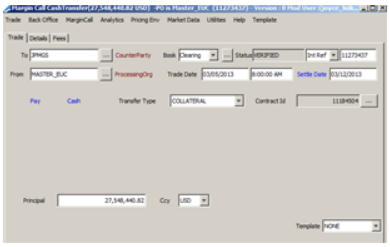
task COLLATERAL_MANAGEMENT.

This scheduled task is automatically executed by the Scheduler engine.

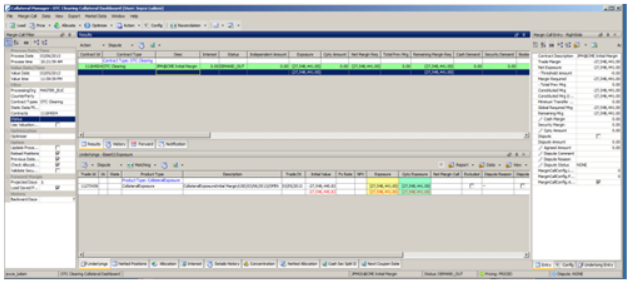
Attribute	Value
Template	Clearing-CGM
Optimization	
Concentration	
Reload Positions	false
Price method	PRICE
Total Thread Pool Size	

[NOTE: The template is a Collateral Manager template]

For IM contracts, the scheduled task loads the corresponding Collateral Exposure trades. The exposure is the PL mark MARGIN_CALL.



Generating the Margin Call from the Collateral Manager



- Please refer to Calypso Collateral Management documentation for complete details on using the scheduled task COLLATERAL_MANAGEMENT or the Collateral Manager.
- Sample margin call allocations are also shown in the *Calypso Clearing Member User Guide*.

Netting and Compression Process

The purpose behind compression is to reduce gross notional amounts outstanding while keeping economic details of a party's net position as is.

The benefits are a decrease in operational risk, smaller capital charged (as they apply to gross notional amount) and improved operational costs (each trade costs CCP fees to maintain).

7.1 Overview

The current scope of Netting and compression process applies to following products:

- Credit Derivatives: CDS, CDX
- Interest Rate Derivatives: IRS, OIS, FRAs
- Forex: FX NDF

We support two types of netting:

- Standard netting for all the product types listed above. Standard netting is based on a set of product specific trade fields that need to match for the netting to be executed
- Coupon/ Price Blending for IRS, Basis Swaps, OIS and NDFs. Blending is based on the standard netting keys less the trade rate/ price. This methodology allows to include more trades in the compression cycle.

7.2 Netting Process

The system generates a file as part of the netting process so that the user can remove some trades from the netting cycle as needed by updating the trade filter on the scheduled task.

Netting is done for outstanding trades by book and counterparty, and provided upfront fees are paid on the trade.

For standard netting, the system will create a netting remnant trade in case the notional is not completely offset.

For price/ coupon blending, the system will create 2 netting remnant trades in case the notional is not completely offset.

7.2.1 Optional Configuration

- Additional netting keys

You can also specify the netting keys using the following domains: CDSNettingKeys for CDS products, IRDNettingKeys for IRD, NDFNettingKeys for FX NDF. They can contain the trade keywords to be used as netting keys.

Note: The corresponding trade keywords must be set on the trades.

- Flexible counterparty

You can also use the domain "UseFlexNettingCpty" to remove the counterparty netting key.

  - If Value = True, the counterparty is not used as a netting key. In this case, the counterparty on the remnant trade is set to the value of the CCP trade keyword.
  - If Value = False or empty (default behaviour), the counterparty is used as a netting key.

7.2.2 NETTING_SERVICE ScheduledTask

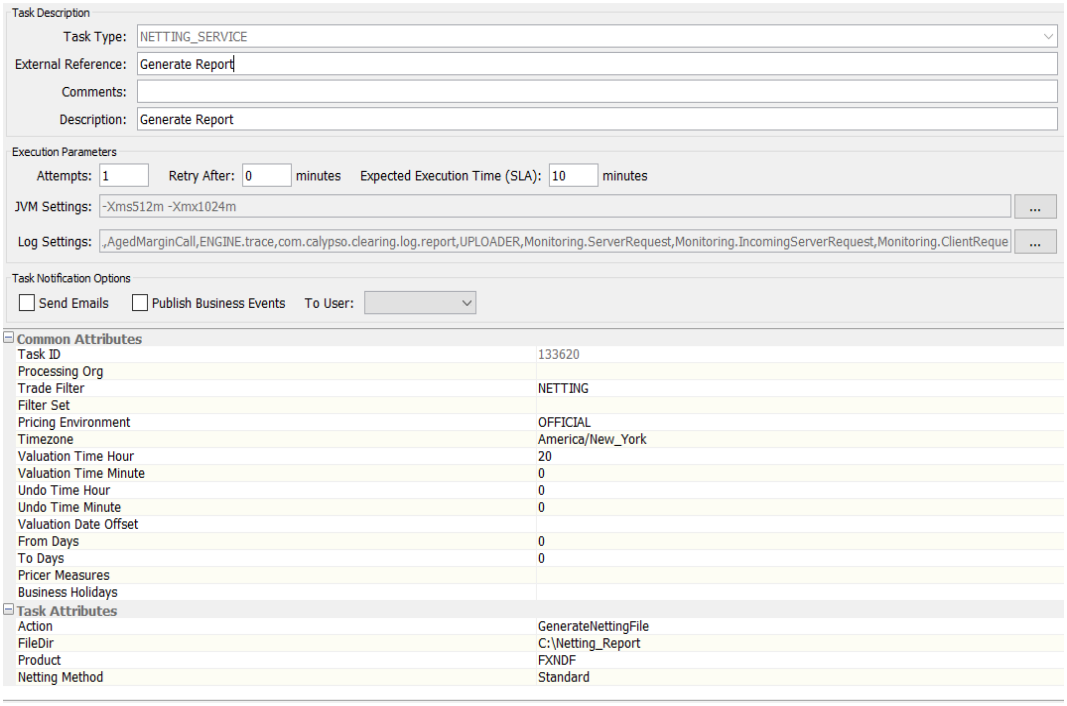
- Define the Product and Netting Method to be applied in the compression cycle

A NETTING_SERVICE ScheduledTask needs to be configured for each Product/ Netting Method combination.

Following Product/ Netting Methods are supported

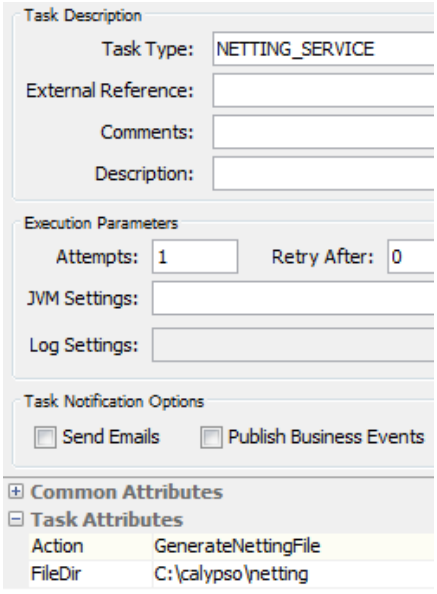
	Netting Method	
Product	Standard	Blending
IRD	✓	✓
FXNDF	✓	✓
CDS	✓	✗

Example



- Generating the netting file

Configure the scheduled task NETTING_SERVICE with Action = GenerateNettingFile. Enter the location of the file in the attribute FileDir.



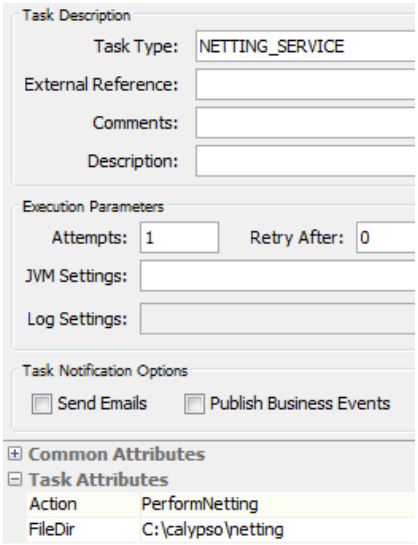
The file is saved as “Netting_Execution_< yyyymmdd hhmmss>”.

It will include various generic columns like shown below plus specific columns depending on the product that is being netted

- Netting ID - Netting Identifier applied on group of trades netting together
- TradeId
- Product Description
- CounterParty
- Trading Book
- Notional
- Comments – Details on why a given trade has been excluded from the netting.

- Perform Netting

Configure the scheduled task NETTING_SERVICE with Action = PerformNetting. Enter the location of the file previously created in the attribute FileDir.



It applies the TERMINATE action on the set of trades which are part of netting process and creates the netted trades. Make sure that the TERMINATE action is configured in the workflow.

The following trade keywords are set on the terminated trades:

- REMNANT_TRADEID - Trade ID of the netted trade.
- TERMINATING_EVENT - PARTIAL_NETTING or FULL_NETTING.

The following trades keywords are set on the netted trade:

- CCPHistory - List of terminated trades
- TradeSource - “Compression” or “Compression Blending” in case of coupon/ price blending

- CCPClearedDate – Scheduled task Valuation Date in format of mm-dd-yyyy
- CCPOriginalClearedDate – Same as CCPClearedDate
- CCPNettingId – Netting ID

7.2.3 Standard Netting

Standard netting is based on a set of netting keys that are specific to each product.

Full and Partial netting are both supported.

Example

➢ **Partial Netting**

	Currency Pair	Direction	Price	USD Notional	CLP Notional	Trade Status
NDF 1	USD/CLP	Buy	860	5,000,000.00	4,300,000,000.00	TERMINATED
NDF 2	USD/CLP	Buy	860	3,500,000.00	3,010,000,000.00	TERMINATED
NDF 3	USD/CLP	Sell	860	(7,000,000.00)	(6,020,000,000.00)	TERMINATED
NDF 4	USD/CLP	Sell	860	(2,000,000.00)	(1,720,000,000.00)	TERMINATED
NDF 5	USD/CLP	Buy	860	9,000,000.00	7,740,000,000.00	TERMINATED
NDF 6	USD/CLP	Sell	860	(1,000,000.00)	(860,000,000.00)	TERMINATED
Remnant Trade	USD/CLP	Sell	860	7,500,000.00	6,450,000,000.00	VERIFIED

➢ **Full Netting**

	Currency Pair	Direction	Price	USD Notional	CLP Notional	Trade Status
NDF 1	USD/CLP	Buy	860	3,000,000.00	2,580,000,000.00	TERMINATED
NDF 2	USD/CLP	Sell	860	(3,200,000.00)	(2,752,000,000.00)	TERMINATED
NDF 3	USD/CLP	Sell	860	(800,000.00)	(688,000,000.00)	TERMINATED
NDF 4	USD/CLP	Buy	860	1,000,000.00	860,000,000.00	TERMINATED
Total remaining notional				0	0	-

7.2.4 Blending Methodology

Blending is a netting methodology that allows trades that have different prices (NDFs) or rates (IRD) to be compressed based on the average weighted notional of the trades. Price blending is a risk-free netting methodology like standard netting. The net cash flows of the resulting positions will remain the same as the targeted netting group. Partial and Full Netting are supported.

Blending Methodology for IRS/ OIS/ FRA

1. Determine the Net Weighted Notional Amount => ∑ Notional × Fixed rate.
2. Determine the notional of remnant trade 1 (R1) using the highest Fixed Rate for this trade.
   R1 Trade = (Net Weighted Average Notional - (Sum of signed USD Notional × Lowest Price)) ÷ (Highest Price - Lowest Price)
3. Determine the notional of remnant trade 2 (R2) using the lowest Fixed Rate for this trade. R2 Notional = Net Notional – R1 Notional.
4. Verify that the cashflows are unchanged and are matching the cashflows of the original trades that have been terminated.

Blending Methodology for NDF

1. Determine the net weighted average notional & the highest/lowest price.
2. Determine the remnant trade 1 (R1) using the highest price. R1 Notional = (Net Weighted Notional - Net Notional × Lowest Fixed Rate) ÷ (Highest Fixed Rate - Lowest Fixed Rate)
3. Determine the remnant trade 2 (R2) using the lowest price. R2 Trade = Sum of signed USD Notional - R1 USD Notional.
4. Verify that the cashflows are unchanged and are matching the cashflows of the original trades that have been terminated.

Note: If both, the net Notional and the net Weighted Notional are netted down to zero, then terminate all the trades and no remnant trades will be created in this specific case.

Example for NDF Blending

- Determine the net Weighted Notional:

	Currency Pair	Direction	Price	USD Notional	CLP Notional
NDF 1	USD/CLP	Buy	869	10,000,000.00	(8,690,000,000.00)
NDF 2	USD/CLP	Buy	872	6,500,000.00	(5,668,000,000.00)
NDF 3	USD/CLP	Sell	871	(8,381,745.12)	7,300,500,000.00
NDF 4	USD/CLP	Sell	881	(2,270,147.56)	2,000,000,000.00
NDF 5	USD/CLP	Buy	888	4,000,000.00	(3,552,000,000.00)
NDF 6	USD/CLP	Sell	875	(10,286,628.57)	9,000,800,000.00
NDF 7	USD/CLP	Buy	879	5,000,000.00	(4,395,000,000.00)
NDF 8	USD/CLP	Buy	880	8,500,000.00	(7,480,000,000.00)
NDF 9	USD/CLP	Sell	885	(3,389,830.51)	3,000,000,000.00
NDF 10	USD/CLP	Buy	883	7,000,000.00	6,181,000,000.00
			Hi 888 / Lo 869	**16,671,648.24**	**(2,302,700,000.00)**

- Determine the remnant trade 1 using the highest price:

R1 USD Notional = (2,302,700,000.00 – (16,671,648.24 × 869)) ÷ (888 - 869)
= - 641,313,806.34
R1 applicable price = 888
R1 CLP Notional = - 641,313,806.34 × 888 ×-1
= 569,486,660,032.74

- Determine the remnant trade 2 using the lowest price:

R2 USD Notional = 16,671,648.24 - (- 641,313,806.34)
= 657,985,454.58
R2 applicable Price = 869

R2 CLP Notional = 657,985,454.58× 869 ×-1
= - 571,789,360,032.74

- The Cashflows are unchanged and are matching the cashflows of the original trades that have been terminated.

	Currency Pair	Direction	Price	USD Notional	CLP Notional
R1	USD/CLP	Sell	888	(641,313,806.34)	569,486,660,032.74
R2	USD/CLP	Buy	869	657,985,454.58	(571,789,360,032.74)
				16,671,648.24	**(2,302,700,000.00)**

Settlement

8.1 Settlement Approach

- SWIFT instructions should not be sent for Cleared trades.
- The settlement information will be sent by the CMF to the Clearing End User via its Broker Statement.

A sample multi-currency customer statement is shown below:

CALYPSO

Statement on Mar 5, 2013 for CLIENTA (33227)

Financial Summary

	USD	AUD	CAD	CHF	EUR	GBP	JPY	Total in USD
Beginning Cash Balance	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Commissions/Fees	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
PAI	-159.67	0.00	0.00	0.00	-0.87	386.66	-34	416.46
Coupon	-6,210.00	0.00	0.00	0.00	0.00	0.00	0	-6,210.00
FRA Settlements	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Upfront Fees	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Cash Movements	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Ending Cash Balance	-6,369.67	0.00	0.00	0.00	-0.87	386.66	-34	-5,793.54
Mark to Market	-428,824.35	0.00	0.00	0.00	-8,218.22	-1,070,627.29	-919,442	-2,048,582.13
Total Equity	-677,296.24	0.00	0.00	0.00	0.00	0.00	0	-677,296.24
Pending Cash	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Total Equity plus Pending Cash	-677,296.24	0.00	0.00	0.00	0.00	0.00	0	-677,296.24
Initial Margin CME IRS	-26,809,313.13	0.00	0.00	0.00	0.00	0.00	0	-26,809,313.13
Total Initial Margin	-26,809,313.13	0.00	0.00	0.00	0.00	0.00	0	-26,809,313.13
Market Value of Securities Collateral	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Market Value of Cash Collateral (IM)	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Total of IM Collateral (cash and non-cash)	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Market Value of Cash Collateral (VM)	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
IM Margin Call/Excess								-26,809,313.13
VM Margin Call/Excess								0.00
Account Liquidation Value	-677,296.24	0.00	0.00	0.00	0.00	0.00	0	-677,296.24
Net Margin Requirement/Excess								-27,486,609.37
FX Rate		1.0323	0.9748	1.0588	1.3054	1.4939	0.0105	

The items highlighted in the statement need to be included in the settlement to the Clearing Broker/CMF.

All the transfers related clearing components (i.e. Clearing Transfers and Margin Call trades) will be netted in one single transfer from the End User to the CMF. SWIFT messages will be triggered from those transfers to settle cash and securities payments with the CMF.

8.2 VM, IM and Fees Settlement

The settlement with CMF will have 3 components:

- Initial Margin: This can be settled either in cash or securities. The IM is settled in the base currency of the client. It is modeled as a Margin Call trade (as detailed above).
- Variation Margin: This represents the daily cash close out with the CMF. It is modeled as a Clearing Transfer trade.

  It is comprised of the following:

  - Commissions/Fees
  - PAI
  - Coupons
  - FRA Settlements
  - Trade level fees: Upfront fees
  - Change in underlying trades' Mark to Market (VM)

  This must be settled in cash. The CMF might ask for a settlement in the trade currency, i.e. for settlement in each of the traded currencies or for a single settlement in their base currency. This will be driven by the Clearing Transfer file they provide. For each line in the Clearing Transfer file, a settlement will be created in the corresponding currency.
- Excess Margin Deposit: If there is any excess margin deposit, it needs to be modeled as a Margin Call trade and it will be handled as part of the IM settlement process in the Collateral Manager.

8.3 Treatment of Unsettled Flows for Cleared Swaps

In the case of unsettled coupons at the time of clearing, there are specific rules defining if the settlements should be generated from the bilateral swaps or as part of the clearing transfers.

To accommodate for those rules, which might be changed by the CCPs, there are currency attributes (SwapClearSpotDays and CMESpotDays) available to define the settlement rules:

The currency attribute has the same meaning for both CME and SwapClear i.e.:

- If set to blank,
  - no specific rule i.e. all the T+1 and T+2 coupon related settlements are generated from the child trade
- If set to 1,
  - T+2 coupon related settlements are generated from the child trade
  - T+1 coupon related settlements are generated from the parent trade
- If set to 2,
  - T+2 coupon related settlements are generated from the parent trade
  - T+1 coupon related settlements are generated from the parent trade

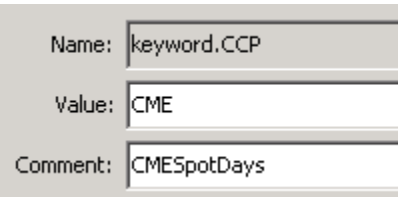
The fees settlement will be generated as detailed in the table below.

The best practice is the following:

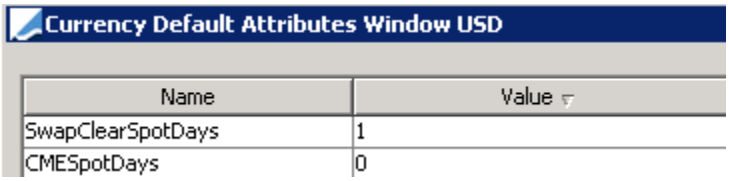
- SwapClearSpotDays for T+1 currencies = blank
- SwapClearSpotDays for T+2 currencies = 0
- CMESpotDays for T+1 currencies = 0
- CMESpotDays for T+2 currencies = 1

The name of the attribute can be set in the domain “keyword.CCP” for each CCP:

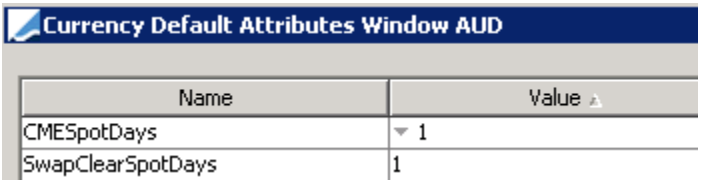
- Value = <CCP short name>
- Comment = <attribute name>



Example – USD Currency Default Attributes



Example – AUD Currency Default Attributes



Supported used cases:

			Payment Dates			
			T	T+1	T+2	T+3
CME	T+1 Currency					
		Upfront Fee	Fails Elig-Bilat	DCO	DCO	DCO
		Coupon Payment	Bilat	Bilat	DCO	DCO
	T+2 Currency					
		Upfront Fee	Fails Elig-Bilat	Fails Elig-Bilat	DCO	DCO
		Coupon Payment	Bilat	Bilat	Bilat	DCO
LCH-Dealer (SCM)	T+1 Currency					
		Upfront Fee	Bilat	DCO	DCO	DCO
		Coupon Payment	Bilat	DCO	DCO	DCO
	T+2 Currency					
		Upfront Fee	Bilat	Bilat	DCO	DCO
		Coupon Payment	Bilat	Bilat	DCO	DCO
LCH-Client (FCM)	T+1 Currency					
		Upfront Fee	Reject-Bilat	DCO	DCO	DCO
		Coupon Payment	Bilat	DCO	DCO	DCO
	T+2 Currency					
		Upfront Fee	Reject-Bilat	Reject-Bilat	DCO	DCO
		Coupon Payment	Bilat	Bilat	DCO	DCO

T+1	USD, EUR, GBP, CAD
T+2	All other currencies

Accounting and P&L

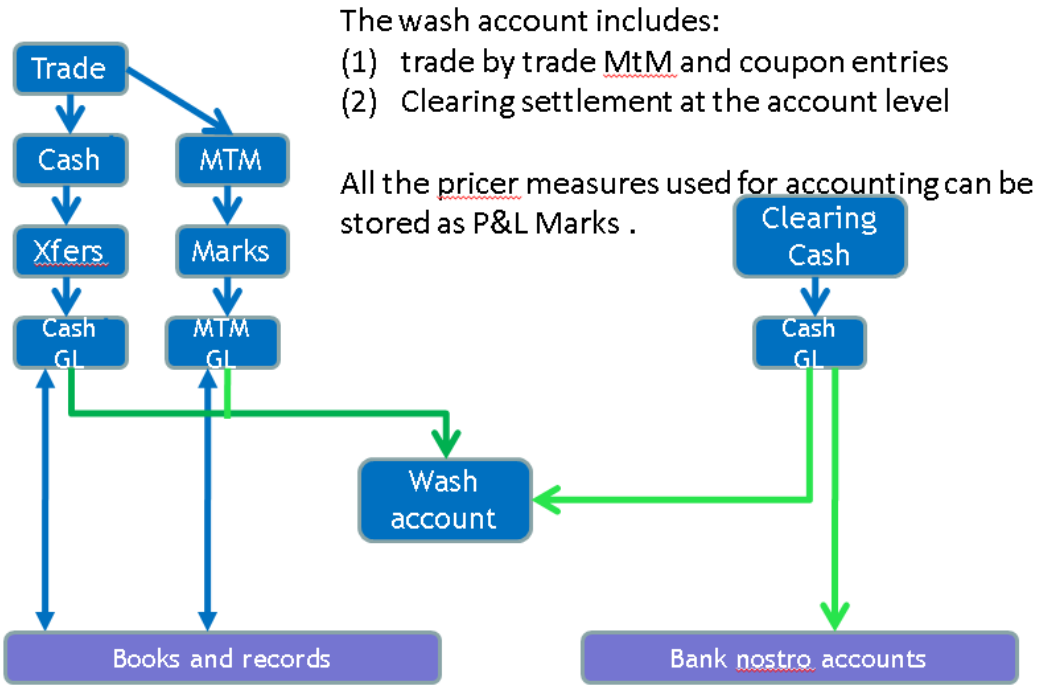
9.1 High-level Approach

With OTC clearing, the accounting for Swaps, CDS and NDF is now done at 2 levels:

Trade level accounting

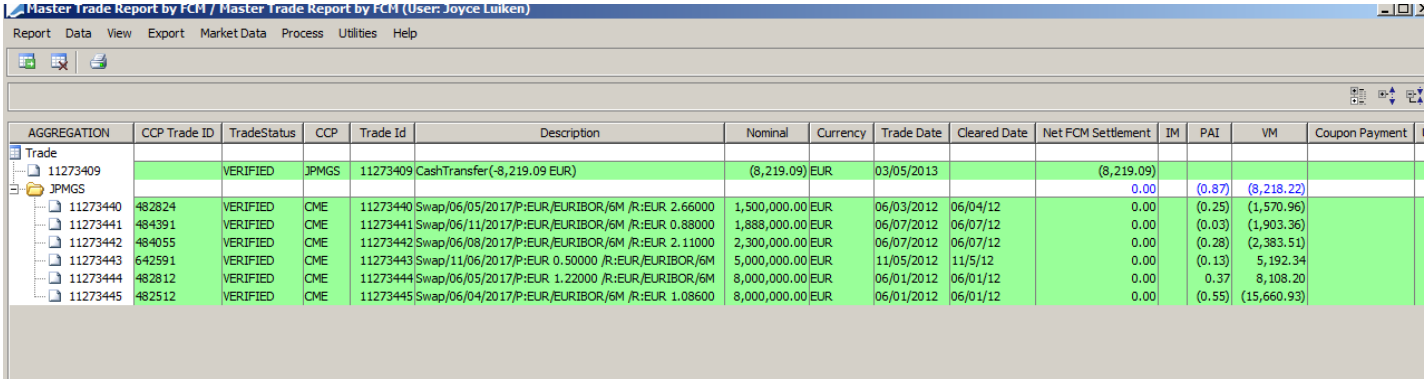
Clearing transfer and margin call accounting (at the clearing account level)

Both sets of accounting rules generate offsetting entries in a wash account:



In a second step, reports can be run to view side by side the aggregated settlements done at the clearing aggregated level (Clearing Position or Margin Account) and the trade level.

The example below shows how we can compare the total VM settled to the MTM change reported at the trade level:



AGGREGATION	CCP Trade ID	TradeStatus	CCP	Trade Id	Description	Nominal	Currency	Trade Date	Cleared Date	Net FCM Settlement	IM	PAI	VM	Coupon Payment
Trade														
11273409		VERIFIED	JPMGS	11273409	CashTransfer(-8,219.09 EUR)	(8,219.09)	EUR	03/05/2013		(8,219.09)				
JPMGS										0.00		(0.87)	(8,218.22)	
11273440	482824	VERIFIED	CME	11273440	Swap/06/05/2017/P:EUR/EURIBOR/6M /R:EUR 2.66000	1,500,000.00	EUR	06/03/2012	06/04/12	0.00		(0.25)	(1,570.96)	
11273441	484391	VERIFIED	CME	11273441	Swap/06/11/2017/P:EUR/EURIBOR/6M /R:EUR 0.88000	1,888,000.00	EUR	06/07/2012	06/07/12	0.00		(0.03)	(1,903.36)	
11273442	484055	VERIFIED	CME	11273442	Swap/06/08/2017/P:EUR/EURIBOR/6M /R:EUR 2.11000	2,300,000.00	EUR	06/07/2012	06/07/12	0.00		(0.28)	(2,383.51)	
11273443	642591	VERIFIED	CME	11273443	Swap/11/06/2017/P:EUR 0.50000 /R:EUR/EURIBOR/6M	5,000,000.00	EUR	11/05/2012	11/5/12	0.00		(0.13)	5,192.34	
11273444	482812	VERIFIED	CME	11273444	Swap/06/05/2017/P:EUR 1.22000 /R:EUR/EURIBOR/6M	8,000,000.00	EUR	06/01/2012	06/01/12	0.00		0.37	8,108.20	
11273445	482512	VERIFIED	CME	11273445	Swap/06/04/2017/P:EUR/EURIBOR/6M /R:EUR 1.08600	8,000,000.00	EUR	06/01/2012	06/01/12	0.00		(0.55)	(15,660.93)	

9.2 Accounting Setup

The accounting setup needs to address the various types of accounts required – wash, control and cash.

- The Clearing Transfer (in the VM currency in the case of single ccy margining) trade principal is posted to the actual cash account.
- Fees on the Clearing Transfer (in the trade native currency in all the cases) will be debited / credited between wash account and credit control account.
- Swap Trade Level Accounting Entries are like bilateral accounting entries except for the settlement entries, which are entered against a wash account in the case of OTC clearing. For Swap Trade Level postings, valuations and coupons entries can be based on the trades booked in Calypso and on the Calypso Pricing Environment. And / or they can be based on PL Marks imported from the CMF files or the CCP files.
- New accounting events will have to be added for VM and PAI.
- The two levels of control accounts enable the use of the same accounting rules for all swaps, whether bi-lateral or cleared. Using Static Data Filters, a different rule will be used to post the swap coupon payment. For cleared swaps a third rule posts the net entry based on the CMF file.

Here is a summary of the approach by product type:

CLEARED TRADES

- Trade level (based on trade info and internal curves):
  - MTM posting using OTC internal curve
  - coupon
  - upfront/novation/termination trade level fees
- **Trade level (based on imported PL marks):**
  - PAI
  - internal on cash balances
  - cleared trades fees

CLEARING TRANSFERS

- Clearing transfers (Fee Event based)
  - FCM Coupon
  - FCM Upfront Fees
  - FCM PAI
  - FCM Interest on Excess
- Clearing transfers (based on PL Marks)
  - Other fees
- Clearing transfer VM (Base)
  - CST settled

BILATERAL TRADES

- Trade level (based on trade info and internal curves):
  - MTM posting using OTC internal curve
  - coupon
  - upfront/novation/termination trade level fees
- Trade level
  - CST Settled

MARGIN CALL TRADES

- Margin Call Trades cash- IM
  - CST settled
- Margin Call Trades security- IM
  - CST settled

Valuation

10.1 Trade Pricing, P&L and Risk Reports

The trade valuation process is unchanged for any P&L or Risk report. Front Office and Middle Office users have the choice to select various pricing environments. If a new pricing environment has been created to import the CCP market data, this pricing environment can be used to generate any valuation.

10.2 P&L

- The P&L for cleared swaps is like the P&L of non-cleared swaps. In the Official P&L, the same P&L formulas will be applied (default P&L pricer).
- Regarding Clearing Transfers, they do not generate any P&L in the Official P&L; otherwise, the P&L would be duplicated.
- Trades in TERMINATED status should not be excluded from the Trade filter to run the Official P&L as it could hide part of the P&L. TERMINATED trades should be soft archived.
- If the PAI at the trade level is available in the broker statement, as part of Official P&L Marks Import, the PAI can be imported.

10.3 Clearing Valuation

Trade valuation can be based on an internal pricing environment/pricers, on valuations imported from the CMF (stored as PL Marks), or from market data imported from the CCPs.

- The PL Marks can be used in:

  A Pricing Analysis report to compare valuations from various sources.

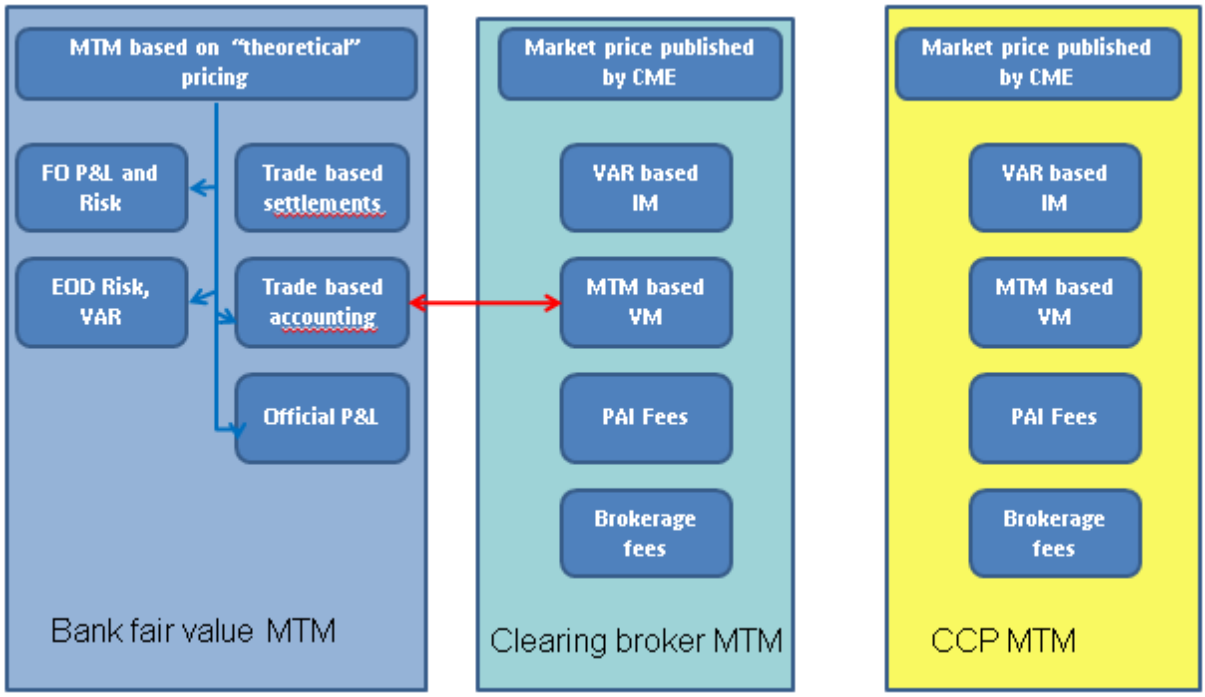
  To value trades as part of the accounting entries generation.

▶ See Importing Marks from the CMF for details.

10.4 Comparing Valuations

10.4.1 High Level Approach

To reconcile the trade-by-trade MTM accounting entries with the clearing account settlement entry in the wash account, one solution is to generate a trade-by-trade report, which includes the NPV based on each valuation source (i.e. internal, CCP and CMF) and creates a subtotal at the clearing account level. The Clearing account subtotal can be modeled based on the CMF trade keyword.



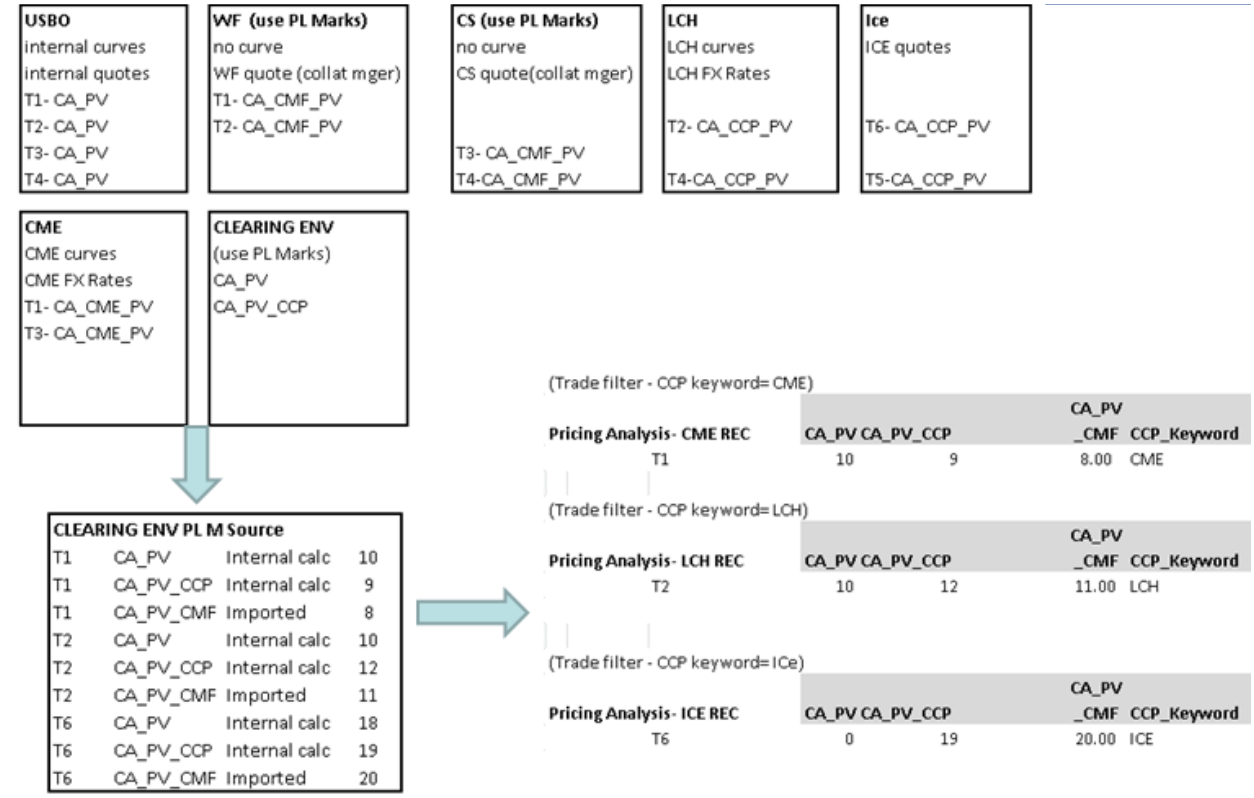
To generate PL Marks based on different valuation sources and consolidate all the PL Marks in a single Pricing Environment, the following steps are required:

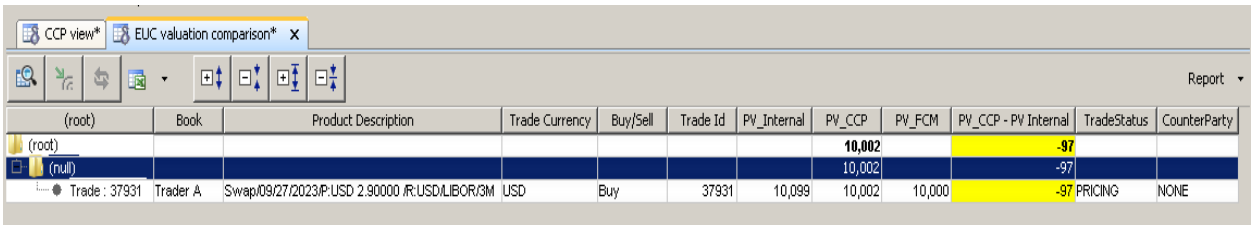
- Store each valuation in a separate Pricing Environment
- Use different Pricer Measure Names for each source of valuation (example: NPV_CMF, NPV_CCP)
- Transfer all PL Marks to a central "Clearing" Pricing Environment

PE1: Valuations imported from CMF1
PE2: Valuations imported from CMF2
PE3: Valuations calculated based on CCP market data
PE4: Valuations calculated with internal market data
PE5: Clearing environment- consolidation of all valuations

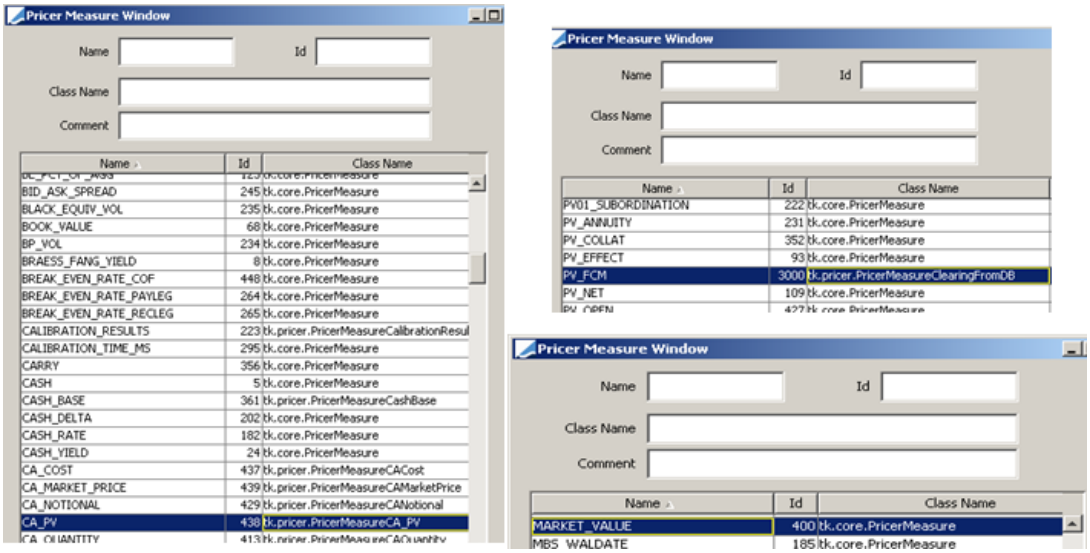
	Internal			CMF			CCP		
	NPV	CASH	FEES	NPV	CASH	FEES	NPV	CASH	FEES
Swap2	100	10	1	101	10	1	102	11	2
Swap3	102	12	3	103	12	3	104	13	4
Swap4	104	14	5	105	14	5	106	15	6
ClearingT				300	40	9			

10.4.2 Example





Setup


Pricer Measure Window
Name
Id
Class Name
Comment
Name
Id
Class Name
BID_ASK_SPREAD 245 tk.core.PricerMeasure
BLACK_EQUIV_VOL 235 tk.core.PricerMeasure
BOOK_VALUE 68 tk.core.PricerMeasure
BP_VOL 234 tk.core.PricerMeasure
BRAESS_FANG_YIELD 8 tk.core.PricerMeasure
BREAK_EVEN_RATE_COF 448 tk.core.PricerMeasure
BREAK_EVEN_RATE_PAYLEG 264 tk.core.PricerMeasure
BREAK_EVEN_RATE_RECLEG 265 tk.core.PricerMeasure
CALIBRATION_RESULTS 223 tk.pricer.PricerMeasureCalibrationResul
CALIBRATION_TIME_MS 295 tk.core.PricerMeasure
CARRY 356 tk.core.PricerMeasure
CASH 5 tk.core.PricerMeasure
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CASH_RATE 182 tk.core.PricerMeasure
CASH_YIELD 24 tk.core.PricerMeasure
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CA_PV 438 tk.pricer.PricerMeasureCA_PV
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