Nasdaq Calypso

Reuters TOF Integration Guide

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Approved

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Introduction

Reuters TOF is a straight through processing (STP) feed used by Reuters Deal Tracking Server (DTS). It carries trade information sending to TOF consumer applications.

The Calypso Reuters TOF Module serves as a connector component which integrates Calypso with Reuters DTS, communicating by Reuters TOF feeds, so that Calypso can capture trades sending from Reuters DTS (Only DTS Version 5.0 or above is supported.).

The Module allows capturing spot trades, outright trades (deliverable), regular FX NDF trades, FX swap trades and loan/deposit trades.

This user guide covers the installation and configuration of the Calypso Reuters TOF Module.

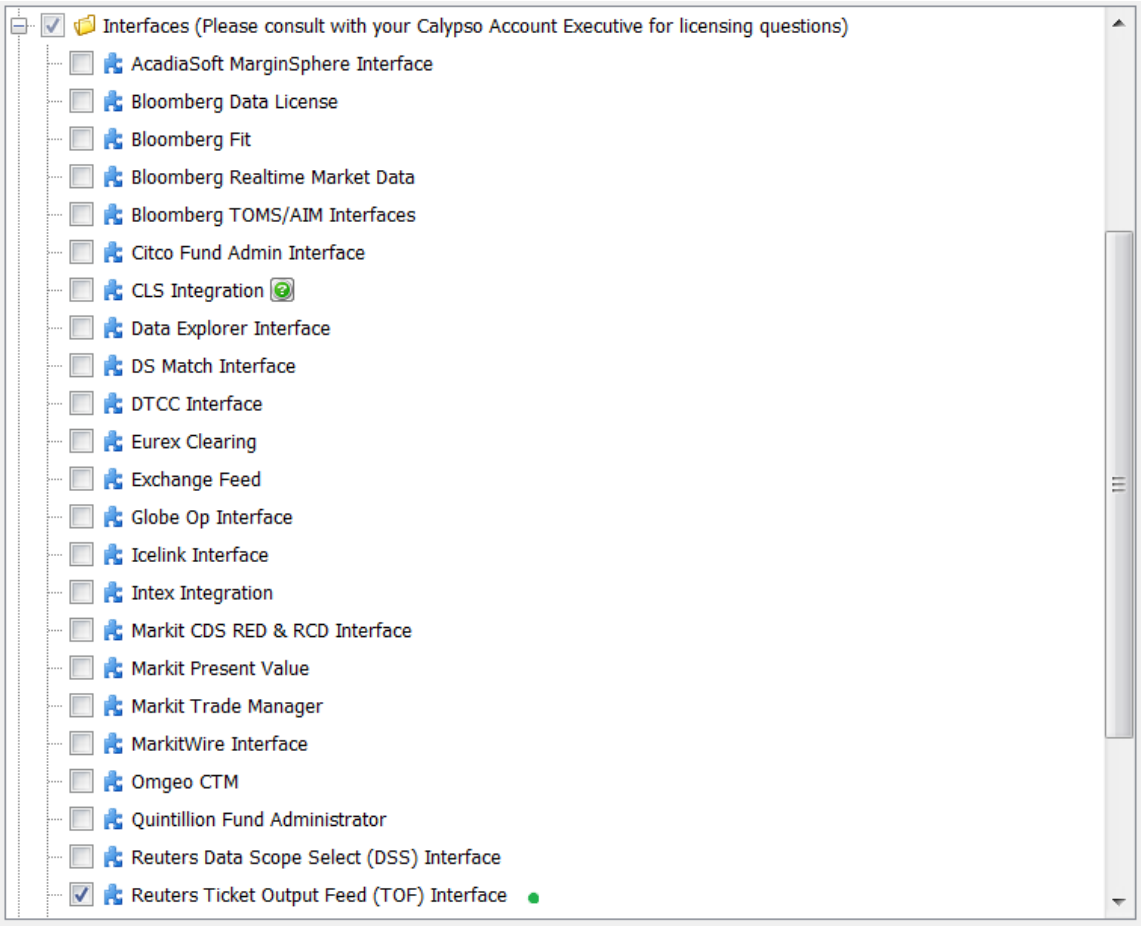
Installation and Setup

2.1 Prerequisites

Before installing the Reuters TOF module, please ensure that a Calypso instance and the Data Uploader Module are set up properly. Please refer to the Calypso installation guides and the Data Uploader user guide for setup details.

2.2 System Setup

Follow the Calypso System Guide “Installation and Upgrade” to install Calypso. Check the component Reuters Ticket Output Feed (TOF) Interface during the installation.



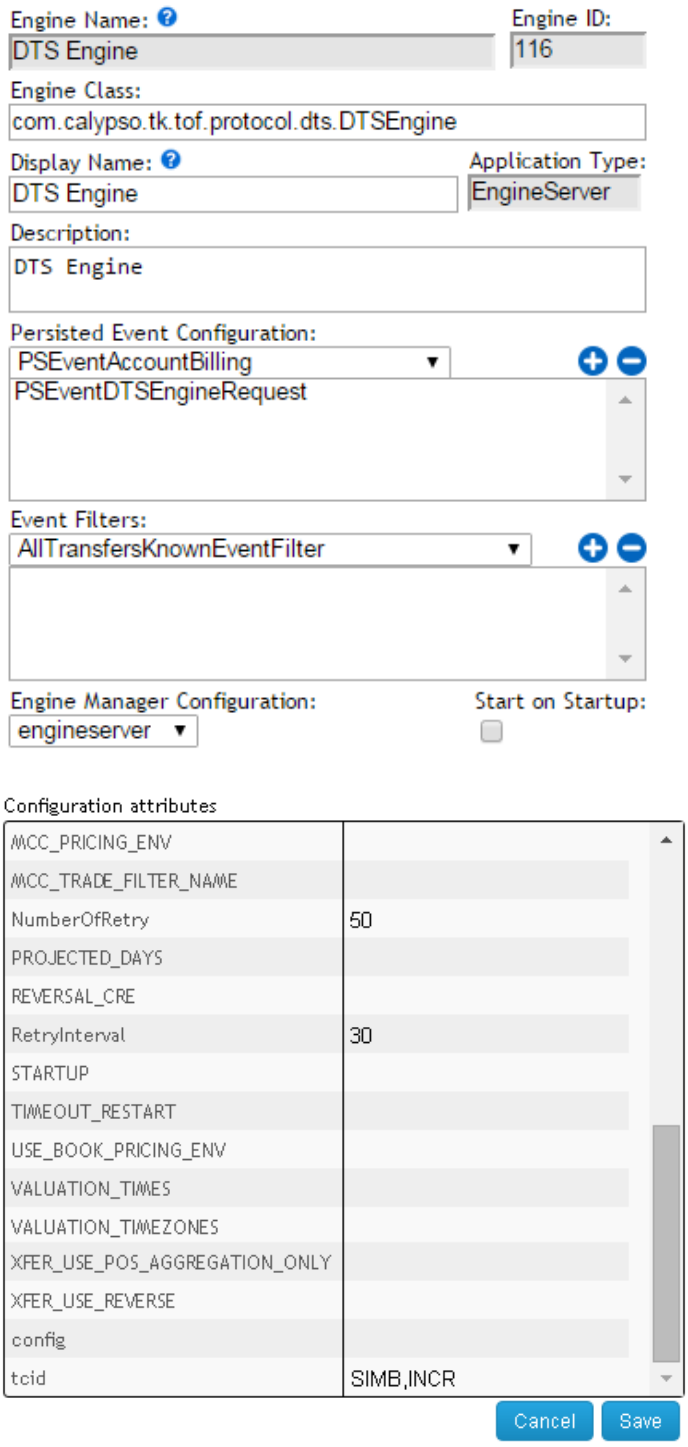
Synchronize your database with the TOF data.

Migration scripts are automatically applied, the schema files are automatically uploaded, and there is no checkbox in Execute SQL.

You can now start the Data Server and Navigator.

2.3 DTS Engine Configuration

Create an engine configuration for DTS Engine through the Engine Manager in Web Admin. Please refer to Calypso Web Admin documentation for complete details.



DTS Engine Parameters

Set the following engine parameters as needed:

- NumberOfRetry: The maximum number of times that DTS Engine tries to connect to Reuters server until successful (optional, default = 10, minimum = 0, which indicates unlimited number of retry)
- RetryInterval: Interval (in seconds) between each retry to connect to Reuters server (optional, default = 15, minimum = 15)
- tcid: List of TCIDs (defined in Calypso) to be connected from this engine instance (optional, if absent, this engine will connect to all TCIDs defined in Calypso)
- PollingInterval - Polling interval to fetch new deals from DTS server.Default is 1 (minute).
- LocalPort - Originating port of the DTS engine.

2.4 Update Manager Engine Configuration

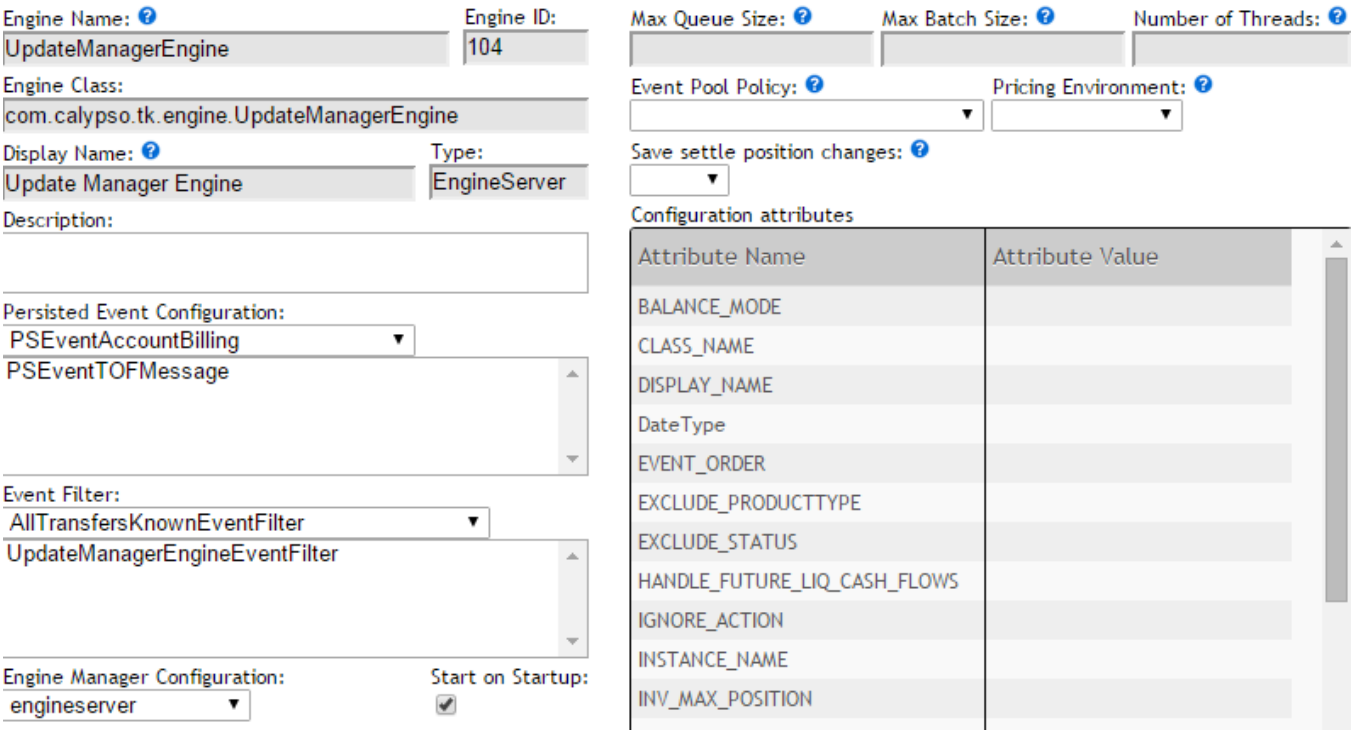
The Update Manager engine is used to link back the Conversation Text (information from Reuters System related to the trade) to the Calypso Trade.

In some cases, the translation from TOF message to Calypso Trade may fail (e.g. missing trade book), such that the Calypso Trade is not created in the first time processing.

In such a case, the Conversation Text is linked to the TOF Message (source message) temporarily.

Then, if the end-user fixes the static data (e.g. adding the trade book) and reprocesses the TOF message, the Calypso Trade is created. The Update Manager engine is notified (by PSEventTOFMessage) and links the Conversation Text to the Calypso Trade.

Create an engine configuration for UpdateManagerEngine through the Engine Manager in Web Admin. Please refer to Calypso Web Admin documentation for complete details.



Name = UpdateManagerEngine

Class = com.calypso.tk.engine.UpdateManagerEngine

It subscribes to PSEventTOFMessage events.

Event filter = UpdateManagerEngineEventFilter

2.5 Navigator Configuration

Add the following new menu items:

Name: DTS Configuration Window

Action: `tof.DTSConfigFrame`

Name: TOF Mapping Window

Action: `tof.mapping.TOFMappingWindow`

Name: TOF Monitor Window

Action: `tof.TOFMonitorWindow`

Name: DTS Connection Monitor Window

Action: `tof.DTSConnectionMonitorWindow`

2.6 Installing the Reuters Deal Tracker Server

The Reuters Deal Tracker Server (DTS) takes in deals from Reuters and EBS dealing systems, and combines them into one deal feed. Please refer to the appropriate Reuters Deal Tracker Server installation and/or user guide for help with Reuters DTS.

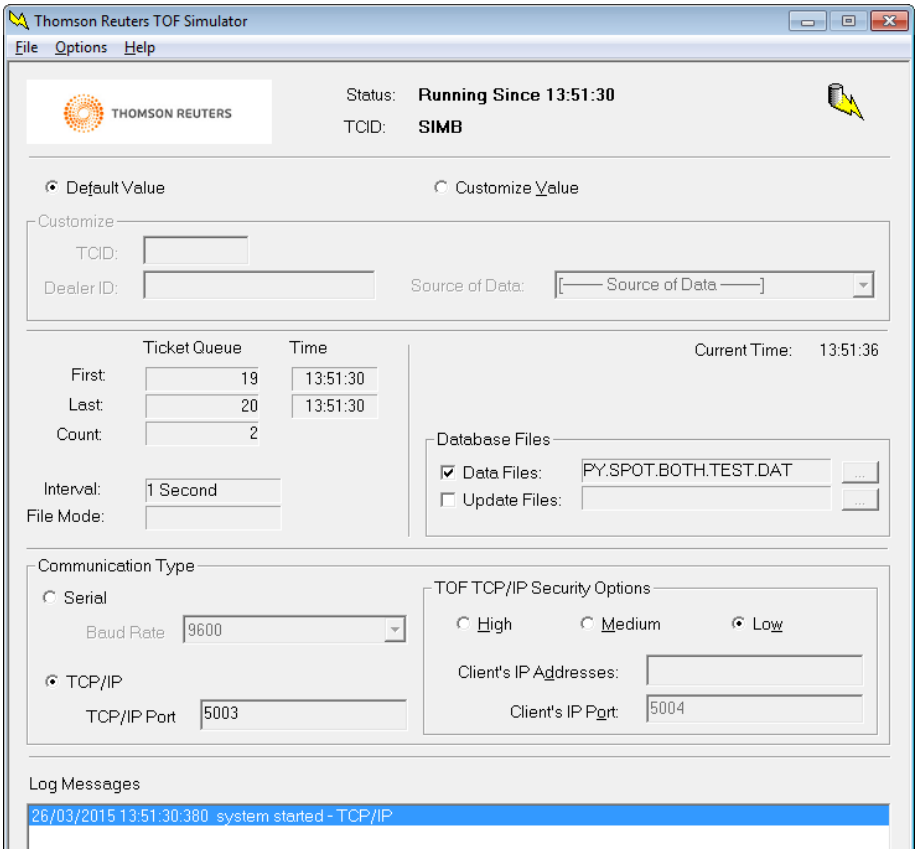
2.7 Access Permissions

The following access permissions functions can be set in **Navigator > Configuration > User Access Control > Access Permissions > Group Access**. Refer to the Calypso Security User Guide for information on setting access permissions.

Permission	Description
ViewTOFMonitor	Permission to open the TOF Message Monitor.
AllowTOFMessageAmendments	Permission to modify TOF messages from the TOF Message Monitor.

2.8 Installing the Reuters TOF Simulator (optional, for testing purposes)

The TOF Simulator is provided by Reuters for testing the Ticket Output Feed protocol. Install TOF Simulator version 6.3.0.x and start the simulator:

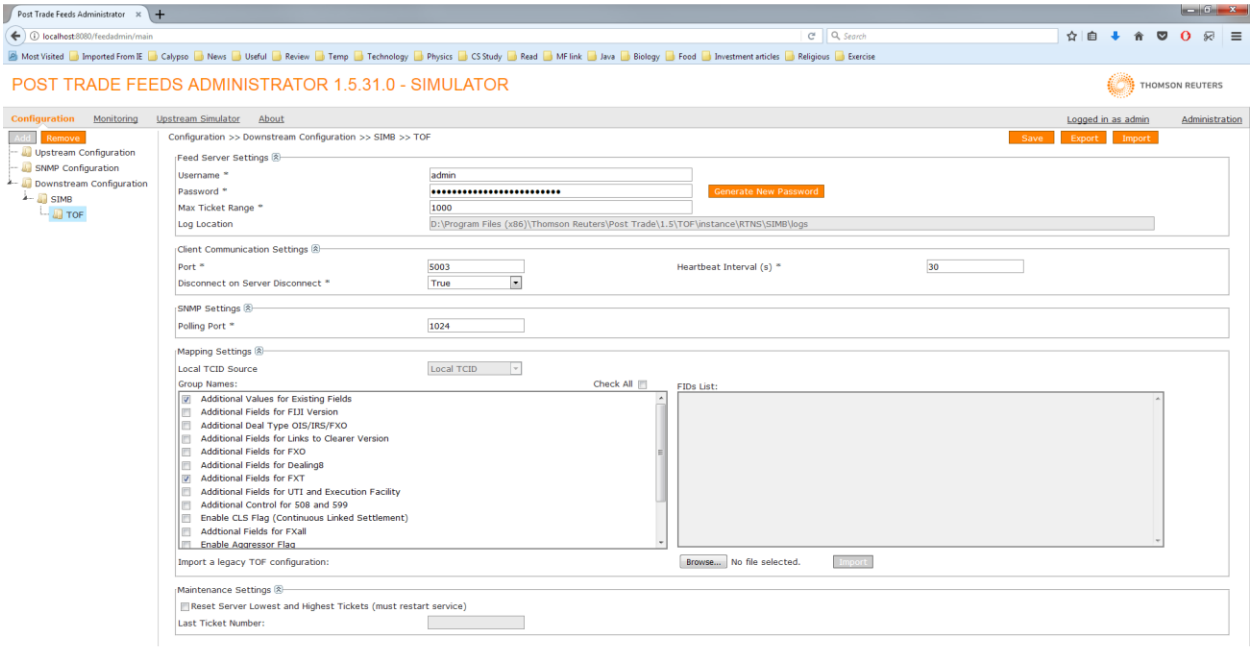


Please refer to the Thomson Reuters TOF Simulator User Guide for installation or usage details.

2.9 Installing Thomson Reuters FX Trading Post Trade Feed

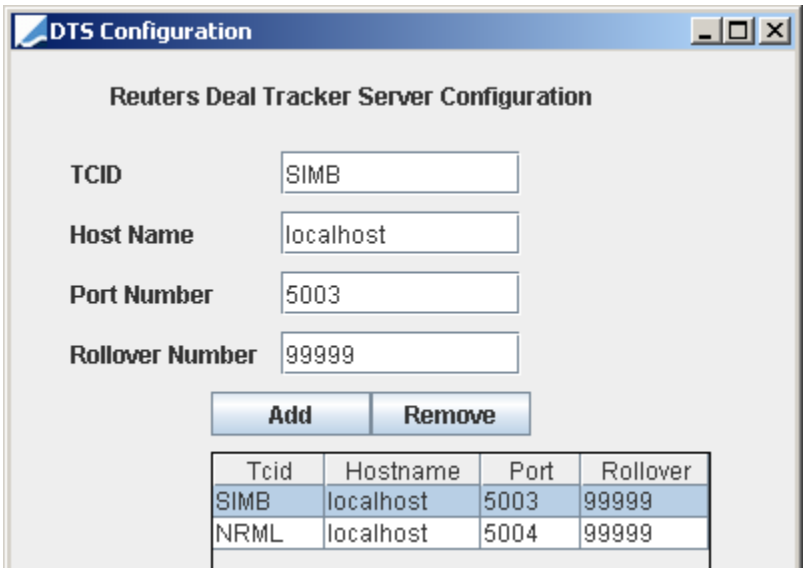
(Optional, for MIFID testing purpose)

TOF Simulator with MIFID support is present in Thomson Reuters FX Trading Post Trade Feed version 1.5.31.0. It is provided by Reuters and can be used in simulator mode for testing MIFID support.



Please refer to the Thomson Reuters FXT Post Trade Feed Adapter Installation Configuration Guide for installation and configuration to use it in Simulator mode.

2.10 Setting the DTS Configuration



Each dealing server is identified by a unique TCID. Each dealing server is associated with its own configuration like host name, port number and rollover number.

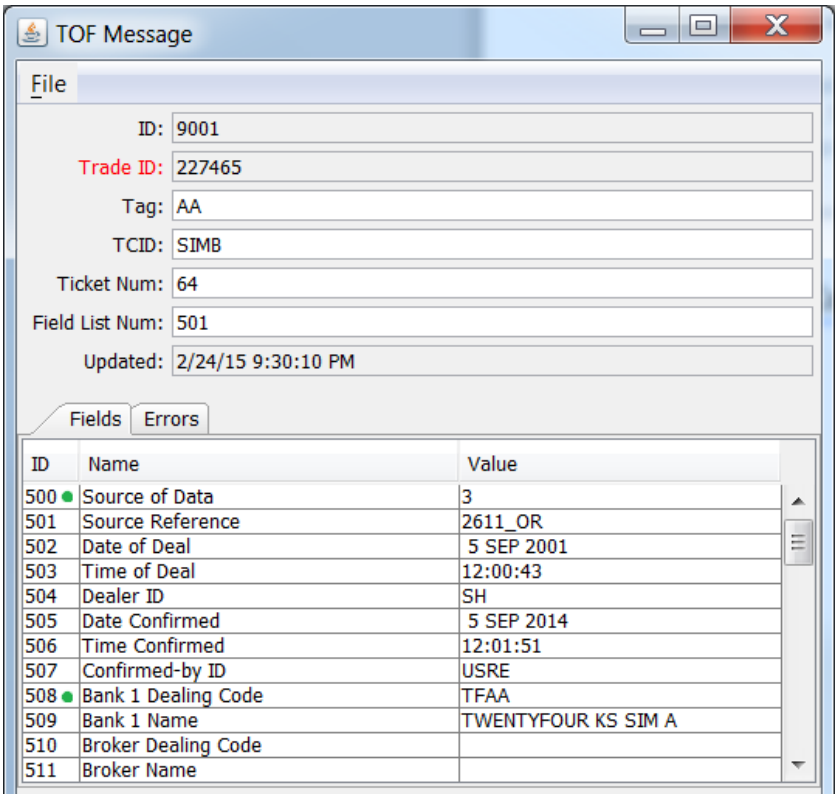
- Enter the correct TCID, host name, port number and rollover number for the Reuters Deal Tracker Server.
- The TCID should be unique.

- The host name and port number should be unique for each TCID.
- The Rollover number is the number when the ticket number starts over. For example, if you enter 655535 as the Rollover number, the ticket id after 655535 is 1.
- If you are testing against the TOF Simulator, then enter the correct host name and port number for your TOF Simulator connection instead, and enter the TCID for the test data file that you are using.

2.11 Counterparty Mapping

The counterparty of the mapped Calypso trade is determined by Source of Data (field 500) and Bank 1 Dealing Code (field 508) of the incoming TOF message.

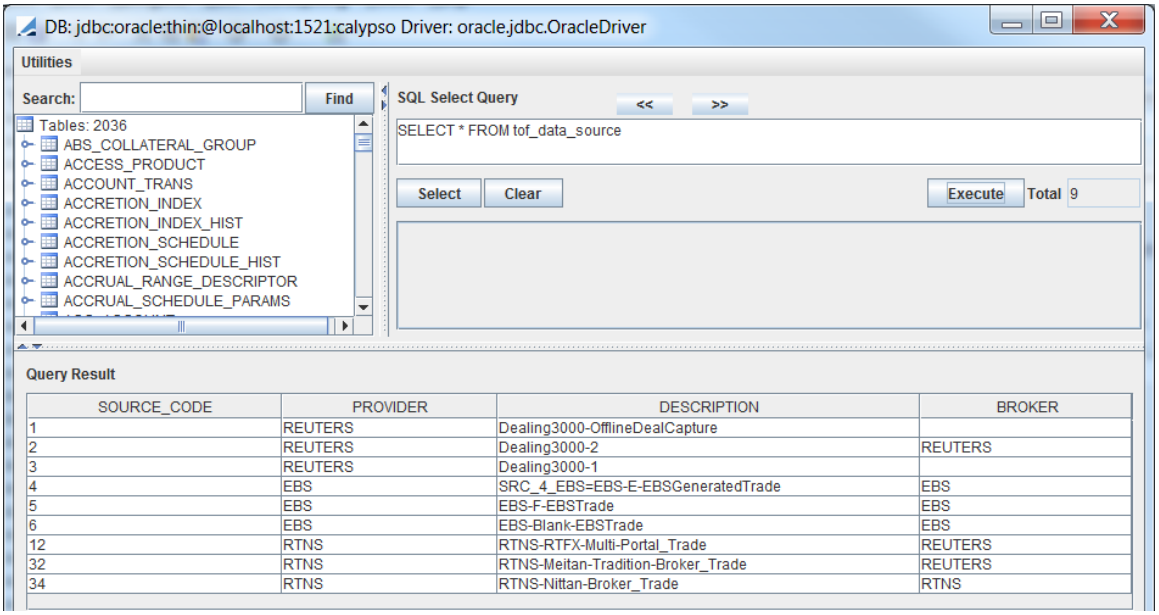
For example, the Source of Data of the following TOF message is 3 and the Bank 1 Dealing Code is TFAA.



Firstly, the provider is looked up from the TOF Data Source Configuration according to the TOF message source code (field 500).

The implementer can check the setting in the tof_data_source table and update the configuration through Execute SQL. This is a one-time setup.

For the message shown above, the source code is 3 and the provider will be REUTERS.

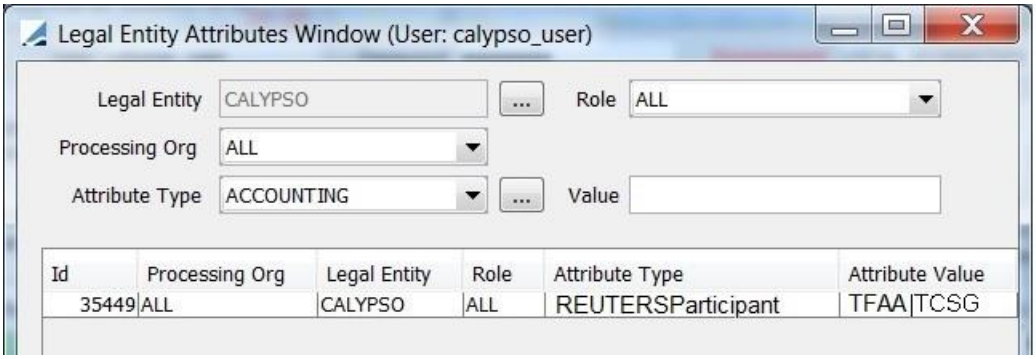


SOURCE_CODE	PROVIDER	DESCRIPTION	BROKER
1	REUTERS	Dealing3000-OfflineDealCapture	
2	REUTERS	Dealing3000-2	REUTERS
3	REUTERS	Dealing3000-1	
4	EBS	SRC_4_EBS=EBS-E-EBSGeneratedTrade	EBS
5	EBS	EBS-F-EBSTrade	EBS
6	EBS	EBS-Blank-EBSTrade	EBS
12	RTNS	RTNS-RTFX-Multi-Portal_Trade	REUTERS
32	RTNS	RTNS-Meitan-Tradition-Broker_Trade	REUTERS
34	RTNS	RTNS-Nittan-Broker_Trade	RTNS

Then the system will look up the counterparty having a legal entity attribute type {Provider}Participant, e.g. REUTERSParticipant in the message above, for a value list which contains Bank 1 Dealing Code (field 508) in the TOF message, for example, TFAA.

The value list is separated by a pipe ('|').

So, for the above TOF message, In order to let the system lookup this counterparty, add an legal entity attribute REUTERSParticipant. The attribute value must contain TFAA.



2.12 Legal Entity Identifier

In Reuters MIFID support following TOF fields contains legal entity identifier (LEI):

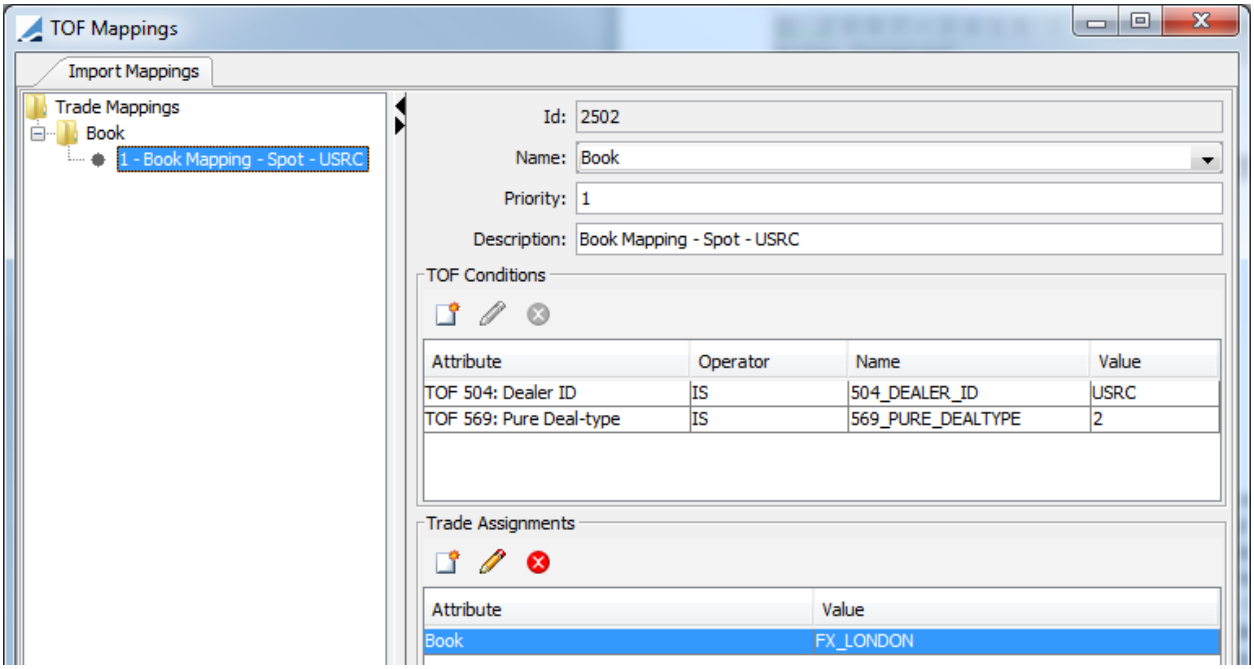
- 15446 - Submitting entity identification code
- 15462 - Buyer identification code
- 15463 - Seller identification code

The LEI value of these fields is resolved to calypso legal entity name, similarly, as seen in the previous section Counterparty Mapping.

2.13 Defining TOF Mapping

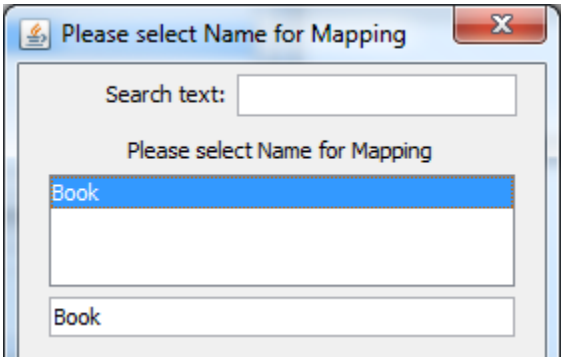
The TOF Mapping Window (menu action: `tof.mapping.TOFMappingWindow`) allows you to specify mapping rules between TOF and Calypso trades. As such, you can select conditions on one or more TOF fields to specify a Book, a CounterParty, a Broker, and a Trader. Please note that TOF Mapping will override all other mappings done by the TOF translator, counterparty lookup, etc. and give a final value to counterparty, trade book, trader, etc. to the Calypso trade.

The screenshot below shows the TOF Mapping Window.

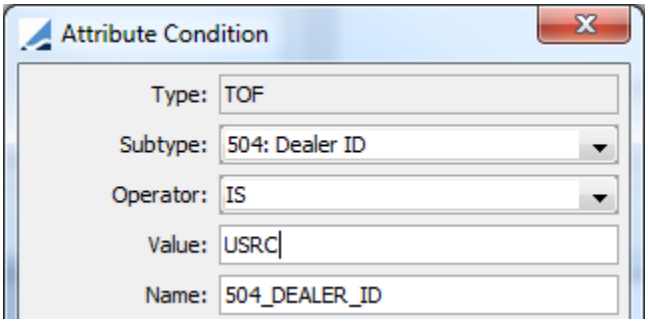


In the screenshot above, you see the mapping named "Book". It is telling the system that when the incoming TOF message has the Pure Deal Type (Field 569) equal 2 and the Dealer ID (Field 504) equal USRC, then the trade book FX_LONDON is assigned to the Calypso trade.

Now we will go through the steps of defining a TOF mapping. Firstly, in the TOF Mapping Window, click the "New" button.



Now let's add the TOF condition. Click on the "New condition" icon. Choose Subtype (a TOF message field), operator, value for the condition and then click OK.

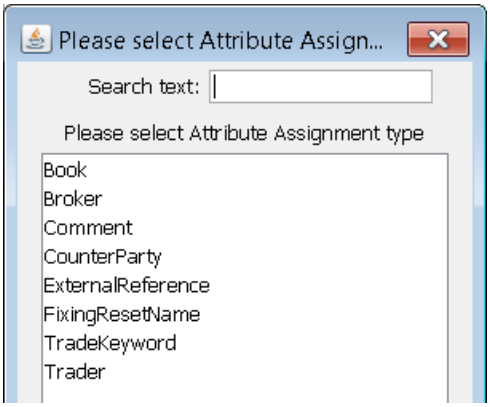


The system supports the following operators for comparing values:

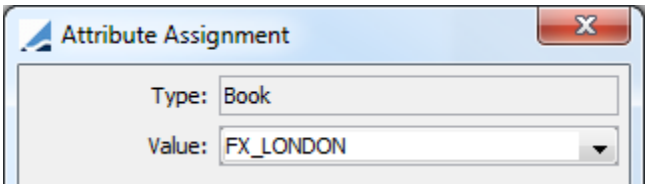
- IS (equal)
- IS NOT (not equal)
- IN (in the list defined in Value field, comma separated)
- NOT IN (not in the list defined in Value field, comma separated)
- LIKE (similar to the pattern in Value field, % as wildcard)
- NOT LIKE (not similar to the pattern in Value field, % as wildcard)
- ASSIGN (assign the TOF message field value to an internal variable, which could be referred by the Trade assignment in the next part)

Similarly, the TOF conditional for Pure Deal Type (field 569) could be added as well.

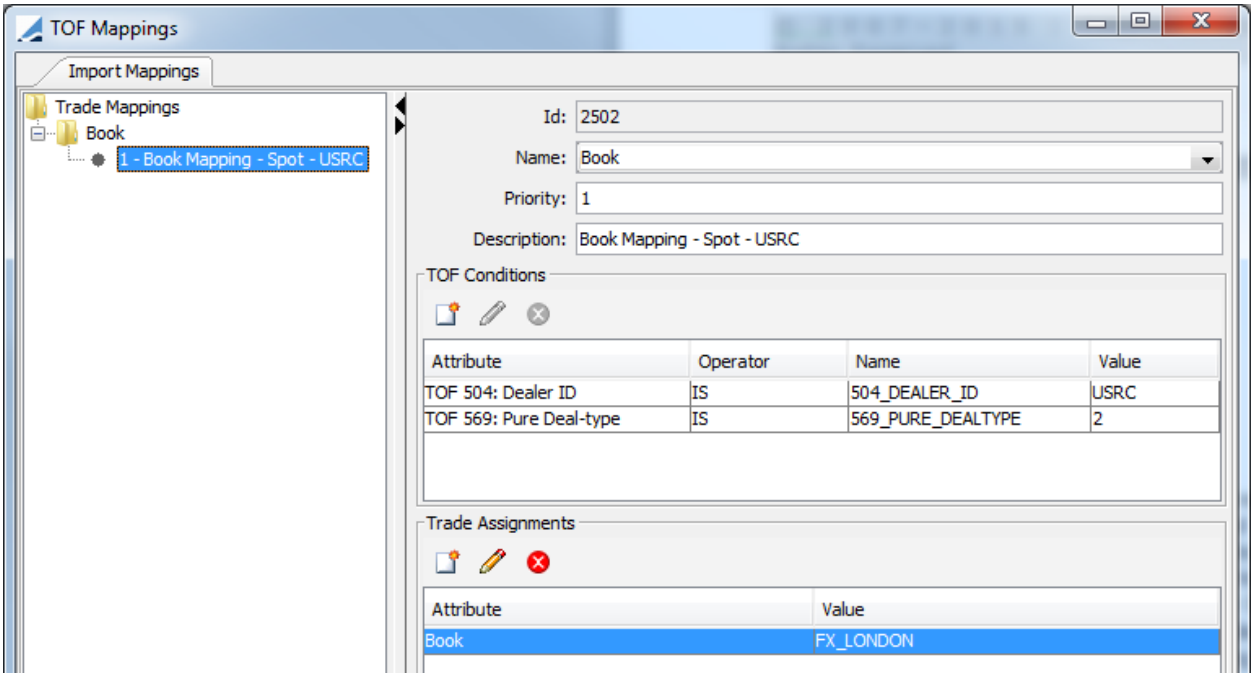
Then add a Trade assignment. Click on the "New Assignment" icon. Choose "Book" and then click OK.



Choose the book FX_LONDON and then click OK.



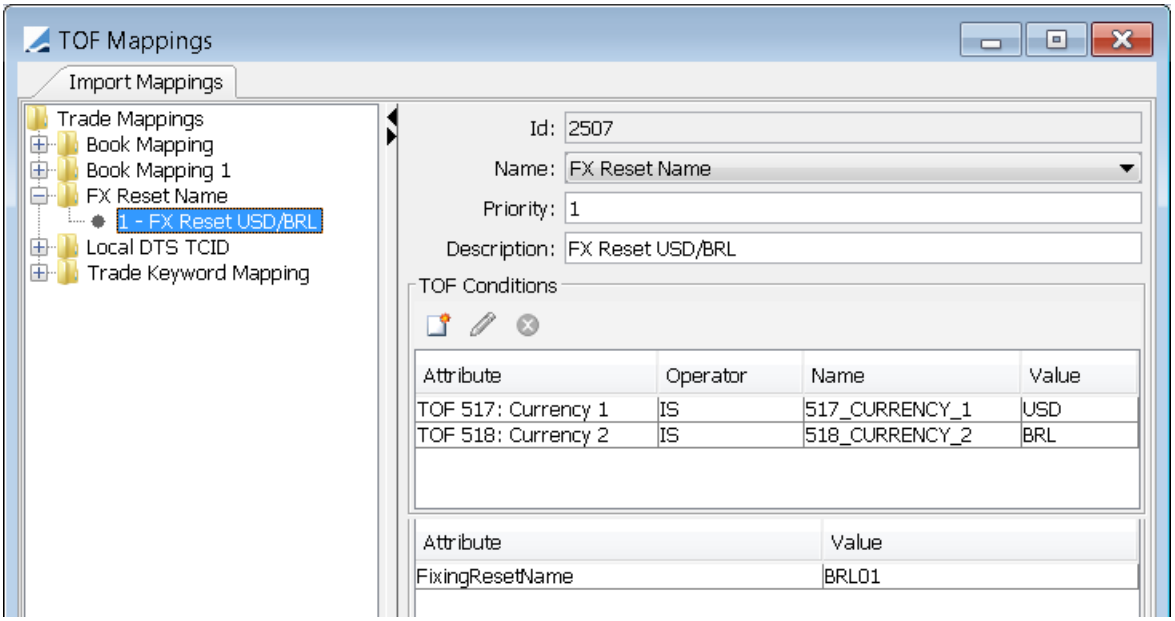
Finally, click the "Save" button. The TOF mapping is then saved.



The mappings rules will be executed in alphabetical order of the category they belong to. In some cases, TOF Mapping could have more than 1 mapping under the same category (e.g. Book) with priorities 1, 2, 3 and so on. The

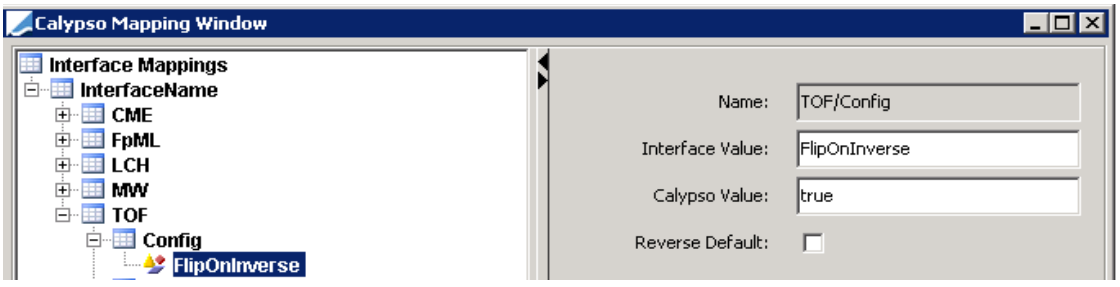
mapping with priority 1 will be attempted first. If all TOF conditions are met, that particular assignment is applied. If not all the conditions are met, then the mapping with priority 2 will be tried, and so on. If none of the mappings under the category Book could be applied, a mapping error will be attached to the TOF Message. It is a good idea to have a catch-all mapping with priority, say, 9999, that ensures that you will be setting some default BOOK if none of the other criteria match.

Please add TOF Mapping for Fixing Rate Name, if the module is expected to process TOF FX NDF trade messages. A sample setup is shown in the screenshot below. Please note that the value of FixingResetName should be one of those defined in Calypso via **Navigator > Configuration > Foreign Exchange > FX Rate Definitions Window**.



2.14 FX Swap Mapping

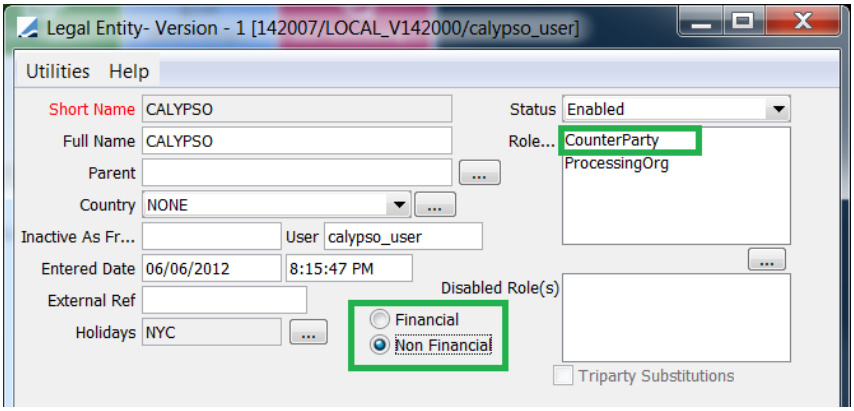
For FX Swaps with inverse rate direction (negotiated currency is Quoting currency instead of Primary currency), the far rate is the inverse far rate. To obtain the proper far rate, you can set FlipOnInverse = true in the Calypso Mapping window (menu action `mapping.CalypsoMappingWindow`) for the TOF config.



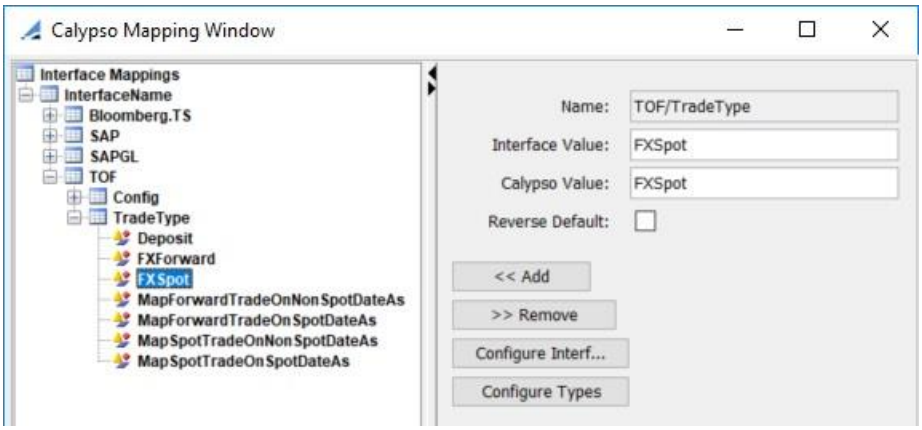
2.15 Flexi Forward Support

For TOF Spot and TOF Outright messages, if the mapped counterparty is non-financial, the messages will be converted to Calypso Flexi Forward trades with subtype Merchant FX.

The screenshot below shows the setup of a non-financial counterparty legal entity.



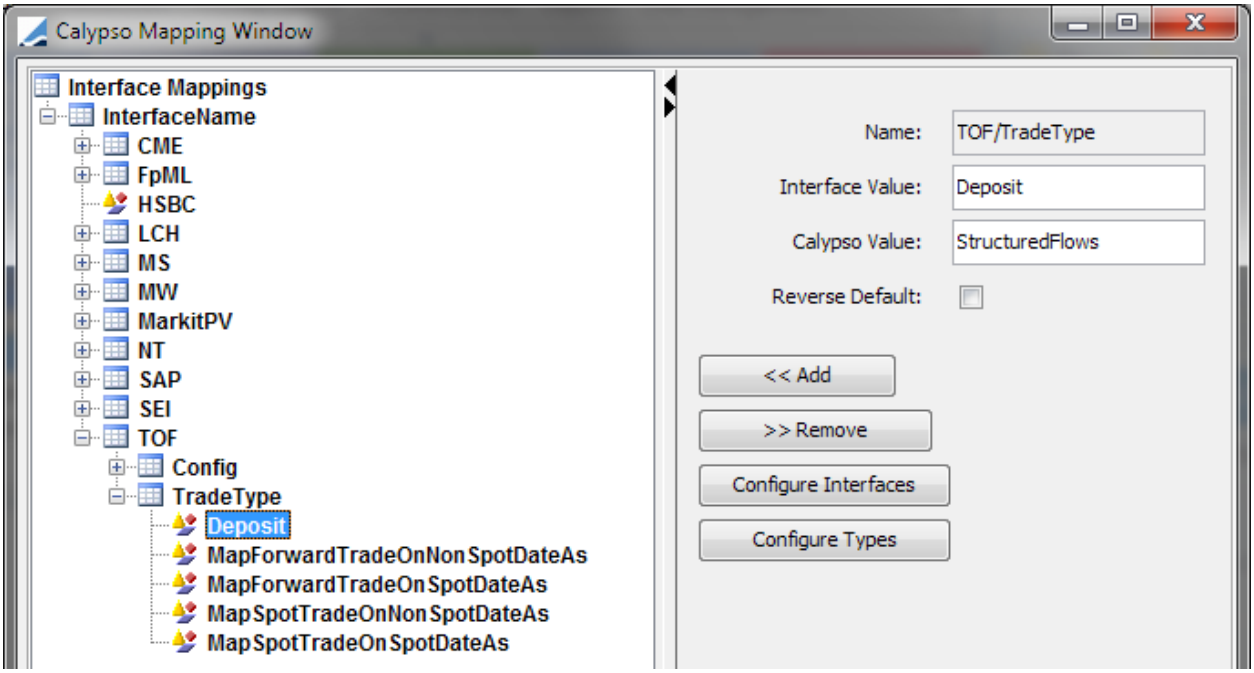
If you want to book these trades as FX Spot and FX Forward respectively, you can set the desired result product type using TradeType in the Calypso Mapping window (menu action `mapping.CalypsoMappingWindow`).



2.16 Structured Flows Support

Reuters TOF can be configured to save Money Market (Deposit) TOF message as Structured Flows trade or Cash trade in Calypso.

Configuration is provided in the Calypso Mapping window (menu action `mapping.CalypsoMappingWindow`) as shown below. Default support is enabled for Structured Flows, to enable Cash trade support mapping value should be kept empty.



You also need to use the following mapping to determine the direction type:

Name = TOF/Config

Interface Value = StructuredFlowsDirectionType

Calypso Value = Interest or Principal

2.17 Log Categories

For debug purpose, if necessary, add the following log categories to the Calypso logger.

- Messaging
- Detail
- DTSConnection
- TOFMessage
- ReutersTOF
- ReutersTOF.FILE

2.18 Customizing TOF Import

You can create custom TOF import classes in `tk.tof.domain.importing` that implement `com.calypso.tk.tof.domain.importing.TOFImportMapper`. The fully qualified class names must be registered in the domain “TOFImportTask”.

Execution

3.1 Starting the Reuters TOF Simulator (Optional, for testing purposes)

Only the TCP/IP mode is supported by the Calypso Reuters TOF Module

Start the Reuters TOF Simulator (see section 2.5 for installation) only if you are on testing purposes.

Please refer to the Thomson Reuters TOF Simulator User Guide for installation or usage details.

3.2 Starting the Reuters Deal Tracker Server (Live feed)

Follow the instructions from Reuters. Note that you do not need to start the Reuters TOF Simulator when using the Reuters DTS Server live feed.

3.3 Starting the DTS Engine

You can start the DTS Engine through the Engine Server Web Admin.

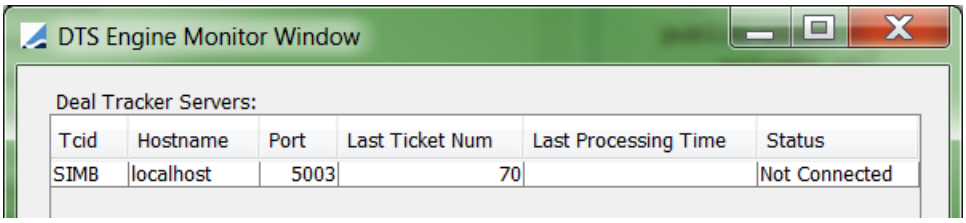
When the DTS Engine starts, it does the following:

- Connect to the Calypso Data Server.
- Find all Reuters DTS deals that have been retrieved from the DTS server and stored into the Calypso database with only mapping errors are reprocessed and mapped to Calypso Trades.
- Retrieves all the configured DTS Connections and tries to connect to the respective Reuters DTS servers.
- Restores the state of the previous DTS Engine session. That is, the DTS Engine remembers the last deals that it retrieved from the DTS server for each TCID, and starts retrieving deals from the DTS server after those deals. The DTS Engine also requests that the DTS server alert the DTS Engine whenever there is a new deal added to the DTS server.
- After a deal has been retrieved from the DTS server, the DTS Engine checks the deal for validity (that is, for correct formatting and to make sure all expected data fields have been sent by the DTS server). If the deal is not valid, DTS Engine reconstructs the last deal and requests it again from DTS Server.
- If the DTS deal is valid, the DTS Engine submits the deal to the Data Uploader for translation and persisting as a Calypso trade. If the DTS deal is not valid, the DTS Engine flags that it could not be mapped. The user must then check the deal in DTS Monitor window directly and fix any problems before the DTS Engine can retrieve it and try to map it again.
- The product of the trade is determined by the pure deal type (field 569) and the fixing date (field 554) of the DTS deal. (For the value of pure deal type (field 569), 2: Spot, 4: Outright (deliverable) or regular FX NDF, 8: FX Swap, 16: Loan/Deposit. Fixing date (field 554) is only present for regular FX NDF.)

ⓘ **NOTE: Run only ONE instance of the DTS Engine at a time**

3.4 Starting the DTS Connection Monitor Window

Open the DTS Connection Monitor window (Navigator Menu is configured in section 2.3).



The window displays all the possible DTS connections based on the DTS configurations. By default all the connections are in status "Not Connected".

The following information is displayed on then monitor window:

- Tcid of the DTS Server
- Host name of the DTS Server
- Port number of the DTS Server
- Last Ticket Number processed by the DTS Engine
- "Last Processing time" is the time at which the last message from the DTS Server was processed
- Status – "Connected" – Indicated the DTS Connection is live. "Not Connected" indicates that the connection was terminated or never started.

3.5 Starting the TOF Message Monitor Window

Open the TOF Monitor window (Navigator Menu is configured in section 2.5).

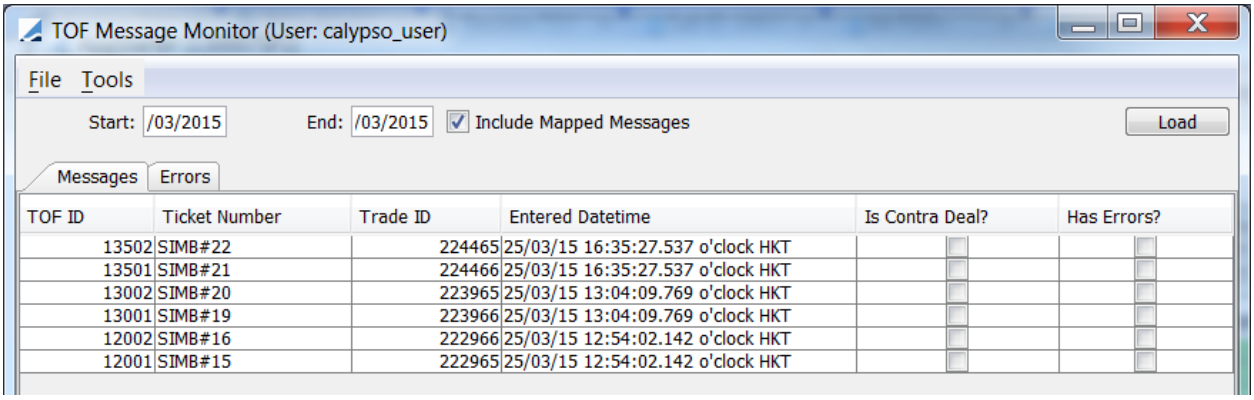
3.5.1 Loading TOF Messages

The Messages tab shows the TOF message information. Note that information for all TOF messages are displayed, whether the deal was mapped to a Calypso trade or not.

TOF messages that have a trade id > 0 are deals that have been mapped to a Calypso trade.

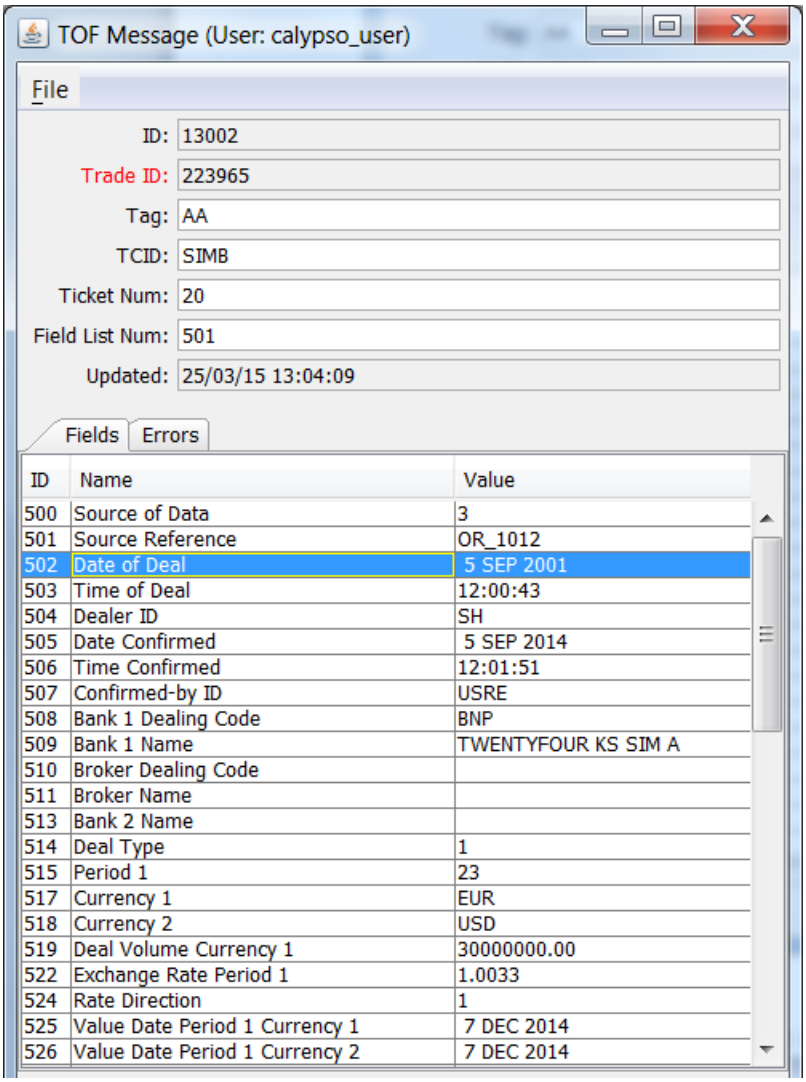
A TOF message with trade id = -1 is a contra deal, and thus does not need to be mapped to a Calypso trade. Instead, the original deal for which this deal is a contra will be cancelled.

A TOF Message that with no trade Id is a deal that either has not been mapped yet or the mapping was attempted but either there was not enough information to do so or there was an error in the data transmission from DTS for that deal.



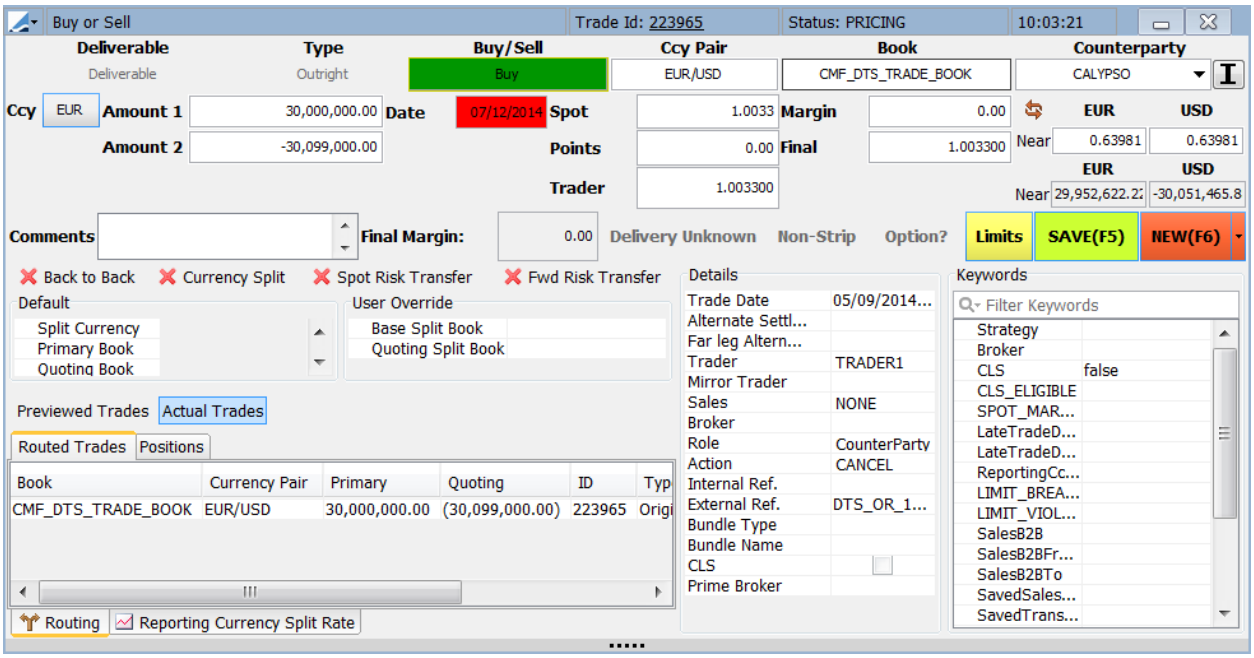
Select start and end dates and click **Load** to load DTS deal info.

You can double-click on a TOF message to get the full details.



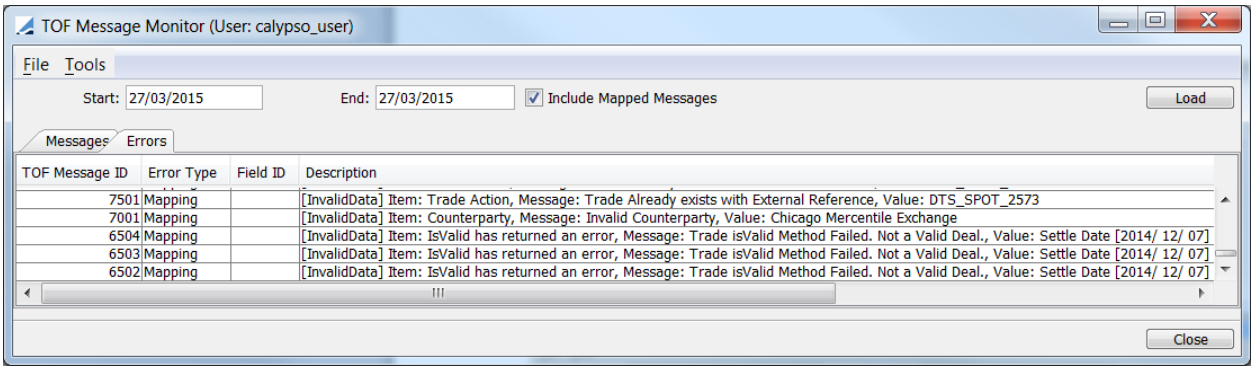
If the TOF Message has been mapped to a Calypso Trade, you can double-click on the "Trade ID" label or from the TOF Message Monitor Window via the popup menu "Trade Details" to open the trade. (In order to open a trade from the DTS Mapper Monitor window by double clicking a row, you need to have the proper Trade Window Configuration. Refer to Trade Window Configuration in the Appendix for details.) The popup menu could be brought up by right clicking a specific message entry in the Messages tab.

The trade will be shown in a corresponding Trade Window.



3.5.2 Viewing Mapping Errors

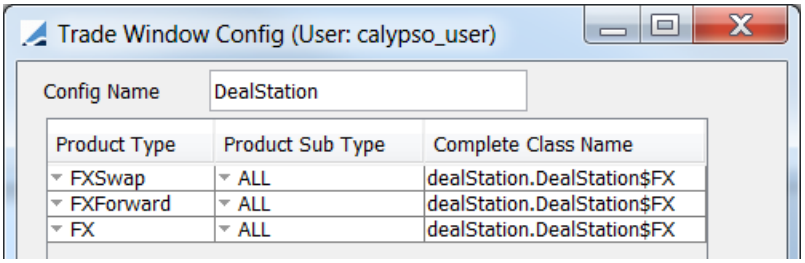
You can view mapping errors in the Errors tab.



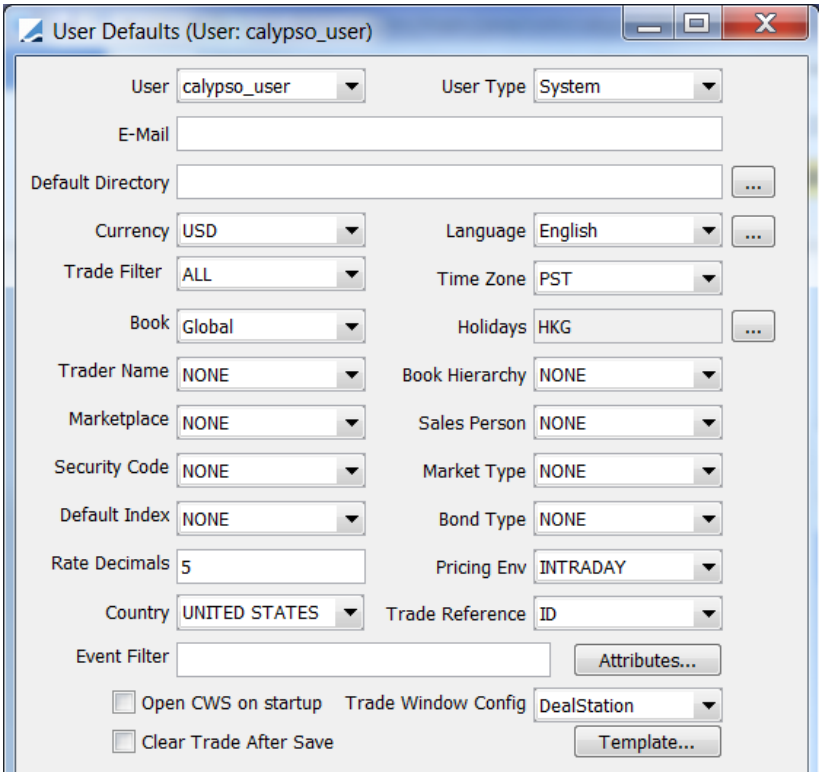
Appendix

4.1 Trade Window Configuration

In order to open a trade from the DTS Mapper Monitor window by double clicking a row, you need to have the proper Trade Window Configuration (**Navigator > Configuration > User Access Control > Trade Window**).



The Trade Window Config must be set in the User Defaults.



4.2 Trade Keywords

The following trade keywords will be added by the Reuters TOF Module:

- DealOrigin: Field 500
- DealOriginType: Field 500
- DTS_Id: The ID assigned by the DTS Engine to the raw DTS deal after it has been read by the DTS Engine and before it has been mapped
- DTS_LOCAL_TCID: Local TCID (field 551)
- DTS_TicketNum: The TCID and ticket number of the DTS deal from the originating dealing system, such as from the Reuters or EBS dealing system
- EBS_ReferenceNum: Field 562
- ElectronicBrokerage: Field 540
- ContraDeal_DTS_Id: Field 567
- DTS_NegotiatedPrice: Field 522
- DTS_RateDirection: Field 524

MIFID Keywords

Trade Keyword	Description	TOF FID
ReportingMIFIDTransactionIdentifier	Generated or user submitted per transaction	15458
ReportingMIFIDTransactionIdentifier Leg2	Generated or user submitted per transaction	15459
ReportingMIFIDOTCPostTradeIndicator	Selectable flags submitted per transaction	15438 15439 15440 15441
ReportingMIFIDWaiverIndicator	Selectable flags submitted per transaction	15453 15460
ReportingMIFIDSecuritiesFinancingTxnIndicator	Securities financing transaction identifier	15454
ReportingInvestmentDecisionMaker	User submitted per transaction, can be defaulted based upon user logged in	15455
ExecutionVenueMIC	MICs taken from static, selectable on a transaction	15435
ExecutionVenue	Venue type	15303

Trade Keyword	Description	TOF FID
InstrumentISIN	Instrument identification code	15431
InstrumentISIN Leg2	Instrument identification code Leg2	15432
InstrumentFullName	Instrument full name	15433
InstrumentFullName Leg2	Instrument full name Leg2	15434
ReportingMIFIDCounterparty	Calypso Legal entity for the corresponding party selected in ReutersTOF as the Reporting Party	15446
ReportingTradingCapacity	Trading capacity Refer section. Legal entity identifier for further detail.	15448
ExecutionDateTime	Trading date and time microseconds	15427
ReportingMIFIDTransactionReferenceNumber	Transaction reference number	15443
ReportingMIFIDTransactionReferenceNumber Leg2	Transaction reference number leg2	15449
ReportingMIFIDSecuritiesFinancingTxnIndicator	Securities financing transaction indicator	15454

Order Details Keywords

Keyword	Description	TOF FID
TypeOfOrder	Execution Type	15442
OrderTransmission	Transmission of order indicator	15447
OrderBuyer	Calypso Legal entity for the corresponding party selected in ReutersTOF as buyer identification code. Refer section. Legal entity identifier for further detail.	15462

Keyword	Description	TOF FID
OrderSeller	Calypso Legal entity for the corresponding party selected in ReutersTOF as seller identification code Refer section. Legal entity identifier for further detail.	15463