



Nasdaq Calypso

MarketAxess Integration Guide (Formerly TRAX)

Version 5.6.0

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Approved

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2.0	October 2017	Second edition for version 3.4.0
3.0	November 2018	Third edition for version 3.5.4
4.0	March 2019	Fourth edition for version 3.5.6
5.0	March 2020	Fifth edition for version 3.5.7
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7.0	August 2020	Seventh edition for version 3.5.9
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25.0	February 2024	Edition 25 for version 4.11.1, 5.1.1 – Both are technical releases only
26.0	May 2024	Updates for version 5.2.0
27.0	July 2024	Updates for version 5.3.0 – Release notes only
28.0	August 2024	Updates for version 4.12.0 – Release notes only
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31.0	February 2025	Updates for version 4.15.0 – Release notes only
32.0	March 2025	Updates for version 5.6.0 – Release notes only

This document guides you through the setup required for generating and reconciling MarketAxess messages.

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

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Installation

1.1 Gateway

1.1.1 Third Parties Software Dependencies

ActiveMQ and stunnel must be installed.

1.1.2 Installation process

The rel-zip for the TRAX gateway is included under <calypso home>/deploy.

Set ActiveMQ installation properties in **resources/application.properties**:

- calypso.activemq.connection.url
- calypso.activemq.connection.login
- calypso.activemq.connection.password

Set FIX Session specific properties in **resources/calypso-fix-out.properties**:

- SenderCompID
- SocketConnectPort
- SocketConnectHost

Starting the Trax Gateway in version 16.1

You can start the Gateway at the command line using the following command:

```
java -cp "jars/*;lib/*;resources/*;resources/camel-trax.xml;" com.calypso.apps.trax.StartTraxGateway
```

Starting the Trax Gateway in version 17 / 18

You can start the Gateway at the command line using the following command from <calypso home>:

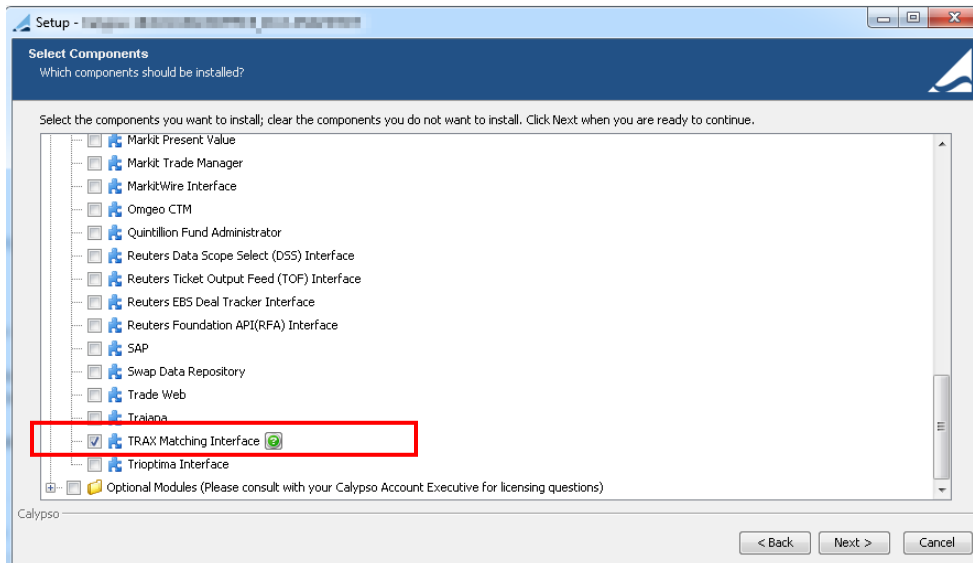
```
java -cp "client/resources/*;client/lib/*;server/trax-gateway/lib/*" com.calypso.apps.trax.StartTraxGateway
```

If you want to start the trax gateway from a different machine, make sure that you copy the following folders:

- client/resources
- client/lib
- server/trax-gateway/lib

1.2 Module

Run the installer and tick “TRAX Matching Interface” in Interfaces



Set TRAX specific properties in **resources/calypso_trax_config.properties**:

- jms.url
- input.queue.name
- output.queue.name
- trax.subscriber.id

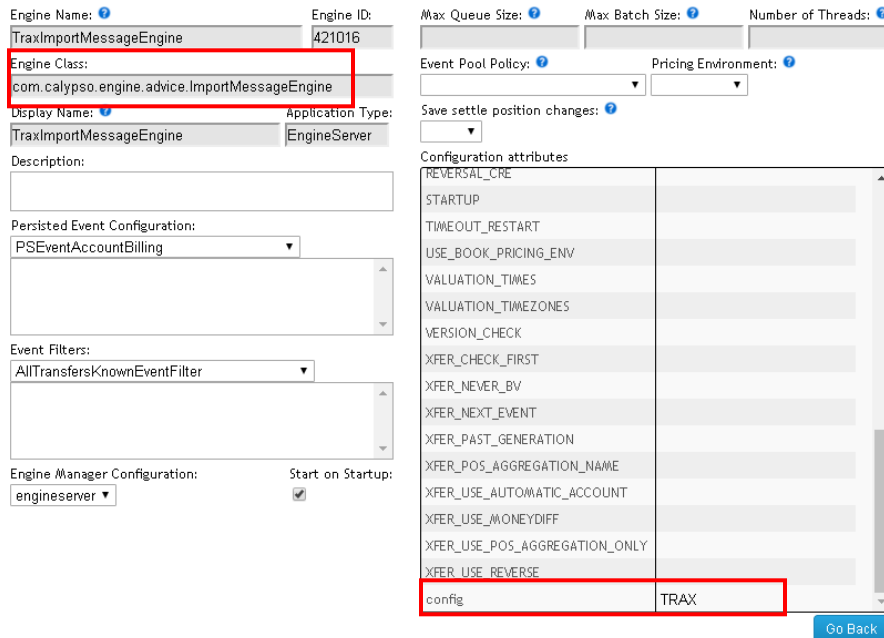
Note: Use calypso_trax_config.properties.sample for reference

Run Execute SQL on **TRAXSchemaData.xml** and **TRAXSchemaBase.xml**

Optional: **TRAXSchemaDataExtraConfig.xml** (message setup).

1.3 TRAX Importer Engine Setup

The setup should be performed through the Engine Manager.



Engine Name: Engine ID:

Max Queue Size: Max Batch Size: Number of Threads:

Engine Class:

Event Pool Policy: Pricing Environment:

Display Name: Application Type:

Save settle position changes:

Description:

Persisted Event Configuration:

Event Filters:

Engine Manager Configuration: Start on Startup: ☒

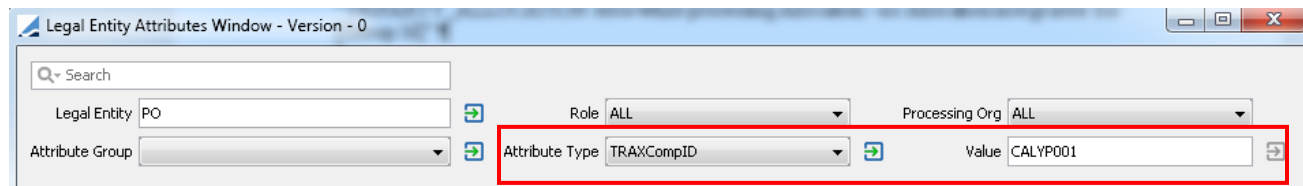
Configuration attributes

REVERSAL_CRE	
STARTUP	
TIMEOUT_RESTART	
USE_BOOK_PRICING_ENV	
VALUATION_TIMES	
VALUATION_TIMEZONES	
VERSION_CHECK	
XFER_CHECK_FIRST	
XFER_NEVER_BV	
XFER_NEXT_EVENT	
XFER_PAST_GENERATION	
XFER_POS_AGGREGATION_NAME	
XFER_USE_AUTOMATIC_ACCOUNT	
XFER_USE_MONEYDIFF	
XFER_USE_POS_AGGREGATION_ONLY	
XFER_USE_REVERSE	
config	TRAX

- Engine Class: com.calypso.engine.advice.ImportMessageEngine
- Config: TRAX

1.4 Legal Entity

The TRAX Subscriber (CompID) should be set on the ProcessingOrg using the Legal Entity Attribute TRAXCompID.



Legal Entity Attributes Window - Version - 0

Search:

Legal Entity:

Attribute Group:

Role:

Processing Org:

Attribute Type:

Value:

1.5 TRAX Rate Index Code

For variable rate repos, TRAX uses its own nomenclature to describe the name of the index:

- LIBOR: London Interbank Offered Rate
- EONIA: Euro Overnight Index Average
- EUREPO: Euro GC Repo Market
- SONIA: Sterling Overnight Interbank Average

- FEDEFF: US Federal Fund Rate

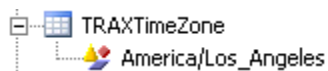
Since Calypso allows the name of your choice in the rate index definition, we need a place to store the corresponding TRAX code. You can do that by setting the attribute `TRAXRateIndexCode` of corresponding rate index.

1.6 Time Zone

The `TimeZone` to be used by the `TRAXFormatter` when creating TRAX messages can be set in the domain `TRAXTimeZone`.

The syntax for this domain value is based on IANA Timezone Names (e.g. "America/Los_Angeles" or "Europe/London").

Example:



1.7 SSL Setup for Trax Gateway

The Trax Gateway can only connect to ActiveMQ. Here are the steps to use SSL with ActiveMQ and the Trax Gateway.

Step 1 – You first need to create the proper keystore and truststore. This is only done once.

When you generate your self-signed certificate, make sure you answer this question like that:

```

What is your first and last name?
[Unknown]: localhost

//The rest you can fill accordingly
  
```

» Create a keystore for the broker SERVER

```
keytool -genkey -alias amq-server -keyalg RSA -keysize 2048 -keystore amq-server.ks
```

» Export the broker SERVER certificate from the keystore

```
keytool -export -alias amq-server -keystore amq-server.ks -file amq-server_cert
```

» Create the CLIENT keystore

```
keytool -genkey -alias amq-client -keyalg RSA -keysize 2048 -keystore amq-client.ks
```

- » Import the previous exported broker's certificate into a CLIENT truststore

```
keytool -import -alias amq-server -keystore amq-client.ts -file amq-server_cert
```

- » If you want to make trusted also the client, you must export the client's certificate from the keystore

```
keytool -export -alias amq-client -keystore amq-client.ts -file amq-client_cert
```

- » Import the client's exported certificate into a broker SERVER truststore

```
keytool -import -alias amq-client -keystore amq-server.ts -file amq-client_cert
```

- » copy the files to the conf folder of activeMQ

```
copy amq-server.ts ${ACTIVEMQ_HOME}/conf/  
copy amq-client.ts ${ACTIVEMQ_HOME}/conf/
```

Step 2 - Change the <transportConnectors> element in the \${ACTIVEMQ_HOME}/conf/activemq.xml file. Edit the file \${ACTIVEMQ_HOME}/conf/activemq.xml as below. Replace <password> with your own password.

```
<broker xmlns="http://activemq.apache.org/schema/core" brokerName="localhost" dataDirectory="${activemq.data}">  
  <transportConnectors>  
    <transportConnector name="ssl" uri="ssl://0.0.0.0:61617?trace=true" />  
  </transportConnectors>  
  <!-- SSL Configuration Context -->  
  <sslContext>  
    <sslContext keyStore="file:${activemq.base}/conf/amq-server.ts"  
      keyStorePassword="<password>"  
      trustStore="file:${activemq.base}/conf/amq-client.ts"  
      trustStorePassword="<password>" />  
    </sslContext>  
  </broker>
```

Step 3 - Your activeMQ should start with a possibility to connect using SSL on port 61617. You should see something like this in the console.

```

ACTIVEMQ_HOME: C:\tools\apache-activemq-5.14.5\bin\..
ACTIVEMQ_BASE: C:\tools\apache-activemq-5.14.5\bin\..
ACTIVEMQ_CONF: C:\tools\apache-activemq-5.14.5\bin\..\conf
ACTIVEMQ_DATA: C:\tools\apache-activemq-5.14.5\bin\..\data
Loading message broker from: xbean:activemq.xml
INFO | Refreshing org.apache.activemq.xbean.XBeanBrokerFactory$1@343f4d3d: startup date [Mon Dec 26 04:49:31 PST 2022]; root of c
ontext hierarchy
INFO | Using Persistence Adapter: KahaDBPersistenceAdapter[C:\tools\apache-activemq-5.14.5\bin\..\data\kahadb]
INFO | KahaDB is version 6
INFO | Recovering from the journal @18:25223240
INFO | Recovery replayed 167 operations from the journal in 0.031 seconds.
INFO | PListStore[C:\tools\apache-activemq-5.14.5\bin\..\data\localhost\tmp_storage1 started
INFO | Apache ActiveMQ 5.14.5 (localhost, ID:colotrax01-58485-1672058972802-0:1) is starting
INFO | Listening for connections at: ssl://colotrax01:61617?maximumConnections=1000&wireFormat.maxFrameSize=104857600
INFO | Connector ssl started
INFO | Listening for connections at: tcp://colotrax01:61616?maximumConnections=1000&wireFormat.maxFrameSize=104857600
INFO | Connector openwire started
INFO | Listening for connections at: amqp://colotrax01:5672?maximumConnections=1000&wireFormat.maxFrameSize=104857600
INFO | Connector amqp started
INFO | Listening for connections at: stomp://colotrax01:61613?maximumConnections=1000&wireFormat.maxFrameSize=104857600
INFO | Connector stomp started
INFO | Listening for connections at: mqtt://colotrax01:1883?maximumConnections=1000&wireFormat.maxFrameSize=104857600
INFO | Connector mqtt started
WARN | ServletContext@o.e.j.s.ServletContextHandler@4b2a01d4/,null,STARTING) has uncovered http methods for path: /
INFO | Listening for connections at ws://colotrax01:61614?maximumConnections=1000&wireFormat.maxFrameSize=104857600
INFO | Connector ws started
INFO | Apache ActiveMQ 5.14.5 (localhost, ID:colotrax01-58485-1672058972802-0:1) started

```

Step 4 – You need to configure the Trax Gateway to connect using SSL and not the standard way.

You will need to edit the file `trax-gateway-application.properties` and set update the following properties:

```

calypso.activemq.connection.existingBroker = false
calypso.activemq.connection.url=ssl://localhost:61617

```

Then edit the file `trax-beans.xml` and add the following bean definition:

```

<bean id="amq" class="org.apache.activemq.ActiveMQSslConnectionFactory">
    <property name="keyStore" value="amq-client.ks" />
    <property name="keyStorePassword" value="Calypso123" />
    <property name="trustStore" value="amq-client.ts" />
    <property name="trustStorePassword" value="Calypso123" />
</bean>

```

Note that the id of the bean must have the same value as the property `calypso.jms.activemq.component` in `trax-gateway-application.properties`.

Reference Data Setup

2.1 Workflow Configuration

Go to [Configuration > Workflow > Workflow](#) to create the needed Message Workflows

The four following workflow files that be imported:

- “TRAX_CONFIRM.wf” for outgoing trade confirmations
- “TRAX_INCOMING.wf” for incoming advisory messages and confirmation responses
- “TRAX_PTA_CONFIRM.wf” for outgoing PTA messages
- “TRAX_PTA_INCOMING.wf” for incoming PTA messages.

2.2 Message Sender Configuration

Go to [Configuration > Messages & Matching > Message Sender](#) to create the needed Message Sender Configuration for the outgoing TRAX_CONFIRM and TRAX_PTA_CONFIRM messages.

Status	Product	Advice Type	Address Type	Gateway	Send	Save	By Gateway	By Method
TO_SEND	ALL	TRAX_CONFIRM	TRAX	TRAX	true	true	true	false
TO_SEND	ALL	TRAX_PTA_CONFIRM	TRAX	TRAX	true	true	true	false

2.3 Preparing for Message Setup

The kind of reporting and matching required depends on a combination of the following criteria:

- Type of Trade – For example a Cash Bond trade is Reportable, but a movement of the same Bond as collateral for a margin call for a SWAP is not.
- The Security - Some Bonds (because of their “length of time to Maturity”) are not reportable to ICMA.
- The Counterparty - Some Counterparties are ICMA members and therefore will require Matching as well as reporting in TRAX (Matching is referred to as “On Database” while Reporting only is referred to as “Off Database”).

The following list shows the different possible combinations for the Counterparty and Security to decide whether a Trade should be reported to TRAX. For a reportable trade type:

- If the Counterparty is an ICMA Member and the Security is ICMA Reportable – you do Report and Match via TRAX

(regardless of whether the Security is FSA reportable)

- If the Counterparty is an ICMA Member but the Security is not ICMA Reportable - you do not Report or Match via TRAX
(where the Security is not FSA reportable)
- If the Counterparty is an ICMA Member but the Security is not ICMA Reportable - you do Report but do not Match via TRAX
(where the Security is FSA reportable)
- If the Counterparty is not an ICMA Member, but the Security is ICMA Reportable – you do Report but do not Match via TRAX
(where the Counterparty is an FSA reportable Counterparty)
- If the Counterparty is not an ICMA Member, but the Security is ICMA Reportable – you do not Report or Match via TRAX
(where the Counterparty is not an FSA reportable Counterparty)
- If the Counterparty is not an ICMA Member, and the Security is not ICMA Reportable – you do not Report or Match via TRAX
(regardless of whether the Security is FSA reportable)

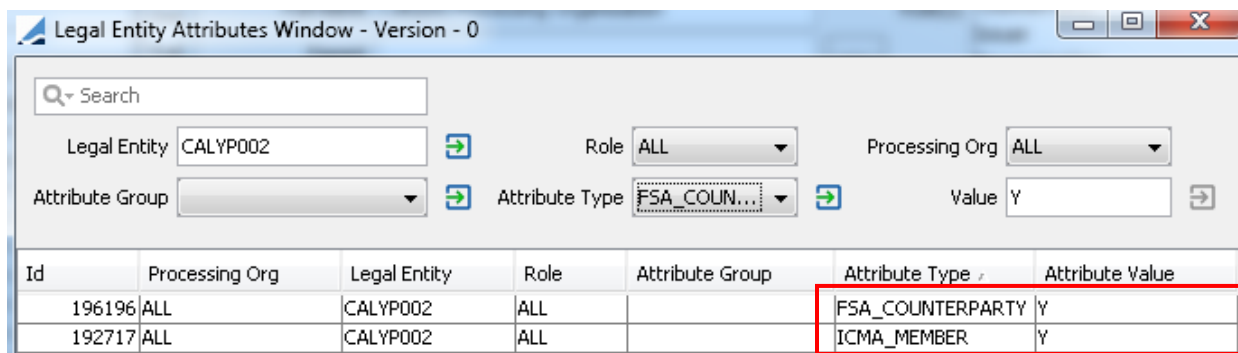
To determine which transactions need to be reported to ICMA via TRAX (using the above criteria) you need to carry out some static data configuration.

This is managed using a combination of Legal Entity Attributes, Product Codes and Message Set Up.

2.3.1 Legal Entity Attributes

You need to set two Legal Entity Attributes:

- FSA_COUNTERPARTY
- ICMA_MEMBER



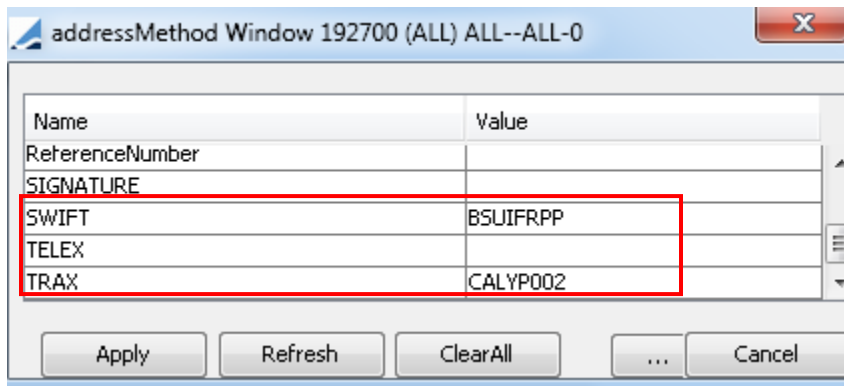
Id	Processing Org	Legal Entity	Role	Attribute Group	Attribute Type	Attribute Value
196196	ALL	CALYP002	ALL		FSA_COUNTERPARTY	Y
192717	ALL	CALYP002	ALL		ICMA_MEMBER	Y

2.3.2 Legal Entity Contacts Address Codes

One of these three different address codes can be set on the Legal Entities' Contacts to be used in TRAX messages:

- TRAX

- SWIFT
- FSA

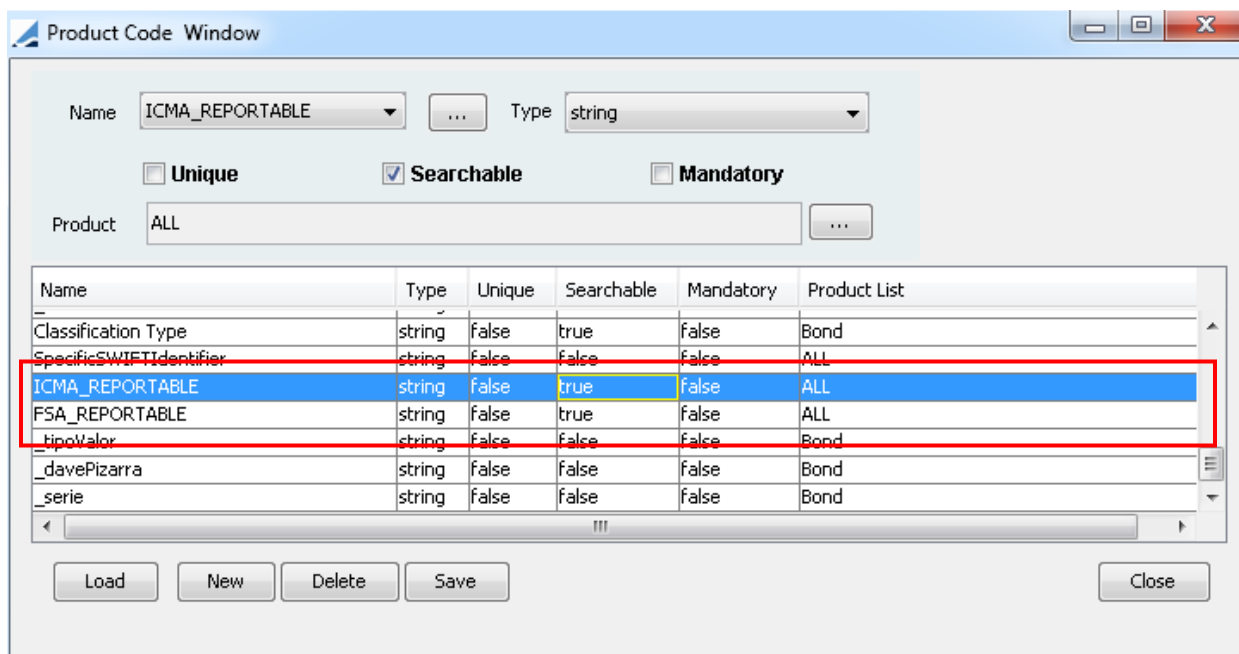


Name	Value
ReferenceNumber	
SIGNATURE	
SWIFT	BSUIFRPP
TELEX	
TRAX	CALYP002

Buttons: Apply, Refresh, ClearAll, ..., Cancel

2.3.3 Product Code Setup

You need to set two new Product Codes:



Name: ICMA_REPORTABLE Type: string

☐ Unique ☒ Searchable ☐ Mandatory

Product: ALL

Name	Type	Unique	Searchable	Mandatory	Product List
Classification Type	string	false	true	false	Bond
SpecificSWIFTIdentifier	string	false	false	false	ALL
ICMA_REPORTABLE	string	false	true	false	ALL
FSA_REPORTABLE	string	false	true	false	ALL
tipoValor	string	false	false	false	Bond
_davePizarra	string	false	false	false	Bond
_serie	string	false	false	false	Bond

Buttons: Load, New, Delete, Save, Close

These can then be set on the relevant Products as appropriate from the Product Static Data Window:

Code Window BondDBR 4 1/4 07/04/39/10Y/07/04/2039/4.25%	
Product Code Name	Value
DebtSeniority	SENIOR_UNSECURED
Feed	BLOOMBERG
ICMA_REPORTABLE	Y
ISIN	DE0001135325
BB_ID_BB_ULTIMATE_PARENT_CO_NAME	

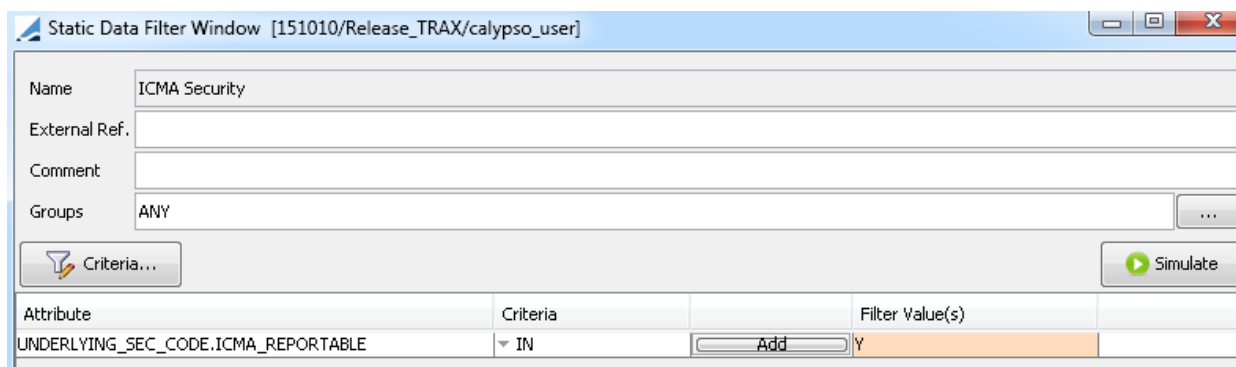
2.3.4 Static Data Filters Setup

The following is an example of the Static Data filters that are needed to generate the correct TRAX Reporting Messages.

Static Data Filter Window [151010/Release_TRAX/calypso_user]			
Name	FSA Counterparty		
External Ref.			
Comment			
Groups	ANY		
Criteria...		Simulate	
Attribute	Criteria		Filter Value(s)
CPTY_ATTRIBUTE.FSA_COUNTERPARTY	IN	Add	Y

Static Data Filter Window [151010/Release_TRAX/calypso_user]			
Name	ICMA Member		
External Ref.			
Comment			
Groups	ANY		
Criteria...		Simulate	
Attribute	Criteria		Filter Value(s)
CPTY_ATTRIBUTE.ICMA_MEMBER	IN	Add	Y

Static Data Filter Window [151010/Release_TRAX/calypso_user]			
Name	FSA Security		
External Ref.			
Comment			
Groups	ANY		
Criteria...		Simulate	
Attribute	Criteria		Filter Value(s)
UNDERLYING_SEC_CODE.FSA_REPORTABLE	IN	Add	Y



Static Data Filter Window [151010/Release_TRAX/calypso_user]

Name: ICMA Security

External Ref.:

Comment:

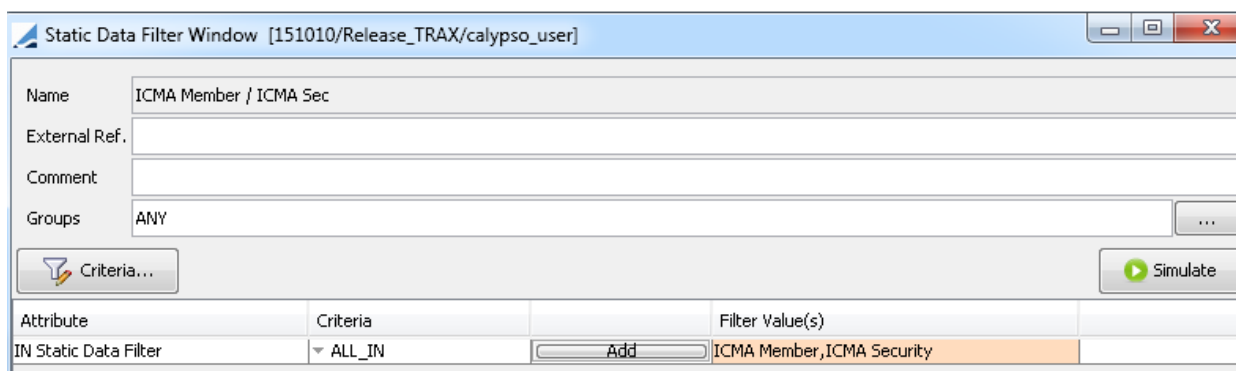
Groups: ANY

Criteria... Simulate

Attribute	Criteria	Filter Value(s)
UNDERLYING_SEC_CODE.ICMA_REPORTABLE	IN	Y

Then to achieve the TRAX Reporting Logic defined above, you can create three more Static Data Filters using a combination of these filters – to meet the three categories where TRAX Reporting is required:

- If the Counterparty is an ICMA Member and the Security is ICMA Reportable – you do Report and Match via TRAX (regardless of whether the Security is FSA reportable)



Static Data Filter Window [151010/Release_TRAX/calypso_user]

Name: ICMA Member / ICMA Sec

External Ref.:

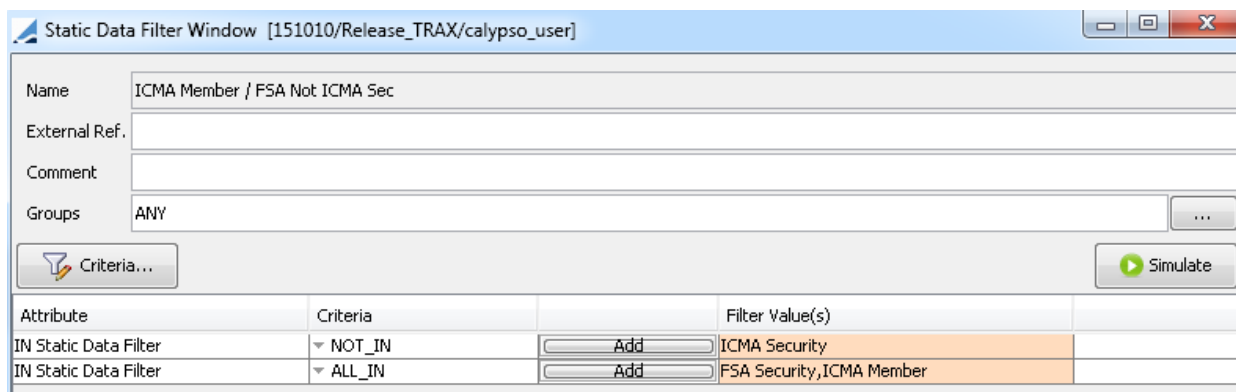
Comment:

Groups: ANY

Criteria... Simulate

Attribute	Criteria	Filter Value(s)
IN Static Data Filter	ALL_IN	ICMA Member, ICMA Security

- If the Counterparty is an ICMA Member but the Security is not ICMA Reportable - you do Report but do not Match via TRAX (where the Security is FSA reportable)



Static Data Filter Window [151010/Release_TRAX/calypso_user]

Name: ICMA Member / FSA Not ICMA Sec

External Ref.:

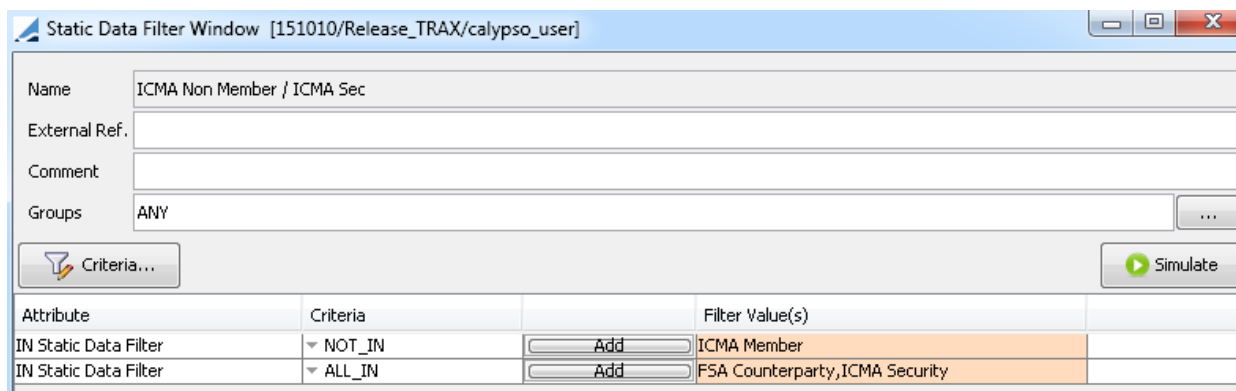
Comment:

Groups: ANY

Criteria... Simulate

Attribute	Criteria	Filter Value(s)
IN Static Data Filter	NOT_IN	ICMA Security
IN Static Data Filter	ALL_IN	FSA Security, ICMA Member

- If the Counterparty is not an ICMA Member, but the Security is ICMA Reportable – you do Report but do not Match via TRAX ([where the Counterparty is an FSA reportable Counterparty](#))



Static Data Filter Window [151010/Release_TRAX/calypso_user]

Name: ICMA Non Member / ICMA Sec

External Ref.:

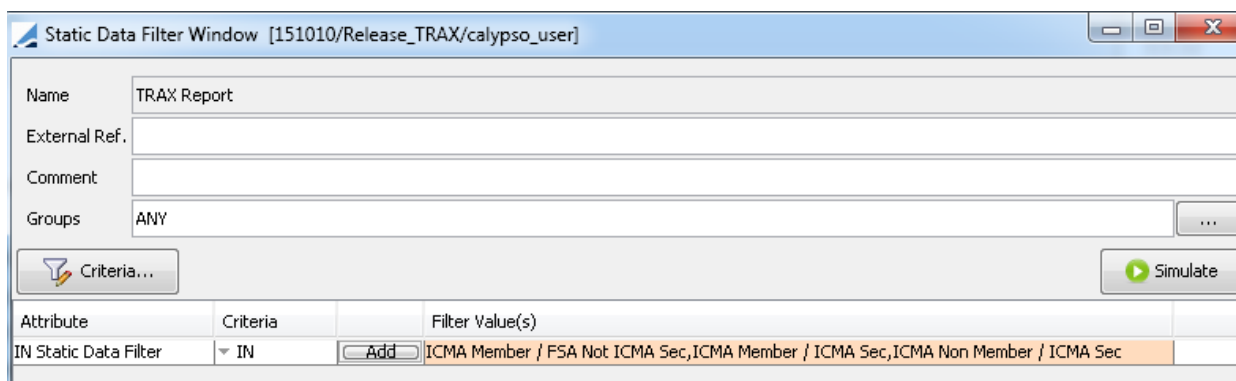
Comment:

Groups: ANY

Criteria... Simulate

Attribute	Criteria	Filter Value(s)
IN Static Data Filter	NOT_IN	ICMA Member
IN Static Data Filter	ALL_IN	FSA Counterparty, ICMA Security

Finally, the following Static Data Filter to combines these three filters:



Static Data Filter Window [151010/Release_TRAX/calypso_user]

Name: TRAX Report

External Ref.:

Comment:

Groups: ANY

Criteria... Simulate

Attribute	Criteria	Filter Value(s)
IN Static Data Filter	IN	ICMA Member / FSA Not ICMA Sec, ICMA Member / ICMA Sec, ICMA Non Member / ICMA Sec

It is the basis Static Data Filter to decide which trades should be sent to TRAX. Then we will see in the next section that we need to combine this filter with other criteria to have a working message setup.

2.4 Message Setup

Go to [Configuration > Messages & Matching > Message Set-up](#) to configure the message setup for the outgoing TRAX_CONFIRM and TRAX_PTA_CONFIRM messages:

Product	Event	Message Type	Template Name	Static Filter
Bond	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
Bond	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondAssetBacked	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm

Product	Event	Message Type	Template Name	Static Filter
BondAssetBacked	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondBrady	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondBrady	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondConvertible	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondConvertible	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondMMDiscount	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondMMDiscount	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondMMInterest	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
BondMMInterest	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
Equity	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
Equity	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_TRAD.xml	TRAX Report Confirm
Repo	VERIFIED_TRADE	TRAX_PTA_CONFIRM	TransactionRequest_PTA.xml	TRAX Report Confirm or RPU
Repo	TERMINATED_TRADE	TRAX_PTA_CONFIRM	TransactionRequest_PTA.xml	TRAX Report PTA
Repo	ROLLOVERED_TRADE	TRAX_PTA_CONFIRM	TransactionRequest_PTA.xml	TRAX Report PTA
Repo	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_REPO.xml	TRAX Report Confirm or RPU
Repo	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_REPO.xml	TRAX Report

Product	Event	Message Type	Template Name	Static Filter
SimpleRepo	CANCELED_TRADE	TRAX_CONFIRM	TransactionRequest_REPO.xml	TRAX Report Confirm
SimpleRepo	VERIFIED_TRADE	TRAX_CONFIRM	TransactionRequest_REPO.xml	TRAX Report

The other options need to be set as follow for all the message configurations:

- Processing Org = ALL
- Processing Org Contact Type = Default
- Receiver = ALL
- Receiver Role = CounterParty
- Receiver Contact Type = Default
- Language = English
- Address Type = TRAX
- Gateway = TRAX
- Format Type = TRAX
- Matching checked

Calypso provides four different sets of message templates that can be customized according to the user's need:

- The templates whose name contains TRAD are standard trade message templates without all the mandatory fields for the extended settlement matching in TRAX.
- The templates whose name contains XMAT are standard trade message templates with the mandatory fields for the extended settlement matching in TRAX.
- The templates whose name contains REPO are repo trade message templates.
- The templates whose name contains PTA are repo post trade action message templates.

You can use the TRAD or XMAT templates for non-repo trades depending on whether you want to include in your TRAX messages the extended settlement information or not

You should always use the REPO templates for repo trades.

Processing of Incoming Messages

When the TRAX_INCOMING or TRAX_PTA_INCOMING message goes through its workflow, it should go through the PENDING > PROCESSED transition. This transition has a workflow rule **UpdateTRAXTransactionRequest** that applies to the outgoing message the action named as the Transaction Status or PTA Status of the incoming reply from TRAX.

Let's say for example that you enter a new trade. Your outgoing TRAX_CONFIRMATION is SENT and then the incoming response from TRAX says that the transaction status is UNM (unmatched). The rule **UpdateTRAXTransactionRequest** will then try to apply the action UNM on the TRAX_CONFIRMATION.

If you want to alias the name of the action applied, you can add a value to the domain TRAXMessageActions that is named as the transaction status (e.g. UNM) and that has in comment the actual action that you want to be applied (e.g. UNMATCH).

If you want the applied action to depend not only from the transaction status in TRAX but also from the current workflow status of the message in Calypso, you can use the Mapping Status Configuration ([Configuration > Messages & Matching > Incoming Status](#)).

Another message workflow rule applied when the saving the incoming message is UpdateTRAXTrade. This rule will set the trade keywords and then save the trade with the workflow action defined in the **TRAXTradeAction** domain value (**UPDATE** by default).

The UTI field is stored by default in the trade keyword TRAXUTI unless you specify the trade keyword in the domain "TRAXTradeKeywordUTI".

Repo Trades and Post Trade Actions

The lifecycle of a Repo trade can be divided in two phases. The first phase is before the trade is matched by TRAX with the information provided by the counterparty. This phase is the same as the lifecycle for non-Repo trades. During this phase, most information about the trade can be amended to reach a matching status.

The second phase of the workflow is the one after the trade as been matched. Then only the limited amendment described in the PTA definitions above are allowed. In Calypso these operations are referred to as Event Type Actions:

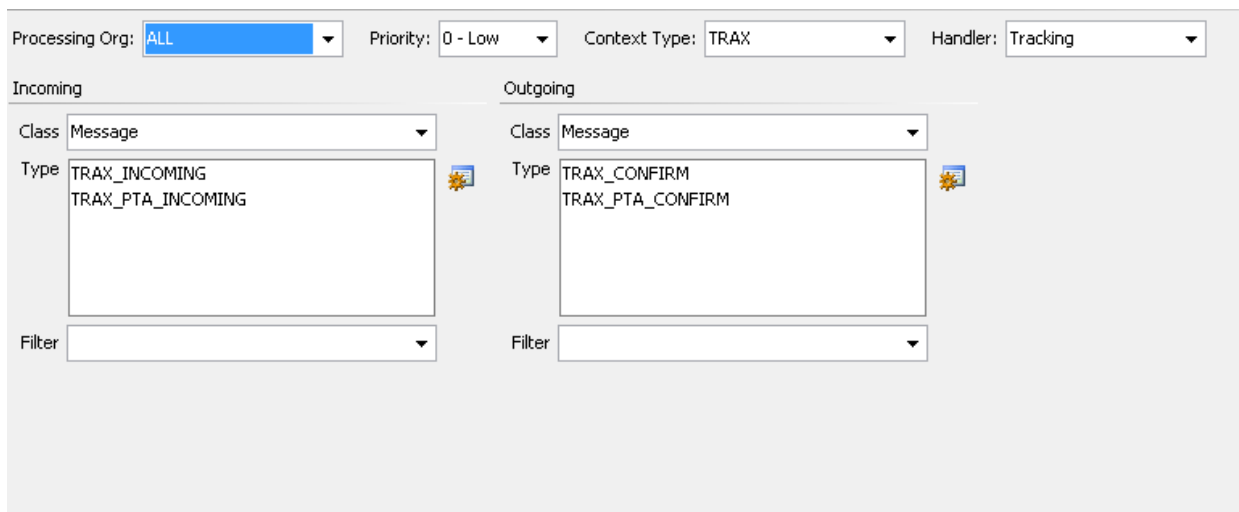
Post Trade Actions	Event Type Actions	Trade Workflows Actions
CLOS	Termination	TERMINATE
ENDD	Rollover	ROLLOVER
RATE	Rerate	RERATE
RPRI	Reprice Collateral	RERICE

Monitoring and Matching

The TRAX module benefits from Calypso's matching framework to monitor the status of your trade in TRAX and to investigate the trades alleged by counter parties as well as your unmatched submitted trades.

5.1 Configuring the Matching Module to monitor TRAX messages

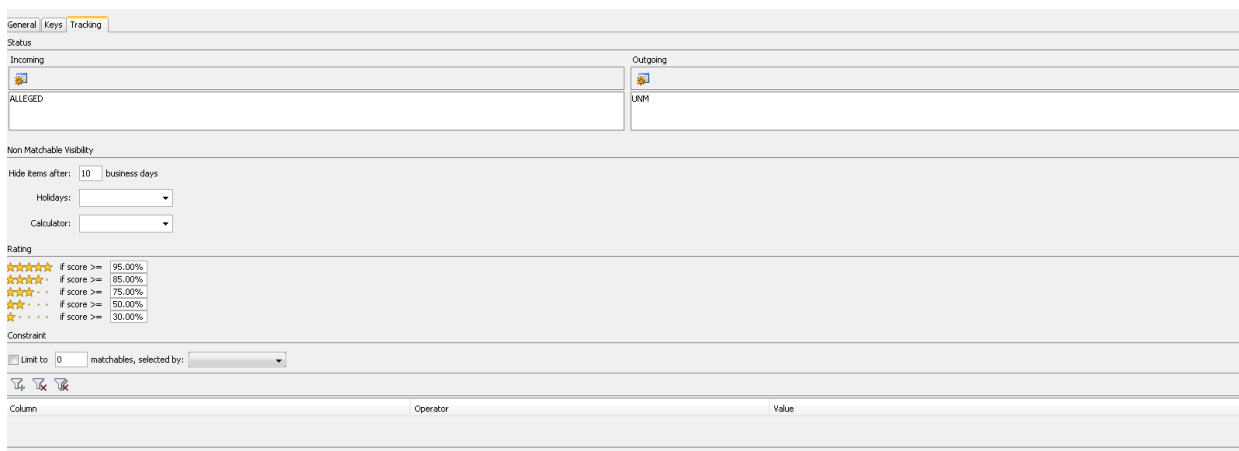
A TRAX Matching Context should be created using the Tracking Handler.



You can select any field of the TRAX messages as a matching key. However not all the fields are populated in all the messages so some keys may be empty.

Name	Weight	Usage	Options
Type: Amount			
CounterpartyRepoSettlementAmount	1 All	Cumulative	
CounterpartysSettlementAmount	1 All	Cumulative	
DealPrice	1 All	Cumulative	
EndCash	1 All	Cumulative	
ExercisePrice	1 All	Cumulative	
FIX_LastPx	1 All	Cumulative	
FIX_LastQty	1 All	Cumulative	
FIX_NetMoney	1 All	Cumulative	
FIX_UnderlyingEndPrice	1 All	Cumulative	
FIX_UnderlyingQty	1 All	Cumulative	
ForwardLegDealPrice	1 All	Cumulative	
MessageSequenceNumber	1 All	Cumulative	
NoStipulations	1 All	Cumulative	
OpeningLegDealPrice	1 All	Cumulative	
PrincipalSettlementAmount	1 All	Cumulative	
QuantityOfFinancialInstrument	1 All	Cumulative	
RepoSettlementAmount	1 All	Cumulative	
StartCash	1 All	Cumulative	

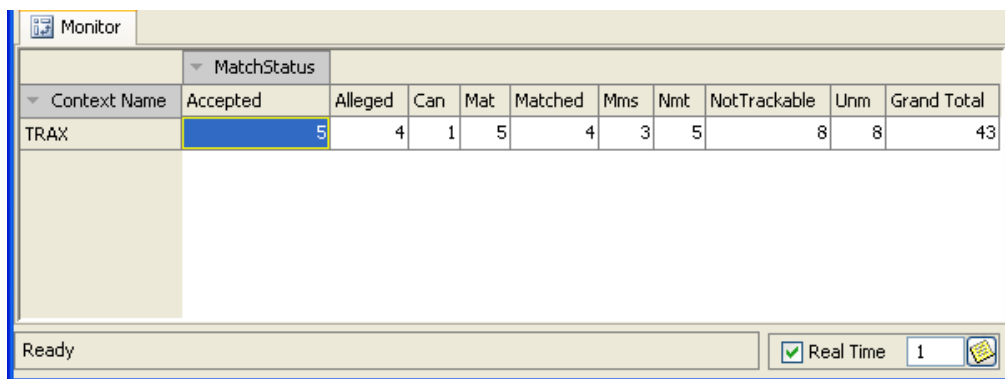
Finally, you can decide what statuses you want to monitor. The most interesting statuses are probably ALLEGED for the incoming messages and UNM for the outgoing confirmations.



5.2 Investigating Unmatched TRAX messages

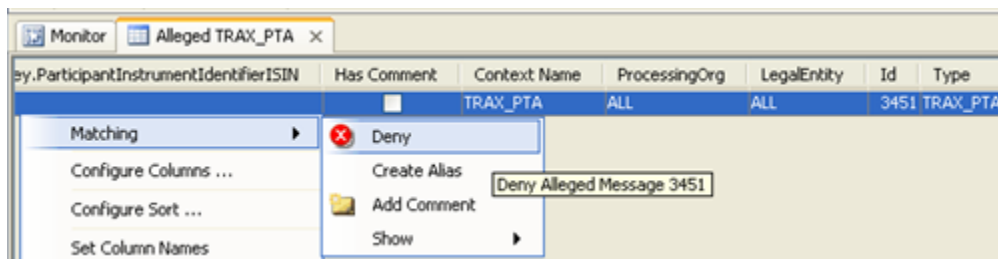
Once your matching contexts are configured, you can run the Matching Engine and the Matchable Builder Engine to start the tracking process.

The result can be seen in real-time from the Matching Manager Window.

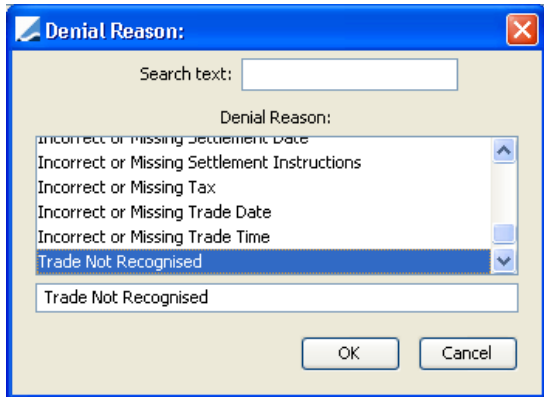


Context Name	MatchStatus	Alleged	Can	Mat	Matched	Mms	Nmt	NotTrackable	Unm	Grand Total
TRAX	5	4	1	5	4	3	5	8	8	43

If you want to deny an alleged trade, select the corresponding incoming message in the detail view or the best match view. A Deny button will appear in the Matching Window toolbar. A Deny menu item is also available in the context menu appearing when right-clicking on the incoming message.



If you choose to Deny a message, the following pop-up window will appear. This window contains a list of the standard denial reason as defined in the calypso_trax_rejection_codes.properties file.



If one of these standard denial reasons is selected, the corresponding reason code will be used in the denial message sent to TRAX. If an arbitrary denial reason is provided instead, that reason will be sent as a narrative reason in the denial message sent to TRAX.

Release Notes

6.1 Changes in Version 3.5.4

TRAX-344 – HD 163752 - Move 'TRAX message setup' configuration from default file (TRAXSchemaData.xml) to a new file.

Added TRAXSchemaDataExtraConfig.xml for TRAX message setup.

TRAX-341 – HD 163752 – Duplicate workflows when executing Execute SQL.

6.2 Changes in Version 3.5.6

TRAX-356 – SQL binding implementation.

6.3 Changes in Version 3.5.7

Component	HelpDesk	Issue	Type	Description
TRAX 3.5.7		TRAX-374	Enh	Issue – Upgrade org.apache.poi library to version 3.17.
TRAX 3.5.7		TRAX-371	Enh	Issue – Upgrade org.apache.camel:camel-core library to version 2.23.2.

6.4 Changes in Version 3.5.8

Component	HelpDesk	Issue	Type	Description
TRAX 3.5.8		TRAX-383	Enh	Issue – Upgrade spring library to version 4.3.24.
TRAX 3.5.8		TRAX-379	Enh	Issue – Upgrade gateway dependency library mina-core to version 2.1.3.

6.5 Changes in Version 3.5.9

Component	HelpDesk	Issue	Type	Description
TRAX 3.5.9	196705	TRAX-390	Enh	Issue - Map UTI field from TRAX message to trade keyword. Fix – You need to define the name of the trade keyword that should contain the UTI field in the

Component	HelpDesk	Issue	Type	Description
				domain TRAXTradeKeywordUTI. Otherwise it is stored in the trade keyword TRAXUTI. It will be updated by the workflow rule UpdateTRAXTrade.
TRAX 3.5.9		TRAX-388	Issue	Issue – Remove duplicate domains from TRAX schema data.

6.6 Changes in Version 3.5.10

Component	HelpDesk	Issue	Type	Description
TRAX 3.5.10		TRAX-396	Issue	Issue – Wrong location for TRAXSchemaDataExtraConfig.xml.

6.7 Changes in Version 3.5.11, 3.5.12

 **Important Note-** The property file `application.properties` has been renamed `trax-gateway-application.properties` – See issue TRAX-405 below for details.

Component	HelpDesk	Issue	Type	Description
TRAX 3.5.12		TRAX-405	Enh	Issue – Upgrade spring library to version 5.2.9. Fix - The property file <code>application.properties</code> has been renamed <code>trax-gateway-application.properties</code> . Make sure that you update and deploy the new property file accordingly.
TRAX 3.5.12		TRAX-426	Enh	Issue – Update <code>camel-trax.xml</code> with the new property file. Fix – <code>camel-trax.xml</code> is now referencing <code>trax-gateway-application.properties</code> .

6.8 Changes in Version 3.5.13

Component	HelpDesk	RPM	Issue	Type	Description
TRAX 3.5.13			TRAX-436	Issue	Issue – TRAXSchemaData.xml does not need to define the domainName xmlFormatType as it is already defined in Core Calypso. Impact analysis – Local impact - Removed xmlFormatType from TRAXSchemaData.xml.
TRAX 3.5.13			TRAX-433	Issue	Issue – Fix typo in logs. Impact Analysis – Local impact to TRAXGatewaySenderJob – Fixed spelling error for “succeeded”.

6.9 Changes in Version 3.5.14, 3.5.15

Component	Case	RPM	Issue	Type	Description
TRAX 3.5.15	00027853		TRAX-452	Enh	Issue – Trax-gateway rel zip is incomplete. Impact Analysis - The rel-zip for the TRAX gateway is now included in each trax rel-zip under <calypso home>/docs.

6.10 Changes in Version 3.6.0

Component	Case	RPM	Issue	Type	Description
TRAX 3.6.0	00027853		TRAX-453	Enh	Issue – Trax-gateway rel zip is incomplete. Impact Analysis - The rel-zip for the TRAX gateway is now included in each trax rel-zip under <calypso home>/docs.

6.11 Changes in Version 3.6.1

 **Important Note - The trax gateway is now delivered in the deploy folder instead of the docs folder – See issue TRAX-459 for details.**

Component	Case	RPM	Issue	Type	Description
TRAX 3.6.1			TRAX-459	Enh	Issue – Invalid trax distribution packaging. Fix – Removed unused libraries and updated dependencies. The trax gateway is now delivered in the <calypso home>/deploy folder instead of the <calypso home>/docs folder.

6.12 Changes in Version 3.6.2

 **Important Note - BYSE_REPO_RATE_ELEMENT is replaced by FIX_UNDERLYING_END_PRICE in Trax report.**

Component	Case	RPM	Issue	Type	Description
TRAX 3.6.2			TRAX-477	Enh	Issue – Introduce a new profile to support change in Repo. Fix – The element BYSE_REPO_RATE_ELEMENT is replaced by FIX_UNDERLYING_END_PRICE in the Trax report.

6.13 Changes in Version 3.7.0

Component	Case	RPM	Issue	Type	Description
TRAX 3.7.0		RPM-10913	TRAX-490	Sec	Issue – Security – Upgrade log4j library to version 2.18.0.
TRAX 3.7.0			TRAX-488	Sec	Issue – Security – Remove dependency on jackson-databind library.

6.14 Changes in Version 3.8.0

Component	Case	APL	Issue	Type	Description
TRAX 3.8.0		APL-6662	TRAX-517	Sec	Issue – Security – Upgrade slf4j-api library to version 1.7.36.

Component	Case	APL	Issue	Type	Description
TRAX 3.8.0		APL-6588	TRAX-516	Sec	Issue – Security - Upgrade spring-webmvc library to version 5.3.26.

6.15 Changes in Version 3.9.0

Component	Case	APL	Issue	Type	Description
TRAX 3.9.0			TRAX-537	Enh	Issue - Removal of calypso-id-api jar dependency. Impact Analysis - Created packages "com.calypso.helper" and "com.calypso.cia.util", created wrapper classes by module.
TRAX 3.9.0			TRAX-548	Sec	Issue – Security - Upgrade activemq library to version 5.16.7.

6.16 Changes in Version 4.0.0, 4.0.1, 4.0.2

Component	Case	RPM	Issue	Type	Description
TRAX 4.0.2			TRAX-435	Issue	Issue – TRAXSchemaData.xml does not need to define the domainName xmlFormatType as it is already defined in Core Calypso. Impact analysis – Local impact - Removed xmlFormatType from TRAXSchemaData.xml.
TRAX 4.0.2			TRAX-432	Issue	Issue – Fix typo in logs. Impact Analysis – Local impact to TRAXGatewaySenderJob – Fixed spelling error for “succeeded”.
TRAX 4.0.1		RPM-3906	TRAX-406	Enh	Issue – Security - Upgrade spring library to version 5.2.9. Fix - The property file application.properties has been renamed trax-gateway-application.properties. Make sure that you update and deploy the new property file accordingly.
TRAX 4.0.2			TRAX-425	Enh	Issue – Update camel-trax.xml with the new property file.

Component	Case	RPM	Issue	Type	Description
					Fix – camel-trax.xml is now referencing trax-gateway-application.properties.
TRAX 4.0.2		RPM-3902	TRAX-403	Enh	Issue – Security – Upgrade camel library to version 3.4.2.
TRAX 4.0.2			TRAX-397	Issue	Issue – Wrong location for TRAXSchemaDataExtraConfig.xml.
TRAX 4.0.2	196705		TRAX-389	Enh	Issue - Map UTI field from TRAX message to trade keyword. Fix – You need to define the name of the trade keyword that should contain the UTI field in the domain TRAXTradeKeywordUTI. Otherwise it is stored in the trade keyword TRAXUTI. It will be updated by the workflow rule UpdateTRAXTrade.
TRAX 4.0.2			TRAX-387	Issue	Issue – Remove duplicate domains from TRAX schema data. Impact Analysis – Local impact - Removed domain “exceptionType” from TRAXSchemaData.xml.
TRAX 4.0.2		RPM-1683	TRAX-379	Enh	Issue – Security Upgrade gateway dependency library mina-core to version 2.1.3.
TRAX 4.0.2		RPM-1682	TRAX-374	Enh	Issue – Upgrade org.apache.poi library to version 3.17.

6.17 Changes in Version 4.1.0

Component	Case	RPM	Issue	Type	Description
TRAX 4.1.0	00027853		TRAX-451	Enh	Issue – Trax-gateway rel zip is incomplete. Impact Analysis - The rel-zip for the TRAX gateway is now included in each trax rel-zip under <calypso home>/docs.

6.18 Changes in Version 4.1.1

Important Note - The trax gateway is now delivered in the **deploy** folder instead of the **docs** folder and the start command is different – See issue TRAX-460 for details.

Component	Case	RPM	Issue	Type	Description
TRAX 4.1.1			TRAX-460	Enh	Issue – Invalid trax distribution packaging. Fix – Removed unused libraries and updated dependencies. The trax gateway is now delivered in the <calypso home>/deploy folder instead of the <calypso home>/docs folder. Please see Installation process for information on starting the trax gateway.

6.19 Changes in Version 4.3.0

Important Note - BYSE_REPO_RATE_ELEMENT is replaced by FIX_UNDERLYING_END_PRICE in Trax report.

Component	Case	RPM	Issue	Type	Description
TRAX 4.3.0			TRAX-476	Enh	Issue – Introduce a new profile to support change in Repo. Fix – The element BYSE_REPO_RATE_ELEMENT is replaced by FIX_UNDERLYING_END_PRICE in the Trax report.

6.20 Changes in Version 4.4.0

Component	Case	RPM	Issue	Type	Description
TRAX 4.4.0		RPM-10246	TRAX-483	Sec	Issue – Security - Upgrade spring libraries to version 5.3.19.

6.21 Changes in Version 4.5.0

Component	Case	RPM	Issue	Type	Description
TRAX 4.5.0		RPM-10913	TRAX-491	Sec	Issue – Security – Upgrade log4j library to version 2.18.0.
TRAX 4.5.0			TRAX-492	Sec	Issue – Security – Remove dependency on jackson-databind library.

6.22 Changes in Version 4.6.0

Component	Case	RPM	Issue	Type	Description
TRAX 4.6.0		RPM-10048	TRAX-486	Enh	Issue – Technical – Add support for gradle bom. Impact Analysis – Added support for gradle bom.

6.23 Changes in Version 4.7.0

Component	Case	APL	Issue	Type	Description
TRAX 4.7.0		APL-4329	TRAX-503	Sec	Issue – Security – Upgrade the following libraries: spring from 5.3.19 to 5.3.24 Log4j from 2.18.0 to 2.19.0 mina-core from 2.1.3 to 2.2.1 jackson-* from 2.13.3 to 2.14.1 snakeyaml from 1.32 to 1.33

6.24 Changes in Version 4.8.0

Component	Case	APL	Issue	Type	Description
TRAX 4.8.0		APL-6183	TRAX-503	Sec	Issue – Security – Upgrade org.springframework:spring-expression library to version 5.3.27.

6.25 Changes in Version 4.9.0

Component	Case	APL	Issue	Type	Description
TRAX 4.9.0		APL-6792	TRAX-514	Sec	Issue – Security – Upgrade org.apache.camel library to version 3.14.8.

6.26 Changes in Version 4.10.0

Component	Case	APL	Issue	Type	Description
TRAX 4.10.0		APL-6816	TRAX-520	Sec	Issue – Security – Upgrade slf4j-api library to version 1.7.36.

6.27 Changes in Version 4.11.0

Component	Case	APL	Issue	Type	Description
TRAX 4.11.0			TRAX-536	Enh	Issue - Removal of calypso-id-api jar dependency. Impact Analysis - Created packages "com.calypso.helper" and "com.calypso.cia.util", created wrapper classes by module.

6.28 Changes in Version 4.12.0

Component	Case	APL	Issue	Type	Description
TRAX 4.12.0		APL-10456	TRAX-563	Sec	Issue – Security – Upgrade org.springframework:spring-web library to version 5.3.34.

6.29 Changes in Version 4.13.0

Component	Case	APL	Issue	Type	Description
TRAX 4.13.0		APL-11494	TRAX-570	Sec	Issue – Security – Upgrade org.springframework:spring-* library to version 5.3.39

6.30 Changes in Version 4.14.0

Component	Case	APL	Issue	Type	Description
TRAX 4.14.0		APL-13282	TRAX-582	Sec	Issue - Security - Upgrade org.apache.mina:mina-core library to version 2.1.10.

6.31 Changes in Version 4.15.0

Component	Case	APL	Issue	Type	Description
TRAX 4.15.0		APL-13016	TRAX-578	Sec	Issue – Security - Upgrade the com.thoughtworks.xstream:xstream library to version 1.4.21.

6.32 Changes in Version 5.1.0

Component	Case	APL	Issue	Type	Description
TRAX 5.1.0			TRAX-546	Enh	Issue – Updating beans. Impact Analysis – Updating camel library in trax-beans.xml to org.apache.camel.model.RedeliveryPolicyDefinition.

6.33 Changes in Version 5.2.0

Component	Case	APL	Issue	Type	Description
TRAX 5.2.0		APL-9588	TRAX-558	Sec	Issue – Security – The following third-party libraries have been upgraded: guava to version 32.1.3 camel to version 4.2.0 commons_lang3 to version 3.14.0 commons_logging to version 1.3.0 commons_pool2 to version 2.12.0 spring to version 6.1.4 xbean_spring to version 4.24 jackson to version 2.16.0

Component	Case	APL	Issue	Type	Description
					snakeyaml to version 2.2 commons-configurations2 to version 2.9.0 cglib to version 3.3.0

6.34 Changes in Version 5.3.0

Component	Case	APL	Issue	Type	Description
TRAX 5.3.0		APL-9845	TRAX-561	Sec	Issue – Security – Upgrade spring.springframework:spring library to version 6.1.6.

6.35 Changes in Version 5.4.0

Component	Case	APL	Issue	Type	Description
TRAX 5.4.0		APL-10821	TRAX-566	Sec	Issue – Security – The following libraries have been upgraded: spring.springframework:spring to version 6.1.11 springboot-* to version 3.3.1 spring-security to version 6.3.1 commons-text to version 1.12.0 camel to version 4.7.0 activemq to version 6.1.2 Jackson Library to version 2.17.2 Log4j2 library to version 2.23.1 xbean-spring to version 4.25 guava to version 33.2.0-jre

6.36 Changes in Version 5.5.0

Component	Case	APL	Issue	Type	Description
TRAX 5.5.0		APL-12285, APL-13280	TRAX-576	Sec	Issue - Security - The following libraries have been upgraded:

Component	Case	APL	Issue	Type	Description
					org.springframework:spring-webmvc to version 6.1.15 org.apache.mina:mina-core to version 2.1.10

6.37 Changes in Version 5.6.0

Component	Case	APL	Issue	Type	Description
TRAX 5.6.0		APL-13645	TRAX-586	Sec	Issue - Security - Upgrade spring-* library to version 6.1.16