1. MESSAGES OVERVIEW

The message functionality is two-fold:

- Generation of messages and associated physical/soft documents
- Processing of incoming messages

A message identifies any document or payment that you send/receive to/from an organization (including contacts within your organization) to alert them about an event that has occurred on a trade, a payment, a position, etc.

Message Generation

The generation of messages is a two-step process:

- The message engine generates messages based on **message configurations** and **contact information**. A message follows its own workflow, and is associated with a physical document generated according to a **message template**. The physical document at this point, is just a preview. It has to be processed by the sender engine in order to be actually saved to the database, and sent to the recipients.

  [**NOTE**: Contact information is set on the sender and recipient legal entities - Review address, swift code, email, fax number, etc. as needed based on what method will be used to send the message]
- The physical documents can then be saved to the database and sent to a number of recipients using the sender engine based on **message sender configurations**.

Calypso Fast-Track provides message workflows, message templates, and message configurations out-of-the-box.

Reconciling Incoming Messages

Reconciling incoming messages can be done manually through the task station (using the ACKED, NACKED, MATCH, MISMATCH actions, etc.), or using various processes depending on where the messages are coming from.

See Matching Overview for details.

Contents

- Message setup
- Generating messages
- Viewing messages
- Message grouping overview (Refer to Message Grouping Documentation for complete details)
- Message sender setup
- Sending messages
- Viewing documents
- Editing documents
- Matching overview

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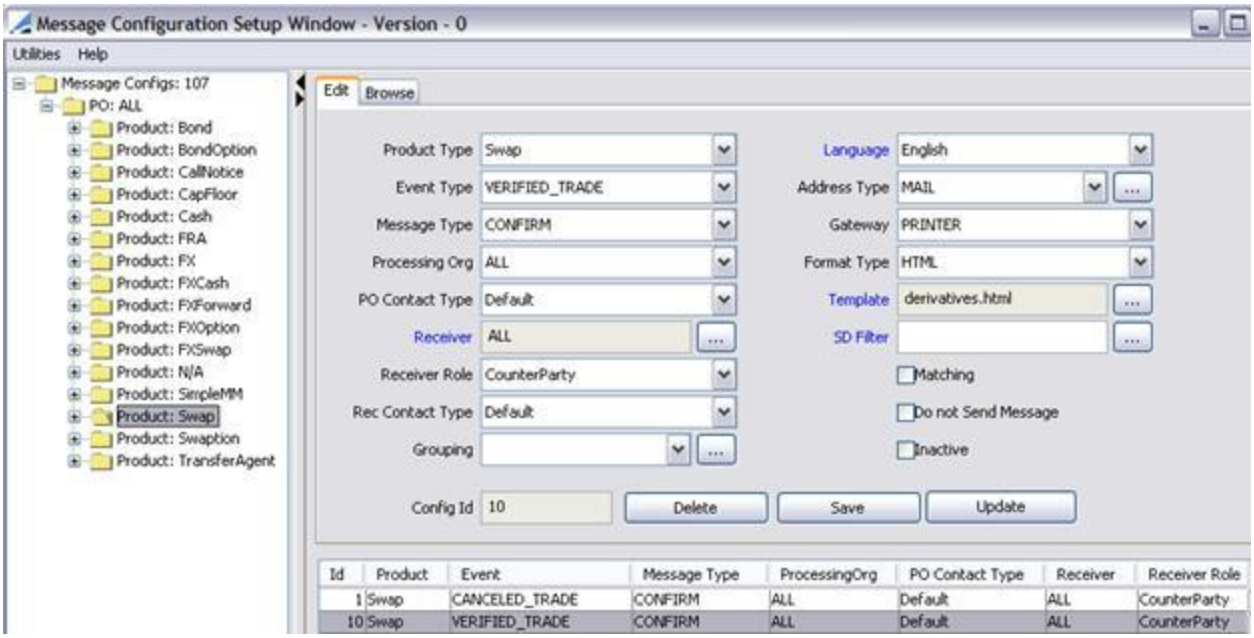
2. MESSAGE SETUP

The Message Set-Up window allows defining message configurations.

A message identifies any document or payment that you send to an organization (including people within your organization) to alert them about an event that has occurred on a trade, payment, reset, etc.

Choose Main Entry > Messages & Matching > Message Set-up (`refdata.AdviceSetupWindow`) to setup message configurations.



Contents

- Defining Message Configurations
- Confirmations with a Matching System
- Modifying Message Configurations
- Duplicating Message Configurations
- Deleting Message Configurations
- Displaying Pending Message Configurations

2.1 DEFINING MESSAGE CONFIGURATIONS

Message configurations are defined by product type, event type, message type, sender contact, and receiver contact.

» To create a new message configuration, select the Edit panel and enter the fields described below.

» Then click **Save** to save your changes.

If the Authorization mode is enabled, another user will have to authorize your entries.

Fields	Description
Product Type	Select a product type to which the message configuration applies. Choose "N/A" to generate messages from netted transfers and statements that have no reference to a product. The product type can be a group of products create using Main Entry > Configuration > Product Configuration > Product Group (`refdata.ProductGroupWindow`). Note that the environment property USE_PRODUCT_GROUP should be set to true in order to allow specifying message configurations by product group. [**NOTE**: If you specify a message configuration for the product group and for the product, the message configuration for the product will take precedence over the message configuration for the product group]
Event Type	Select the type of event that will trigger the generation of the message. The following types of events are available: • Trade related event types have the form "<trade_status>_TRADE", where "<trade_status>" comes from the Trade workflow configuration ("tradeStatus" domain). • Transfer related event types have the form "<transfer_status>_SEC_DELIVERY", "<transfer_status>_SEC_RECEIPT", "<transfer_status>_PAYMENT", and "<transfer_status>_RECEIPT", where "<transfer_status>" comes from the Transfer workflow configuration ("transferStatus" domain). • Exception related event types have the form "EX_<exception_type>", where "<exception_type>" comes from the "exceptionType" domain. • You can also generate messages for price fixings (event types "<transfer_status>_PRICE_FIXING"), rate resets (event types "<transfer_status>_RATE_RESET"), FX valuations, liquidated positions, statements, etc. [NOTE: A message event cannot trigger the generation of another message]

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Fields	Description
Message Type	Select the type of message that will be generated. [**NOTE**: A single event may trigger the generation of multiple types of messages - Specify a message configuration for each type of message] The following message types are available: • ACC_STATEMENT — Account statement. The Statement frequency is set on the account attached to the client. Account statements are generated using the ACCOUNT_STATEMENT scheduled task. Refer to the *Calypso Cash Management User Guide*for details on generating account statements. • CONFIRM — Trade confirmation. • EXERCISE_NOTICE — Trade notification that an option has been exercised. • MC_STATEMENT — Margin call statement. Refer to the *Calypso Collateral Management User Guide*for details on generating margin call statements. • PAYMENT_ADVICE — Transfer message reminding the counterparty of an upcoming payment from the agent. • PAYMENTMSG — Transfer message instructing the agent to pay the transfer amount. • PRICE_FIXING_ADVICE — Transfer message informing the counterparty of a price fixing. • RATE_RESET — Transfer message informing the counterparty that a floating rate payment has been reset and calculated. • RECEIPT_ADVICE — Transfer message reminding the counterparty of an upcoming payment to the agent. • RECEIPTMSG — Transfer message instructing the agent to receive the transfer amount. • SEC_DELIVERYMSG — Transfer message instructing the agent to deliver securities (Against Payment or Free of Payment). • SEC_RECEIPTMSG — Transfer message instructing the agent to receive securities (Against Payment or Free of Payment). • SUPPLEMENT — Supplement to a trade confirmation. • TICKET — Trade ticket for internal consumption. Message types are registered in the "messageType" domain.

Fields	Description
Processing Org	Select the processing org for which the message configuration is specified, or ALL. The following order applies for selecting a message configuration, when multiple message configurations are specified with multiple combinations of processing orgs and receivers. • Specific processing org and specific receiver • ALL processing orgs and specific receiver • Specific processing org and ALL receivers • ALL processing orgs and ALL receivers Note that if the environment property MSGENGINE_MULTMESS is set to true, even if a specific configuration is found, if there are any general configurations where the address type is different from that of the specific configuration, messages will be generated for the general configurations as well. Note the use of the environment property CHECK_STATIC_DATA_FILTER when there is a specific configuration with a static data filter. True to pick up a general message configuration if any, and generate the corresponding message, if the static data filter is not satisfied for the specific message. False to prevent any message generation if the static data filter is not satisfied, regardless of the existence of a general message configuration. If the static data filter on the specific configuration is satisfied, the generation of one or two messages depends on the environment property MSGENGINE_MULTMESS.
PO Contact Type	Select the type of contact that sends the message.
Receiver	Select the receiver of the message to which the message configuration applies, or ALL. Note that the message will only apply to the legal entities of specified receiver role. ALL indicates that this message configuration applies to all legal entities of specified role. If you want to use a specific template for a given counterparty for example, set the Receiver Role to CounterParty and select the counterparty here.
Receiver Role	Select the role of the legal entity that will actually receive the message. The role CounterParty will retrieve all legal entities with the role CounterParty in the trade (including counterparties defined in fees and allocations). For payment message, the role CounterParty will retrieve the transfer's external legal entity. The role ProcessingOrg will retrieve the book's owner. For payment message, the role ProcessingOrg will retrieve the transfer's internal legal entity. The role Agent will retrieve all agents specified in the SDIs associated with the trade. Note that for payments messages, the Msg checkbox must also be checked for the agent on the SDI. Other roles will be retrieved legal entities of specified role from associated fees and allocations. To send a given message to multiple legal entities of the trade, specify a message configuration for each role.
Rec Contact Type	Select the type of contact that receives the message. To send a given message to multiple contacts, specify a message configuration for each contact type.
Grouping	Select a grouping key to group a certain type of message. The actual grouped message will be of type GROUPED_MESSAGE. Grouping keys are defined using Main Entry > Configuration > Messages & Matching > Message Grouping (util.MessageGroupingWindow). Refer to the *Calypso Message Grouping User Guide* for details.
Language	Select the language in which the message will be printed. Currently, the system does not use this setting. In the current version of Calypso, you should make sure that you use a template written in the desired language.

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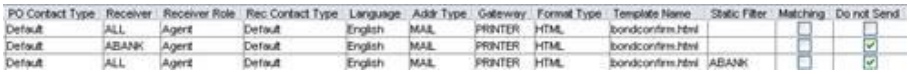
Fields	Description
Address Type	Select the type of address information that should be retrieved from the contact. For example, for the SWIFT address type, the Swift code is specified on the contact. Click ... to add address types as applicable. The address type information can be specified on the contact, using the contact attributes.
Gateway	Select the gateway that is used to physically transmit the message. Out-of-the-box, the BONY, GSCC, and DTCC gateways are supported. Refer to the corresponding integration user guides for details. You can implement custom gateways as applicable. Refer to the *Calypso Developer's Guide* for details. Gateways are registered in the "gateway" domain.
Format Type	Select the format of the message. Out-of-the-box, the DTCC, HTML, TEXT, TRAX, SWIFT and XML formats are supported. You can implement custom types of formatters as applicable. Refer to the *Calypso Developer's Guide* for details. Format types are registered in the "formatType" domain. ***Note on FX Swaps*** In order to allow generating a message for the near leg and a message for the far leg for FX Swaps, you need to add the format type to the domain "multiMessageFormatType". If not set, only SWIFT messages allow generating a message for the near leg and a message for the far leg for FX Swaps.
Template	Click ... to select a message template. Defining document templates is described under Main Entry > Help > Message Template Keywords. A number of document templates are provided out-of-the-box under `resources/com/calypso/templates`. They can be customized or you can create your own templates. Document templates are registered in the "MESSAGE.Templates" domain. Templates contain free-form text as well as template keywords to retrieve information from trades, messages and transfers. Swift templates should be registered in the "SWIFT.Templates" domain. ***Notes on Payment Messages*** • The message template "Payment.selector" allows picking up automatically the proper MTx92, MT202 or MT103 XML templates. • The message template "Securities.selector" allows picking up automatically the proper MT540-543 XML templates. • The message template "PaymentCOV.selector" allows producing "standard" MT202, "standard" MT103, "standard" MT210, and related "standard" MT192 and 292, when no cover message is required. It also allows producing the MT202 COV (instead of a standard MT202) when a cover message is required. A cover message is required when the counterparty SDI (settlement instruction) is flagged with "Msg". Refer to Calypso Settlements documentation for more details on payment messages.
SD Filter	Click ... to select a static data filter to restrict the message generation based on trade, product and legal entity attributes as applicable. It can be useful, for example, if you do not want to generate a message for a given counterparty with specific attributes. See also "Do Not Send Message" below. Double-click the SD Filter label to specify a static data filter. Note that the static data filter of a CANCELED_TRADE message configuration, MUST be the same as the static data filter of the VERIFIED_TRADE message configuration, if any.

Fields	Description
Matching	This checkbox can be used to identify the reference confirmation used for matching incoming messages, when you specify multiple confirmations. Note that the actual use of this checkbox is dependent upon the implementation of the interface Matcher for a given type of incoming message.
Do Not Send Message	This checkbox can be used when you have a general configuration that applies to ALL except to a specific case. For example, you have a general configuration that applies to ALL agents, except to agent ABANK. So you create the general configuration, then you create the specific configuration for the agent ABANK (or using a static data filter), and you check the "Do Not Send Message" checkbox.  The message will be generated for all agents except for agent ABANK.
Inactive	Check to deactivate a message configuration. A deactivated configuration will not generate any message. Deactivated message configurations will appear grayed-out.
Config Id	Displays the configuration id given by the system when the message configuration is saved.

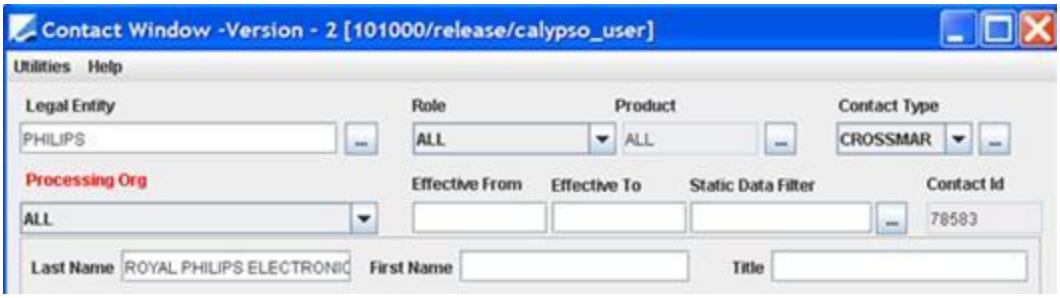
2.2 CONFIRMATIONS WITH A MATCHING SYSTEM

This feature only applies to the FXConfirm and LoanDepositConfirm SWIFT templates, as well as MT300 (300,304 series and MT320) XML templates.

1. Counterparty Setup

Set the MatchingSystem attribute on the counterparty, for example MATCHINGSYSTEM = CROSSMAR.

Define a contact for which the type is the matching system, for example Contact Type = CROSSMAR. This contact type is used to populate TAG87J and 83J.



2. Matching System Setup

Create a legal entity for the matching system with role MatchingSystem, for example CROSSMAR.

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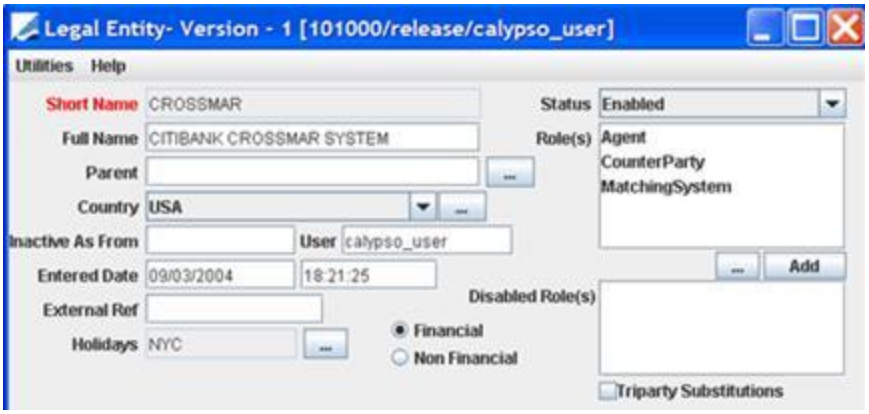
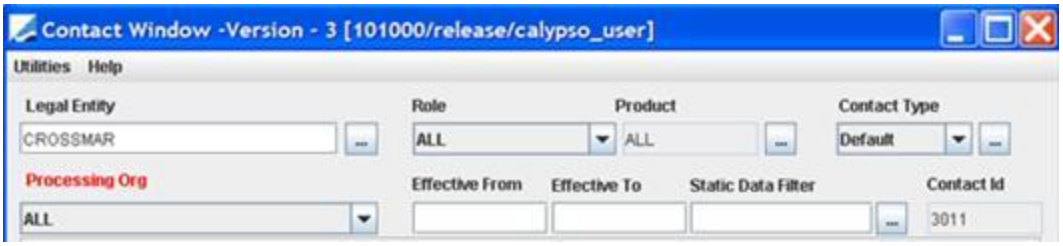
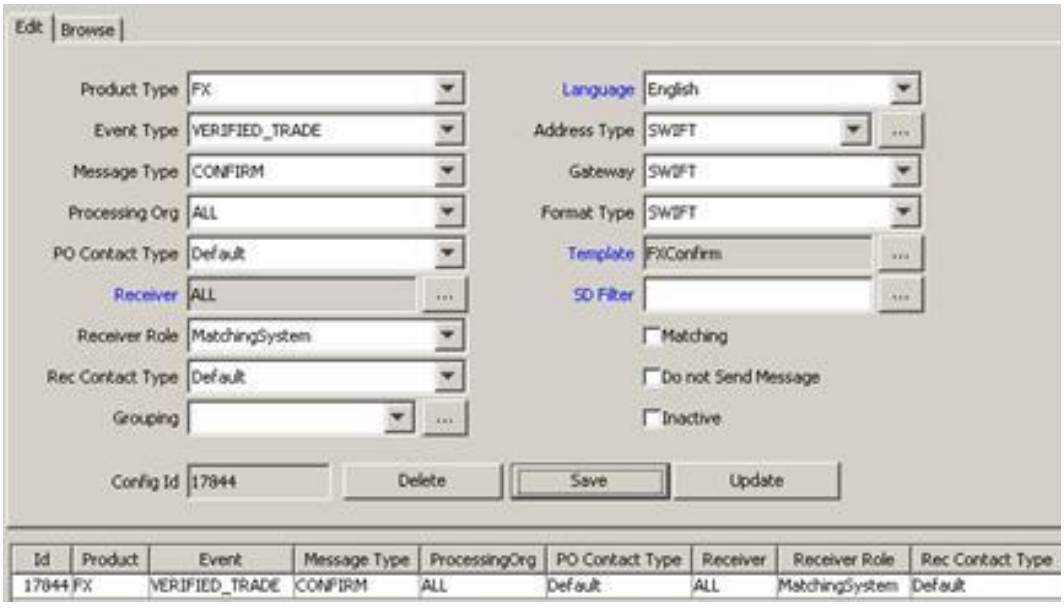


Define a contact of type Default. It is used to populate the **Receiver** part of the Swift Header and for TAG 22C (Common Ref).



3. Message Setup



2.3 MODIFYING MESSAGE CONFIGURATIONS

» Select the Browse panel, and enter selection criteria. Then click **Load**.

You can also navigate existing message configurations from the left-hand side of the window. Double-click a message configuration, and it will be loaded in the Edit panel.

You can double-click any column heading to sort the message configurations by the values in that column.

To sort based on multiple columns, press Ctrl+ any column heading. A selector dialog will appear. Select the sort columns and click **OK** when you are done.

» Then modify the fields as applicable, and click **Update**.

If the Authorization mode is enabled, another user will have to authorize your entries.

2.4 Duplicating Message Configurations

» Load a message configuration and click **Duplicate** to copy the selected message configuration to a given processing org or product type. You will be prompted to select a processing org or a product type.

2.5 Deleting Message Configurations

» Load a message configuration and click **Delete**.

A message will warn you if the message configuration has been used to generate messages.

If the Authorization mode is enabled, another user will have to authorize your entries.

2.6 Displaying Pending Message Configurations

» Click **Show Pending Authorizations** to see any message configuration pending authorization. This only applies if the Authorization mode is enabled.

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3. GENERATING MESSAGES

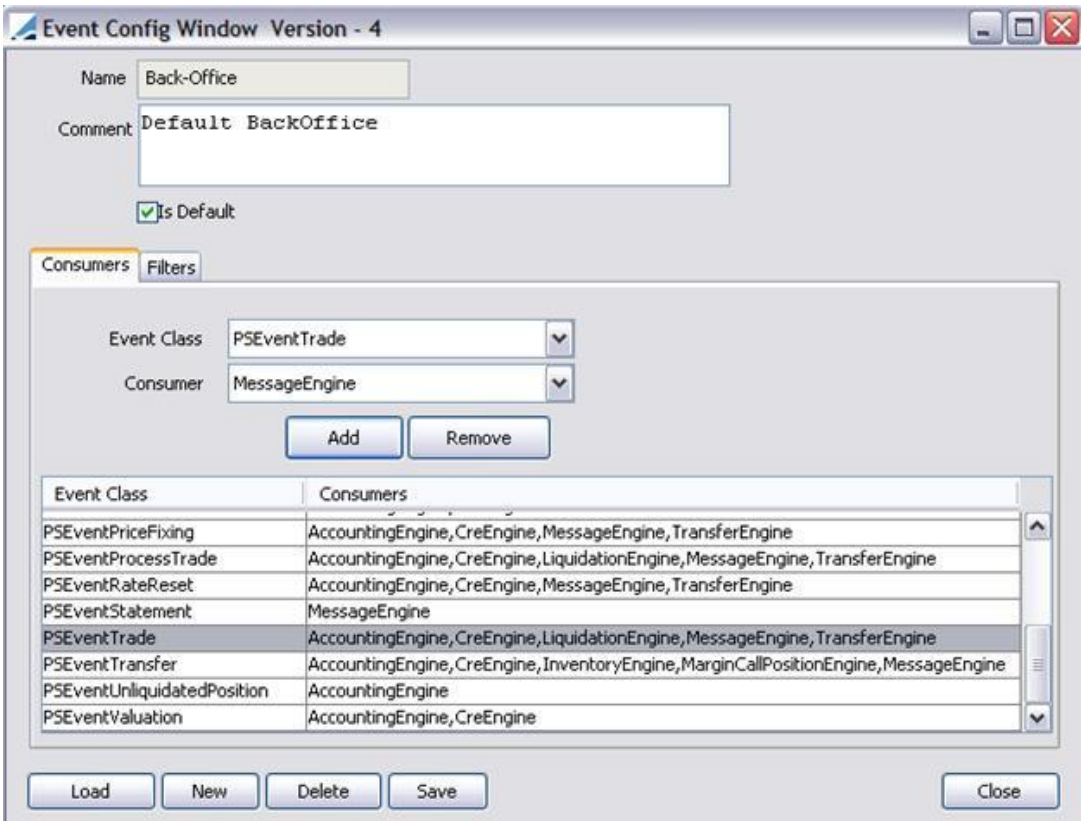
In order to generate messages, you need to start the message engine.

Contents

- Events Configuration
- Message Engine Parameters
- Starting the Message Engine

3.1 EVENTS CONFIGURATION

Choose Main Entry > Configuration > System > Event Configuration (`util.EventConfigWindow`) to review event subscription requirements for the message engine.



» In the Consumers panel, you can select the events to which the message engine subscribes to.

The message engine can subscribe to the following events:

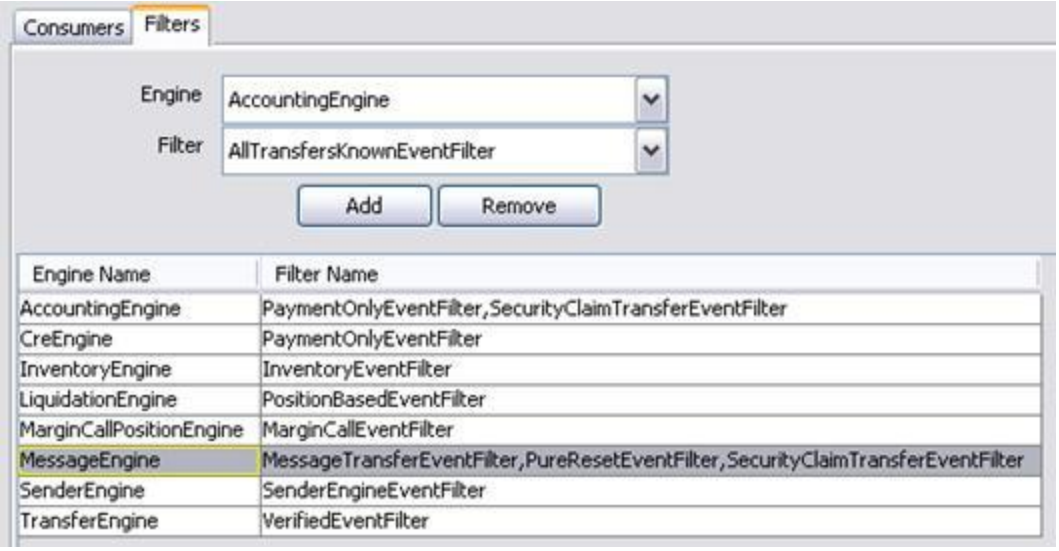
- Trade events
- Transfer events — The message engine uses the MessageTransferEventFilter to filter only the transfers representing known payments. Typically, a payment advice will combine payment information and rate reset information (if a reset has been performed). For netted transfers, the payment advice will be generated when the netting is executed. Refer to the *Calypso Settlements User Guide* for more information about transfers.

- Rate Reset events — The message engine will process rate resets events only for intermediary resets through the PureResetEventFilter, since resets that trigger a transfer will be handled through transfer events.
- Price Fixing events
- Mutation events
- Statement events — Statement events include account statements and margin call statements.
- Process Trade events
- Static Data Modification events (to refresh Message Configurations used by the message engine)
- Bundle events (PSEventBundleStatement) — In order to generate this type of event, you need to plug in the "GenerateBundleStatement" workflow rule in the trade workflow. You may need to write your own rule in case you want to have a better control on how and when you want to generate this event. Typically, you would only generate it once all your trades reach a given status. Also, the "One Msg" checkbox should be checked on the Trade Bundle window.

» In the Filters panel, review the filters associated with the message engine.

The message engine can use the following filters:

- MessageTransferEventFilter — Filters transfers updated by rate resets, and real payments.
- PureResetEventFilter — Filters intermediary rate resets that do not trigger any transfer (for compounding trades for example).
- MessageMutationEventFilter — Filters PROCESSED mutations.
- SecurityClaimTransferEventFilter — Filters "claim" transfers on repos.



3.2 Message Engine Parameters

The behavior of the message engine may be modified with the following engine parameters and environment properties.

Engine parameters are specified using Admin > Engine Thread. If a parameter is not available for setup, you can register it in the engineParam domain.

Environment properties are specified using User Env.

Parameters and Properties	Description
ADVICE_ON_SETTLEDATE	***Specified under User Env > Properties.*** True of False. True to create advices on the settle date, or false to create advices as soon as the events are received.
CALYPSO_SWIFT_CHECK_MAX_LENGTH	***Specified under User Env > Properties.***

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Parameters and Properties	Description
	True or False. True to send an error message if the swift amount is greater than 15 characters, or False to take the first 15 characters of the swift amount.
CALYPSO_SWIFT_LINE_SEPARATOR	***Specified under User Env > Properties.*** Used as SWIFT message line separator if set. Otherwise, OS dependent line separator will be used.
CHECK_STATIC_DATA_FILTER	***Specified in Admin > Engine Thread.*** Used when there is a specific message configuration with a static data filter. True or False. True to pick up a general message configuration if any, and generate the corresponding message, if the static data filter is not satisfied for the specific configuration. False to prevent any message generation if the static data filter is not satisfied, regardless of the existence of a general message configuration. Default is False. For example, there is a general configuration for ALL agents, and a specific configuration with a static data filter. If the static data filter is not satisfied and CHECK_STATIC_DATA_FILTER is true, a message will be generated using the general configuration. If the static data filter is not satisfied and CHECK_STATIC_DATA_FILTER is false, no message is generated. Note that if the static data filter on the specific configuration is satisfied, the generation of one or two messages depends on the environment property MSGENGINE_MULTMESS.
DOCUMENT_CHAR_ENCODING	***Specified under Env > Properties.*** Document character encoding for export to HTML and Excel. In message templates, you can display Japanese characters in the PDF templates format by setting the property to shift_jis. See also DOCUMENT_FONT. Default is us-ascii.
DOCUMENT_FONT	***Specified under Env > Properties.*** Document character font for export to HTML and Excel. For example, on a Japanese system, you might want to use MS Gothic. See also DOCUMENT_CHAR_ENCODING. Default is Arial.
IGNORE_ACTION	***Specified in Admin > Engine Thread.*** Comma-separated list of trade actions to be ignored by the message engine.
MAX_BATCH_EVENT	***Specified in Admin > Engine Thread.*** Maximum number of persistent events loaded at one time by an engine in batch mode. The engine will load events in MAX_BATCH_ EVENT chunks until all events are processed. Persistent events received after MAX_QUEUE_SIZE is reached will be processed in batch mode. Allows controlling engine memory usage, therefore improving the performance.
MAX_QUEUE_SIZE	***Specified in Admin > Engine Thread.*** Maximum number of events buffered on an engine event queue. When this number is exceeded, real time events are discarded and the engine restarts based on the restart timer (TIMEOUT_RESTART), in order to process the unprocessed persistent events using batch mode. This parameter can be useful for controlling the engine's memory usage. If not set, the default value for this parameter is no

Parameters and Properties	Description
	limit on queue size. Allows controlling engine memory usage, therefore improving the performance.
MSGENGINE_CHECK_SD	***Specified in Admin > Engine Thread.*** True or False. If set to true, in case the new message does not have to be generated because of a SD Filter, we do not try to cancel/amend the previous message, and just ignore the old message. If false, we try to cancel the old message.
MSGENGINE_INCL_UPDATE	***Specified in Admin > Engine Thread.*** True to change messages to AMENDED and keep their original ids for a partial match on trade fields (for example, the book has changed on a trade), or false to cancel the original messages and create new ones. Use this property to override the default logic around the UPDATE and ALLOCATE actions when a trade is saved.
MSGENGINE_MULTMESS	***Specified under User Env > Properties.*** True or False. True to generate a message for the general configuration, even if a specific configuration is found, and there is a general configuration where the address type is different from that of the specific configuration, or False to generate a message for the specific configuration only. If the format type is SWIFT, and the event is related to a transfer, the message Address Method is set to the Settlement Method specified on the Transfer.
OPTIMIZE_FIND_LE	***Specified under User Env > Properties.*** True to search legal entities per role, or False to search legal entities for each message configuration.
PricingEnv	***Specified in Admin > Engine Thread.*** Pricing environment used by the engine. If not set, the default Pricing Environment of the user running the engine will be used.
SWIFT_SDI_NETTING	***Specified under Env > Properties.*** True or False. When set to True, whatever option A or D is used we will always put as Tag 57 the value NET. When set to False, if there is a BIC Code on the agent, we will use Option A for Tag 57 and set the BIC address of the Agent without NET keyword; if no BIC Code is set on the Agent, we will use Option D and set 57D with value NET. [**NOTE**: When set to N, make sure that the netting key ExternalAgent is part of the netting configuration - This allows the SWIFT MT300 to display both agent BIC codes in the two fields 57]
SWIFT_ZIP_FIRST	***Specified under Env > Properties.*** True or False. True to set the zip code will be before the city, or False otherwise. Default is False.
THREAD_COUNT	***Specified in Admin > Engine Thread.*** Number of concurrent threads used in an engine for processing. Increase the thread count for better performance.
TIMEOUT_RESTART	***Specified in Admin > Engine Thread.*** Number of seconds to wait before an engine restarts after MAX_

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Parameters and Properties	Description
	QUEUE_SIZE has been reached. The default value is 3600 seconds (1 hour).
USE_MESSAGE_AMOUNT_FORMAT	***Specified under Env > Properties.*** Y or N. Y to format message amounts according to the Locale parameter set with the message template keyword (example |TRADE_SETTLEMENT_AMOUNT#US|) or according to the language of the Message Configuration. N to format message amounts according to the default format xxx,yyy.zz. Default is N.
VERSION_CHECK	***Specified in Admin > Engine Thread.*** If true, out-of-date events are not processed, otherwise all events are processed.

3.3 Starting the Message Engine

It can be started using the application `com.calypso.apps.startup.StartMessageEngine`.

The message engine publishes message events (PSEventMessage) and saves the messages to the database (BOMessage objects). It also publishes task events. All exceptions are created with the source "MessageEngine" and the exception type "MESSAGE_SETUP".

Whenever the message engine is started, it processes all outstanding events to which it subscribes that were published while it was inactive.

The business logic for generating messages differs based on the type of event that is received.

3.3.1 Trade Event Processing

When a trade event is received, if the action applied to the trade was UPDATE, then no message is generated (the UPDATE action on a trade is a reserved action for modifying a trade without re-generating messages).

For other actions, the system retrieves the message configurations that apply to the roles / legal entities of the trade.

Role / Legal Entity Lookup

The TradeRoleFinder API performs the role / legal entity lookup:

Roles	Returns
CounterParty	Returns all legal entities involved in the trade with the CounterParty role (including counterparties defined in the fees and allocations).
ProcessingOrg	Returns the legal entity attached to the book.
Agent	Returns all the agents involved in the Settlement Instructions.
Custom Roles	Returns all legal entities defined in the fees and allocations for the given role.

Retrieving Message Configurations

The message engine checks if a specific message configuration has been set up. The search logic is the following. If the first check does not return a message configuration, the second check is performed, and so on, until a general message configuration is found if any (ALL processing organizations, ALL product types, ALL message types, and ALL contacts).

Order	Processing Org	Contact Type	Product Type	Message Type
First Check	**X**	**X**	**X**	**X**
Second Check		**X**	**X**	**X**
Third Check	**X**	**X**		**X**
Fourth Check		**X**		**X**

Note that if the environment property MSGENGINE_MULTMESS is set to true, even if a specific configuration is found, if there are any general configurations where the address type is different from that of the specific configuration, messages will be generated for the general configurations as well.

Note the use of the environment property CHECK_STATIC_DATA_FILTER when there is a specific configuration with a static data filter. True to pick up a general message configuration if any, and generate the corresponding message, if the static data filter is not satisfied for the specific message. False to prevent any message generation if the static data filter is not satisfied, regardless of the existence of a general message configuration.

If the static data filter on the specific configuration is satisfied, the generation of one or two messages depends on the environment property MSGENGINE_MULTMESS.

Building Messages

For all receivers requiring a message, the message engine generates a message (with action = NEW, status = NONE, creation date = NOW, and settle date = trade settle date).

Message Matching

The last step in the message generation is to identify if the message already exists, and if existing messages must be canceled.

The system tries to retrieve an identical message already produced for the same receiver, the same contact, and same trade.

If the trade is not in CANCELED status:

- No messages are found or all messages found are canceled. It means it is a first-time message. The message just needs to be created. The Sub action field in the Message is set up to 'NONE'.
- A message is found. It checks, based on the workflow configuration, if the retrieved message is cancelable.

  If it is cancelable, the retrieved message will be canceled during saving of the processing. The Sub Action field of the new message is set up to NONE.

  If not cancelable, the Sub Action of the new message is set to AMEND. The field 'linkedId' is set to the value of the original message. (Note that in case further amendments occur, the linked id field is always set up to the value of the original message).

If the trade is in a CANCELED status:

- No messages are found or all messages found are canceled. No message needs to be produced, not even the new message. Nothing happens - the new message is not generated.
- A message is found. It checks, based on the workflow configuration, if the retrieved message is cancelable.

  If it is cancelable, the retrieved message will be canceled during saving of the processing. No new message is produced.

  If not cancelable, the Sub Action of the new message is set to CANCEL to indicate it is a cancellation message. The field 'linkedId' is set to the value of the original message.

You can add criteria to the domain TradeFieldsNotAmendment. If the critetia in that domain are modified on the trade, the system will NOT regenerate a confirmation. Examples of criteria: _book, _trader, _salesPerson, _status.

You can also add fee types to the domain FeeNotAmendment. If the fee types in that domain are modified on the trade, the system will NOT regenerate a confirmation. Example of fee type: PL_TRANSFER.

FX Swaps Case

For FX Swaps, market practice requires that two confirmations of type MT300 be sent, one for each leg of the product. To support it, a special handling has been done for the FX Swap product type.

The system automatically generates two distinct messages if Swift format type has been specified in the message configuration related to FX Swaps. In order to distinguish between the two messages, the message engine sets the first message with the Settle Date of the short leg, and the second message with the Settle Date of the second leg.

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3.3.2 Rate Reset Events Processing

The system retrieves the message configurations that apply to the roles / legal entities of the rate reset.

The logic is the same as for trade events. The creation date of the message is the reset date.

3.3.3 Transfer Events Processing

The system retrieves the message configurations that apply to the roles / legal entities of the transfer.

Role / Legal Entity Lookup

The TradeRoleFinder API performs the role / legal entity lookup:

Role	Returns
CounterParty	Transfer's external legal entity.
ProcessingOrg	Transfer's internal legal entity.
Agent	Agents specified in the Settlement Delivery Instructions if the Msg checkbox is checked on the SDI.

Retrieving Message Configurations

The message engine checks if a specific message configuration has been set up. The search logic is the following. If the first check does not return a message configuration, the second check is performed, and so on, until a general message configuration is found if any (ALL processing organizations, ALL product types, ALL message types, and ALL contacts).

Order	Processing Org	Contact Type	Product Type	Message Type
First Check	**X**	**X**	**X**	**X**
Second Check		**X**	**X**	**X**
Third Check	**X**	**X**		**X**
Fourth Check		**X**		**X**

Note that if the engine parameter MSGENGINE_MULTMESS is set to true, even if a specific configuration is found, if there are any general configurations where the address type is different from that of the specific configuration, messages will be generated for the general configurations as well. If Format Type is equal to SWIFT, the Message Address Method is set up to the Settlement Method specified in the Transfer.

Note the use of the environment property CHECK_STATIC_DATA_FILTER when there is a specific configuration with a static data filter. True to pick up a general message configuration if any, and generate the corresponding message, if the static data filter is not satisfied for the specific message. False to prevent any message generation if the static data filter is not satisfied, regardless of the existence of a general message configuration.

If the static data filter on the specific configuration is satisfied, the generation of one or two messages depends on the environment property MSGENGINE_MULTMESS.

Building Messages

For all receivers requiring a message, the message engine generates a message (with action = NEW, and status = NONE).

The creation date and settle date are set as follows:

Event	Settle Date	Creation Date
Transfer event of type reset	Transfer Known Date (Date of the Fixing)	Now

Event	Settle Date	Creation Date
Transfer event of type Payment (not sent to the agent)	Transfer Known Date (ADVICE_ON_SETTLEDATE = false)	Now
	Transfer Value Date (ADVICE_ON_SETTLEDATE = true)	Transfer Value Date
Transfer event of type Payment (sent to the agent), or transfer event for which Netting is not by Trade Id	Transfer Value Date	Transfer Value Date

If the transfer delivery type is set up to "DAP" (Delivery Against Payment) and the transfer is not related to security, no message will be produced. It is done to prevent the sending of two messages to the Agent, as one message contains both pieces of information.

Message Matching

The last step in the message generation is to identify if the message already exists, and if existing messages must be canceled.

The system tries to retrieve an identical message already produced to the same receiver, same contact, and same transfer.

If the transfer is not in CANCELED status:

- No Messages are found or all messages found are canceled: it means it is a first-time message. The message just needs to be created. The Sub action field in the Message is set NONE.
- A message is found. It checks, based on the workflow configuration, if the retrieved message is amendable or cancelable.

  If it is amendable, the retrieved message will be amended and no new message produced.

  If not amendable but cancelable, the retrieved message is canceled, and the new message will be created.

  If not amendable and not cancelable, the new message is created.

If the transfer is in CANCELED status:

- No Messages are found or all messages found are canceled. No message needs to be produced. Nothing happens; the new message is not generated.
- A message is found. It checks, based on the workflow configuration, if the retrieved message is cancelable.

  If it is cancelable, the retrieved message will be canceled during saving of the processing. No new message is produced.

  If not cancelable, the Sub Action of the new message is set to CANCEL to indicate it is a cancellation message. The field 'linkedId' is set to the value of the original message.

You can add the fields which do not require the creation of a message in case a Xfer is modified to the domain "XferFieldsNotAmendment".

3.3.4 Statement Events Processing

Account Statements

The scheduled task ACCOUNT_STATEMENT generates statement events for accounts that have a statement configuration. You select the type of message when you run the scheduled task.

The statement events are then processed by the message engine to generate the specified type of message.

Refer to the *Calypso Cash Management User Guide* for details on generating statements.

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Margin Call Statements

The margin call manager generates statements events for margin calls.

The statement events are then processed by the message engine to generate MC_STATEMENT messages.

Refer to the *Calypso Collateral Management User Guide*for details on generating margin call statements.

3.3.5 MUTATION EVENTS PROCESSING

Mutation events are processed using the same logic as Trade events. New, Cancel and Amend mutations are handled.

The following configuration is necessary:

- Add the mutation types to the domain eventType as MUTATION_<MutationType>, e.g. MUTATION_EXERCISE, MUTATION_PARTIALTERMINATION, etc.
- Add the event filter MessageMutationEventFilter to the Engine configuration for the message engine.
- Configure your Message Set up using the MUTATION_EXERCISE message type.

The Mutation Id will be stored in the BOMessage Statement Id field.

4. VIEWING MESSAGES

You can view the messages generated by the message engine using the Message report. The status of newly created messages depends on the workflow configuration (according to the standard workflow, if the contact information is specified, the messages will be in status VERIFIED).

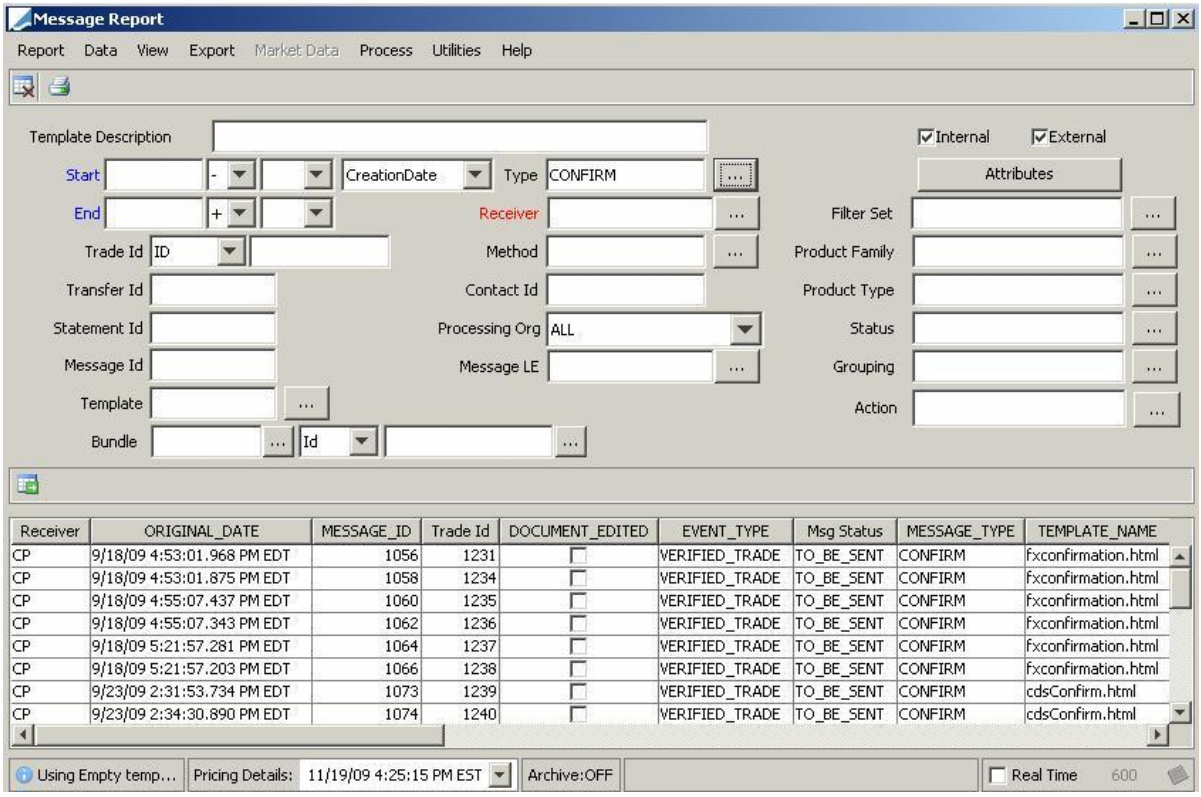
You can also access messages from a trade window using Back Office > BO Window, and you can drill-down to messages from a trade report, transfer report, etc.

Contents

- Message Report
- Message Report Results
- Applying Actions
- Message Viewer

4.1 MESSAGE REPORT

Choose Main Entry > Reports > Message Reports > Message Report (reporting.ReportWindow$Message).



[**NOTE**: The columns of this picture have been configured. Sort columns, subheadings and subtotals have to be explicitly specified. See Help > Menu Items for details]

» You can change the pricing details at the bottom of the window - By default, the pricing environment comes from the User Defaults, and the valuation date is the current date and time.

» Specify search criteria as applicable and click to load the corresponding messages.

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» You can uncheck the menu item View > Criteria to hide the search criteria (this menu item operates as a checkbox).

» Click to print the report results.

4.2 MESSAGE REPORT RESULTS

You can click any column heading to sort the results based on that column.

You can right-click any row to invoke the functions of the report menus. See Help > Menu Items for details.

The default columns of the report are the following.

Columns	Description
Message Id	Unique id number of this message in the system.
Trade Id	Id number of the trade that triggered this message, if any. A value of 0 indicates that this message does not pertain to one particular trade.
DOCUMENT_EDITED	A check mark indicates that the document has been edited. See Editing Documents for details.
UpdateTime	Message's last edit date/time.
Event Type	The type of event that generated this message.
Product Family	Product Family of the deal of this message.
Product Type	Product Type of the deal of this message.
Message Type	Type of this message.
Sender	Short name of the sending legal entity.
Sender Role	Role (in the trade) of the sending legal entity.
Sender Contact Type	Department of the contact sending this message.
Sender Address Code	Sender's address based on the address method.
Receiver	Short name of the receiving legal entity.
Receiver Role	Role (in the trade) of the receiving legal entity.
Receiver Contact Type	Department of the contact receiving this message.
Receiver Address Code	Receiver's address. The sort of address depends on the Address Mode (see below).
Address Mode	Type of address used to direct this message.
Language	Language of this message.
Gateway	Type of system used to produce this message.
Creation Date	Message's creation date/time.
Message Status	Message status.
Processed	True/false flag that shows whether this message is the reference message that indicates whether the Trade is matched or not matched. See Processed Flag for details.
Template Name	Name of the advice template used to produce this message. See Message Template for details.
Action	The most recent action carried out on this message.
Linked Id	The message id number of the message related to this message. For example, if this is a message announcing the cancellation of a previous message, this field shows the id number of that previous message.
Transfer Id	The id number of the transfer or payment related to this message. This message will have a Transfer Id only if this message was triggered by a payment or transfer.
Settle Date	Depends on the type of message: • For a rate reset message, this is the reset date. • For a transfer message, this is the value date (expected payment date). • For a trade message, this is the settlement date of the trade.
Sub Action	Code indicating whether this message amends or cancels a previous message. If it does, the id number of the cancelled or amended message will appear in the Linked Id field. See Sub Action for details.

4.2.1 Processed Flag

This is a true/false flag that shows whether this message is the reference message that indicates whether the Trade is matched or not matched. Note that this flag DOES NOT indicate whether this message has been matched. For example, for a single trade you might send three messages:

- One to the CounterParty by FAX,
- One the CounterParty by SWIFT, and
- One to the Broker.

Generally, the reference confirmation is the one sent to the counterparty by SWIFT. Therefore, it does not matter if the other messages (the one sent to the counterparty by fax and the one to the broker) are matched or if they are not received at all. The confirmation that matters is the message whose matching flag is set to "true." With this setting in place, you could set up your Workflow so that only the Matching Swift Confirmation would trigger the release of payment. (Or, if you have a Chasing engine, you can simply resend all the messages that have this flag set to ON.)

4.2.2 Message Template

The Message Template column in the Message Report Window shows the name of the base message template that is used to format this message. The Message engine uses the template name specified by the user in his Message Set-Up.

The system uses the Template Name differently, depending on the format type:

- For HTML/XML-formatted messages, the Message engine looks in the templates directory for an HTML/XML file with same name as the Template Name. If a special Template Selector is in place, then the template name set here is just the base template name to be fed into the Template Selector. The Template Selector will determine the actual file name based on the type of deal and this name.
- For SWIFT-formatted messages, the Message engine looks for a method matching the "TemplateName" in the Swift Formatter.

4.2.3 Sub Action

The Sub Action of this message may be one of the following three actions:

- NONE indicating that this message is a new message.
- CANCEL indicating that this message cancels a previous one. In this case, the Linked Id in this message is the id of the cancelled message.
- AMEND indicating that this message amends a previously sent message. In this case, the Linked Id in this message is the id of the amended message.

These values allow the system to display and format the message correctly. For example, if this field is set to "AMEND," the system will format this message in a way that makes it clear that this message is an amendment to the previous message.

The Message engine sets the Sub Action automatically using the following logic, based on the triggering event.

- If this message is a trade or rate reset message, the Sub Action is set to
  - NONE if no other identical message was already sent.
  - AMEND if an identical message was already sent and that message is not cancelable, based on the workflow set-up and the current status of the other, identical messages.
  - CANCEL if the trade is CANCELED and this message is being sent to cancel a message already sent.
- If this is a payment advice or message, the logic is as follows. (Note: the keyword AMEND is not used here.)
  - NONE if no other identical message was already sent.
  - CANCEL if an identical message was already sent and that message is not cancelable, based on the workflow set-up and the current Status of the other, identical messages.

4.2.4 Message Document

Right-click a message and choose Show > Message from the popup menu to view the actual message document.

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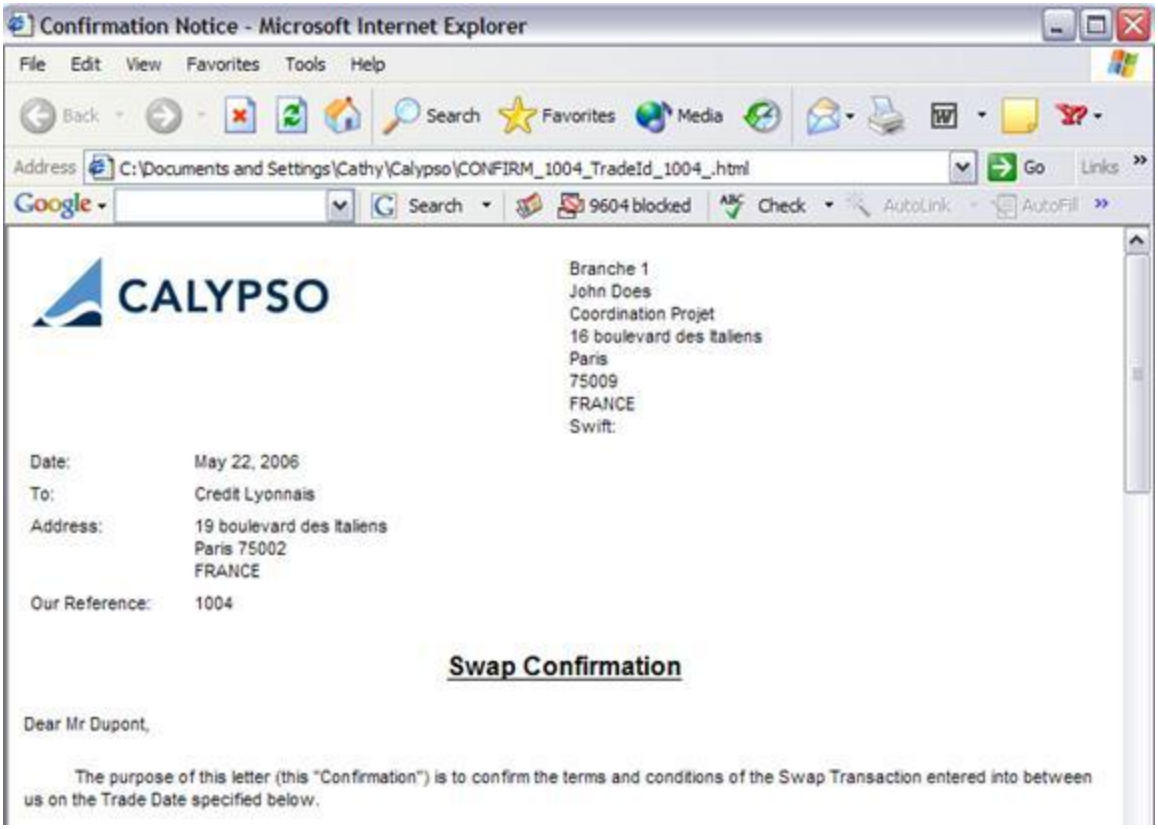
You can right-click a message and choose Show > Message to view the actual document.

Note that the physical document at this point, is just a preview. It has to be processed by the sender engine in order to be actually saved to the database, and sent to the recipients. Also, if you edit the document, you can save it to the database.

Sample confirmation:



4.3 Applying Actions

From here, you can apply a number of actions to the message, based on the message workflow configuration. Actions can also be applied from the task station and the back office window.

To apply an action from the message report, right-click a message and choose Action > any action. The actions defined in the standard workflow are described below.

4.3.1 AMEND Action

The AMEND action is a reserved action.

In order to modify a message, you have to apply the AMEND action. It will bring up the TS Amend panel.

» You can modify all the fields.

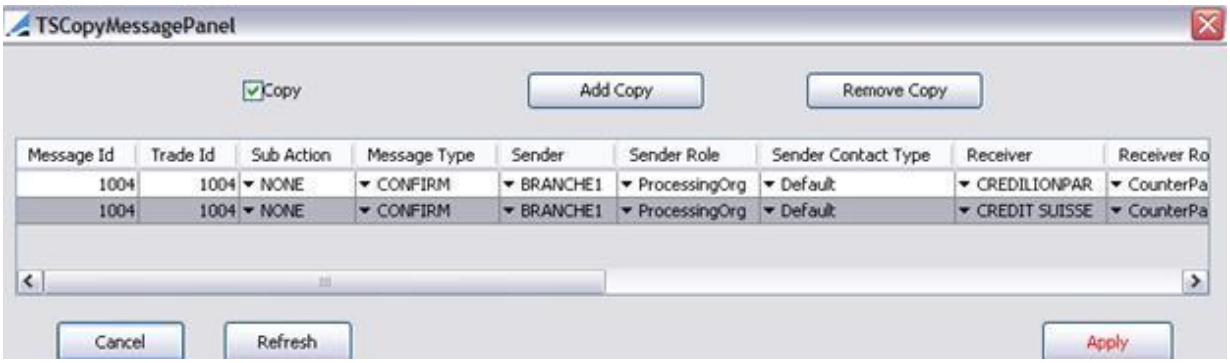
» Then click **Apply** to save your changes.

4.3.2 COPY ACTION – SEND_AS_NEW ACTION

The COPY action and SEND_AS_NEW action are reserved actions.

You can apply the COPY action to copy the message. For example, if you want to send the message to multiple recipients that you have not configured in the message configuration.

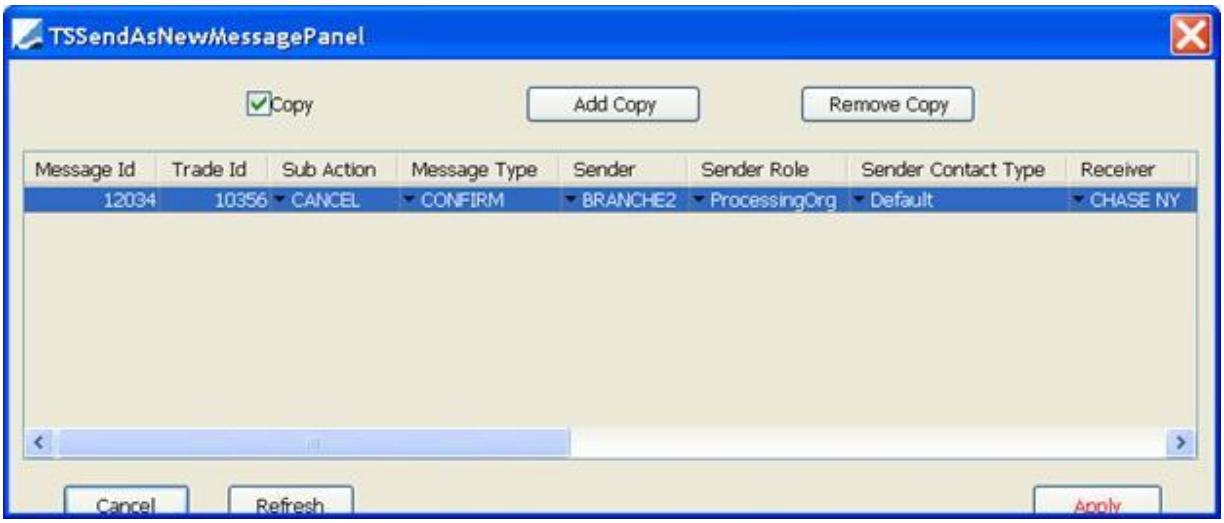
It will bring up the TS Copy panel.



» Select a row then click **Add Copy**. A second row will be added. You can modify all the fields.

» Then click **Apply** to save your changes.

If you want to cancel the initial message when you copy a message, you must use the action SEND_AS_NEW instead of COPY with the sub action CANCEL.



4.3.3 EDIT ACTION

The EDIT action is a reserved action.

You can edit the actual document associated with a message. By default the workflow is configured so that a different user can edit a document (different from the user who generated the document).

The modification of the actual documents is multi-fold: you can modify the content of the documents, you can add a comment, and you can attach other documents.

See Editing Documents for details.

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4.3.4 SEND ACTION

The SEND action is not a reserved action. You can rename it as needed. The sender engine can be configured for any action. However, some gateways may require the SEND action – it will be indicated when needed.

When a message is ready to be sent to the recipient, apply the SEND action. The sender engine will then send the documents to the recipients. See Sending Documents for details.

Once the documents have been sent, you can set up an import mechanism to reconcile acknowledgement receipts. You can also manually apply the ACK/NACK actions to the messages as applicable.

For payments, you can set up an import mechanism to reconcile payment receipts and proceed to the actual payments. You can also manually apply the MATCHED/UNMATCHED actions to the messages as applicable.

See Reconciling Incoming Messages for information on setting up an import mechanism for messages.

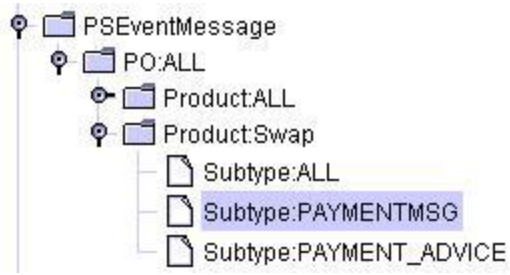
Amending / Canceling SENT Messages

In case a trade is amended or a transfer is cancelled after its related messages have been sent, it is possible to explicitly direct the message engine to generate either one Amend message (a message with SubAction AMEND), or two messages: one Cancel message (a message with SubAction CANCEL) and one new message (a message with SubAction NEW). Use the action CANCELNEW in your message workflow.

The CANCELNEW action is a reserved action.

By using this workflow action it is also straightforward to have two different behaviors for PAYMENTMSG and PAYMENT ADVICE. If you duplicate the Message workflow for those two message types and put the CANCELNEW action only on PAYMENTMSG, then based on the same trigger event (VERIFIED_PAYMENT or VERIFIED_RECEIPT), you could have an AMEND PAYMENT ADVICE and two PAYMENTMSGs (one CANCEL, one NEW) for each transfer amendment.

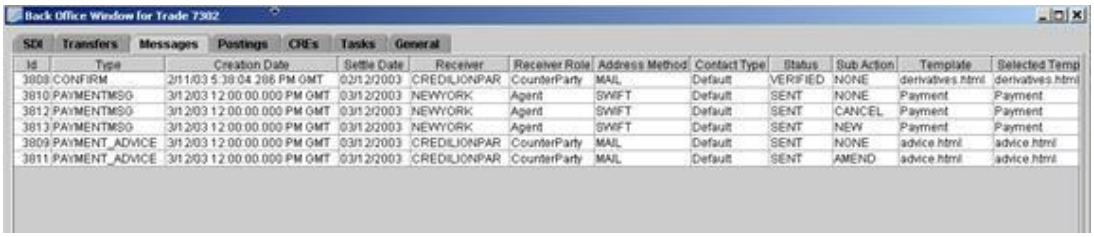
For example:



Advice and Payment Message have been sent.

- Before Trade Amendment on simple Swap

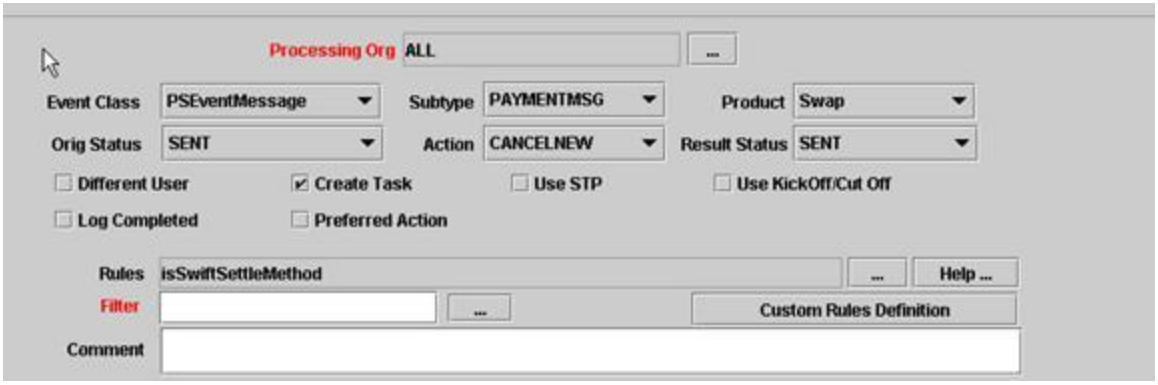
- After Trade Amendment (change floating rate)



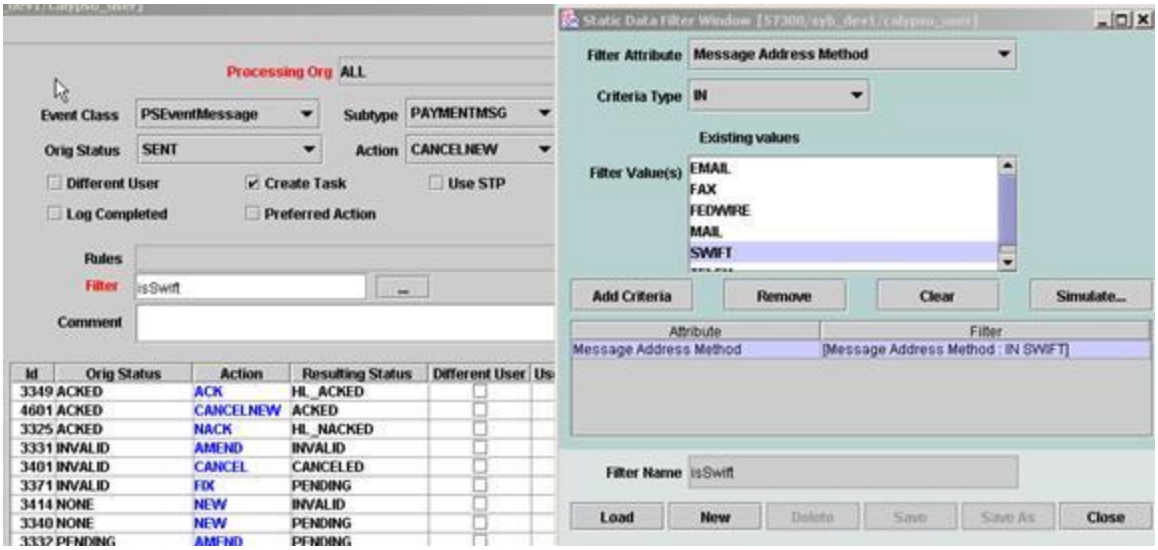
Sometimes based upon the settlement method used, the CANCEL/NEW message cannot be used. For instance Fedwire does not support cancellation messages like Swift (MT292). In this case, the user needs to restrict the

CANCELNEW action mechanism according to the address method or settlement method. A static data filter could be added on the transition SENT - CANCELNEW - SENT to allow this type of transition only if SWIFT method is used.

In the example below we create a simple message workflow rule which looks at the settlement method attached to the transfer.



Or you could have the same behavior using a static data filter.



Advice and Payment Message have been sent.

- Before Trade Amendment on simple Swap

  Swift settlement:

  Fedwire settlement:

- After Trade Amendment (change floating rate)

  Swift settlement:

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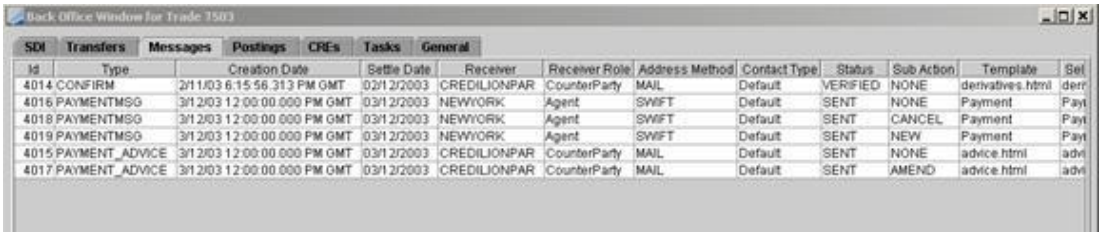
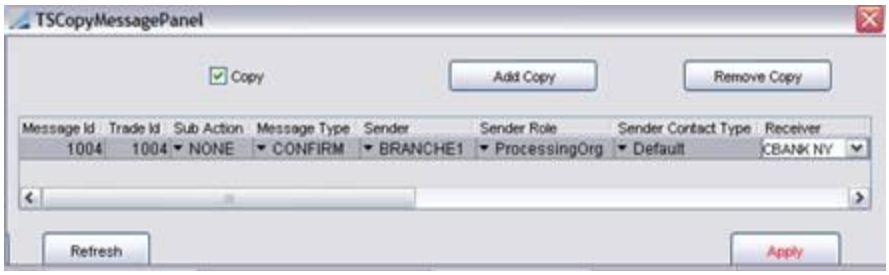
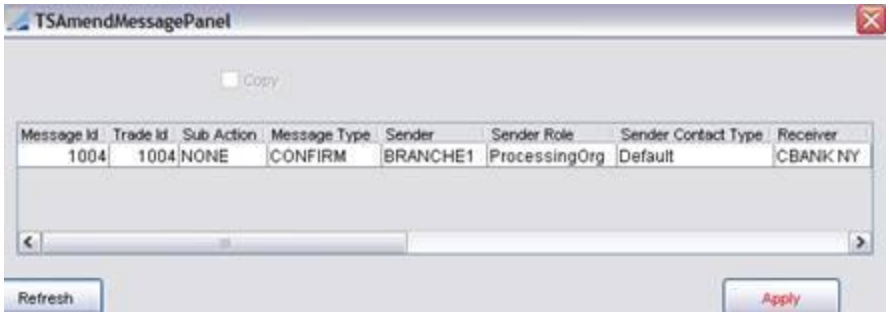


Fedwire settlement:

4.4 Process Menu

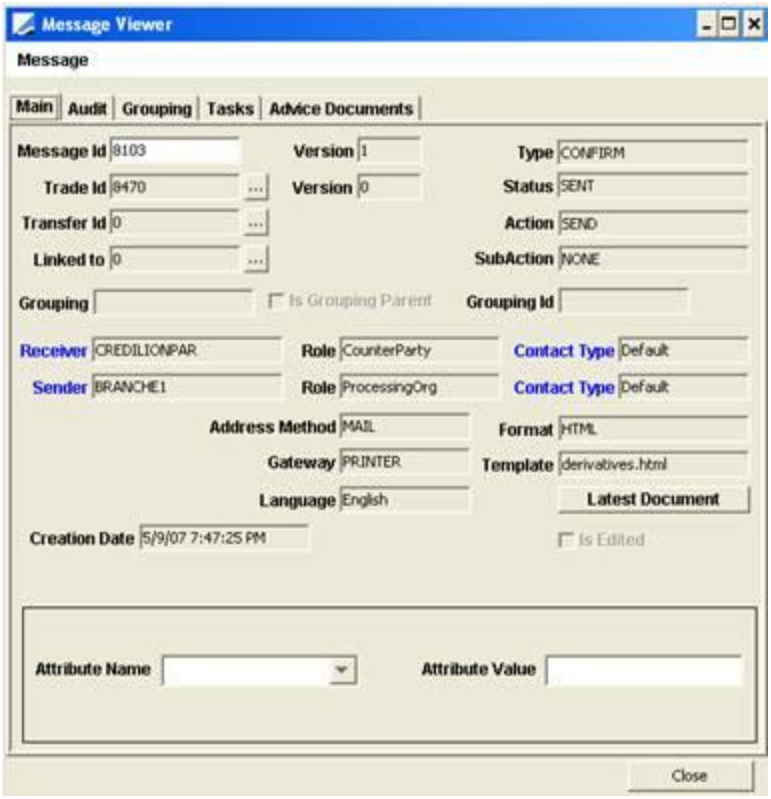
The menu items of the Process menu are described below.

Menu Items	Description
Copy Messages	To open the TSCopyMessagePanel window to copy the selected message as shown below.  » Modify any of the fields and click **Add Copy**. » Then click **Apply**.
Amend Messages	Invokes the window to amend the selected message as shown below.  » Modify any of the fields and click **Apply**. Note that the AMEND action should be configured in the workflow for the selected message status.
Update Messages	Updates the selected message. Note that the UPDATE action should be configured in the workflow for the selected message status.
Regenerate Document	Forces re-generation of the advice document for the selected message. It needs the same authorization as an UPDATE action on the message.

Menu Items	Description
Generate MT609	Select the messages you want to incorporate in an MT609 (select MT600 messages already produced for FX, FX Forward and FX Swap bullion deals), and choose Generate MT609 to generate the statement of outstanding FX (FX Spot, FX Forward and FX Swap) bullion contracts. Refer to the *Calypso Message Grouping User Guide*for information on generating MT600 messages.
Add Generic Comment	To add a comment to a message.

4.5 MESSAGE VIEWER

The Message Viewer is available from the Message report, from the Task Station, and from the Back Office window. When you right-click a message, choose Show > Message Viewer from the popup menu to display details the message.

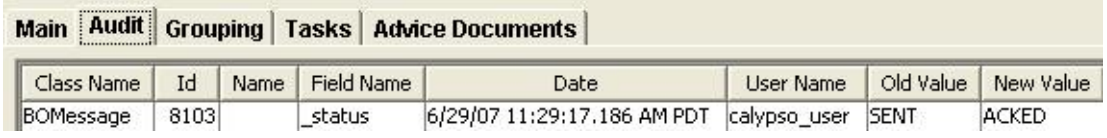


» You can right-click a row in any panel to display a popup menu that allows configuring columns, defining templates, etc. The menu items are described under Help > Menu Items in the Message Report.

» Select the panels as applicable to view the different elements associated with the message.

In the Main panel, double-click any of the blue labels to display more details: receiver, sender, and contact types.

The Audit panel shows audit information provided the value BOMessage has been added to the domain classAuditMode.



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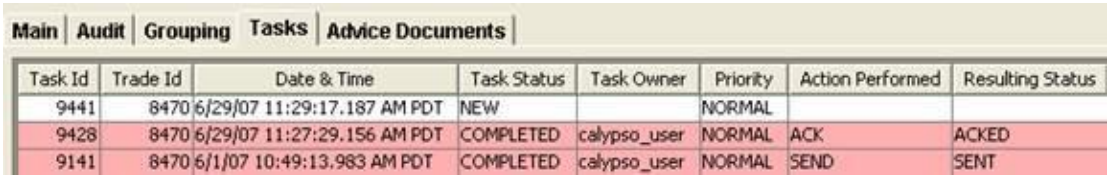
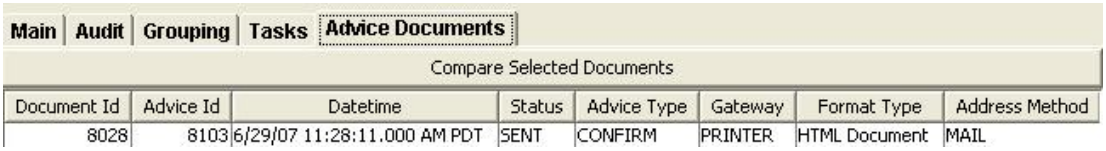
The Grouping panel shows grouped messages and messages that compose a grouped message provided message grouping has been configured. You can refer to the *Calypso Message Grouping User Guide* for information on configuring grouped messages.

The Tasks panel shows the tasks related to the message.



Task Id	Trade Id	Date & Time	Task Status	Task Owner	Priority	Action Performed	Resulting Status
9441	8470	6/29/07 11:29:17.187 AM PDT	NEW		NORMAL		
9428	8470	6/29/07 11:27:29.156 AM PDT	COMPLETED	calypso_user	NORMAL	ACK	ACKED
9141	8470	6/1/07 10:49:13.983 AM PDT	COMPLETED	calypso_user	NORMAL	SEND	SENT

The Advice Documents panel shows the actual message documents associated with the message.



Document Id	Advice Id	Datetime	Status	Advice Type	Gateway	Format Type	Address Method
8028	8103	6/29/07 11:28:11.000 AM PDT	SENT	CONFIRM	PRINTER	HTML Document	MAIL

In the case where multiple documents have been generated, you can select two documents and click **Compare Selected Documents** to display differences between the selected documents.

» Choose Message > Add Generic Comment to add a comment to the transfer. Help is available from that window.

[NOTE: The Message Viewer converts date message attributes to the local timezone - To avoid this, you can add date message attributes to the domain "MessageViewer.MsgAttributes.DateAttributesToKeep" so that they will not be converted.

5. MESSAGE GROUPING OVERVIEW

To generate grouped messages, the general process is the following:

- Define message grouping keys using the Message Grouping window.
- Set message grouping keys on a message configuration using the Message Setup-Up window.
- Run the MESSAGE_GROUPING scheduled task to generate the actual grouped messages.

We currently support the generation of the following grouped messages:

- MT604 / MULTIPLE Precious Metal Transfer / Delivery Order, and MT605 / MULTIPLE Precious Metal Notice to Receiver.

  MT692 that allows canceling only one single Transaction of a Multiple Message (MT692 will be produced to cancel one transaction which is part of an initial GLOBAL/MULTIPLE Delivery Order Message MT604 or MT605).
- MT203 that allows grouping of MT202 / MT103 - MT205 that allows grouping of MT202 / MT103

  Note that the grouping of MT202 only works for underlying MT202 XML templates and does not apply to the standard *CustomerCreditTransfer* or *Payment* templates.
- MT102 that allows grouping of MT103.
- MT101 that allows grouping of individual MT101 - Refer to the *Calypso Corporate Cash Management User Guide*.

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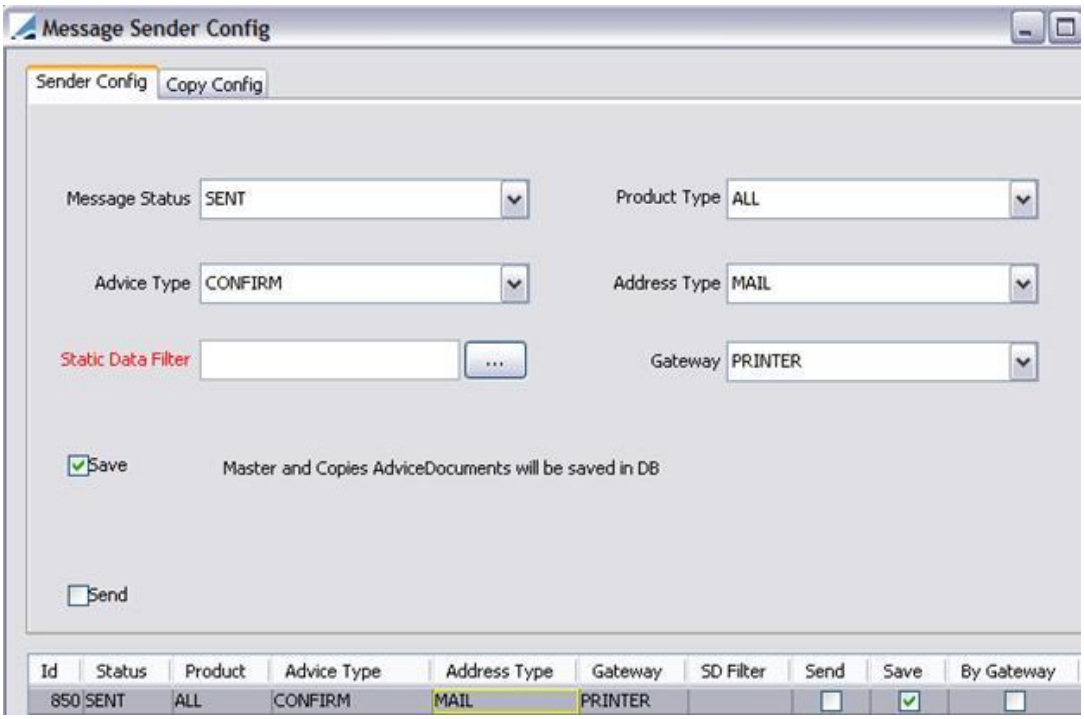
6. MESSAGE SENDER

Once messages have been generated by the message engine, the sender engine sends the actual documents attached to the messages based on **message sender configurations**.

Message sender configurations define if the documents are saved to the database, how they are sent to the recipients, and if copies of the documents are required.

Choose Main Entry > Configuration > Messages & Matching > Message Sender (`refdata.SenderConfigWindow`) to define message sender configurations.



Contents

- Defining Message Sender Configurations
- Modifying Message Sender Configurations
- Deleting Message Sender Configurations
- Defining Copy Configurations
- Modifying Copy Configurations
- Deleting Copy Configurations

6.1 DEFINING MESSAGE SENDER CONFIGURATIONS

You need to create a message sender configuration that matches a message configuration, then you can configure copies of the documents.

The Sender Config panel is selected by default.

» Click **New** to create a new message sender configuration and enter the fields described below.

» Then click **Save** to save your changes.

» Click **Help** for complete details.

6.1.1 EMAILDocumentSender

To use EMAILDocumentSender, you must specify your Mail server in a file named `calypso_mail_config.properties`. This file should be found in your CLASSPATH.

The content of the file should be:

```
HOST= <HostName or IP address of MailServer>
PORT= <Port Usually 25>
FROM= <from address not mandatory>
```

The TO email address will be the email address of the receiver as defined in the receiver's contact information, and if the FROM email address is not specified in the property files, it will be the email address of the sender as defined in the sender's contact information.

Note that when you select the EMAIL address type, you should select the PRINTER gateway.

6.2 Modifying Message Sender Configurations

All existing configurations are loaded by default.

» Select a configuration, and modify the fields as needed.

» Then click **Save** to save your changes.

6.3 Deleting Message Sender Configurations

All existing configurations are loaded by default.

» Select a configuration, and click **Remove**.

Any existing copy configuration will be removed as well.

6.4 Defining Copy Configurations

Select the Copy Config panel to configure copies of documents. You can send copies to contacts of the sender, of the receiver, using a different type of message, using a different sending method, etc.

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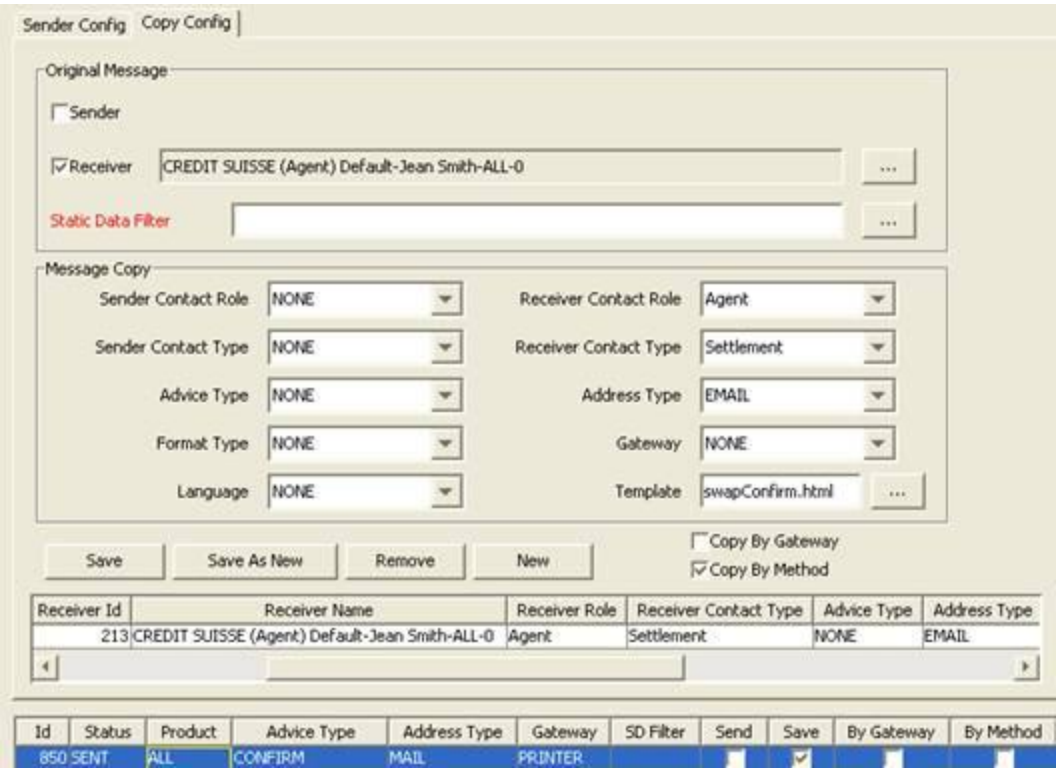

» Select a message sender configuration from the lower table to select what document you want to copy.

Then click **New**, and enter the fields described below to specify the recipients of the copy and how the message is copied.

» Then click **Save** to save the copy configuration for the selected message sender configuration.

The copies are sent through their own DocumentSender provided Save is not checked in the Sender Configuration. If Save is checked in the Sender Configuration, copies can only be sent if the DocumentSender of the Sender Configuration takes care of sending the copies as well - See Copy Sending Logic for details.

Note that the copies are never saved.

» Click **Help** for complete details.

6.4.1 Copy Sending Logic

When you configure a Sender Configuration with Copy Configurations, the logic is the following.

1 – The system creates the main document of the Sender Configuration.

2 – The system creates the copies of the Copy Configurations.

3 – The rest depends on checkboxes Send and Save:

- If only Send is checked – The system sends the main document through the DocumentSender of the Sender Configuration, and sends the copies through their own DocumentSender as defined in the Copy Configuration.
- If only Save is checked – The system saves the main document – Nothing is done on the copies.
- If both Save and Send are checked – The system sends and saves the main document. The copies can only be sent if the DocumentSender of the Sender Configuration takes care of sending them.
- If both Save and Send are NOT checked – The system sends the copies through their own DocumentSender as defined in the Copy Configuration.

6.5 Modifying Copy Configurations

Select the Copy Config panel.

» Select a message sender configuration from the lower table. All corresponding copy configurations will be loaded.

Select a copy configuration and modify the fields as applicable.

» Then click **Save** to save your changes.

6.6 Deleting Copy Configurations

Select the Copy Config panel.

» Select a message sender configuration from the lower table. All corresponding copy configurations will be loaded.

Select a copy configuration and click **Remove**.

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7. SENDING MESSAGES

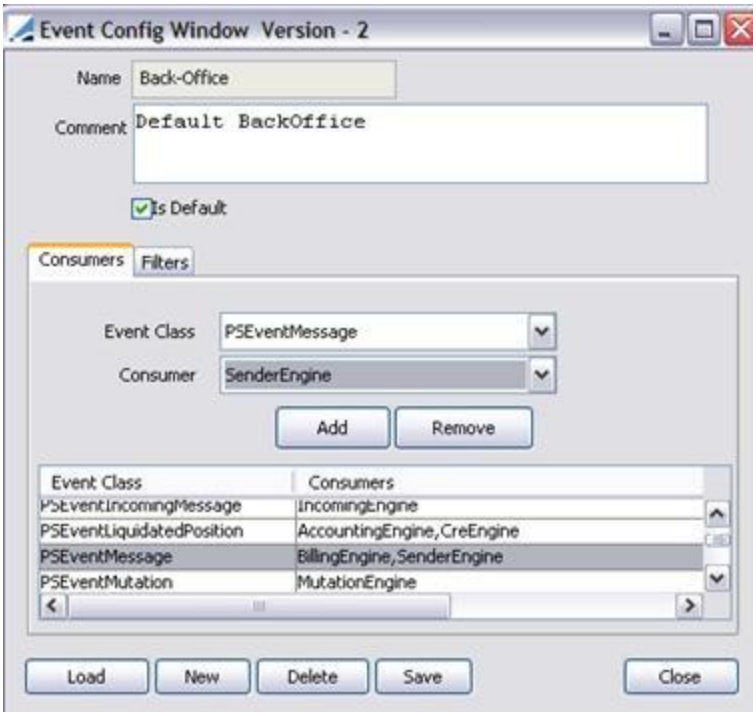
In order to generate messages, you need to start the sender engine.

Contents

- Events Configuration
- Sender Engine Parameters
- Starting the Sender Engine

7.1 EVENTS CONFIGURATION

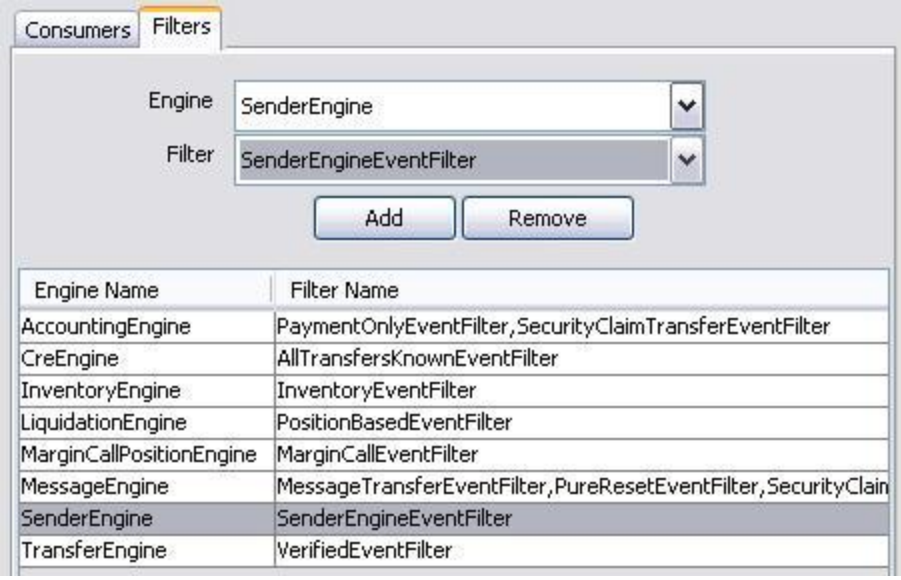
Choose Main Entry > Configuration > System > Event Configuration (util.EventConfigWindow) to review event subscription requirements for the sender engine.



» In the Consumers panel, you can select the events to which the sender engine subscribes to. The sender engine can only subscribe to message events.

» In the Filters panel, review the filters associated with the sender engine.

The sender engine can only use the SenderEngineEventFilter, which filters messages associated with a message sender configuration only.



7.2 SENDER ENGINE PARAMETERS

The behavior of the sender engine may be modified with the following engine parameters and environment properties.

Engine parameters are specified using Admin > Engine Thread. If a parameter is not available for setup, you can register it in the engineParam domain.

Environment properties are specified using User Env.

Parameters and Properties	Description
MAX_BATCH_EVENT	***Specified in Admin > Engine Thread.*** Maximum number of persistent events loaded at one time by an engine in batch mode. The engine will load events in MAX_BATCH_EVENT chunks until all events are processed. Persistent events received after MAX_QUEUE_SIZE is reached will be processed in batch mode. Allows controlling engine memory usage, therefore improving the performance.
MAX_QUEUE_SIZE	***Specified in Admin > Engine Thread.*** Maximum number of events buffered on an engine event queue. When this number is exceeded, real time events are discarded and the engine restarts based on the restart timer (TIMEOUT_RESTART), in order to process the unprocessed persistent events using batch mode. This parameter can be useful for controlling the engine's memory usage. If not set, the default value for this parameter is no limit on queue size. Allows controlling engine memory usage, therefore improving the performance.
PricingEnv	***Specified in Admin > Engine Thread.*** Pricing environment used by the engine. If not set, the default Pricing Environment of the user running the engine will be used.
THREAD_COUNT	***Specified in Admin > Engine Thread.*** Number of concurrent threads used in an engine for processing. Increase the thread count for better performance.
TIMEOUT_RESTART	***Specified in Admin > Engine Thread.*** Number of seconds to wait before an engine restarts after MAX_QUEUE_SIZE has been reached. The default value is 3600 seconds (1 hour).

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7.3 Starting the Sender Engine

It can be started using the application com.calypso.apps.startup.StartSenderEngine.

The sender engine publishes document events (PSEventAdviceDocument) and saves the documents to the database (if the Save checkbox is checked in the Message Sender Configuration, and if the document does not already exists in the database). It also publishes task events.

The documents are flagged as being sent.

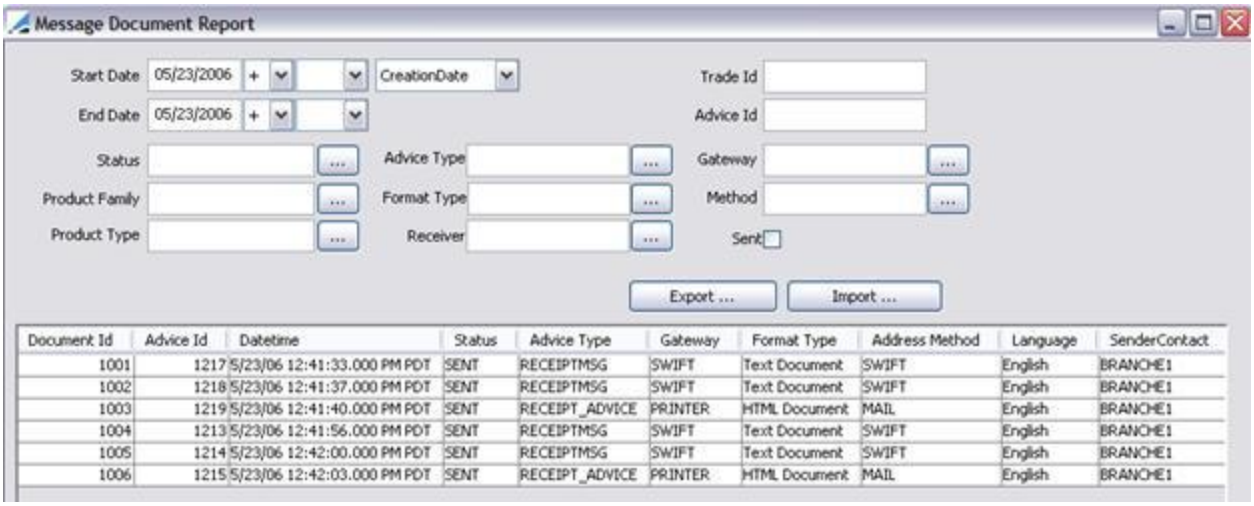
Whenever the sender engine is started, it processes all outstanding events to which it subscribes that were published while it was inactive.

8. VIEWING DOCUMENTS

You can view the documents generated by the sender engine using the Saved Message Documents report.

8.1 MESSAGE DOCUMENTS REPORT

Choose Main Entry > Reports > Message Reports > Message Documents (reporting.AdviceDocumentReportWindow).



You can double-click a document to view the actual physical document.

Sample Swift document:

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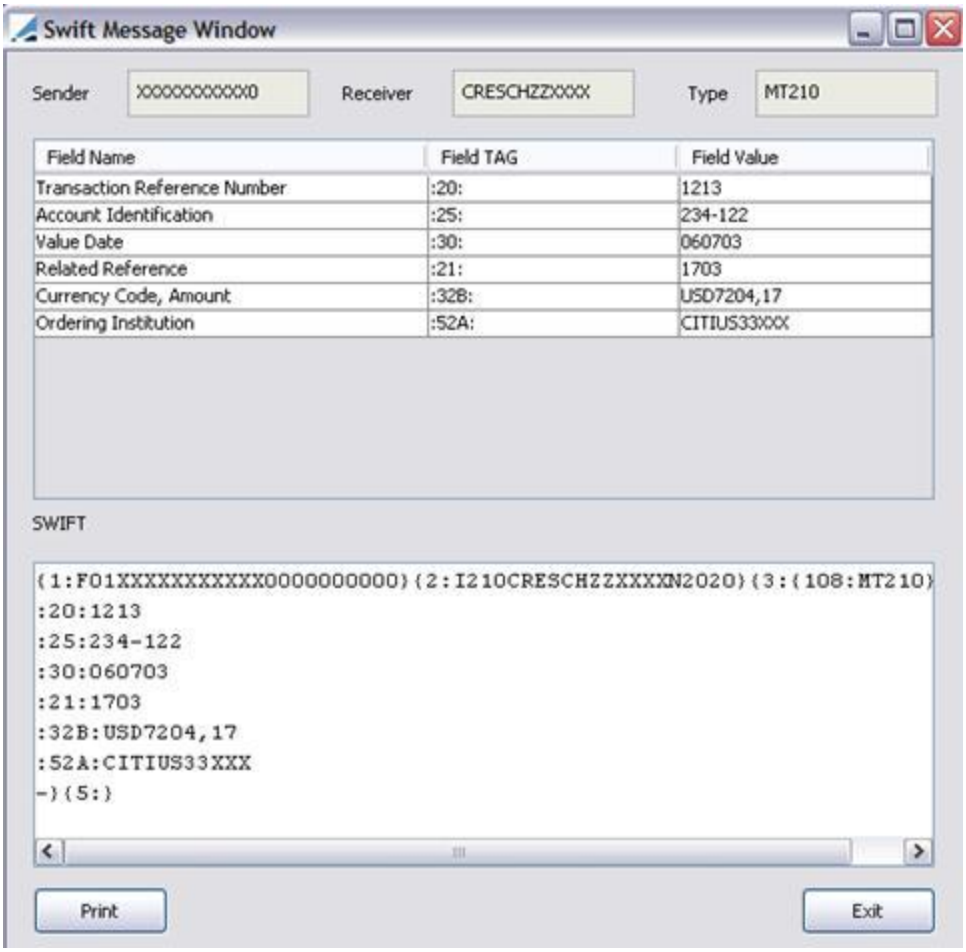

8.2 Regenerating a Document

You can ask the sender engine to regenerate a document using the REGENERATE action, or any action specified in the domain messageRegenerateStatus.

So for example, you can add a transition SENT - REGENERATE - REGENERATED in order to regenerate a document. Note however that it will only regenerate the document if the document has not been edited.

Make sure that a Message Sender Configuration is available for the original status, SENT in this example.

9. EDITING DOCUMENTS

The modification of the actual documents is multi-fold: you can modify the content of the documents, you can add a comment, and you can attach other documents.

No setup is required for adding comments and attaching documents.

9.1 DOCUMENT MODIFICATION SETUP FOR HTML DOCUMENTS

Note that this section applies to HTML documents only, and only if you enable document security (environment property DOCUMENT_SECURITY is set to true).

In this case, you will not be able to edit the whole document, only the regions authorized by Document Manager.

By default, you can define regions in the HTML documents, and using Document Manager you specify if the regions are editable or read-only.

Calypso provides an API in order to customize how HTML documents are displayed in Document Manager. Refer to the *Calypso Developer's Guide* for details. A custom document filter must be registered in the environment property DOCUMENT_FILTER.

9.1.1 DEFINING DOCUMENT REGIONS

If a document does not define any region, then the whole document defaults to read-only, meaning that it cannot be modified. Regions are defined using the following tags in the HTML templates:

```
<!--region:NAME--> ... <!--/region-->
```

This would define a region named NAME. Note that the syntax has to be exactly the same.

Note that out-of-the-box Calypso templates do not define any region.

Example:

```
<p>Offices:<br>
(a)    The Office of Party A for the Swap Transaction is
 <!--region:SADDRESS-->|SENDER_ADDRESS|<!--/region-->|SENDER_CITY| |SENDER_STATE|
|SENDER_ZIPCODE| |SENDER_COUNTRY|; and<br>
(b)    The Office of Party B for the Swap Transaction is
 <!--region:RADDRESS-->|RECEIVER_ADDRESS|<!--/region-->|RECEIVER_CITY| |RECEIVER_STATE|
|RECEIVER_ZIPCODE| |RECEIVER_COUNTRY|.
</p>";
```

9.1.2 ASSOCIATING PERMISSIONS WITH DOCUMENT REGIONS

Choose Main Entry > Configuration > Messages & Matching > Document Manager (refdata.DocumentManagerWindow) to associate permissions with document regions. The regions previously defined will appear as shown below.

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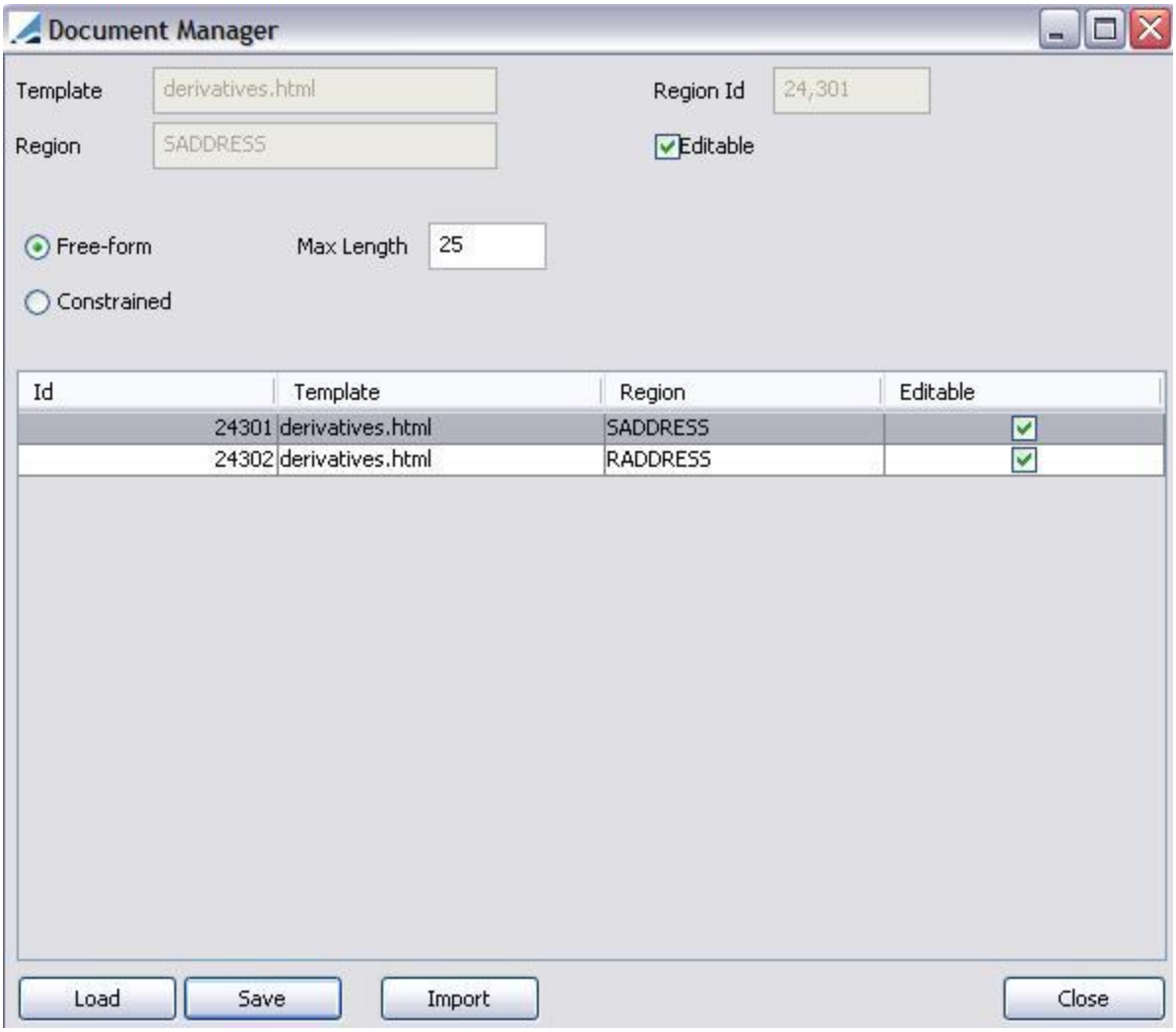


» Click **Import** to import a template. You will be prompted to select an HTML template. HTML templates are registered in the "MESSAGE.Templates" domain.

You can also click **Load** to load HTML templates that have already been imported. You will be prompted to select an HTML template.

Note that you will only be able to import or load HTML templates that define regions.

Each region will appear in the window. By default, the regions are set as read-only.

» To make a region editable, select a region and check the Editable checkbox. You will be able to choose if you want a free-form editable region, or a constrained editable region.

- Click the Free-form radio button to make the region editable as a free-form field.

Enter the maximum number of characters of the region in the Max Length field. It defaults to 0 which indicates that there is no length limit. The user will be able to enter anything of the specified length in the corresponding region when editing the document.

- Or click the Constrained radio button to limit the values of the editable region.

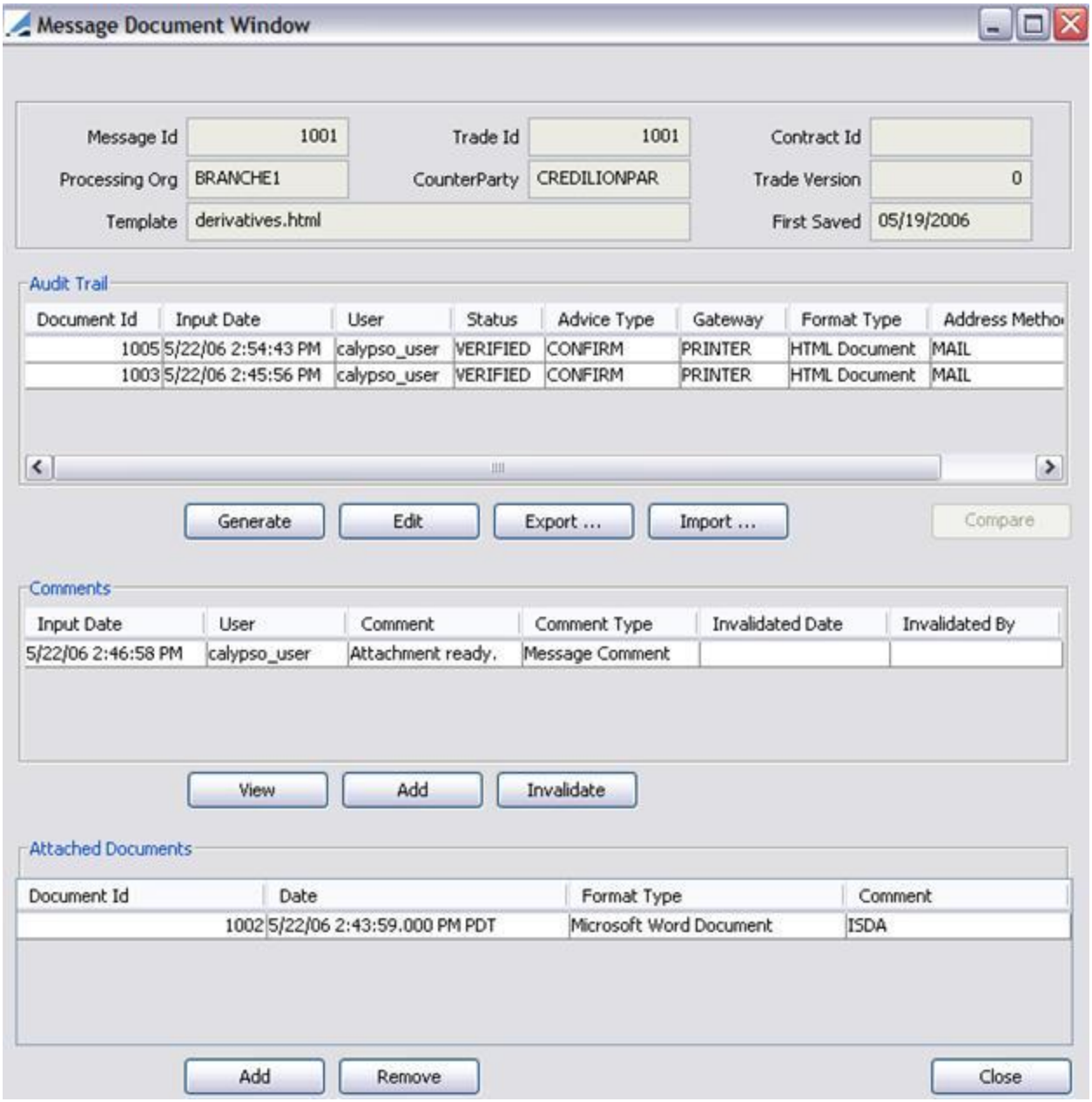
Click ... next to the Values field to specify the available values. You will be prompted to enter values. The user will only be able to select one of those values for the corresponding region when editing the document.

» Click **Save** to save your changes.

9.2 MODIFYING DOCUMENTS

To modify the document attached to a message, you can apply the EDIT action. You can also right-click a message and choose Show > Documents.

The Message Document Window will appear.



Note that if the documents have been sent, the **Generate** and **Edit** buttons will not be available.

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If the message has already been saved to the database, it will appear in the Audit Trail section. Otherwise, click **Generate** to create the document.

» To edit a document, select a document and click **Edit**.

- For a swift document, the Calypso built-in swift editor will be used.
- For an HTML document, the editor specified in the HTML_EDITOR environment property will be used. If the environment property AUTOMATIC_IMPORT is set to true, the modified document will be automatically saved to the database. If the environment property DOCUMENT_SECURITY is true, you will only be able to modify editable regions.

» To generate more documents for this message, click **Generate** again. You can select the same document template (from the document previously edited and saved), or the initial document template.

» To compare two documents, select two generated documents and click **Compare**.

» To add a comment, click **Add** in the Comments area, and enter a comment.

» To add an attachment, click **Add** in the Attached Documents area, and select a document for attachment.

10. Matching Overview

Out-of-the-box, Calypso offers integration for the following messages:

- CLS — Refer to the *Calypso CLS Integration Guide*
- DTCC — Refer to the *Calypso DTCC Integration Guide*
- FX Confirmations —Refer to the *Calypso FX Confirmation Matching Guide*
- GSCC and BONY — Refer to the *Calypso Fixed Income Integration Guide*
- MT537, MT544, MT545, MT546, MT547, MT548, MT578 and MT586 — Refer to the *Calypso Settlement Returns Integration Guide*
- MT103, MT202, MT210, MT900, and MT910 — Refer to Calypso Settlements Documentation
- MT940 and MT950 — Refer to Calypso Cash Management Documentation
- Swift Acknowledgements - Refer to Calypso Messages Documentation for details.
- Broker Affirmations - Refer to Calypso Messages Documentation for details.

10.1 Incoming and Matching Process

The reconciliation of incoming messages is a two-step process.

10.1.1 Step 1 – Importing Incoming Messages

Incoming messages are imported by the ImportMessageEngine – The ImportMessageEngine is triggered by an IEAdapterListener listening to an IEAdapter. Each time a new message is detected by the adapter, it calls the engine which saves the message in Calypso. An incoming workflow must be specified to handle the incoming message.

Each integration scheme requires a specific configuration file to be passed as a parameter to the ImportMessageEngine. Refer to the corresponding integration user guide for details.

10.1.2 Step 2 – Matching Incoming Messages and Outgoing Messages

Incoming messages can be matched to outgoing messages using the matching framework.

The matching framework is an independent module.

If the incoming messages are eligible for matching within a Matching Context, the MatchableBuilderEngine creates a Matchable object containing the matching information necessary for this object to go through the matching process, in particular the Matching Keys.

The MatchingEngine subscribes to Matchable objects and tries to automatically process them, depending on the matching information defined in the associated context. The MatchingEngine applies the workflow actions associated with the matching context, if any. In case workflow actions are specified in the matching context configuration, they must also be defined in the incoming workflow and the outgoing workflow.

The Matching Monitor keeps track of matched and unmatched items and allows performing manual processes.

In order to bring up the Matching Context, you need to define a menu item for action "`refdata.MatchingContextConfigurationWindow`" - Help is available from that window.

In order to bring up the matching monitor, you need to define a menu item for action "`reporting.MatchingUILauncher Matchable`". [**NOTE**: There is space before Matchable] - - Help is available from that window.

10.2 Matching Components Installation

10.2.1 Installation

Download the Matching jar from the Calypso download website and unzip it under $calypso_home.

Add the following jars to your CLASSPATH:

- matching.jar

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10.2.2 SERVICE REGISTRATION

In the file resources/service.properties, add MatchingServer to the services line, as shown below (this is a one-line command).

```
serv-
ices=A-
ccessServer,TradeServer,BackOfficeServer,ReferenceDataServer,AccountingServer,ProductServer,MarketDataS
```

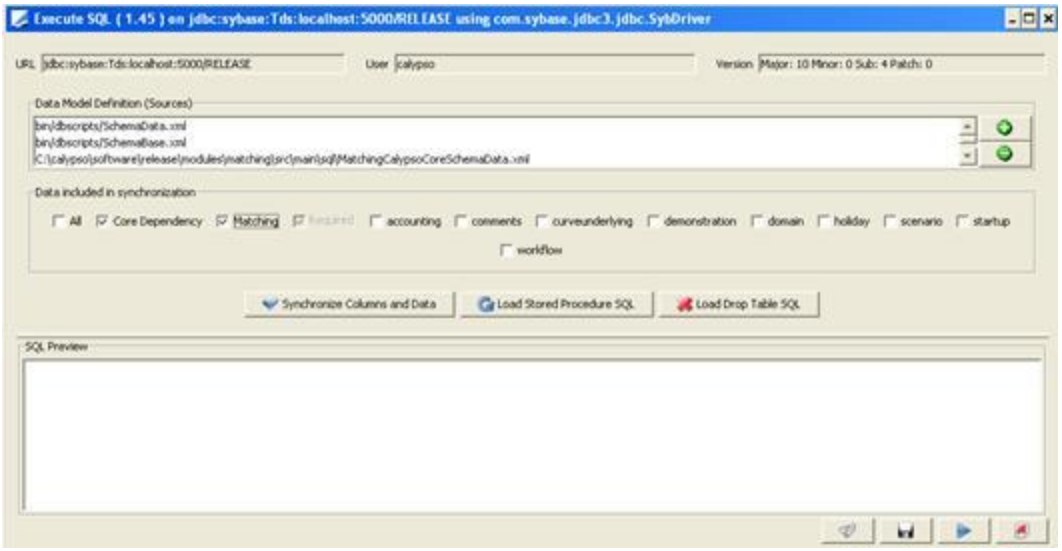
[**NOTE**: Do not remove any out-of-the-box service from that line]

10.2.3 DATA SYNCHRONIZATION

Synchronize your database with the Matching data.

Run ExecuteSQL and add the following file:

- $calypso_home/modules/matching/src/main/sql/MatchingSchemaData.xml
- $calypso_home/modules/matching/src/main/sql/MatchingSchemaData.xml
- $calypso_home/modules/matching/src/main/sql/MatchingCalypsoCoreSchemaData.xml



» Click **Add** to add the files.

» Check "Core Dependency" and "Matching" to create the relevant domain values

» Click **Synchronize Columns and Data**.

» Click .

You can now restart the Data Server.