



Nasdaq Calypso

HKEX FCM Integration Guide

Version 2.3.0

Revision 2.0
January 2024
Approved

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Document History

Revision	Published	Summary of Changes
1.0	August 2023	First edition for version 1.1.1
2.0	January 2024	Updates for version 2.3.0 (compatibility with version 18)

This document describes the HKEX SwapConnect interface for incoming /outgoing trade messages and EOD process.

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Introduction

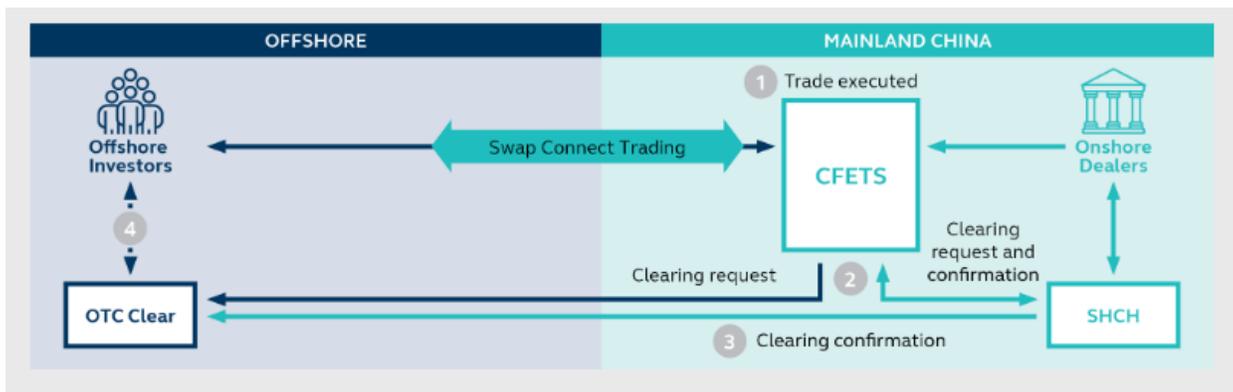
Swap Connect is run in partnership by China Foreign Exchange Trade System (CFETS), Shanghai Clearing House (SHCH) and HKEX through its clearing subsidiary OTC Clearing Hong Kong Limited (OTC Clear).

In its initial stage, Swap Connect has connected Hong Kong and international investors with Mainland China’s interbank interest rate swap market through a Northbound route.

OTC Clear will provide central clearing services for offshore investors, while SHCH will provide central clearing services to onshore investors.

HKEX OTC Clear service plays an important role for international investors and Mainland Chinese swap market makers as a central counterparty (CCP) helping mitigate the risks involved in transacting interest rate swaps.

- Offshore investors and onshore dealers execute trades and match these on CFETS.
- CFETS sends the clearing request to both OTC Clear and SHCH.
- SHCH provides the final clearing status confirmation to both OTC Clear and CFETS.
- Offshore investors will face OTC Clear once the trade is cleared.



Scope

Below Swap Connect messages from HKEX to Clearing Member & Clearing Member to HKEX are supported. These messages will be available in SFTP location which will be uploaded via scheduled task HKEXFCM_BRIDGE_MESSAGE_LOADER.

Message Type	Direction	Description	Incoming/Outgoing
requestConsent	OCASS -> Clearing Broker	Request to ask for clearing broker's consent for a client trade. Trade details and margin requirements are included	Incoming
consentAcknowledgement	Clearing Broker -> OCASS	Acknowledgement that clearing broker received the requestConsent	Outgoing
consentGranted	Clearing Broker -> OCASS	Clearing broker accept the client trade for clearing	Incoming
consentRefused	Clearing Broker -> OCASS	Clearing broker reject the client trade for clearing	Outgoing
clearingConfirmed	OCASS -> Clearing Broker	Trade is cleared	Incoming
clearingRefused	OCASS -> Clearing Broker	Trade is rejected	Incoming

Setup Requirements

2.1 Installation Instructions

The HKEX SwapConnect interface is installed as part of Calypso when you select the HKEX Clearing interface:

Setup - Calypso 17.23.9.1-SNAPSHOT

Select Components
Which components should be installed?

Select the components you want to install; clear the components you do not want to install. Click Next when

<input checked="" type="checkbox"/>		Reuters Data Scope Select (DSS) Interface
<input type="checkbox"/>		Reuters Ticket Output Feed (TOF) Interface
<input type="checkbox"/>		Reuters EBS Deal Tracker Interface
<input type="checkbox"/>		Reuters Foundation API(RFA) Interface
<input type="checkbox"/>		SAP
<input type="checkbox"/>		Swap Data Repository
<input type="checkbox"/>		Trade Web
<input type="checkbox"/>		Traiana
<input checked="" type="checkbox"/>		TRAX Matching Interface
<input checked="" type="checkbox"/>		Trioptima Interface
<input type="checkbox"/>		FXAll
<input type="checkbox"/>		Refinitiv-TradeNotification
<input checked="" type="checkbox"/>		HKEX Clearing
<input type="checkbox"/>		Anna-DSB
<input checked="" type="checkbox"/>		Optional Modules (Please consult with your Calypso Account Executive for licensing questions)

NOTE: It requires the Clearing Member solution to be installed as well.

2.2 HKEXFCM Properties File

For Message Upload via HKEXFCM_BRIDGE_MESSAGE_LOADER scheduled task, set ExternalURIPrefix= **upload**.

For Message Upload via Message Injector, set ExternalURIPrefix= **source**.

```

1  uploadSource=HKEXFCM
2  # The Value of this attribute indicates from where the message originates; do
3  # This value is used by the translator to identify the mappings in the Calypso
4
5  uploadFormat=
6  # The Value of this attribute indicates the format; do not change the value (
7  # This value is used by the Data Uploader framework to identify the translat
8
9  ExternalURIPrefix=upload
10 # The Value of this attribute specifies the config name [Spring bean] to use
11 # connect to the CCP using JMS, IBM MQ, etc. The config name used in this XML
12
13 ExternalIncomingURI=queue.hkexfcm.calypso
14 # Please change the value of this attribute to the queue name from which the
15
16 ExternalOutgoingURI=queue.calypso.hkexfcm
17 # Please change the value of this attribute to the queue name which the CCP (
18
19 BusinessFlow=FCM
20 # The Value of this attribute indicates whether the Credit Check (Collateral
21 # a) FCM (No Head Room Check) b) FCMHRC (Head Room Check is used for Risk).
22 # the Trade workflow is different for these solutions. And based on this, the
23
24 Features=AuditOn,AutoRejectOn
25 # AuditOn specifies that a copy of all Incoming & Outgoing messages should be
26 # message processing, the BO Message will still be saved. Please do not chang
27 # AutoRejectOff/AutoRejectOn is an advanced feature and Calypso advice shoul
28
29 ExternalIncomingURIParams=
30 # The value should be left empty unless a value is provided by Calypso out o
31
32 # The value should be left empty unless a value is provided by Calypso out o
33 # If 'logMessages' property is true, then transformation files will be gener
34 # By default 'messageFileDir' is an optional field. If messageFileDir is not
35
36 logMessages=true
37 messageFileDir=C:\FCMHKEX\Message
  
```

2.3 Properties used in datauploaderExternalURI File

```

1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <beans xmlns="http://www.springframework.org/schema/beans"
4  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:broker="http://activemq.apache.org/schema/core"
5  xsi:schemaLocation="
6  http://www.springframework.org/schema/beans http://www.springframework.org/schema/beans/spring-beans-3.0.xsd
7  http://camel.apache.org/schema/spring http://camel.apache.org/schema/spring/camel-spring.xsd
8  http://activemq.apache.org/schema/core http://activemq.apache.org/schema/core/activemq-core.xsd
9  http://www.springframework.org/schema/tx http://www.springframework.org/schema/tx/spring-tx-3.0.xsd">
10
11  <bean id="source" parent="lljms" >
12  <!-- TODO: Figure out how to set the incoming consumer count from the service properties file -->
13  <!-- TODO: Actually, expectation is that you will leave the defaults as-is, so you won't set
14  in the env file. Therefore, for incoming feeds where it can handle more consumers, you can just
15  set the env value in the start script itself. Or, we can add new param for start node java code. -->
16  <!-- In most cases this should be set to 1 so that messages are taken off the queue in sequence. -->
17  <!-- Individual <service>Service.properties files should override where appropriate. -->
18  <property name="concurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}" />
19  <property name="maxConcurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}" />
20  </bean>
21
22  <!-- Sample for setting up Active MQ connection to External Queue -->
23  <!-- Minimum customization required: brokerURL -->
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103  <!-- AMQ STANDALONE BROKER. This is NOT the LJM broker, but an external, separate one -->
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117  <!-- EUREX SETTINGS
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122  <!-- EUREX ETD SETTINGS with exceptionlistener
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2.4 Imported Files

HKEX supports 2 types of clients one which settles the cashflows with FCM and the one which settles the cashflows directly with HKEX. The clients which settle directly with HKEX are termed as 'Sponsored Member clients' i.e. SSM clients. Thus, for the SSM clients, HKEX is generating unique file for each SSM client (these trades are not reported in the EOD file to FCM).

However, to reflect correct positions at the FCM for these SSM clients, FCM should be importing these files.

To note, IM files are same for SSM and non-SSM client.

The file structure for the SSM clients is same as the non-SSM EOD files only the reporting file is different.

IM files: Initial margin for Swapconnect trades is included in existing Non-Swapconnect files.

TV files:

- House file: WEB Settle Details IRS_NB
- Client file: WEB Settle Details IRS NB_C
- Client file: WEB ClientPAI_C

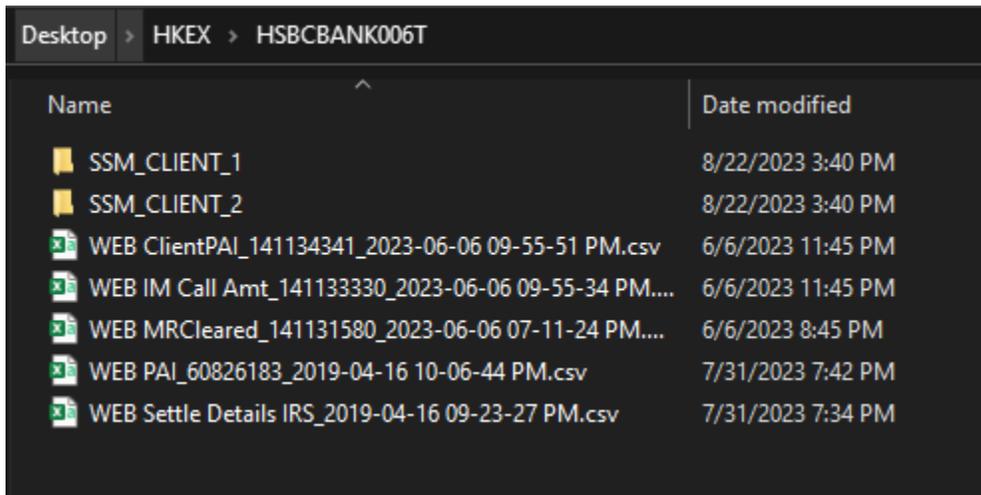
File Setup Details

Below setup is an example to illustrate how subfolders are supported within HKEX CCP. Any folder / sub-folder (irrespective of folder names) placed inside HKEX CCP will be translated.

FCM EOD files:

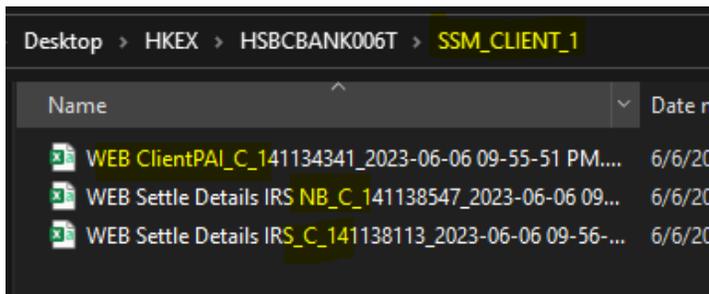
1st folder will include:

- IM ITD file: House + non SSM client + SSM Client for Swapconnect & Non-Swapconnect
- IM EOD file: House + non SSM client + SSM Client for Swapconnect & Non-Swapconnect
- PAI file: House at (Non Swapconnect + Swapconnect)
- ClientPAI file: non SSM Client at (Non Swapconnect + Swapconnect)
- TV file: Web Settle Details IRS : House at Non Swapconnect
- TV file: Web Settle Details IRS NB : House at Swapconnect (created this manually, sample file NA)

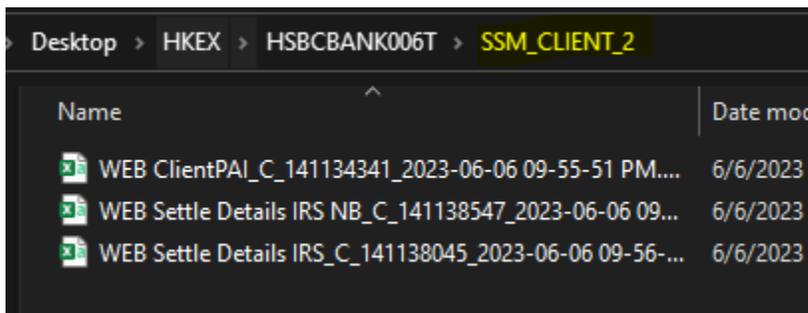


'SSM_Client_1' folder will include below files:

- ClientPAL_C file: SSM Client at (Non Swapconnect + Swapconnect)
- TV file: Web Settle Details IRS_C: SSM client at Non Swapconnect
- TV file: Web Settle Details IRS NB_C : SSM client at Swapconnect

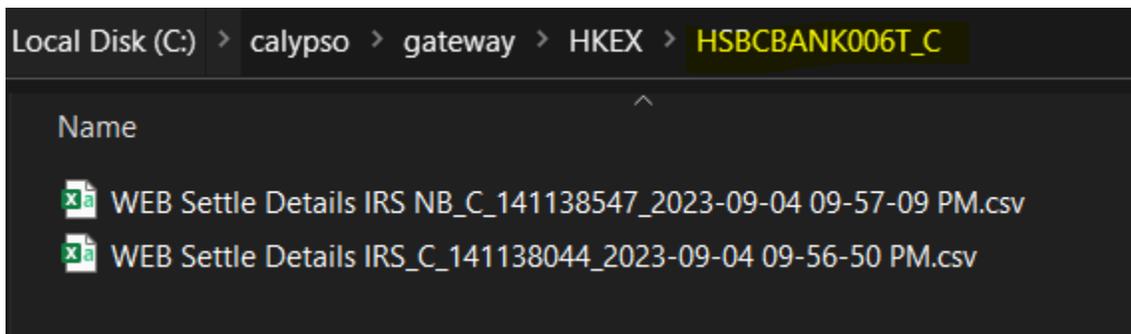
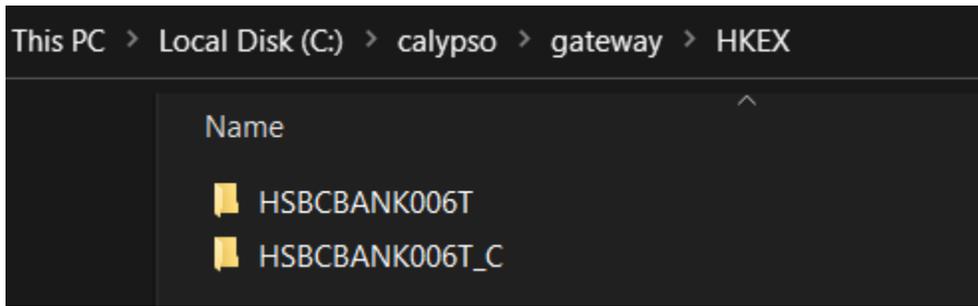


Similarly, we will have multiple SSM client folders within this Member firm ID folder:



Further, we also have non-SSM client TV files which are placed in separate folder within the HKEX CCP folder.

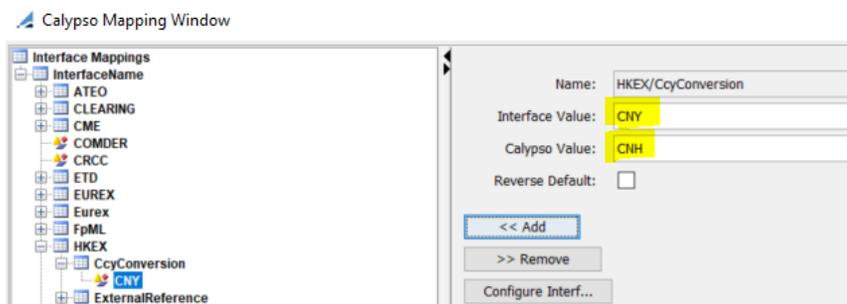
Eg. Memberfirmid is HSBCBANK006T will include all House IM / TV files + SSM Client folder + Client IM / PAI file and HSBCBANK006T_C will include non-SSM client : Swapconnect & non-Swapconnect TV files.



When the Translate scheduled task is executed, all the folders placed inside HKEX CCP folder will be read to create the CDML IM / TV report.

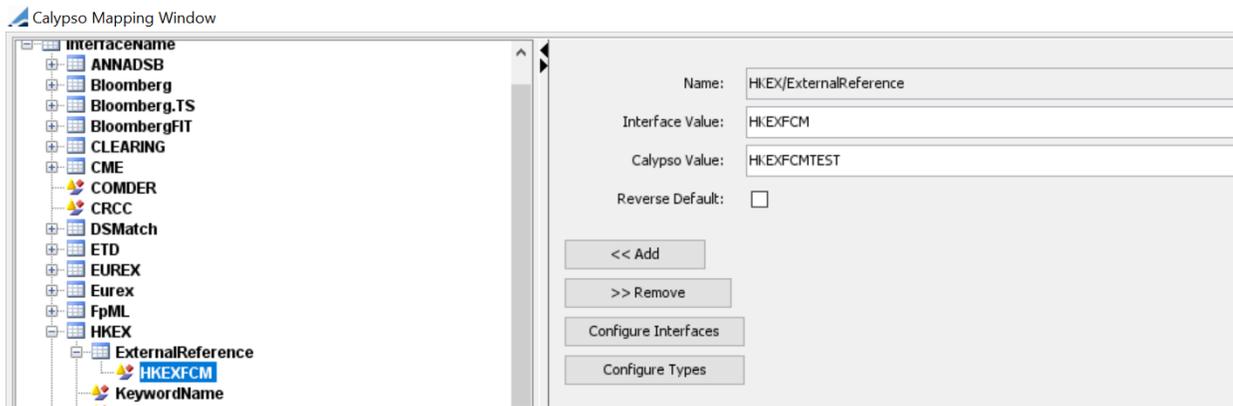
2.5 Calypso Mapping

Calypso conversion on Clearing Transfers

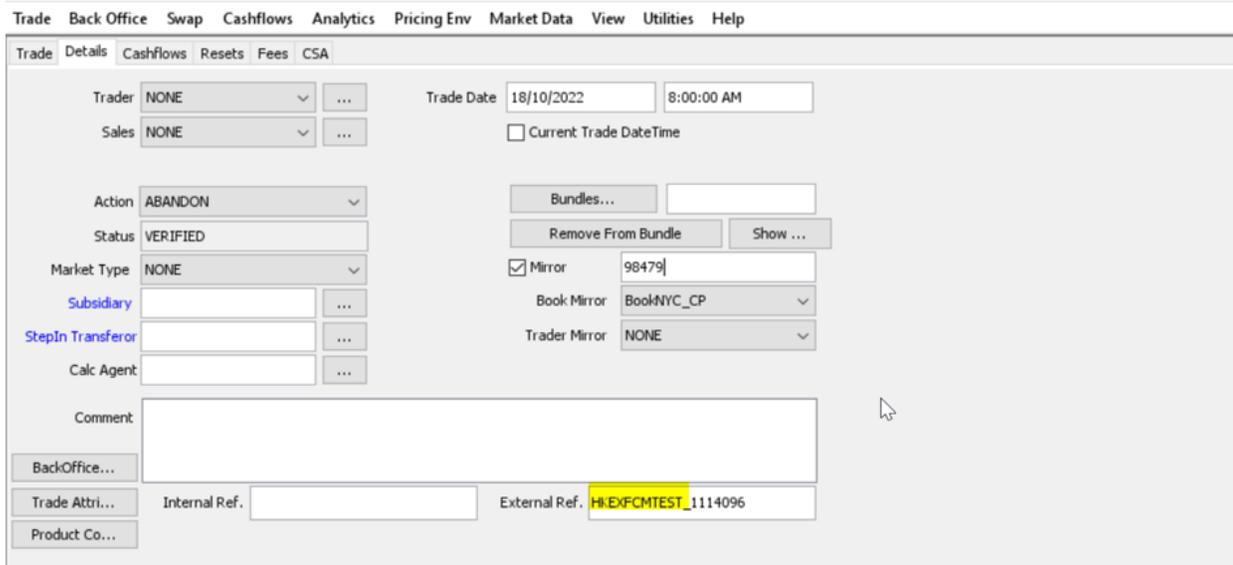


External reference

Interface value will be HKEXFCM. Calypso value can be customized as per user preference. Value mentioned in Calypso value will be added as a prefix to the external reference. Default Calypso value is HKEFCM.



Swap/18/10/2030/P:CNY/FR007/1W /R:CNY 3.92000 -PO is Default Processing Organisation (98478) - Version : 2 Mod User :(calypso_user) [17230501/FCMHKEXHSBCCP]



Integration Process

Start the following servers:

- Authserver
- Eventserver
- Dataserver
- Engineserver
- CalypsoMessagingserver
- hkexfcmIncomingFeed
- hkexfcmInjectMessage (required for Message Injector)
- DataPersistor
- FeedTranslator
- OutgoingFeed
- Scheduler (required for HKEXFCM_BRIDGE_MESSAGE_LOADER scheduled task)

3.1 Trade Booking via Scheduled Task

Post starting the servers, user can initiate trade booking via below scheduled task.

The screenshot shows a task configuration window with the following details:

- Task Description:** Task Type: HKEXFCM_BRIDGE_MESSAGE_LOADER, External Reference: HKEXFCM_BRIDGE_MESSAGE_LOADER, Comments: HKEXFCM_BRIDGE_MESSAGE_LOADER, Description: HKEXFCM_BRIDGE_MESSAGE_LOADER.
- Execution Parameters:** Attempts: 1, Retry After: 0 minutes, Expected Execution Time (SLA): 3 minutes, JVM Settings: -Xms512m -Xmx1024m, Log Settings: .\UPLOADER,UPLOADER,UPLOADER_STATS,HC,ExchangeFeedLCH,ExchangeFeedCME,Monitoring.ServerRequest,Monitoring.IncomingServerRequest,Monitoring.ClientRequest
- Task Notification Options:** Send Emails, Publish Business Events, To User: [dropdown]
- Common Attributes:** Task ID: 5120, Processing Org, Trade Filter, Filter Set, Pricing Environment, Timezone: America/New_York, Valuation Time Hour, Valuation Time Minute, Undo Time Hour: 0, Undo Time Minute: 0, Valuation Date Offset, From Days: 0, To Days: 0, Pricer Measures, Business Holidays.
- Task Attributes:** FILE_DIRECTORY: C:\HKEX, FILE_TYPE: xml, SERVICE: HKEXFCM, THREAD_SIZE: 1, MODE: Messaging.

Execute the scheduled task to upload below request consent message.

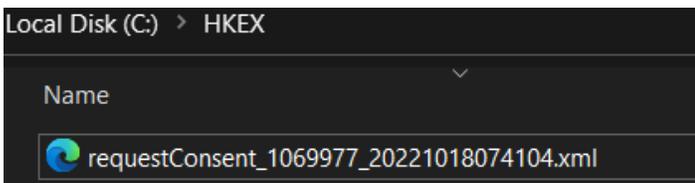
Valuation Datetime Selector ✕

Please specify date and time to use as the valuation datetime to use to execute this scheduled task.

Use Valuation Time from Configuration (Uses valuation-time from individual tasks configuration)

Valuation Datetime:
9/1/23 9:03:21.000 AM EDT

▶ Run Cancel



Above message looks like: CCPtrade ID is sourced from 'clearer' tag

```

requestConsent_1069977_20221018074104.xml  IRS_Clearing_Confirm_CFTC_Rewrite_UPI.xml  FX_CFTC_Rewrite_UPI
1  <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
2  <requestConsent fpmlVersion="5-11" xsi:schemaLocation="http://www.fpml.org/FpML-5/confirmation" xmlns="http://www.fr
3  <header>
4      <messageId messageIdScheme="http://www.otcclearinghk.com/coding-scheme/message-id">122635357</messageId>
5      <sentBy messageAddressScheme="http://www.otcclearinghk.com/coding-scheme/party-id">HKEX</sentBy>
6      <sendTo messageAddressScheme="http://www.otcclearinghk.com/coding-scheme/party-id">CB1</sendTo>
7      <creationTimestamp>2022-10-18T07:41:06.859</creationTimestamp>
8  </header>
9  <isCorrection>false</isCorrection>
10 <correlationId correlationIdScheme="http://www.otcclearinghk.com/coding-scheme/correlation-id">1069888_IRS202210
11 <sequenceNumber>1</sequenceNumber>
12 <requestedAction>Clearing</requestedAction>
13 <trade>
14     <tradeHeader>
15         <partyTradeIdentifier>
16             <tradeId>IRS20221018000277</tradeId>
17             <partyReference href="matcher"/>
18         </partyTradeIdentifier>
19         <partyTradeIdentifier>
20             <tradeId tradeIdScheme="http://www.otcclearinghk.com/coding-scheme/trade-id">1069977</tradeId>
21             <partyReference href="clearer"/>
22         </partyTradeIdentifier>
23     </tradeHeader>
24     <measureType>Collateral</measureType>
25     <currency>HKD</currency>
26 </quote>
27     <party id="partyA">
28         <partyId partyIdScheme="http://www.otcclearinghk.com/coding-scheme/party-id">HKEX123</partyId>
29     </party>
30     <party id="partyB">
31         <partyId partyIdScheme="http://www.otcclearinghk.com/coding-scheme/party-id">SHCH</partyId>
32     </party>
33     <party id="clearer">
34         <partyId partyIdScheme="http://www.otcclearinghk.com/coding-scheme/party-id">HKEX</partyId>
35     </party>
36     <party id="matcher">
37         <partyId partyIdScheme="http://www.otcclearinghk.com/coding-scheme/party-id">CFETS</partyId>
38     </party>
39     <party id="broker">
40         <partyId partyIdScheme="http://www.otcclearinghk.com/coding-scheme/party-id">CB1</partyId>
41     </party>
42     <party id="client">
43         <partyId partyIdScheme="http://www.otcclearinghk.com/coding-scheme/party-id">HKEX123</partyId>
44     </party>
45 </requestConsent>
    
```

Party id=client tag indicates the client position Ac & broker tag indicates the clearing memberfirm ID

External Reference	Trade Id	Product Description	Trade Date	Trade Settle Date	Book	CounterParty	TradeStatus	Trade Currency	Settle Cur.	Entered Date
HKEXFCM 1069977	92932	Swap/10/18/2030/P:CNY 3.92000 /R:CNY FR007/1W	Oct 18, 2022 08:03 AM	10/18/2022	BookNYC	HKEX	PENDING_LIMIT	CNY	CNY	Sep 01, 2023 09:14 AM

Swap/10/18/2030/P:CNY/FR007/1W /R:CNY 3.92000 -PO is Default Processing Organisation (92932) - Version : 0 Mod User:(calypso_user) [17230801/HKEXFCMV17]

Trade Back Office Swap Cashflows Analytics Pricing Env Market Data View Utilities Help

Trade Details Cashflows Resets Fees CSA

CounterP... HKEX Hong Kong Stock Exchange ID 92932

Book BookNYC Status PENDING_LIMIT Tem... NONE

Subtype Standard Broker

Not Cancellable
Not Credit Contingent
No Principal Adjustments
Name
Not Resettable

Fix Rec CNY 15,000,000.00
Bulleted
Act...
Start 10/18/2022 End 10/18/2030
3.920000 % Fixed Amount
C...
NONE

Float Pay CNY 15,000,000.00
Bulleted
Act...
Start 10/18/2022 End 10/18/2030
.000000 CNY FR007 1W + 0bp CNR
C... QTR Spread 0.0000...
BEG_PER Lag -10 Bus, (BEJ) NONE

Avg NONE 1st R... 0.00

Pmt QTR END_PER NONE
MOD_FOLLOW DAY 18 Lag 0
ACT/365 BEJ NEAREST
NONE ADJUSTED

Intermediate...
Settlement...

Market Data Pricer Params Results Pricer Override Market Data Item Override
ZC USD Libor 3M/6M/USD(R)CLOSE 5/26/10 11:59:00.000 PM EDT

Trade Attributes

Setup Editable

Name	Value
BusinessFlow	FCM
CCP	HKEX
CCPAccountReference	HKEX123
CCPBroker	CB1
CCPClearer	HKEX
CCPClient	HKEX123
CCPMatcher	CFETS
CCPMatcherTradeId	IRS20221018000277
CCPMessageTimestamp	2022-10-18T07:41:06.859
CCPOriginCode	CLIENT
CCPPartyA	HKEX123
CCPPartyB	SHCH
CCPStatus	Consent
CCPTTradeID	1069977
Connector	HKEXFCM
CorrelationID	1069888_IRS20221018000279
FpMLVersion	5-11
IncomingMessageID	122635357
IS_CLIENT	false
Matcher	CFETS
NegotiatedCurrency	CNY
RelatedProductType	IRD
SentBy	HKEX
SentTo	CB1
Service	HKEXFCM
Status	ALLEGED
TradeSource	DataUploader
ISCTimeIndication	26T
ACCOMMODATION_CHARGE_ID	
AccountNumber	
ADR Currency	
ADR Fee	
AFMAPricingCashRate	
AFMAPricingSwapRate	
AFMAPricingTM	
AfterSettlementCutoffTime	
Agent	
AllocatedFrom	
AllocationClearingType	
AmendmentEffectiveDate	
AmendmentTradeDatetime	

OK Cancel

Below is the mirror trade :

Swap/10/18/2030/P:CNY 3.92000 /R:CNY/FR007/1W -PO is Default Processing Organisation (92933) - Version : 0 Mod User :(calypso_user) [17230801/HKEXFCM17]

Trade Back Office Swap Cashflows Analytics Pricing Env Market Data View Utilities Help

Trade Details Cashflows Resets Fees CSA

CounterP... CP Delete during implementation ID 92933

Book BookNYC_CP Status PENDING_LIMIT Tem... NONE

Subtype Standard Broker

Trade Attributes

Name	Value
BusinessFlow	FCM
CCP	HKEX
CCPAccountReference	HKEX123
CCPOriginCode	CLIENT
CCPStatus	Consent
CCPTradeID	1069977
CMFAccountReference	81235
IS_CLIENT	true
NegotiatedCurrency	CNY
RelatedProductType	IRD
Service	HKEXFCM
13CTimeIndication	26T
ACCOMMODATION_CHARGE_ID	
AccountNumber	
ADR Currency	
ADR Fee	
AFMAPricingCashRate	
AFMAPricingSwapRate	
AFMAPricingTM	
AfterSettlementCutoffTime	
Agent	
AllocatedFrom	
AllocationClearingType	

Swap/10/18/2030/P:CNY 3.92000 /R:CNY/FR007/1W -PO is Default Processing Organisation (92933)

Trade Back Office Swap Cashflows Analytics Pricing Env Market Data View Utilities Help

Trade Details Cashflows Resets Fees CSA

Trader NONE Trade Date 10/18/2022 8:00:00 AM

Sales NONE Current Trade DateTime

Action ACCEPT Bundles... Remove From Bundle Show ...

Status PENDING_LIMIT Mirror 92932

Market Type NONE Book Mirror BookNYC

Subsidiary Trader Mir... NONE

StepIn Transf... Calc Agent

Comment

BackOffic... Trade Att... Internal Ref. External Ref. HKEXFCM_1069977

Product C...

External Reference	Trade ID	Product Description	Trade Date	Trade Settle Date	Book	CounterParty	TradeStatus	Trade Currency	Settle Cur.	Entered Date
HKEXFCM_1069977	92933	Swap/10/18/2030/P:CNY 3.92000 /R:CNY/FR007/1W	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC_CP	CP	PENDING_LIMIT	CNY	CNY	Oct 01, 2023 09:1
HKEXFCM_1069977	92932	Swap/10/18/2030/P:CNY/FR007/1W /R:CNY 3.92000	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC	HKEX	PENDING_LIMIT	CNY	CNY	Oct 01, 2023 09:1
HKEXFCM_1069887	92931	Swap/10/18/2030/P:CNY 3.92000 /R:CNY/FR007/1W	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC_CP	CP	LIMIT_APPROVED	Action	ACCEPT	Oct 01, 2023 09:1
HKEXFCM_1069887	92930	Swap/10/18/2030/P:CNY/FR007/1W /R:CNY 3.92000	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC	HKEX	LIMIT_APPROVED	Show	ACCEPT	Oct 01, 2023 09:1

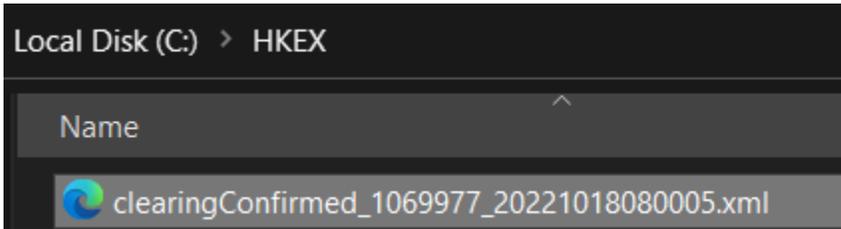
User must click on Accept and trade will move to 'Limit Approved' with an outgoing message to be generated.

External Reference	Trade Id	Product Description	Trade Date	Trade Settle Date	Book	CounterParty	TradeStatus	Trade Currency	Settle Cur.	Entered Date
HKEXFCM_1069977	92932	Swap/10/18/2030/P-CNY 3.92000 /R-CNY/FR007/1W	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC_CP	CP	LIMIT_APPROVED	CNY	CNY	Sep 01, 2023 09:14 AM
HKEXFCM_1069977	92932	Swap/10/18/2030/P-CNY/FR007/1W /R-CNY 3.92000	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC	HKEX	LIMIT_APPROVED	CNY	CNY	Sep 01, 2023 09:14 AM

Incoming message 'requestConsent'

Outgoing message 'consentGranted'

Further, run scheduled task to upload 'clearingconfirmed' message which will move the trade from 'Limit approved' status to 'Verified' status.



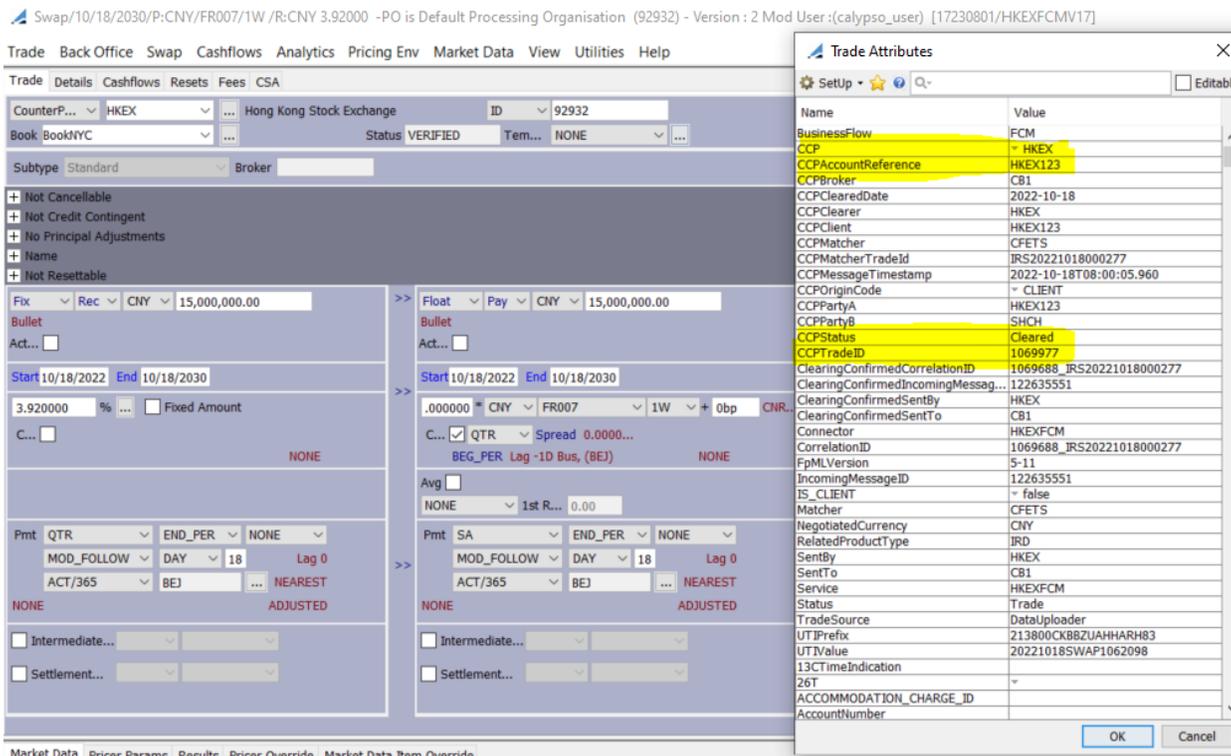
Incoming message 'clearingConfirmed'

```

1 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
2 <clearingConfirmed fpmlVersion="5-11" xsi:schemaLocation="http://www.fpml.org/FpML-5/confirmation" xmlns="http://www.f
3 <header>
4   <messageId messageIdScheme="http://www.otcclearinghk.com/coding-scheme/message-id">122635551</messageId>
5   <inReplyTo messageIdScheme="http://www.otcclearinghk.com/coding-scheme/message-id">122635357</inReplyTo>
6   <sentBy messageAddressScheme="http://www.otcclearinghk.com/coding-scheme/party-id">HKEX</sentBy>
7   <sendTo messageAddressScheme="http://www.otcclearinghk.com/coding-scheme/party-id">CB1</sendTo>
8   <creationTimestamp>2022-10-18T08:00:05.960</creationTimestamp>
9 </header>
10 <correlationId correlationIdScheme="http://www.otcclearinghk.com/coding-scheme/correlation-id">1069688_IRS20221018<
11 <sequenceNumber>1</sequenceNumber>
12 <trade>
13   <tradeHeader>
14     <partyTradeIdentifier>
15       <tradeId>IRS20221018000277</tradeId>
16       <partyReference href="matcher"/>
17     </partyTradeIdentifier>
18     <partyTradeIdentifier>
19       <tradeId tradeIdScheme="http://www.otcclearinghk.com/coding-scheme/trade-id">1069977</tradeId>
20       <partyReference href="clearer"/>
21     </partyTradeIdentifier>
22     <partyTradeIdentifier>
  
```


MESSAGE_ID	Trade Id	Msg Status	DOCUMENT_EDITED	TRADE_UPDATE_DATETIME	EVENT_TYPE	Family	Product Type	MESSAGE_TYPE	Sender
75983	92932	COMPLETED			EX_INCOMINGFEEDMSG			INCOMINGFEEDMSG	HKEX
75986	92932	COMPLETED			EX_OUTGOINGFEEDMSG			OUTGOINGFEEDMSG	PO
75989	92932	COMPLETED			EX_OUTGOINGFEEDMSG			OUTGOINGFEEDMSG	PO
75998	92932	COMPLETED			EX_INCOMINGFEEDMSG			INCOMINGFEEDMSG	HKEX

External Reference	Trade Id	Product Description	Trade Date	Trade Settle Date	Book	CounterParty	TradeStatus	Trade Currency	Settle Cur.	Entered Date
HKEXFCM_1069977	92932	Swap/10/18/2030/F:CHY 3.92000 /R:CHY/FR007/1W	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC_CP	CF	VERIFIED	CNY	CNY	Sep 01, 2023 09:14 AM
HKEXFCM_1069977	92932	Swap/10/18/2030/F:CHY/FR007/1W /R:CHY 3.92000	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC	HKEX	VERIFIED	CNY	CNY	Sep 01, 2023 09:14 AM



Similarly, user can upload request consent / consent refused + request consent / consent granted / clearing refused in similar way.

3.2 Trade Booking via Message Injector

Along-with above mentioned servers, user should start `hkexfcmInjectMessage.bat\sh`

Below changes are required in `HKEXFCMService.properties`:

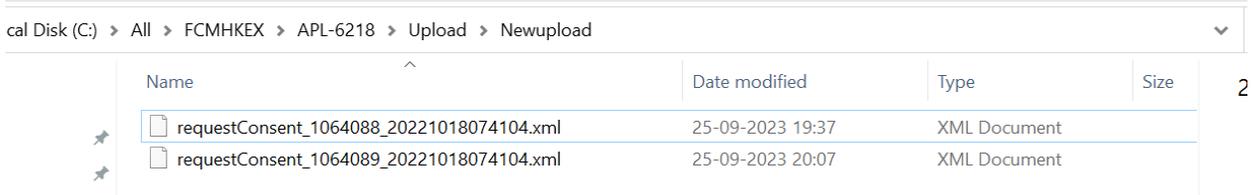
```
ExternalURIPrefix= source
```

Changes in Message Injector startup file to upload all the files in the folder.

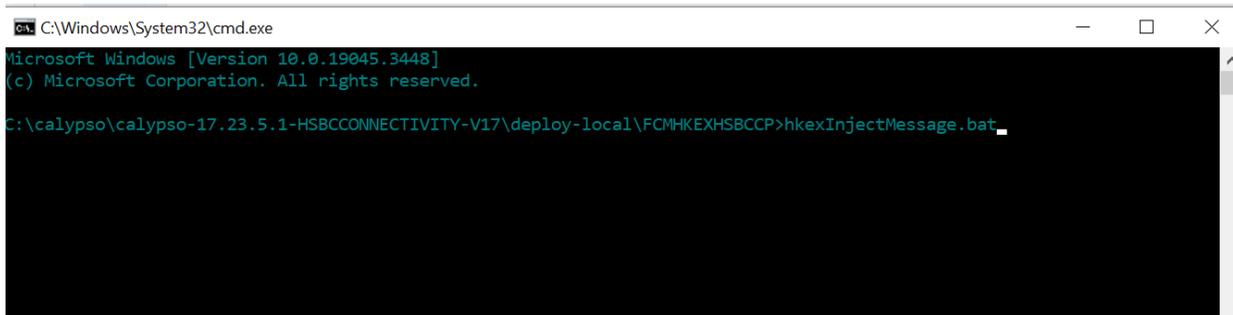
Below message location should be mentioned in message injector startup file if all the files in the folder should be consumed.

Along-with this, below property should be set:

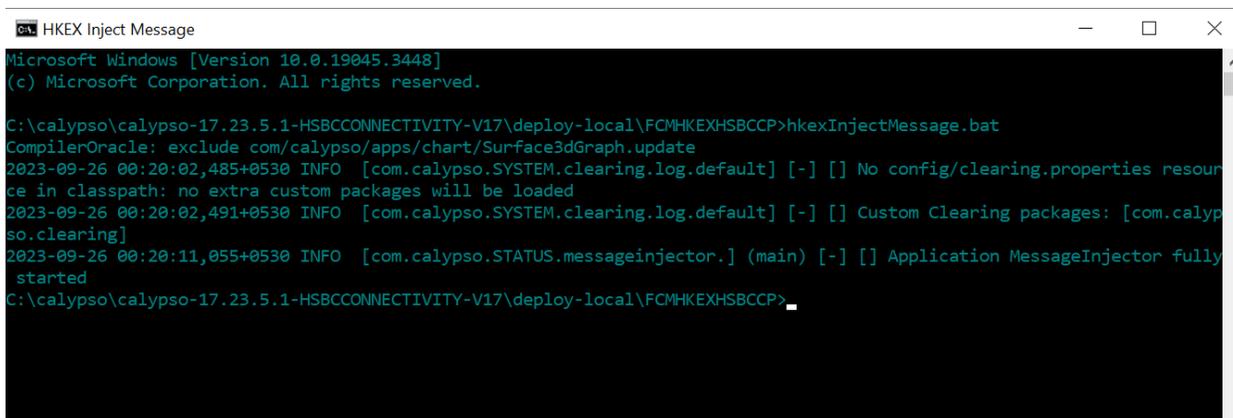
- `-startID 1` : This should be the trade Id sequence
- `-noOfDeals X` : X = the count of message files mentioned at the location



Run message injector:



Once the trade messages are consumed, we see the below message as 'Application MessageInjector fully started' which confirms trades are booked.

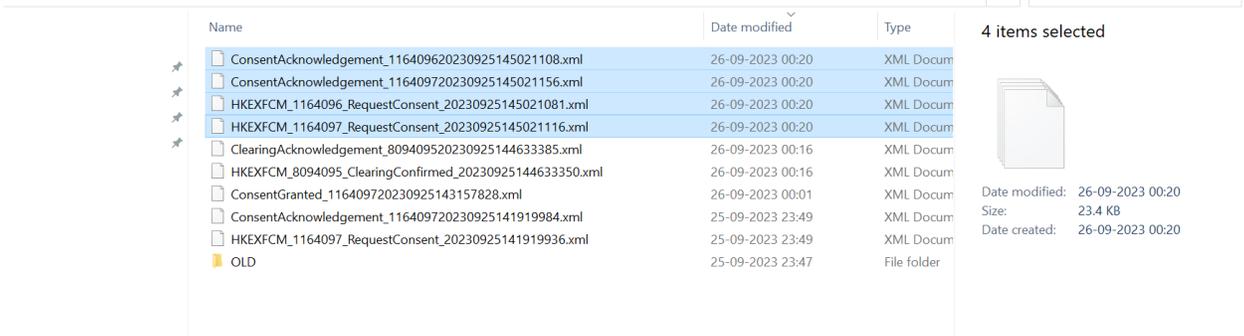


MESSAGE_ID	Msg Status	Trade Id	DOCUMENT_EDITED	TRADE_UPDATE_DATETIME	EVENT_TYPE	Family	Product Type	MESSAGE_TYPE	Sender	Sender_Role	Sender.Contact Type	Sender.Address Code	Receiver
81799	COMPLETED	-1	<input type="checkbox"/>		EX_OUTGOINGFEEDMSG			OUTGOINGFEEDMSG					
81800	COMPLETED	-1	<input type="checkbox"/>		EX_OUTGOINGFEEDMSG			OUTGOINGFEEDMSG					
81801	COMPLETED	98474	<input type="checkbox"/>		EX_INCOMINGFEEDMSG			INCOMINGFEEDMSG	HKEX				PO
81802	COMPLETED	98476	<input type="checkbox"/>		EX_INCOMINGFEEDMSG			INCOMINGFEEDMSG	HKEX				PO

Incoming & outgoing messages are saved at the location mentioned in the HKEXFCMService properties file

```

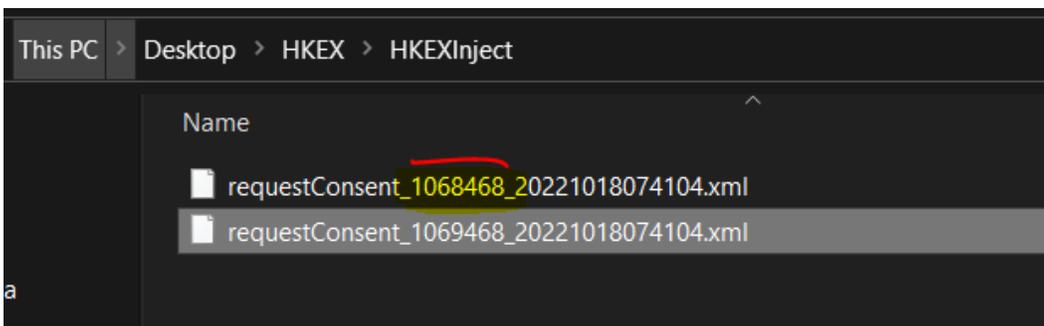
new 1 HKEXFCMService.properties
1 uploadSource=HKEXFCM
2 # The Value of this attribute indicates from where the message originates; do not change the value of this attribute in the files supplied
3 # This value is used by the translator to identify the mappings in the Calypso Mapping Window.
4
5 uploadFormat=
6 # The Value of this attribute indicates the format; do not change the value of this attribute in the files supplied by Calypso.
7 # This value is used by the Data Uploader framework to identify the translator to translate the message. It is valid for this attribute to
8
9 ExternalURIPrefix=source
10 # The Value of this attribute specifies the config name [Spring bean] to use from the file datauploaderExternalURI.xml This XML file contain
11 # connect to the CCP using JMS, IBM MQ, etc. The config name used in this XML file to create the Messaging definitions is the value to be a
12
13 ExternalIncomingURI=queue.hkexfcm.calypso
14 # Please change the value of this attribute to the queue name from which the CCP sends the message to the Clearing Member.
15
16 ExternalOutgoingURI=queue.calypso.hkexfcm
17 # Please change the value of this attribute to the queue name which the CCP expects the acknowledgement
18
19 BusinessFlow=FCM
20 # The Value of this attribute indicates whether the Credit Check (Collateral and LimitCheck) is part of the Clearing Member Solution. The P
21 # a) FCM (No Head Room Check) b) FCMHRC (Head Room Check is used for Risk). c) Uploader (For No Limit check and persist the trade). This v
22 # the Trade workflow is different for these solutions. And based on this, the the Update manager listens to different Trade Status Messages
23
24 Features=AuditOn,AutoRejectOn
25 # AuditOn specifies that a copy of all Incoming & Outgoing messages should be saved as BO Messages. When set to AuditOff, in cases where an
26 # message processing, the BO Message will still be saved. Please do not change this without advice from Calypso
27 # AutoRejectOff/AutoRejectOn is an advanced feature and Calypso advice should be sought before changing this value.
28
29 ExternalIncomingURIParams=
30 # The value should be left empty unless a value is provided by Calypso out of the box. This attribute is mandatory to be present even if it
31
32 # The value should be left empty unless a value is provided by Calypso out of the box. This attribute is mandatory to be present even if it
33 # If 'logMessages' property is true, then transformation files will be generated.
34 # By default 'messageFileDir' is an optional field. If messageFileDir is not provided then transformation file will be generated in CALYPSO
35 logMessages=true
36 messageFileDir=C:\\FCMHKEX\\Messages
  
```



Changes in Message Injector startup file to upload only 1 file at the particular location:

Message location should be mentioned in Message Injector startup file if only **one** particular message file is to be uploaded.

Example:



Post this changes, user should start - hkexfcmInjectMessage.bat\sh and the message will be consumed from the mentioned location.

When the application is started successfully, resp trade will be booked.

```

HKEXFCM Inject Message
Microsoft Windows [Version 10.0.19045.3448]
(c) Microsoft Corporation. All rights reserved.

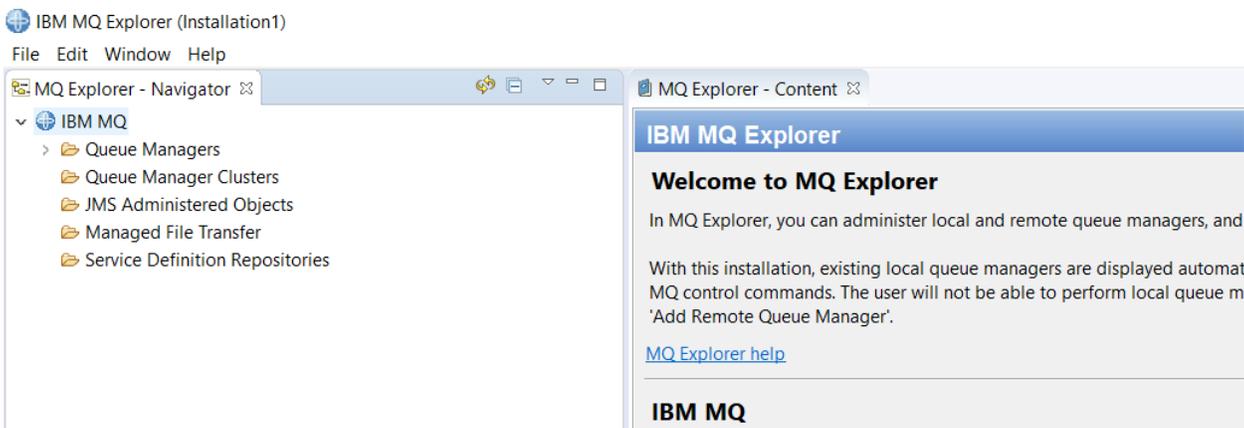
C:\calypso\calypso-17.23.0.1-INTERFACES_17-HKEX-CLEARING-SNAPSHOT\deploy-local\HKEXFCM17\hkexfcmInjectMessage.bat
"C:\calypso\calypso-17.23.0.1-INTERFACES_17-HKEX-CLEARING-SNAPSHOT\client\bin\calypso.bat" -dependentServer" is not recognized as an internal or external command,
operable program or batch file.

C:\calypso\calypso-17.23.0.1-INTERFACES_17-HKEX-CLEARING-SNAPSHOT\deploy-local\HKEXFCM17\hkexfcmInjectMessage.bat
CompilerOptions: exclude com.calypso.apps.chart/Service300-app.update
2023-09-25 15:14:51.095-0530 INFO [com.calypso.SYSTEM.clearing.log.default] [-] [] No config/clearing.properties resource in classpath: no extra custom packages will be loaded
2023-09-25 15:14:51.107-0530 INFO [com.calypso.SYSTEM.clearing.log.default] [-] [] Custom Clearing packages: {com.calypso.clearing}
2023-09-25 15:15:04.514-0530 INFO [com.calypso.STATUS.messageinjector.] (main) [-] [] Application MessageInjector fully started
C:\calypso\calypso-17.23.0.1-INTERFACES_17-HKEX-CLEARING-SNAPSHOT\deploy-local\HKEXFCM17>
    
```

External Reference	Trade Id	Product Description	Trade Date	Trade Settle Date	Book	CounterParty	TradeStatus	Trade Currency	Settle Cur.	Entered Date
HKEXFCM_1068468	93935	Swap/10/18/2030/P:CNH 3.02000 /R:CNH/FR007/1W	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC_CP	CP	PENDING_LIMIT	CNY	CNY	Sep 25, 2023 06:34 AM
HKEXFCM_1068468	93934	Swap/10/18/2030/P:CNH 3.02000 /R:CNH 3.02000	Oct 18, 2022 08:00 AM	10/18/2022	BookNYC	HKEX	PENDING_LIMIT	CNY	CNY	Sep 25, 2023 06:34 AM

3.3 Trade Booking via MQ

For trade booking via MQ, we require MQ explorer to be downloaded.



Post completion, the queues should be configured. Channel / port details and should be added to datauploaderExternalURI.xml

```

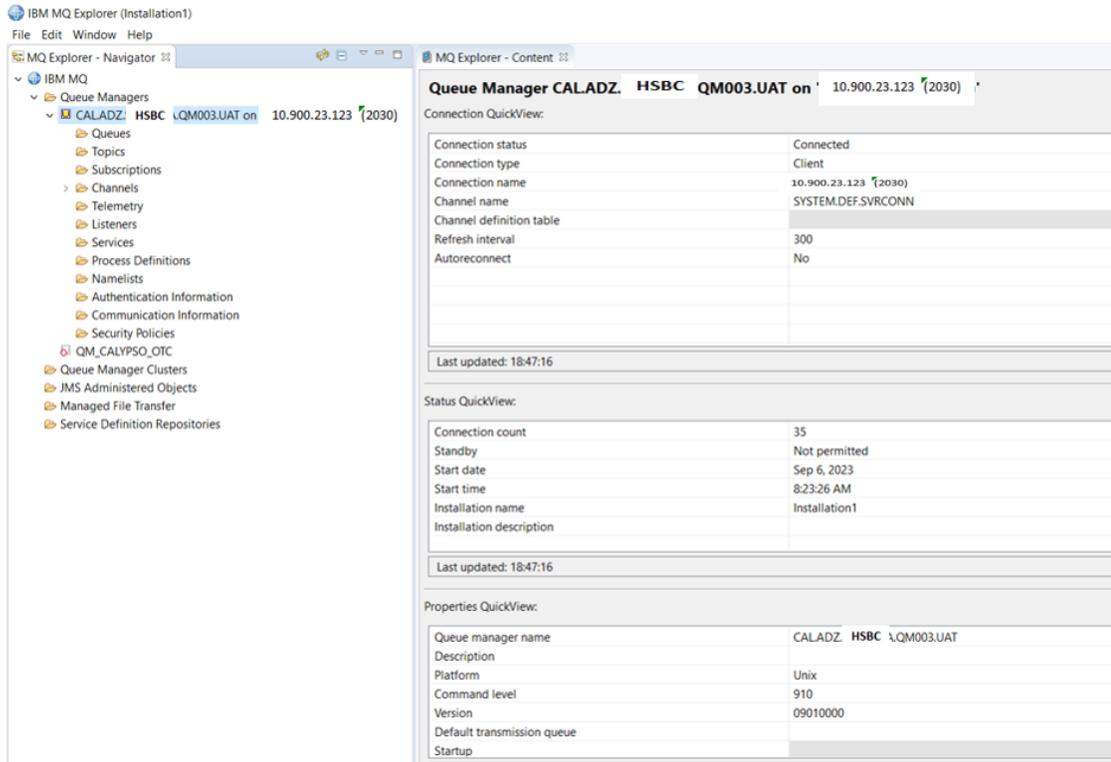
1 <?xml version="1.0" encoding="UTF-8"?>
2
3 <beans xmlns="http://www.springframework.org/schema/beans"
4       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:broker="http://activemq.apache.org/schema/core"
5       xsi:schemaLocation="
6         http://www.springframework.org/schema/beans http://www.springframework.org/schema/beans/spring-beans-3.0.xsd
7         http://camel.apache.org/schema/spring http://camel.apache.org/schema/spring/camel-spring.xsd
8         http://activemq.apache.org/schema/core http://activemq.apache.org/schema/core/activemq-core.xsd
9         http://www.springframework.org/schema/jee http://www.springframework.org/schema/jee/spring-jee-3.0.xsd">
10
11 <bean id="source" parent="lljms" >
12     <!-- TODO: Figure out how to set the incoming consumer count from the service properties file -->
13     <!-- TODO: Actually, expectation is that you will leave the defaults as-is, so you won't set
14     in the env file. Therefore, for incoming feeds where it can handle more consumers, you can just
15     set the env value in the start script itself. Or, we can add new param for start node java code. -->
16     <!-- In most cases this should be set to 1 so that messages are taken off the queue in sequence. -->
17     <!-- Individual <service>Service.properties files should override where appropriate. -->
18     <property name="concurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}" />
19     <property name="maxConcurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}" />
20 </bean>
21
22 <!-- Sample for setting up Active MQ connection to External Queue -->
23 <!-- Minimum customization required: brokerURL -->
24 <!--
25 <bean id="amqSource" parent="amqjms" >
26     <property name="concurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}" />
27     <property name="maxConcurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}" />
28 </bean>
    
```

Below highlighted details should be updated as per the IP/ channel / port number: (highlighted details are sample representation)

```

73     class="org.springframework.jms.connection.JmsTransactionManager">
74     <property name="connectionFactory" ref="amqJmsConnectionFactory" />
75 </bean>
76 -->
77
78 <!-- Sample for setting up IBM MQ connection to External Queue -->
79 <!-- Minimum customization required: hostName, port, queueManager, channel -->
80
81 <bean id="ibmqSource" parent="wmq">
82     <property name="concurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}"/>
83     <property name="maxConcurrentConsumers" value="${INCOMING_CONSUMERCOUNT:1}"/>
84 </bean>
85
86 <bean id="wmq" class="org.apache.camel.component.jms.JmsComponent">
87     <property name="connectionFactory" ref="cachedConnectionFactory"/>
88 </bean>
89
90 <bean id="cachedConnectionFactory" class="org.springframework.jms.connection.CachingConnectionFactory">
91     <property name="targetConnectionFactory" ref="jmsConnectionFactory"/>
92     <property name="sessionCacheSize" value="10"/>
93 </bean>
94
95 <bean id="jmsConnectionFactory" class="com.ibm.mq.jms.MQQueueConnectionFactory">
96     <property name="transportType" value="1"/>
97     <property name="hostName" value="10.900.23.123"/>
98     <property name="port" value="2030"/>
99     <property name="queueManager" value="CAL.ADZ.HSBC.QM003.UAT"/>
100    <property name="channel" value="ADZ.HSBC.SVRCONN"/>
101 </bean>
102 -->
103 <!-- AMQ STANDALONE BROKER. This is NOT the LLM broker, but an external, separate one -->
104 <!--
105 <bean id="amqSource" parent="amqjms">
    
```

Post configuring the above MQ details, MQ UI will appear as below:



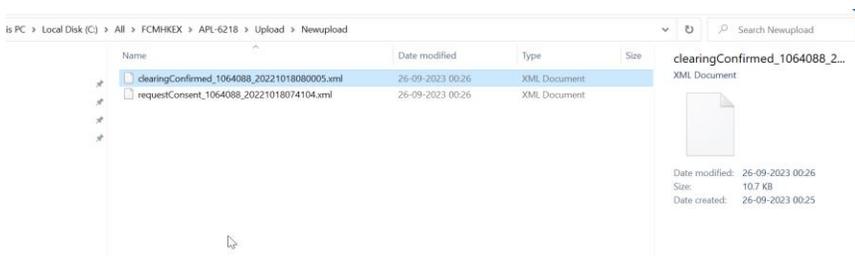
Below sender / receiver queues should be created

The screenshot shows the 'Queues' view in IBM MQ Explorer. A filter 'Standard for Queues' is applied. A table lists several queues with their properties.

Queue name	Queue type	Open input count	Open output count	Current queue depth	Put messages
CALADZ.EUREXETD.UAT.C7.SEND.FEED	Remote				Allowed
CALADZ.UAT.RCV.FEED	Local	0	0	13	Allowed
CALADZ.UAT.SEND.FEED	Remote				Allowed
CALADZACK.UAT.RCV.FEED	Local	0	0	0	Allowed
CALADZEB.UAT.RCV.FEED	Local	0	0	0	Allowed

3.4 Trade Booking via Data Uploader

Place trade messages in the local folder as below:



Upload requestconsent message:

UploadStatus	schemaLocation	fpmlVersion	messageId	messageIdScheme	sentBy	messageAddress...	sendTo	messageAddress...
Success	http://www.fpm...	5-11	222635389	http://www.otcc...	HKEX	http://www.otcc...	CB1	http://www.otcc...

On successful upload, open the trade and accept the trade. Trade transits to 'Limit Approved' status.

Trade: Swap/18/10/2030/P:CNY/FR007/1W /R:CNY 3.92000 -PO is Default Processing Organisation (98478) - Version : 1 Mod User :calypso_user [17230501/FCMHKEXHSBCCP]

Trade Back Office Swap Cashflows Analytics Pricing Env Market Data View Utilities Help

Trade Details Cashflows Resets Fees CSA

CounterParty: HKEX Hong Kong Stock Exchange ID: 98478

Book: BookNYC Status: LIMIT_APPROVED Template: NONE

Subtype: Standard Broker: []

Not Cancellable
Not Credit Contingent
No Principal Adjustments
Name
Not Resettable

Fix: Rec CNY 15,000,000.00

Bullet
Actual: []

Start: 18/10/2022 End: 18/10/2030

3.920000 % Fixed Amount
Cmp: [] NONE

Pmt: QTR END_PER: NONE
MOD_FOLLOW: DAY 18 Lag 0
ACT/365: CNY NEAREST
NONE ADJUSTED

Intermediate Ccy: []

Now, upload clearingconfirmed.xml which will transit the trade to 'Verified' Status.

Data Uploader: HKEXFCM - FpML

Uploader Utilities

Source: HI:EXFCM Format: FpML Select File / Folder C:\All\FCM\HI:EX\APL-6218\Upload\Newupload\clearingConfirmed_1064088_20221018080000... Refresh Upload

Persist Message: None

clearingConfirmed_1064088_20221018080005.xml

Filter Data

UploadStatus	schemalocation	fpmVersion	messageId	messageIdScheme	inReplyTo	messageIdScheme	sentBy	messageAddress...	Upload Field	Value
Success	http://www.fpm...	5-11	122835551	http://www.otcc...	122835357	http://www.otcc...	HKEX	http://www.otcc...	schemalocation	http://www.fpm.org/FpML-5/co...
									fpmVersion	5-11
									messageId	122835551
									messageIdScheme	http://www.otclearinghk.com/c...
									inReplyTo	122835357
									messageIdScheme	http://www.otclearinghk.com/c...
									sentBy	HKEX
									messageAddressScheme	http://www.otclearinghk.com/c...
									sendTo	CB1
									messageAddressScheme	http://www.otclearinghk.com/c...
									creationTimestamp	2022-10-18T08:00:05.960
									correlationId	1114096_IR520221018000277
									correlationIdScheme	http://www.otclearinghk.com/c...
									sequenceNumber	1
									tradeId	IRS20221018000277
									partyReference	
									Status Field	Value
									ExternalRef	HI:EXFCM_1114096
									ProcessingOrg	PO
									CalypsoTradeId	98478
									Status	Success
									Action	CLEAR
									TradeCustom:eywords	

Swap/18/10/2030/P:CNY/FR007/1W /R:CNY 3.92000 -PO is Default Processing Organisation (98478) - Version : 2 Mod User :(calypso_user) [17230501/FCMHKEXHSBCCP]

Trade Back Office Swap Cashflows Analytics Pricing Env Market Data View Utilities Help

Trade Details Cashflows Resets Fees CSA

CounterParty HI:EX Hong Kong Stock Exchange ID 98478

Book BookNYC Status VERIFIED Template NONE

Subtype Standard Broker

Not Cancellable
 Not Credit Contingent
 No Principal Adjustments
 Name
 Not Resettable

Fix Rec CNY 15,000,000.00 Bullet Actual <input type="checkbox"/> Start 18/10/2022 End 18/10/2030 3.920000 % <input type="checkbox"/> Fixed Amount Cmp <input type="checkbox"/> NONE Pmt QTR END_PER NONE MOD_FOLLOW DAY 18 Lag 0 ACT/365 CNY NEAREST NONE ADJUSTED <input type="checkbox"/> Intermediate Ccy	>> Float Pay CNY 15,000,000.00 Bullet Actual <input type="checkbox"/> Start 18/10/2022 End 18/10/2030 >> 1.000000 * CNY FR007 1W + 0bp BBA Cmp <input checked="" type="checkbox"/> QTR Spread 0.000000 BEG_PER Lag -1D Bus, (CNY) NONE Avg <input type="checkbox"/> NONE 1st Rate 0.00 Pmt SA END_PER NONE MOD_FOLLOW DAY 18 Lag 0 ACT/365 CNY NEAREST NONE ADJUSTED <input type="checkbox"/> Intermediate Ccy
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