



# Military Bank Vietnam

MB POC Clarification

1<sup>st</sup> April 2020

Updated 9<sup>th</sup> April 2020



Document Includes  
the following items:

Fraud Clarifications

AML Clarifications

Technical Clarifications



# Investigation – Part III

## Clarifications



# Fraud Scenario

Creation of Rules within a Scenario

## SAS Fraud Management - 6.1M0 Demo - LIS

Last Sign In Time: 23/10/2019 18:22:48

Reports Strategies Templates Notifications Business Units Users Models Alerts Explore Preferences Rules Console Tables

Rules ▾ Business Unit: TCB

Search

Coding Testing Production Trash

ID	Name	Type	Order and Priority	Transaction Scope	Delete Requested	Status	Customer Impact Ratio	Analyst Impact Ratio	Run Time
54162.1	TCB	Authorization (X)	Main	Global (A)		●	0 : 2	0 : 2	
53925.3	1.6.11 - ATO Block	Authorization (X)	Main	Global (A)		●	0 : 2	0 : 2	
53924.4	1.6.11 - Transfer	Authorization (X)	Main	Global (A)		●	2 : 0	2 : 0	
53922.1	1.6.11 - Phone Change	Variable	Main	Global (A)		●	0 : 15	0 : 15	
53921.2	1.2.2.2 - Geographic	Authorization (X)	Main	Global (A)		●	0 : 2	0 : 2	
53918.2	1.2.2.1 - VIP Lookuplist	Authorization	Pre : 0	Global (A)		●	0 : 2	0 : 2	
53917.2	1.2.2.2 - Terminal	Authorization (X)	Main	Global (A)		●	0 : 2	0 : 2	
53916.2	1.3.1 Fraud Risk Score	Authorization (X)	Main	Global (A)		●	0 : 2	0 : 2	
53914.1	FS6 - Account Takeover - Mobile Changes	Variable	Main	Global (A)		●	0 : 15	0 : 15	
53913.2	FS6 - Account Takeover	Authorization (X)	Main	Global (A)		●	0 : 0	1 : 0	
53912.1	FS6 - Account Takeover - Login at TCB	Variable	Main	Global (A)		●	0 : 15	0 : 15	
53905.3	FS3 - Unauthorised Axcess	Authorization (X)	Main	Global (A)		●	1 : 0	1 : 0	
53904.1	FS3 - Unauthorised Axcess - Login Behaviour	Variable	Main	Global (A)		●	0 : 15	0 : 15	
53903.2	FS2 - ATM Fraud	Authorization (X)	Main	Global (A)		●	0 : 2	0 : 2	
53902.3	FS2 - ATM Fraud - Deposit Cntry	Variable	Main	Global (A)		●	0 : 5	0 : 5	
<input checked="" type="checkbox"/> 53901.5	FS1 - ATM Fraud	Authorization (X)	Main	Global (A)		●	0 : 0	1 : 0	
53900.2	FS1 - ATM Fraud - Tracking Deposits	Variable	Main	Global (A)		●	0 : 5	0 : 5	

Rule 53901.5 FS1-ATM  
Fraud being deployed in  
production

[about:blank](#)

## SAS Fraud Management - 6.1M0 Demo -

23/10/2019 18:54:34

Rule ID	Rule Type	Rule Name	Description
53901.5	Authorization	FS1 - ATM Fraud	None

Details of the rules  
including variables, creator,  
and the code

### Rule 53901.5: FS1 - ATM Fraud

Rule Name	FS1 - ATM Fraud	Created	22/10/2019 22:25:02
Rule ID	53901.5	Created By	LISWYV
Rule State	Production	Last Updated	23/10/2019 01:21:30
Rule Type	Authorization	Last Updated By	LISWYV
Business Unit	TCB	Execution Order	Main
Queue	FS1 - ATM Fraud	Alert Type	Customer Number (X)
Transaction Scope	Global (A)		
Transaction Type	Checking/Savings Account Bill Payment/Fund Transfer to Third Party or self account (CSBF)		
Description	None		
Max. Execution Time	None		
Alert Reason	Depositing money at CRM/ATM to deposit illegal money into the bank then dispersing assets		
Dependencies	#V53900: FS1 - ATM Fraud - Tracking Deposits - Production (sets _A_DEPOSIT_COUNT_1, _A_DEPOSIT_COUNT_2, _A_DEPOSIT_COUNT_3, _A_DEPOSIT_COUNT_4, _A_DEPOSIT_COUNT_5, _A_DEPOSIT_AMOUNT_1, _A_DEPOSIT_AMOUNT_2, _A_DEPOSIT_AMOUNT_3, _A_DEPOSIT_AMOUNT_4, _A_DEPOSIT_AMOUNT_5)		
Variables	_A_DEPOSIT_AMOUNT_3, _A_DEPOSIT_AMOUNT_4, _A_DEPOSIT_AMOUNT_5, AQD_AVAIL_BAL, TPP_TRAN_AMT, _A_DEPOSIT_COUNT_1, _A_DEPOSIT_COUNT_2, _A_DEPOSIT_COUNT_3, _A_DEPOSIT_COUNT_4, _A_DEPOSIT_COUNT_5, _A_DEPOSIT_AMOUNT_1, _A_DEPOSIT_AMOUNT_2		
Code	<pre>/*Detection strategy: + Supervision period: 5 days + Customer has deposit transactions 3 days in a row + Total amount of cumulative deposit / days &gt;= 50,000,000 USD</pre>		

① about:blank

```
_A_DEPOSIT_COUNT_5,_A_DEPOSIT_AMOUNT_1,_A_DEPOSIT_AMOUNT_2,_A_DEPOSIT_AMOUNT_3,_A_DEPOSIT_AMOUNT_4,_A_DEPOSIT_AMOUNT_5)  
  
Variables  
_A_DEPOSIT_AMOUNT_3,_A_DEPOSIT_AMOUNT_4,_A_DEPOSIT_AMOUNT_5,AQD_AVAIL_BAL,TPP_TRAN_AMT,_A_DEPOSIT_COUNT_1,_A_DEPOSIT_COUNT_2,  
_A_DEPOSIT_COUNT_3,_A_DEPOSIT_COUNT_4,_A_DEPOSIT_COUNT_5,_A_DEPOSIT_AMOUNT_1,_A_DEPOSIT_AMOUNT_2
```

```
Code  
/*Detection strategy:  
+ Supervision period: 5 days  
+ Customer has deposit transactions 3 days in a row  
+ Total amount of cumulative deposit >= 50,000,000 VND  
- Account balance: <= 200,000 VND  
==> raise alerts*/  
  
/*Detection strategy:  
+ Supervision period: 5 days  
+ Customer has deposit transactions 3 days in a row  
+ Total amount of cumulative deposit >= 50,000,000 VND  
- Account balance: <= 200,000 VND  
==> raise alerts*/
```

The codes written specifically for this rule

```
%Declarerarray(&rule.deposit_count,_a_deposit_count_1-_a_deposit_count_5);  
%Declarerarray(&rule.deposit_amount,_a_deposit_amount_1-_a_deposit_amount_5);  
  
do &rule.i = 1 to 5;  
  &rule.day_count = 0;  
  &rule.total_amt = 0;  
  do &rule.j = &rule.i to &rule.i + 2;  
    if %get(&rule.deposit_count,&rule.j) > 0  
      then do;  
        &rule.day_count = &rule.day_count + 1;  
        &rule.total_amt = &rule.total_amt + %get(&rule.deposit_amount,&rule.j);  
      end;  
    end;  
  if &rule.day_count = 3  
    and &rule.total_amt >= 50000000  
    and aqd_avail_bal - tpp_tran_amt <= 200000  
    then do;  
      %Action_alert;  
    end;  
  end;
```

**Part A:** Pre-defined the calculation for total frequency of deposits and total deposits amount.

**Part B:** Do a consecutive check based on 5 days interval and calculated the total frequency of deposits and total deposits amount.

**Part C:** If it hits the condition in the detection strategy, then an alert will be tagged with this customer.

# An example of transaction that fired this rule.

Last Sign In Time: 23/10/2019 18:22:48

Reports Strategies Templates Notifications Business

Check out this alert.

No Applicable Analyst Lists for Displayed Entity

Refresh

Unable to retrieve latest information. The displayed data might have changed.

CUSTOMER : DM1_007_000000050131		Contact	Demographics	Verification	Rules Fired for Transaction	
		Amount	Expiration (h:m)	Status	Serviced At	Reason
	DM1_007_000000050131	\$0.00		SAVE PENDING	23/10/2019	FS1 - ATM Fraud Depositing money at CRM/ATM to deposit illegal money into the bank then dispersing assets
	898765600050054	\$299.00		VERIFIED ACTIVITY	12/06/201	

	All Tab	BillPay	Dep_DepRev	Date	Time	All Rules	Action Code	Action Reason	Amount	Amount	Available balance	Type of Deposit	Terminal ID	IP address	Online Banking device	Date of the session begin	Time of the session begin	Online Banking Session ID	Deposit ref #	Transfer ref #	Purpose	Resp Req	Sc
1				BillPay	19/10/2019 13:23:45		1	zzzz	\$54,900,000.00	\$55,000,000.00			45.126.128.64	C	19/10/2019	13:22:12	R939183780	0019950312		TRANSFER	1	860	
2				Dep_DepRev	19/10/2019 10:55:21		1	zzzz		\$5,000,000.00		W	A3244784						0019324576		ATM DEPOSIT	1	638
3				Dep_DepRev	19/10/2019 10:30:41		1	zzzz		\$5,000,000.00		W	A3245321						0019295323		ATM DEPOSIT	1	243
4				Dep_DepRev	18/10/2019 15:10:55		1	zzzz		\$15,000,000.00		W	A3247865						0019254241		ATM DEPOSIT	1	870
5				Dep_DepRev	17/10/2019 14:36:23		1	zzzz		\$25,000,000.00		W	A3245321						0019213863		ATM DEPOSIT	1	540

1-5 of 5 (through 16/10/2019)

Previous Next

History		Date	Time	User ID	Result	System Block	Transaction Block	Memo	Home	Work	Mobile	Email	Letter	SMS
1		23/10/2019	16:22:00	LISWYV	SAVE PENDING	No Change	No Change							

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# Fraud Scenario

Automated Blacklist Addition

# Case Management

## Based on the workflow

SAS® Visual Investigator - Investigate and Search Data - Case Investigation

Home   Alerts   Tasks   Management   Search | [New Case Investigation](#) [Logout](#)

Create New Case

Suspects' Images

Drag and drop an image here to upload, or browse for an image file to upload.

Add image...

Financial Amount Involved

USD

Case Title \*

Case Priority \*

Due Date \*

The Team

Owner \*

Select user

Supervisor \*

Select user

Investigators

Select users

Case Category

Main Category \*

Subcategory Level 1 \*

Summary

B I U

(inherited font)

(inherited size)

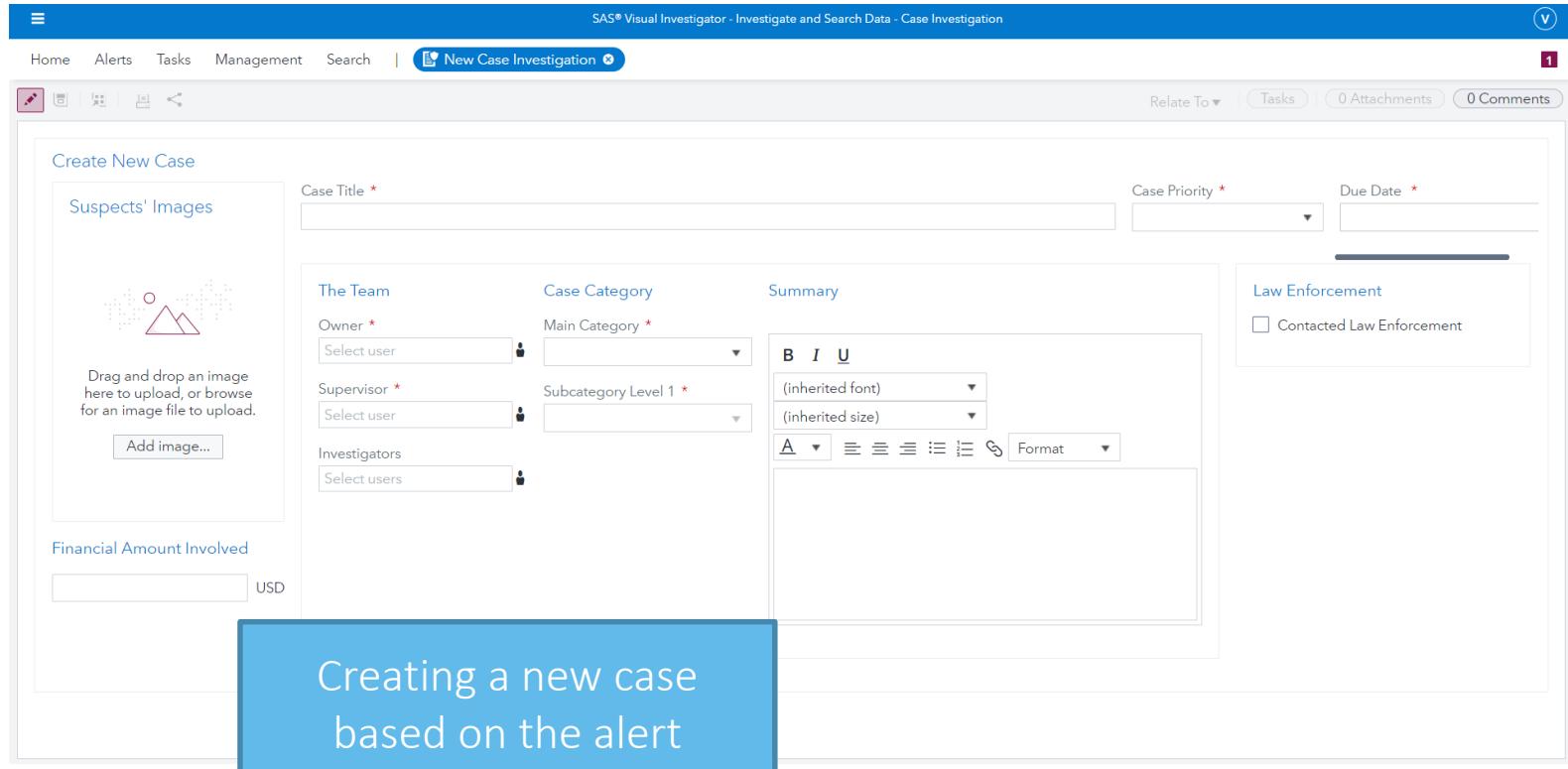
A

Format

Law Enforcement

Contacted Law Enforcement

Creating a new case based on the alert



# Case Management

## Adding relevant information to support this case

SAS® Visual Investigator - Investigate and Search Data - Case Investigation

Case Overview \* +

Tasks 0 Attachments 0 Comments 1

Edit a Case

Case Status

Case Title \* Case Test SV

Case Filed CaseInv-3

Case Priority \* Due Date \* 12/8/2020

Suspects' Images

Drag and drop an image here to upload, or browse for an image file to upload.

Add image...

The Team

Owner \* VI Demo User

Main Category \* Subcategory Level 1 \*

Owner's E-Mail

Supervisor \*

Supervisor's E-Mail

Investigators

Select users

B I U (inherited font) (inherited size)

A Format

Overview \* Case Category Summary

Law Enforcement

Contacted Law Enforcement

The object was created.

Adding information

# Case Management

## The designed workflow before decisioning

SAS® Visual Investigator - Investigate and Search Data - Case Investigation

Case Investigation Workflow

```
graph TD; Start(( )) --> Approve[Approve Case Creation]; Approve -- Approved --> Gather[Gather Evidence]; Gather --> Review[Review Evidences]; Review -- Insufficient Evidence --> Email[Email Notification]; Email --> Gather; Review -- Guilty / Innocent --> End((( )))
```

Case Overview \* +

Edit a Case

Case Status

New

Suspects' Images

Drag and drop an image here to upload, or browse for an image file to upload.

Add image...

Financial Amount Involved

USD

Case Title \* Case Test SV

Overview \* The Team

Owner \* VI Demo

Owner's E-M

Supervisor \* VI Demo

Supervisor's

Investigators Select users

Tasks (1) 0 Attachments 0 Comments

(1)

gathering.

# Case Management

## Concluding the case = Confirmed Guilty

SAS® Visual Investigator - Investigate and Search Data - Case Investigation

Case Test SV

Case Overview \* +

Home Alerts Tasks Management Search | Relate To ▾ Tasks (1) 0 Attachments 0 Comments

Tasks

Tasks (1) History

Case Investigation Workflow (1)

Review Evidences

Claimed by: videomo

Prompts the user to review the evidence gathered and determine whether the suspect is guilty or innocent.

Confirmed Guilty Confirmed Innocent Insufficient Evidence Release Claim

Suspects' Images

Drag and drop an image here to upload, or browse for an image file to upload.

Add image...

The Team

Owner \* VI Demo

Owner's E-M

Supervisor \* VI Demo

Supervisor's

Investigators

Select users

Financial Amount Involved

USD

Selecting “Confirmed Guilty” as final decision

# Data Preparation

The results will go through ETL process to append to a Blacklist

The screenshot shows the SAS Data Studio - Prepare Data interface. On the left, the "Source Table - CASEINV" is displayed with 34 columns, 1 row, and a size of 583 bytes. The row data is highlighted with a red box. In the center, the "Plan 1" window shows a "1. Filter" step. A blue arrow points from a text box at the bottom right to the filter criteria. The filter criteria are: Column: CaseStatus, Operator: Equal to, Value: CG. To the right, the "Result Table - CASEINV (session)" is shown with 35 columns, 1 row, and a size of 583 bytes.

Uniq...	case...	crea...	last...	crea...	last...	versi...
201	Caselnv-2	videmo	sas.svi...	08APR2...	08APR2...	6

**Filtering the cases for = “confirmed guilty”.  
Caselnv-2 is the person**

# Data Preparation

## Added to the blacklist

The screenshot shows the SAS Data Explorer interface with the title "SAS® Data Explorer - Manage Data". On the left, a sidebar lists various datasets: VI\_Internal, ALERTING\_ACTIVITY\_TO\_MANY, BLACKLIST\_2, BLACKLIST\_MB (which is highlighted with a red box), CASEINV, CASEINV, CASEINV\_TO\_FINACC\_BRIDGE, CRIMSYND, and CRIMSYND\_TO\_CASEINV\_BRIDGE. A blue arrow points from the "BLACKLIST\_MB" entry in the sidebar to the table view on the right. The table view displays a sample of data from the "BLACKLIST\_MB" table, with one row highlighted by a red box. This row contains columns such as CaseID, CaseStatus, CaseType, CaseTitle, and LawEnforcement. The row is labeled "Test Case 2". A large blue callout box in the foreground states: "Filtered case are appended to the Blacklist\_MB table".

CaseID	CaseStatus	CaseType	CaseTitle	LawEnforcement
05	CG	FIN	FIN-FRA...	.
				Test Case 2

# Visual Investigator Interface

## The person is added to the blacklist

The screenshot shows the SAS Visual Investigator interface with a search results page. The search bar at the top contains the query "Blacklist Mb". The results pane displays one item: "CaselInv-2" with the following details: Casepriority: 05, Casestatus: CG, and Casetcategory Main: FIN. A red box highlights this result. A blue arrow points from the text in the bottom right box to the "Blacklist Mb" filter in the left sidebar, and another blue arrow points from the same text to the highlighted result in the results pane.

1 result found.

Sort results by: Relevance Results per page: 40

Tools Object Inspector

Select a single object to see the details.

Filters

- All Types
- Alert (9)
- Blacklist Mb (1) (highlighted)
- Case Investigation (
- Corporates (5)
- Financial Accounts (
- International Transf
- Persons (20)
- Remittances (8)
- Transactions (73)

The particular person who is confirmed guilty is added to the list and reflected in the Visual Investigator Blacklist entity. CaselInv-2



# AML – Part V

## Clarifications



# Part V – POC Scanning Function

## AML

This shows we used all 1200 items. For the purpose of the POC, we have highlighted the following entities:

- Nguyen Ngoc Tien
- Kelly Trieu Thanh Hoa
- Parchin Chemical Industries

```
++START SECTION: PREP_INS_CLOSING 09APR20:04:32:54
```

```
NOTE: Table MST_PREP.INS_CLOSING created, with 1291 rows and 11 columns.
```

```
NOTE: PROCEDURE SQL used (Total process time):
```

real time	0.06 seconds
cpu time	0.04 seconds

# Part V : Clarifications

No	POC Requirements	SAS Comments
2	Requirement 3: Vendor to demonstrate the function to include fraudulent information of the entity in to MB's internal fraud blacklist	To share again screens on the ability to support multiple approvals and investigators.

# Overall Workflow

Step 1

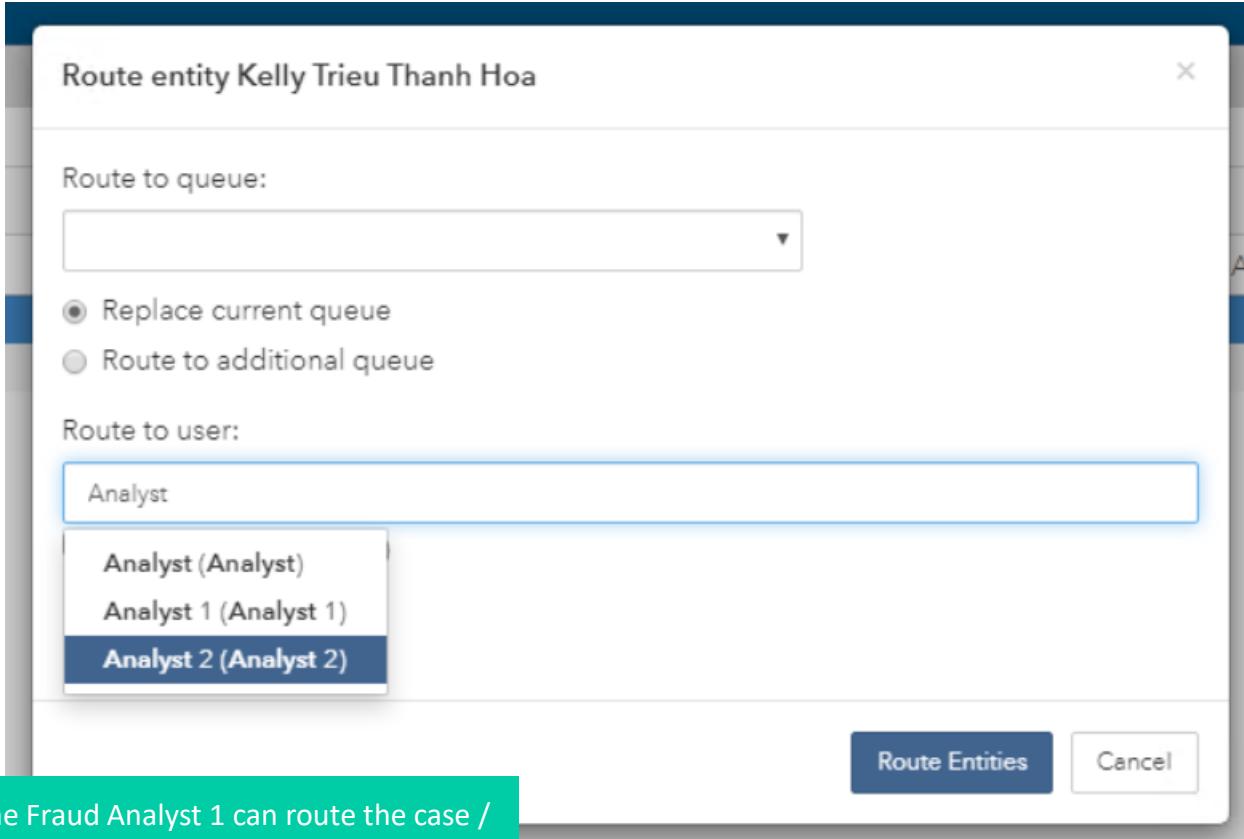
Triage													Cases	Risk Assessments	Search
Refresh		Route		Claim		List: Available entities ▾									
P..	A.	Name	Owner	E..	Segment	Number	Type	R...	Aggreg...	MLS	Alert Age	Queue			
1	Kelly Trieu Thanh Hoa	Analyst 1...	No	10001801	Customer	Low	\$0.00	870	6						
1	Nguyen Ngoc Tien		No	10001719	Customer	Low	\$0.00	870	6						

We will use Kelly Trieu Thanh Hoa to show the process / workflow.

- Fraud Analyst 1 access Triage and views the alerts

## Overall Workflow

Step 2



Based on the alert, the Fraud Analyst 1 can route the case / alert to another Fraud Analyst for further checking.

# Overall Workflow

Step 3

SAS® Anti-Money Laundering BANK2BU													List:	My entities
P..	A..	Name	Owner	E..	Segment	Number	Type	R...	Aggreg...	MLS	Alert Age	Queue		
1	Kelly.Trieu.Thanh.Hoa	Analyst 2...	No	10001801	Customer	Low	\$0.00	870	6					



Fraud Analyst 2 logs in and access the alerts under Triage section for further review.

## Overall Workflow

Step 4

### Route entity Kelly Trieu Thanh Hoa

x

Route to queue:

- Replace current queue
- Route to additional queue

Route to user:

- Investigator (Investigator)
- Investigator 1 (Investigator 1)**
- Investigator 2 (Investigator 2)

Route Entities

Cancel

Fraud Analyst 2 will then assigns the case / alert to the Investigator 1.

# Overall Workflow

Step 5

The screenshot shows the SAS Anti-Money Laundering interface for BANK2BU. The top navigation bar includes links for Triage, Cases, Risk Assessments, and Search. A green arrow points down from the 'Owner' column to the row for Kelly Trieu Thanh Hoa. Another green arrow points down from the 'List' dropdown menu to the 'My entities' option. The main table displays one entity (None selected) with columns for P., A., Name, Owner, E., Segment, Number, Type, R..., Aggreg..., MLS, Alert Age, and Queue. The first row shows an ID of 1, a name of Kelly Trieu Thanh Hoa, an owner of Investigator 1, and other details like Segment (No), Number (10001801), Type (Customer), Risk Level (Low), and Alert Age (870).

P..	A..	Name	Owner	E..	Segment	Number	Type	R...	Aggreg...	MLS	Alert Age	Queue
1	Kelly Trieu Thanh Hoa	Investigator 1	No	10001801	Customer	Low	\$0.00	870	6			

Investigator 1 logs in and views the assigned case / alert and investigates.

# Overall Workflow

Step 6

Route entity Kelly Trieu Thanh Hoa X

Route to queue:

Replace current queue  
 Route to additional queue

Route to user:

Investigator |

Investigator (Investigator)  
Investigator 1 (Investigator 1)  
**Investigator 2 (Investigator 2)**

Route Entities Cancel

For next level of investigation, Investigator 1 can then route the alert / case to Investigator 2.

# Overall Workflow

Step 7

The screenshot shows the SAS Anti-Money Laundering interface for the BANK2BU module. The top navigation bar includes links for Triage, Cases, Risk Assessments, and Search. Below the navigation is a toolbar with Refresh, Route, and Return to Queue buttons. A status message indicates "1 entity (None selected)". The main area displays a table with columns for P., A., Name, Owner, E., Segment, Number, Type, R..., Aggreg..., MLS, Alert Age, and Queue. One row is visible, showing an ID of 1, a name of Kelly Trieu Thanh Hoa, an owner of Investigator 2, and other details like Segment (No), Number (10001801), Type (Customer), Risk Level (Low), and Alert Age (870). A green arrow points down to the Owner column, and another green arrow points down to the Queue column. The Queue value is highlighted with a yellow box.

P..	A..	Name	Owner	E..	Segment	Number	Type	R...	Aggreg...	MLS	Alert Age	Queue
1	Kelly Trieu Thanh Hoa	Investigator 2...	No			10001801	Customer	Low		\$0.00	870	6

Investigator 2 logs in and views the assigned case / alert and continues to investigate.

# Overall Workflow

Step 8

### Close/Defer 1 alert

Reason:

- False Positive
- Money Laundering - Investigated
- Money Laundering - Report Filed
- Other

▼ Alerts (1)

Alerts may be closed or deferred. Note: Deferred alerts will remain in Entity Triage for further analysis.

Action	ID	Scenario Description	Run Date
Close ▾	11955	Terrorist on Watch List	November 21, 2018

Once Investigator 2 completes the investigation, Investigator 2 will provide the findings by selecting the Reason and taking Action on the alert / case.

**Close Alerts** **Cancel**

# Part V : Clarifications

No	POC Requirements	SAS Comments
1	Requirement 3: Vendor to demonstrate the function to include fraudulent information of the entity in to MB's internal fraud blacklist	<p>SAS to share the outcome for the following:</p> <ul style="list-style-type: none"><li>▪ NGUYEN NGOC TREN</li><li>▪ KELLY TRIEU THANH HOA</li><li>▪ PARCHIN CHEMICAL INDUSTRIES</li></ul>

## Customer Alert | 11953 (Nguyen Ngoc Tien)

### Alert Information

Customer 10001719

Number:

Employee: No

Description: Terrorist on Watch List (SAS10082)

Alert Terrorist Match = INDIVIDUAL For NGUYEN NGOC TIEN; Exact Name-Birth Year-Complete

Threshold: Address; Watch List ID = 10000124DSDM; Watch List Name = DSDM

Run Date: November 21, 2018

Status: Active

[View audit events](#)

### Alert Information

- watch\_list\_name = Danh Sach Den MB (DSDM)
- Match of exact name and birth date and address

# Kelly Trieu Thanh Hoa

Details | Kelly Trieu Thanh Hoa

Alerts and Transactions

1 active alert, total \$0.00

ID	Alert L...	Emplo...	Segment	Scenario Type	Scenario Description	Run Date	M..	Queue
11955	Customer	No	Watch List Entities	Terrorist on Watch List	November 2...	870		

10 items per page 1 - 1 of 1 items

Alerted Transactions: 1 alert selected 11 transactions, total \$0.00

Tr...	Account Nu...	Transaction Date	Amo...	C/D/I	Primary ...	Second...	Mechanism	Beneficiary	Associate Na...
	01-0000002672	November 21, 2018 00...	\$42.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$20.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$60.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$5.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$60.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$101.50	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$383.33	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$255.55	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$204.08	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$20.00	Event	Trade Finance	N/a	N/a	n/a	n/a

Scanning matched 11 transactions

## Customer Alert | 11955 (Kelly Trieu Thanh Hoa)

### Alert Information

Customer 10001801

Number:

Employee: No

Description: Terrorist on Watch List (SAS10082)

Alert Terrorist Match = INDIVIDUAL For KELLY TRIEU THANH HOA; Exact Name-Birth Date; Watch

Threshold: List ID = 10000131DSDM; Watch List Name = DSDM

Run Date: November 21, 2018

Status: Active

[View audit events](#)

### Alert Information

- watch\_list\_name = Danh Sach Den MB (DSDM)
- Match of exact name and birth date

# Kelly Trieu Thanh Hoa

SAS® Anti-Money Laundering BANK2BU

Triage Cases Reports E-Files Risk Assessments Search Admin | Kelly Trieu Thanh Hoa x 1039148786 x Parchin Chemical Industr... x

Lock | Unlock | Suppress | Close | Add to Case | Create Risk Assessment | Create Alert | Route (Current queue: WAT Watch list alerts) |

## Details | Kelly Trieu Thanh Hoa

### ▼ Alerts and Transactions

1 active alert, total \$0.00

ID	Alert L...	Emplo...	Segment	Scenario Type	Scenario Description	Run Date	M..	Queue
11955	Customer	No	Watch List Entities	Terrorist on Watch List	November 2...	870		

10 items per page  1 - 1 of 1 items

Alerted Transactions: 1 alert selected 11 transactions, total \$0.00

Tr...	Account Nu...	Transaction Date	Amo...	C/D/I	Primary ...	Second...	Mechanism	Beneficiary	Associate Na...
	01-0000002672	November 21, 2018 00...	\$42.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$20.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$60.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$5.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$60.00	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$101.50	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$383.33	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$255.55	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$204.08	Event	Trade Finance	N/a	N/a	n/a	n/a
	01-0000002672	November 21, 2018 00...	\$20.00	Event	Trade Finance	N/a	N/a	n/a	n/a

Selecting a transaction to view the details.

1 - 10 of 11 items

# Kelly Trieu Thanh Hoa

Transaction | 1039148786

▼ Transaction Information

Reference Number: 1039148786

General Information

Date and Time: 11/21/2018 12:04 AM  
Posted Date: November 21, 2018  
Base Currency Amount: USD 42.00  
Transaction Currency Amount: UNK 42.00  
Account Currency Amount: CAD 42.00  
Remitter Country:

Transaction Type Information

Description: /Rfb/mother Nguyen Thi Dan Transfers To Son Luu The Long  
Funds/Securities: Funds  
Transaction Type: Event  
Primary Medium: Trade Finance  
Secondary Medium: N/a  
Mechanism: N/a

Transaction Status Information

Status: Success  
Status Reason: N/a

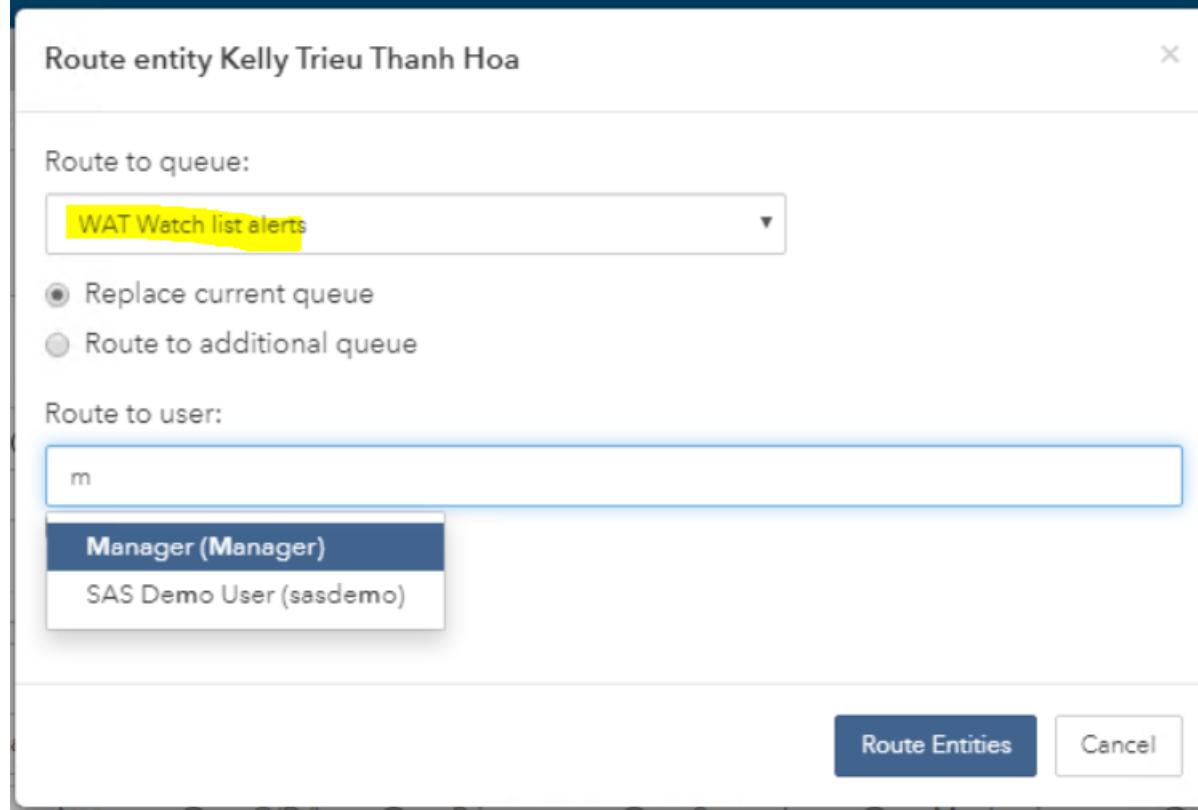
▼ Additional Information

Account and Branch Information

Account Number: 01-0000002672  
Account Name: Kelly Trieu Thanh Hoa  
Branch: 1025155 Branch  
Associate Name:

Transaction Information

- One of the Trade Finance transaction for which the alert is generated for Kelly Trieu Thanh Hoa.



- Analyst route the alert / entity to the Manager
- A special queue called “WAT Watch list alerts” which is already created and the assigned manager(s) can be grouped here

SAS® Anti-Money Laundering BANK2BU

Triage Cases Risk Assessments Search |

Refresh Route Return to Queue

1 entity (None selected)

P..	A..	Name	Owner	Queue	E..
	1	Kelly Trieu Thanh Hoa	Manager ...	WAT Watch list alerts	No

Manager logs in and see the routed alert / entity

## Close/Defer 1 alert

X

### Reason:

- False Positive
- Money Laundering - Investigated
- Money Laundering - Report Filed
- Other

### ▼ Alerts (1)

Alerts may be closed or deferred. Note: Deferred alerts will remain in Entity Triage for further analysis.

Action	ID	Scenario Description	Run Date
Close ▾	11955	Terrorist on Watch List	November 21, 2018

- Manager then determines reason of the alert / entity.
- Selects the right reason and action.
- Manager close the alert.

Close Alerts

Cancel

N/A

N/A

# Parchin Chemical Industries

Details | Parchin Chemical Industries

▼ Alerts and Transactions

3 active alerts, total \$0.00

ID	Alert L...	Emplo...	Segment	Scenario Type	Scenario Description	Run Date	M..	Queue
12037	Customer			Watch List Entities	Non-Terrorist on Watch List	November 2...	999	
12036	Customer			Watch List Entities	Non-Terrorist on Watch List	November 2...	999	
12033	Customer			Watch List Entities	Non-Terrorist on Watch List	November 2...	999	

◀ 10 ▶ items per page 1 - 3 of 3 items ⌂

Alerted Transactions: 3 alerts selected 1 transaction, total \$0.00

Tr...	Account Nu...	Transaction Date	Amo...	C/D/I	Primary ...	Second...	Mechanism	Beneficiary	Associate Na...
	01-0000062554	November 26, 2018 00...	\$81.50	Event	Trade Finance	N/a	N/a	n/a	n/a

◀ 10 ▶ items per page 1 - 1 of 1 items ⌂

Scanning generated 3 alerts against a single transaction because the entity 'Parchin Chemical Industries' matched in 3 different watchlists.

## Customer Alert | 12037 (Parchin Chemical Industries)

### Alert Information

Customer 10026222

Number:

Employee: n/a

Description: Non-Terrorist on Watch List (SAS10080)

Alert Watch List Entry = ORGANIZATION; For PARCHIN CHEMICAL INDUSTRIES; Exact Name;

Threshold: Watch List ID = 162625EUFSIRN; Watch List Name = EUFS

Run Date: November 26, 2018

Status: Active

[View audit events](#)

### Alert Information: 12037

- watch\_list\_name = EUFS
- Match of exact name

## Customer Alert | 12033 (Parchin Chemical Industries)

### Alert Information

Customer 10026222

Number:

Employee: n/a

Description: Non-Terrorist on Watch List (SAS10080)

Alert Watch List Entry = ORGANIZATION; For PARCHIN CHEMICAL INDUSTRIES; Exact Name-

Threshold: Complete Address; Watch List ID = 234916OFAC470735; Watch List Name = OFAC

Run Date: November 26, 2018

Status: Active

[View audit events](#)

### Alert Information: 12033

- watch\_list\_name = OFAC
- Match of exact name + complete address

## Customer Alert | 12036 (Parchin Chemical Industries)

### Alert Information

Customer 10026222

Number:

Employee: n/a

Description: Non-Terrorist on Watch List (SAS10080)

Alert Watch List Entry = ORGANIZATION; For PARCHIN CHEMICAL INDUSTRIES; Exact Name:

Threshold: Watch List ID = 150573UNSC1249; Watch List Name = UNSC

Run Date: November 26, 2018

Status: Active

[View audit events](#)

### Alert Information: 12036

- watch\_list\_name = UNSC
- Match of exact name

# Part V : Clarifications

No	POC Requirements	SAS Comments
	<p>Screenshot showing the different authorised scope for different users, e.g. the Trade Finance team and the Overseas Payment Team should have different authorised scope and so, they cannot view or are involved in investigation of the alerts that are not in their authorised scope.</p>	<p>SAS to show where different Business Unit can be configured within the SAS solution.</p> <p>During the demo, we showcased different Business Unit and mentioned that we can work with the Bank to define the group/department and users with authorized access to the system.</p>

# AML interface showing different Business Unit (BU1)

SAS® Anti-Money Laundering													BANK1BU	?		User	
	P.	A.	Name	Owner	E..	Segment	Number	Type	R...	Aggreg...	MLS	Alert Age	Queue				
!	3	Robert N Smith	Bank1BU ...	No	10473895	Customer	Low	\$2,069,429.84	745	506	Alert Investig...						
!	3	Jim Cook	Bank1Use...	No	10529923	Customer	Low	\$831,186.25	745	506	Alert Investig...						
!	4	Sheila Tusser	SasInst Sa...	No	10507736	Customer	Low	\$665,335.29	789	506	Alert Investig...						
!	2	Ken Eldridge	SasInst Sa...	No	10507099	Customer	Low	\$894,524.73	687	506							
!	1	Edward Leonard	Bank1Use...	No	10500873	Customer	Low	\$565,885.39	598	506							
!	3	Emilio Rodriguez	Bank1Use...	No	990000200	Customer	Low	\$180,000.00	789	506	Alert Investig...						
!	1	Robin Hunt		No	90531271	External ...	N/A	\$27,000.00	999	506	Alert Investig...						
!	2	Mazoon Electricity Company	sasdemo ...		10922300	Customer	Low	\$300,000.00	687	506							
!	1	Jose Ricardo Perdomo	Bank1Use...	No	10895600	Customer	Low	\$50,000.00	598	506							
!	1	James T Krivanek	SAS SAS	No	10799098	Customer	Low	\$1,980.88	598	506							
!	1	Jerry Houck	SasInst Sa...	No	10790212	Customer	Low	\$1,011.98	598	506							
!	1	Norma J Harlacher	SAS SAS	No	10783387	Customer	Low	\$1,324.25	598	506							
!	1	John Schulte	sasdemo ...	No	10770674	Customer	Low	\$50,000.00	598	506							
!	1	Tom Goodwin	SasInst Sa...	No	10770620	Customer	Low	\$37,870.00	598	506							
!	1	Communication Hardware Inc	Bank1BU ...		10765087	Customer	Low	\$39,070.16	598	506							
!	1	Raymond J Puzio	SAS SAS	No	10763463	Customer	Low	\$29,700.00	598	506							
!	1	Youth & Adult Corectn Agcy Sec	Bank2Use...		10750597	Customer	Low	\$11,936.75	598	506							
!	1	Laura Dowdy	Bank2Use...	No	10747132	Customer	Low	\$2,000.00	687	506							
!	2	Pamela Johnson	SasInst Sa...	No	10746221	Customer	Low	\$1,391.34	687	506							
!	1	Jim Louder	SasInst Sa...	No	10741413	Customer	Low	\$568.33	598	506							

Notice the names seen by different Business Units. This can be referred to the Bank's Trade Finance / Overseas Payment business unit.

# AML interface showing different Business Unit (BU2)

SAS® Anti-Money Laundering												BANK2BU	?		User							
		Triage	Cases	Reports	E-Files	Risk Assessments	Search	Admin														
		Refresh	Route	Claim	Return to Queue													List:	All entities			
71 entities (1 selected)																						
P.	A.	Name	Owner	E..	Segment	Number	Type	R...	Aggreg...	MLS	Alert Age	Queue										
2	Robin Hunt	Bank2BU ...	No	90531271	External ...	N/A	\$0.00	999	520													
1	Vietnam Southern Food One Member Limited Jsc Vin...	sasdemo ...	No	10057150	Customer	Low	\$0.00	802	520													
3	Bredenkamp, John	Bank2Use...	No	10056230	Customer	Medium	\$0.00	956	504													
1	Than Thi Diem Giap	SAS SAS	No	10050504	Customer	Low	\$0.00	802	520													
1	Han Cham Vo	Bank2BU ...	No	10050345	Customer	Low	\$0.00	802	520													
1	Tu Trong Nam	sasdemo ...	No	10047029	Customer	Low	\$0.00	802	520													
1	Than Thi Huynh Nghiep	SasInst Sa...	No	10046536	Customer	Low	\$0.00	802	520													
1	Quang Daykin Viet	SAS SAS	No	10046534	Customer	Low	\$0.00	802	520													
1	Dang Thi Trong Bich	SasInst Sa...	No	10044948	Customer	Low	\$0.00	802	520													
1	Than Vien Luat	Bank2BU ...	No	10044524	Customer	Low	\$0.00	802	520													
1	Quang Thi Tiem Huyen	sasdemo ...	No	10044523	Customer	Low	\$0.00	802	520													
1	Au Sinh Long	SasInst Sa...	No	10043971	Customer	Low	\$0.00	802	520													
1	Quang Thang Sau	SAS SAS	No	10042671	Customer	Low	\$0.00	802	520													
1	Dai Duc Can	SAS SAS	No	10042613	Customer	Low	\$0.00	802	520													
2	Than Dao Nam Quy	Bank2BU ...	No	10042612	Customer	Low	\$0.00	728	520													
1	Au Duc Quan	sasdemo ...	No	10042591	Customer	Low	\$0.00	802	520													
1	Tu Thi Xiec	SasInst Sa...	No	10042250	Customer	Low	\$0.00	802	520													
1	Tu The May	SAS SAS	No	10041783	Customer	Low	\$0.00	870	520													
1	Trong Mai Suong	Analyst An...	No	10041700	Customer	Low	\$0.00	802	520													
1	Quang Doi Kim Khoat	Bank2BU ...	No	10041698	Customer	Low	\$0.00	802	520													

Notice the names seen by different Business Units. This can be referred to the Bank's Trade Finance / Overseas Payment business unit.

# Part V : Clarifications

No	POC Requirements	SAS Comments
3	Requirement 4: Vendor to demonstrate the function of monitoring and management of action programs given after the investigation findings	Explain how the Suppress feature helps in the flow.

# Suppress Capability

## SAS® Anti-Money Laundering BANK2BU

Triage Cases Risk Assessments Search | Kelly Trieu Thanh Hoa x

◀ Lock | Unlock | **Suppress** | Close | Add to Case | Create Risk Assessment | Create Alert | Route (Current queue: WAT Watch list alerts) |

### Details | Kelly Trieu Thanh Hoa

#### ▼ Alerts and Transactions

1 active alert, total \$0.00

ID	Alert L...	Emplo...	Segment	Scenario Type	Scenario Description
11955	Customer	No		Watch List Entities	Terrorist on Watch List

◀ ▶ ⏪ ⏩ 10 ▾ items per page

The Fraud Analyst is able to Suppress an alert by clicking on the Suppress link as indicated in the image above.

## Suppress Capability

Suppress 1 alert X

Reason:  
False Positive

Suppress until:  
Apr 6, 2020 Calendar icon

Suppress indefinitely

Suppress Alerts Cancel

The Fraud Analyst then provides a reason as well as the duration for the suppression.



# Technical Requirements

Clarifications conducted on 8<sup>th</sup> April 2020

# SAS BOSS – SAS Fraud Management Demo

## SAS BOSS configurations

- Next few screenshots will share the configuration of SAS BOSS via REST
- As shared, configurations for different transport endpoints will be done in “camel-context.xml”
- “camel-context.xml” is the primary configuration file for all connectors within SAS BOSS

# This screen shows BOSS route details for REST API (HTTP POST) connector end point.

```
<post uri="/onlinewithdrawal">
    <route id="processOnlineWithdrawal">
        <to uri="log:procesOnlineWithdrawal?level=INFO&amp;groupInterval=1000"/>
        <bean ref="odeUtils" method="decodeWebString"/>
        <!--display the raw input transaction-->
        <to uri="log:*****Online Withdrawal Raw Input?level=INFO&amp;showBody=true&amp;multiline=true"/>
        <!--specify format, schema file ID (fbsId) and mapperId used to process the input transaction-->
        <setHeader headerName="format"><constant>fbs</constant></setHeader>
        <setHeader headerName="fbsId"><constant>onlineWithdrawalFbsId</constant></setHeader>
        <setHeader headerName="mapperId"><constant>onlineWithdrawalMap</constant></setHeader>
        <!--stop processing the transaction if a blank card_number is received-->
        <choice>
            <when>
                <simple>${body.substring(4,23).trim().isEmpty()}</simple>
                <log message="Error: received a blank card_number" loggingLevel="INFO" />
                <stop/>
            </when>
        </choice>
        <!--map the input transaction to SASFM and send to ODE and wait for response from ODE-->
        <to uri="direct:requestDispatcher"/>
        <!-- For XML/JSON/MAP outbound mapping -->
        <bean ref="OBM_Sanction" method="mapFromExchangeAndUpdateBody" />
        <bean ref="OBM_Sanction" method="escapeStringForHtmlViewer" />
        <removeHeaders pattern="web" />
        <!-- <to uri="Log:*****ODE Response?level=INFO&amp;showBody=true&amp;multiline=true"/> -->
    </route>
</post>
</rest>
```

## Sample of data ingestion with mapping for ISO8583 input:

### Sample Input:

```
02000006999999999999991000000001234202003040812549876548888888888  
888888844
```

In the “schema definition file”, the above data is mapped to source system fields as below:

```
|fbsId=onlineWithdrawal|fbsId  
mti,0,3  
card_number,4,19  
amount,23,12  
date,35,8  
time,43,6  
nsu,49,6  
account_number,55,19
```

Mapping for data fields and field length is defined

## Inbound mapping – Indicates mapping from source system fields to SAS Fraud solution fields

```
<?xml version="1.0"?>
<!-- Online withdrawal transaction requests -->
<application xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns="https://www.sas.com/sfm/eop"
  xsi:schemaLocation="http://www.sas.com/sfm/eop_mapping.xsd">

  <messages name="onlineWithdrawalTransaction">
    <message messageType="onlineWithdrawalTransaction" subType="1.0" mapperId="onlineWithdrawalMap">
      <fields>
        <field name="smh_tran_type" default="TRX"/>
        <field name="smh_cust_type" default="I"/>
        <field name="smh_acct_type" default="CS"/>
        <field name="smh_authenticate_mtd" default="NC"/>
        <field name="smh_channel_type" default="C"/>
        <field name="smh_activity_type" default="CA"/>
        <field name="smh_activity_detail1" default="NAP"/>
        <field name="smh_activity_detail2" default="NAP"/>
        <field name="smh_activity_detail3" default="NAP"/>
        <field name="smh_multi_org_name" default="GLOBAL"/>
        <field name="smh_msg_type" default="1"/>
        <field name="smh_resp_req" default="1"/>
        <field name="smh_source">
          <srcField name="mti">
            </srcField>
        </field>
        <field name="hqe_card_num">
          <srcField name="card_number"/>
          <groovy>System.out.println("cartao_duka = " + card_number)</groovy>
        </field>
        <field name="tca_merch_amt">
          <srcField name="amount"/>
          <groovy>
            <![CDATA[
              System.out.println("teste1 = " + amount);
            ]]>
          </groovy>
        </field>

        <field name="rqo_tran_date">
          <srcField name="date"/>
        </field>
      </fields>
    </message>
  </messages>
</application>
```

## Outbound mapping – Indicates mapping from SAS Fraud solution fields to source system fields

```
<?xml version="1.0"?>

<application>
  <messages name="Sanction">
    <message messageType="Sanction" subType="0.1" mapperId="sanctionResp">
      <fields>
        <field name="From Card Number">
          <srcField name="card_number"/>
        </field>
        <field name="To Account Number">
          <srcField name="account_number"/>
        </field>

        <field name="SMH Rtn Code">
          <sfmField name="smh_rtn_code" default="00">
            <groovy>
              return (value == '12')? 'ERR' : value
            </groovy>
          </sfmField>
        </field>

        <field name="Authorization system Response">
          <sfmField name="rrr_action_code">
            <groovy>
              return (value == '4')? 'Declined' : 'Approved'
            </groovy>
          </sfmField>
        </field>

        <field name="Rule Result 1">
          <sfmField name="rur_30byte_string_001"/>
        </field>

        <field name="Rule Result 2">
          <sfmField name="rur_8byte_string_001"/>
        </field>

      </fields>
    </message>
  </messages>
</application>
```

## Another example: Sample SAS BOSS configuration route for IBM MQ Connector

```
<route id="processWmqRequestEndToEnd">
  <from uri="ibmmq:queue:{boss_request_queue}?disableReplyTo=true"/>
  <to uri="log:processWmqRequestEndToEnd?level=INFO&groupInterval=1000"/>
  <!--specify format, schema file ID (fbSid) and mapperId used to process the input transaction-->
  <setHeader headerName="format"><constant>fb</constant></setHeader>
  <setHeader headerName="fbSid"><constant>onlineWithdrawalfbSid</constant></setHeader>
  <setHeader headerName="mapperId"><constant>onlineWithdrawalMap</constant></setHeader>
  <!--stop processing the transaction if a blank card_number is received-->
  <choice>
    <when>
      <simple>${body.substring(4,23).trim().isEmpty()}</simple>
      <log message="Error: received a blank card_number" loggingLevel="INFO" />
      <stop/>
    </when>
  </choice>
  <!--map the input transaction to SASFM and send to ODE and wait for response from ODE-->
  <to uri="direct:requestDispatcher"/>
  <bean beanType="com.sas.finance.fraud.ol.xmlmapping.utils.TransactionBackedMap" method="createMapFromTransaction"/>
  <setHeader headerName="JMSCorrelationID">
    <simple>${header.JMSMessageID}</simple>
  </setHeader>
  <!--send ODE response to MQ reply queue-->
  <to uri="ibmmq:queue:{boss_reply_queue}?disableReplyTo=true"/>
</route>
```

# SAS BOSS – SAS Fraud Management Demo

## SAS BOSS configurations, testing

- The following screens will show the sample data/transaction that is pushed into SAS BOSS
- The screen will also show the output of transaction and the response

## This screen shows BOSS route details for REST (HTTP POST) connector end point.

Transaction data to send:

0200000069999999999999920000000012342020030408125498765488888888888888844

Card Number

Send to: <http://sasfmhost61.race.sas.com:9090/onlinewithdrawal>

Submit

Send speed



1 TPS

Start

7 sent

Clear

04/09/2020, 11:59:19 AM <root>

```
<Authorization system Response>Declined</Authorization system Response>
<From Card Number>00069999999999992</From Card Number>
<Rule Result 1>Mr.Dummy Customer 2</Rule Result 1>
<Rule Result 2>MB POC</Rule Result 2>
<SMH Rtn Code>00</SMH Rtn Code>
<Service.ExceptionMsg></Service.ExceptionMsg>
<Service.ExceptionName></Service.ExceptionName>
<Service.Status>Successful</Service.Status>
<To Account Number>8888888888888844</To Account Number>
</root>
```

Authorization response

Card Number

# SAS BOSS – SAS Fraud Management Demo

## SAS BOSS configurations, test with 40K transactions

- The following screens will show the outcome of the real-time transaction simulation of 40K transactions being ‘pushed’ into SAS BOSS
- The screen will indicate transaction per second (tps) response

- Pumper Utility logs showing 40k transactions successfully sent to SAS BOSS
- Screen also shows response time captured

```

2020-04-08T11:00:54,946 [INDATB_CSCAOnly_40k 0] INFO LogAction elapsed=0.6ms cmx_tran_id= smh_client_tran_type="0000075136" smh_activity_type="CA" smh rtn_code="00" smh_reason_code="0000" rrr_sys rtn_code="0000" rrr_sys_err_code="0000" rrr_sys_err_info1="0000" rrr_sys_err_info2="0000" rur_numeric_001=2.4089911326253E13 rur_8byte_string_001="MB POC"
2020-04-08T11:00:54,947 [INDATB_CSCAOnly_40k 0] INFO LogAction elapsed=0.7ms cmx_tran_id= smh_client_tran_type="0000013724" smh_activity_type="CA" smh rtn_code="00" smh_reason_code="0000" rrr_sys rtn_code="0000" rrr_sys_err_code="0000" rrr_sys_err_info1="0000" rrr_sys_err_info2="0000" rur_numeric_001=2.4089911326254E13 rur_8byte_string_001="MB POC"
2020-04-08T11:00:54,947 [INDATB_CSCAOnly_40k 0] DEBUG Pumper
INDATB_CSCAOnly_40k count: 40,000 errors: 0 ~average: 1.01 ms:%# .03: .06: .13: .25: 0% 118 .5: 88% 35,282 1: 8% 3,20
1 2: 2% 713 4: 1% 369 8: 1% 271 16: 0% 36 32: 0% 8 64: 0% 2
2020-04-08T11:00:54,948 [main] INFO Pumper
INDATB_CSCAOnly_40k count: 40,000 errors: 0 ~average: 1.01 ms:%# .03: .06: .13: .25: 0% 118 .5: 88% 35,282 1: 8% 3,20
1 2: 2% 713 4: 1% 369 8: 1% 271 16: 0% 36 32: 0% 8 64: 0% 2
2020-04-08T11:00:54,948 [main] INFO LoadGenerator 40,000 transactions, 1,081 TPS
2020-04-08T11:00:54,948 [INDATB_CSCAOnly_40k 0] DEBUG LoggingThread [INDATB_CSCAOnly_40k 0] (id=19) finished
2020-04-08T11:00:54,949 [main] INFO LoadGenerator
INDATB_CSCAOnly_40k count: 40,000 errors: 0 ~average: 1.01 ms:%# .03: .06: .13: .25: 0% 118 .5: 88% 35,282 1: 8% 3,20
1 2: 2% 713 4: 1% 369 8: 1% 271 16: 0% 36 32: 0% 8 64: 0% 2

```

Count : 40,000

Average : 1 millisecond per transaction

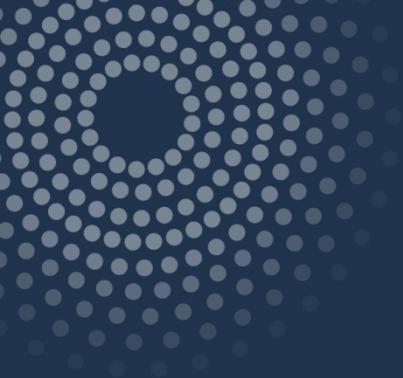
1,081 TPS response for 40,000 transactions

## SAS BOSS logs showing performance metrics captured for this Route

```
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:34 INFO olSocket-01 - Received: 1362 new messages, with total 13689 so far. Last group took: 1000 m  
illis which is: 1,362 messages per second. average: 839.147  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:35 INFO olSocket-01 - Received: 1272 new messages, with total 14961 so far. Last group took: 1011 m  
illis which is: 1,258.16 messages per second. average: 863.6  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:36 INFO olSocket-01 - Received: 1192 new messages, with total 16153 so far. Last group took: 989 m  
illis which is: 1,205.258 messages per second. average: 882.051  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:37 INFO olSocket-01 - Received: 1209 new messages, with total 17362 so far. Last group took: 1000 m  
illis which is: 1,209 messages per second. average: 898.98  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:38 INFO olSocket-01 - Received: 1430 new messages, with total 18792 so far. Last group took: 1000 m  
illis which is: 1,430 messages per second. average: 925.122  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:39 INFO olSocket-01 - Received: 1054 new messages, with total 19846 so far. Last group took: 1009 m  
illis which is: 1,044.599 messages per second. average: 930.776  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:40 INFO olSocket-01 - Received: 1092 new messages, with total 20938 so far. Last group took: 991 m  
illis which is: 1,101.917 messages per second. average: 938.377  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:41 INFO olSocket-01 - Received: 1325 new messages, with total 22263 so far. Last group took: 1000 m  
illis which is: 1,325 messages per second. average: 954.961  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:42 INFO olSocket-01 - Received: 1362 new messages, with total 23625 so far. Last group took: 1000 m  
illis which is: 1,362 messages per second. average: 971.702  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:43 INFO olSocket-01 - Received: 1264 new messages, with total 24889 so far. Last group took: 1000 m  
illis which is: 1,264 messages per second. average: 983.25  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:44 INFO olSocket-01 - Received: 1285 new messages, with total 26174 so far. Last group took: 1000 m  
illis which is: 1,285 messages per second. average: 994.717  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:45 INFO olSocket-01 - Received: 1424 new messages, with total 27598 so far. Last group took: 1000 m  
illis which is: 1,424 messages per second. average: 1,010.435  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:46 INFO olSocket-01 - Received: 1407 new messages, with total 29005 so far. Last group took: 1000 m  
illis which is: 1,407 messages per second. average: 1,024.441  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:47 INFO olSocket-01 - Received: 1194 new messages, with total 30199 so far. Last group took: 1000 m  
illis which is: 1,194 messages per second. average: 1,030.225  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:48 INFO olSocket-01 - Received: 1361 new messages, with total 31560 so far. Last group took: 1000 m  
illis which is: 1,361 messages per second. average: 1,041.137  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:49 INFO olSocket-01 - Received: 1350 new messages, with total 32910 so far. Last group took: 1000 m  
illis which is: 1,350 messages per second. average: 1,051.001  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:50 INFO olSocket-01 - Received: 1427 new messages, with total 34337 so far. Last group took: 1000 m  
illis which is: 1,427 messages per second. average: 1,062.637  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:51 INFO olSocket-01 - Received: 1389 new messages, with total 35726 so far. Last group took: 1000 m  
illis which is: 1,389 messages per second. average: 1,072.434  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:52 INFO olSocket-01 - Received: 1169 new messages, with total 36895 so far. Last group took: 1000 m  
illis which is: 1,169 messages per second. average: 1,075.248  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:53 INFO olSocket-01 - Received: 1210 new messages, with total 38105 so far. Last group took: 1000 m  
illis which is: 1,210 messages per second. average: 1,079.064  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:54 INFO olSocket-01 - Received: 1175 new messages, with total 39280 so far. Last group took: 1000 m  
illis which is: 1,175 messages per second. average: 1,081.706  
Camel (SFM_OL) thread #4 - ThroughputLogger 2020-04-08 07:00:55 INFO olSocket-01 - Received: 720 new messages, with total 40000 so far. Last group took: 1000 m  
illis which is: 720 messages per second. average: 1,072.012
```

## Statistics on SAS Fraud solution OnDemand Decision Engine (ODE) showing the TPS processing rate

2020-04-08T11:01:00,001 [pool-3-thread-1] INFO INTERVAL_STATS	
Cluster	Leader
Transaction	Load (txns/sec)
	1,080.5 +1,070.7
Transaction	Response Time
	count: 6,204 errors: 0 ~average: .14 -.02
Transaction	Execution Wait
	count: 6,204 errors: 0 ~average: .06 -.01
Transaction	Execution Prep
	count: 6,204 errors: 0 ~average: .06 +-0
Transaction	MEH Fetch
	count: 6,204 errors: 0 ~average: .06 +-0
Transaction	Model/Rules (SAS)
	count: 6,204 errors: 0 ~average: .11 -.02
SocketPort.5018	Received
	count: 6,204
SocketPort.5018	Reply
	count: 6,204 errors: 0 ~average: .06 +-0
Engine	Run Thread
	count: 10,804 errors: 0 ~average: 10.88 +10.22
Engine	Run Thread TPS
	count: 519
HybridQueue	Current Size
	count: 23,164
HybridQueue	Insert
	count: 6,204 errors: 0 ~average: .06 +-0
HybridQueue	Remove
	count: 4,600 errors: 0 ~average: .06 +-0
MEHCORE.Fetch.0	Total
	count: 6,204 errors: 0 ~average: .06 +-0
FCMCORE	Connection Wait
	count: 1 errors: 0 ~average: .06 -.06
FCMCORE	Rollback
	count: 1 errors: 0 ~average: .09 -.06
TDRCORE	Connection Wait
	count: 46 errors: 0 ~average: .06 -2.00
TDRCORE	Commit
	count: 46 errors: 0 ~average: 8.22 -2.10
TDRCORE.FCM_CSCA/VXX/IXX	Insert Batch
	count: 46 errors: 0 ~average: 2,529.39 +1,489.75
TDRCORE.FCM_CSCA/VXX/IXX	Insert Batch Count
	count: 4,600



# End of Document

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