

Profiling Controls

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 RiskTech
100 2019 Gartner 2015
CoolVendor



Summary

- Overview
- Profiling in Theory
- Profiling in Practice
 - Aggregation
 - Monitoring and alerting
 - Visualizations
 - Result export



Overview

NetGuardian's Profiling System
computes a
global Risk Score
for individual events (such as financial transactions)
from the event characteristics
scored against Statistical Metrics.

It is based on a Probabilistic Approach.

Principle

1. Profiling process

- Compute statistical Metrics capturing users / customers / etc. characteristics
- Consolidate metrics by periodical aggregations



2. Monitoring Process

- Monitor every new business event (Financial Transaction, Ebanking connection)
- and compute Risk Score by scoring characteristics against Profiles



3. Alerting Process

- Raise alerts for events suffering from a risk score above a certain threshold





Business Events Characteristics

Trans. ID	Customer ID	Custom. Type	Channel Type	User ID	Input date time	Value Date	Account ID	Counterparty ID	CntParty Type	Currency	Amount
124576	AB12	Institutional	Fax	JKE	2017.03.14 13:54:12	2017.03.14	AB12CHF1	982651712	Institutional	CHF	150000.5
125689	EBA12	Retail	eBanking	EB_USER	2017.03.14 18:56:13	2017.03.15	EBA12CHF1	7645238445	Online Shop	CHF	78.5

Business events have characteristics

- Profiling process
 - Analyses business events and captures metrics from their characteristics
- Monitoring process
 - New business event characteristics are scored against metrics (probabilistic approach) and a global risk score is computed



Probabilistic Approach

- Compute Partial Score (Pscore) for business events characteristics
 - Inverse of the probability of occurrence of the characteristics
- Pscores are computed for every characteristics that is tracked by Profiling Control
- Pscores will be weighted to compute a global risk score

		Count	
Channel Type	Fax	18	← There have been 18 operations through Fax Channel
	ATM	37	
	Credit card	41	
	Email	33	
	Phone call	61	
	Branch	82	
	Ebanking	24	
Customer ID AB12			
Total		296	← Out of a total number of 296 operations

$$Pscore_{Fax} \cong * 1 - \left(\frac{18}{296} \right) = 0.81$$



Pscores

	Trans. ID	Customer ID	Custom. Type	Channel Type	User ID	Input date time	Value Date	Account ID	Counterparty ID	CntParty Type	Currency	Amount
Event	124576	AB12	Institutional	Fax	JKE	2017.03.14 13:54:12	2017.03.14	AB12CHF1	982651712	Institutional	CHF	150000.5
Pscore	-	-	0.67	0.81	0.64	0.78	0.23	0.12	0.98	0.36	0.12	0.83

- Value from 0 to 1
- Inverse of probability of occurrence of characteristic
- Weighted to compose a global risk score
- Risk score used for decision making
 - Trigger value based



Risk Score

NG|Screeener computes a Risk Score for business events from the Partial Scores – or Pcores – computed from the event characteristics



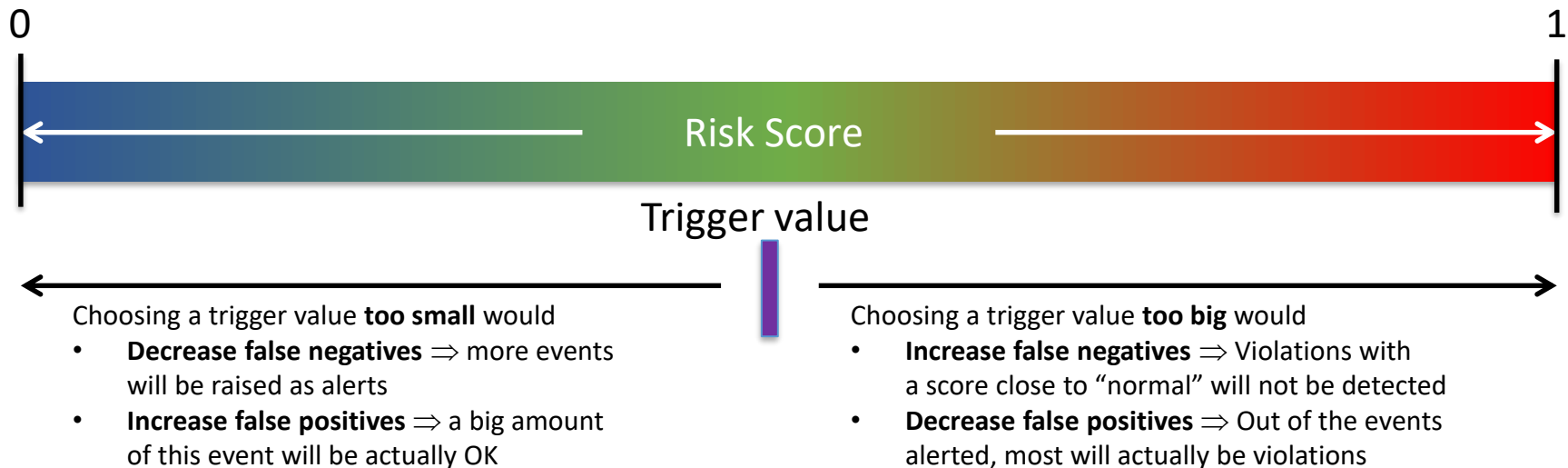
- The bigger the Risk Score, the more suspicious is the business events
- The smaller the Risk Score, the more common and normal is the business events

But the system needs to know what is the trigger value above which alerts should be raised when events have a Risk Score above it.



Risk Score

NG|Screener **raises alerts** for business events with a **risk score above a certain threshold** value : the trigger value



The trigger value should be chosen wisely in an empirical way to **minimize both false positives and false negatives**.



A focus on :

1. Profiling process

- Compute statistical Metrics capturing users / customers / etc. characteristics
- Consolidate metrics by periodical aggregations
- The profiling process is an offline and continuous process computing accurate and up to date statistical metrics.



In a few words

$$Prob_x = \frac{\text{Number of Events}_x}{\text{Total Number of Events}}$$

The Profiling process consists in tracking Statistical values following certain dimensions to capture the metrics required to score business events characteristics

Metrics example (1/2)

Metric on 1D : We aggregate the target value = Transaction Amount on 1 single dimension = Customer ID
(Since at the end of the day we do customer Profiling)

Average transaction amount per customer					
9169.09	2226.02	997.42	4667.00	7015.61	...
123	986	312	567	298	...
Customer ID					

Metric on 2D : We aggregate the target value = Transaction Amount on 2 dimensions = Customer ID + Channel Type
(A little more realistic example)

Average transaction amount per channel type and customer							
Channel Type	Fax	9787.15	3368.09				...
	ATM	1577.20	3897.26	4691.91	3411.33	6943.62	...
	Credit Card	2573.78	6416.51	6449.27	2536.48	7044.85	...
	Email	5333.31	4106.86	9311.23			...
	Phone call	1063.72	1984.87			1951.60	...
	Branch	7090.02			4297.06	334.91	...
	Ebanking		7447.33	1327.81	9334.78	1059.52	...
		123	986	312	567	298	...
Customer ID							

Metrics example (2/2)

Metric on 3D:

Here we aggregate the target characteristics = *Transaction Amount*

on 3 other characteristics (dimensions) :

- CustomerID (always if we do customer profiling)
- Transaction Type
- Channel Type

=> Even more realistic example !

Average transaction amount per channel type and transaction type and customer									
Channel Type	Fax	4952.71	9935.46	7391.28	9478.26	2957.46	...		
	ATM	2814.22	729.30	979.64	556.44		...		
	Credit Card			8410.81	4012.62	9946.59	...		
	Email	7631.92	9598.42	9145.53	8.20	4593.50	...		
	Phone call		3457.49		2581.64		...		
	Branch	1787.22		6660.88	7752.79	8121.81	...		
	Ebanking	3863.17	5054.76	469.46	8894.75	6845.27	...		
		FT	Paym.	Sale	Purchase	Cash	...		
Transaction Type									
Customer ID = 123									
Channel Type	Fax		2724.98	1876.06		6495.95	...		
	ATM	1555.08	5668.81			1918.74	...		
	Credit Card		9698.56				...		
	Email	9652.31	1085.60			6867.96	...		
	Phone call	3750.77		7436.15			...		
	Branch		4946.26			2641.79	...		
	Ebanking	3287.11				6233.61	...		
		FT	Paym.	Sale	Purchase	Cash	...		
Transaction Type									
Customer ID = 986									
Channel Type	Fax	9475.71	1500.00	2909.77	7442.39		...		
	ATM	104.09		1681.79	4305.91		...		
	Credit Card		689.72				...		
	Email	8492.73	7235.19	1835.32			...		
	Phone call		3898.59	8863.32	982.40	4625.62	...		
	Branch	7581.37			459.65	2635.51	...		
	Ebanking	4294.39	3570.27	3492.15	6524.26	4969.24	...		
		FT	Paym.	Sale	Purchase	Cash	...		
Transaction Type									
Customer ID = 312									
Channel Type	Fax	1943.73	2627.35	6255.37	5075.65	7285.11	...		
	ATM	8834.85	3027.79	2209.09	1839.54		...		
	Credit Card	5483.09	502.49		4937.44	7306.82	...		
	Email	9072.94	9388.13				...		
	Phone call		9278.98	5155.68	271.28	2186.57	...		
	Branch	7301.78	6401.23	6930.41	5352.94	4853.17	...		
	Ebanking			7528.00	6540.21		...		
		FT	Paym.	Sale	Purchase	Cash	...		
Transaction Type									
Customer ID = 567									
Channel Type	Fax	4055.40	4479.44		191.80	5856.67	...		
	ATM	1569.15	4426.71	3756.65	9590.90	2731.33	...		
	Credit Card	8499.30	8845.44	1440.97		1961.70	...		
	Email		4223.35	2868.13	8005.39		...		
	Phone call	8455.19	7067.59	3722.24	6467.63	6192.67	...		
	Branch	5386.91		5840.28	7312.62	4603.63	...		
	Ebanking	3999.44	3632.17	5659.68	1081.27		...		
		FT	Paym.	Sale	Purchase	Cash	...		
Transaction Type									
Customer ID = 298									
Channel Type	Fax	...	...	...	...	...	...
	ATM	...	...	...	...	...	...
	Credit Card	...	...	...	...	...	...
	Email	...	...	...	...	...	...
	Phone call	...	...	...	...	...	...
	Branch	...	...	...	...	...	...
	Ebanking	...	...	...	...	...	...
		FT	Paym.	Sale	Purchase	Cash	...		
Transaction Type									
Customer ID = ...									



Special Case - Global Metrics

- Global Variables are special metrics computed at bank level
 - Not specific to any Customer or User
- Could be Currencies, Beneficiary, etc...
- Special computations for this part

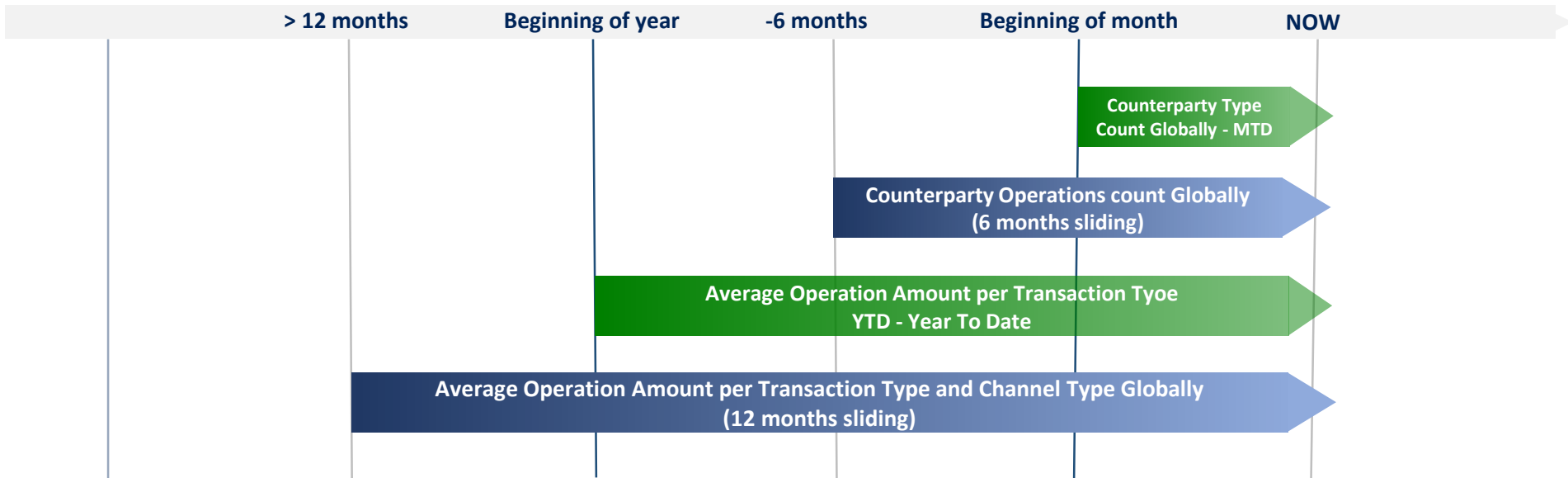


Statistical scoring vs Logarithmic scoring

- Discrete variable have two options in regards to scoring
 - Statistical → Most commonly used (example in previous slides)
 - Logarithmical
 - Be able to influence and make small statistical numbers still suspicious or the other way around
 - Example: we have 20'000 payments to the same beneficiary and we would like to make it not suspicious even if the total number of payments in profile is 100'000'000.



Metrics are periodic!





Profiles

- Defined as the collection of aggregates (metrics) computed at the same level
- Mostly computed at
 - User Level
 - Customer Level
- Collection of all the statistics computed on the same base level (User, Customer or else)



A focus on :

2. Monitoring process

- Monitor every new business event (Financial Transaction, Ebanking connection)
- and compute Risk Score by scoring characteristics against Profiles
- The monitoring process is an online and continuous process computing scores for each and every business event.



In a few words

The Monitoring process consists in monitoring business events continuously and calculating the Pcores and Risk Score.

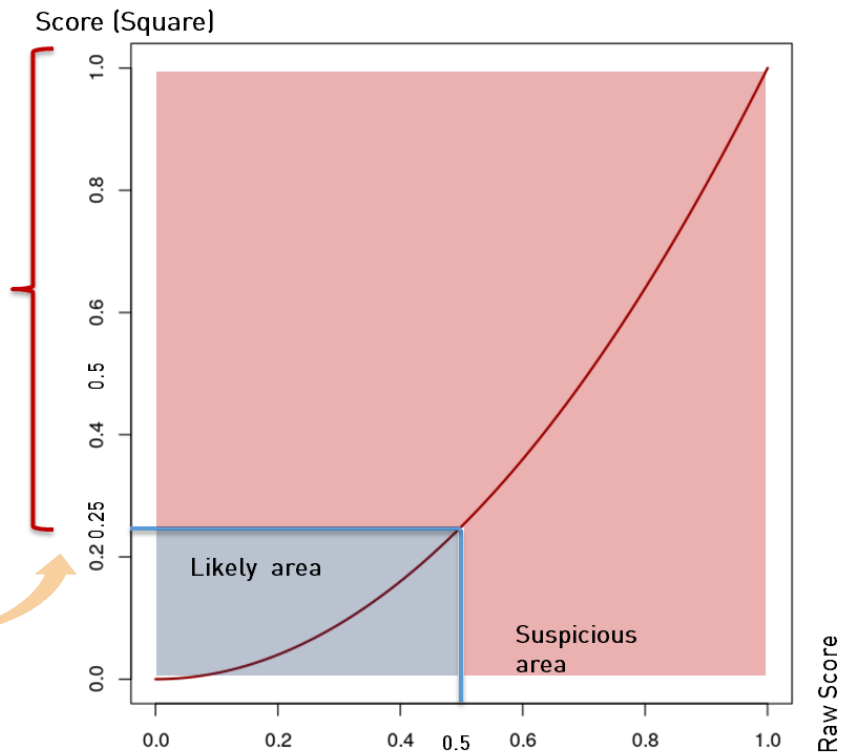
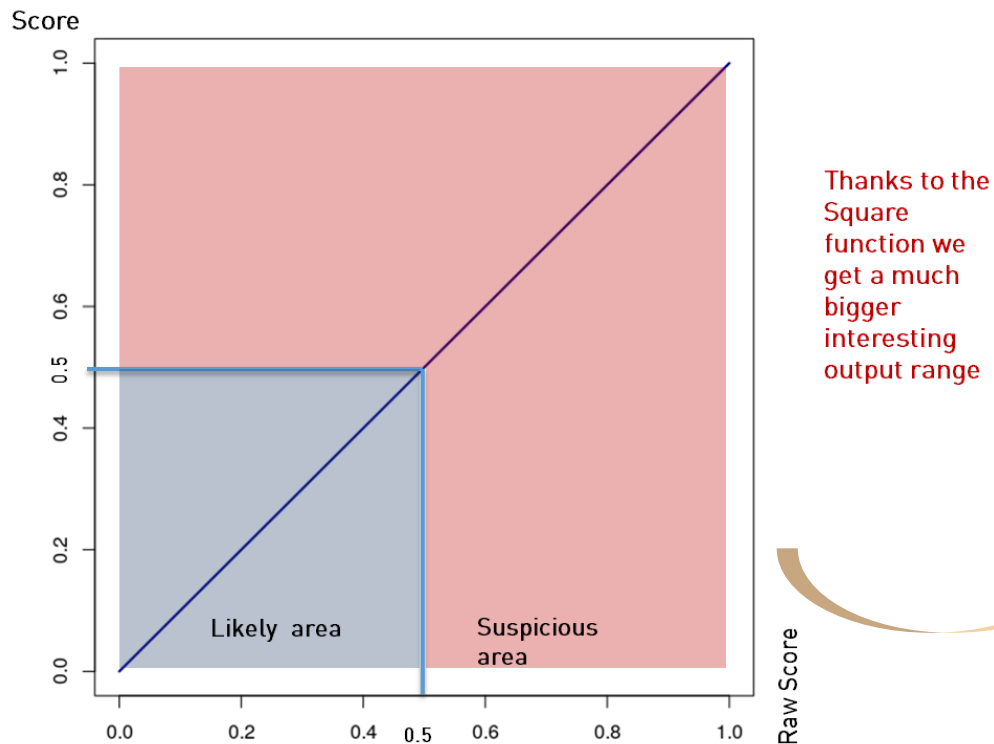
The Risk Score is the square of the weighted average of Pcores

$$\text{Risk Score} = \left(\frac{\sum_{i=1}^n (\text{PScore}_i \times \text{Weight}_i)}{\sum_{i=1}^n \text{Weight}_i} \right)^2$$

The **weighted arithmetic mean** is similar to an ordinary average, except that instead of each of the data points contributing equally to the final average, some data points contribute more than others



Square function





A focus on :

3. Alerting Process

- Raise alerts for events suffering from a risk score above a certain threshold
- The alerting process opens cases in NG|Case Manager for suspicious business events (such as financial transaction) as well as on the violation Dashboard in NG|Screener



In a few words

The alerting process consists in raising alerts for events with Risk Scores about the defined trigger value

IF *Risk Score > Trigger Value* **THEN** raise alert



NG|Case Manager Hit

« Banking Violation #7: Pr02 - Unusual Location

Search



Edit Watch Copy Del

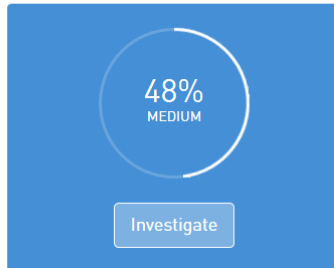
▼ Added by **Redmine Admin** 23 minutes ago.

« Previous | 2 of 7 | Next »

Status: NEW
Priority: Normal
Assignee: **Redmine Admin**

Start date: 18.07.2018
Due date:
% Done: 0%

Description

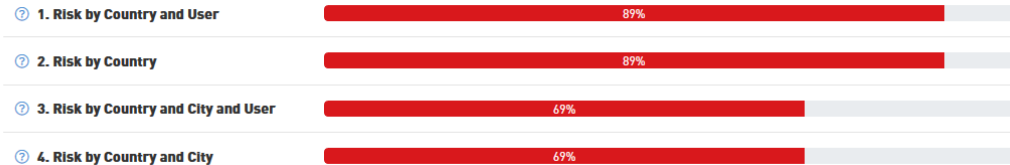


Additional information

User	N/A
Country	Switzerland
City	Zurich

Risk score composite

Toggle scores





NG | Case Manager Hit

Risk score composite

Toggle scores

? 1. Transaction Creation
(day of week)



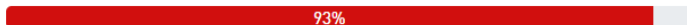
? 2. Payment Initiator
(Employee)



? 3. Payment Initiator
(Employee) Risk Factor



? 4. Currency of Transaction
(Bank)



? 5. Receiver Bank Country
(Bank, stat)



? 6. Beneficiary Account
(Client)



? 7. Account ID



NG|Case Manager Hit

NG|CaseManager

All

Banking Systems Information

Banking Systems Violations

Control Validation

Infrastructure Systems Information

Infrastructure Systems Violations

Internet Banking

E-Banking Transactions

TP Suspicious Transaction Monitoring

TP - Risky Destinations

TP - Unusual Transactions

« Banking Systems Violations

Search

?

Create Overview Activity Issues Settings

Filters

☒ Status

open

☒ Tracker

is

Banking Violation

Add filter

Options

Apply Save Clear

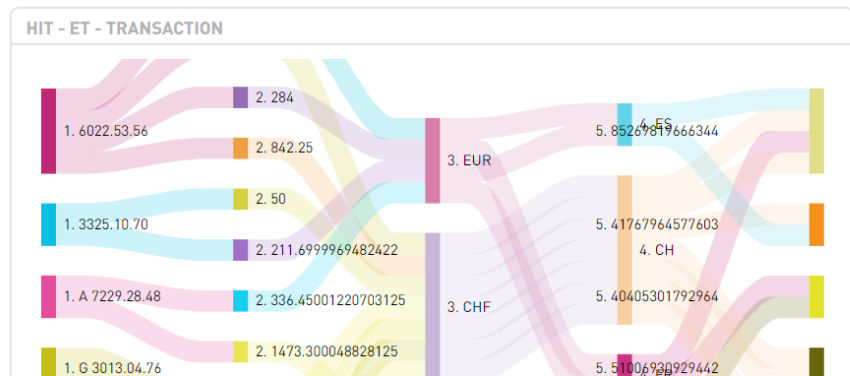
<input type="checkbox"/>	#	Tracker	Status	Priority	Subject	Assignee	Updated
<input type="checkbox"/>	# 8	Banking Violation	New	Normal	Pr02 - Unusual Location	Redmine Admin	18.07.2018 15:50
<input type="checkbox"/>	# 7	Banking Violation	New	Normal	Pr02 - Unusual Location	Redmine Admin	18.07.2018 15:50
<input type="checkbox"/>	# 6	Banking Violation	New	Normal	Pr02 - Unusual Location	Redmine Admin	18.07.2018 15:50
<input type="checkbox"/>	# 5	Banking Violation	New	Normal	Pr02 - Unusual Location	Redmine Admin	18.07.2018 15:50



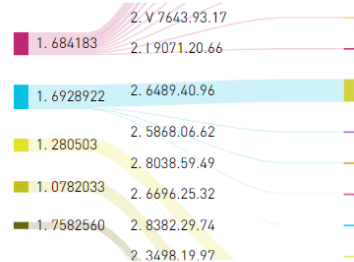
Profiling Dashboard

Risk Model: eBanking Transactions

Risk Model: e-Banking Transactions. Full Control over payments issued via eBanking and their Session context



EBTP - CUSTOMER VS ACCOUNT



HIT - ET - NUMBER OF HITS

3 5

HIT - ET - COUNTERPARTY ADDRESS

01. (anonymized); boulevard de Meyer 98; 6152 Bonvin-la-Ville
02. (anonymized); 19 Webb plains; West Ireneland; WF0 4NY
03. (anonymized); 2, rue de Georges; 59150 Bruneau

2

1

1

Profiling in Practice

How to define a profiling control





Profiling Controls in a Nutshell

- Profiling control is composed of
 - Profiling Aggregations (metrics)
 - Compose Profiles
 - Monitoring and Alerting Script
 - Define metrics to use and weight of each of them
 - Define alerting threshold (risk score)
 - Profiling Dashboard
 - Output and display “hits” by the profiling script → cf. Dashboard training

Profiling Aggregations

List of existing aggregations

Create a new one

NG|Screeners

Profiling aggregations

Profiling peer groups

Channels

Smart filters

Reference data

Monitoring >

Processing >

Security roles

Data capture alerting

Licensing

Field mappings

Change management >

Profiling aggregations

PROFILING AGGREGATIONS	
FFE Country	COMPUTED
FFE Country City	COMPUTED
FFE User Country	COMPUTED
FFE User Country City	COMPUTED
FFE User Day_of_Week	COMPUTED
FFE User Part_of_Day	COMPUTED
et_counterparty_account_id	COMPUTED
et_counterparty_bank	COMPUTED
et_counterparty_bank_country	COMPUTED
et_glob_counterparty_account_id	COMPUTED
et_glob_counterparty_bank	COMPUTED
et_new_contract	COMPUTED
et_operation_type	COMPUTED

Profiling aggregation edition

Enabled

Name (required)
FFE Country

Owner (required)
[USER] admin

Public

Services (required)
fortinetFortigateEvent@*

Variable (required)
source_country

Dimensions

Period value (required)

Period type (required)
Months sliding

Schedule unit (required)
Hour

Aggregations need to be defined before monitoring control



Profiling Aggregations

- Parameters of aggregation
 - Name**
 - Services:** service on which to apply aggregation
 - Dimension:** cf. slides 12-13
 - Variable:** Values on which statistics will be computed per dimensions
 - Period:** history of values to take into account
 - Scheduled:** How often to re-compute aggregations
 - Custom filter:** filter data to be used for aggregations

The screenshot shows a web form titled "PROFILING AGGREGATION EDITION". It contains several fields and controls for configuring an aggregation:

- Enabled:** A toggle switch is turned on.
- Name (required):** A text input field containing "tp_transaction_sender_amount_by_currency".
- Owner (required):** A dropdown menu showing "[USER] admin".
- Public:** A toggle switch is turned off.
- Services (required):** A dropdown menu showing "swisscomFinnovaCorebankingTra...".
- Variable (required):** A dropdown menu showing "transaction_amount".
- Dimensions:** A dropdown menu showing "customer_name" and "transaction_currency".
- Period value (required):** A text input field containing "12".
- Period type (required):** A dropdown menu showing "Months sliding".
- Schedule value (required):** A text input field containing "5".
- Schedule unit (required):** A dropdown menu showing "Day".
- Query filter:** A text input field containing "transaction_status:900".



Profiling aggregations

- Aggregations will be stored in separate Elastic Search index in type:
na--tenant_name-aggregation_name
- Example :
 - Aggregation name for tenant DEFAULT: *temenos_trx_acc_currency_amount*
→ What you specify in NG|Screener UI
 - Index name created: *na--default-temenos_trx_acc_currency_amount* →
What will be created in NG|Storage (Elastic Search)



Profiling Aggregation ngadmin commands

- Several commands for administrating aggregations on the system
 - `ngadmin aggregator_exportProfilingAggregations`
 - Export aggregations to file
 - `ngadmin aggregator_importProfilingAggregations`
 - Import aggregations from file
 - `ngadmin aggregator_recomputeAggregations`
 - Ask the solution to recompute aggregations
 - `ngadmin aggregator_renameProfilingAggregation`
 - Rename an aggregation



Monitoring and Alerting script

- Toggle to Profiling mode by selecting “**PROFILING**” as control type in **General tab**.
- Compute Pcores and define variable weight
 - Cf. Controls Administration training for General control configuration
 - Advanced or simple configuration (Profiling tab in control configuration)
 - Simple: Visual configuration
 - Advanced: Configuration through [Python coding](#)
 - Profiling Dashboard (Profiling Visualization tab in control configuration)
 - Dashboard to list violations and how each variable contributed to global score
 - Cf. dashboard creation slides

Control edition

General	Report	Dashboard	Profiling	Scheduling
Name (required) <input type="text" value="Tn04 - Unusual Amount Transaction"/>				
Owner (required) <input type="text" value="[USER] admin"/> <input type="button" value="v"/>				
<input checked="" type="radio"/> Profiling <input type="radio"/> PBI <input type="checkbox"/> Event tracking				
<input type="checkbox"/> Public <input type="checkbox"/> Violation				

Monitoring and Alerting script – Simple profiling

The screenshot shows the 'Simple profiling' configuration page in the NetGuardians interface. The page has a navigation bar with tabs: General, Report, Dashboard, Profiling (active), Scheduling, and Description. Below the navigation bar, there are several configuration options:

- Normalization:** A toggle switch is turned on. A callout box points to the 'Max score: 100' label on the right side of the slider, stating: "Normalize scores – Change scale (0 to max score selected)".
- Violation threshold:** A slider is set to 90. A callout box points to the slider, stating: "Threshold for alerting (based on normalized score)".
- Violation matching attribute:** A text input field contains 'transaction_id'. A callout box points to the input field, stating: "Primary key of the created violation (avoid duplicated violations)".
- Automatic mapping:** A toggle switch is turned on.
- Profile limits:** A toggle switch is turned off.
- Peer grouping:** A toggle switch is turned off.



Monitoring and Alerting script – Simple profiling

General Profiling Scheduling Description

☒ Normalization

Fields in aggregations correspond to fields in events to monitor

Max score: 100

Violation threshold: 80

Min/Max profiling size to score transactions (define on which aggregation to be based)

Violation matching attribute

transaction_id

☒ Automatic mapping

☐ Profile limits




☐ Peer grouping

Advanced algorithm – not covered

Monitoring and Alerting script - Simple profiling

Selected predefined aggregation
(cf. slide 27-28)

Define weight of the Pscore
computed using this variable
(weighted average)

PROFILING VARIABLES								
Aggregation	Field mapping		Scoring	Whitelisted	Blacklisted	Weight		
tp_transaction_sender_amount_by_currency	transaction_amount customer_name transaction_currency		STATISTICAL	false	false	10		
Total entries: 1								

Show used fields for selected aggregation. In bold, used variable. Example when using Automatic mapping.

For **discret variables**, 2 scoring methods are available: **statistical or logarithmic**

If option is selected score of whitelisted events will be 0 (opposite for blacklisted events)



Monitoring and Alerting script - Simple profiling

Profiling variable



Aggregation [required]

tp_transaction_sender_amount_by_currency



Divider [required]

10

Weight [required]

10

☒ Whitelisted

☐ Blacklisted

☒ Ignore missing values

If toggled, new values will have
minimal score.
If not toggled, new values will have
maximum score.

Save

Divider only available for
continuous values or
logarithmical method.
Change sensitivity on
computed score

Monitoring and Alerting script

- Advanced Profiling (Python script)
 - Toggle on “Advanced” in Report tab
 - Warning: From advanced mode could not go back to simple mode
 - Creates a python skeleton based on configuration done in simple mode
- Note: Python scripting will not be covered in training

Control edition

General Report Dashboard Scheduling Description

Selection ☐ Preview

☒ Advanced

Report type

☒ Status ☐ Export

☐ Timeline

Chart

☒ None ☐ Bar chart ☐ Pie chart

☒ Table

Table type

☒ Normal ☐ Console

Selected fields

customer_name transaction_amount @timestamp transaction_id counterparty_customer_name transaction_currency

Common code

```
aggdf = {}
try:
```

NetGuardians

Tn04 - Unusual Amount Transaction

Report Subtitle

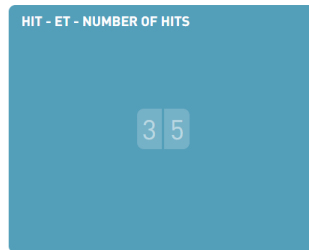
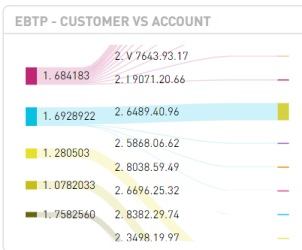
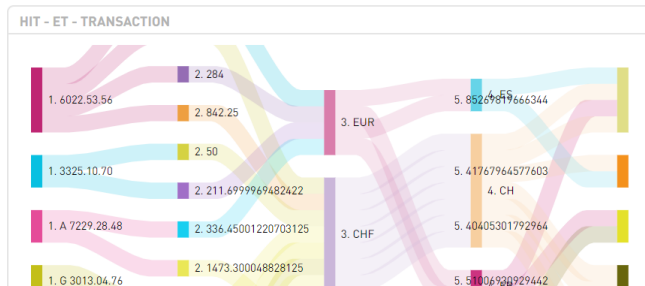
From Sun, 25 Aug 2019 00:00 to Mon, 26 Aug 2019 00:00

Profiling Visualization

- Write Dashboard to highlight hits detected by profiling control
- Dashboard will be created in Discover part of NG|Screeener UI (cf. Dashboard creation slides)

Risk Model: eBanking Transactions

Risk Model: e-Banking Transactions. Full Control over payments issued via eBanking and their Session context



HIT - ET - COUNTERPARTY ADDRESS		
01.	(anonymized); boulevard de Meyer 98; 6152 Bonvin-la-Ville	2
02.	(anonymized); 19 Webb plains; West Ireneland; WF0 4NY	1
03.	(anonymized); 2, rue de Georges; 59150 Bruneau	1



Results report and export

- In addition of the dashboard, results can be
 - Shown in PDF reports
 - Exported to NG|Case Manager (CSV)
- CSV export to NG|Case Manager will enable to map CSV fields into Case Manager Custom fields
 - Enable customized views in CM
 - Enable filtering on specific fields



Specific Exporter Channel

- In Admin / Channels / Targets
- Specific description for profiling needed
- Toggle on “Custom Description” to use predefined template
- Parameters to fill depending on template

Custom Description:

Template:

Filter

Time Window

\$GLOBAL_SCORE_FIELD\$

Threshold Low:

Threshold Medium:

Threshold High:



customProfilingDescription.html

*

6

MONTH

#13

33

66

100

Custom Description 1

Custom Description

Title:

User

Custom Description

Value:

#1

Custom Description 2

Custom Description

Title:

Country

Custom Description

Value:

#2

Custom Description 3

Custom Description

Title:

City

Custom Description

Value:

#3

Partial Score 1

Partial Score Title:

Risk by Country and City

Partial Score

Description:

This is a risk

Partial Score Value:

#8

Example : Specific Export Channel

- Activate custom description
- Here you specify the on-purpose filter for dashboard
- No clue about the “impact” threshold in advance

Custom Description:

Template:

Filter

\$TRANSACTION_IDS

\$GLOBAL_SCORE_FIELDS

\$TIME_FIELDS

Threshold Low:

Threshold Medium:

Threshold High:



customProfilingDescription.html

(business_reference:#3 AND _type: violation) OR (transaction_sender_cust

#3

#1

#2

60

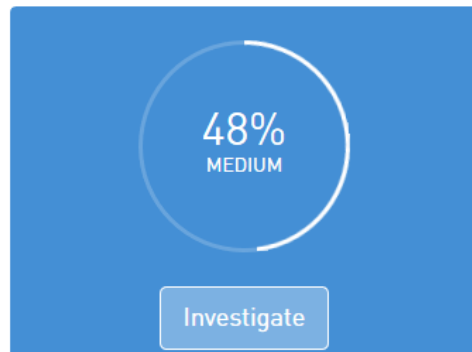
70

90

Example:

*(business_reference:#30 AND
_index:"ngv-*") OR*

*(transaction_sender_bank_id:#21 AND
_index:"ngt-*")*



Additional information

User	N/A
Country	Switzerland
City	Zurich

Example : Specific Export Channel

« Banking Violation #2: Pr02 - Unusual Location

Search

Create - Overview Activity **Issues** Settings

Edit Watch Copy Delete

Added by Redmine Admin 8 minutes ago. Previous | 7 of 7 | Next »

Status: **NEW**
Priority: Normal
Assignee: Redmine Admin

Start date: 18.07.2018
Due date:
% Done: 0%

Description

49%
MEDIUM
Investigate

Additional information

User	N/A
Country	Switzerland
City	Zurich

Risk score composite

Toggle scores

1. Risk by Country and User

89%

2. Risk by Country

89%

3. Risk by Country and City and User

69%

4. Risk by Country and City

69%

Subtasks Add

Related issues Add

Partial Score 1

Partial Score Title:

Risk by Country and City

Partial Score Description:

This is a risk

Partial Score Value:

#8

Partial Score 2

Partial Score Title:

Risk by Country and City and User

Partial Score Description:

This is a suspicious address

Partial Score Value:

#7

Partial Score 3

Partial Score Title:

Risk by Day and User

Partial Score Description:

This is an abnormal email

Partial Score Value:

#9

Partial Score 4

Partial Score Title:

Risk by Time Slot and User

Partial Score Description:

This is a suspicious address

Partial Score Value:

#10

Partial Score 5

Partial Score Title:

Risk by Country

Partial Score Description:

This is a suspicious address

Partial Score Value:

#12

Partial Score 6

Partial Score Title:

Risk by Country and User

Partial Score Description:

This is an abnormal email

Partial Score Value:

#11



Example : Specific Export Channel

- Define a subject
- The Mapping begins!

Project Id*	tp-risky-destinations	
Subject*	TP Risky Destinations	
01_Custom field key*	62	Risk Score
01_Custom field value*	#1	
02_Custom field key*	5	Business Ref.
02_Custom field value*	#3	
03_Custom field key*	84	Creation Transaction Date
03_Custom field value*	#38	





Thank you!

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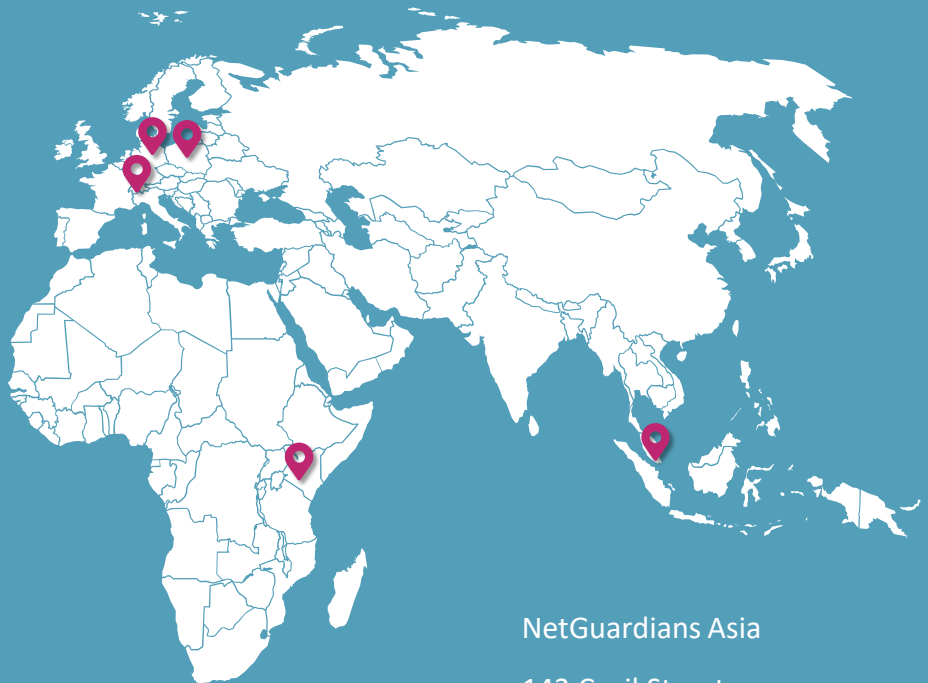
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