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Detecting SSH bruteforce attacks using triggers in QoE

[Triggers](#) are used to search data in QoE Stor by specified parameters. When a trigger fires, one of the following actions can occur:

- notification in GUI
- HTTP action
- email delivery

Required SSG DPI options:

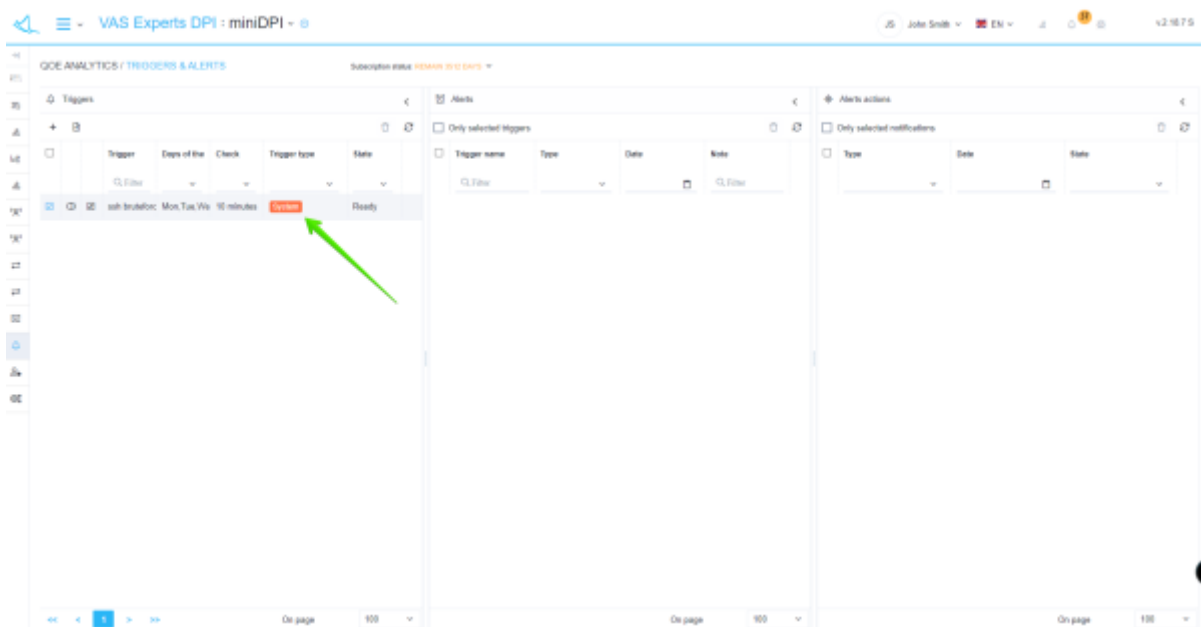
- [Statistics gathering and analysis on protocols and directions](#)
- [Subscriber notifications](#)

Required additional modules:

- [DPIUI2 \(GUI - Graphical User Interface\)](#)
- [Implementation and administration](#)

System trigger for detecting SSH bruteforce attacks

The trigger for detecting SSH bruteforce attacks (name — "ssh bruteforce") is a system trigger and is available in "QoE analytics" → "Triggers and notifications" (disabled by default).



General trigger information

Common							
Trigger name *			Severity		Trigger		
ssh bruteforce			Hight		▼		Disabled
Days of the week *		Check frequency *		Number of positives			
Mon, Tue, Wed, Thu, Fri, Sat, Sun		10 minutes		0			
Start date		End date		Start time		End time	
12/01/2024		12/31/2099		00:00		23:55	

- Trigger name: "ssh bruteforce";
- Days of week — all;
- Check frequency — 10 minutes;
- Trigger activation frequency — 0;
- Start/end dates and times can be set if needed.



Every day, a check will be performed every 10 minutes according to the conditions described below.

Queries

Queries						
+						
	Query name	Report		Period from	Period to	
☒ On	A	Ssh bruteforce	▼	now - 30 minutes	now - 20 minutes	🗑

For this trigger a non-editable query is preset with the following parameters:

- Table to scan: Raw full netflow → Tables → Attacks detection → Ssh bruteforce;
- Period from: now - 30 minutes
- Period to: now - 20 minutes

Conditions

Conditions							
+							
	Bind	Query name	Function	Combinator	Serie	Operator	Value
☒ On	AND	A	avg		Session lifetir	<=	20
☒ On	AND	A	max		Sessions per	>=	1500

- Add two "+" fields

- Link - AND
- Function - avg
- Series in field 1 - session lifetime to subscriber ≤ 20 (ms)
- Series in field 2 - number of sessions per subscriber ≥ 1500



We set the trigger conditions: average duration of SSH sessions to a subscriber is less than 20 ms and the number of SSH sessions for the subscriber is greater than 1500 for the analyzed period.

Error handling



- In "If no errors" — no data
- In "If error or timeout" — save last state



With this configuration, if there are no errors, no data is saved; if errors occur, information about suspicious activity is saved.

Actions

E-mail action



- Click the "</>" icon to auto-fill the form
- In the "To" field — specify the email address
- With this setup, when the trigger fires an email with the notification details (ID, trigger name, status, link to the report — saved state) will be sent to the specified address

Notification



- Click "</>" to auto-fill the form
- Select notification type — "Warning"
- This will create a notification in the SSG system

Alerts					Alerts actions				
Only selected triggers					Only selected notifications				
Trigger name	Type	Date	Note		Type	Date	State		
ssh bruteforce	Alerting	20.05.2021 14:45:24	count(sess_subscribe		notification	20.05.2021 14:45:44	Complete		
ssh bruteforce	Ok	20.05.2021 14:31:43							
ssh bruteforce	Ok	20.05.2021 14:13:24	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:12:03	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:10:42	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:09:24	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:08:03	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:06:42	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:05:23	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:04:04	count(sess_subscribe						
ssh bruteforce	Ok	20.05.2021 14:02:43	count(sess_subscribe						

You can get a link to the report via the notifications menu

Notifications

Triggers

ssh bruteforce (1)

Id: 1

Subscribers synchronization

Hardware: miniDPI

Success

Subscribers synchronization

Hardware: centos8

Success

Subscribers synchronization

Hardware: miniDPI

Success

Subscribers synchronization

Hardware: centos8

Success

Subscribers synchronization

Hardware: miniDPI

Success

Subscribers synchronization

Hardware: centos8

Success

20.05.2021 02:45

20.05.2021 02:44

20.05.2021 02:42

20.05.2021 02:42

20.05.2021 02:40

20.05.2021 02:40

Details

Mark as read

Delete

<<

<

1

2

3

4

5

>

>>

Select the notification Choose — "Details"

← Triggers

Status **New**

Notification date **20.05.2021 02:45**

Notify type **Warning**

Notification content

ssh bruteforce (1)

Id: 1

Trigger: ssh bruteforce

Status: firing

Severity: hight

Queries:

A: QoETableFullnetflowRawSshBruteForceWidget

Reasons for the occurrence of notification:

count(sess_subscribers) > 0 is true in query A

Links to reports:

A: https://localhost/#QoEAnyReport/report_id=896Fj5ZLpG8WenE

Follow the report link — the report will open in a new browser window.

HTTP action



Click "</>" to auto-fill the form. Choose the method most suitable for your ticket system and enter the URL.



Keep in mind — the numeric thresholds for sessions, incoming packets, etc., are given as averaged examples. Fine-tune thresholds based on your network specifics.