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Triggers in QoE

Triggers are used to search for data in QoE Stor according to the specified parameters. After the trigger is fired, one of the following actions is possible:

- GUI notification
- HTTP action
- sending email

Required SSG options:

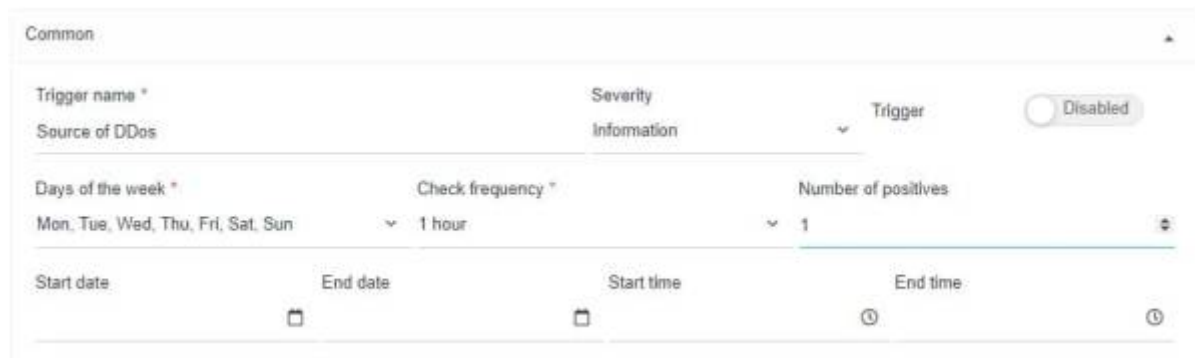
- [Statistics gathering and analysis on protocols and directions](#)
- [Subscriber notifications](#)

Required additional modules:

- [DPIUI2 \(GUI - Graphical User Interface\)](#)
- [QoE Stor \(Statistics collection module\)](#)

Trigger configuration example: Finding the source of a Flood DDOS attack

General Information



The screenshot shows a configuration window titled 'Common' for a trigger named 'Source of DDos'. The trigger is currently 'Disabled'. The configuration includes the following fields:

- Trigger name ***: Source of DDos
- Severity**: Information
- Days of the week ***: Mon, Tue, Wed, Thu, Fri, Sat, Sun
- Check frequency ***: 1 hour
- Number of positives**: 1
- Start date**: (empty)
- End date**: (empty)
- Start time**: (empty)
- End time**: (empty)

Trigger name «Source of DDoS», days of week – all, check frequency – every hour, number of positives – once, time and date of start/end - not specified.



Every day, once an hour, a check will be carried out according to the conditions described below.

Queries

Queries						
+						
	Query name	Report		Period from	Period to	
<input checked="" type="checkbox"/> On	A	Maxi		now - 15 minute	now	

- Add a field
- Name: A
- Choose a table to be scanned: Raw full netflow → Tables → Attacks detection → Top hosts IPs → Maxi
- Set the period from: «now - 15minute», until : «now»



In this case, the traffic analysis for the selected page will be carried out for the period of the last 15 minutes.

Conditions

Conditions								
+								
	Bind	Query name	Function	Combinator	Serie	Operator	Value	
<input checked="" type="checkbox"/> On	AND	A	avg		Session lifetime	<=	20	
<input checked="" type="checkbox"/> On	AND	A	avg		Sessions	>=	1500	

- Add "+" 2 fields
- Bind - AND
- Function - avg
- Serie in the 1 field - session timeout <= 20(ms)
- Serie in the 2 field - number of sessions >= 1500



We have set a condition — the trigger will fire when it detects both signs: sessions with lifetime equal or less than 20ms AND more than 1500 sessions from one IP-host.

Error handling

No data & error handling	
If no data *	If execution error or timeout *
No data	Keep last state

- In the field "If no data" — No data

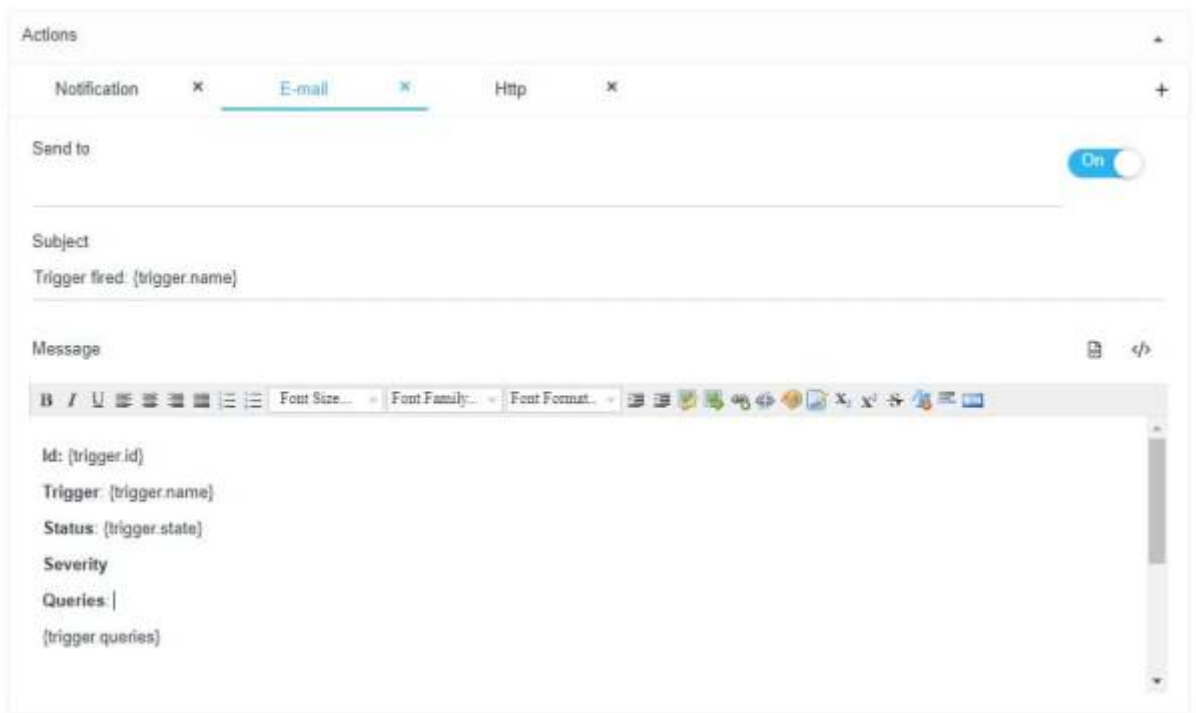
- In the field "If execution error or timeout" — Keep last state



In this configuration — if there are no errors, no data will be saved; if any, information will be saved in the form of a table containing suspicious sessions.

Actions

E-mail

The screenshot shows the 'Actions' configuration window with the 'E-mail' tab selected. It features a 'Send to' field with a toggle switch set to 'On', a 'Subject' field containing the placeholder 'Trigger fired: {trigger.name}', and a 'Message' field with a rich text editor. The message content includes placeholders for trigger details: 'Id: {trigger.id}', 'Trigger: {trigger.name}', 'Status: {trigger.state}', 'Severity', 'Queries: |', and '{trigger queries}'. The rich text editor has a toolbar with various formatting options like bold, italic, underline, and font color.

- For automatic filling - click on the "</>" icon (automatic filling of the form)
- In the field "Send to" — specify email address



With this setting, when the trigger is fired, all information about the event will be sent to the specified email: ID, trigger name, status, link to the report (saved state).

Notification

Actions

Notification * E-mail * Http *

Notification title
{trigger.name}









Notification subtitle
{trigger.id}

Notification type
Warning

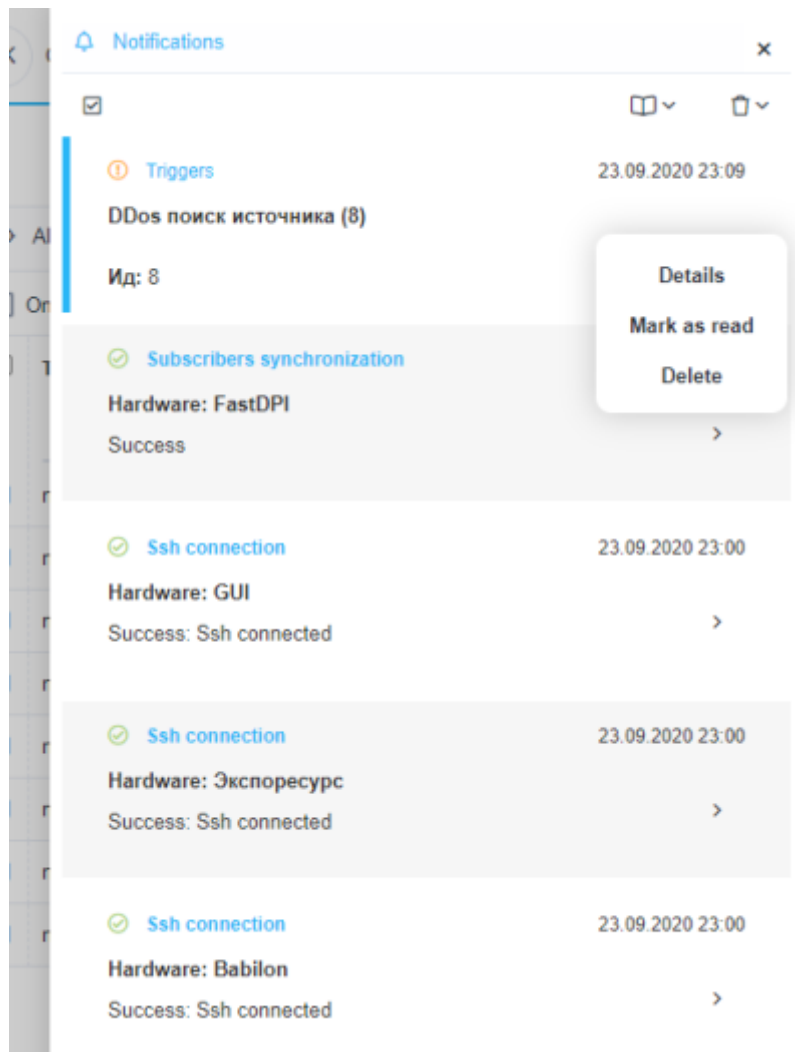
Message

Id: {trigger.id}
Trigger: {trigger.name}
Status: {trigger.state}
Severity
Queries:
{trigger.queries}

- For automatic filling - click on the "</>" icon (automatic filling of the form)
- Choose the notification type — "Warning"
- With this setting, a notification will be created in the SSG

Alerts					Alerts actions			
<input type="checkbox"/> Only selected triggers					<input type="checkbox"/> Only selected notifications			
Trigger name	Type	Date	Note		Type	Date	State	
<input type="checkbox"/> Ddos  Alerting 14.08.2020 13:58: avg(flow_vol_to_s)					<input type="checkbox"/> notification 14.08.2020 13:59:03 Complete			
<input type="checkbox"/> DDos поиск исто-  Alerting 14.08.2020 13:58: avg(avg_ses_lifet)					<input type="checkbox"/> notification 14.08.2020 13:58:23 Complete			
<input type="checkbox"/> Ddos  Alerting 14.08.2020 13:56: avg(flow_vol_to_s)					<input type="checkbox"/> notification 14.08.2020 13:56:43 Complete			
<input type="checkbox"/> DDos поиск исто-  Alerting 14.08.2020 13:55: avg(avg_ses_lifet)					<input type="checkbox"/> notification 14.08.2020 13:56:05 Complete			
<input type="checkbox"/> Ddos  Alerting 14.08.2020 13:54: avg(flow_vol_to_s)					<input type="checkbox"/> notification 14.08.2020 13:54:23 Complete			
<input type="checkbox"/> Ddos  Alerting 14.08.2020 13:52: avg(flow_vol_to_s)					<input type="checkbox"/> notification 14.08.2020 13:52:22 Complete			
<input type="checkbox"/> DDos поиск исто-  OK 14.08.2020 13:51: avg(avg_ses_lifet)					<input type="checkbox"/> notification 14.08.2020 13:50:25 Complete			
<input type="checkbox"/> Ddos  Alerting 14.08.2020 13:50: avg(flow_vol_to_s)								

You can get a link to the report in the notification menu



Select notification
Select - "Details"

Notifications

←

Triggers

Status

Read

Notification date

23.09.2020 23:09

Notify type

Warning

Notification content

DDos поиск источника (8)

Ид: 8

Триггер: DDos поиск источника

Статус: firing

Важность: information

Запросы:

A: QoETableFullflowRawTopHostsIpsWidget

Причины возникновения нотификации:

avg(avg_ses_lifetime) <= 200000 is true in query A

avg(sessions_uniq) >= 1 is true in query A

Ссылки на отчеты:

A: https://192.168.88.11/#QoEAnyReport/report_id=rMeFuKSp316vU1b

Follow the link to the report - it will open in a new tab.

HTTP

Actions

Notification × E-mail × Http × +

Method POST Url https://your_redmine_host/issues.xml?key=your_redmine_api_key On

Headers < Body >

+ </>

Name	Value
Content-Type	application/xml

```
<?xml version="1.0"?>
<issue>
  <project_id>1</project_id>
  <subject>Сработал триггер: {trigger.name}</subject>
  <priority_id>1</priority_id>
  <description>Ид: {trigger.id}
  Триггер: {trigger.name}
  Статус: {trigger.state}
  Важность: {trigger.severity}

  Запросы:
  {trigger.queries}
</issue>
```

REDMINE JSON
REDMINE XML

- For automatic filling - click on the "</>" icon (automatic filling of the form)
- Choose the method most suitable for your ticket system and enter the URL



It is important to understand: the number of established sessions, the number of incoming packets, etc. are averaged. More precise configuration should be made taking into account the specifics of your network.

Trigger configuration example: Finding the target of a Flood DDOS attack

It differs from the previous example in setting 2 and 3 stages (Queries and Conditions).

Queries

Queries

	Query name	Report	Period from	Period to
<input checked="" type="checkbox"/> On	A	Maxi	now - 15 minutes	now

Conditions

Bind	Operator	Value
<input checked="" type="checkbox"/> On	AND	>= 100

No data & error handling

If no data *

No data

meout *

SSH bruteforce

Top application protocols

Top subscribers

By traffic

By flow

By session lifetime

By subscribers and hosts

Maxi

Top hosts IPs

Raw clickstream

In the "Report" field choose Raw full netflow → Tables → Attacks detection → Top subscribers → Maxi

Conditions

Conditions

	Bind	Query name	Function	Combinator	Serie	Operator	Value
<input checked="" type="checkbox"/> On	AND	A	avg		Flow volume to	>=	10000

Serie — "Flow volume to subscribers", >= 10000



It is important to understand: the number of established sessions, the number of incoming packets, etc. are averaged. More precise configuration should be made taking into account the specifics of your network.

BotNet Analysis

It differs from the previous example in setting 2 and 3 stages (Queries and Conditions).

Queries

Queries						
+						
	Query name	Report		Period from	Period to	
<input checked="" type="checkbox"/> On	A	Maxi	🔍	now - 15 minute	now	🗑️
<input checked="" type="checkbox"/> On	B	Full raw log	🔍	now - 15 minute	now	🗑️

- Choose Raw full netflow → Tables → Attacks detection → Top application protocols → Maxi for the "A" value
- Raw full network → Tables → Raw log → Full raw log for the "B" value

Conditions

Conditions							
+							
	Bind	Query name	Function	Combinator	Serie	Operator	Value
<input checked="" type="checkbox"/> On	OR	B	avg		Destination port	=	6667
<input checked="" type="checkbox"/> On	OR	B	avg		Source port	=	6667
<input checked="" type="checkbox"/> On	OR	B	avg		Destination port	=	1080
<input checked="" type="checkbox"/> On	OR	B	avg		Source port	=	1080
<input checked="" type="checkbox"/> On	AND	A	avg		Flow, Pkts/s	>=	2000

Most often, BotNet uses ports 6667 and 1080 — add each destination/source port by selecting query "B" with value "OR" and choose Flow Pcts/s equal or more than 2000.



With this configuration, if at least on one of the ports (6667/1080) the number of passing packets is more than 2000 per second, the trigger will fire.



It is important to understand: the number of established sessions, the number of incoming packets, etc. are averaged. More precise configuration should be made taking into account the specifics of your network.

Subscriber's interest in competitor resources

General information

Common

Trigger name *
Subscriber's interest in competitor resources

Severity
Information

Trigger
Enabled

Days of the week *
Mon, Tue, Wed, Thu, Fri, Sat, Sun

Check frequency *
1 hour

Number of positives
1

Start date
End date
Start time
End time

Trigger name «Subscriber's interest in competitor resources», days of week – all, check frequency – every hour, number of positives – once, time and date of start/end – not specified.



Every day, once an hour, a check will be carried out according to the conditions described below.

Queries




Queries						
+						
	Query name	Report		Period from	Period to	
<input checked="" type="checkbox"/> On	A	Raw clickstream	▼	now - 1 hour	now	🗑️
<input checked="" type="checkbox"/> On	B	Maxi	▼	now - 1 hour	now	🗑️

- Add "+" field
- Name A
Choose a table to be scanned: Raw clickstream → Tables → Raw clickstream
- Name B
Choose a table to be scanned: Raw full netflow → Tables → Attacks detection → Top hosts IPs → Maxi
- Set the period from: "now - 1 hour", until : "now"



In this case, the traffic analysis for the selected tables will be carried out every hour.

Conditions

Conditions								
+								
	Bind	Query name	Function	Combinator	Serie	Operator	Value	
<input checked="" type="checkbox"/> On	OR	A	avg		Host	=	*megafon.ru	
<input checked="" type="checkbox"/> On	AND	B	avg		Flow volume fro	>=	800	
<input checked="" type="checkbox"/> On	OR	A	avg		Host	=	*mts.ru	

- Add "+" 3 fields
- First field — choose table "A"; Bind - "OR"; Function - "avg"; Serie Host = *megafon.com (or any other competitor ISP)
- Second field — choose table "B"; Bind "AND"; Function - "avg"; Serie Flow volume from subscriber, Pct/s >= 800



We have set a condition — the trigger will fire at least 800 packets (not an accidental but meaningful visits) from a subscriber to a competitor's site.

Error handling

No data & error handling	
If no data *	If execution error or timeout *
No data	Keep last state

- In the field "If no data" — No data
- In the field "If execution error or timeout" — Keep last state



In this configuration — if there are no errors, no data will be saved; if any, information will be saved in the form of a table containing suspicious sessions.

Actions

E-mail

- For automatic filling - click on the "</>" icon (automatic filling of the form)
- In the field "Send to" — specify email address



With this setting, when the trigger is fired, all information about the event will be sent to the specified email: ID, trigger name, status, link to the report (saved state).

Notification

- For automatic filling - click on the "</>" icon (automatic filling of the form)

- Choose the notification type — "Warning"
- With this setting, a notification will be created in the SSG

Alerts					Alerts actions				
<input type="checkbox"/> Only selected triggers					<input type="checkbox"/> Only selected notifications				
<input type="checkbox"/>	Trigger name	Type	Date	Note	<input type="checkbox"/>	Type	Date	State	<input type="checkbox"/>
	<input type="text" value="Filter"/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value="Filter"/>		<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	
<input type="checkbox"/>	Ddos	Alerting	14.08.2020 13:58:	avg(flow_vol_to_s	<input type="checkbox"/>	notification	14.08.2020 13:59:03	Complete	<input type="checkbox"/>
<input type="checkbox"/>	DDos power victo	Alerting	14.08.2020 13:58:	avg(avg_ses_lifet	<input type="checkbox"/>	notification	14.08.2020 13:58:23	Complete	<input type="checkbox"/>
<input type="checkbox"/>	Ddos	Alerting	14.08.2020 13:56:	avg(flow_vol_to_s	<input type="checkbox"/>	notification	14.08.2020 13:56:43	Complete	<input type="checkbox"/>
<input type="checkbox"/>	DDos power victo	Alerting	14.08.2020 13:55:	avg(avg_ses_lifet	<input type="checkbox"/>	notification	14.08.2020 13:56:05	Complete	<input type="checkbox"/>
<input type="checkbox"/>	Ddos	Alerting	14.08.2020 13:54:	avg(flow_vol_to_s	<input type="checkbox"/>	notification	14.08.2020 13:54:23	Complete	<input type="checkbox"/>
<input type="checkbox"/>	Ddos	Alerting	14.08.2020 13:52:	avg(flow_vol_to_s	<input type="checkbox"/>	notification	14.08.2020 13:52:22	Complete	<input type="checkbox"/>
<input type="checkbox"/>	DDos power victo	Ok	14.08.2020 13:51:	avg(avg_ses_lifet	<input type="checkbox"/>	notification	14.08.2020 13:50:25	Complete	<input type="checkbox"/>
<input type="checkbox"/>	Ddos	Alerting	14.08.2020 13:50:	avg(flow_vol_to_s					

You can get a link to the report in the notification menu

Notifications

X

☑️

📖 ▾ 🗑️ ▾

⚠️ Triggers

DDos поиск источника (8)

Ид: 8

Details
Mark as read
Delete

✅ Subscribers synchronization

Hardware: FastDPI

Success >

✅ Ssh connection

Hardware: GUI

Success: Ssh connected >

✅ Ssh connection

Hardware: Экспересурс

Success: Ssh connected >

✅ Ssh connection

Hardware: Babilon

Success: Ssh connected >

Select notification
Select — "Details"

Notifications

←

Triggers

Status

Read

Notification date

23.09.2020 23:09

Notify type

ⓘ

Warning

Notification content

DDos поиск источника (8)

Ид: 8

Триггер: DDos поиск источника

Статус: firing

Важность: information

Запросы:

A: QoETableFullflowRawTopHostsIpsWidget

Причины возникновения нотификации:

avg(avg_ses_lifetime) <= 200000 is true in query A

avg(sessions_uniq) >= 1 is true in query A

Ссылки на отчеты:

A: https://192.168.88.11/#QoEAnyReport/report_id=rMeFuKSp316vU1b

Follow the link to the report — it will open in a new tab.

HTTP

Actions

Notification × E-mail × Http × +

Method POST Url https://your_redmine_host/issues.xml?key=your_redmine_api_key On

Headers < Body >

+ 📄 </>

Name	Value	
Content-Type	application/xml	📄

```
<?xml version="1.0"?>
<issue>
  <project_id>1</project_id>
  <subject>Сработал триггер: {trigger.name}</subject>
  <priority_id>1</priority_id>
  <description>Ид: {trigger.id}
  Триггер: {trigger.name}
  Статус: {trigger.state}
  Важность: {trigger.severity}

  Запросы:
  {trigger.queries}
</issue>
```

REDMINE JSON
REDMINE XML

- For automatic filling — click on the "</>" icon (automatic filling of the form)
- Choose the method most suitable for your ticket system and enter the URL



It is important to understand: the number of established sessions, the number of incoming packets, etc. are averaged. More precise configuration should be made taking into account the specifics of your network.