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# 16 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



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		
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 * No data	If execution error or timeout * 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).

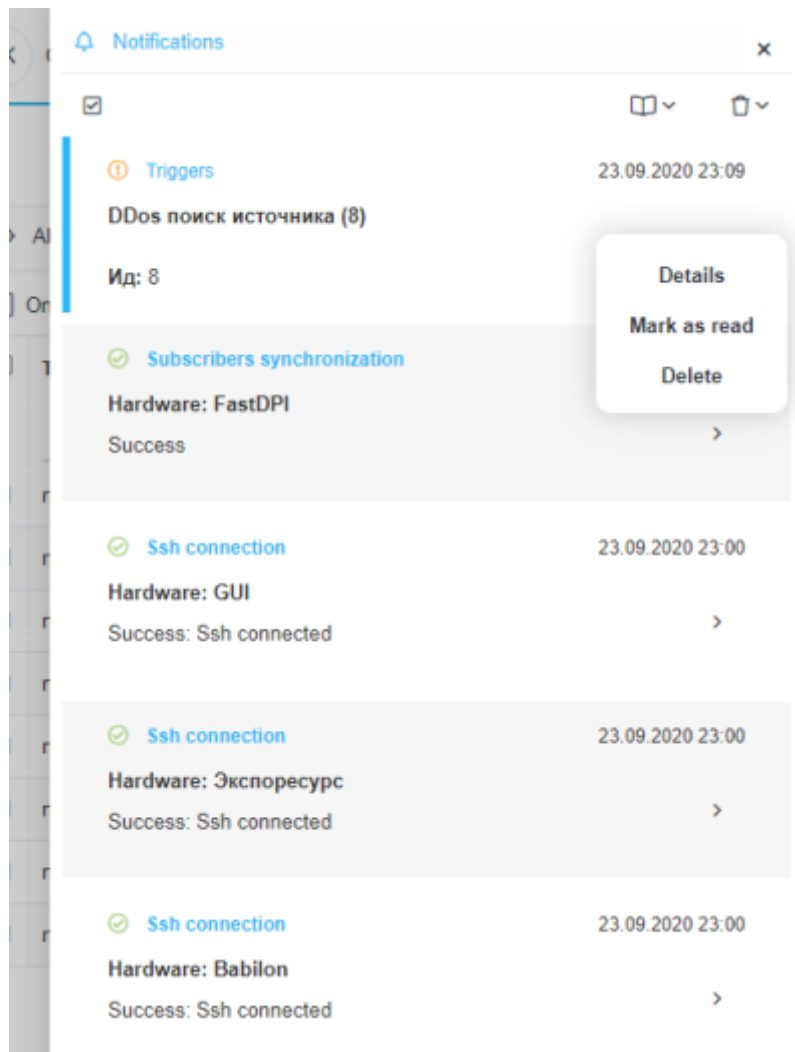
### Notification



- 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="text" value="Filter"/>					<input type="text" value="Filter"/>			
<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 по уровню истощения	Alerting	14.08.2020 13:58:	avg(avg_ses_life)	<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 по уровню истощения	Alerting	14.08.2020 13:56:	avg(avg_ses_life)	<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 по уровню истощения	Ok	14.08.2020 13:51:	avg(avg_ses_life)	<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](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](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



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			
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_lifeti		<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_lifeti		<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_lifeti		<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

Notifications

☒

Triggers
 23.09.2020 23:09

DDos поиск источника (8)
 

Ид: 8
 

Details
 Mark as read
 Delete

Subscribers synchronization
 23.09.2020 23:00

Hardware: FastDPI
 Success
 >

Ssh connection
 23.09.2020 23:00

Hardware: GUI
 Success: Ssh connected
 >

Ssh connection
 23.09.2020 23:00

Hardware: Эксперисупс
 Success: Ssh connected
 >

Ssh connection
 23.09.2020 23:00

Hardware: Babylon
 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  
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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](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.