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Detecting DDoS attacks, BotNet activity, and visits to specific resources using triggers in QoE

Triggers are used to search data in QoE Stor based on specified parameters. When a trigger fires, one of the following actions can occur:

- Notification in GUI
- HTTP action
- Email notification

Required SSG DPI options:

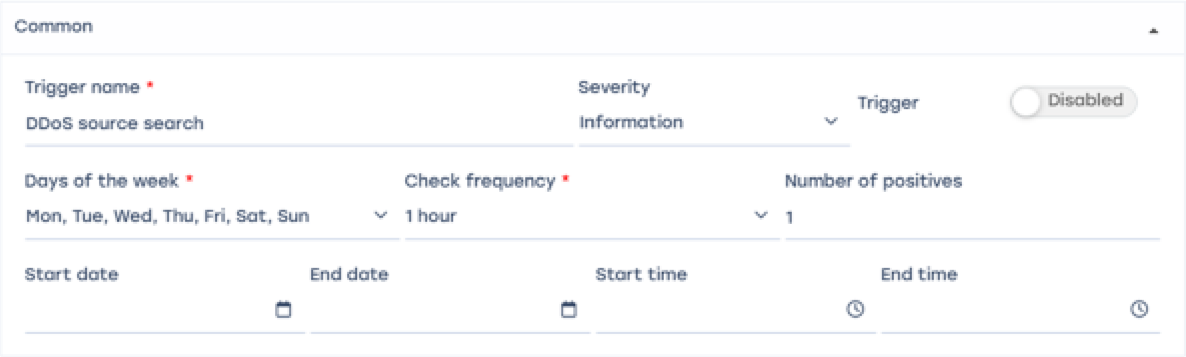
- Statistics gathering and analysis on protocols and directions
- Subscriber notifications

Required additional modules:

- DPIUI2 (GUI - Graphical User Interface)
- Implementation and administration

Example: configuring a trigger to detect the source of a Flood-type DDoS attack

General trigger information



Common

Trigger name *: DDoS source search

Severity: Information

Trigger: Disabled

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

Check frequency *: 1 hour

Number of positives: 1

Start date

End date

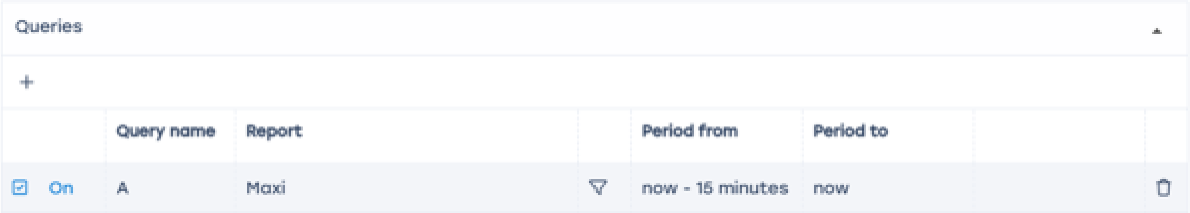
Start time

End time

Trigger name: “DDOS source detection”, days of the week – all, check frequency – 1 hour, trigger activation frequency – once, start and end times not set.

Every day, the system will perform a check every hour based on the conditions described below.

Queries



Queries

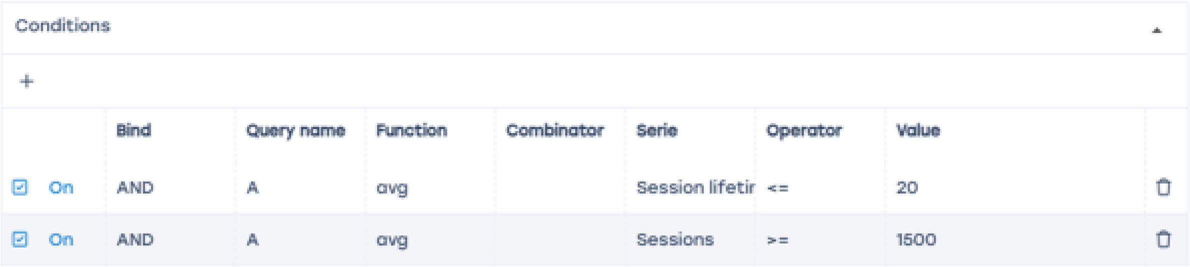
+

	Query name	Report		Period from	Period to	
☑ On	A	Maxi	▽	now - 15 minutes	now	🗑

- Add field
- Name: A
- Select table for scanning: Raw full netflow → Tables → Attacks detection → Top hosts IPs → Maxi
- Select period from “now – 15 minutes” to “now”

In this case, the system analyzes traffic for the selected page during the last 15 minutes.

Conditions



Conditions

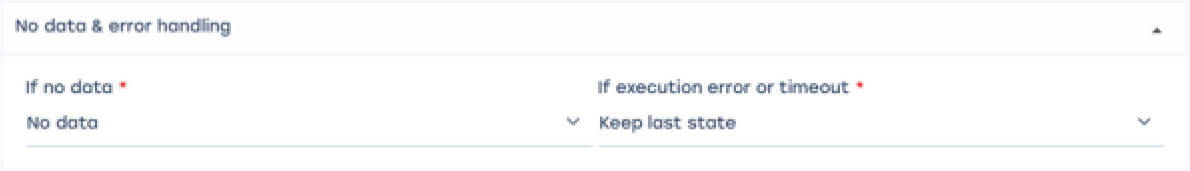
+

	Bind	Query name	Function	Combinator	Serie	Operator	Value	
☑ On	AND	A	avg		Session lifetir	<=	20	🗑
☑ On	AND	A	avg		Sessions	>=	1500	🗑

- Add two "+" fields
- Link – AND
- Function – avg
- Condition 1 – session lifetime <= 20 (ms)
- Condition 2 – number of sessions >= 1500

This means the trigger will fire if sessions with lifetimes ≤ 20ms AND more than 1500 sessions from the same IP host are detected.

Error handling



No data & error handling

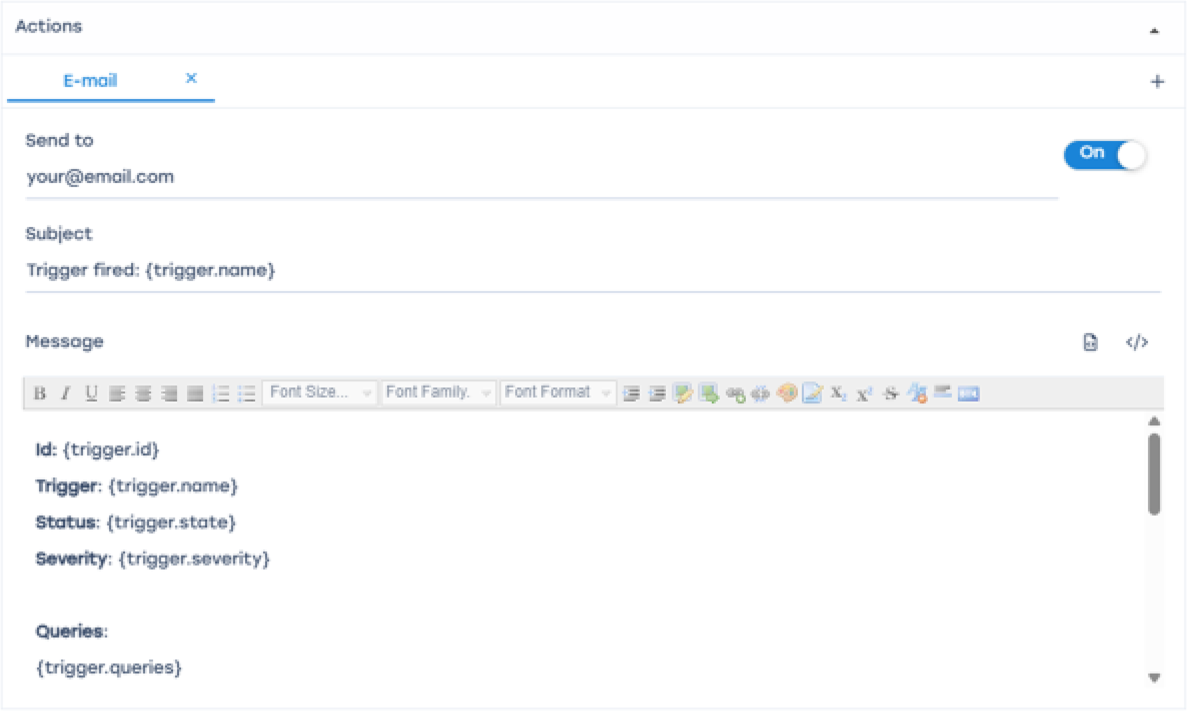
If no data *	If execution error or timeout *
No data	Keep last state

- “If no errors” — no data
- “If there is an error or timeout” — save last state

> In this configuration, no data will be saved if there are no errors, but if errors occur, information about suspicious sessions will be saved as a table.

Actions

E-mail action



Send to
your@email.com

Subject
Trigger fired: {trigger.name}

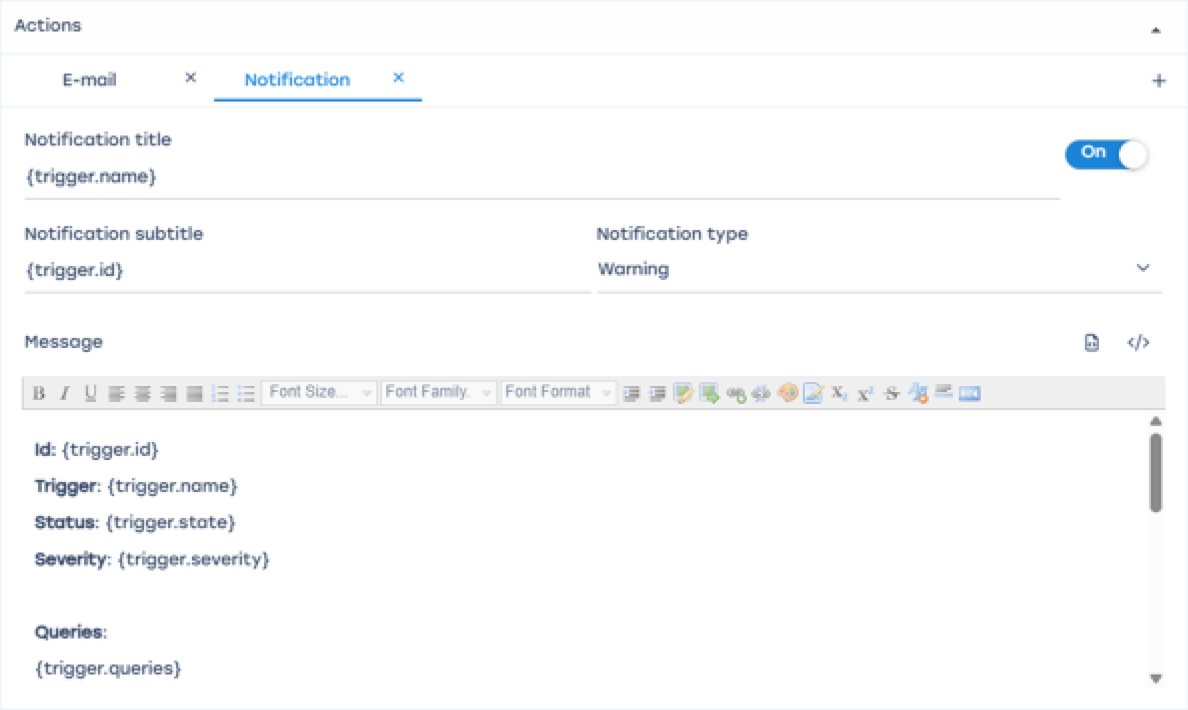
Message

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

Queries:
{trigger.queries}

- Click the "</>" icon to auto-fill the form
- Enter the recipient email address in the “To” field
- When triggered, a notification will be sent to the specified email containing the trigger ID, name, status, and report link (saved state).

Notification



Notification title: {trigger.name}

Notification subtitle: {trigger.id}

Notification type: Warning

Message:

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

Queries:
{trigger.queries}

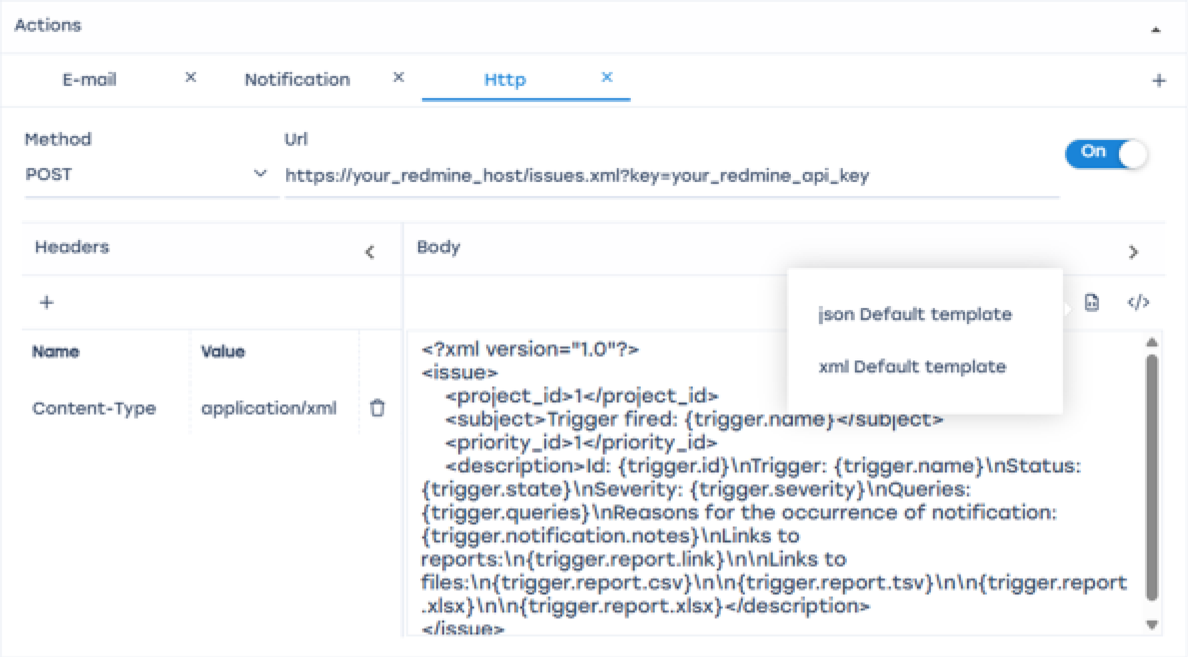
- Click "</>" to auto-fill the form
- Select notification type — “Warning”
- A notification will be created in the SSG system

The report link can be obtained from the notifications menu.

Select the notification Click **Details**

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

HTTP action



Method: POST

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

Name	Value
Content-Type	application/xml

```
<?xml version="1.0"?>
<issue>
    <project_id>1</project_id>
    <subject>Trigger fired: {trigger.name}</subject>
    <priority_id>1</priority_id>
    <description>Id: {trigger.id}\nTrigger: {trigger.name}\nStatus:
{trigger.state}\nSeverity: {trigger.severity}\nQueries:
{trigger.queries}\nReasons for the occurrence of notification:
{trigger.notification.notes}\nLinks to
reports:\n{trigger.report.link}\n\nLinks to
files:\n{trigger.report.csv}\n\n{trigger.report.tsv}\n\n{trigger.report
.xlsx}\n\n{trigger.report.xlsx}</description>
</issue>
```

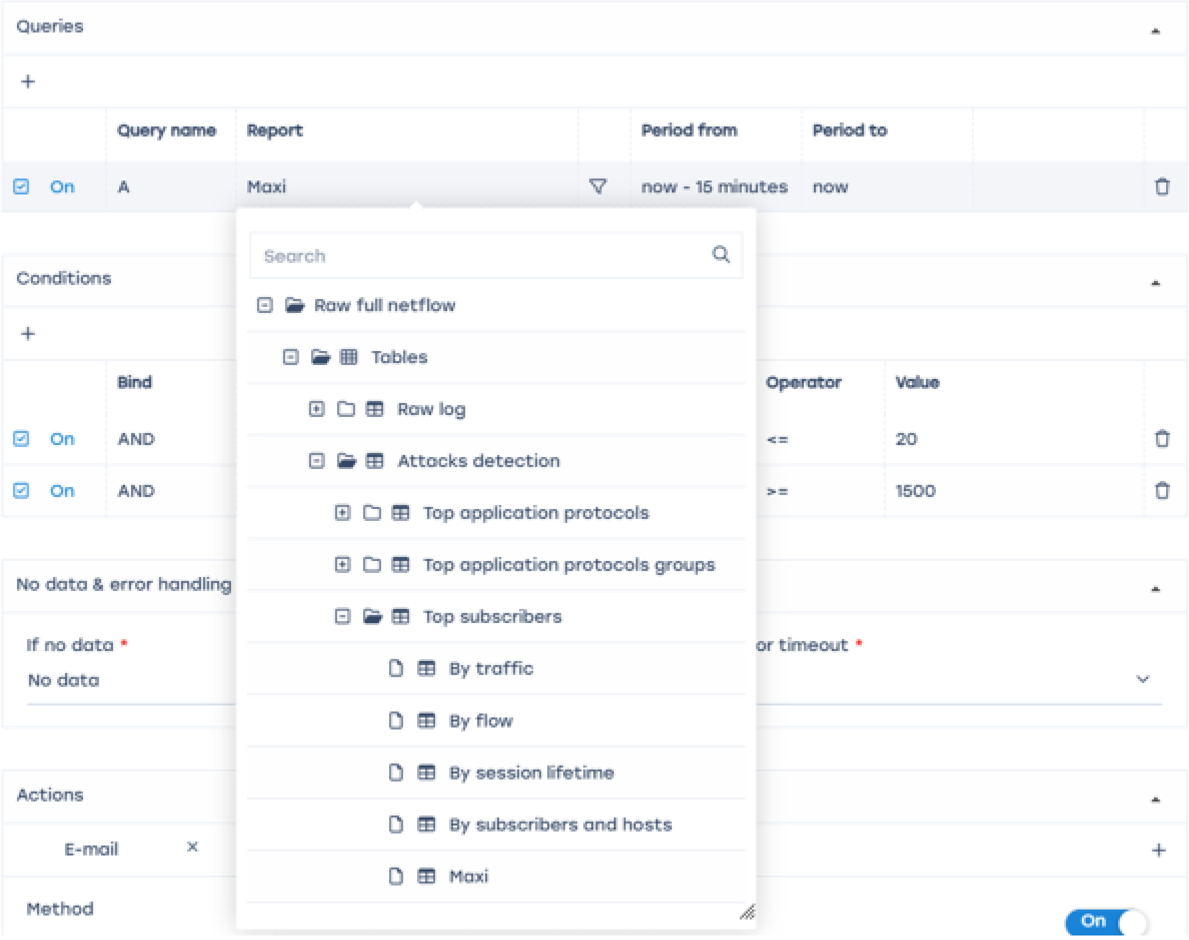
Click "</>" to auto-fill the form, select the method suitable for your ticket system, and enter the URL address.

Keep in mind — values such as session count and packet rate are averaged. Fine-tuning should be performed based on your network specifics.

Example: configuring a trigger to detect the target of a Flood-type DDoS attack

This configuration differs from the previous example in steps 2 and 3 (Queries and Conditions).

Queries



Queries

	Query name	Report	Period from	Period to
☑ On	A	Maxi	now - 15 minutes	now

Conditions

	Bind	Operator	Value
☑ On	AND	<=	20
☑ On	AND	>=	1500

No data & error handling

If no data *: No data

or timeout *

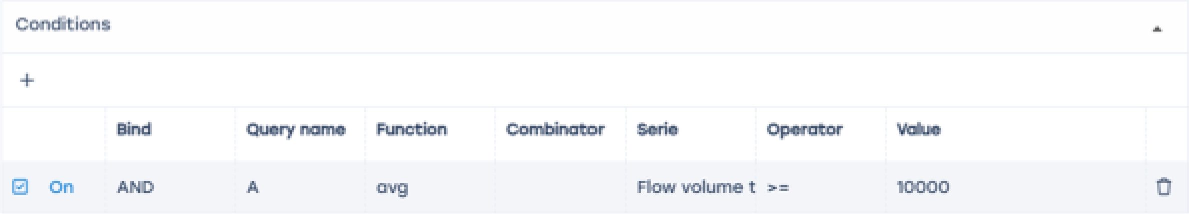
Actions

E-mail

Method: On

In the report field, select Raw full netflow → Tables → Attacks detection → Top subscribers → Maxi

Conditions



Conditions

+

	Bind	Query name	Function	Combinator	Serie	Operator	Value	
☑ On	AND	A	avg		Flow volume t	>=	10000	🗑

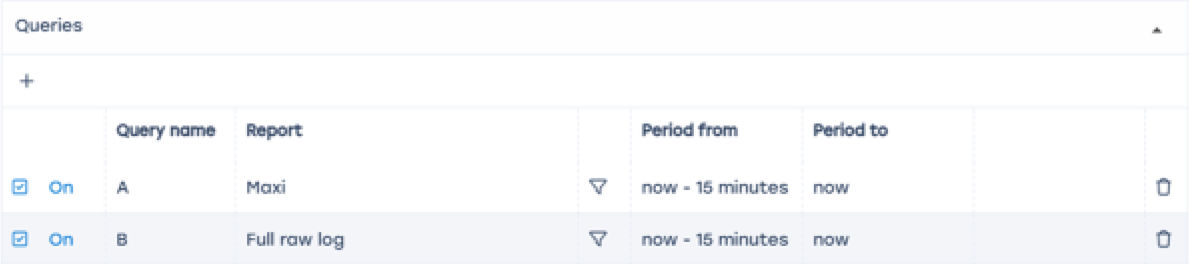
Series — “Flow volume to subscribers, Pct/s” >= 10000

Values such as session count and packet rate are averaged. Fine-tuning should be performed based on your network specifics.

BotNet analysis

This configuration differs from the previous example in steps 2 and 3 (Queries and Conditions).

Queries



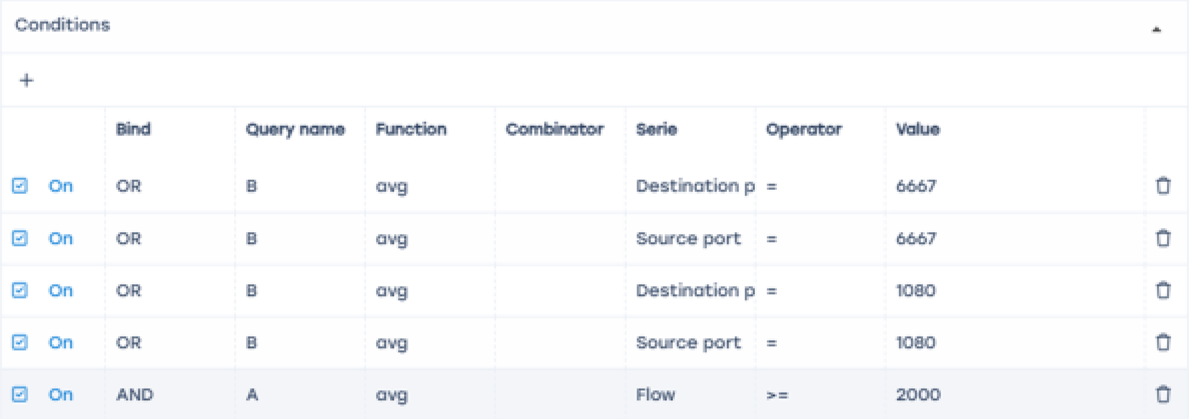
Queries

+

	Query name	Report		Period from	Period to		
☑ On	A	Maxi	▽	now - 15 minutes	now		🗑
☑ On	B	Full raw log	▽	now - 15 minutes	now		🗑

- Select Raw full netflow → Tables → Attacks detection → Top application protocols → Maxi for “A”
- Raw full network → Tables → Raw log → Full raw log for “B”

Conditions



Conditions

+

	Bind	Query name	Function	Combinator	Serie	Operator	Value	
☑ On	OR	B	avg		Destination p	=	6667	🗑
☑ On	OR	B	avg		Source port	=	6667	🗑
☑ On	OR	B	avg		Destination p	=	1080	🗑
☑ On	OR	B	avg		Source port	=	1080	🗑
☑ On	AND	A	avg		Flow	>=	2000	🗑

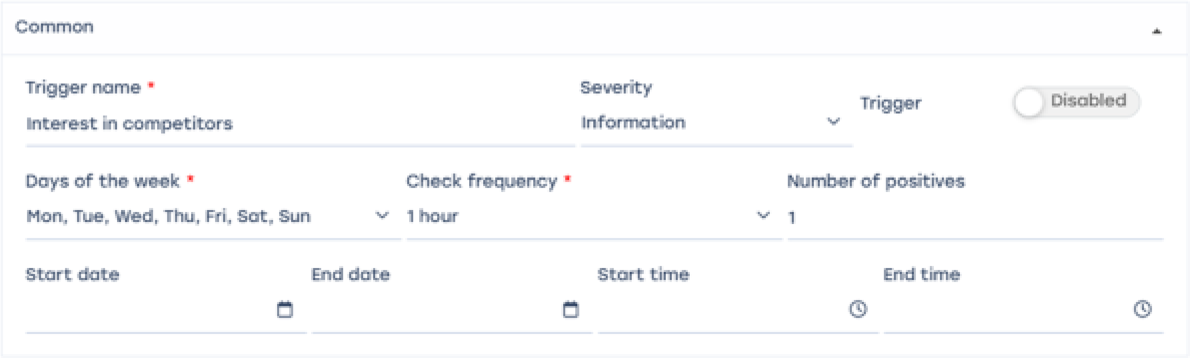
Since BotNet often uses ports 6667 and 1080 — add each destination/source port by selecting query “B” with “OR” condition, and Flow Pcts/s >= 2000.

In this configuration, the trigger will fire if on any of the ports (6667/1080) the packet rate exceeds 2000 per second.

Values such as session count and packet rate are averaged. Fine-tuning should be performed based on your network specifics.

Detecting subscriber visits to competitor resources

General trigger information



Common

Trigger name * Interest in competitors

Severity Information

Trigger Disabled

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

Check frequency * 1 hour

Number of positives 1

Start date

End date

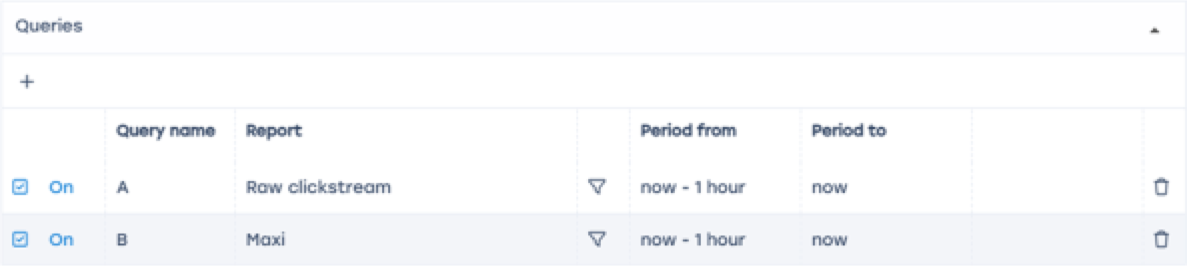
Start time

End time

Trigger name: “Interest in competitors”, days of the week – all, check frequency – 1 hour, trigger activation frequency – once, start and end times not set.

Every day, the system will perform a check every hour based on the conditions described below.

Queries



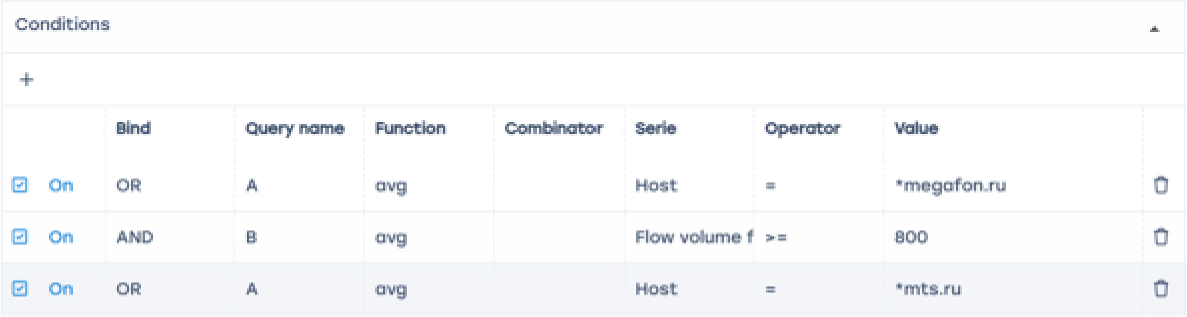
Queries

+

	Query name	Report		Period from	Period to	
☑ On	A	Raw clickstream	▽	now - 1 hour	now	🗑
☑ On	B	Maxi	▽	now - 1 hour	now	🗑

- Add “+” field
- Name A — select table: Raw clickstream → Tables → Raw clickstream
- Name B — select table: Raw full netflow → Tables → Attacks detection → Top hosts IPs → Maxi
- Select period from “now – 1 hour” to “now”
- This setup analyzes traffic hourly based on the selected tables.

Conditions



Conditions

+

	Bind	Query name	Function	Combinator	Serie	Operator	Value	
☑ On	OR	A	avg		Host	=	*megafon.ru	🗑
☑ On	AND	B	avg		Flow volume f	>=	800	🗑
☑ On	OR	A	avg		Host	=	*mts.ru	🗑

- Add 3 “+” fields
- First field — select table “A”; Link – “OR”; Function – “avg”; Series Host = *megafon.ru (or your competitor)
- Second field — select table “B”; Link – “AND”; Function – “avg”; Series Flow volume from subscriber, Pct/s >= 800

The trigger will fire if at least 800 packets (indicating a meaningful visit) from a subscriber to a competitor’s website are detected.

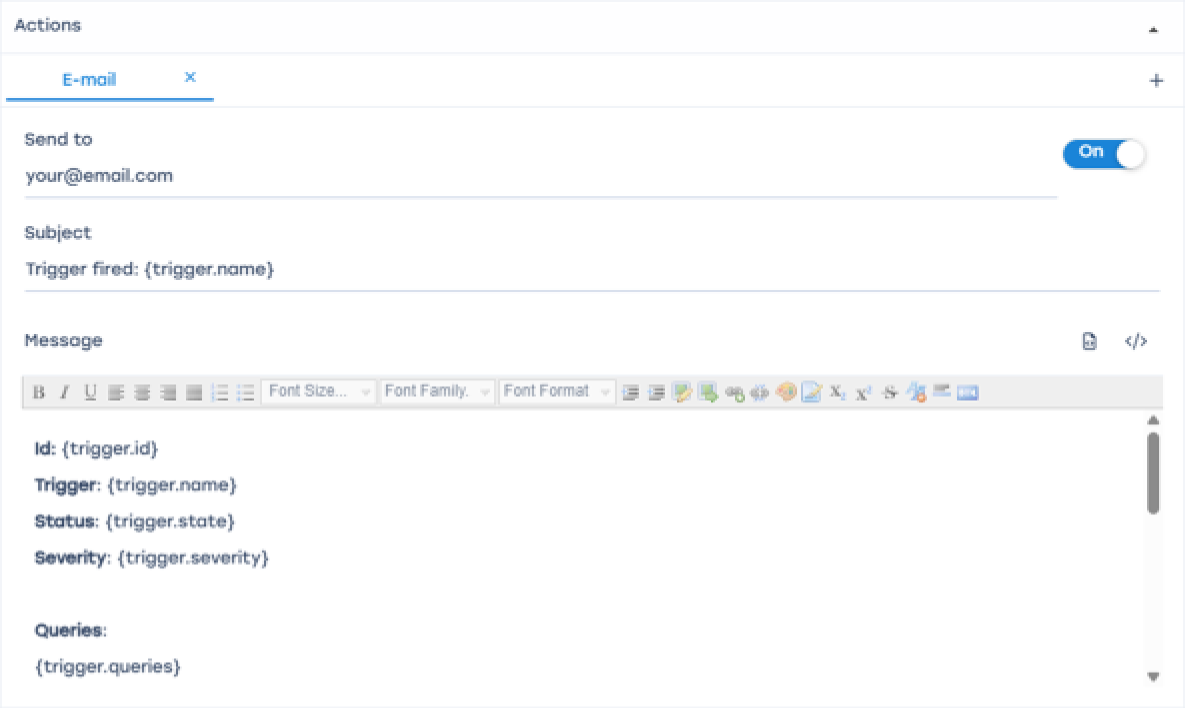
Error handling

- “If no errors” — no data
- “If there is an error or timeout” — save last state

In this configuration, no data will be saved if there are no errors, but if errors occur, information about suspicious sessions will be saved as a table.

Actions

E-mail action



Send to
your@email.com

Subject
Trigger fired: {trigger.name}

Message

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

Queries:
{trigger.queries}

- Click to auto-fill the form
- Enter recipient email address in “To” field

When triggered, an email containing notification details — ID, trigger name, status, and report link (saved state) — will be sent to the specified address.

Notification

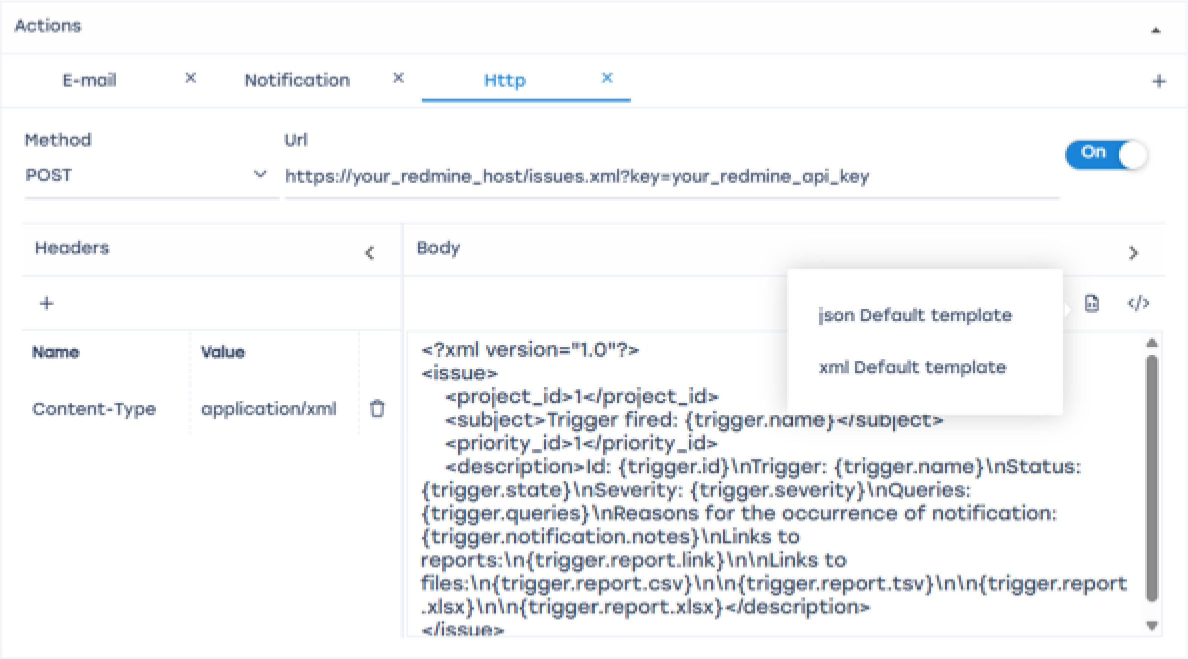
- Click "</>" to auto-fill the form
- Select notification type — “Warning”
- A notification will be created in the SSG system

The report link can be obtained from the notifications menu.

Select the notification Click **Details**

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

HTTP action



Method: POST

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

Name	Value
Content-Type	application/xml

```
<?xml version="1.0"?>
<issue>
   <project_id>1</project_id>
   <subject>Trigger fired: {trigger.name}</subject>
   <priority_id>1</priority_id>
   <description>Id: {trigger.id}\nTrigger: {trigger.name}\nStatus:
{trigger.state}\nSeverity: {trigger.severity}\nQueries:
{trigger.queries}\nReasons for the occurrence of notification:
{trigger.notification.notes}\nLinks to
reports:\n{trigger.report.link}\n\nLinks to
files:\n{trigger.report.csv}\n\n{trigger.report.tsv}\n\n{trigger.report
.xlsx}\n\n{trigger.report.xlsx}</description>
</issue>
```

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

Keep in mind — values such as session count and packet rate are averaged. Fine-tuning should be performed based on your network specifics.