

# Building Your Own Workflows in MISP

Tutorial and Hands-On

Sami Mokaddem & Alexandre Dulaunoy

MISP Project


<https://www.misp-project.org/>





**Sami Mokaddem**

mokaddem

 @mokaddem\_sami



**Alexandre Dulaunoy**

adulau

 @adulau

 @adulau@infosec.exchange





## MISP API / PyMISP

- Needs CRON Jobs in place
- Potentially heavy for the server
- Not realtime



## PubSub channels

- After the actions happen: No feedback to MISP
  - Tougher to put in place & to share
  - Full integration amounts to develop a new tool
- No way to **prevent** behavior
- Difficult to setup **hooks** to execute callbacks

# WHAT TYPE OF USE-CASES ARE WE TRYING TO SUPPORT?

- **Prevent** default MISP behaviors to happen
  - ▶ Prevent **publication of events** not passing sanity checks
  - ▶ Prevent **querying** thrid-party **services** with sensitive information
  - ▶ ...
  
- **Hook** specific actions to run callbacks
  - ▶ **Automatically run** enrichment services
  - ▶ Modify data on-the-fly: False positives, enable CTI-Pipeline
  - ▶ Send notifications in a chat rooms
  - ▶ ...



## ■ Why?

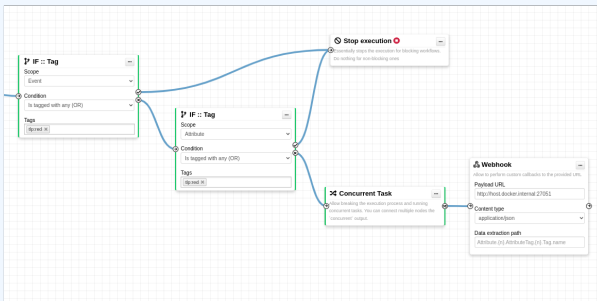
- ▶ Everyone loves **simple automation**
- ▶ **Visual** dataflow programming
- ▶ Users want **more control**

## ■ How?

- ▶ **Drag & Drop** editor
- ▶ Prevent actions **before they happen**
- ▶ Flexible **Plug & Play** system
- ▶ **Share** workflows, **debug** and **replay**

# CONTENT OF THE PRESENTATION

- MISP Workflows fundamentals
- Demo with examples
- Using the system
- How it can be extended

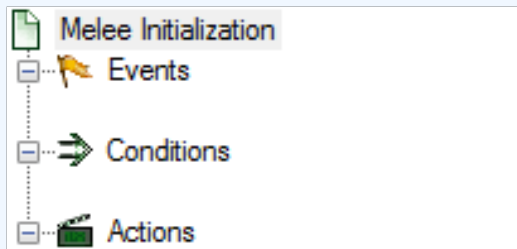


# WORKFLOW - FUNDAMENTALS

**Objective:** Start with the foundation to understand the basics



# HOW DOES IT WORK




1. An **event** happens in MISP
2. Check if all **conditions** are satisfied
3. Execute all **actions**
  - ▶ May prevent MISP to complete its original event



## Events

- New MISP Event
- Attribute has been saved
- New discussion post
- New user created
- Query against third-party services
- ...

 Supported events in MISP are called **Triggers**

 A **Trigger** is associated with **1-and-only-1 Workflow**

# TRIGGERS CURRENTLY AVAILABLE

Currently 10 triggers can be hooked. 3 being 🛑 Blocking.

## 🚩 Triggers

List the available triggers that can be listened to by workflows.

Missing a trigger? Feel free to open a [GitHub issue!](#)

[📄 Documentation and concepts](#)

« previous   next »

All attribute event object others post user Blocking Enabled Disabled

Trigger name	Scope	Trigger overhead	Run counter	Blocking Workflow	MISP Core format	Workflow ID	Last Update	Debug enabled	Enabled	Actions
🔗 Attribute After Save	attribute	high <span>?</span>	83	×	✓	160	2022-08-03 09:00:41	<input type="checkbox"/>	×	▶ ⏪ ⏩ ⏹
✳️ Enrichment Before Query	others	low	1154	✓	✓	162	2022-10-17 12:35:57	<input type="checkbox"/>	✓	▶ ⏪ ⏩ ⏹
📧 Event After Save	event	high <span>?</span>	49	×	✓	175	2022-10-14 13:32:01	<input type="checkbox"/>	✓	▶ ⏪ ⏩ ⏹
📧 Event After Save New	event	low	5	×	✓	182	2022-10-17 09:12:14	<input checked="" type="checkbox"/>	✓	▶ ⏪ ⏩ ⏹
📧 Event After Save New From Pull	event	low	6	×	✓	183	2022-10-17 09:01:36	<input checked="" type="checkbox"/>	✓	▶ ⏪ ⏩ ⏹
👤 Event Publish	event	low	126	✓	✓	180	2022-10-13 10:42:53	<input checked="" type="checkbox"/>	✓	▶ ⏪ ⏩ ⏹
🔗 Object After Save	object	high <span>?</span>	35	×	✓	161	2022-08-05 07:12:52	<input type="checkbox"/>	×	▶ ⏪ ⏩ ⏹
📧 Post After Save	post	low	36	×	×	176	2022-07-28 13:59:51	<input type="checkbox"/>	×	▶ ⏪ ⏩ ⏹
👤 User After Save	user	low	0	×	×	181	2022-08-05 07:19:46	<input type="checkbox"/>	×	▶ ⏪ ⏩ ⏹
👤 User Before Save	user	low	42	✓	×	158	2022-07-28 14:00:32	<input type="checkbox"/>	×	▶ ⏪ ⏩ ⏹

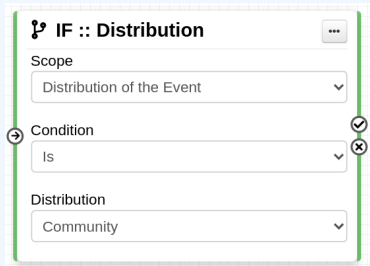
Page 1 of 1, showing 1 records out of 10 total, starting on record 1, ending on 10

# WHAT KIND OF CONDITIONS?

## ⇒ Conditions

- A MISP Event is tagged with `tlp:red`
- The distribution of an Attribute is a sharing group
- The creator organisation is `circ1.lu`
- Or any other **generic** conditions

? These are also called **Logic modules**



The screenshot shows a configuration window for a logic module named "IF :: Distribution". It contains three dropdown menus:

- Scope:** Set to "Distribution of the Event".
- Condition:** Set to "Is".
- Distribution:** Set to "Community".

There are also small icons for adding, deleting, and confirming the module.

# WORKFLOW - LOGIC MODULES

- ➔ **logic** modules: Allow to redirect the execution flow.
  - ▶ IF conditions
  - ▶ Delay execution

All Action Logic misp-module Custom Blocking Enabled Disabled		Enter value to search						Filter X
<input type="checkbox"/>	Module name	Type	Blocking	MISP Core format	misp-module	Custom	Enabled	Actions
<input type="checkbox"/>	🏗️ Blueprint logic module	logic	x	x	x	✓	x	▶👁️
<input type="checkbox"/>	🔄 Concurrent Task	logic	x	x	x	x	✓	■👁️
<input type="checkbox"/>	🔗 IF :: Distribution	logic	x	✓	x	x	✓	■👁️
<input type="checkbox"/>	⚙️ Filter :: Generic	logic	x	x	x	x	x	▶👁️
<input type="checkbox"/>	🗑️ Filter :: Remove filter	logic	x	x	x	x	x	▶👁️
<input type="checkbox"/>	🔗 IF :: Generic	logic	x	x	x	x	✓	■👁️
<input type="checkbox"/>	🔗 IF :: Organisation	logic	x	✓	x	x	✓	■👁️
<input type="checkbox"/>	🔗 IF :: Published	logic	x	✓	x	x	✓	■👁️
<input type="checkbox"/>	🔗 IF :: Tag	logic	x	✓	x	x	✓	■👁️
<input type="checkbox"/>	🔗 IF :: Threat Level	logic	x	x	x	x	x	▶👁️

# WHAT KIND OF ACTIONS?




## Actions

- Send an email notification
- Perform enrichments
- Send a chat message on MS Teams
- Attach a local tag
- ...

? These are also called **Action modules**

The screenshot shows a configuration window for a 'Send Mail' action. At the top, there is a title bar with an envelope icon, the text 'Send Mail', and a three-dot menu icon. Below the title bar, a subtitle reads 'Allow to send a Mail to a list or recipients'. The main configuration area contains three sections: 'Recipients' with a text input field containing 'All accounts' and a close button (x); 'Mail template subject' with a text input field containing 'I'm the mail subject!'; and 'Mail template body' with a text input field containing 'And I'm the body!'. Each section has a circular arrow icon on its left and right sides, indicating that the sections can be reordered.

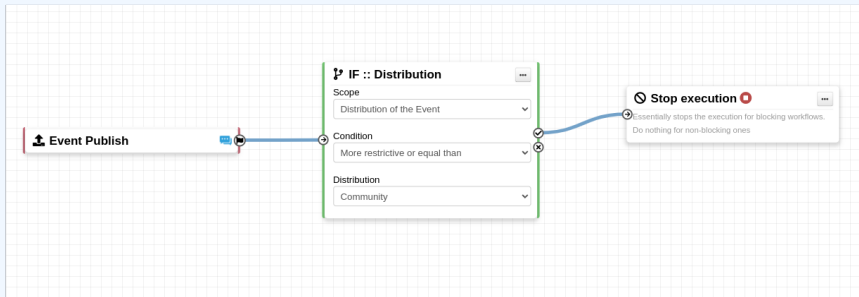
# WORKFLOW - ACTION MODULES

-  **action** modules: Allow to executes operations
  - ▶ Tag operations
  - ▶ Send notifications
  - ▶ Webhooks & Custom scripts

All <b>Action</b> Logic misp-module Custom Blocking Enabled Disabled							Enter value to search	Filter X
<input type="checkbox"/>	Module name	Type	Blocking	MISP Core format	misp-module	Custom	Enabled	Actions
<input type="checkbox"/>	* Attach enrichment	action	x	✓	x	x	✓	■ 🔗
<input type="checkbox"/>	📄 Attribute edition operation	action	x	✓	x	x	✓	■ 🔗
<input type="checkbox"/>	📄 Attribute IDS Flag operation	action	x	✓	x	x	✓	■ 🔗
<input type="checkbox"/>	🏗️ Blueprint action module	action	x	x	x	✓	✓	■ 🔗
<input type="checkbox"/>	* Enrich Event	action	x	✓	x	x	✓	■ 🔗
<input type="checkbox"/>	📌 mattermost	action	x	x	✓	x	✓	■ 🔗
<input type="checkbox"/>	🗣️ MS Teams Webhook	action	x	x	x	x	✓	■ 🔗
<input type="checkbox"/>	🔗 Push to ZMQ	action	x	x	x	x	✓	■ 🔗
<input type="checkbox"/>	✉️ Send Log Mail	action	x	x	x	x	x	▶ 🔗
<input type="checkbox"/>	✉️ Send Mail	action	x	x	x	x	✓	■ 🔗
<input type="checkbox"/>	> Splunk HEC export	action	x	✓	x	x	x	▶ 🔗
<input type="checkbox"/>	🛑 Stop execution	action	✓	x	x	x	✓	■ 🔗
<input type="checkbox"/>	🏷️ Tag operation	action	x	✓	x	x	✓	■ 🔗
<input type="checkbox"/>	📌 testaction	action	x	x	✓	x	✓	■ 🔗
<input type="checkbox"/>	🔗 Webhook	action	x	x	x	x	✓	■ 🔗

# WHAT IS A MISP WORKFLOW?

- Sequence of all nodes to be executed in a specific order
- Workflows can be enabled / disabled
- A Workflow is associated to **1-and-only-1 trigger**



# WORKFLOW EXECUTION FOR EVENT PUBLISH



An Event is about to be published

- ▶ The workflow for the event-publish trigger starts



Conditions are evaluated

- ▶ They might change the path taken during the execution



Actions are executed

- ▶ **success**: Continue the publishing action

```
execute_workflow Finished executing workflow for trigger `event-publish` (180). Outcome: success
```

- ▶ **failure** | **blocked**: Stop publishing and log the reason

```
execute_workflow Execution stopped.
```

```
Node `stop-execution` (8) from Workflow `Workflow for trigger event-publish` (180) returned the following error: Execution stopped
```



# BLOCKING AND NON-BLOCKING

Two types of workflows:

## ❑ Blocking Workflows

- ▶ Can prevent / block the original event to happen
- ▶ If a **blocking module** ❑ blocks the action

## ✅ Non blocking Workflows execution outcome has no impact

- ▶ No way to prevent something that happened in the past



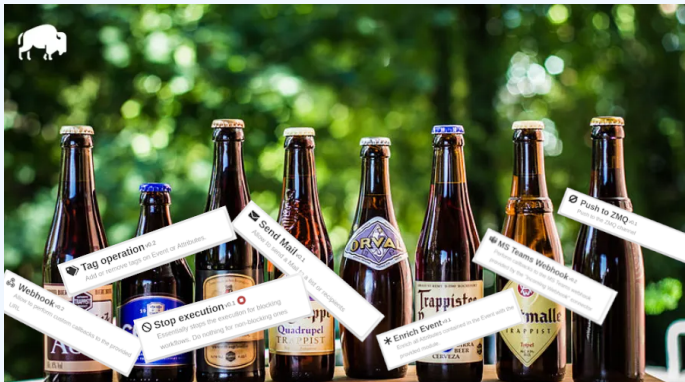
Currently 36 built-in modules.

- **Trigger** module (11): built-in **only**
  - ▶ Get in touch if you want more
- **Logic** module (10): built-in & **custom**
- **Action** module (15): built-in & **custom**

# SOURCES OF WORKFLOW MODULES (1)

## ■ Built-in **default** modules

- ▶ Part of the MISP codebase
- ▶ Get in touch if you want us to increase the selection (or merge PR!)



# SOURCES OF WORKFLOW MODULES (2)

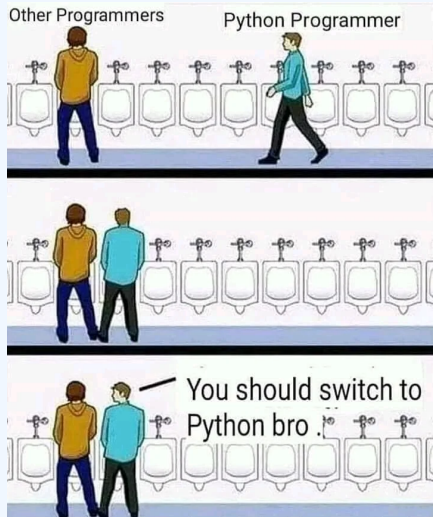
## User-defined **custom** modules

- Written in PHP
- Extend existing modules
- MISP code reuse



# SOURCES OF WORKFLOW MODULES (3)

Modules from the `misp-module`  enrichment service



- Written in Python
- Can use any python libraries
- Plug & Play

WF-1. Send an email to **all** when a new event has been pulled

WF-2. Block queries on 3rd party services when **tlp:red** or **PAP:red**

- ▶ **tlp:red**: For the eyes and ears of individual recipients only
- ▶ **PAP:RED**: Only passive actions that are not detectable from the outside

# WORKFLOW - GETTING STARTED

**Objective:** How to install & configure workflows



## 2.4.160 Epic summer release

 **iglocska** released this 08 Aug 2022  v2.4.160   71d4e2c 

1. Update your MISP server
2. Update all your sub-modules





# GETTING STARTED WITH WORKFLOWS (2)

Review MISP settings:

1. Make sure `MISP.background_jobs` is turned on
2. Make sure workers are up-and-running and healthy
3. Turn the setting `Plugin.Workflow_enable` on

Overview	MISP settings (20 ▲)	Encryption settings (7 ▲)	Proxy settings (5)	Security settings (8 ▲)	Plugin settings (465 ▲)	SimpleBackgroundJobs settings (11 ▲)	Diagnos
Enrichment	<input type="text" value="Filter the table(s) below"/>						
Import							
Export							
Action							
Cortex							
Sightings							
<u>Workflow</u>							
Recommended	Plugin.Workflow_enable	true	Enable/disable workflow feature				

# GETTING STARTED WITH WORKFLOWS (3)

Review MISP settings:

4. [optional:misp-module] Turn the setting `Plugin.Action_services_enable` on

Overview MISP settings (20 ▲) Encryption settings (7 ▲) Proxy settings (5) Security settings (8 ▲) **Plugin settings (465 ▲)** SimpleBackgroundJobs settings (11 ▲) Diagnostics

Enrichment

Import

Export

Action

Critical	Plugin.Action_services_enable	true	Enable/disable the action services	
Recommended	Plugin.Action_services_url	http://host.docker.internal	The url used to access the action services. By default, it is accessible at http://127.0.0.1:6666	
Recommended	Plugin.Action_services_port	6677	The port used to access the action services. By default, it is accessible at 127.0.0.1:6666	
Recommended	Plugin.Action_timeout	10	Set a timeout for the action services	Value not set.

If you wish to use action modules from `misp-module`, make sure to have:

- The latest update of `misp-module`
  - ▶ There should be an `action_mod` module type in `misp-modules/misp_modules/modules`
- Restarted your `misp-module` application

---

```
1 # This command should show all 'action' modules
2 $ curl -s http://127.0.0.1:6666/modules | \
3 jq '.[] | select(.meta."module-type"[] | contains("action")) |
4 {name: .name, version: .meta.version}'
```

---

Everything is ready?

Let's see how to build a workflow!



1. Prevent event publication if **tlp:red** tag
2. Send a mail to `admin@admin.test` about potential data leak
3. Otherwise, send a notification on **Mattermost, MS Teams, Telegram, ...**

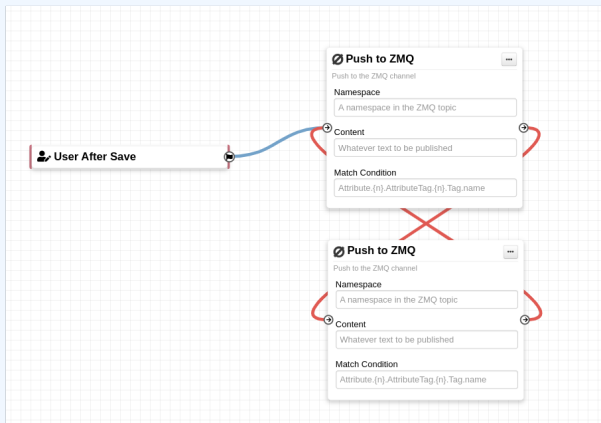
# CONSIDERATIONS WHEN WORKING WITH WORKFLOWS

**Objective:** Overview of some common pitfalls

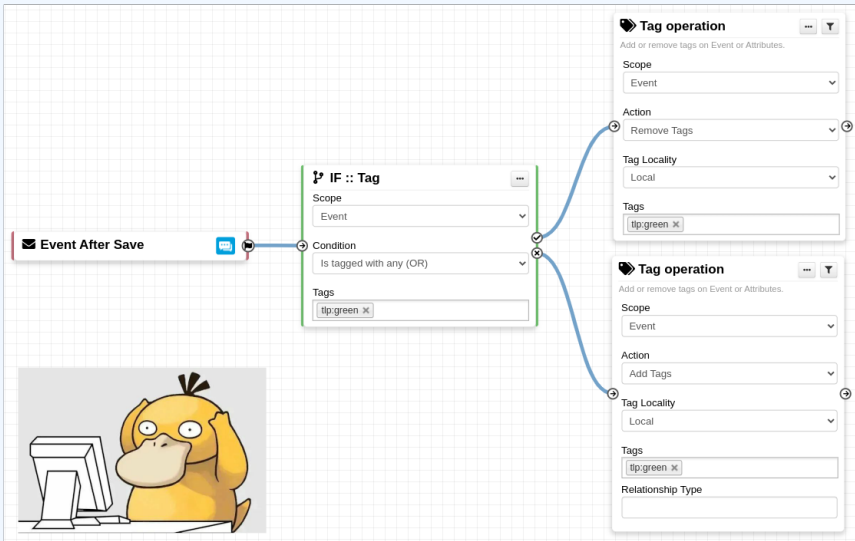


# WORKING WITH THE EDITOR - OPERATIONS NOT ALLOWED

Execution loop are not authorized



# RECURSIVE WORKFLOWS

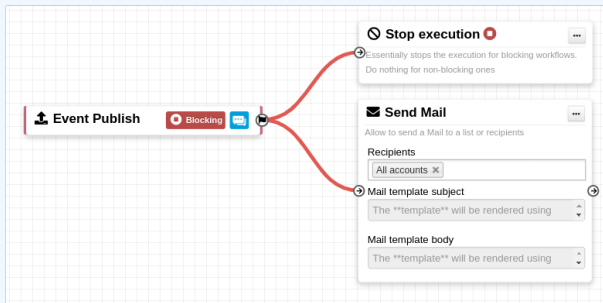


⚠ Recursion: If an action re-run the workflow





# WORKING WITH THE EDITOR - OPERATIONS NOT ALLOWED

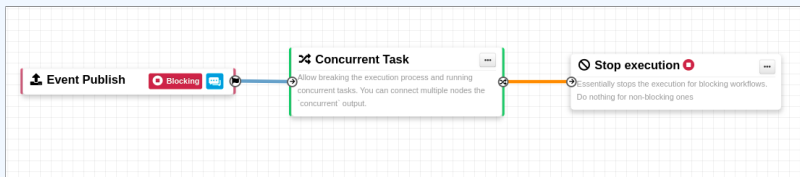
## Multiple connections from the same output



- Execution order not guaranteed
- Confusing for users

Cases showing a warning:

- **Blocking** modules  in a  **Non blocking** workflow 
- **Blocking** modules  after a **concurrent tasks** module



# ADVANCED USAGE

**Objective:** Overview of Blueprints, Data format and Filtering




1. Blueprints allow to **re-use parts** of a workflow in another one
2. Blueprints can be saved, exported and **shared**

### Debugging webhook v1656059209

9ff210dd-ee7e-49c8-a5af-10cd42cdadb6

Default: ✕

Blueprint Content: **1 node**

 1

Webhook module pre-configured for debugging purposes

Blueprints sources:



1. Created or imported by users
2. From the MISP/misp-workflow-blueprints repository<sup>1</sup>

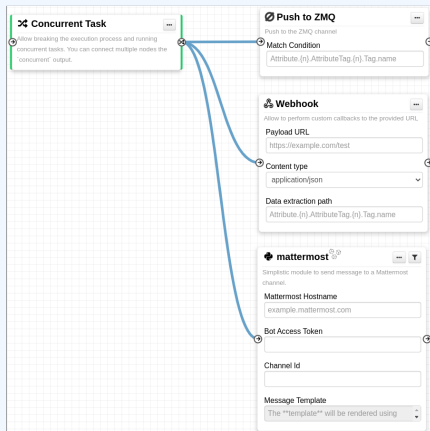
<sup>1</sup><https://github.com/MISP/misp-workflow-blueprints>

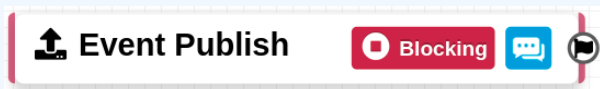
Currently, 4 blueprints available:

- Attach the `tlp:clear` tag on elements having the `tlp:white` tag
- Block actions if any attributes have the `PAP:RED` or `tlp:red` tag
- Disable `to_ids` flag for existing hash in *hashlookup*
- Set tag based on *BGP Ranking* maliciousness level

# LOGIC MODULE: CONCURRENT TASK

- Logic module allowing **multiple output** connections
- **Postpone the execution** for remaining modules
- Convert  **Blocking** →  **Non blocking**





- In most cases, the format is the **MISP Core format**
  - ▶ Attributes are **always encapsulated** in the Event or Object
- But has **additional properties**
  - ▶ Additional key **\_AttributeFlattened**
  - ▶ Additional key **\_allTags**
  - ▶ Additional key **inherited** for Tags

# HASH PATH FILTERING (1)

Filtering and checking conditions using hash path expression.

```
1 $path_expression = '{n}[name=fred].id';
2 $users = [
3     {'id': 123, 'name': 'fred', 'surname': 'bloggs'},
4     {'id': 245, 'name': 'fred', 'surname': 'smith'},
5     {'id': 356, 'name': 'joe', 'surname': 'smith'},
6 ];
7 $ids = Hash::extract($users, $path_expression);
8 // => $ids will be [123, 245]
```

```
{
  "Attribute": [
    {
      "type": "domain",
      "value": "cti-summit.org",
      "Tag": [
        {
          "name": "t1p:red",
          "colour": "#CC0033"
        }
      ]
    }
  ]
}
```

The screenshot shows a configuration window titled "IF :: Generic". It contains three input fields:

- Value:** t1p:red
- Operator:** In (with a dropdown arrow and a close button)
- Hash path:** Attribute.{n}.Tag.{n}.name



## HASH PATH FILTERING (2)

Hash path filtering can be used to **filter** data **on the node** it is passed to or on the **execution path**.

### Node Filtering

Element selector

Value

Operator

Hash Path

### Filter :: Generic

Generic data filtering block. The module filters incoming data and forward the matching data to its output.

Filtering Label

Data selector

Value

Operator

Hash path

# HASH PATH FILTERING - EXAMPLE

```
1 {
2   "Event": {
3     "uuid": ...
4     "timestamp": ...
5     "distribution": 1,
6     "published": false,
7     "Attribute": [
8       {
9         "type": "ip-src",
10        "value": "8.8.8.8", ...
11      },
12      {
13        "type": "domain",
14        "value": "misp-project.org", ...
15      }
16    ],
17    ...
18  }
19 }
```

1. Access Event distribution
  - ▶ Event.distribution

# HASH PATH FILTERING - EXERCISE (1)

```
1 {
2   "Event": {
3     "uuid": ...
4     "distribution": 1,
5     "published": false,
6     "Attribute": [
7       {
8         "type": "ip-src",
9         "value": "8.8.8.8", ...
10      },
11      {
12        "type": "domain",
13        "value": "misp-project.org", ...
14      }
15    ],
16    ...
17  }
18 }
```

## 2. Access Event published state

# HASH PATH FILTERING - EXERCISE (1)

```
1 {
2   "Event": {
3     "uuid": ...
4     "distribution": 1,
5     "published": false,
6     "Attribute": [
7       {
8         "type": "ip-src",
9         "value": "8.8.8.8", ...
10      },
11      {
12        "type": "domain",
13        "value": "misp-project.org", ...
14      }
15    ],
16    ...
17  }
18 }
```

## 2. Access Event published state

- ▶ `Event.published`

## HASH PATH FILTERING - EXERCISE (2)

```
1 {
2   "Event": {
3     "uuid": ...
4     "distribution": 1,
5     "published": false,
6     "Attribute": [
7       {
8         "type": "ip-src",
9         "value": "8.8.8.8", ...
10      },
11      {
12        "type": "domain",
13        "value": "misp-project.org", ...
14      }
15    ],
16    ...
17  }
18 }
```

### 3. Access all Attribute types

- ▶ Hint: Use `{n}` to loop

## HASH PATH FILTERING - EXERCISE (2)

```
1 {
2   "Event": {
3     "uuid": ...
4     "distribution": 1,
5     "published": false,
6     "Attribute": [
7       {
8         "type": "ip-src",
9         "value": "8.8.8.8", ...
10      },
11      {
12        "type": "domain",
13        "value": "misp-project.org", ...
14      }
15    ],
16    ...
17  }
18 }
```

### 3. Access all Attribute types

- ▶ Hint: Use `{n}` to loop
- ▶ `Event.Attribute.{n}.type`

## HASH PATH FILTERING - EXERCISE (3)

```
1 {
2   "Event": {
3     "Attribute": [
4       {
5         "type": "ip-src",
6         "value": "8.8.8.8",
7         "Tag": [
8           {
9             "name": "PAP:AMBER", ...
10          }
11        ], ...
12      }
13    ],
14    ...
15  }
16 }
```

### 3. Access all Tags attached to Attributes

## HASH PATH FILTERING - EXERCISE (3)

```
1 {
2   "Event": {
3     "Attribute": [
4       {
5         "type": "ip-src",
6         "value": "8.8.8.8",
7         "Tag": [
8           {
9             "name": "PAP:AMBER", ...
10          }
11        ], ...
12      }
13    ],
14    ...
15  }
16 }
```

### 3. Access all Tags attached to Attributes

- ▶ `Event.Attribute.{n}.Tag.{n}.name`



## HASH PATH FILTERING - EXERCISE (4)

```
1 {
2   "Event": {
3     "Tag": [
4       {
5         "name": "tlp:green", ...
6       }
7     ], ...
8     "Attribute": [
9       {
10        "value": "8.8.8.8",
11        "Tag": [
12          {
13            "name": "PAP:AMBER", ...
14          }
15        ], ...
16      }
17    ],
18  }
19 }
```

4. Access all Tags attached to Attributes and from the Event

# HASH PATH FILTERING - EXERCISE (4)

```
1 {
2   "Event": {
3     "Tag": [
4       {
5         "name": "tlp:green", ...
6       }
7     ], ...
8     "Attribute": [
9       {
10        "value": "8.8.8.8",
11        "Tag": [
12          {
13            "name": "PAP:AMBER", ...
14          }
15        ], ...
16      }
17    ],
18  }
19 }
```

## 4. Access all Tags attached to Attributes and from the Event

- ▶ `Event.Attribute.{n}._allTags.{n}.name`

## HASH PATH FILTERING - EXERCISE (4)

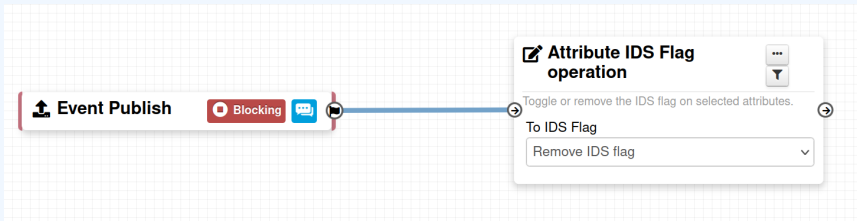
```
1 {
2   "Event": {
3     "Tag": [...],
4     "Attribute": [
5       {
6         "value": "8.8.8.8",
7         "_allTags": [
8           {
9             "name": "tlp:green",
10            "inherited": true, ...
11          },
12          {
13            "name": "PAP:AMBER",
14            "inherited": false, ...
15          }
16        ],
17      }
18    ...
19  }
```

### 4. Access all Tags attached to Attributes and from the Event

- ▶ `Event.Attribute.{n}._allTags.{n}.name`

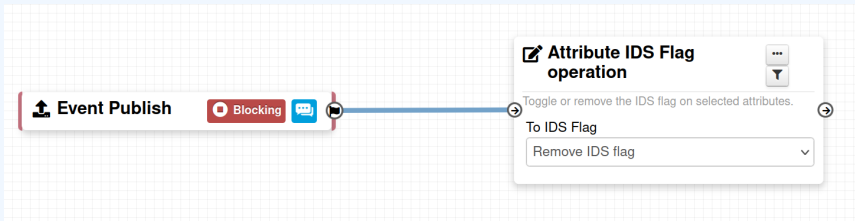
# FILTERING DATA ON WHICH TO APPLY A MODULE

What happens when an Event is about to be published?



# FILTERING DATA ON WHICH TO APPLY A MODULE

What happens when an Event is about to be published?

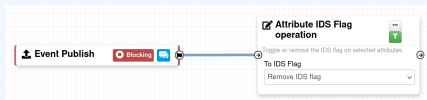


All Attributes get their `to_ids` turned off.

How could we force that action only on Attribute of type comment?

→ Hash path filtering!

# FILTERING DATA ON WHICH TO APPLY A MODULE



## Node Filtering

Element selector

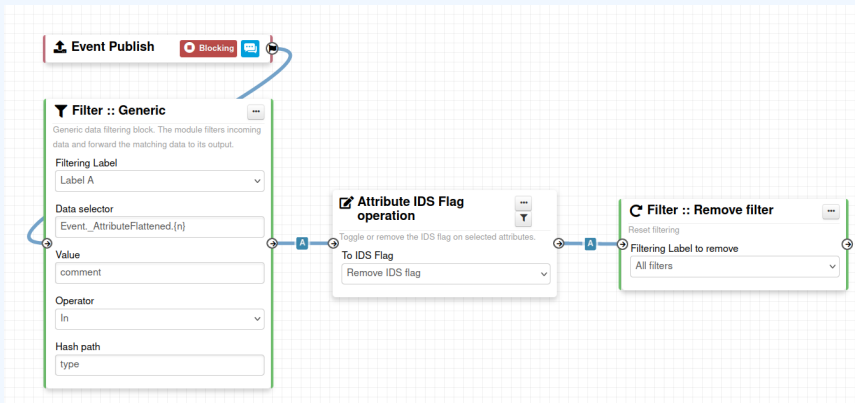
Value

Operator

Hash Path

# FITLERING DATA ON WHICH TO APPLY ON MULTIPLE MODULES

New feature as of **v2.4.171** allows setting filters on a path.



# EXERCICES



1. PAP:RED and tlp:red blocking
2. Replace tlp:white by tlp:clear
3. Attach tag on attribute having a low value (<50) in bgp ranking
4. Remove to\_ids flag for attribute having a match in hashlookup

# DEBUGGING

# DEBUGGING WORKFLOWS: LOG ENTRIES


- Workflow execution is logged in the application logs:
  - ▶ `/admin/logs/index`
  - ▶ Note: Might be phased out as its too verbose
- Or stored on disk in the following file:
  - ▶ `/app/tmp/logs/workflow-execution.log`

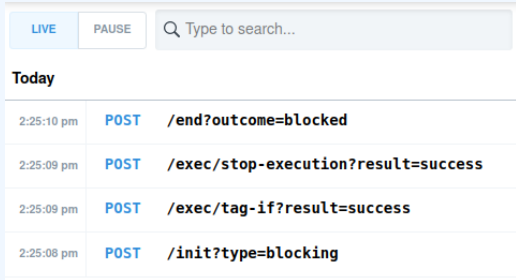
## Logs

« previous   next »

Emails   Authentication issues   MISP Update results   Setting changes   Warnings and errors							
<b>Id</b> ↑	<b>Email</b>	<b>Org</b>	<b>Created</b>	<b>Model</b>	<b>Model ID</b>	<b>Action</b>	<b>Title</b>
49146	SYSTEM	SYSTEM	2022-08-01 07:34:40	Workflow	162	execute_workflow	Finished executing workflow for trigger `enrichment-before-query` (162). Outcome: success
49144	SYSTEM	SYSTEM	2022-08-01 07:34:39	Workflow	162	execute_workflow	Started executing workflow for trigger `enrichment-before-query` (162)

# DEBUGGING WORKFLOWS: DEBUG MODE

- The  can be turned on for each workflows
- Each nodes will send data to the provided URL
  - ▶ Configure the setting: `Plugin.Workflow_debug_url`
- Result can be visualized in
  - ▶ **offline:** `tools/misp-workflows/webhook-listener.py`
  - ▶ **online:** `requestbin.com` or similar websites



LIVE		PAUSE	🔍 Type to search...
<b>Today</b>			
2:25:10 pm	POST	/end?outcome=blocked	
2:25:09 pm	POST	/exec/stop-execution?result=success	
2:25:09 pm	POST	/exec/tag-if?result=success	
2:25:08 pm	POST	/init?type=blocking	

## ■ Test custom modules with custom input

### Stateless module execution

#### Module parameters

Payload URL

Content type

Data extraction path

#### Input data

Convert input data into MISP core format

Module Input Data

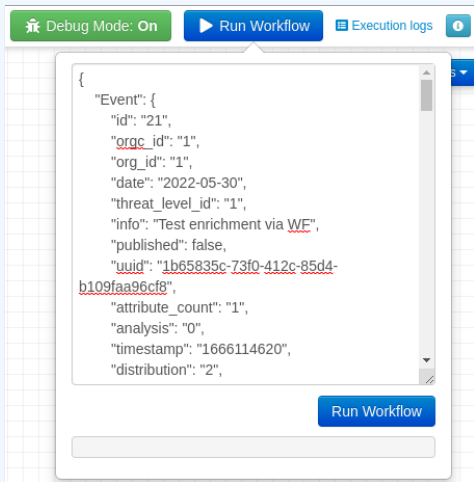
```
{  
  "foo": "bar"  
}
```

Execute module

Execution result: 200 [56 ms]

# DEBUGGING MODULES: RE-RUNNING WORKFLOWS

- Try workflows with custom input
- Re-run workflows to ease debugging



The screenshot shows a workflow debugging interface. At the top, there is a green button labeled "Debug Mode: On" with a bug icon, a blue "Run Workflow" button with a play icon, and a link to "Execution logs" with a document icon. Below these is a large text area containing a JSON object representing an event. The JSON is as follows:

```
{
  "Event": {
    "id": "21",
    "orgc_id": "1",
    "org_id": "1",
    "date": "2022-05-30",
    "threat_level_id": "1",
    "info": "Test enrichment via WF",
    "published": false,
    "uuid": "1b65835c-73f0-412c-85d4-b109faa96cf8",
    "attribute_count": "1",
    "analysis": "0",
    "timestamp": "1666114620",
    "distribution": "2",
  }
}
```

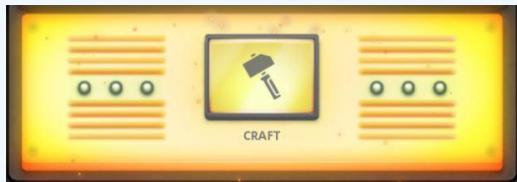
At the bottom right of the text area, there is a blue "Run Workflow" button. Below the text area is a light gray input field.

# DEBUGGING OPTIONS

- Workflow **execution and outcome**
- Module **execution and outcome**
- **Live** workflow debugging with module inspection
- **Re-running/testing** workflows with custom data
- **Stateless** module execution



# EXTENDING THE SYSTEM







- **app/Lib/WorkflowModules/action/[module\_name].php**
- Designed to be easily extended
  - ▶ Helper functions
  - ▶ Module configuration as variables
  - ▶ Implement runtime logic
- Main benefits
  - ▶ Fast
  - ▶ Re-use existing functionalities
  - ▶ No need for misp-modules

# CREATING A NEW MODULE IN PHP

```
app > Lib > WorkflowModules > action > Module_blueprint_action_module.php > ...
 1  <?php
 2  include_once APP_PATH.'Model/WorkflowModules/WorkflowBaseModule.php';
 3
 4  class Module_blueprint_action_module extends WorkflowBaseModule
 5  {
 6      public $is_blocking = false;
 7      public $disabled = true;
 8      public $id = 'blueprint-action-module';
 9      public $name = 'Blueprint action module';
10      public $description = 'Lorem ipsum dolor, sit amet consectetur adipisicing elit.';
11      public $icon = 'shapes';
12      public $inputs = 1;
13      public $outputs = 1;
14      public $params = [];
15
16      public function exec(array $node, WorkflowRoamingData $roamingData, array &$errors = [])
17          : bool
18      {
19          parent::exec($node, $roamingData, $errors);
20          // If $this->is_blocking == true, returning `false` will stop the execution.
21          $errors[] = __('Execution stopped');
22          return false;
23      }
24  }
```



- Similar to how other `misp`-modules are implemented
  - ▶ Helper functions
  - ▶ Module configuration as variables
  - ▶ Implement runtime logic
- Main benefits
  - ▶ Easier than PHP
  - ▶ Lots of libraries for integration

# CREATING A NEW MODULE IN PYTHON

```
home > sami > git > misp-modules > misp_modules > modules > action_mod > testaction.py > ...
1 > import json
2
3
4 mispererrors = {'error': 'Error'}
5
6 # config fields that your code expects from the site admin
7 moduleconfig = {
8     'foo': {
9         'type': 'string',
10        'description': 'blablabla',
11        'value': 'xyz'
12    },
13    'bar': {
14        'type': 'string',
15        'value': 'meh'
16    }
17 };
18
19 # blocking modules break the execution of the chain of actions (such as publishing)
20 blocking = False
21
22 # returns either "boolean" or "data"
23 # Boolean is used to simply signal that the execution has finished.
24 # For blocking modules the actual boolean value determines whether we break execution
25 returns = 'boolean'
26
27 moduleinfo = {'version': '0.1', 'author': 'Andras Ikloody',
28              'description': 'This module is merely a test, always returning true. Triggers on event publishing.',
29              'module-type': ['action']}
30
31
32 def handler(q=False):
33     if q is False:
34         return False
35     result = json.loads(q) # noqa
36     output = result # Insert your magic here!
37     r = {"data": output}
38     return r
```

# SHOULD I MIGRATE TO MISP WORKFLOWS

I have automation in place using the API / ZMQ. Should I move to Workflows?

- I (have/am planning to create) a curation pipeline using the API, should I port them to workflows?
  - ▶ **No** in general, but WF can be used to start the curation process
- What if I want to **block** some actions
  - ▶ Put the blocking logic in the WF, the remaining outside
- Currently, workflows with **lots of node are not encouraged**
- Bottom line is **Keep it simple**

- Notification when new users join an instance
- Extend existing MISP behavior: Push correlation in another system
- Sanity check to block publishing
- Automated alerts for high-priority IOCs
- Assign tasks and notify incident response team members
- ...

# FUTURE WORKS

- More 🎬 modules
- More ➡ modules
- More 🦊 triggers
- More documentation
- Recursion prevention system
- On-the-fly data override?



- Designed to **quickly** and **cheaply** integrate MISP in CTI pipelines
- **Beta** Feature unlikely to change. But still..
- Waiting for feedback!
  - ▶ New triggers?
  - ▶ New modules?
  - ▶ What's achievable

