README.md

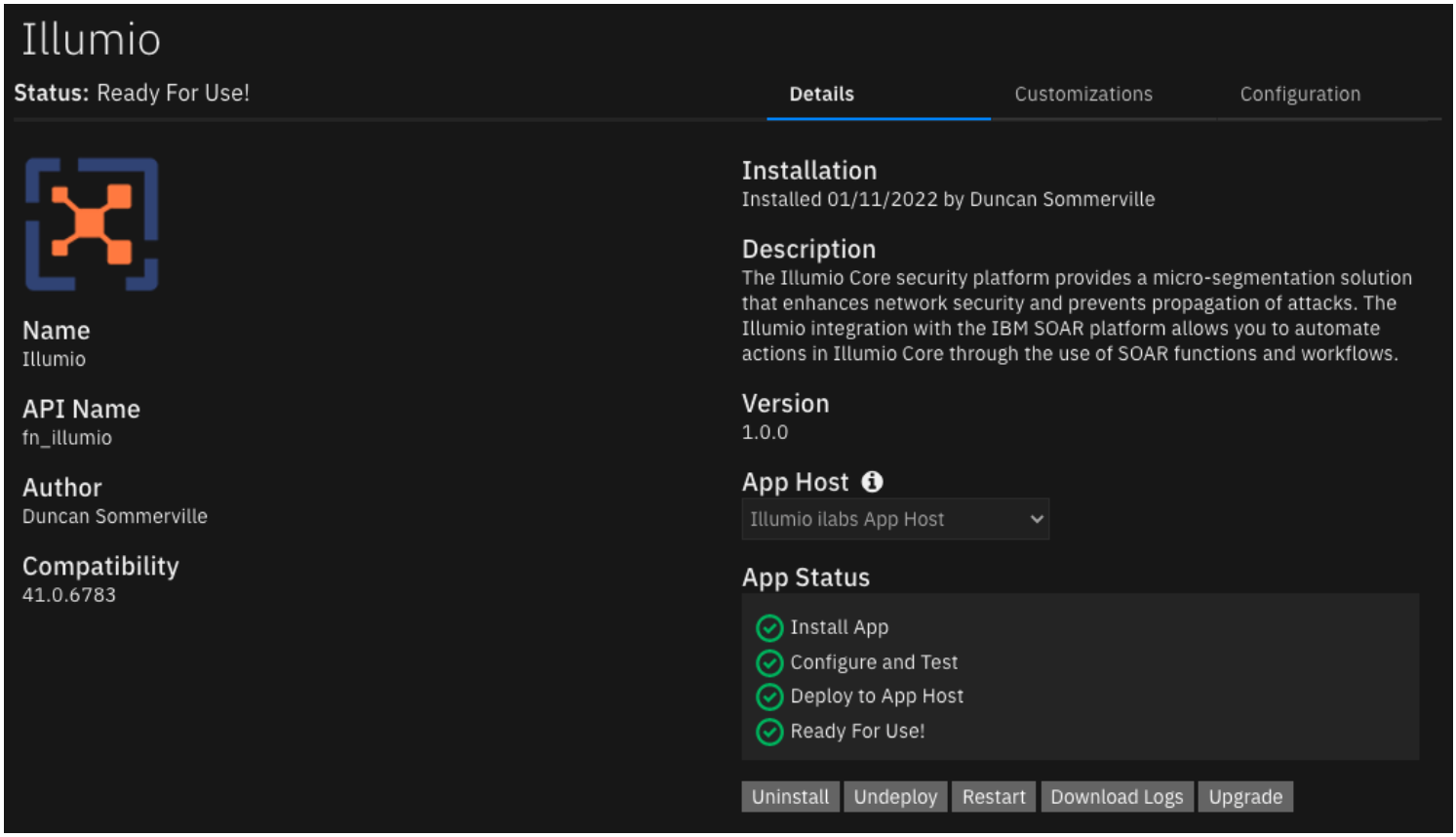
Illumio

Release Notes

Version	Date	Notes
1.0.0	02/2022	Initial Release. Block port workflow and related actions

Overview

Illumio Core Integration for IBM SOAR



The Illumio Core security platform provides a micro-segmentation solution that enhances network security and prevents propagation of attacks. The Illumio integration with the IBM SOAR platform allows you to automate actions in the Illumio Core Policy Compute Engine using SOAR functions and workflows.

You can find additional documentation for your version of Illumio Core through the Illumio Support Portal.

> The actions in this integration perform changes to the Illumio Policy Compute Engine that may impact the flow of traffic between workloads in your network. Please exercise caution when running functions and workflows to avoid service interruption.

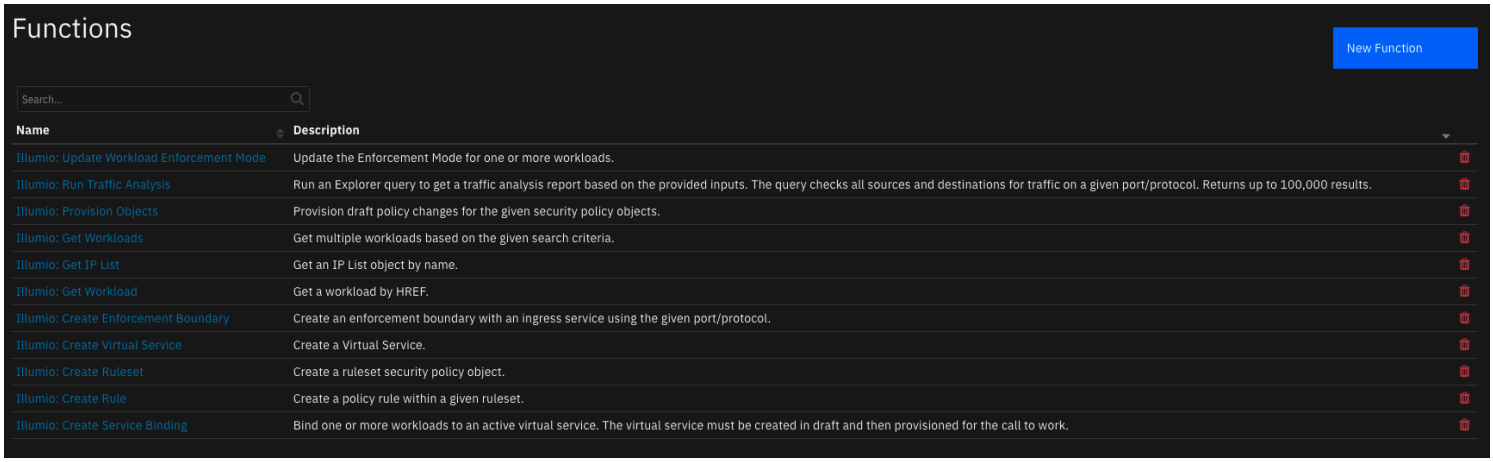
Key Features

The following functions are currently implemented:

- Create an Enforcement Boundary
- Create a Rule Set
  - Create a Rule
- Create a Virtual Service
  - Bind Workloads to a Virtual Service
- Get an IP List by name
- Get one or more Workloads
- Provision policy objects
- Run a traffic analysis query
- Update the enforcement modes of one or more Workloads

Additionally, the integration provides the following workflow actions:

- Block traffic on a specified port and protocol across all Workloads



These functions are covered in more detail in the User Guide.

Requirements

This app supports the IBM Resilient SOAR Platform and the IBM Cloud Pak for Security.

Resilient platform

The Resilient platform supports two app deployment mechanisms, App Host and integration server.

If deploying to a Resilient platform with an App Host, the requirements are:

- Resilient platform >= `41.0.6783` .
- The app is in a container-based format (available from the AppExchange as a `zip` file).

If deploying to a Resilient platform with an integration server, the requirements are:

- Resilient platform >= `41.0.6783` .
- The app is in the older integration format (available from the AppExchange as a `zip` file which contains a `tar.gz` file).
- Integration server is running `resilient-circuits>=42.0.0` .
- If using an API key account, make sure the account provides the following minimum permissions:

Name	Permissions
Org Data	Read
Function	Read

The following Resilient platform guides provide additional information:

- *App Host Deployment Guide*: provides installation, configuration, and troubleshooting information, including proxy server settings.
- *Integration Server Guide*: provides installation, configuration, and troubleshooting information, including proxy server settings.
- *System Administrator Guide*: provides the procedure to install, configure and deploy apps.

The above guides are available on the IBM Knowledge Center at ibm.biz/resilient-docs. On this web page, select your Resilient platform version. On the follow-on page, you can find the *App Host Deployment Guide* or *Integration Server Guide* by expanding **Resilient Apps** in the Table of Contents pane. The System Administrator Guide is available by expanding **System Administrator**.

Cloud Pak for Security

If you are deploying to IBM Cloud Pak for Security, the requirements are:

- IBM Cloud Pak for Security >= 1.4.
- Cloud Pak is configured with an App Host.
- The app is in a container-based format (available from the AppExchange as a `zip` file).

The following Cloud Pak guides provide additional information:

- *App Host Deployment Guide*: provides installation, configuration, and troubleshooting information, including proxy server settings. From the Table of Contents, select Case Management and Orchestration & Automation > **Orchestration and Automation Apps**.
- *System Administrator Guide*: provides information to install, configure, and deploy apps. From the IBM Cloud Pak for Security Knowledge Center table of contents, select Case Management and Orchestration & Automation > **System administrator**.

These guides are available on the IBM Knowledge Center at ibm.biz/cp4s-docs. From this web page, select your IBM Cloud Pak for Security version. From the version-specific Knowledge Center page, select Case Management and Orchestration & Automation.

Illumio Core platform

The app supports Illumio Core >= 21.2.0. The app and the *illumio* python library it depends on rely on the Illumio Core REST API.

Proxy Server

The app **does** support a proxy server. Proxy settings can be specified in the app configuration file as detailed in the installation section below.

Python Environment

Python >= 3.6 is supported. Additional package dependencies may exist for each of these packages:

- resilient-circuits>=42.0.0
- illumio>=0.7.2

The *illumio* python library is provided as a wheel package and distributed as-is within the app integration binary and source releases under the */lib* subdirectory.

For app host installations, the Dockerfile in the app distribution will automatically install the *illumio* library from */lib*.

For integration server installations, the provided *illumio* wheel must be installed before installing the *fn_illumio* package:

```
# from the fn_illumio root
$ pip install ./lib/illumio*.whl
$ pip install .
```

Installation

Install

- To install or uninstall an App or Integration on the *Resilient platform*, see the documentation at ibm.biz/resilient-docs.
- To install or uninstall an App on *IBM Cloud Pak for Security*, see the documentation at ibm.biz/cp4s-docs and follow the instructions above to navigate to Orchestration and Automation.

App Configuration

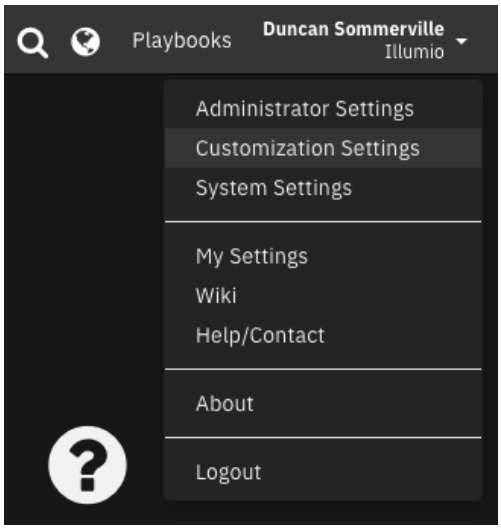
The following table provides the settings you need to configure the app. These settings are made in the app.config file. See the documentation discussed in the Requirements section for the procedure.

```
[fn_illumio]
illumio_pce_domain_name = <PCE_DOMAIN_NAME>
illumio_pce_port = 443
illumio_pce_org_id = 1
illumio_pce_api_key = <PCE_API_KEY>
illumio_pce_api_secret = <PCE_API_SECRET>
# Optional proxy settings
#http_proxy=http://proxy:80
#https_proxy=http://proxy:80
```

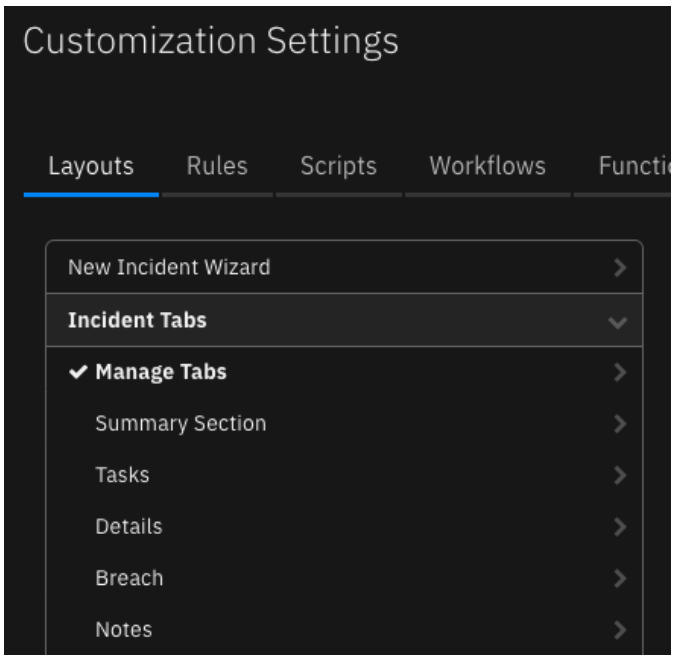
Config	Required	Example	Description
illumio_pce_domain_name	Yes	`example.pce.com`	*The fully-qualified domain name of the Illumio Policy Compute Engine to connect to*
illumio_pce_port	Yes	`443`	*The port the Illumio Policy Compute Engine is listening on*
illumio_pce_org_id	Yes	`1`	*The organization ID to connect to on the Illumio Policy Compute Engine*
illumio_pce_api_key	Yes	`api_1a1a2233b45c678d9`	*The Illumio Policy Compute Engine API key username*
illumio_pce_api_secret	Yes	`0a1bc2d3ef...`	*The Illumio Policy Compute Engine API key secret*
http_proxy	No	`http://proxy:80`	*HTTP proxy configuration*
https_proxy	No	`http://proxy:80`	*HTTPS proxy configuration*

Custom Layouts

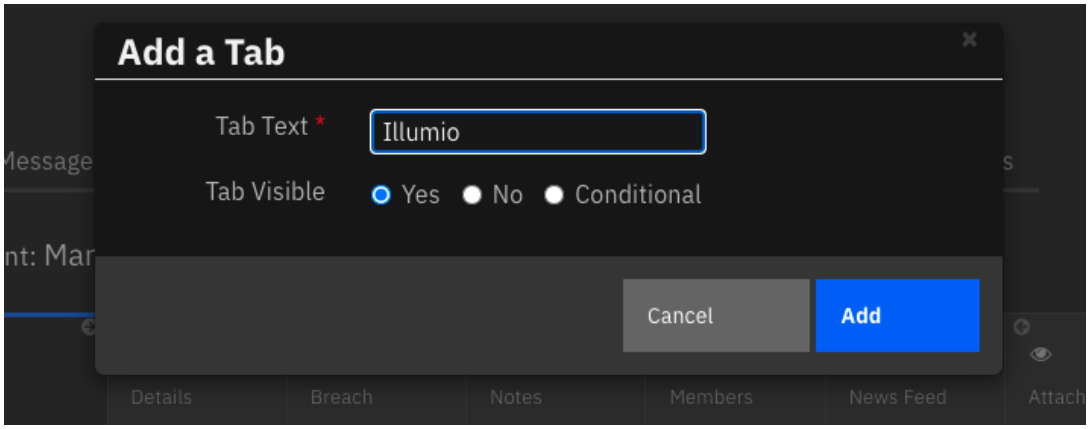
The provided functions and workflows populate custom Data Tables that require a custom incident layout. To configure a new tab to display the tables, navigate to the **Customization Settings** page from the menu as shown:



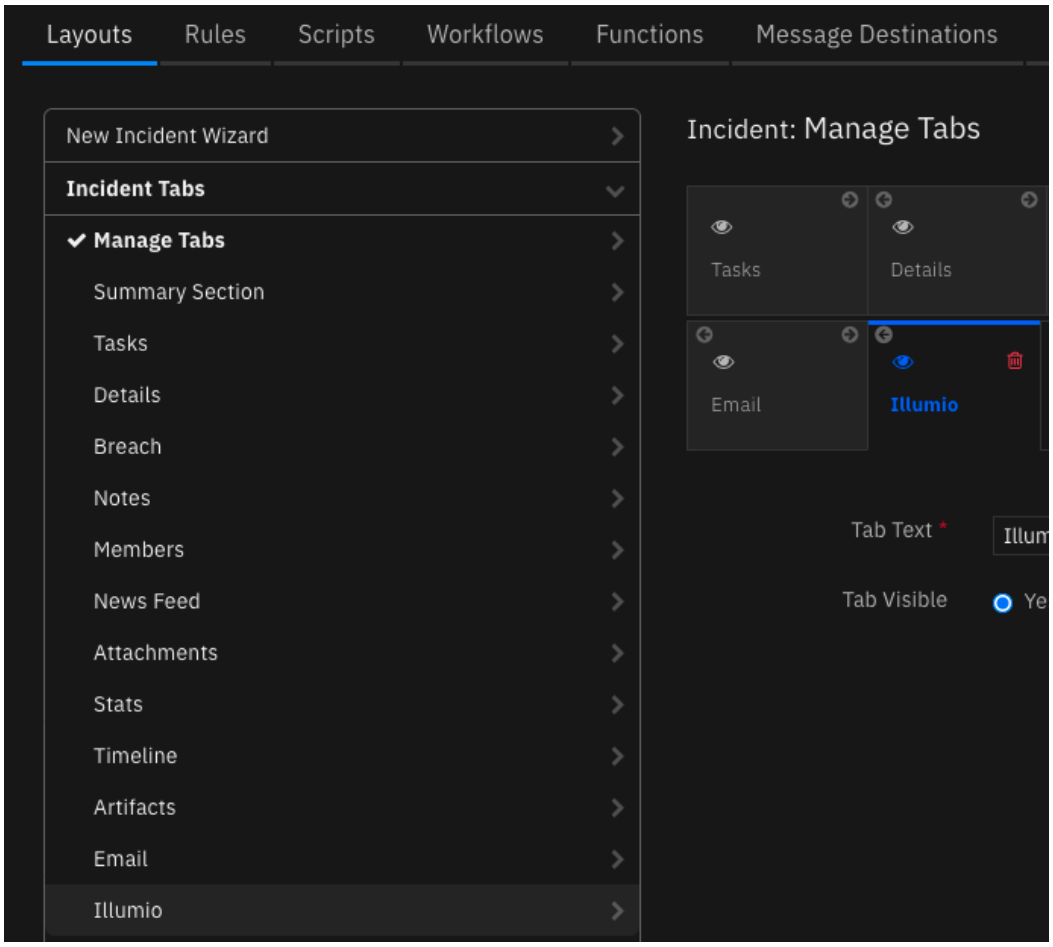
From the Layouts tab (the default), select the **Incident Tabs** menu to bring up the default Incident tab layout.



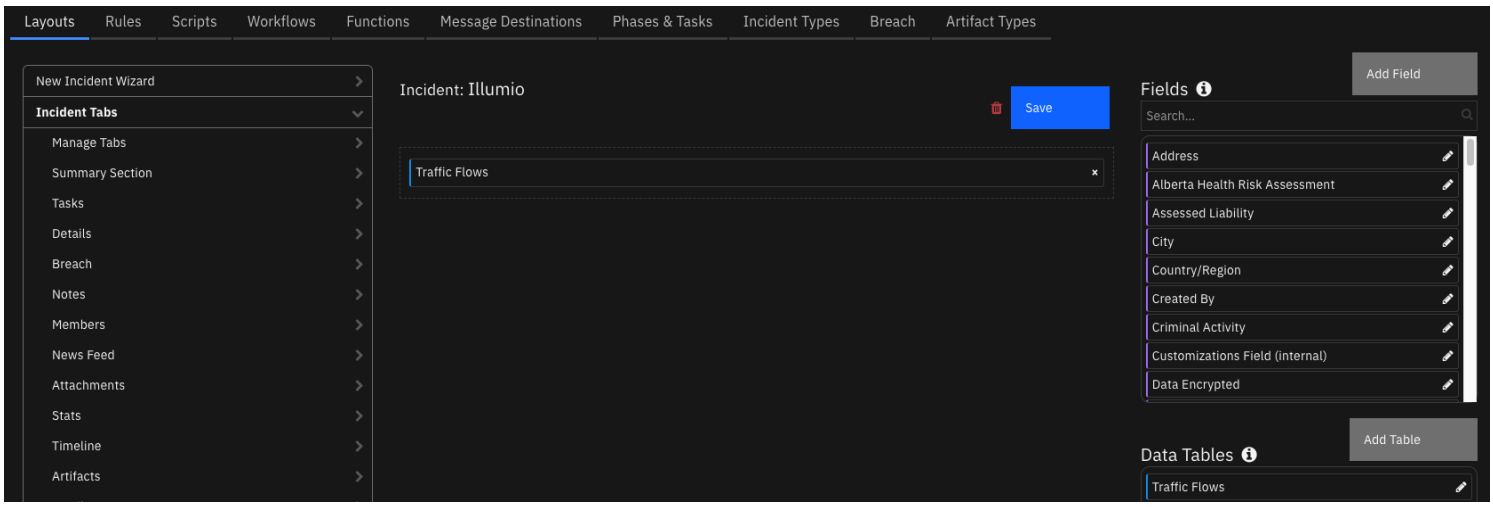
To add a custom tab, click the **+** icon at the end of the tab list. This will bring up a dialog box. Name the tab and click **Add**:



Click the **Save** button to save your changes. Select your new custom tab from the tab list on the left of the screen to edit the layout:



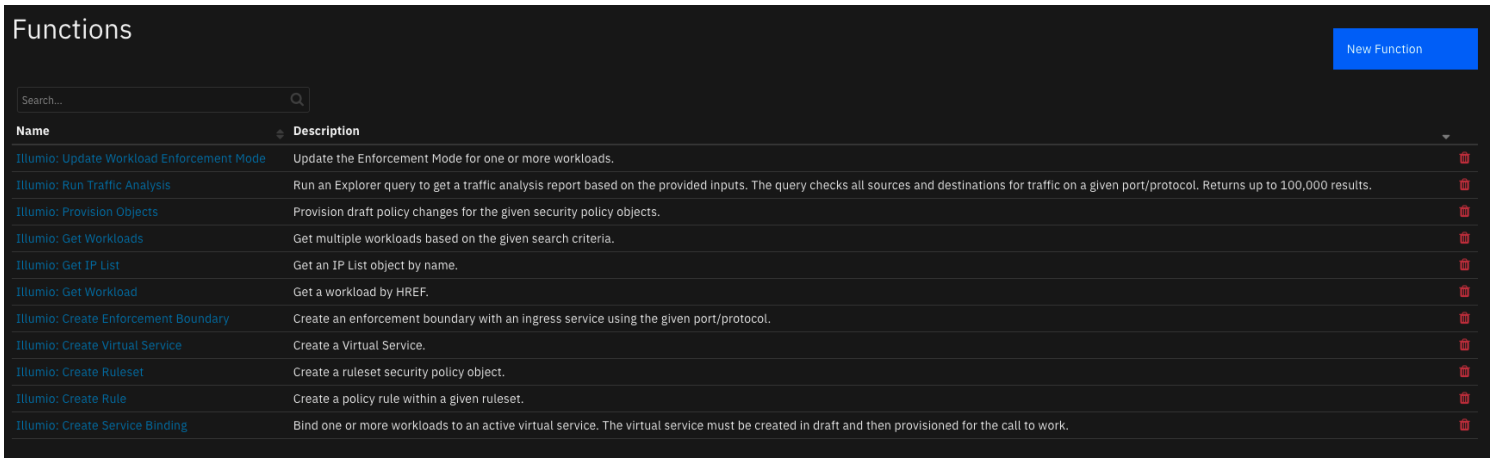
Drag the Data Tables over from the right-hand side to add them to your custom tab layout:



Click the **Save** button to save your changes. The new tab should now appear on each Incident page.

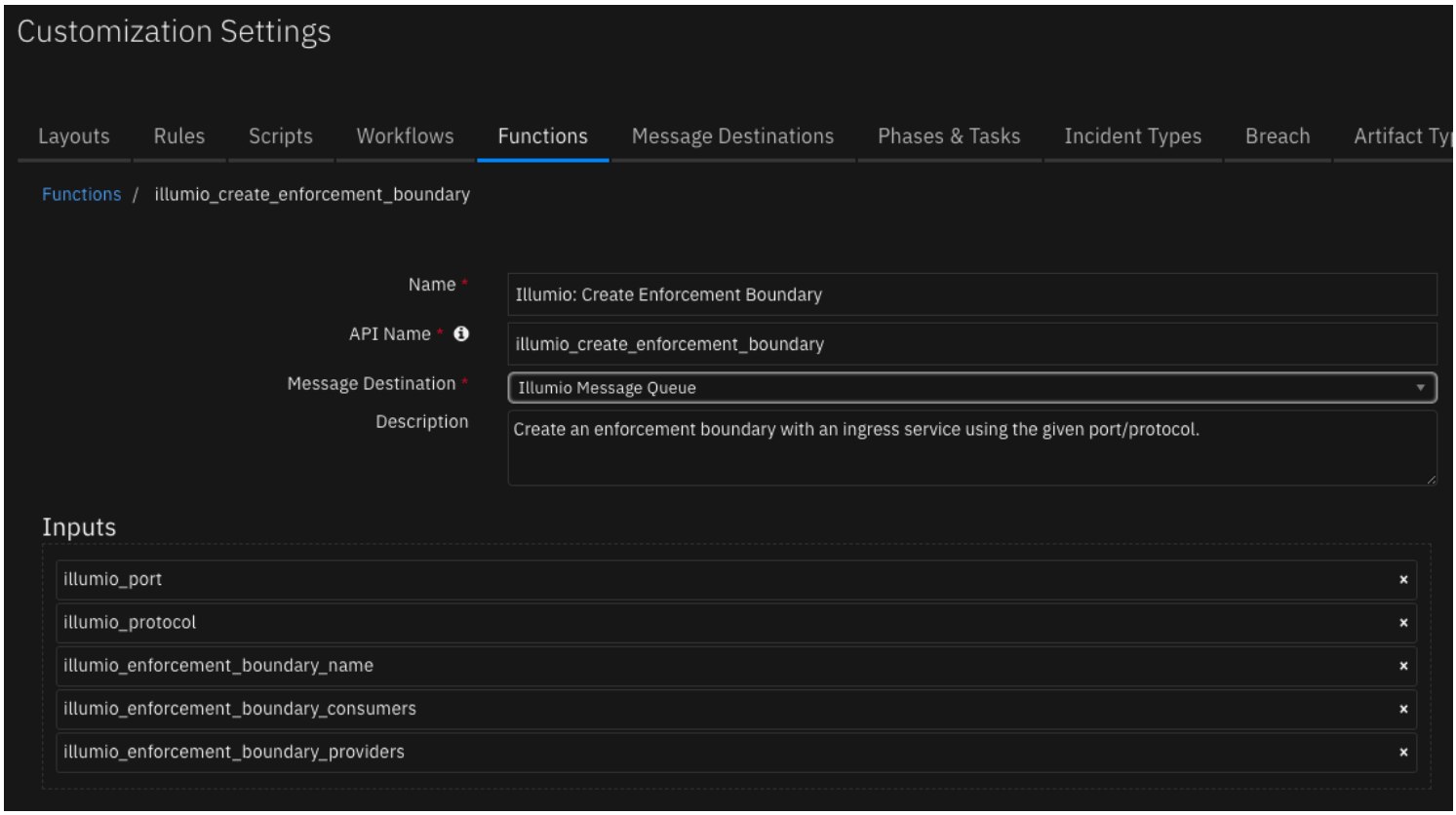
If needed, you can configure conditions for when the tab will be visible, restricting it to only certain Incidents. This customization is beyond the scope of this document.

User Guide: fn_illumio_v1.0.0



Function - Illumio: Create Enforcement Boundary

Create an enforcement boundary with an ingress service using the given port/protocol.



▼ Inputs:

Name	Type	Required	Example	Tooltip
illumio_enforcement_boundary_consumers	text	Yes	ams	Comma-separated list of HREFs of entities to be used as consumers for the rule, or "ams" for all workloads
illumio_enforcement_boundary_name	text	Yes	EB-IBM-SOAR	Enforcement boundary name
illumio_enforcement_boundary_providers	text	Yes	ams	Comma-separated list of HREFs of entities to be used as providers for the rule, or "ams" for all workloads
illumio_port	number	Yes	8080	Port number
illumio_protocol	select	Yes	-	Communication protocol

▼ Outputs:


```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "href": "/orgs/1/sec_policy/active/enforcement_boundaries/1019",
        "name": "EB-IBM-SOAR-3389-TCP",
        "created_at": "2022-01-07T16:17:25.515Z",
        "updated_at": "2022-01-07T16:17:25.526Z",
        "created_by": {
            "href": "/users/464"
        },
        "updated_by": {
            "href": "/users/464"
        },
        "caps": [
            "write",
            "provision"
        ],
        "ingress_services": [
            {
                "port": 3389,
                "proto": 6
            }
        ],
        "providers": [
            {
                "actors": "ams"
            }
        ],
        "consumers": [
            {
                "ip_list": {
                    "href": "/orgs/1/sec_policy/active/ip_lists/1334"
                }
            }
        ]
    },
    "raw": None,
    "inputs": {
        "illumio_protocol": "TCP",
        "illumio_enforcement_boundary_providers": "ams",
        "illumio_enforcement_boundary_name": "EB-IBM-SOAR-3389-TCP",
```

```
        "illumio_port": 3389,
        "illumio_enforcement_boundary_consumers": "/orgs/1/sec_policy/active/ip_lists/1334"
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 604,
        "timestamp": "2022-01-07 11:41:47"
    }
}
```


▼ Example Pre-Process Script:

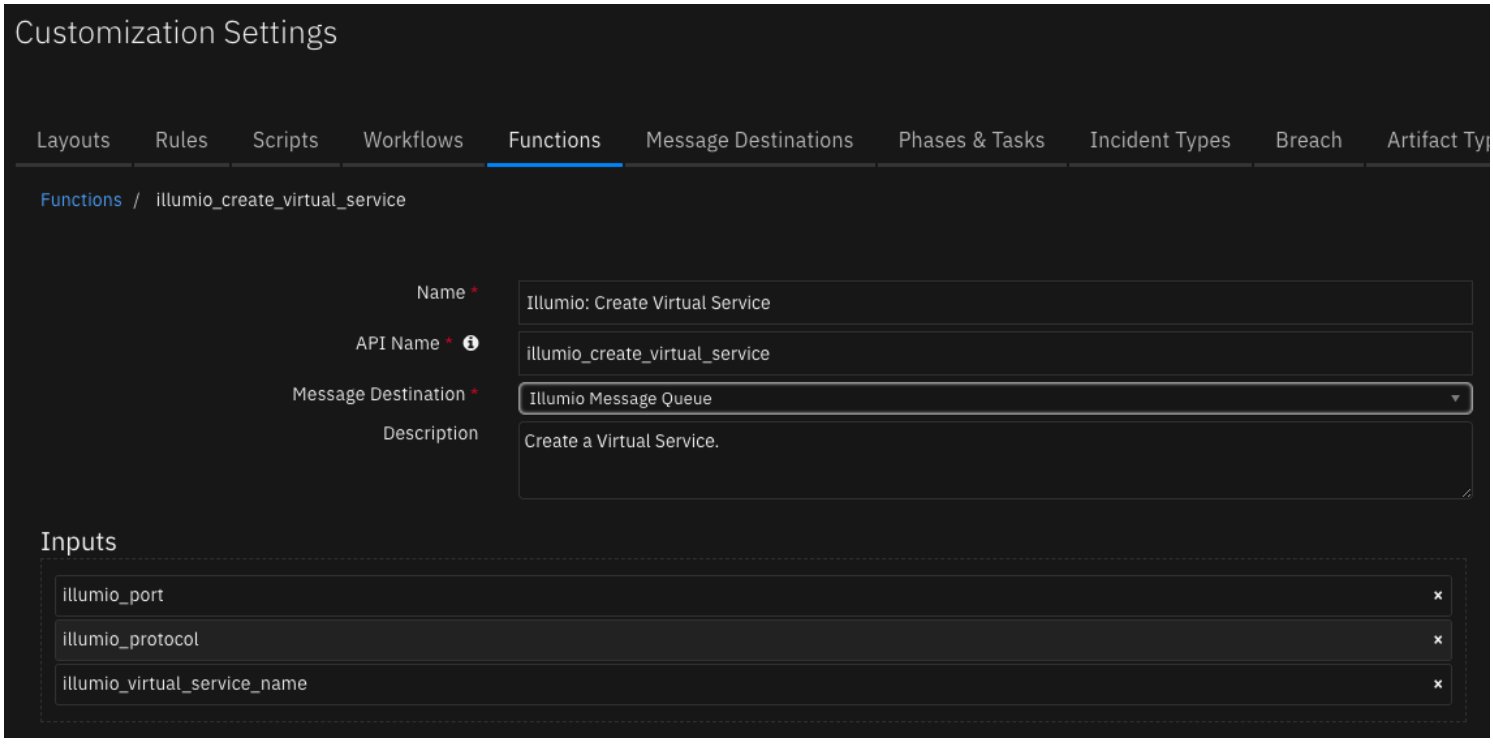
```
port = rule.properties.illumio_port
protocol = rule.properties.illumio_protocol

inputs.illumio_port = port
inputs.illumio_protocol = protocol
inputs.illumio_enforcement_boundary_name = "EB-IBM-SOAR-{0}-{1}".format(str(port), protocol)
inputs.illumio_enforcement_boundary_consumers = workflow.properties.any_ip_list.content['href']
```

▼ Example Post-Process Script:

```
None
```

Function - Illumio: Create Virtual Service

Create a Virtual Service.



▼ Inputs:

Name	Type	Required	Example	Tooltip
illumio_port	number	Yes	8080	Port number
illumio_protocol	select	Yes	-	Communication protocol. TCP and UDP are supported
illumio_virtual_service_name	text	Yes	VS-IBM-SOAR	Virtual service name. If no value is set, use the value SOAR-{port}-{protocol}

▼ Outputs:


```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "href": "/orgs/1/sec_policy/draft/virtual_services/575f43f4-3f99-4bb0-8a6f-9e2da7a9fbd2",
        "name": "VS-IBM-SOAR-3389-TCP",
        "created_at": "2022-01-07T15:23:17.885Z",
        "updated_at": "2022-01-07T15:23:17.897Z",
        "update_type": "create",
        "created_by": {
            "href": "/users/464"
        },
        "updated_by": {
            "href": "/users/464"
        },
        "caps": [
            "write",
            "provision",
            "delete"
        ],
        "apply_to": "host_only",
        "service_ports": [
            {
                "port": 3389,
                "proto": 6
            }
        ],
        "ip_overrides": []
    },
    "raw": None,
    "inputs": {
        "illumio_protocol": "TCP",
        "illumio_port": 3389,
        "illumio_virtual_service_name": "VS-IBM-SOAR-3389-TCP"
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 658,
        "timestamp": "2022-01-07 10:23:17"
    }
}
```


▼ Example Pre-Process Script:

```
port = rule.properties.illumio_port
protocol = rule.properties.illumio_protocol
```

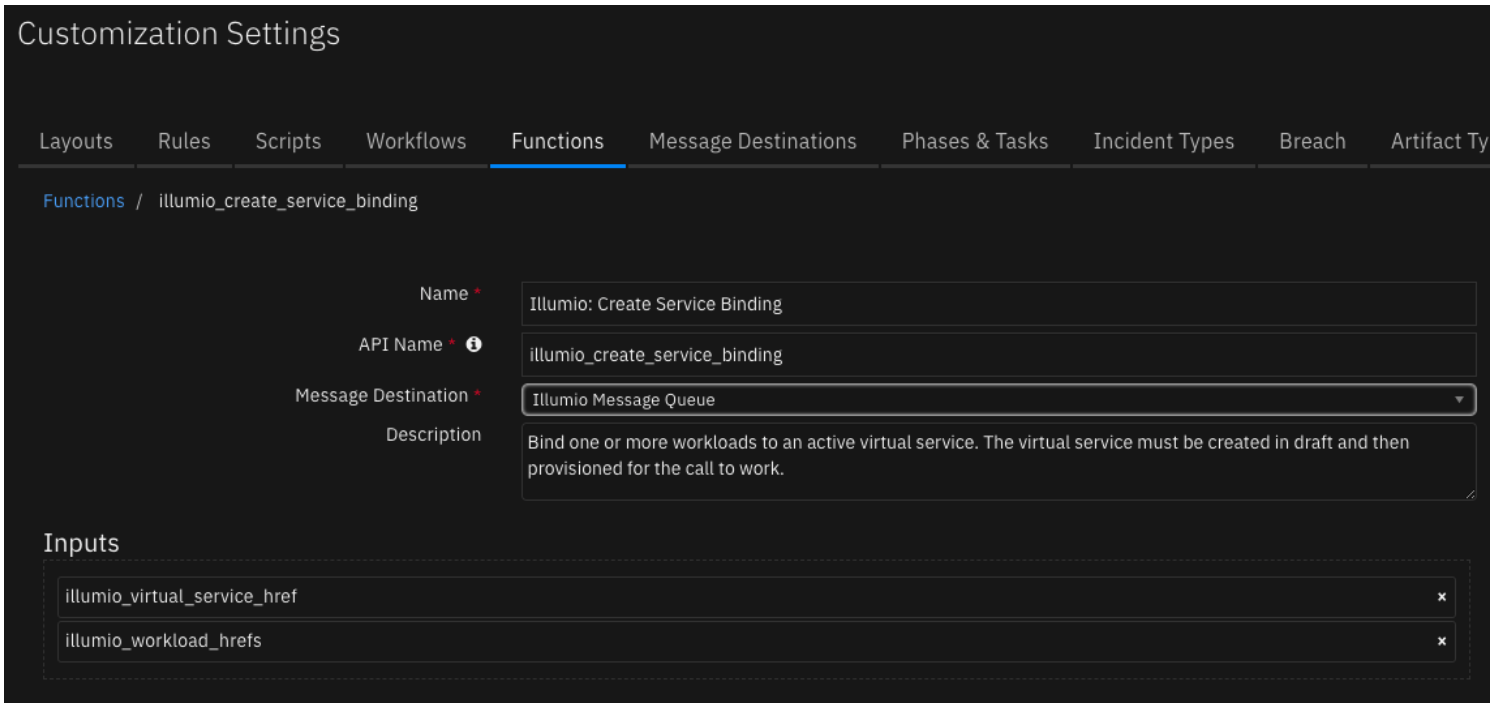
```
inputs.illumio_port = port
inputs.illumio_protocol = protocol
inputs.illumio_virtual_service_name = "VS-IBM-SOAR-{0}-{1}".format(str(port), protocol)
```

▼ Example Post-Process Script:

```
None
```

Function - Illumio: Create Service Binding

Bind one or more workloads to an active virtual service. The virtual service must be created in draft and then provisioned for the call to work.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_virtual_service_href`	`text`	Yes	–	Virtual Service object reference key
`illumio_workload_hrefs`	`text`	Yes	–	Comma-separated string of workload HREF values

▼ Outputs:

```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "service_bindings": [
            {
                "href": "/orgs/1/service_bindings/c7098f30-8460-4873-a06c-8df87dc1ba1d"
            },
            {
                "href": "/orgs/1/service_bindings/ef302a43-0e59-4288-a4aa-1196369d1f29"
```

```
            },
            {
                "href": "/orgs/1/service_bindings/0fe5b79a-0b0d-4281-89db-d8a7867aaf61"
            }
        ],
        "errors": []
    },
    "raw": None,
    "inputs": {
        "illumio_workload_hrefs": "/orgs/1/workloads/32e366cc-bd18-44aa-a637-9a6e761e268e,/orgs/1/workloads/...",
        "illumio_virtual_service_href": "/orgs/1/sec_policy/active/virtual_services/..."
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 469,
        "timestamp": "2022-01-07 10:23:22"
    }
}
```


▼ Example Pre-Process Script:

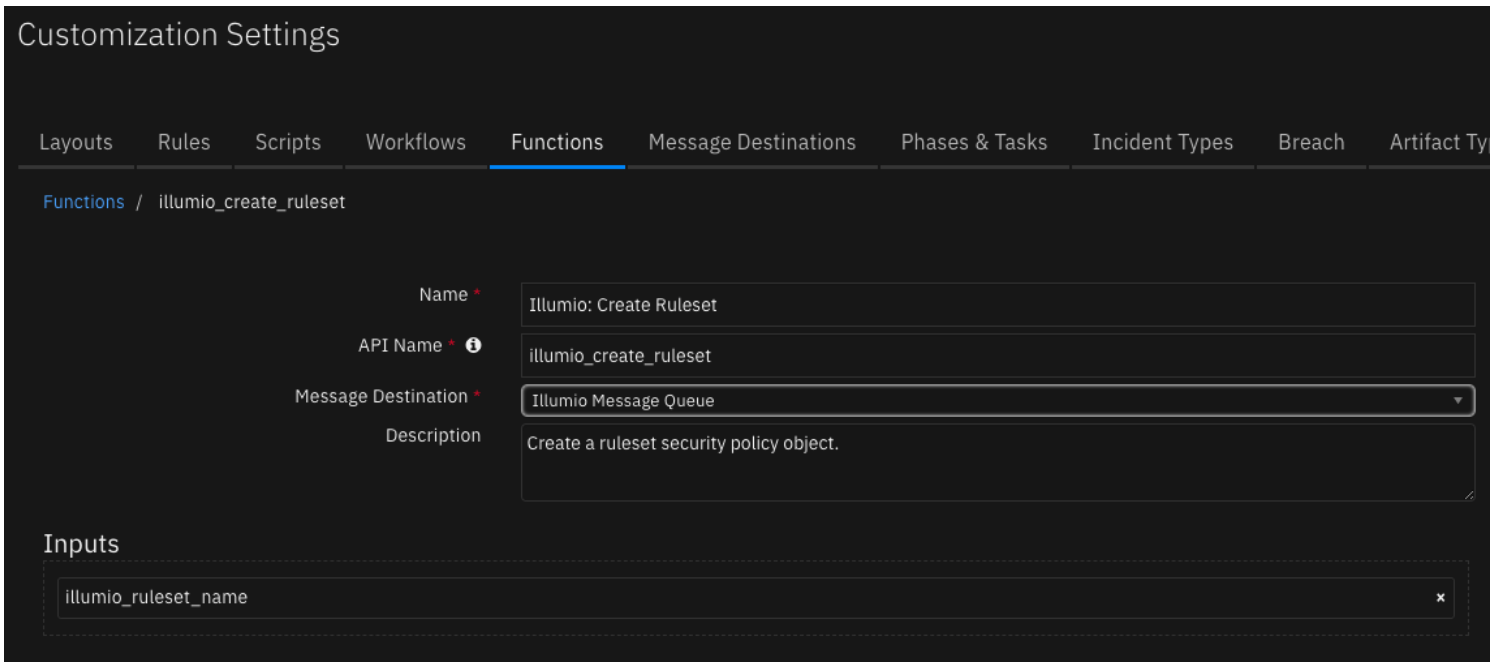
```
inputs.illumio_virtual_service_href = workflow.properties.virtual_service_active_href['href']
inputs.illumio_workload_hrefs = ','.join(workflow.properties.traffic_flow_workloads['hrefs'])
```

▼ Example Post-Process Script:

```
None
```

Function - Illumio: Create Ruleset

Create a ruleset security policy object.



▼ Inputs:

Name	Type	Required	Example	Tooltip
illumio_ruleset_name	text	Yes	RS-IBM-SOAR	Ruleset display name

▼ Outputs:


```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "href": "/orgs/1/sec_policy/draft/rule_sets/11110",
        "name": "RS-IBM-SOAR-3389-TCP",
        "created_at": "2022-01-07T15:23:25.411Z",
        "updated_at": "2022-01-07T15:23:25.411Z",
        "update_type": "create",
        "created_by": {
            "href": "/users/464"
        },
        "updated_by": {
            "href": "/users/464"
        },
        "caps": [
            "write",
            "provision"
        ],
        "enabled": True,
        "scopes": [
            []
        ]
    },
    "raw": None,
    "inputs": {
        "illumio_ruleset_name": "RS-IBM-SOAR-3389-TCP"
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 780,
        "timestamp": "2022-01-07 10:23:25"
    }
}
```


▼ Example Pre-Process Script:

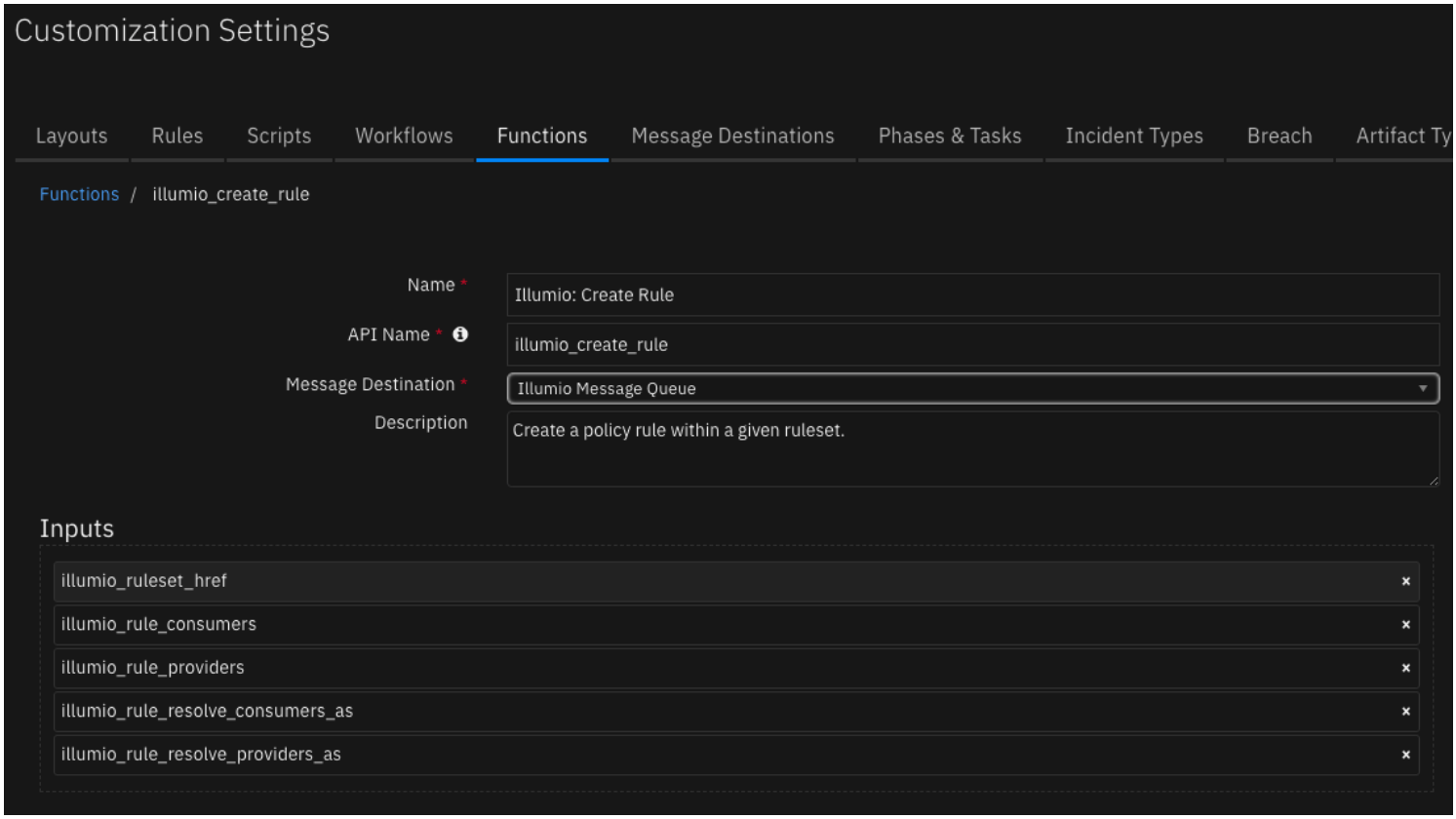
```
port = rule.properties.illumio_port
protocol = rule.properties.illumio_protocol

inputs.illumio_ruleset_name = "RS-IBM-SOAR-{0}-{1}".format(str(port), protocol)
```

▼ Example Post-Process Script:

```
None
```

Function - Illumio: Create Rule

Create a policy rule within a given ruleset.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_rule_consumers`	`text`	Yes	–	Comma-separated list of HREFs of entities to be used as consumers
`illumio_rule_providers`	`text`	Yes	–	Comma-separated list of HREFs of entities to be used as providers
`illumio_rule_resolve_consumers_as`	`multiselect`	Yes	–	Consumer objects the rule should apply to
`illumio_rule_resolve_providers_as`	`multiselect`	Yes	–	Provider objects the rule should apply to
`illumio_ruleset_href`	`text`	Yes	–	Ruleset object reference key

▼ Outputs:


```
results = {
    "version": 2.0,
    "success": True,
    "content": {
        "href": "/orgs/1/sec_policy/draft/rule_sets/11110/sec_rules/18665",
        "created_at": "2022-01-07T16:41:42.244Z",
        "updated_at": "2022-01-07T16:41:42.255Z",
        "update_type": "create",
        "created_by": {
            "href": "/users/464"
        },
        "updated_by": {
            "href": "/users/464"
```

```
        },
        "ingress_services": [],
        "providers": [
            {
                "virtual_service": {
                    "href": "/orgs/1/sec_policy/draft/virtual_services/575f43f4-3f99-4bb0-8a6f-9e2da7a9fbd2"
                }
            }
        ],
        "consumers": [
            {
                "ip_list": {
                    "href": "/orgs/1/sec_policy/draft/ip_lists/1334"
                }
            }
        ],
        "enabled": True,
        "resolve_labels_as": {
            "providers": [
                "virtual_services"
            ],
            "consumers": [
                "workloads"
            ]
        },
        "sec_connect": False,
        "stateless": False,
        "machine_auth": False,
        "unscoped_consumers": False,
        "network_type": "brn"
    },
    "raw": None,
    "inputs": {
        "illumio_rule_resolve_consumers_as": [
            "workloads"
        ],
        "illumio_rule_consumers": "/orgs/1/sec_policy/active/ip_lists/1334",
        "illumio_ruleset_href": "/orgs/1/sec_policy/draft/rule_sets/11110",
        "illumio_rule_resolve_providers_as": [
            "virtual_services"
        ],
        "illumio_rule_providers": "/orgs/1/sec_policy/active/virtual_services/575f43f4-3f99-4bb0-8a6f-9e2da7a9fbd2"
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 457,
        "timestamp": "2022-01-07 11:41:42"
    }
}
```


▼ Example Pre-Process Script:

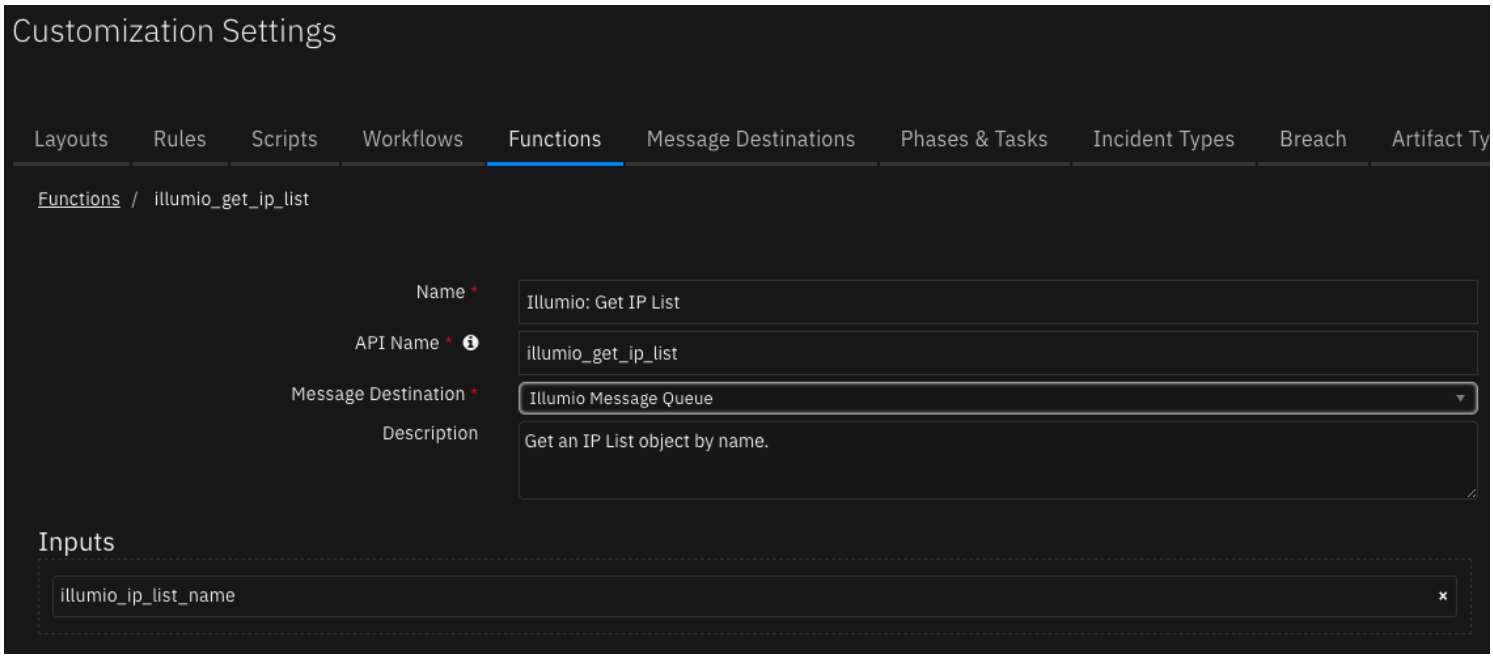
```
inputs.illumio_ruleset_href = workflow.properties.ruleset.content['href']
inputs.illumio_rule_consumers = workflow.properties.any_ip_list.content['href']
inputs.illumio_rule_providers = workflow.properties.virtual_service_active_href['href']
```

▼ Example Post-Process Script:

```
None
```

Function - Illumio: Get IP List

Get an IP List object by name.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_ip_list_name`	`text`	Yes	`Any (0.0.0.0/0 and ::/0)`	IP List object name. Accepts partial matches

▼ Outputs:


```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "href": "/orgs/1/sec_policy/active/ip_lists/1334",
        "name": "Any (0.0.0.0/0 and ::/0)",
        "created_at": "2021-09-13T15:03:07.000Z",
        "updated_at": "2021-09-13T15:03:07.015Z",
        "created_by": {"href": "/users/0"},
        "updated_by": {"href": "/users/0"},
        "ip_ranges": [
            {"from_ip": "0.0.0.0/0", "exclusion": False},
            {"from_ip": "::/0", "exclusion": False}
        ]
    },
    "raw": None,
    "inputs": {
        "illumio_ip_list_name": "Any (0.0.0.0/0 and ::/0)"
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 811,
        "timestamp": "2022-01-07 10:22:52"
```

```
    }
}
```

▼ Example Pre-Process Script:

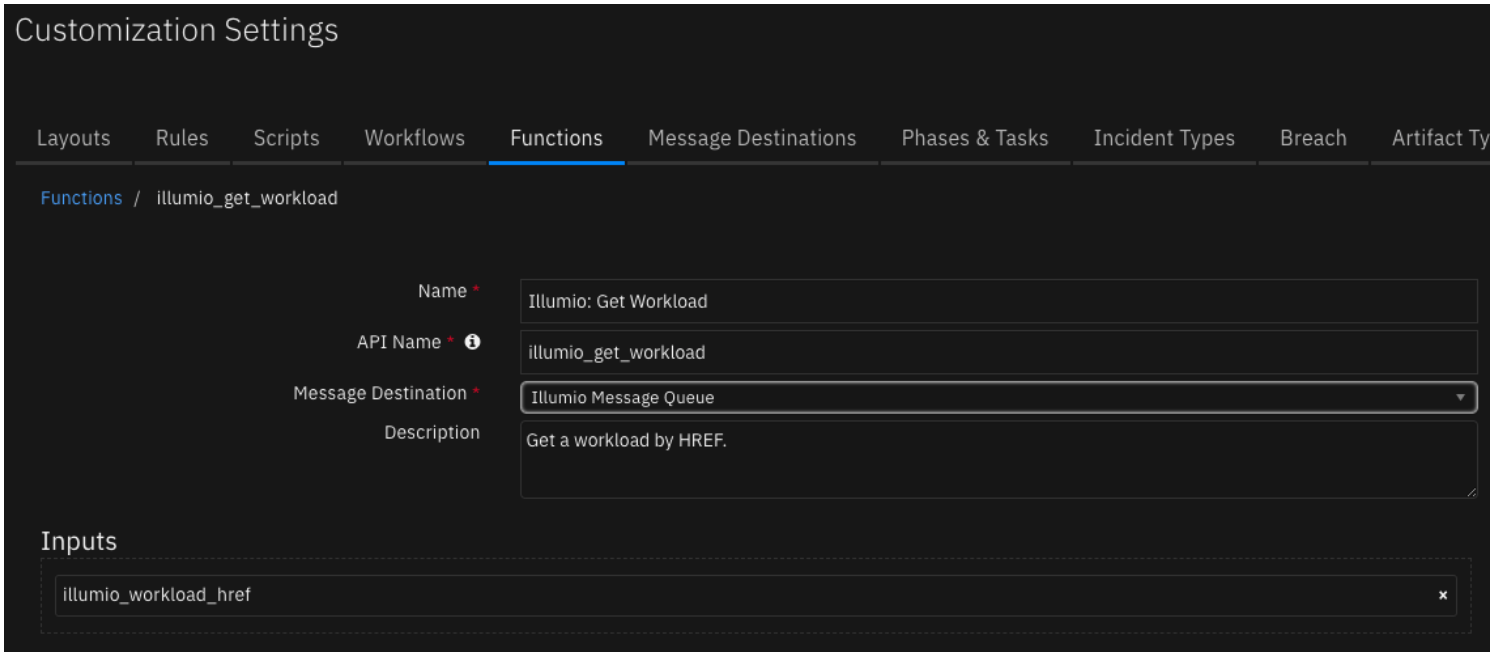
```
None
```

▼ Example Post-Process Script:

```
None
```

Function - Illumio: Get Workload

Get a workload by HREF.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_workload_href`	`text`	Yes	–	Workload object reference key

▼ Outputs:

```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "href": "/orgs/1/workloads/3d14ec61-edaf-452e-b1b9-b7308652c0f6",
        "created_at": "2021-09-13T16:01:07.735779Z",
        "updated_at": "2021-12-16T16:47:04.458647Z",
        "created_by": {
            "href": "/orgs/1/agents/17456"
        },
        "updated_by": {
```

```
    "href": "/orgs/1/agents/17456"
},
"caps": [
    "write"
],
"hostname": "user-4",
"public_ip": "66.124.202.19",
"interfaces": [
    {
        "name": "eth0",
        "address": "fe80::402:ffff:feef:5a4d",
        "cidr_block": 64,
        "network": {
            "href": "/orgs/1/networks/9977853d-639e-4afd-a505-9e0fd419ce06"
        },
        "network_detection_mode": "link_local",
        "loopback": False
    },
    {
        "name": "eth0",
        "address": "10.1.0.46",
        "cidr_block": 24,
        "default_gateway_address": "10.1.0.1",
        "network": {
            "href": "/orgs/1/networks/a9dd8b22-3108-4c64-911b-ac1b2eb5919e"
        },
        "network_detection_mode": "single_private_brn",
        "loopback": False
    },
    {
        "name": "eth0.public",
        "address": "66.124.202.19",
        "cidr_block": 32,
        "network": {
            "href": "/orgs/1/networks/a9dd8b22-3108-4c64-911b-ac1b2eb5919e"
        },
        "network_detection_mode": "manual",
        "loopback": False
    }
],
"service_provider": "example.com",
"data_center": "us-west.example.com",
"data_center_zone": "us-west",
"os_id": "ubuntu-x86_64-xenial",
"os_detail": "5.4.0-1038-aws #40-Ubuntu SMP Fri Feb 5 23:50:40 UTC 2021 (Ubuntu 20.04.2 LTS)",
"online": True,
"deleted": False,
"ignored_interface_names": [],
"containers_inherit_host_policy": False,
"blocked_connection_action": "drop",
"labels": [
    {
        "href": "/orgs/1/labels/15420"
    },
    {
        "href": "/orgs/1/labels/15431"
    },
    {
        "href": "/orgs/1/labels/15430"
    },
    {
        "href": "/orgs/1/labels/15411"
    }
],
"agent": {
```

```
            "href": "/orgs/1/agents/17456",
            "config": {
                "mode": "illuminated",
                "log_traffic": False,
                "visibility_level": "flow_summary"
            },
            "status": {
                "status": "active",
                "uid": "us-west+i-0ab12cd3e4fg5678h",
                "instance_id": "i-0ab12cd3e4fg5678h",
                "last_heartbeat_on": "2022-01-07T16:14:31.378648Z",
                "uptime_seconds": 10025687,
                "agent_version": "21.2.0-7831",
                "managed_since": "2021-09-13T16:01:07.772006Z",
                "fw_config_current": False,
                "firewall_rule_count": 0,
                "security_policy_refresh_at": "2022-01-03T20:54:34.809195Z",
                "security_policy_applied_at": "2022-01-03T20:54:34.809195Z",
                "security_policy_received_at": "2022-01-03T20:54:34.809195Z",
                "agent_health_errors": {
                    "errors": [],
                    "warnings": []
                },
                "security_policy_sync_state": "syncing"
            },
            "unpair_allowed": True,
            "type": "Host"
        },
        "ven": {
            "href": "/orgs/1/vens/3d14ec61-edaf-452e-b1b9-b7308652c0f6"
        },
        "enforcement_mode": "visibility_only",
        "visibility_level": "flow_summary"
    },
    "raw": None,
    "inputs": {
        "illumio_workload_href": "/orgs/1/workloads/3d14ec61-edaf-452e-b1b9-b7308652c0f6"
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 486,
        "timestamp": "2022-01-07 10:27:31"
    }
}
```


▼ Example Pre-Process Script:

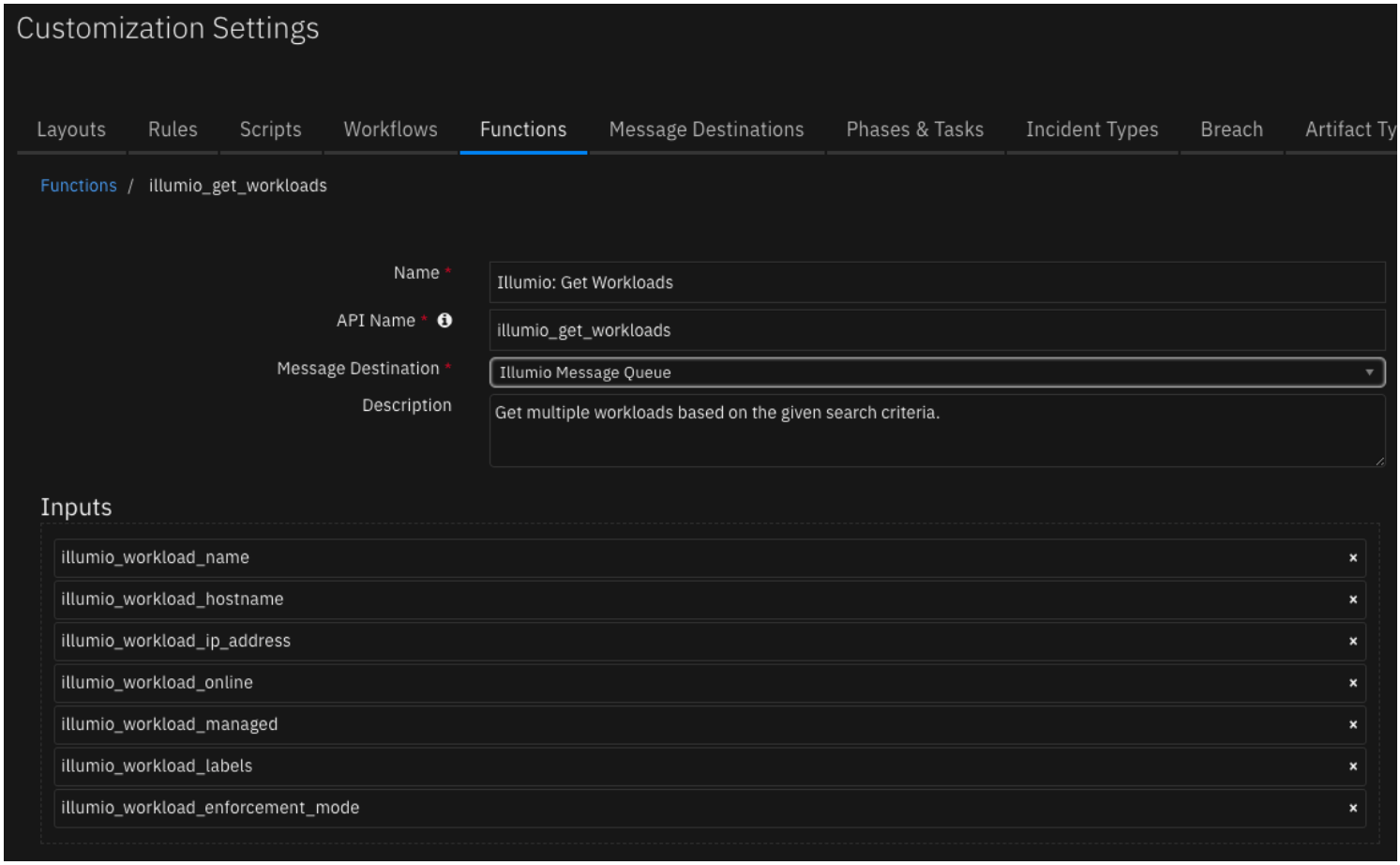
```
None
```

▼ Example Post-Process Script:

```
None
```

Function - Illumio: Get Workloads

Get multiple workloads based on the given search criteria.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_workload_enforcement_mode`	`select`	No	–	Search for workloads based on enforcement mode.
`illumio_workload_hostname`	`text`	No	–	The hostname of the workload to search for.
`illumio_workload_ip_address`	`text`	No	`127.0.0.1`	The IP address of the workload to search for. Supports partial matches.
`illumio_workload_labels`	`text`	No	–	Search for workloads based on a comma-separated list of Label HREFs.
`illumio_workload_managed`	`boolean`	No	–	If set, returns only managed workloads if true, or unmanaged workloads if false.
`illumio_workload_name`	`text`	No	–	The name of the workload(s) to search for. Supports partial matches.
`illumio_workload_online`	`boolean`	No	–	If set, returns only online workloads if true or offline workloads if false.

▼ Outputs:

```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "workloads": [
            {
                "href": "/orgs/1/workloads/3d14ec61-edaf-452e-b1b9-b7308652c0f6",
                "created_at": "2021-09-13T16:01:07.735779Z",
                "updated_at": "2021-12-16T16:47:04.458647Z",
                "created_by": {
                    "href": "/orgs/1/agents/17456"
                },
                "updated_by": {
                    "href": "/orgs/1/agents/17456"
                },
                "caps": [
                    "write"
                ],
                "hostname": "user-4",
                "public_ip": "66.124.202.19",
                "interfaces": [
                    {
                        "name": "eth0",
                        "address": "fe80::402:ffff:feef:5a4d",
                        "cidr_block": 64,
                        "network": {
                            "href": "/orgs/1/networks/9977853d-639e-4afd-a505-9e0fd419ce06"
                        },
                        "network_detection_mode": "link_local",
                        "loopback": False
                    },
                    {
                        "name": "eth0",
                        "address": "10.1.0.46",
                        "cidr_block": 24,
                        "default_gateway_address": "10.1.0.1",
                        "network": {
                            "href": "/orgs/1/networks/a9dd8b22-3108-4c64-911b-ac1b2eb5919e"
                        },
                        "network_detection_mode": "single_private_brn",
                        "loopback": False
                    },
                    {
                        "name": "eth0.public",
                        "address": "66.124.202.19",
                        "cidr_block": 32,
                        "network": {
                            "href": "/orgs/1/networks/a9dd8b22-3108-4c64-911b-ac1b2eb5919e"
                        },
                        "network_detection_mode": "manual",
                        "loopback": False
                    }
                ],
                "service_provider": "example.com",
                "data_center": "us-west.example.com",
                "data_center_zone": "us-west",
                "os_id": "ubuntu-x86_64-xenial",
                "os_detail": "5.4.0-1038-aws #40-Ubuntu SMP Fri Feb 5 23:50:40 UTC 2021 (Ubuntu 20.04.2 LTS)",
                "online": True,
                "deleted": False,
                "ignored_interface_names": [],
                "containers_inherit_host_policy": False,
                "blocked_connection_action": "drop",
```

```
    "labels": [
        {
            "href": "/orgs/1/labels/15420"
        },
        {
            "href": "/orgs/1/labels/15431"
        },
        {
            "href": "/orgs/1/labels/15430"
        },
        {
            "href": "/orgs/1/labels/15411"
        }
    ],
    "agent": {
        "href": "/orgs/1/agents/17456",
        "config": {
            "mode": "illuminated",
            "log_traffic": False,
            "visibility_level": "flow_summary"
        },
        "status": {
            "status": "active",
            "uid": "us-west+i-0ab12cd3e4fg5678h",
            "instance_id": "i-0ab12cd3e4fg5678h",
            "last_heartbeat_on": "2022-01-07T16:14:31.378648Z",
            "uptime_seconds": 10025687,
            "agent_version": "21.2.0-7831",
            "managed_since": "2021-09-13T16:01:07.772006Z",
            "fw_config_current": False,
            "firewall_rule_count": 0,
            "security_policy_refresh_at": "2022-01-03T20:54:34.809195Z",
            "security_policy_applied_at": "2022-01-03T20:54:34.809195Z",
            "security_policy_received_at": "2022-01-03T20:54:34.809195Z",
            "agent_health_errors": {
                "errors": [],
                "warnings": []
            },
            "security_policy_sync_state": "syncing"
        },
        "unpair_allowed": True,
        "type": "Host"
    },
    "ven": {
        "href": "/orgs/1/vens/3d14ec61-edaf-452e-b1b9-b7308652c0f6"
    },
    "enforcement_mode": "visibility_only",
    "visibility_level": "flow_summary"
},
{
    "href": "/orgs/1/workloads/1fd97272-1497-47b8-95c9-6f530dbe0749",
    "created_at": "2021-09-13T16:00:39.951135Z",
    "updated_at": "2021-12-16T16:47:04.465816Z",
    "created_by": {
        "href": "/orgs/1/agents/17423"
    },
    "updated_by": {
        "href": "/orgs/1/agents/17423"
    },
    "caps": [
        "write"
    ],
    "hostname": "dev-db-2",
    "public_ip": "66.124.202.19",
    "interfaces": [
```

```
    {
        "name": "eth0",
        "address": "fe80::45a:d8ff:fea9:54b1",
        "cidr_block": 64,
        "network": {
            "href": "/orgs/1/networks/9977853d-639e-4afd-a505-9e0fd419ce06"
        },
        "network_detection_mode": "link_local",
        "loopback": False
    },
    {
        "name": "eth0",
        "address": "10.1.0.82",
        "cidr_block": 24,
        "default_gateway_address": "10.1.0.1",
        "network": {
            "href": "/orgs/1/networks/a9dd8b22-3108-4c64-911b-ac1b2eb5919e"
        },
        "network_detection_mode": "single_private_brn",
        "loopback": False
    },
    {
        "name": "eth0.public",
        "address": "66.124.202.19",
        "cidr_block": 32,
        "network": {
            "href": "/orgs/1/networks/a9dd8b22-3108-4c64-911b-ac1b2eb5919e"
        },
        "network_detection_mode": "manual",
        "loopback": False
    }
],
"service_provider": "example.com",
"data_center": "us-west.example.com",
"data_center_zone": "us-west",
"os_id": "ubuntu-x86_64-xenial",
"os_detail": "5.4.0-1038-aws #40-Ubuntu SMP Fri Feb 5 23:50:40 UTC 2021 (Ubuntu 20.04.2 LTS)",
"online": True,
"deleted": False,
"ignored_interface_names": [],
"containers_inherit_host_policy": False,
"blocked_connection_action": "drop",
"labels": [
    {
        "href": "/orgs/1/labels/15427"
    },
    {
        "href": "/orgs/1/labels/15426"
    },
    {
        "href": "/orgs/1/labels/15418"
    },
    {
        "href": "/orgs/1/labels/15422"
    }
],
"agent": {
    "href": "/orgs/1/agents/17423",
    "config": {
        "mode": "illuminated",
        "log_traffic": False,
        "visibility_level": "flow_summary"
    },
    "status": {
        "status": "active",
```

```
                        "uid": "us-west+i-0e65e2aec3677d51e",
                        "instance_id": "i-0e65e2aec3677d51e",
                        "last_heartbeat_on": "2022-01-07T16:15:17.913215Z",
                        "uptime_seconds": 10025636,
                        "agent_version": "21.2.0-7831",
                        "managed_since": "2021-09-13T16:00:39.974839Z",
                        "fw_config_current": False,
                        "firewall_rule_count": 0,
                        "security_policy_refresh_at": "2022-01-03T20:55:54.361991Z",
                        "security_policy_applied_at": "2022-01-03T20:55:54.361991Z",
                        "security_policy_received_at": "2022-01-03T20:55:54.361991Z",
                        "agent_health_errors": {
                            "errors": [],
                            "warnings": []
                        },
                        "security_policy_sync_state": "syncing"
                    },
                    "unpair_allowed": True,
                    "type": "Host"
                },
                "ven": {
                    "href": "/orgs/1/vens/1fd97272-1497-47b8-95c9-6f530dbe0749"
                },
                "enforcement_mode": "visibility_only",
                "visibility_level": "flow_summary"
            }
        ]
    },
    "raw": None,
    "inputs": {
        "illumio_workload_enforcement_mode": "visibility_only",
        "illumio_workload_managed": True
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 534,
        "timestamp": "2022-01-07 11:41:53"
    }
}
```


▼ Example Pre-Process Script:

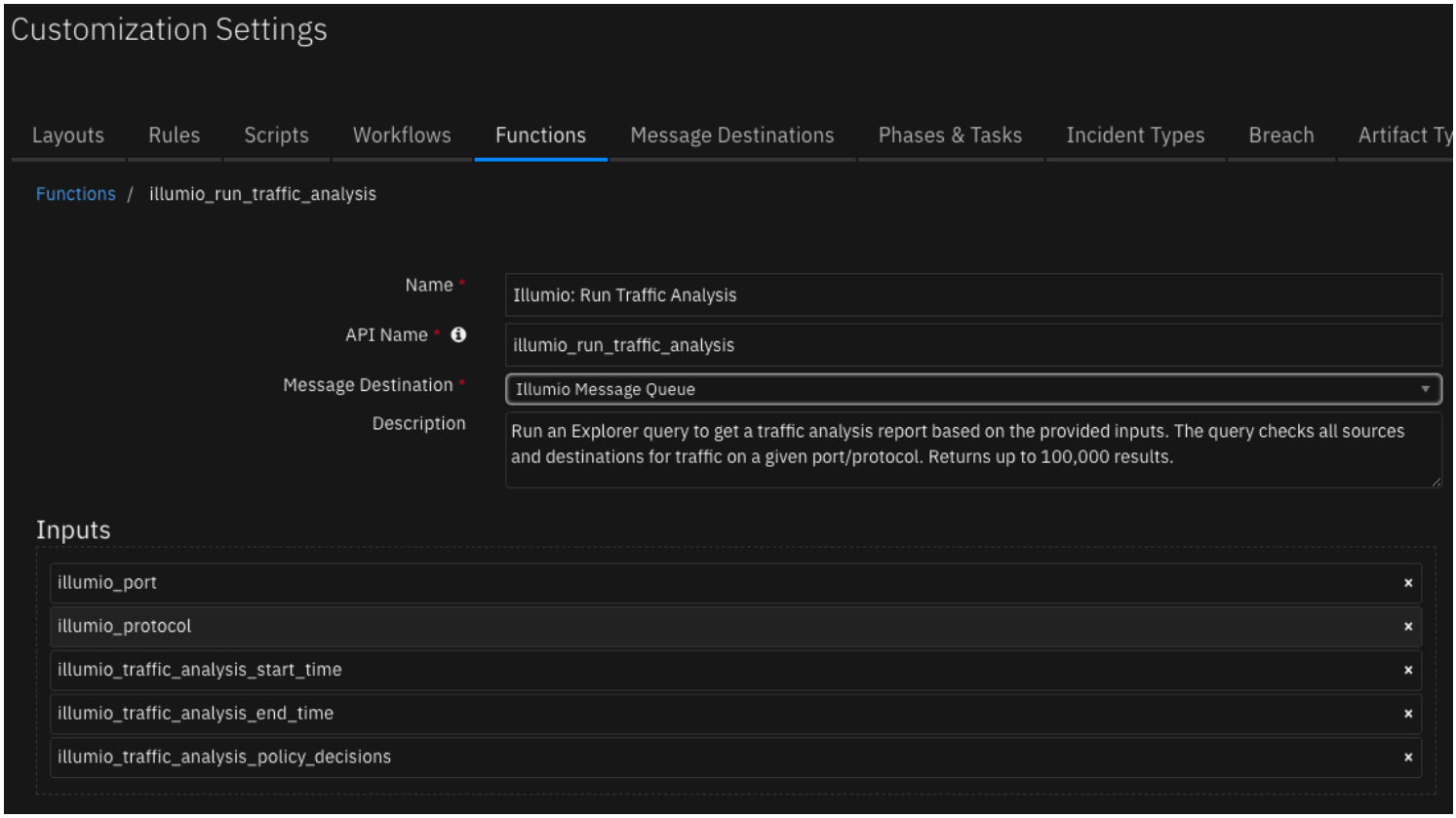
```
None
```

▼ Example Post-Process Script:

```
workload_hrefs = [workload['href'] for workload in results.content['workloads']]
workflow.addProperty('workload_hrefs', {'hrefs': workload_hrefs})
```

Function - Illumio: Run Traffic Analysis

Run an Explorer query to get a traffic analysis report based on the provided inputs. The query checks all sources and destinations for traffic on a given port/protocol. Returns up to 100,000 results.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_port`	`number`	Yes	`8080`	Port number
`illumio_protocol`	`select`	Yes	–	Communication protocol
`illumio_traffic_analysis_end_time`	`datetimepicker`	Yes	–	End of the query time range
`illumio_traffic_analysis_policy_decisions`	`multiselect`	Yes	–	List of policy decisions to include in the search results
`illumio_traffic_analysis_start_time`	`datetimepicker`	Yes	–	Start of the query time range

▼ Outputs:

```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "traffic_flows": [
            {
                "src": {
                    "ip": "198.204.226.234"
                },
                "dst": {
                    "ip": "10.1.100.43",
                    "workload": {
```

```
            "href": "/orgs/1/workloads/9c8b69b9-c741-4689-b8c7-f8ebee0dbee8",
            "hostname": "windows-jumpbox-1",
            "os_type": "windows",
            "labels": [
                {
                    "href": "/orgs/1/labels/15415",
                    "key": "app",
                    "value": "A-ADMIN"
                },
                {
                    "href": "/orgs/1/labels/15411",
                    "key": "env",
                    "value": "E-PROD"
                },
                {
                    "href": "/orgs/1/labels/15412",
                    "key": "loc",
                    "value": "L-DALLAS"
                },
                {
                    "href": "/orgs/1/labels/15416",
                    "key": "role",
                    "value": "R-JUMP-SRV"
                }
            ]
        }
    },
    "service": {
        "port": 3389,
        "proto": 6,
        "process_name": "svchost.exe",
        "windows_service_name": "TermService",
        "user_name": "NETWORK SERVICE"
    },
    "num_connections": 1,
    "state": "active",
    "timestamp_range": {
        "first_detected": "2021-12-29T20:38:13Z",
        "last_detected": "2021-12-29T20:38:13Z"
    },
    "dst_bi": 0,
    "dst_bo": 0,
    "policy_decision": "potentially_blocked",
    "flow_direction": "inbound"
},
{
    "src": {
        "ip": "27.124.5.118"
    },
    "dst": {
        "ip": "10.1.100.43",
        "workload": {
            "href": "/orgs/1/workloads/9c8b69b9-c741-4689-b8c7-f8ebee0dbee8",
            "hostname": "windows-jumpbox-1",
            "os_type": "windows",
            "labels": [
                {
                    "href": "/orgs/1/labels/15415",
                    "key": "app",
                    "value": "A-ADMIN"
                },
                {
                    "href": "/orgs/1/labels/15411",
                    "key": "env",
                    "value": "E-PROD"
```

```
                            },
                            {
                                "href": "/orgs/1/labels/15412",
                                "key": "loc",
                                "value": "L-DALLAS"
                            },
                            {
                                "href": "/orgs/1/labels/15416",
                                "key": "role",
                                "value": "R-JUMP-SRV"
                            }
                        ]
                    }
                },
                "service": {
                    "port": 3389,
                    "proto": 6,
                    "process_name": "svchost.exe",
                    "windows_service_name": "TermService",
                    "user_name": "NETWORK SERVICE"
                },
                "num_connections": 17,
                "state": "timed out",
                "timestamp_range": {
                    "first_detected": "2021-12-25T13:49:29Z",
                    "last_detected": "2021-12-25T13:49:29Z"
                },
                "dst_bi": 0,
                "dst_bo": 0,
                "policy_decision": "potentially_blocked",
                "flow_direction": "inbound"
            }
        ]
    },
    "raw": None,
    "inputs": {
        "illumio_protocol": "TCP",
        "illumio_traffic_analysis_policy_decisions": ["potentially_blocked", "unknown"],
        "illumio_traffic_analysis_end_time": 1640926800000,
        "illumio_traffic_analysis_start_time": 1640322000000,
        "illumio_port": 3389
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 8923,
        "timestamp": "2022-01-07 10:23:10"
    }
}
```


▼ Example Pre-Process Script:

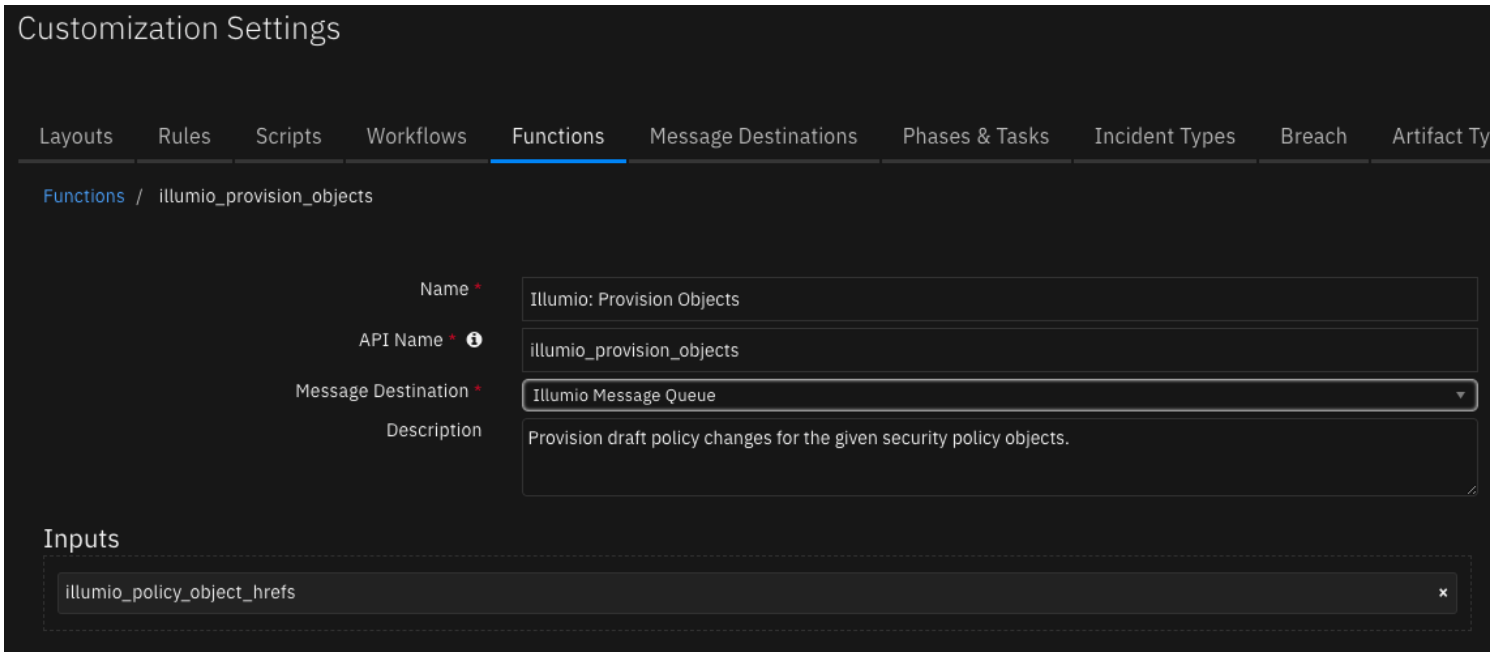
```
from datetime import datetime, timezone, timedelta

inputs.illumio_port = rule.properties.illumio_port
inputs.illumio_protocol = rule.properties.illumio_protocol

start_time = rule.properties.illumio_block_port_traffic_analysis_start_time
end_time = rule.properties.illumio_block_port_traffic_analysis_end_time

inputs.illumio_traffic_analysis_start_time = start_time
inputs.illumio_traffic_analysis_end_time = end_time
```

▼ Example Post-Process Script:

```
flows = results.content['traffic_flows']
traffic_flow_workloads = set()

for flow in flows:
    if 'workload' in flow['dst'] and flow['dst']['workload']['href']:
        traffic_flow_workloads.add(flow['dst']['workload']['href'])

workflow.addProperty('traffic_flow_workloads', {'hrefs': list(traffic_flow_workloads)})
incident.addNote(
    helper.createRichText(
        u"<b>Illumio: Block Port</b> workflow: found <b>{0}</b> traffic flows".format(len(traffic_flow_workloads))
    )
)
```

Function - Illumio: Provision Objects

Provision draft policy changes for the given security policy objects.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_policy_object_hrefs`	`text`	Yes	–	Comma-separated list of policy object HREFs

▼ Outputs:

```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "provisioned_hrefs": [
            "/orgs/1/sec_policy/active/virtual_services/575f43f4-3f99-4bb0-8a6f-9e2da7a9fbd2"
        ]
```

```
    },
    "raw": None,
    "inputs": {
        "illumio_policy_object_hrefs": "/orgs/1/sec_policy/draft/virtual_services/..."
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 490,
        "timestamp": "2022-01-07 10:23:20"
    }
}
```

▼ Example Pre-Process Script:

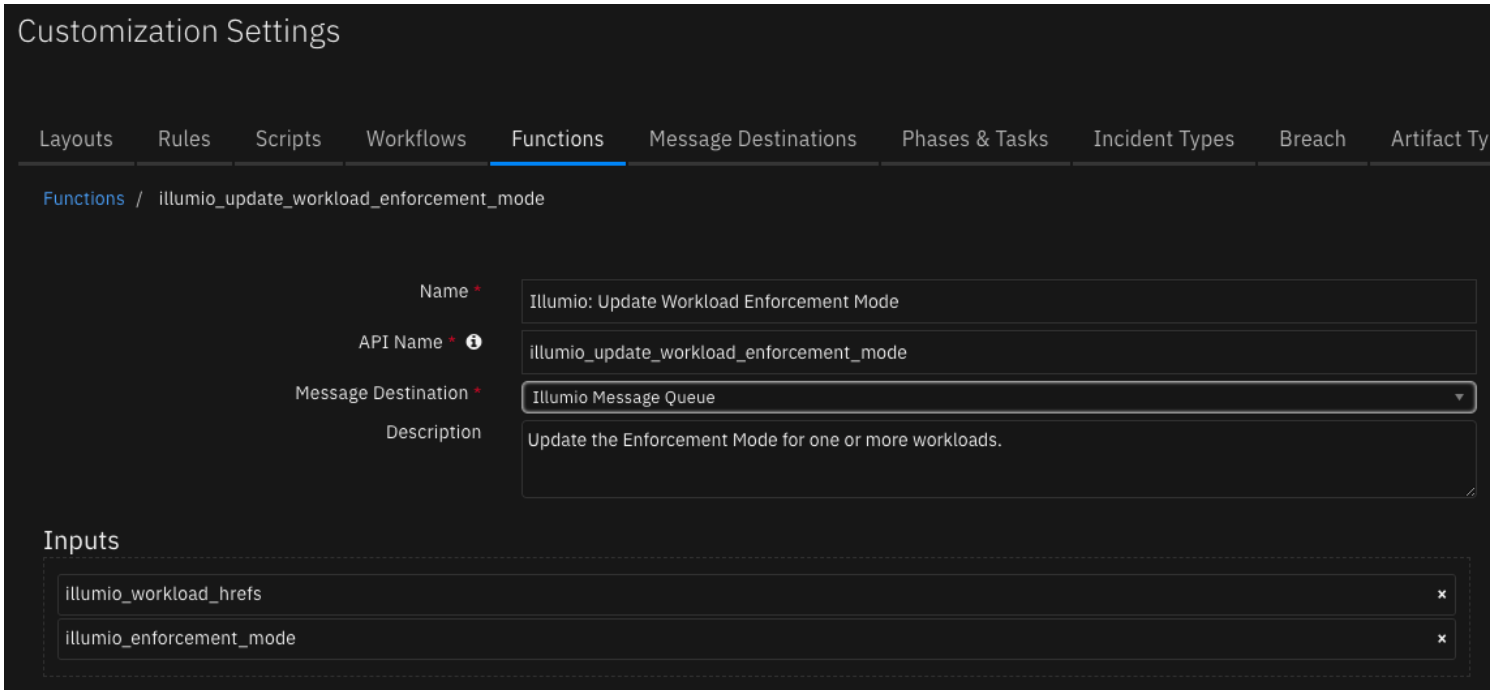
```
inputs.illumio_policy_object_hrefs = workflow.properties.virtual_service.content['href']
```

▼ Example Post-Process Script:

```
if results.content['provisioned_hrefs']:
    active_href = results.content['provisioned_hrefs'][0]
else:
    active_href = workflow.properties.virtual_service.content['href']

workflow.addProperty('virtual_service_active_href', {'href': active_href})
incident.addNote(
    helper.createRichText(
        u"<b>Illumio: Block Port</b> workflow: provisioned service with HREF <b>{0}</b>.".format(active_href)
    )
)
```

Function - Illumio: Update Workload Enforcement Mode

Update the Enforcement Mode for one or more workloads.



▼ Inputs:

Name	Type	Required	Example	Tooltip
`illumio_enforcement_mode`	`select`	Yes	–	Workload enforcement mode
`illumio_workload_hrefs`	`text`	Yes	–	Comma-separated string of workload HREF values

▼ Outputs:


```
results = {
    "version": 2.0,
    "success": True,
    "reason": None,
    "content": {
        "errors": [],
        "workloads": [
            "/orgs/1/workloads/3d14ec61-edaf-452e-b1b9-b7308652c0f6",
            "/orgs/1/workloads/1fd97272-1497-47b8-95c9-6f530dbe0749"
        ]
    },
    "raw": None,
    "inputs": {
        "illumio_enforcement_mode": "selective",
        "illumio_workload_hrefs": "/orgs/1/workloads/3d14ec61-edaf-452e-b1b9-b7308652c0f6,..."
    },
    "metrics": {
        "version": "1.0",
        "package": "fn-illumio",
        "package_version": "1.0.0",
        "host": "C02G82JEMD6R",
        "execution_time_ms": 1107,
        "timestamp": "2022-01-07 11:17:34"
    }
}
```

▼ Example Pre-Process Script:

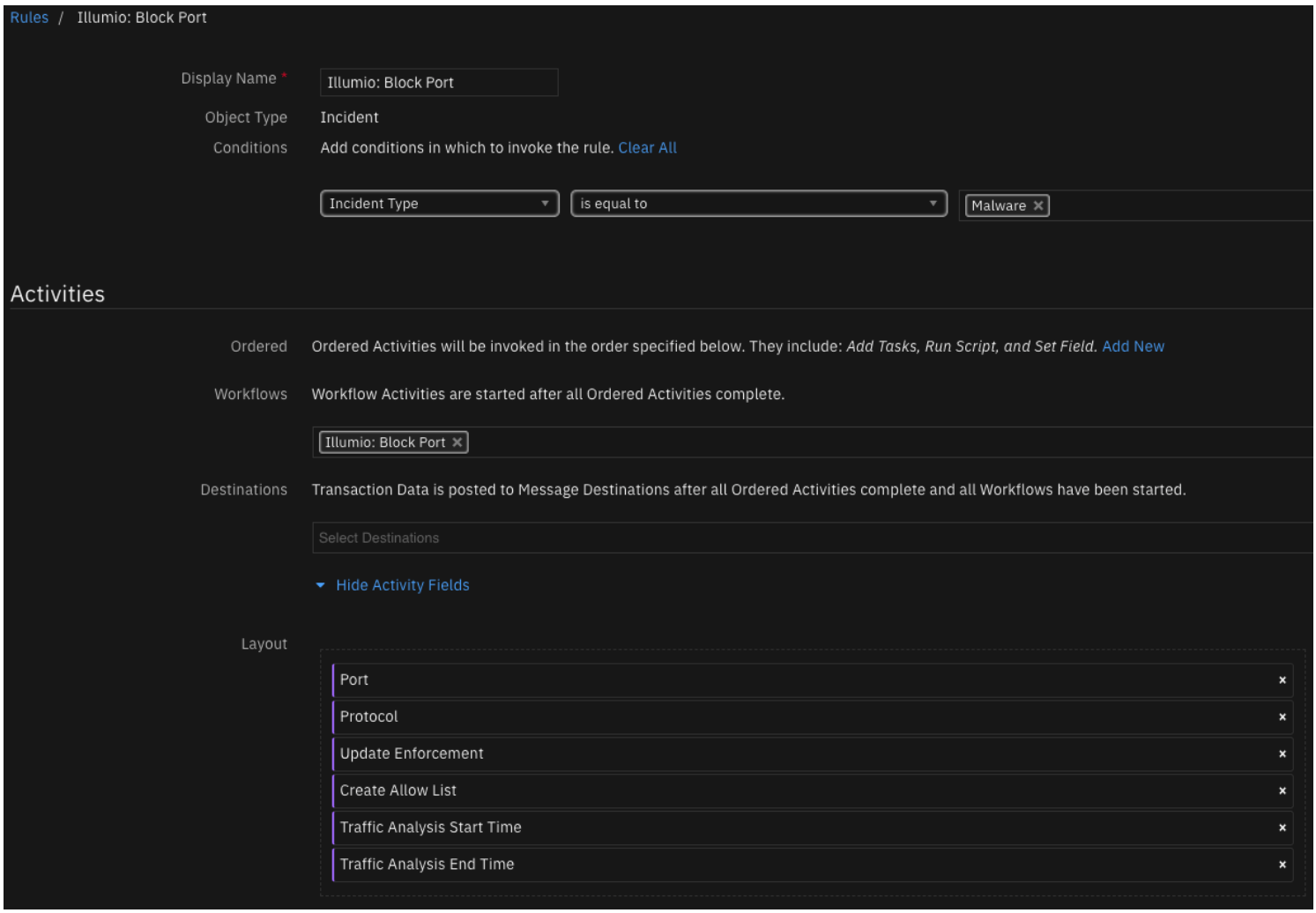
```
inputs.illumio_workload_hrefs = ','.join(workflow.properties.workload_hrefs['hrefs'])
```

▼ Example Post-Process Script:

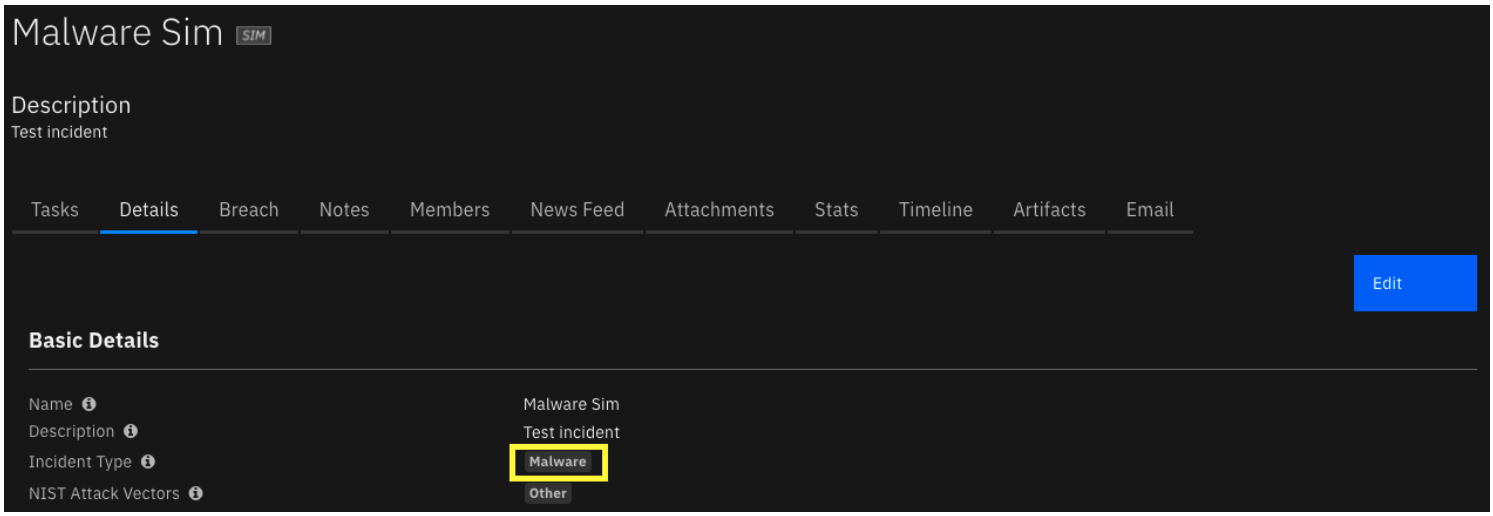
```
incident.addNote(
    helper.createRichText(
        u"<b>Illumio: Block Port</b> workflow: moved all Visibility Only workloads into Selective enforcement."
    )
)
```

Rule - Illumio: Block Port

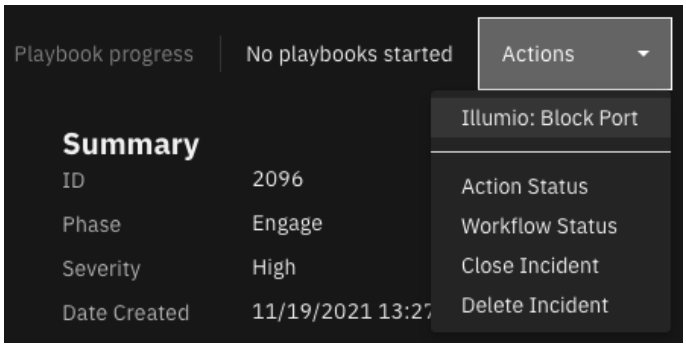
This rule is used to trigger the Block Port workflow for a specified port and protocol.



The action must be run manually from an incident of type **Malware**.

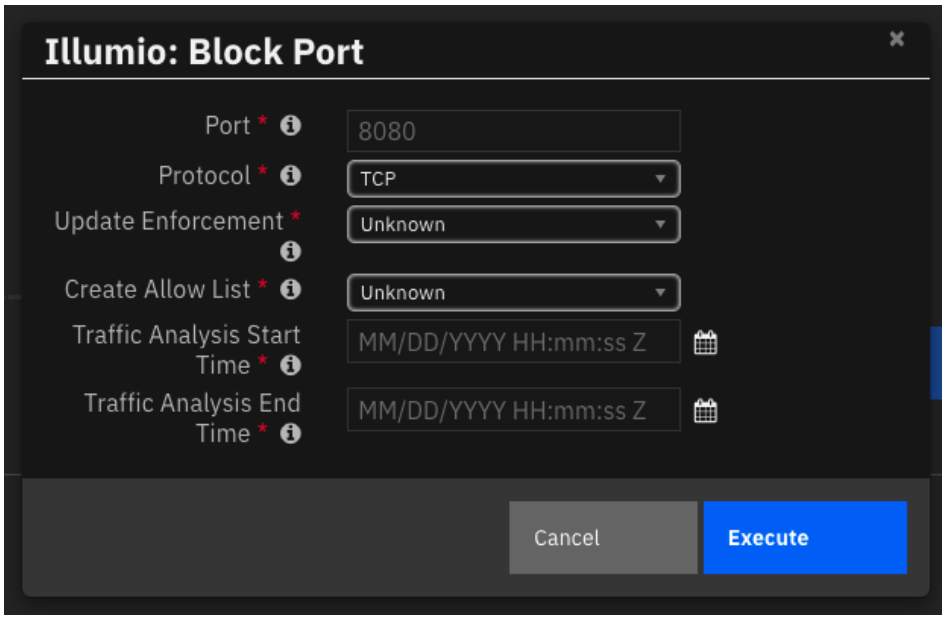


The Block Port rule can be triggered from the Actions dropdown menu at the upper-right of the incident page:



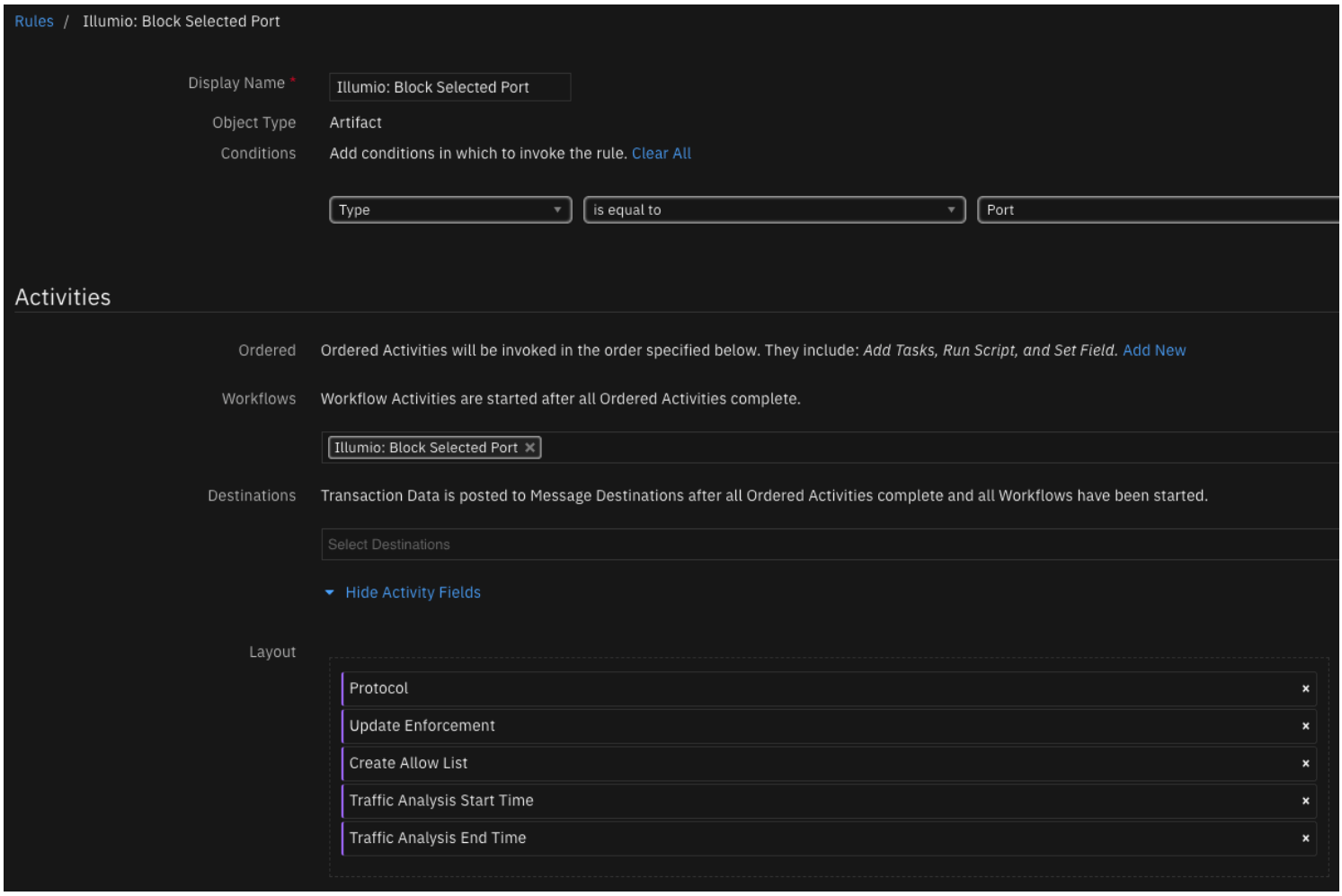
The workflow requires values for the following form fields attached to the Block Port Rule:

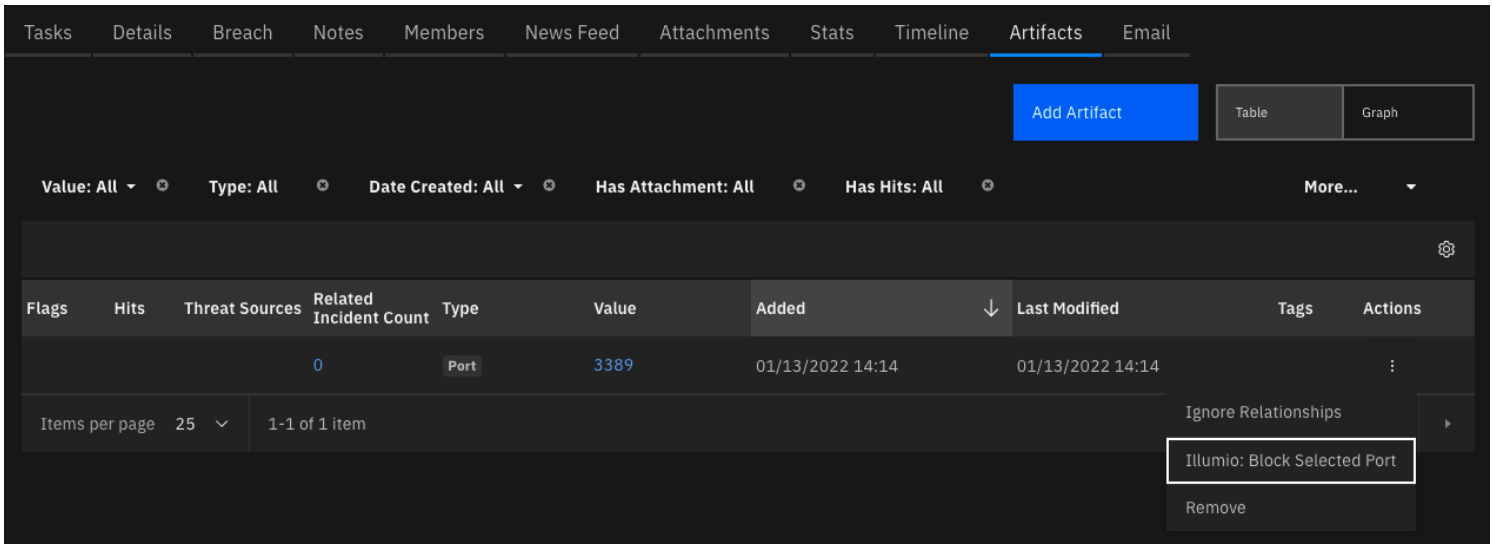
Field	Description
Port	The port to block
Protocol	The traffic protocol to block
Update Enforcement	If yes, updates the enforcement mode of **all** workloads in Visibility Only mode to Selective enforcement
Create Allow List	If yes, creates policy objects and rules to allow traffic from the given traffic analysis timespan on the blocked port and protocol
Traffic Analysis Start Time	The beginning of the analysis period to find traffic flows that will be added to the allow list rule. If **Create Allow List** is set to No, these values are ignored
Traffic Analysis End Time	The end of the analysis period to find traffic flows that will be added to the allow list rule. If **Create Allow List** is set to No, these values are ignored



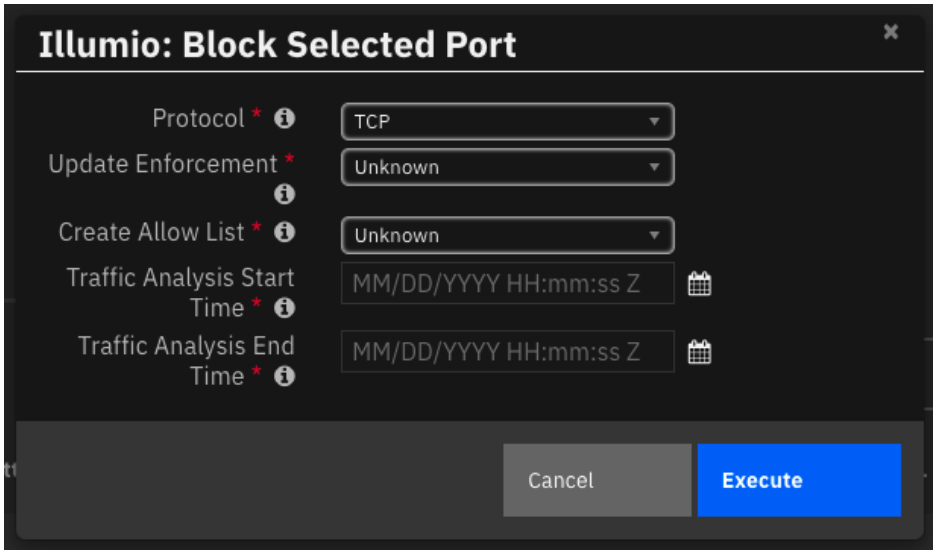
Rule - Illumio: Block Selected Port

This rule is used to trigger the Block Selected Port workflow from an Artifact of type **Port**. It can be triggered from the Actions menu of **Port** artifact in the Artifacts tab once it has been added to an incident. The incident can be of any type.





The Port field is not included in the form fields: the value is instead pulled from the Port Artifact. All remaining fields are identical to the **Block Port** Rule.



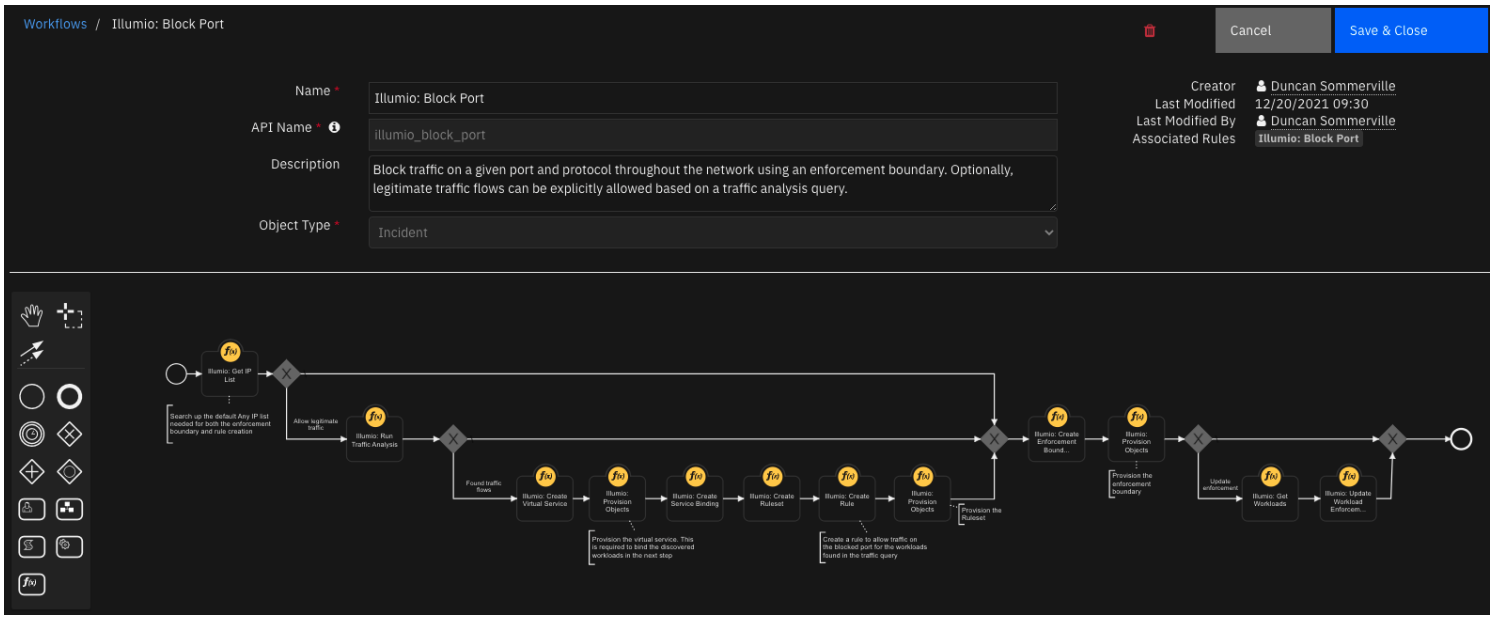
Workflow - Illumio: Block Port

API Name

`illumio_block_port`

Overview

The **Block Port** workflow can be used to block incoming traffic to **all** workloads on a specified port and protocol. This deny rule is configured in the **Illumio** Policy Compute Engine using an Enforcement Boundary.



The first conditional branch of the workflow checks whether a Traffic Analysis search should be performed for traffic within a given timespan. If so, a search is performed for any Potentially Blocked or Unknown traffic on the port and protocol to be blocked within that span of time. If any traffic flows are found, policy objects and rules are then created to make sure traffic is allowed and continues uninterrupted to the destination workloads found in the search.

> **Note:** The Traffic Analysis timespan should not overlap with the breach - it is intended to find "good" traffic from before the attack to mitigate any interruption of legitimate services receiving traffic on the blocked port and protocol.
>
> If you are uncertain when the breach began, err on the side of caution to avoid creating rules that may allow malicious traffic flows.

A Virtual Service is created for the blocked port and protocol to be used in the Rule that will allow traffic. Once the Virtual Service is provisioned, the destination workloads found in the traffic analysis are then bound to it.

A Ruleset and Rule are then created and provisioned to allow the traffic.

In all branches, an Enforcement Boundary is created to deny traffic on the specified port and protocol.

The second conditional branch checks if the Enforcement Mode should be updated for workloads currently in Visibility Only enforcement. If so, all workloads in Visibility Only mode will be changed to Selective enforcement.

Workflow - Illumio: Block Selected Port

API Name

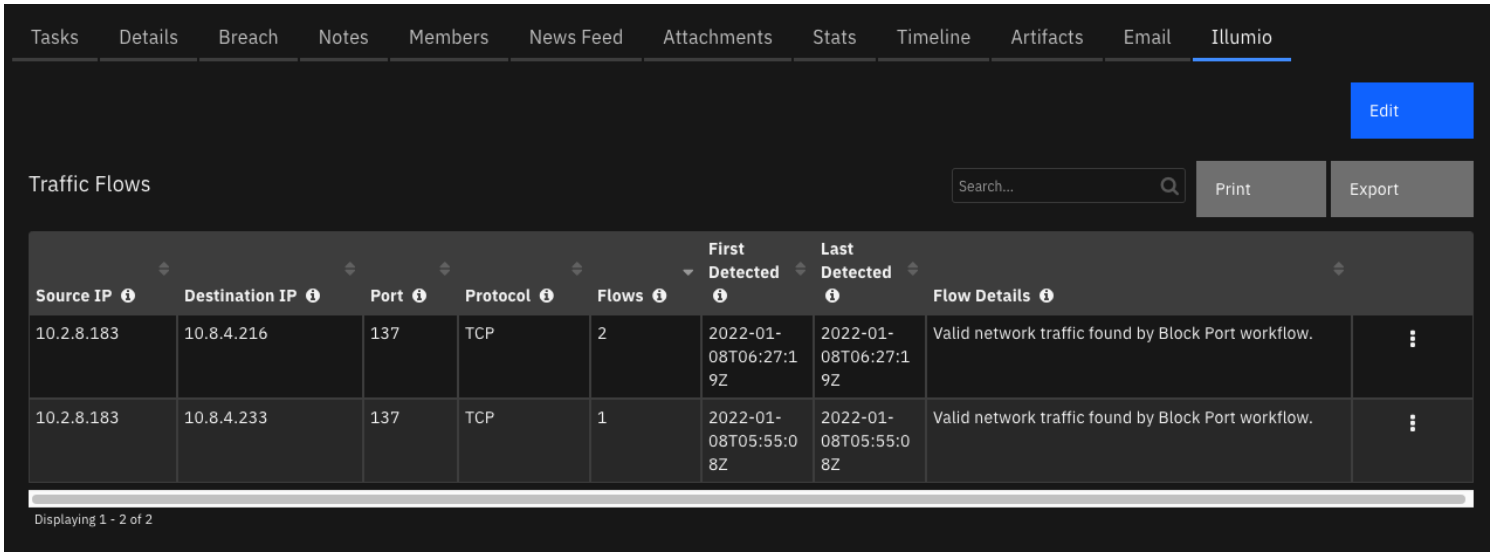
```
illumio_block_selected_port
```

Overview

The **Block Selected Port** workflow clones the Block Port workflow and is used with the Block Selected Port Rule to trigger from **Port**-type Artifacts. Both workflows have the same functionality outside of where the blocked port value originates.

Data Table - Traffic Flows

Data table used to store traffic flow data returned from Explorer traffic analysis queries.



API Name

`illumio_traffic_flows`

Columns

Field Name	API Name	Type	Placeholder	Required	Description
Source IP	`source_ip`	`text`	`127.0.0.1`	`Yes`	Source (consumer) IP address for the traffic flow.
Destination IP	`destination_ip`	`text`	`127.0.0.1`	`Yes`	Destination (provider) IP address for the traffic flow.
Port	`port`	`number`	`8080`	`Yes`	Traffic flow destination port.
Protocol	`protocol`	`select`	`TCP`	`Yes`	Traffic flow protocol.
Flows	`flows`	`number`	`0`	`Yes`	Flow count during detection period.
First Detected	`first_detected`	`text`	`2022-01-01T12:00:00Z`	`Yes`	Timestamp at which the flow was initially detected.
Last Detected	`last_detected`	`text`	`2022-01-01T12:00:00Z`	`Yes`	Timestamp at which the flow was last detected.
Flow Details	`flow_details`	`rich text`		`No`	Any additional details about the traffic flow.

Troubleshooting & Support

Refer to the documentation listed in the Requirements section for troubleshooting information.

For Support

This is a IBM Community provided App. Please search the Community (https://ibm.biz/resilientcommunity), or contact app-integrations@illumio.com for assistance.