algosec Documentation

AlgoSec

May 05, 2019

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CHAPTER 1

AlgoSec Python SDK

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A Python SDK providing simple access to AlgoSec APIs, including handy methods to implement common network security policy management tasks, such as:

- Check whether specific traffic is allowed by the firewalls and security devices in the network.
- Open a network security change request.
- Check status of existing change requests.
- Update business application connectivity requirements (and automatically trigger change requests as needed)

Useful for automation and orchestration (e.g. DevOps), building custom portals, or exposing specific functionality to Application Owners, IT, Helpdesk, Information Security, Security Operations, etc.

Included in this package are clients for AlgoSec Firewall Analyzer, FireFlow and BusinessFlow.

1.1 Installation

Install the latest version from PyPi by running:

```
pip install algosec --upgrade
```

or clone this repo and run:

```
python setup.py install
```

1.2 Contribution

Contributions are welcome! Please follow the standard pull request process.

1.3 Documentation

Documentation available online at: https://algosec-python.readthedocs.io/en/latest/

1.3.1 How to build doc's locally?

Using Spinx:

```
$ cd docs
$ make html
```

Then see the `docs/_build` folder created for the html files.

1.4 Developing

To install the package for local development just run:

```
pipenv install
```

This will install all the dependencies and set the project up for local usage and development .

1.4.1 Testing

To run the unittests for all supported python versions, simply run:

```
tox
```

CHAPTER 2

API Clients

Welcome! This page explain the best way to use `algosec` API clients. We'll start with a short brief description of the module and its constitutions followed by in-depth explanation and exploration of each of the API Clients.

2.1 BusinessFlow API Client

class algosec.api_clients.business_flow.**BusinessFlowAPIClient**(*server_ip*, *user*, *password*, *verify_ssl=True*, *session_adapter=<class 'algosec.helpers.AlgoSecServersHTTPAdapter'>*

BusinessFlow RESTful API client.

Used by initiating and calling its public methods or by sending custom calls using the `session` property. Client implementation is strictly based on AlgoSec's official API guide. To ease the usability for custom API calls, a bunch of base urls were added as properties to this class (see example below).

Examples

Using the public methods to send an API call:

```
from algosec.api_clients.business_flow import BusinessFlowAPIClient
client = BusinessFlowAPIClient(ip, username, password)
application_revision_id = client.get_application_revision_id_by_name(
↪"ApplicationName")
```

Sending a custom API Call:

```
from algosec.api_clients.business_flow import BusinessFlowAPIClient
client = BusinessFlowAPIClient(ip, username, password)
response = client.session.get(
```

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```
    "{}/name/{}".format(client.applications_base_url, application_name)
)
```

Parameters

- **server_ip** (*str*) – IP address of the AlgoSec server.
- **user** (*str*) – Username used to log in to AlgoSec.
- **password** (*str*) – The user's password, similar to the one used to log in to the UI.
- **verify_ssl** (*bool*) – Turn on/off the connection's SSL certificate verification. Defaults to True.

api_base_url
Return the base url for all API calls.

Type str

applications_base_url
Return the base url for all application related API calls.

Type str

apply_application_draft(*app_revision_id*)
Apply an application draft and automatically create a FireFlow change request.

Parameters **app_revision_id** (*int | str*) – The revision ID of the application to apply the draft for.

Raises *AlgoSecAPIError* – If error occurred while trying to apply the application draft.

Returns The API call response.

Return type requests.models.Response

business_flow_base_url
Return the base url for BusinessFlow.

Type str

create_application_flow(*app_revision_id*, *requested_flow*)
Create an application flow.

Creates network services that were defined in the flow but are not currently exist on ABF.

Parameters

- **app_revision_id** (*int*) – The application revision id as defined on ABF to create this flow on
- **requested_flow** (algosec.models.RequestedFlow) – The flow to be created

Raises *AlgoSecAPIError* – If application flow creation failed.

Returns An Application object as defined in the API Guide.

Return type dict

create_missing_network_objects(*all_network_objects*)
Create network objects if they are not already defined on the server.

Parameters **all_network_objects** (*collections.Iterable[str]*) – List of the network objects to create if missing from the server.

Raises *AlgoSecAPIError* – If the one of the network objects creation failed.

Returns List of the created network objects.

Return type list[dict]

Note: If one of the given objects is not a valid IP address or subnet string, the object won't be created.

---

create_network_object(*type*, *content*, *name*)
Create a new network object.

Parameters

- **type** (*algosec.models.NetworkObjectType*) – The network object type
- **content** (*str | list*) – Define the newly created network object. Content depend upon the selected type:
  - *HOST*: Content is the IP address of the object.
  - *RANGE*: Content is IP range or CIDR.
  - ***GROUP*: Content is a list of *ExistingNetworkObject* or *NewNetworkObject* objects as defined in the API Guide.**
  - *ABSTRACT*: Content is None or an empty string.
- **name** (*str*) – Name of the new network object

Raises *AlgoSecAPIError* – If the network object creation failed.

Returns The newly created ExistingNetworkObject object.

Return type dict

create_network_service(*service_name*, *content*, *custom_fields=None*)
Create a network service.

Parameters

- **service_name** (*str*) – The service object's service_name
- **content** (*list[(str, int)]*) – List of (port, proto) pairs defining the services
- **custom_fields** – The custom fields to include for the object.

Raises *AlgoSecAPIError* – If network service creation failed.

Returns The created NetworkService object as defined in the API Guide.

Return type dict

delete_flow_by_id(*app_revision_id*, *flow_id*)
Delete an application flow given its id.

Parameters

- **app_revision_id** (*int | str*) – The revision ID of the application to delete the flow from.
- **flow_id** (*int | str*) – The ID of the flow to delete.

Raises *AlgoSecAPIError* – If the flow deletion failed.

Returns None

delete_flow_by_name(*app_revision_id*, *flow_name*)
Delete an application flow given its name.

Parameters

- **app_revision_id** (*int* | *str*) – The revision ID of the application to delete the flow from.
- **flow_name** (*str*) – The name of the flow to delete.

Raises

- *AlgoSecAPIError* – If the flow deletion failed.
- *EmptyFlowSearch* – If no flow matching that name could be found.

Returns None

get_abf_application_dashboard_url(*application_revision_id*)
Return URL for the application dashboard.

This is the applications's dashboard on AlgoSec BusinessFlow and it can be viewed in the browser.

Parameters **application_revision_id** – The application revision ID to return the dashboard URL for.

Returns URL for the application dashboard on the AlgoSec BusinessFlow. An Example would look like that: https://10.0.0.12/BusinessFlow/#application/293/dashboard

Return type str

get_application_by_name(*app_name*)
Return the latest revision of an application by its name.

Parameters **app_name** (*str*) – The application name to look for.

Raises *AlgoSecAPIError* – If no application matching the given name was found.

Returns Json of the latest application revision.

Return type dict

get_application_flows(*app_revision_id*)
Return all flows of the application revision.

Note: Only flows with `flowType` of `APPLICATION_FLOW` are returned. The rest of the flows (e.g shared flows) are filtered out.

Parameters **app_revision_id** (*str* | *int*) – The ID of the application revision to fetch the flows for

Raises *AlgoSecAPIError* – If application flows list could not be fetched.

Returns List of Flow objects as defined in the API Guide.

Return type list[dict]

get_application_revision_id_by_name(*app_name*)
Return the latest revision id of an application by its name.

Parameters **app_name** (*str*) – The application name to look for.

Raises *AlgoSecAPIError* – If no application matching the given name was found.

Returns The latest application revision ID.

Return type int

get_associated_applications(*ip_address*)
Return all applications containing network objects related to IP addresses.

Parameters **ip_address** (*str*) – The IP address to search associated applications for

Raises *AlgoSecAPIError* – If error occurred while trying to fetch associated applications.

Returns List of dictionaries each representing an associated application.

Return type list

get_associated_applications_ui_query(*queried_ip_address*)
Return URL that can be used in the browser to view the associated applications query.

Parameters **queried_ip_address** – The IP address we wish to find associated applications for.

Returns URL for ssociated applications query that can be viewed in the browser.

Return type str

get_flow_by_name(*app_revision_id*, *flow_name*)
Return application flow by its name

Parameters

- **app_revision_id** (*int* | *str*) – The application revision ID to fetch the flow from.
- **flow_name** (*str*) – The name of the flow to fetch.

Raises

- *AlgoSecAPIError* – If fetching the full list of flows for the application revision failed
- *EmptyFlowSearch* – If no flow matching that name could be found

Returns Flow object as defined in the API Guide.

Return type dict

get_flow_connectivity(*app_revision_id*, *flow_id*)
Return a flow connectivity object for a flow given its ID.

Parameters

- **app_revision_id** (*int* | *str*) – The ID of the application revision to lookup the flow in.
- **flow_id** (*int* | *str*) – The ID of the flow to fetch `FlowConnectivity` for.

Raises *AlgoSecAPIError* – If error occurred while fetching the flow connectivity object.

Returns FlowConnectivity object as defined in the API Guide.

Return type dict

get_network_object_by_name(*object_name*)
Return a network object by its name.

Parameters **object_name** (*str*) – The object name to be searched.

Raises *AlgoSecAPIError* – If no network object matching the given name could be found.

Returns The NetworkObject object matching the name lookup.

Return type dict

get_network_service_by_name(*service_name*)
Get a network service object by its name.

Parameters **service_name** (*str*) – The name of the service.

Raises *AlgoSecAPIError* – If no such network service could be found by name.

Returns NetworkObject as defined on the API Guide.

Return type dict

static is_application_critical(*application_json*)
Return True if the application's json has the critical label set.

Parameters **application_json** – The application Json as returned from AlgoSec BusinessFlow APIs.

Returns True if the application is marked as a critical application

Return type bool

network_objects_base_url
Return the base url for all objects related API calls.

Type str

network_services_base_url
Return the base url for all services related API calls.

Type str

search_network_objects(*ip_or_subnet*, *search_type*)
Return network objects related to a given IP or subnet.

Parameters

- **ip_or_subnet** (*str*) – The IP address or hostname of the object, or a subnet. (e.g: 192.1.1.1, 192.168.0.0/16)
- **search_type** (algosec.models.NetworkObjectSearchTypes) – The enum for search type to perform. Could be one of :
  - *INTERSECT* - Search objects which their definition intersect with the given IP or subnet.
  - *CONTAINED* - Search for objects which the given IP or subnet is contained in.
  - *CONTAINING* - Search for objects contained within the given IP or subnet.
  - *EXACT* - Search the object which is defined exactly by (and only by) the given IP or subnet.

Raises *AlgoSecAPIError* – If an error occurred during the object search.

Returns

List of network objects matching the given obj and search type. Each of the objects is a NetworkObject as defined in the API Guide.

Return type list[dict]

2.2 FirewallAnalyzer API Client

class algosec.api_clients.firewall_analyzer.**FirewallAnalyzerAPIClient**(*server_ip*, *user*, *password*, *verify_ssl=True*, *session_adapter=<class 'algosec.helpers.AlgoSecServersHT*

FirewallAnalyzer SOAP API client.

Used by initiating and calling its public methods or by sending custom calls using the `client` property. Client implementation is strictly based on AlgoSec's official API guide.

Example

Using the public methods to send an API call:

```
from algosec.api_clients.firewall_analyzer import FirewallAnalyzerAPIClient
client = FirewallAnalyzerAPIClient(ip, username, password)
query_result = client.run_traffic_simulation_query(source, dest, service)
```

Parameters

- **server_ip** (*str*) – IP address of the AlgoSec server.
- **user** (*str*) – Username used to log in to AlgoSec.
- **password** (*str*) – The user's password, similar to the one used to log in to the UI.
- **verify_ssl** (*bool*) – Turn on/off the connection's SSL certificate verification. Defaults to True.

execute_traffic_simulation_query(*source*, *destination*, *service*, *target=None*, *application=None*)

Return results and browser URL for a traffic simulation query.

Parameters

- **source** (*str*) – Source of the simulated traffic. (e.g. IPs, subnet or an object name)
- **destination** (*str*) – Destination of the simulated traffic. (e.g. IPs, subnet or an object name)
- **service** (*str*) – Service of the simulated traffic (e.g: tcp/200, http)
- **target** (*str*) – Name of a device or a group the query should run on. With the default None value, the query will run on the entire network and all permitted devices for the user.
- **application** (*str*) – Name of the network application to include in the query.

Raises *AlgoSecAPIError* – If any error occurred while executing the traffic simulation query.

Returns

A dict mapping the results to their values. For example:

{ 'result': DeviceAllowanceState.ALLOWED, 'query_url': 'https://local.algosec.com/fa/query/results/#/work/ALL_FIREWALLS_query-1543622562206/'

}

Return type dict

run_traffic_simulation_query(*source*, *destination*, *service*)

Run a traffic simulation query.

Parameters

- **source** (*str*) – Source of the simulated traffic. (e.g. IPs, subnet or an object name)
- **destination** (*str*) – Destination of the simulated traffic. (e.g. IPs, subnet or an object name)
- **service** (*str*) – Service of the simulated traffic (e.g: tcp/200, http)

Raises *AlgoSecAPIError* – If any error occurred while executing the traffic simulation query.

Returns Traffic simulation query result.

Return type *algosec.models.DeviceAllowanceState*

2.3 FireFlow API Client

class algosec.api_clients.fire_flow.**FireFlowAPIClient**(*server_ip*, *user*, *password*, *verify_ssl=True*, *session_adapter=<class 'algosec.helpers.AlgoSecServersHTTPAdapter'>*)

FireFlow SOAP API client.

Used by initiating and calling its public methods or by sending custom calls using the `client` property. Client implementation is strictly based on AlgoSec's official API guide.

Example

Using the public methods to send an API call:

```
from algosec.api_clients.fire_flow import FireFlowAPIClient
client = FireFlowAPIClient(ip, username, password)
change_request = client.get_change_request_by_id(change_request_id)
```

Parameters

- **server_ip** (*str*) – IP address of the AlgoSec server.
- **user** (*str*) – Username used to log in to AlgoSec.
- **password** (*str*) – The user's password, similar to the one used to log in to the UI.
- **verify_ssl** (*bool*) – Turn on/off the connection's SSL certificate verification. Defaults to True.

create_change_request(*subject*, *requestor_name*, *email*, *traffic_lines*, *description=''*, *template=None*)

Create a new change request.

Parameters

- **subject** (*str*) – The ticket subject, will be shown on FireFlow.
- **requestor_name** (*str*) – The ticket creator name, will be shown on FireFlow.
- **email** (*str*) – The email address of the requestor.
- **traffic_lines** (*list[algosec.models.ChangeRequestTrafficLine]*) – List of traffic lines each describing its sources, destinations and services.
- **description** (*str*) – description for the ticket, will be shown on FireFlow.
- **template** (*str*) – When different than None, this template will be passed on to FireFlow to be used as the template for the new change requets.

Raises *AlgoSecAPIError* – If change request creation failed.

Returns The URL for the newley create change request on FireFlow

Return type str

get_change_request_by_id(*change_request_id*)

Get a change request by its ID.

Useful for checking the status of a change request you opened through the API.

Parameters **change_request_id** – The ID of the change request to fetch.

Raises *AlgoSecAPIError* – If the change request was not found on the server or another error occurred while fetching the change request.

Returns The change request ticket object.

2.4 Models and Constants

Define models and enums used by the API clients.

Note: Most developers will not have to use any of the contents of this module directly.

class algosec.models.**ChangeRequestAction**

Enum representing a change request expected action.

ALLOW

This enum will mark the change request to allow the requested traffic

DROP

This enum will mark the change request to block the requested traffic

class algosec.models.**DeviceAllowanceState**

Enum representing different device allowance states as defined on BusinessFlow.

PARTIALLY_BLOCKED

BLOCKED

ALLOWED

NOT_ROUTED

class algosec.models.**NetworkObjectSearchTypes**
Enum used for *search_network_objects()*

class algosec.models.**NetworkObjectType**
Enum representing a `NetworkObject` type as defined on the API Guide.

Used by various API clients to communicate with the AlgoSec servers.

HOST
Denotes an object that is defined by it's IP address.

RANGE
Denotes an object that is defined by an IP range or CIDR.

GROUP
Denotes an object that is defined by a list of ExistingNetworkObject or NewNetworkObject objects.

ABSTRACT
Denotes an object that is devoid of any particular definition. Defined with empty content.

class algosec.models.**RequestedFlow**(*name*, *sources*, *destinations*, *network_users*, *network_applications*, *network_services*, *comment*, *custom_fields=None*, *type='APPLICATION'*)
Represents a NewFlow model from the API Guide.

This model is used by the *BusinessFlowAPIClient* to create and handle different operations regarding new and existing flows.

It is used to represent a new flow that is about to be created.

Parameters

- **name** (*str*) – The name of the new flow.
- **sources** (*list[str]*) – Sources for the flow.
- **destinations** (*list[str]*) – Destinations for the flow.
- **network_users** (*list[str]*) – Network user names for the flow.
- **network_applications** (*list[str]*) – Names of network application for the flow.
- **network_services** (*list[str]*) – Names of network services names for the flow.
- **comment** (*str*) – Any comment to save alongside the flow.
- **custom_fields** (*list*) – Custom fields for the new flow
- **type** (*str*) – Optional. The type of the flow to create. Default to *APPLICATION*.

get_json_flow_definition()
Return a dict object representing a NewFlow as expected by the API.

Returns NewFlow object.

Return type dict

2.5 Exceptions and Errors

Exception and error classes used and thrown by the API clients.

Developers will might use the exceptions and errors in their code while working with the API clients. Each of public methods of the API client document which errors may raise by their use. Then, developers can `try-except` in their code using the AlgoSec defined errors for better clarity of their code.

exception algosec.errors.**AlgoSecAPIError**(**args*, ***kwargs*)
Root parent AlgoSec API error subclassed by all other API errors.

response
The response object that caused the error. If it was not passed to the constructor, will be None.

response_content
The content of the response that caused the error. If it is a JSON, a JSON will be stored and not the raw content. Will be None if is not passed.

Type dict|str

status_code
The status code of the response of the failed API call. (Optional)

Type int

Keyword Arguments

- **response** – The response object that caused the error. (Optional)
- **response_content** (*dict*) – The content of the response of the failed API call. (Optional)
- **status_code** (*int*) – The status code of the response of the failed API call. (Optional)

exception algosec.errors.**AlgoSecBusinessFlowAPIError**(**args*, ***kwargs*)
Raised for any BusinessFlow related API errors.

This error is also subclassed by other more specific BusinessFlow related errors.

exception algosec.errors.**AlgoSecLoginError**(**args*, ***kwargs*)
Raised when login to AlgoSec API fails

exception algosec.errors.**EmptyFlowSearch**(**args*, ***kwargs*)
Raised when flow search by exact name fails.

exception algosec.errors.**UnrecognizedAllowanceState**(**args*, ***kwargs*)
Raised when parsing unknown device allowance state strings.

CHAPTER 3

License

CHAPTER 4

Support

This template/solution is released under an as-is, best effort, support policy. These scripts should be seen as community supported and AlgoSec. will contribute our expertise as and when possible. We do not provide technical support or help in using or troubleshooting the components of the project through our normal support options such as AlgoSec support teams and backline support options. The underlying product used by the scripts or templates are still supported, but the support is only for the product functionality and not for help in deploying or using the template or script itself.

Unless explicitly tagged, all projects or work posted in our GitHub repository or sites other than our official Downloads page are provided under the best effort policy.

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