Configure ESA Dictionary Using Python and AsyncOS REST API

Contents

Introduction

This document describes how to use Python script to add new dictionary to a Cisco Email Security Appliance (ESA) by using the AsyncOS API (REST API).

Prerequisites

Review these prerequisites:

- Python programming language
- Python `requests` module
- JSON
- Cisco Email Security Appliance (ESA)

Requirements

Use the following software and access to run the script:

- Cisco Email Security Appliance (ESA) running AsyncOS 14.x or later
- Python 3
- Python `requests` module
- ESA administrator credentials with permission to use the AsyncOS API (REST API)
- Access to the ESA management interface over HTTPS on port `6443` (recommended)

Components Used

These components were used to complete this lab:

1) Cisco ESA - 15.0.0-104

2) Sublime Text Editor

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Transport and Authentication

- Transport: Use HTTPS on port `6443` for the AsyncOS API when available. Use HTTP/6080 only in non-production or lab environments.
- Authentication: This example uses HTTP Basic authentication. Provide the header `Authorization: Basic <base64(username:password)>`. Do not paste real credentials into the script.

Background Information

For this document:

Goal: Add a dictionary to the ESA by using a Python script and the AsyncOS API (REST API).

Expected outcome: The API returns a successful response and the new dictionary appears in the ESA configuration.

Configure

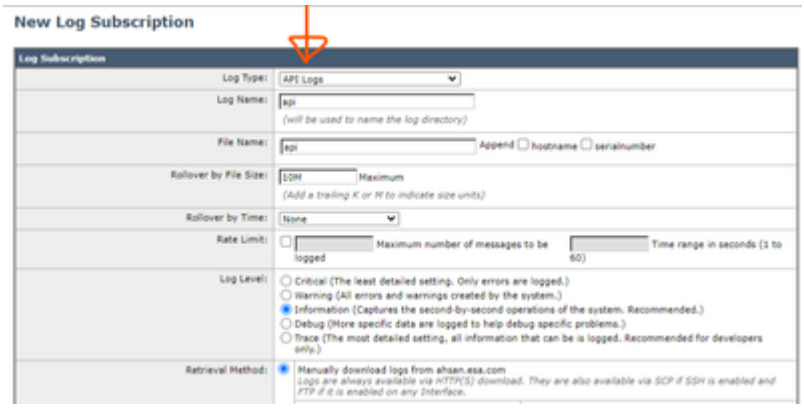
Enable the AsyncOS API (REST API) service on the ESA management interface before running the script.

1. In the Graphical User Interface (GUI), navigate to the **network** or **interface page** that contains the **AsyncOS API HTTP** and **AsyncOS API HTTPS** settings.
2. Enable **AsyncOS API HTTPS** and verify port `6443`.
3. (Optional) Enable **AsyncOS API HTTP** and verify port `6080` for lab use.
4. Click **Save**.

Image 1: Verify that AsyncOS API HTTPS (port 6443) is Enabled on the Management interface.

Configure API logging to troubleshoot AsyncOS API requests.

1. In the **Graphical User Interface (GUI)**, navigate to **System Administration** > **Log Subscriptions**.
2. Click **Add Log Subscription**.
3. From the **Log Type** drop-down list, select **API Logs**.
4. Enter the remaining **required fields**, such as the log name and file name, and then click **Submit**.



Select API Logs from the Log Type drop-down list and enter the **remaining required details**.

Note: Logs can be configured from the GUI.

Script

Use the HTTP `POST` method from the Python `requests` module to create a dictionary.

Use these parameters for the `POST` request:

Parameter	Location	Required	Notes
`device_type`	URL query string	Yes	Set to `esa`.
`ignorecase`	JSON payload	Yes	`0` = case-sensitive, `1` = case-insensitive.
`wholewords`	JSON payload	Yes	`0` = substring match, `1` = whole-word match.
`encoding`	JSON payload	Yes	Use `utf-8` unless a different encoding is required.

`words`	JSON payload	Yes	Array of entries. Use `["term"]` for a literal term. For smart identifiers, use a tuple format such as `["*credit", 2, "prefix"]` as supported by the ESA.
`mode`	URL query string	No	Required only for clustered/group deployments (for example, `mode=cluster`).

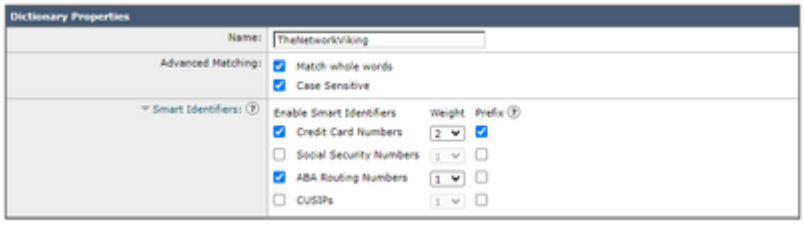
```
import base64
import requests

# ESA management IP address or FQDN
host = "<ESA_IP>"

# Dictionary name to create
dictionary_name = "<DICT_NAME>"

# AsyncOS API endpoint (HTTPS recommended)
url = f"https://{host}:6443/esa/api/v2.0/config/dictionaries/{dictionary_name}?device_type=esa"

payload = {
    "data": {
        "ignorecase": 0,
        "wholewords": 1,
        "words": [
            ["*credit", 2, "prefix"],
            ["*aba"],
            ["Example Term"]
        ],
        "encoding": "utf-8"
    }
}

# Basic authentication header
username = "<USERNAME>"
password = "<PASSWORD>"
creds = base64.b64encode(f"{username}:{password}".encode()).decode()

headers = {
    "Content-Type": "application/json",
    "Authorization": f"Basic {creds}"
}

response = requests.post(url, headers=headers, json=payload, timeout=30, verify=False)
print(f"Status code: {response.status_code}")
try:
    print(response.json())
except ValueError:
    print(response.text)

if response.status_code != 201:
    raise SystemExit("Dictionary creation failed.")
```

In the script, the dictionary name (<**DICT_NAME**>) is included in the request URL path.

Include the required parameters (**ignorecase, wholewords, words,** and **encoding**) in the JSON payload. Add **device_type** to the URL query string.

The mode parameter is required only when the ESAs are in a cluster or group. In that case, append `mode=cluster` to the URL query string in the same way as device_type.

*credit and *aba are added to the payload to enable the smart identifiers for credit card numbers and ABA routing numbers, as shown in the screenshot:



The term Example Term is added to the payload as a dictionary item to match.

Verify

When the `POST` request succeeds, the API log contains an entry similar to this:

```
API log example
Thu October 5 12:58:19 2023 Info: 198.51.100.10 - - 05/Oct/2023 12:58:19 +0000 POST /esa/api/v2.0/confi
```

Expected response:

```
{"data": {"message": "Added Successfully"}}
```

If the dictionary already exists and the `POST` request runs again, the API log contains an entry similar to this:

```
API log example
Thu October 5 13:00:31 2023 Info: 198.51.100.10 - - 05/Oct/2023 13:00:31 +0000 POST /esa/api/v2.0/confi
```

Expected response:

```
{"error": {"message": "Dictionary already exists.", "code": "409", "explanation": "409 = Request confli
```

Related Information

Use the following external resources for additional background (the procedure in this document is self-contained):

Adding Dictionaries using REST API + Python

This document includes the required authentication method and the minimum procedure. Use HTTP Basic authentication with the header `Authorization: Basic <base64(username:password)>` and prefer HTTPS on port `6443`.

REST API and the Cisco ESA

Additionally, the Python code used in this procedure can be extracted from Postman. Review this video tutorial if needed:

Postman - How to Generate a Python Script