■ NetApp

Using Python

Astra Automation

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Using Python

NetApp Astra Control Python SDK

NetApp Astra Control Python SDK is an open source package you can use to automate an Astra Control deployment. The package is also a valuable resource for learning about the Astra Control REST API, perhaps as part of creating your own automation platform.



For simplicity, the NetApp Astra Control Python SDK will be referred to as the **SDK** throughout the remainder this page.

Two related software tools

The SDK includes two different though related tools which operate at different levels of abstraction when accessing the Astra Control REST API.

Astra SDK

The Astra SDK provides the core platform functionality. It includes a set of Python classes which abstract the underlying REST API calls. The classes support administrative actions on various Astra Control resources, including apps, backups, snapshots, and clusters.

The Astra SDK is one part of the package and is provided in the single astraSDK.py file. You can import this file into your environment and use the classes directly.



The **NetApp Astra Control Python SDK** (or just SDK) is the name of the entire package. The **Astra SDK** refers to the core Python classes in the single file astraSDK.py.

Toolkit script

In addition to the Astra SDK file, the toolkit.py script is also available. This script operates at a higher level of abstraction by providing access to discrete administrative actions defined internally as Python functions. The script imports the Astra SDK and makes calls to the classes as needed.

How to access

You can access the SDK in the following ways.

Python package

The SDK is available at Python Package Index under the name **netapp-astra-toolkits**. The package is assigned a version number and will continue to be updated as needed. You must use the **PiP** package management utility to install the package into your environment.

See PyPI: NetApp Astra Control Python SDK for more information.

GitHub source code

The SDK source code is also available at GitHub. The repository includes the following:

astraSDK.py (Astra SDK with Python classes)

- toolkit.py (higher level function-based script)
- · Detailed installation requirements and instructions
- · Installation scripts
- · Additional documentation

You can clone the GitHub: Netapp/netapp-astra-toolkits repository to your local environment.

Installation and basic requirements

There are several options and requirements to consider as part of installing the package and preparing to use it.

Summary of the installation options

You can install the SDK in one of the following ways:

- Use Pip to install the package from PyPI into your Python environment
- Clone the Git Hub repository and either:
 - Deploy the package as a Docker container (which includes everything you need)
 - Copy the two core Python files so they are accessible to your Python client code

Refer to the PyPI and GitHub pages for more information.

Requirements for the Astra Control environment

Whether directly using the Python classes in the Astra SDK or the functions in the toolkit.py script, ultimately you'll be accessing the REST API at an Astra Control deployment. Because of this you'll need an Astra account along with an API token. See Before you begin and the other pages in the **Get started** section of this documentation for more information.

Requirements for the NetApp Astra Control Python SDK

The SDK has several prerequisites related to the local Python environment. For example, you must use Python 3.5 or later. In addition, there are several Python packages that are required. See the GitHub repository page or PyPI package page for more information.

Summary of helpful resources

Here is a summary of the resources you'll need to get started.

- PyPI: NetApp Astra Control Python SDK
- · GitHub: Netapp/netapp-astra-toolkits

Native Python

Before you begin

Python is a popular development language especially for datacenter automation. Before using the native features of Python together with several common packages, you need to

prepare the environment and the required input files.



In addition to accessing the Astra Control REST API directly using Python, NetApp also provides a toolkit package which abstracts the API and removes some of the complexities. See NetApp Astra Control Python SDK for more information.

Prepare the environment

The basic configuration requirements to run the Python scripts are described below.

Python 3

You need to have the latest version of Python 3 installed.

Additional libraries

The **Requests** and **urllib3** libraries must be installed. You can use pip or another Python management tool as appropriate for your environment.

Network access

The workstation where the scripts run must have network access and be able to reach Astra Control. When using Astra Control Service, you must be connected to the internet and be able to connect to the service at https://astra.netapp.io.

Identity information

You need a valid Astra account with the account identifier and API token. See Get an API token for more information.

Create the JSON input files

The Python scripts rely on configuration information contained in JSON input files. Sample files are provided below.



You need to update the samples as appropriate for your environment.

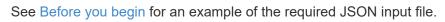
Identity information

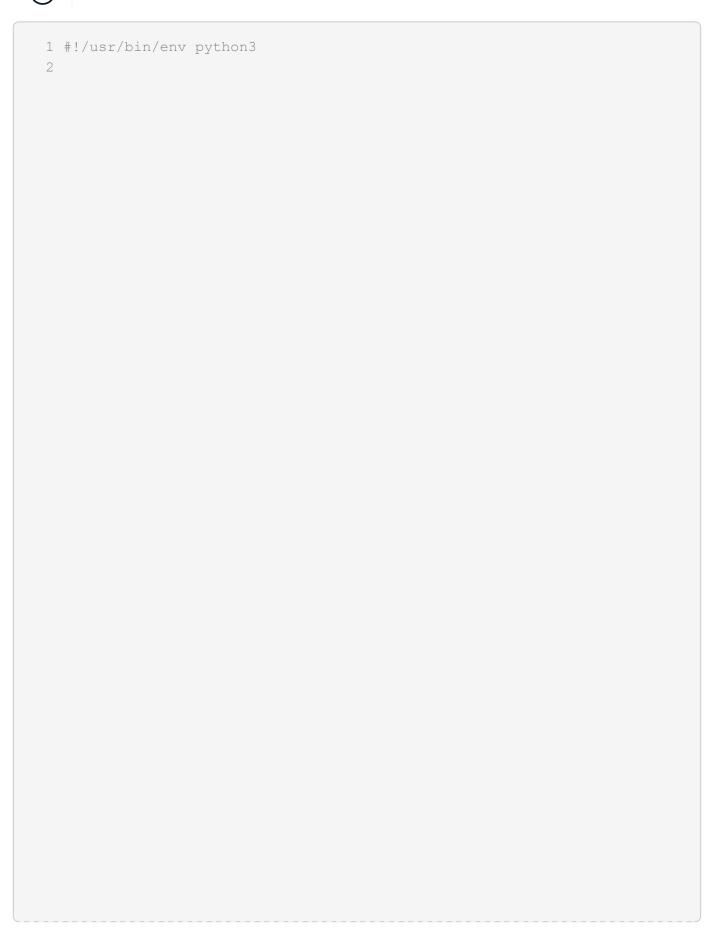
The following file contains the API token and Astra account. You need to pass this file to Python scripts using the -i (or --identity) CLI parameter.

```
{
   "api_token": "kH4CA_uVIa8q9UuPzhJaAHaGlaR7-no901DkkrVjIXk=",
   "account_id": "5131dfdf-03a4-5218-ad4b-fe84442b9786"
}
```

List the managed apps

You can use the following script to list the managed applications for your Astra account.





```
4 # Usage: python3 list man apps.py -i identity file.json
  6 # (C) Copyright 2021 NetApp, Inc.
  8 # This sample code is provided AS IS, with no support or warranties of
  9 # any kind, including but not limited for warranties of
merchantability
 10 # or fitness of any kind, expressed or implied. Permission to use,
 11 # reproduce, modify and create derivatives of the sample code is
granted
 12 # solely for the purpose of researching, designing, developing and
 13 # testing a software application product for use with NetApp products,
 14 # provided that the above copyright notice appears in all copies and
 15 # that the software application product is distributed pursuant to
 16 # no less restrictive than those set forth herein.
17 #
 18
##----
 19
 20 import argparse
 21 import json
 22 import requests
 23 import urllib3
 24 import sys
 25
 26 # Global variables
 27 api token = ""
 28 account id = ""
 29
 30 def get managed apps():
 31
        ''' Get and print the list of managed apps '''
 32
        # Global variables
 33
 34
        global api token
 35
        global account id
 36
 37
        # Create an HTTP session
 38
        sess1 = requests.Session()
 39
 40
        # Suppress SSL unsigned certificate warning
```

```
urllib3.disable warnings(urllib3.exceptions.
   InsecureRequestWarning)
42
43
       # Create URL
       url1 = "https://astra.netapp.io/accounts/" + account id +
44
  "/k8s/v1/managedApps"
45
       # Headers and response output
46
       req headers = {}
47
      resp headers = {}
48
       resp data = {}
49
50
51
       # Prepare the request headers
52
       req headers.clear
       req headers['Authorization'] = "Bearer " + api token
53
       req headers['Content-Type'] = "application/astra-managedApp+json"
54
55
       req_headers['Accept'] = "application/astra-managedApp+json"
56
57
       # Make the REST call
58
       try:
59
          resp1 = sess1.request('get', url1, headers=req headers,
   allow redirects=True, verify=False)
60
61
       except requests.exceptions.ConnectionError:
62
          print("Connection failed")
          sys.exit(1)
63
64
65
       # Retrieve the output
       http code = resp1.status code
66
       resp headers = resp1.headers
67
68
       # Print the list of managed apps
69
70
       if resp1.ok:
           resp data = json.loads(resp1.text)
71
72
          items = resp data['items']
73
          for i in items:
74
              print(" ")
75
               print("Name: " + i['name'])
               print("ID: " + i['id'])
76
77
               print("State: " + i['state'])
78
79
          print("Failed with HTTP status code: " + str(http code))
80
81
      print(" ")
82
83
       # Close the session
```

```
84 sess1.close()
 85
 86
       return
 87
 88 def read id file(idf):
        ''' Read the identity file and save values '''
 89
 90
 91
        # Global variables
 92
        global api token
 93
        global account id
 94
 95
      with open(idf) as f:
 96
            data = json.load(f)
 97
 98
        api token = data['api token']
 99
        account id = data['account id']
100
101
        return
102
103 def main(args):
        ''' Main top level function '''
105
106
      # Global variables
        global api token
107
      global account id
108
109
110
      # Retrieve name of JSON input file
      identity file = args.id file
111
112
113
      # Get token and account
114
      read id file(identity file)
115
116
      # Issue REST call
117
      get managed apps()
118
119
      return
120
121 def parseArgs():
122
           ''' Parse the CLI input parameters '''
123
           parser = argparse.ArgumentParser(description='Astra REST API -
124
   List the managed apps',
125
                             add help = True)
            parser.add argument("-i", "--identity", action="store", dest
    ="id file", default=None,
127
                             help='(Req) Name of the identity input
```

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