



Using Python

Astra Automation

NetApp
February 12, 2024

Table of Contents

- Using Python 1
- NetApp Astra Control Python SDK 1
- Native Python 2

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 of 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 **actoolkit**. 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.

Once installed, the `astraSDK.py` classes can be utilized by placing `import astraSDK` in your scripts. Additionally, `actoolkit` can be invoked directly on your command prompt, and is equivalent to `toolkit.py` (`actoolkit list clusters` is the same as `./toolkit.py list clusters`).

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 the prepared [Docker: NetApp/astra-toolkits](#) image, which has all necessary dependencies installed, including `actoolkit`
- Use Pip to install the `actoolkit` package from PyPI into your Python environment
- Clone the GitHub repository and copy/modify 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 3.8 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 are some the resources you'll need to get started.

- [PyPI: NetApp Astra Control Python SDK](#)
- [GitHub: Netapp/netapp-astra-toolkits](#)
- [Docker: NetApp/astra-toolkits](#)

Native Python

Before you begin

Python is a popular development language 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 apps

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



See [Before you begin](#) for an example of the required JSON input file.

```
1 #!/usr/bin/env python3
```

```
2
```

```

##-----
-----
3 #
4 # Usage: python3 list_man_apps.py -i identity_file.json
5 #
6 # (C) Copyright 2022 NetApp, Inc.
7 #
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
terms
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 apps '''
32
33     # Global variables
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

```

```

41     urllib3.disable_warnings(urllib3.exceptions.
InsecureRequestWarning)
42
43     # Create URL
44     url1 = "https://astra.netapp.io/accounts/" + account_id +
"/k8s/v2/apps"
45
46     # Headers and response output
47     req_headers = {}
48     resp_headers = {}
49     resp_data = {}
50
51     # Prepare the request headers
52     req_headers.clear
53     req_headers['Authorization'] = "Bearer " + api_token
54     req_headers['Content-Type'] = "application/astra-app+json"
55     req_headers['Accept'] = "application/astra-app+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")
63         sys.exit(1)
64
65     # Retrieve the output
66     http_code = resp1.status_code
67     resp_headers = resp1.headers
68
69     # Print the list of apps
70     if resp1.ok:
71         resp_data = json.loads(resp1.text)
72         items = resp_data['items']
73         for i in items:
74             print(" ")
75             print("Name: " + i['name'])
76             print("ID: " + i['id'])
77             print("State: " + i['state'])
78     else:
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):
89     ''' Read the identity file and save values '''
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):
104     ''' Main top level function '''
105
106     # Global variables
107     global api_token
108     global account_id
109
110     # Retrieve name of JSON input file
111     identity_file = args.id_file
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
124     parser = argparse.ArgumentParser(description='Astra REST API -
List the apps',
125                                     add_help = True)
126     parser.add_argument("-i", "--identity", action="store", dest
="id_file", default=None,
127                         help='(Req) Name of the identity input

```

```
    file', required=True)
128
129     return parser.parse_args()
130
131 if __name__ == '__main__':
132     ''' Begin here '''
133
134     # Parse input parameters
135     args = parseArgs()
136
137     # Call main function
138     main(args)
```

Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.