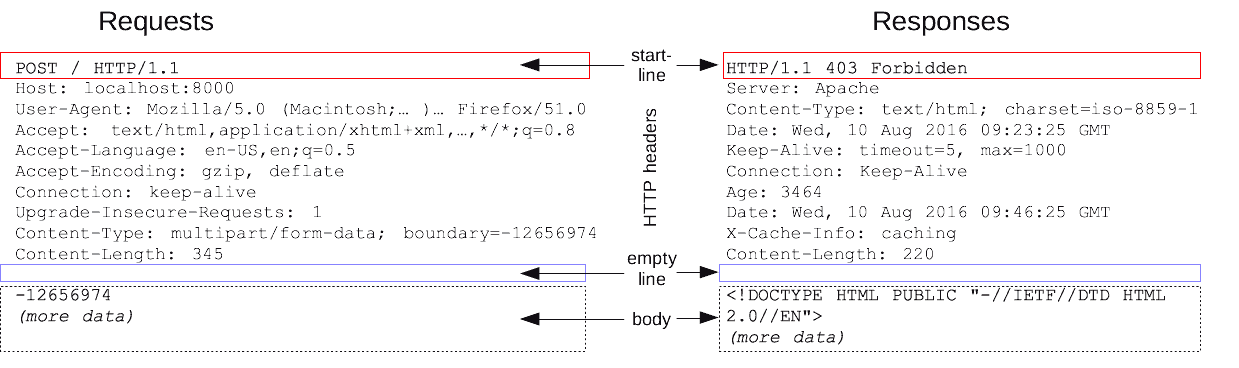
**Recap**



SDK

A good SDK has these qualities:

* Is easy to use
* Is well documented
* Has value-added functionality
* Integrates well with other SDKs
* Has minimal impact on hardware resources

SDKs provide the following advantages:

* Quicker integration
* Faster and more efficient development
* Brand control
* Increased security
* Metrics

**Cisco Network Management Platforms and APIs**

The starting point in exploring all the SDKs that Cisco has to offer is [https://developer.cisco.com](https://developer.cisco.com/).

https://developer.cisco.com/site/sandbox/

**Meraki**

[**https://developer.cisco.com/meraki/**](https://developer.cisco.com/meraki/)

[**https://developer.cisco.com/meraki/api/#!python-meraki/usage**](https://developer.cisco.com/meraki/api/#!python-meraki/usage)

From a programmability perspective, the Meraki cloud platform provides several APIs:

* Captive Portal API : The Captive Portal API extends the power of the built-in Meraki splash page functionality by providing complete control of the content and authentication process that a user interacts with when connecting to a Meraki wireless network.
* Scanning API : The Scanning API takes advantage of Meraki smart devices equipped with wireless and BLE (Bluetooth Low Energy) functionality to provide location analytics and report on user behavior.
* MV Sense Camera API : The MV Sense Camera API takes advantage of the powerful onboard processor and a unique architecture to run machine learning workloads at the edge. Through the MV Sense API, object detection, classification, and tracking are exposed and become available for application integration.
* Dashboard API : The Dashboard API, covered next, provides endpoints and resources for configuration, management, and monitoring automation of the Meraki cloud platform. The Dashboard API is meant to be open ended and can be used for many purposes and use cases.

The hierarchy of the Dashboard API looks as follows:

* Organizations
  + Networks
    - Devices
      * Uplink

**DNAC**

Cisco Digital Network Architecture (DNA) is an open, extensible, software-driven architecture from Cisco that accelerates and simplifies enterprise network operations. Behind this new architecture is the concept of intent-based networking, a new era in networking, in which the network becomes an integral and differentiating part of the business.

Cisco DNA Center is the network management and command center for Cisco DNA. With Cisco DNA Center, you can provision and configure network devices in minutes, define a consistent policy throughout a network, get live and instantaneous statistics, and get granular networkwide views. Multidomain and multivendor integrations are all built on top of a secure platform.

From a programmability perspective, Cisco DNA Center provides a set of REST APIs and SDKs through the Cisco DNA Center platform that are grouped in the following categories:

* Intent API
* Integration API
* Multivendor SDK
* Events and notifications

curl -X POST \

https://sandboxdnac2.cisco.com/dna/system/api/v1/auth/token \

-H 'Authorization: Basic ZGV2bmV0dXNlcjpDaXNjbzEyMyE='

curl -X GET \

https://sandboxdnac2.cisco.com/dna/intent/api/v1/network-device \

-H 'X-Auth-Token: eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.

eyJzdWIiOiI1Y2U3MTJiMDhlZTY2MjAyZmEyZWI4ZjgiLCJhdXRoU291c-

mNlIjoiaW50ZXJuYWwiLCJ0ZW5hbnROYW1lIjoiVE5UMCIsInJvbGVzIjpbI-

jViNmNmZGZmNDMwOTkwMDA4OWYwZmYzNyJdLCJ0ZW5hbnRJZCI6IjViNmNmZG-

ZjNDMwOTkwMDA4OWYwZmYzMCIsImV4cCI6MTU2NjYwODAxMSwidXNlcm5hbWUiOi-

JkZXZuZXR1c2VyIn0.YXc\_2o8FDzSQ1YBhUxUIoxwzYXXWYeNJRkB0oKBlIHI'

https://developer.cisco.com/docs/dna-center/api/1-3-3-x/

**SDWAN**

Cisco currently has two SD-WAN offerings.

* Cisco SD-WAN
* Meraki SD-WAN

The Cisco SD-WAN offering contains several products that perform different functions:

* **vManage**
* **vSmart**
* **vBond**
* **vEdge**

All the components of the Cisco SD-WAN fabric run as virtual appliances, and the vEdges are also available as hardware routers.

Cisco vManage provides a REST API interface that exposes the functionality of the Cisco SD-WAN software and hardware features. The API resources that are available through the REST interface are grouped in the following collections:

* **Administration**
* **Certificate Management**
* **Configuration**
* **Device Inventory**
* **Monitoring**
* **Real-Time Monitoring**
* **Troubleshooting Tools**

<https://sandboxsdwan.cisco.com:8443/apidocs>

<https://sdwan-docs.cisco.com/Product_Documentation/Command_Reference/Command_Reference/vManage_REST_APIs>.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Meraki | DNAC | SDWAN |
| Authorization | X-Cisco-Meraki-API-Key | X-Auth-Token | Cookie JSESSIONID |
| Base URL | <https://api.meraki.com/api/v0> | https://sandboxdnac2.cisco.com/dna/intent/api/v1/ | https://sandboxsdwan.cisco.com:8443/ |
| Sandbox Details | <https://developer.cisco.com/sandbox>  API key 15da0c6ffff295f16267f88f98694cf29a86ed87 | [https://sandboxdnac2.cisco.com](https://sandboxdnac2.cisco.com/)  Username: **devnetuser**  **P**assword : **Cisco123!** | [https://sandboxsdwan.cisco.com](https://sandboxsdwan.cisco.com/).  Username : **devnetuser**  Password : **Cisco123!** |

**Python Scripting with Requests**

* Creating virtual environment

$ pip install virtualenv

PS C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3> pip install virtualenv

Collecting virtualenv

Downloading virtualenv-20.4.2-py2.py3-none-any.whl (7.2 MB)

|████████████████████████████████| 7.2 MB 2.2 MB/s

Collecting appdirs<2,>=1.4.3

Downloading appdirs-1.4.4-py2.py3-none-any.whl (9.6 kB)

Collecting filelock<4,>=3.0.0

Downloading filelock-3.0.12-py3-none-any.whl (7.6 kB)

Requirement already satisfied: six<2,>=1.9.0 in c:\users\sucvenka\appdata\local\programs\python\python37\lib\site-packages (from virtualenv) (1.13.0)

Requirement already satisfied: importlib-metadata>=0.12; python\_version < "3.8" in c:\users\sucvenka\appdata\local\programs\python\python37\lib\site-packages (from virtualenv) (1.3.0)

Collecting distlib<1,>=0.3.1

Downloading distlib-0.3.1-py2.py3-none-any.whl (335 kB)

|████████████████████████████████| 335 kB 6.4 MB/s

Requirement already satisfied: zipp>=0.5 in c:\users\sucvenka\appdata\local\programs\python\python37\lib\site-packages (from importlib-metadata>=0.12; python\_version < "3.8"->virtualenv) (0.6.0)

Requirement already satisfied: more-itertools in c:\users\sucvenka\appdata\local\programs\python\python37\lib\site-packages (from zipp>=0.5->importlib-metadata>=0.12; python\_version < "3.8"->virtualenv) (8.0.2)

Installing collected packages: appdirs, filelock, distlib, virtualenv

Successfully installed appdirs-1.4.4 distlib-0.3.1 filelock-3.0.12 virtualenv-20.4.2

C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3> mkdir Meraki

C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3> cd Meraki

C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3\Meraki> python venv meraki

C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3\Meraki\Scripts>.\activate

(meraki) C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3\Meraki\Scripts>where python

C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3\Meraki\Scripts\python.exe

C:\Users\sucvenka\AppData\Local\Programs\Python\Python37\python.exe

(meraki) C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3\Meraki\Scripts>deactivate

C:\Users\sucvenka\Desktop\Week 2\svs-devnet-handson\Week3>

On macOS and Linux:

source env/bin/activate

On Windows:

.\env\Scripts\activate

On macOS and Linux:

which python

.../env/bin/python

On Windows:

where python

.../env/bin/python.exe

If you want to switch projects or otherwise leave your virtual environment, simply run:

deactivate

* Installing requests

pip install requests