



The bridge to possible

Meraki APIs 101

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Agenda

- Introduction
- APIs in the Meraki platform
- RESTful API basics
- Working with the Meraki Dashboard API
- Tools and resources
- Wrap up

Meraki at a glance

Connecting
passionate people to
their mission by
simplifying the digital
workplace.



Simplifying experiences everywhere



700K+
Customers



99.99%
Cloud SLA

4M+

Customer
networks

12M+

Meraki devices
online

190+

Countries
in network

7B+

External API
monthly calls

330M+

Daily end-user
devices

3.4M+

Active API
users

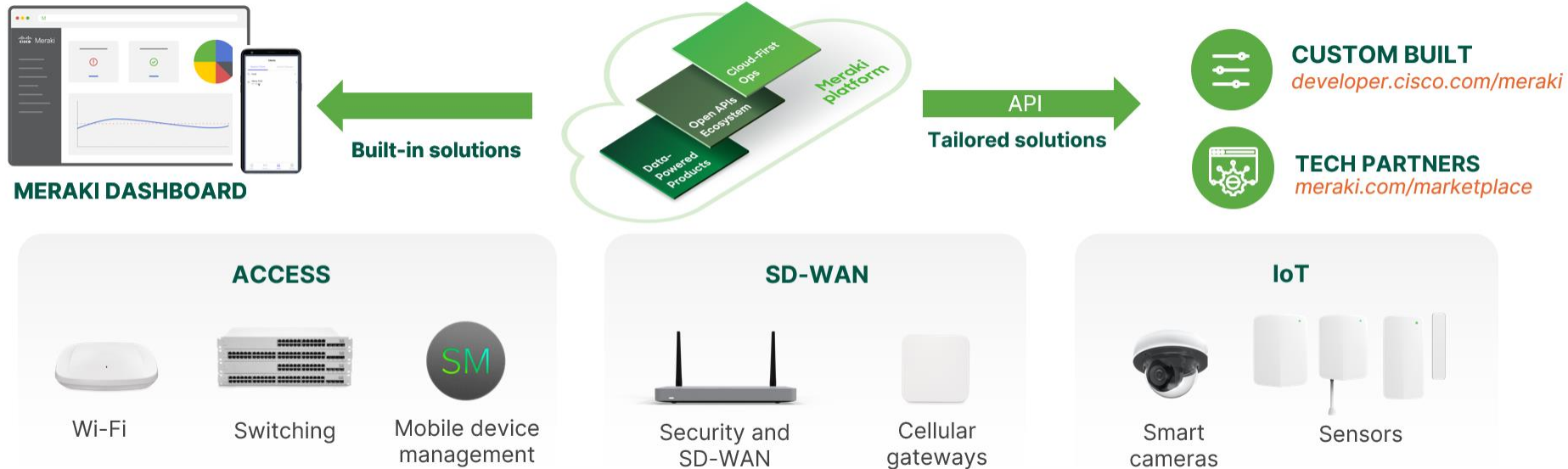
100K+

Active devices for 5+ customers, each

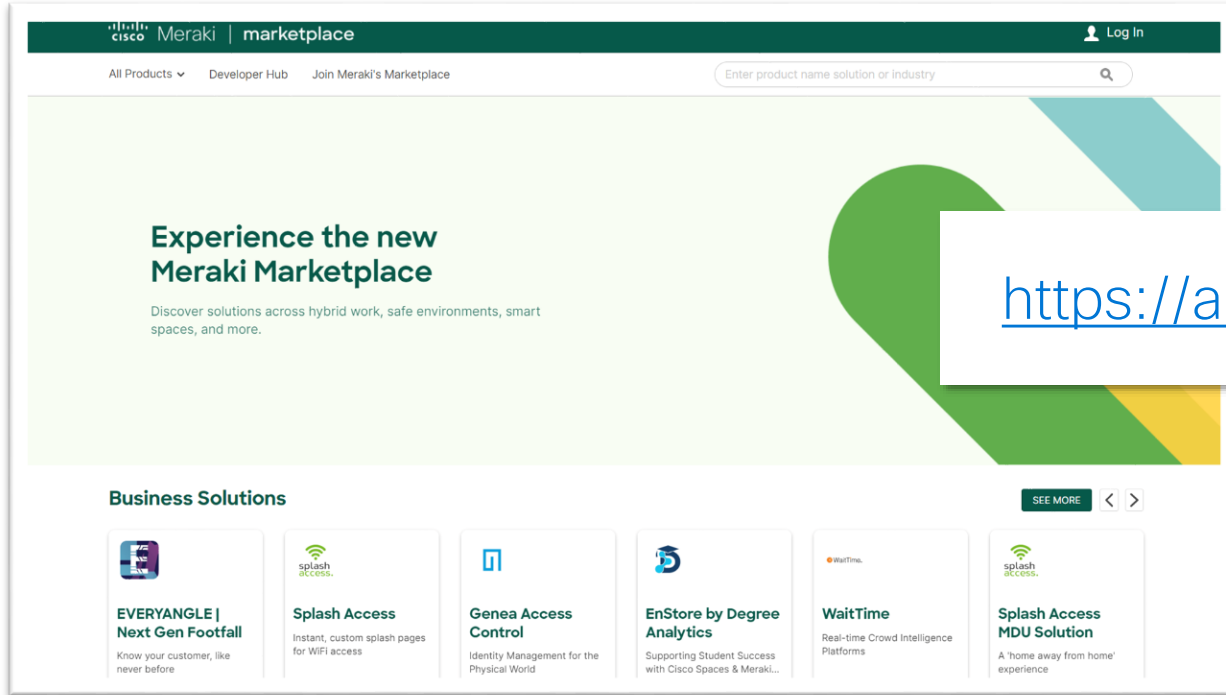
285K+

Access points deployed for a single customer

Components & automation of the Meraki platform



Get the value without the coding

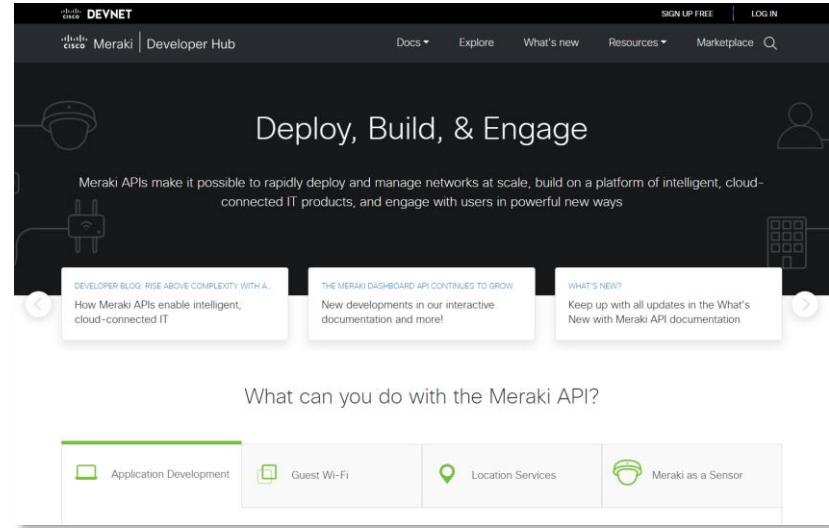


<https://apps.meraki.io>

APIs in the Meraki platform

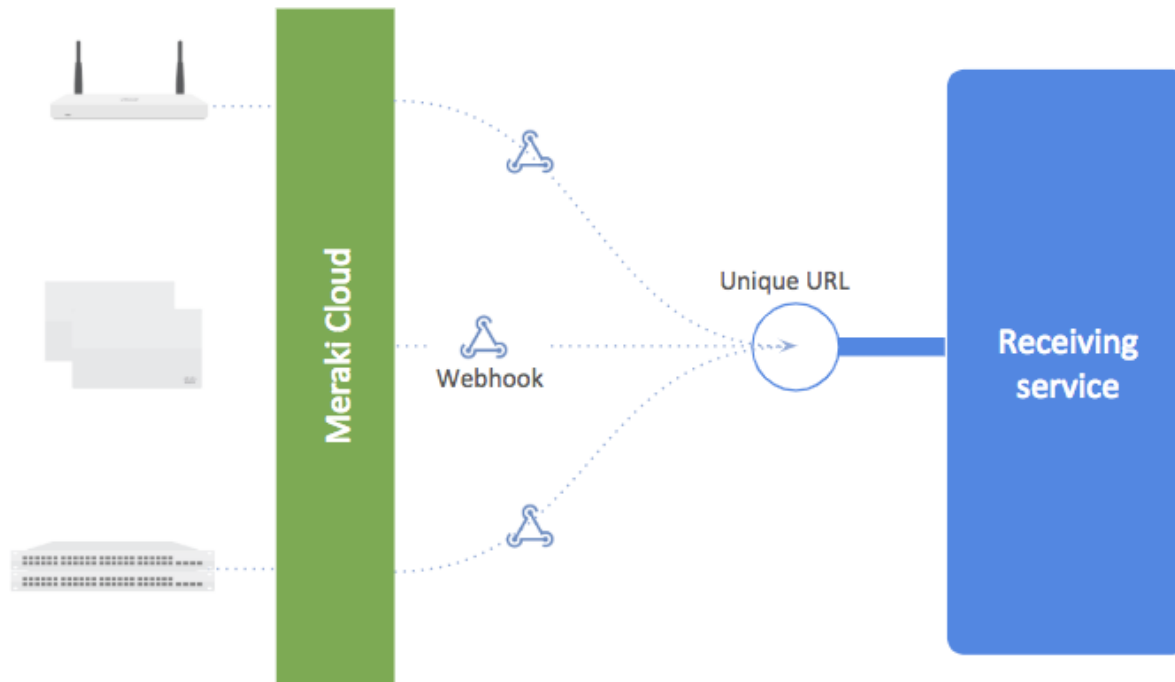
What APIs does the Meraki platform have?

- Dashboard API
- Webhooks
- Captive Portal API
- Location Services
- MV Sense

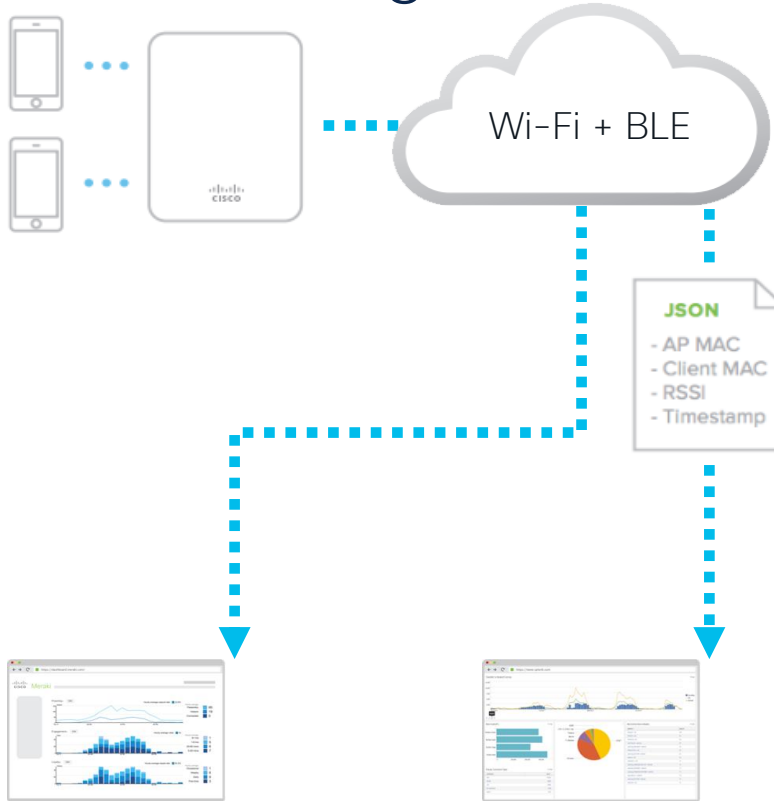


<https://developer.cisco.com/meraki>

Webhook Alerts

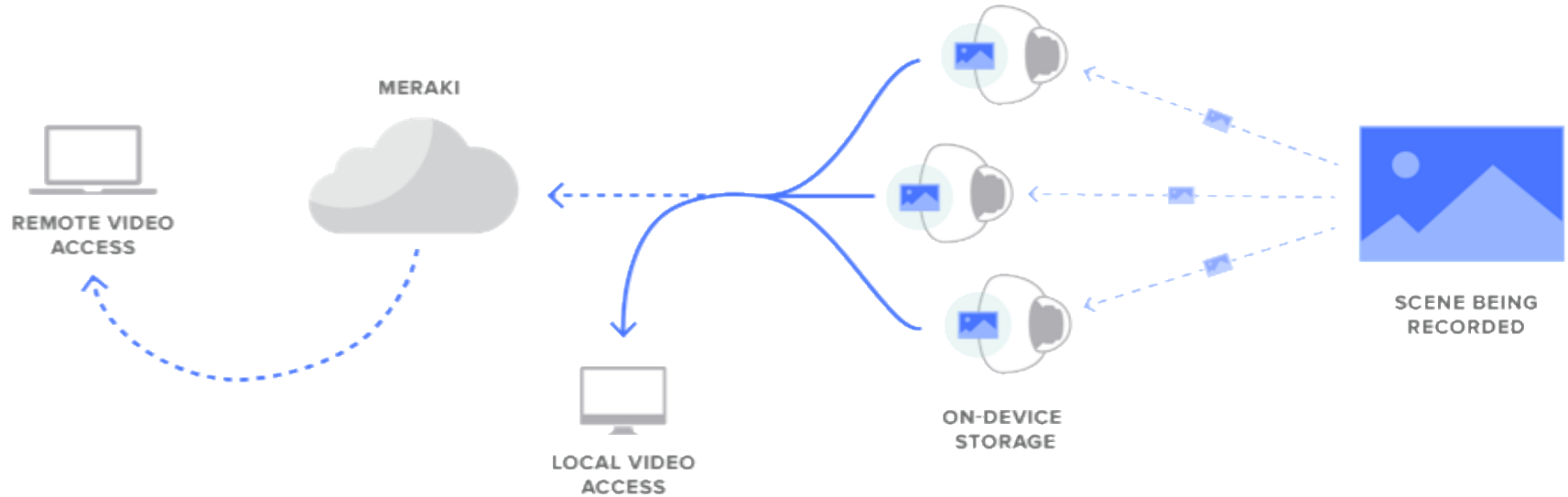


Location Scanning API



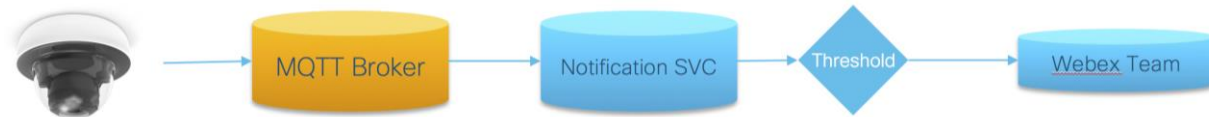
```
{
  "apMac": <string>,
  "apTags": [<string>, ...],
  "apFloors": [<string>, ...],
  "observations": [
    {
      "clientMac": <string>,
      "ipv4": <string>,
      "ipv6": <string>,
      "seenTime": <string>,
      "seenEpoch": <integer>,
      "ssid": <string>,
      "rssi": <integer>,
      "manufacturer": <string>,
      "os": <string>,
      "location": {
        "lat": <decimal>,
        "lng": <decimal>,
        "unc": <decimal>,
        "x": [<decimal>, ...],
        "y": [<decimal>, ...]
      }
    },
    ...
  ]
}
```

MV Sense



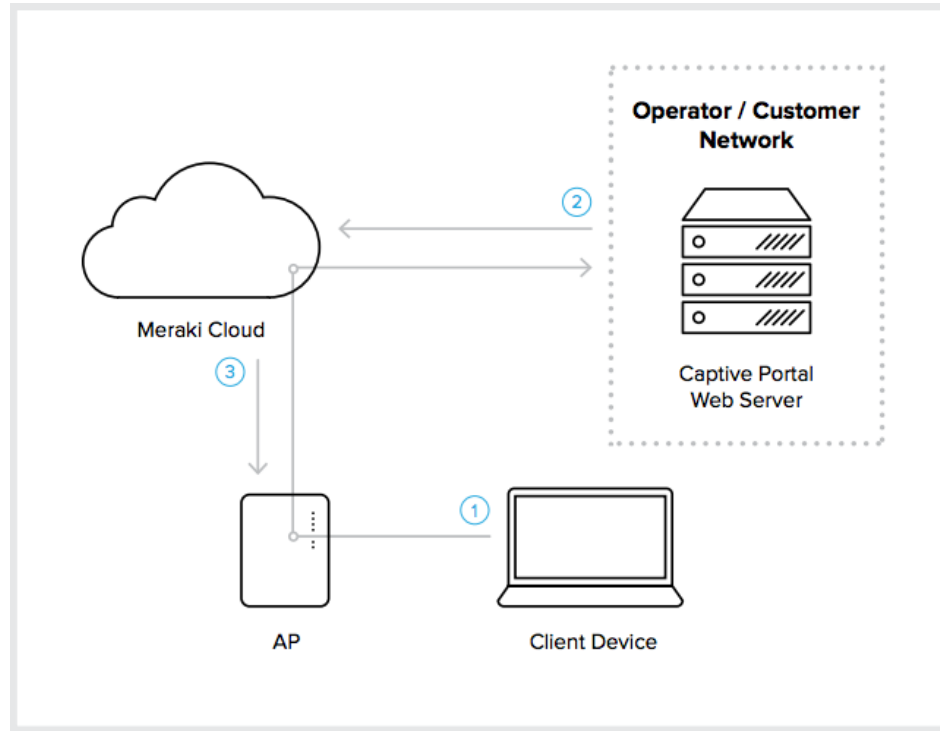
MV Sense Real Time with MQTT

- MQTT is a Client Server publish/subscribe messaging transport protocol.
- MV Camera MQTT client publishes people detection count
- Meraki Camera Notification is sample app
 - App watches people count during off-hours
 - When unexpected people are detected it send alert message using WebEx Team bot.



When detected people start monitoring mode
Condition : Total people Count > Threshold in past 10 frame

EXCAP Architecture



RESTful API basics

REST Web service

What is REST?

- REpresentational State Transfer (REST)
- API framework built on HTTP

What is a REST Web Service?

- REST is *an architecture style* for designing networked applications.
- Popular due to performance, scale, simplicity, and reliability

GET

POST

PUT

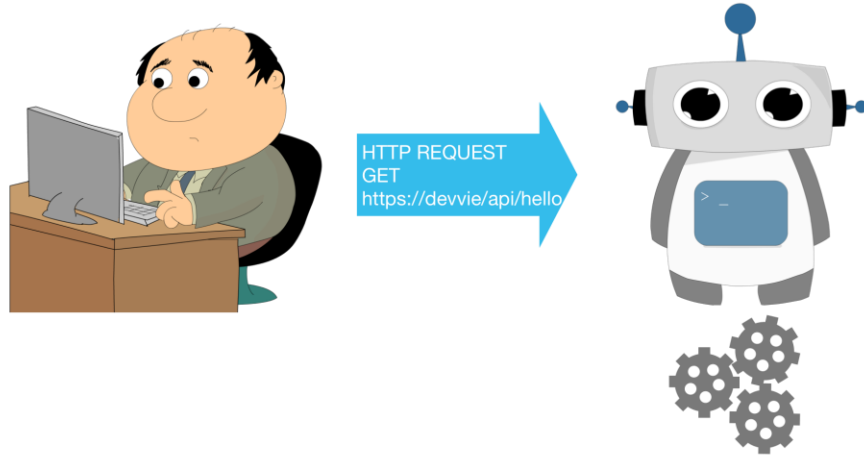
DELETE

{REST}

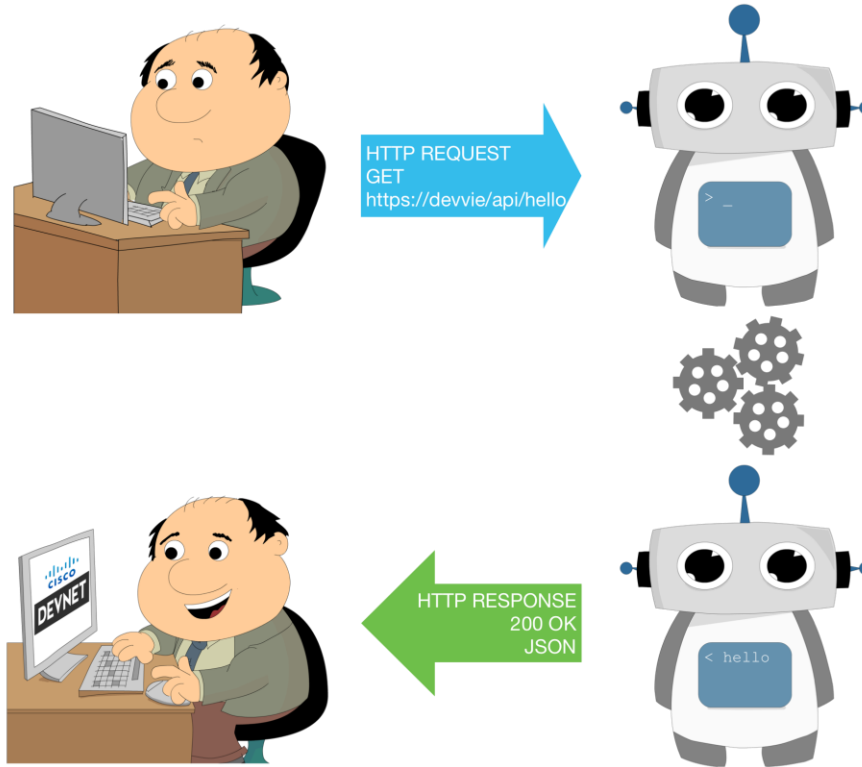
Requests and Response, the REST API Flow



Requests and Response, the REST API Flow



Requests and Response, the REST API Flow



The URI: What are you Requesting?

http://maps.googleapis.com/maps/api/geocode/json?address=sanjose

Server or Host Resource Parameters

- http:// or https://
 - Define whether secure or open http
- **Server or Host**
 - Resolves to the IP and port to connect to
- **Resource**
 - The location of the data or object of interest on the server
- **Parameters**
 - Details to scope, filter, or clarify a request. Often optional.

Data: Sending and Receiving

- Contained in the body
- POST, PUT, PATCH requests typically include data
- GET responses will include data
- Format typically JSON or XML
 - Check “Content-Type” header

```
• {  
•   'title': 'Hamlet',  
•   'author': 'Shakespeare'  
• }
```

HTTP Methods: What to do?

HTTP Verb	Typical Purpose (CRUD)	Description
POST	Create	Used to create a new object, or resource. Example: Add new book to library
GET	Read	Retrieve resource details from the system. Example: Get list of books from the library
PUT	Update	Typically used to replace or update a resource. Can be used to modify or create. Example: Update the borrower details for a book
PATCH	Update	Used to modify some details about a resource. Example: Change the author of a book
DELETE	Delete	Remove a resource from the system. Example: Delete a book from the library.

Response Status Codes: Did it work?

Status Code	Status Message	Meaning
200	OK	All looks good
201	Created	New resource created
400	Bad Request	Request was invalid
401	Unauthorized	Authentication missing or incorrect
403	Forbidden	Request was understood, but not allowed
404	Not Found	Resource not found
500	Internal Server Error	Something wrong with the server
503	Service Unavailable	Server is unable to complete request

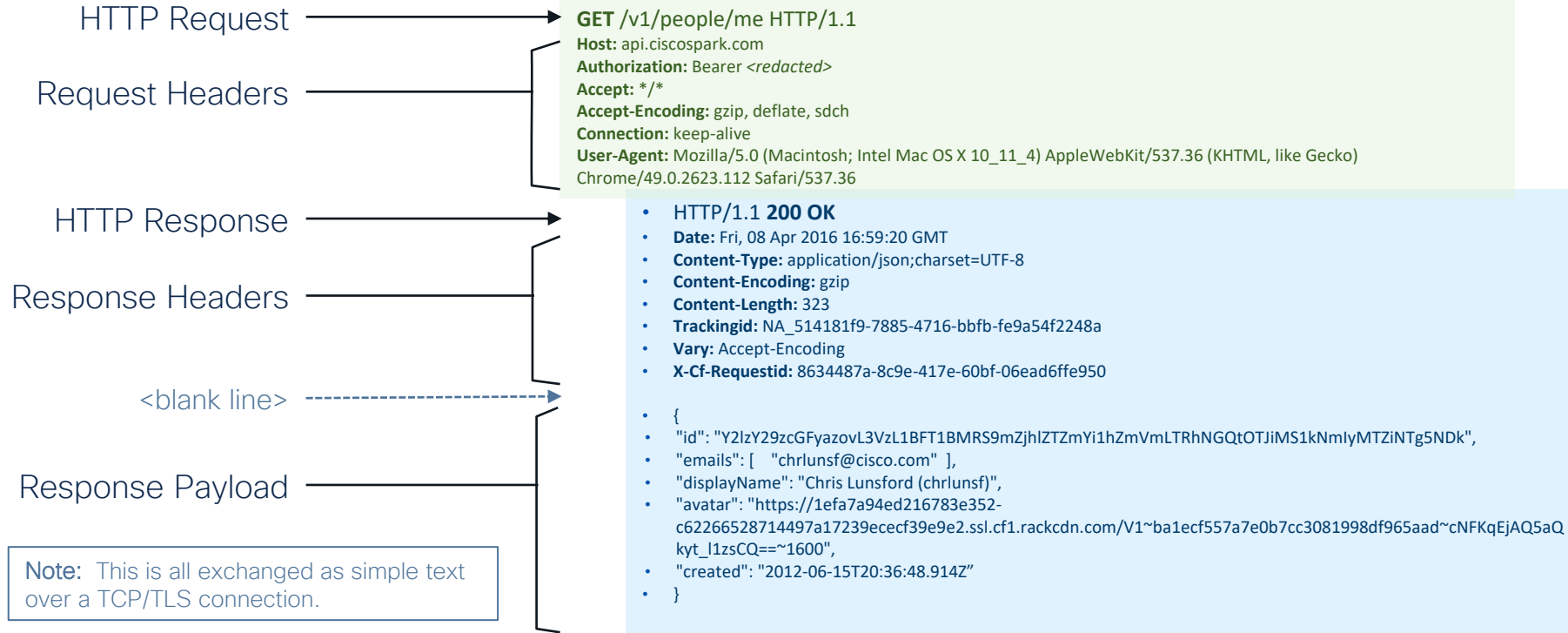
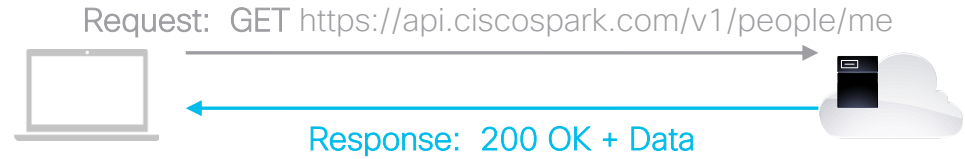
Headers:

What additional details and metadata can I use?

Header	Example Value	Purpose
Content-Type	application/json	Specify the format of the data in the body
Accept	application/json	Specify the requested format for returned data
Authorization	Basic dmFncmFudDp2YWdyYW50	Provide credentials to authorize a request
Date	Tue, 25 Jul 2017 19:26:00 GMT	Date and time of the message

- Used to pass information between client and server
- Included in both REQUEST and RESPONSE
- Some APIs use custom headers for authentication or other purpose

Review: Request/Response



Working with the Meraki Dashboard API

When to use the Meraki Dashboard API

- Automate manual processes
- Provision new customers in seconds
- Integrate to provisioning and monitoring tools
- Run custom reports
- Local telemetry data replication
- ...

Enabling the Dashboard API

API access

API keys

Key	Created at	Last used	
*****0327	Jul 12 2018 20:36 UTC	May 21 2019 15:02 UTC	Revoke

Generate new API key

1. Organization > Settings > Enable API access
2. Go to My profile and Generate API key.
3. Go to <https://developer.cisco.com/meraki/api-v1/>

Provisioning New Networks

Create Organization Network

Operation Id: `createOrganizationNetwork`

Description: *Create a network*

POST

`/organizations/{organizationId}/networks`

```
{
  "name": "Main Office",
  "productTypes": [
    "appliance",
    "switch",
    "wireless"
  ],
  "tags": [ "tag1", "tag2" ],
  "timeZone": "America/Los_Angeles",
  "copyFromNetworkId": "N_24329156",
  "notes": "Additional description of the network"
}
```

Adding devices to the network

Claim Network Devices

Operation Id: *claimNetworkDevices*

Description: *Claim devices into a network. (Note: for recently claimed devices, it may take a few minutes for API requests against that device to succeed)*

POST `/networks/{networkId}/devices/claim`

```
{  
  "serials": [  
    "Q234-ABCD-0001",  
    "Q234-ABCD-0002",  
    "Q234-ABCD-0003"  
  ]  
}
```

Things to look out for

- Rate limiting: max 10 requests per second
 - HTTP error 429
 - Response header: `'retry-after'`
- Multi-page GET responses
 - Response header: `'Link'`
- ... or use the Meraki Python module!

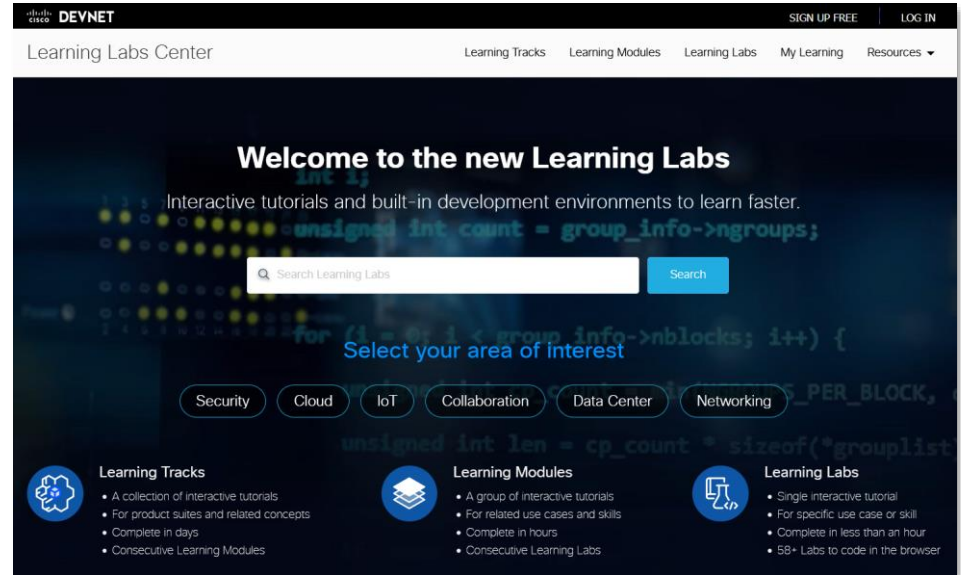
Live demo!



Tools and resources

Cisco DevNet Learning Labs

- <https://developer.cisco.com/learning/>
- Search for “meraki”



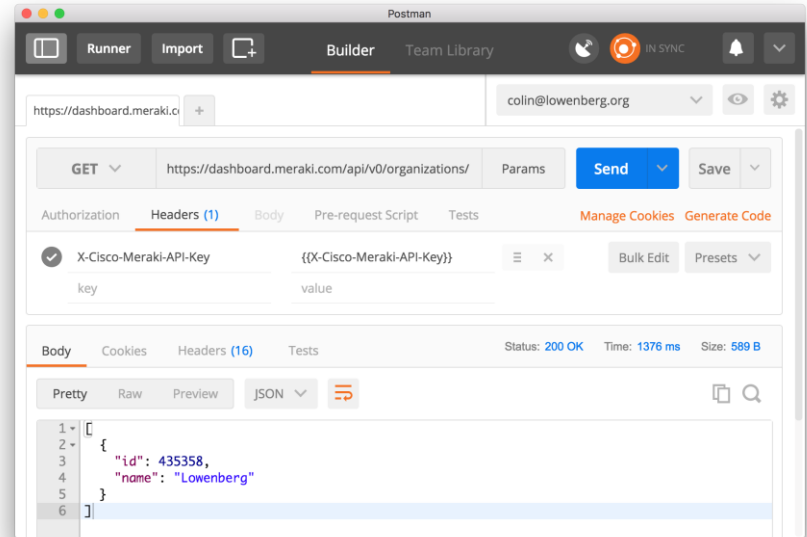
Postman

Get the app:

- <https://www.postman.com/>

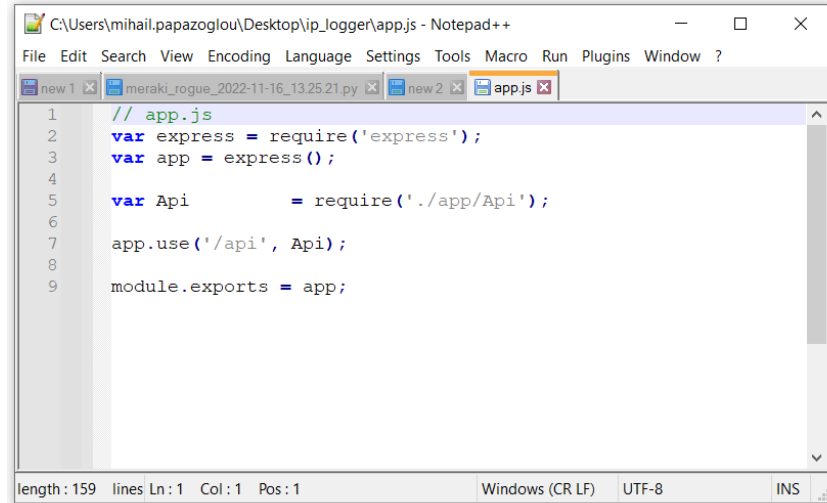
Get the collection:

- <https://developer.cisco.com/meraki/api-v1/#!/postman-collection>



Code editors

- Visual Studio Code
- Notepad++
- Visual Studio Code Cloud
- ...



The screenshot shows a Notepad++ window titled "C:\Users\mihail.papazoglou\Desktop\ip_logger\app.js - Notepad++". The menu bar includes File, Edit, Search, View, Encoding, Language, Settings, Tools, Macro, Run, Plugins, and Window. The tab bar shows four tabs: "new 1", "meraki_rogue_2022-11-16_13.25.21.py", "new 2", and "app.js" (which is the active tab). The editor content is as follows:

```
1 // app.js
2 var express = require('express');
3 var app = express();
4
5 var Api      = require('./app/Api');
6
7 app.use('/api', Api);
8
9 module.exports = app;
```

The status bar at the bottom displays "length : 159", "lines Ln : 1", "Col : 1", "Pos : 1", "Windows (CR LF)", "UTF-8", and "INS".

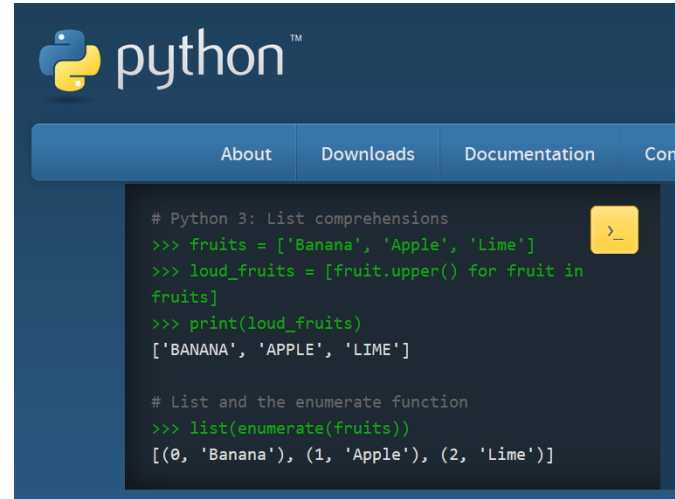
Python // The Meraki Python module

Get Python:

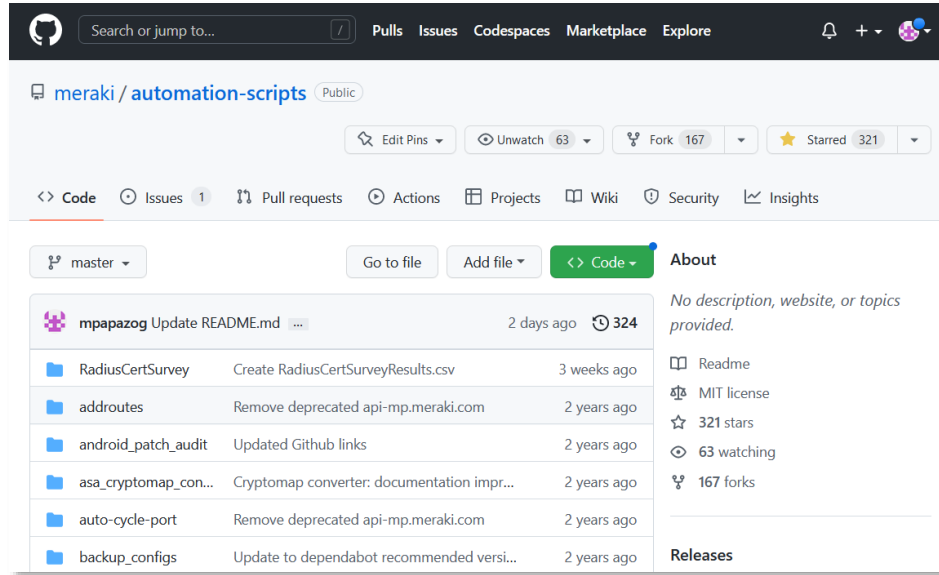
- <https://www.python.org/>

Get the module:

- <https://github.com/meraki/dashboard-api-python>

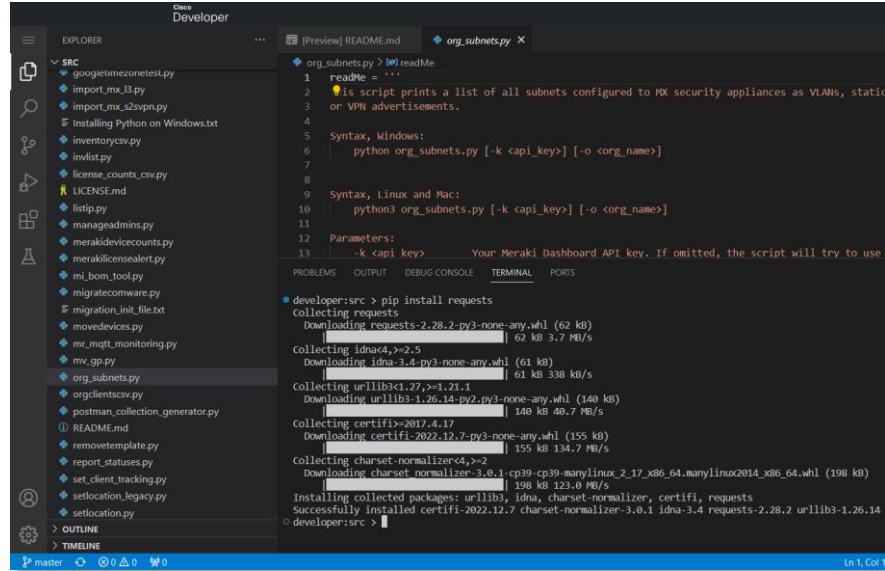


Example scripts



<https://github.com/meraki/automation-scripts>

Cisco DevNet Code Exchange IDE

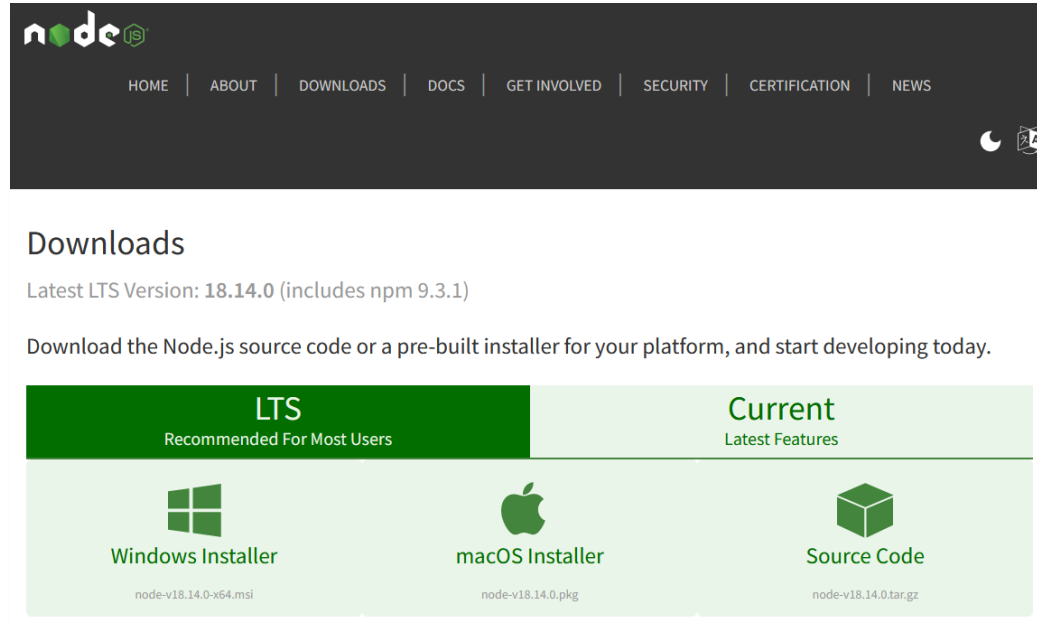


```
1  readme = '''
2  This script prints a list of all subnets configured to MX security appliances as VLANs, static
3  or VPN advertisements.
4
5  Syntax, Windows:
6  python org_subnets.py [-k <api_key>] [-o <org_name>]
7
8  Syntax, Linux and Mac:
9  python3 org_subnets.py [-k <api_key>] [-o <org_name>]
10
11 Parameters:
12 -k <api key>      Your Meraki Dashboard API key. If omitted, the script will try to use
13
14 developer:src > pip install requests
15 Collecting requests
16   Downloading requests-2.28.2-py3-none-any.whl (62 kB)
17     62 kB 3.7 MB/s
18 Collecting idna4,>=2.5
19   Downloading idna-3.4-py3-none-any.whl (61 kB)
20     61 kB 338 kB/s
21 Collecting urllib3<1.27,>=1.21.1
22   Downloading urllib3-1.26.14-py3-none-any.whl (140 kB)
23     140 kB 40.7 MB/s
24 Collecting certifi>=2017.4.17
25   Downloading certifi-2022.12.7-py3-none-any.whl (155 kB)
26     155 kB 134.7 MB/s
27 Collecting charset-normalizer<4,>=2
28   Downloading charset-normalizer-3.0.1-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (198 kB)
29     198 kB 123.0 MB/s
30 Installing collected packages: urllib3, idna, charset-normalizer, certifi, requests
31 Successfully installed certifi-2022.12.7 charset-normalizer-3.0.1 idna-3.4 requests-2.28.2 urllib3-1.26.14
32 developer:src > 
```

<https://developer.cisco.com/codeexchange/github/repo/meraki/automation-scripts/>

Node.js

<https://nodejs.org>



The screenshot shows the Node.js website's 'Downloads' page. At the top is a dark navigation bar with the Node.js logo and links for HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, CERTIFICATION, and NEWS. Below the navigation bar, the 'Downloads' section is highlighted. It states 'Latest LTS Version: 18.14.0 (includes npm 9.3.1)' and encourages users to download the source code or a pre-built installer. Two tabs are visible: 'LTS' (Recommended For Most Users) and 'Current' (Latest Features). Under the 'LTS' tab, three options are presented: 'Windows Installer' (node-v18.14.0-x64.msi), 'macOS Installer' (node-v18.14.0.pkg), and 'Source Code' (node-v18.14.0.targz).




nodejs

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Downloads

Latest LTS Version: **18.14.0** (includes npm 9.3.1)

Download the Node.js source code or a pre-built installer for your platform, and start developing today.

LTS Recommended For Most Users	Current Latest Features	
 Windows Installer node-v18.14.0-x64.msi	 macOS Installer node-v18.14.0.pkg	 Source Code node-v18.14.0.targz

Wrap up

Wrap up

- Powerful APIs covering many use cases
- Well documented
- Secure and reliable
- Many options for tools
- Read the docs, get the training and have fun!

Cisco Webex App

Questions?

Use Cisco Webex App to chat with the speaker after the session

How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated until February 24, 2023.



Complete your Session Survey

- Please complete your session survey after each session. Your feedback is important.
- All surveys can be taken in the Cisco Events Mobile App or by logging in to the Session Catalog and clicking the "Attendee Dashboard" at <https://www.ciscolive.com/emea/learn/sessions/session-catalog.html>



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Attend any of the related sessions at the DevNet, Capture the Flag, and Walk-in Labs zones.



Visit the On-Demand Library for more sessions at ciscolive.com/on-demand.



The bridge to possible

Thank you

CISCO *Live!*

CISCO *Live!*

ALL IN