Cisco DevNet Series

Session 2: Introduction to Coding

Speaker: Matt Denapoli
Hostess: Kara Sullivan | Cisco Networking Academy

14 September 2017

Welcome to the 2nd session of the Cisco DevNet webinar series

- Use the Q and A panel to ask questions.
- Use the Chat panel to communicate with attendees and panelists.
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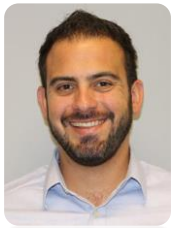

Matt Denapoli
Developer Evangelist
DevNet, Cisco

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Manager for the Emerging Technologies
NetAcad, Cisco

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THIRD SESSION:

Intent Networks

25 October – 9:00 A.M. PT

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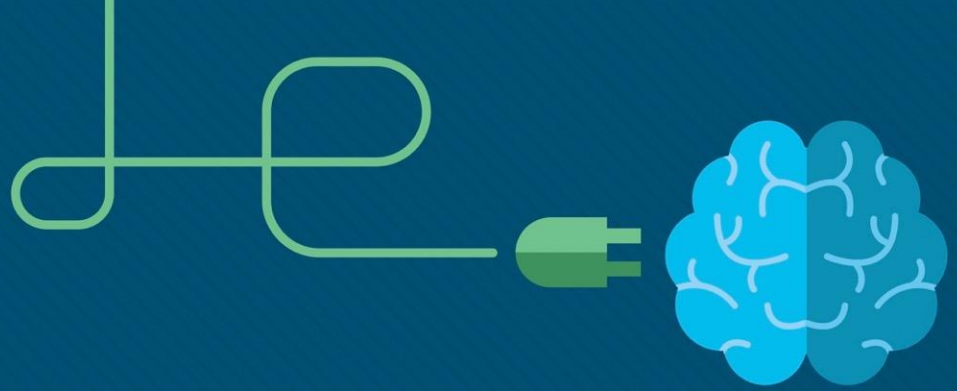

Intro to Coding

Giuseppe Cinque & Wadih Zaatar

Solutions & Marketing

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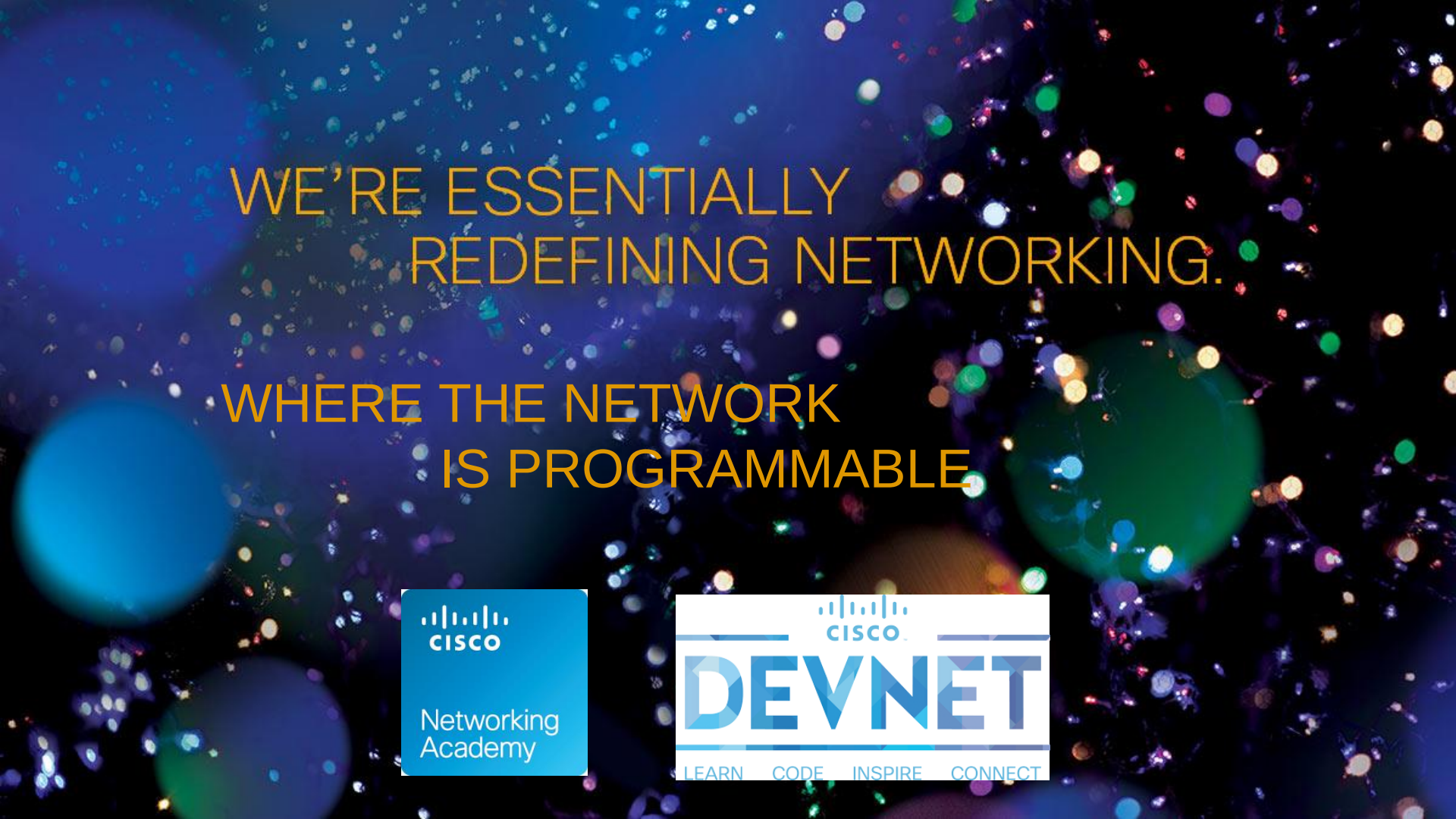
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Module 01

Intro to Coding

Matthew DeNapoli

DevNet Developer Evangelist

Networking Academy | DEVNET

Agenda

- Getting Started
- Learning APIC-EM
- APIC-EM with Postman – HTTP Calls & Generate Code
- Calling APIC-EM REST APIs with Python
- Q&A

Learning APIC-EM

APIC-EM Applications and Use Cases

- Easy QoS
  - Application Priority
- Plug-n-Play
  - Agent based control
- IWAN
  - Policy based automated deployment
- Path Trace
  - Path troubleshooting

APIC-EM Uses REST

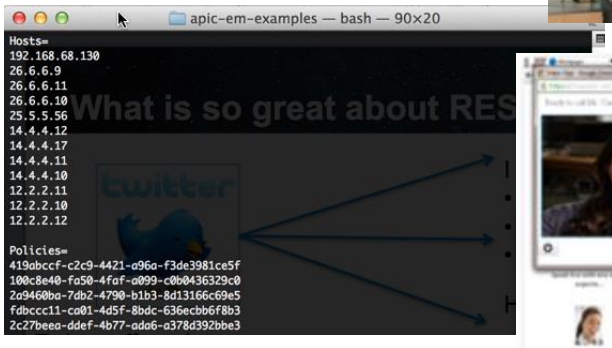
APIC-EM

Easy to use:

- In mobile apps
- In console apps
- In web apps

Cisco APIC-EM REST APIs

- Hosts
- Devices
- Users
- + more



How does this work?

cisco

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Anatomy of a REST Request

Method

- POST, GET, PUT, DELETE (CRUD)

URL

- Example: http://{APIC-EMController}/api/v1/host

Authentication

- Basic HTTP, OAuth, none, Custom

Custom Headers

- HTTP Headers
- Example: Content-Type: application/json

Request Body

- JSON or XML containing data needed to complete request

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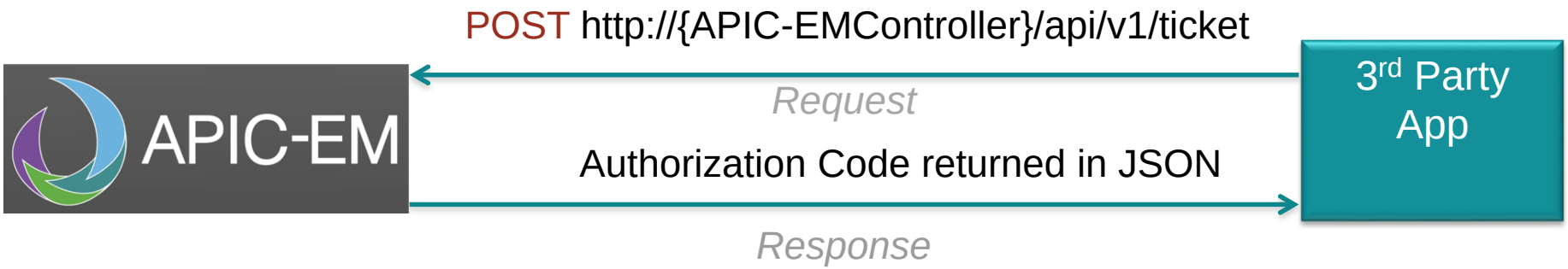
APIC-EM Example: Post Ticket

Application Policy Infrastructure Controller (APIC) Enterprise Module (EM)



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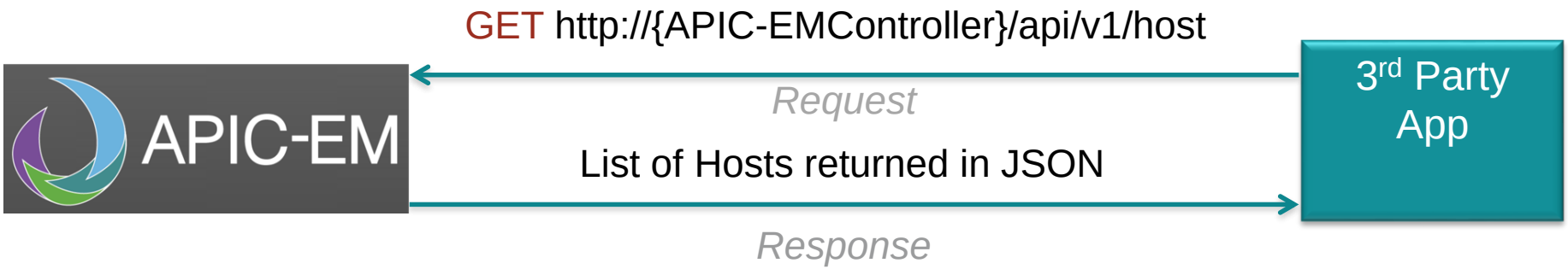
APIC-EM Example: Get Host

Application Policy Infrastructure Controller (APIC) Enterprise Module (EM)



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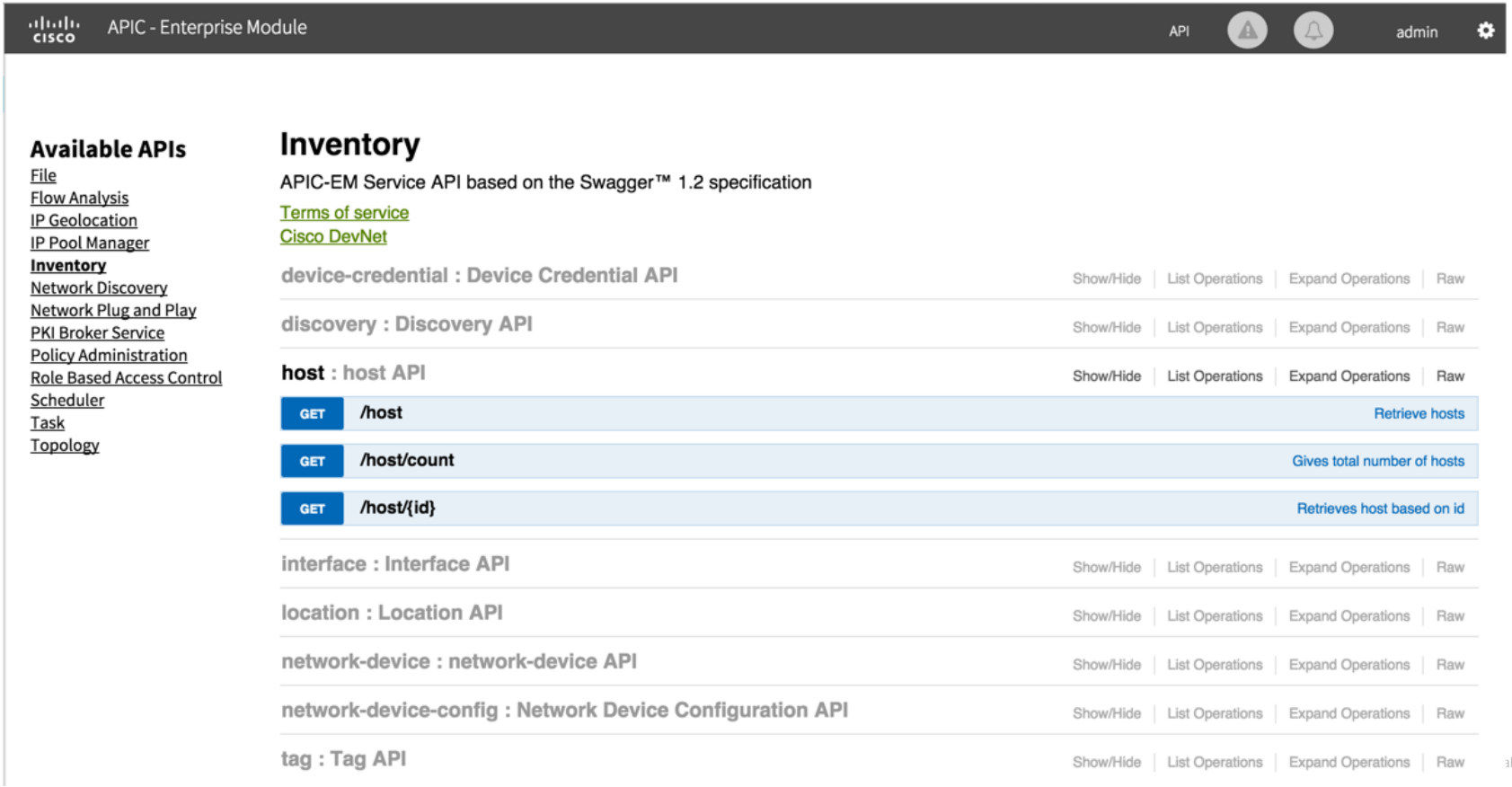
Using the API Reference Documentation



API Reference Guide Details

GET **/host**

Implementation Notes

Get Hosts

Response Class

Model | Model Schema

HostListResult {
version (string, *optional*),
response (array[HostDTO], *optional*)
}
HostDTO {
hostName (string, *optional*): Name of the host,
source (string): Source from which the host gets collected. Available option:200 for inventory collection and 300 for trap based data collection,
lastUpdated (string): Time when the host info last got updated,
vlanId (string, *optional*): Vlan Id of the host,
connectedAPMacAddress (string, *optional*): Mac address of the AP to which wireless host gets connected,
connectedAPName (string, *optional*): Name of the AP to which wireless host gets connected,
connectedInterfaceId (string, *optional*): Id of the interface to which host gets connected,
connectedInterfaceName (string, *optional*): Name of the interface to which host gets connected,
connectedNetworkDeviceId (string): Id of the network device to which host gets connected,
connectedNetworkDeviceIpAddress (string): Ip address of the network device to which host gets connected,
hostIp (string): Ip address of the host,
}

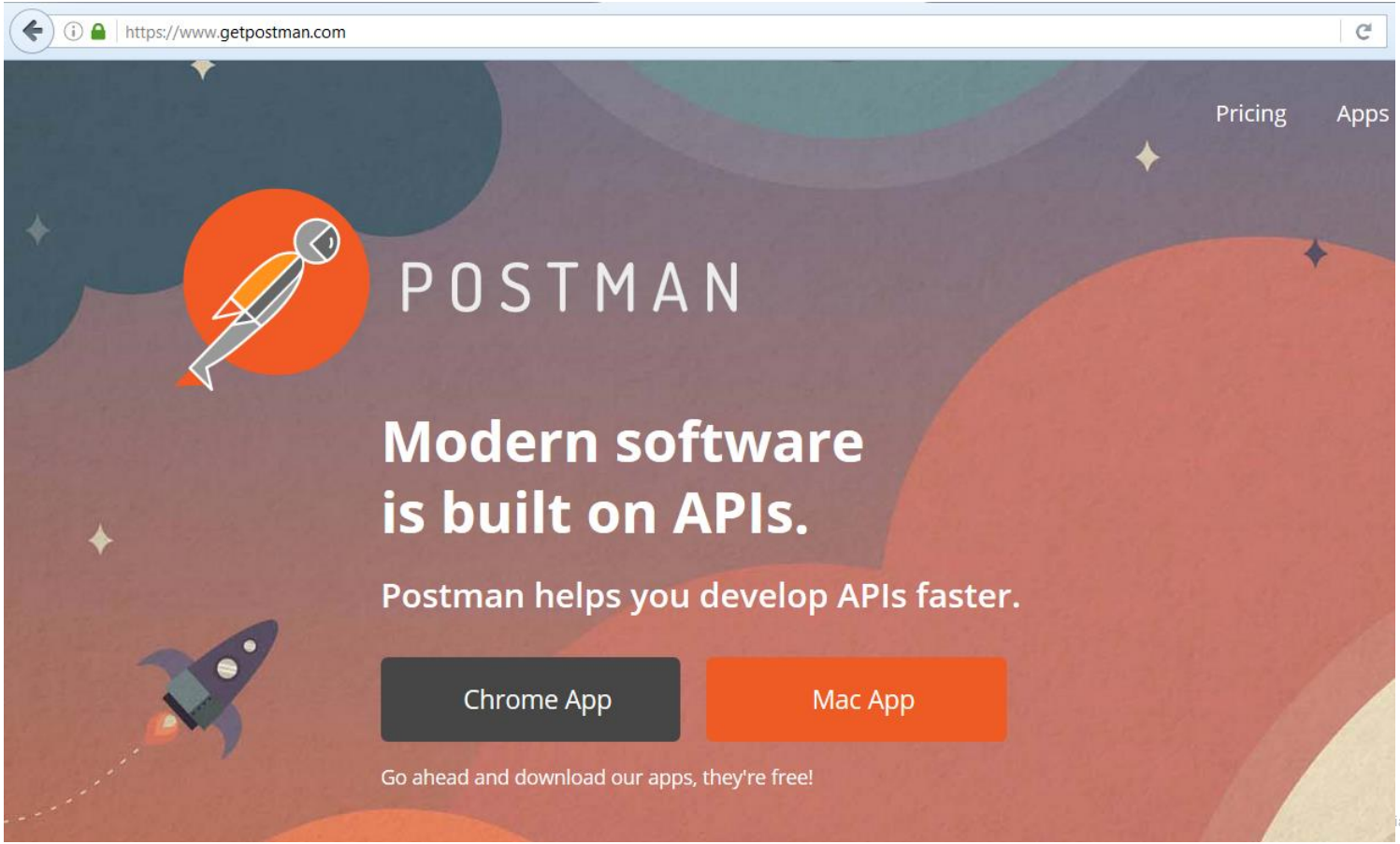
Response Content Type: application/json

Parameters

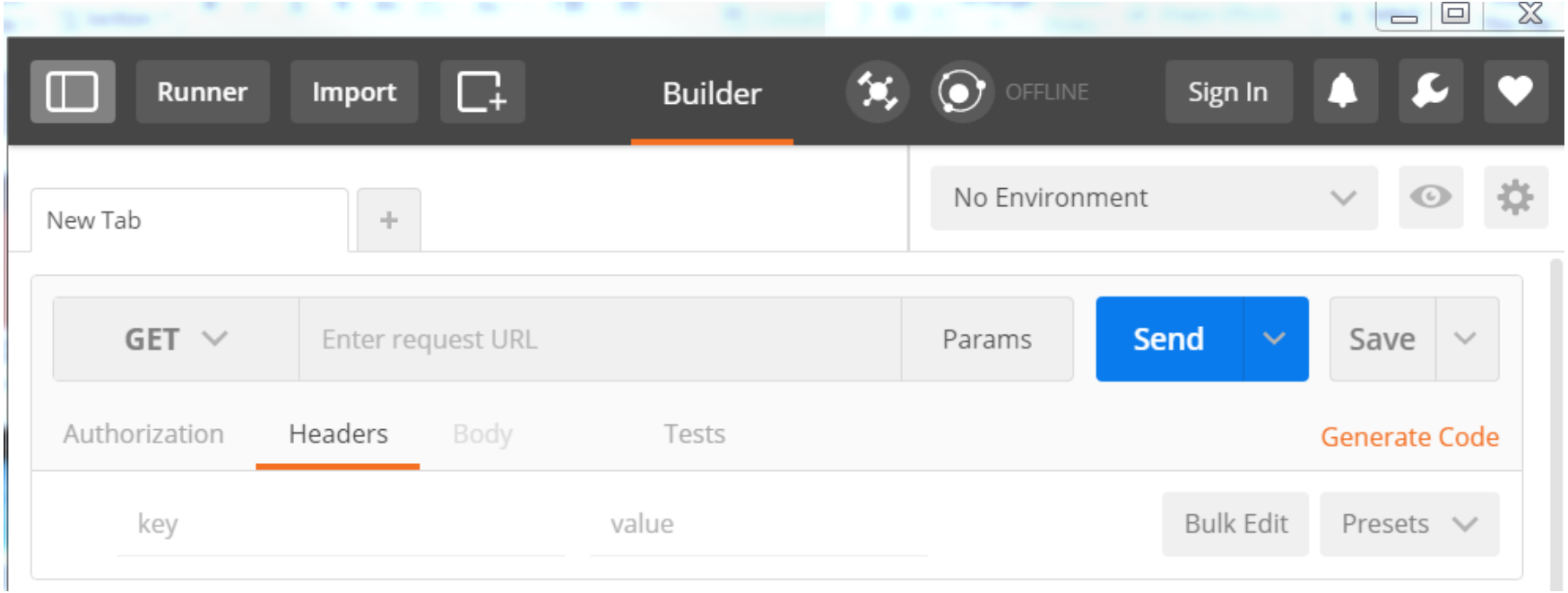
Parameter	Value	Description	Parameter Type	Data Type
limit		limit	query	string
offset		offset	query	string
sortBy		sortBy	query	string

APIC-EM with Postman

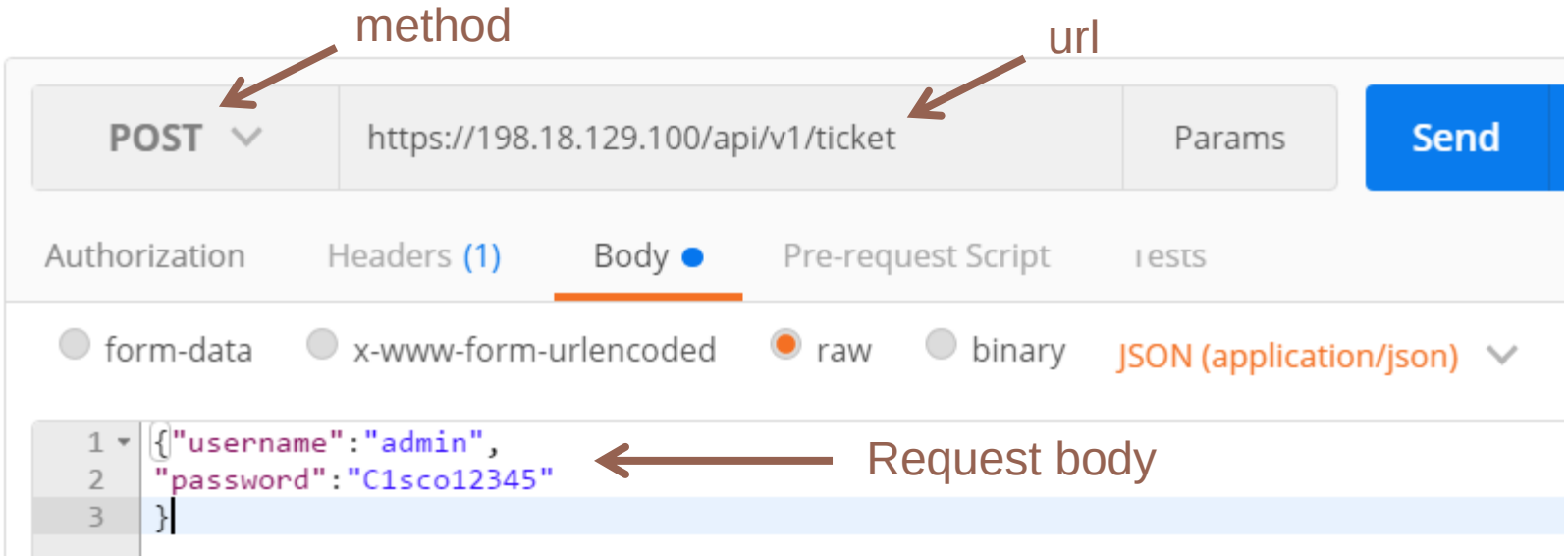
https://www.getpostman.com



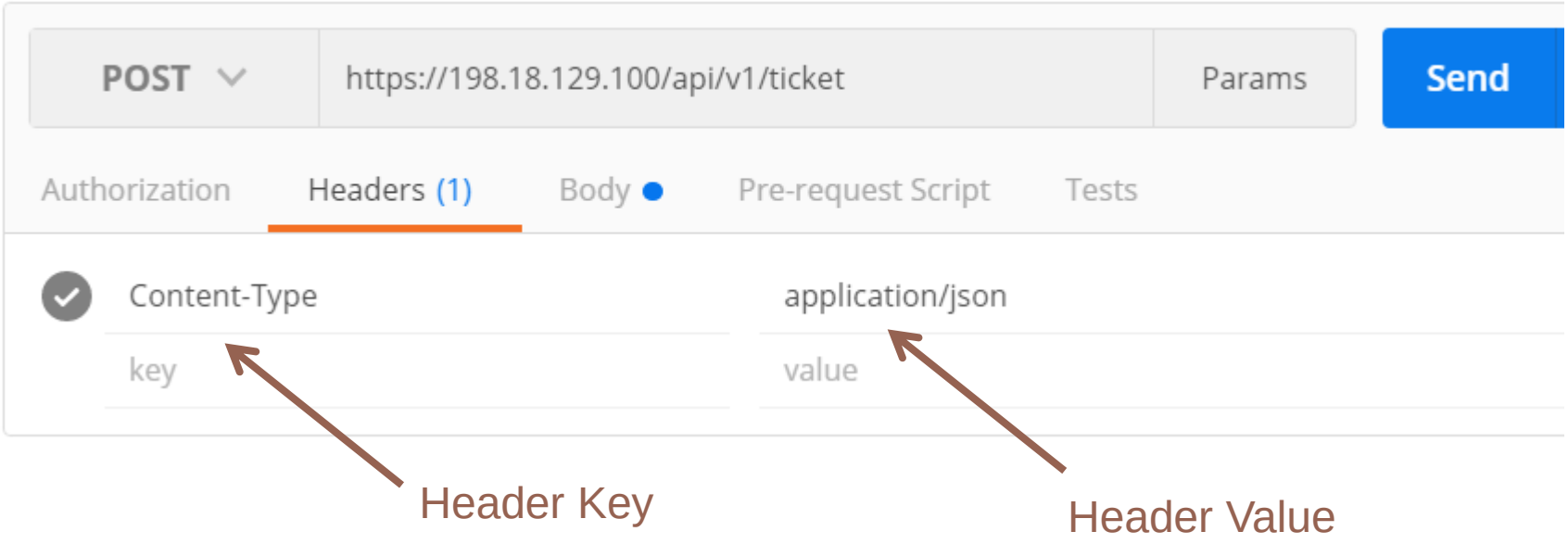
Postman



Create a ticket



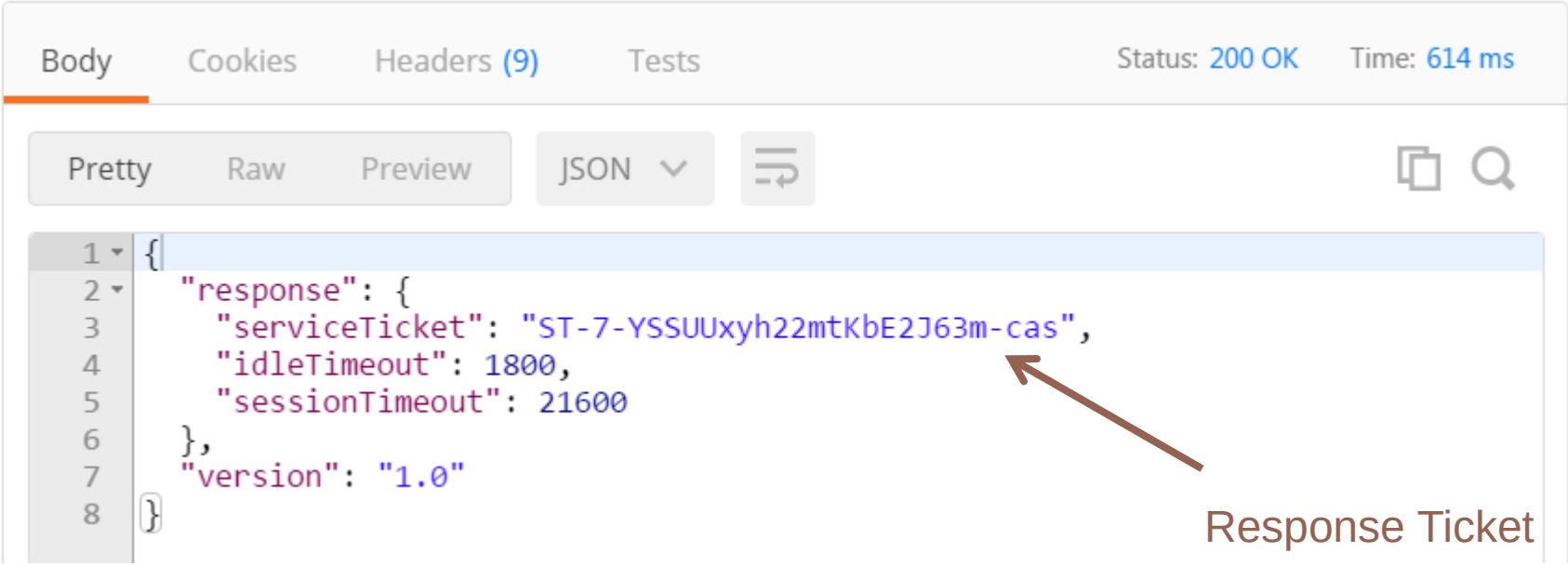
Header Specification



Ticket Returned in Response Body

Body | Cookies | Headers (9) | Tests | Status: 200 OK | Time: 614 ms

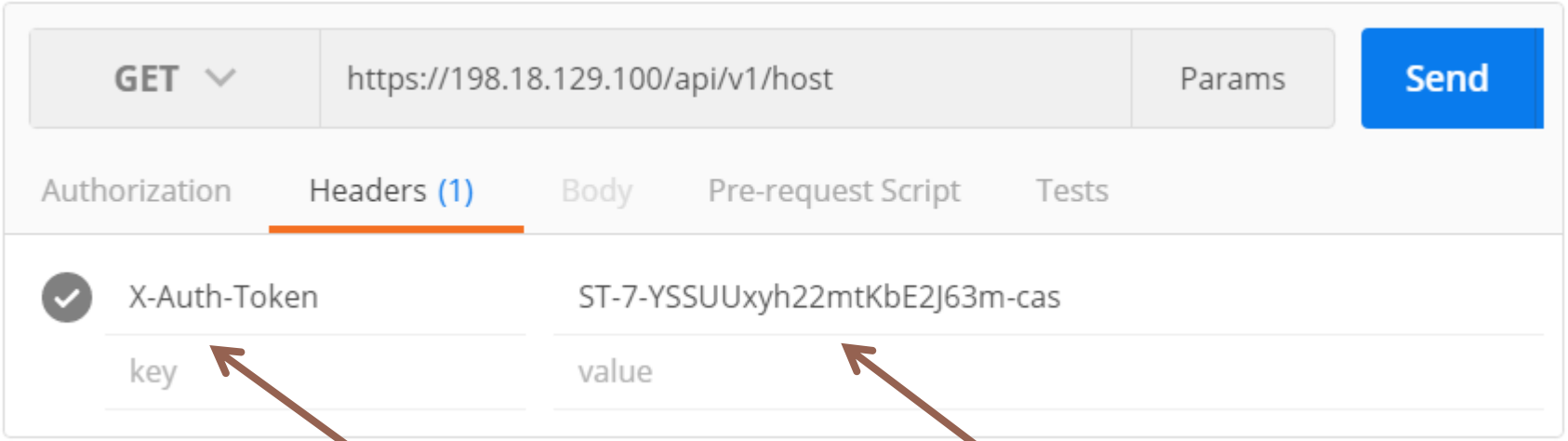
Pretty | Raw | Preview | JSON



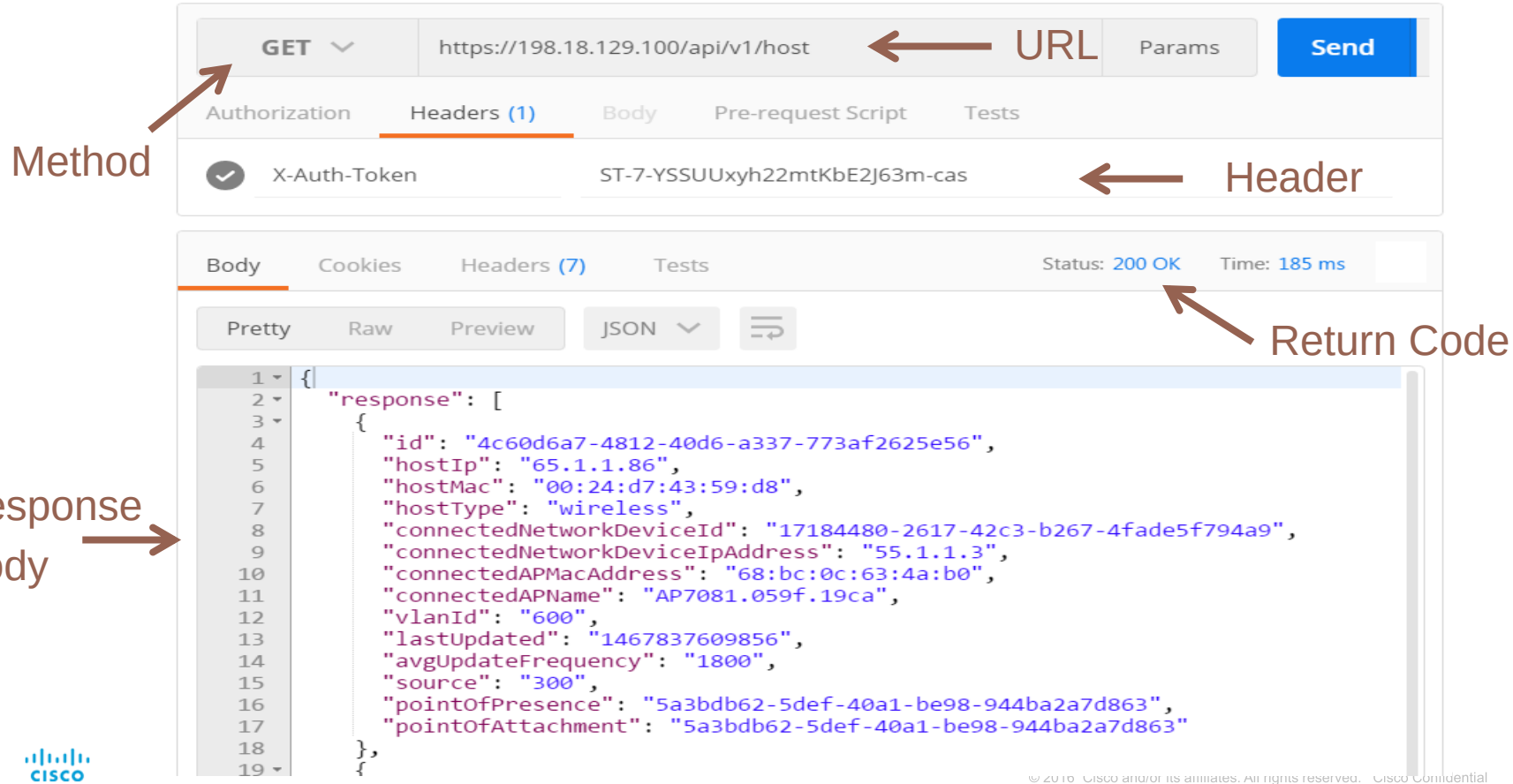
```
{
  "response": {
    "serviceTicket": "ST-7-YSSUUxyh22mtKbE2J63m-cas",
    "idleTimeout": 1800,
    "sessionTimeout": 21600
  },
  "version": "1.0"
}
```

Response Ticket
(save this)

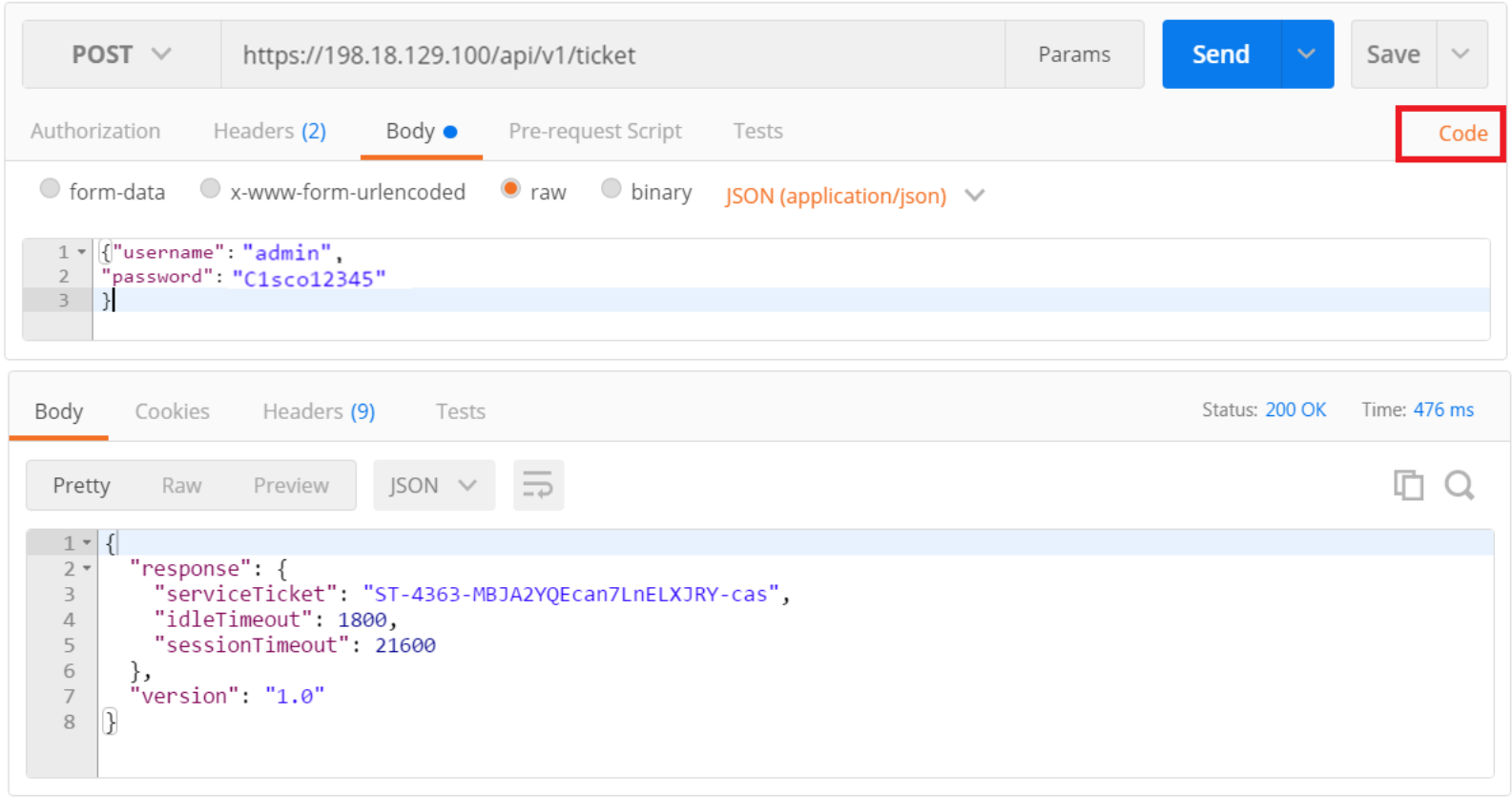
Use ticket in Header in all API Calls



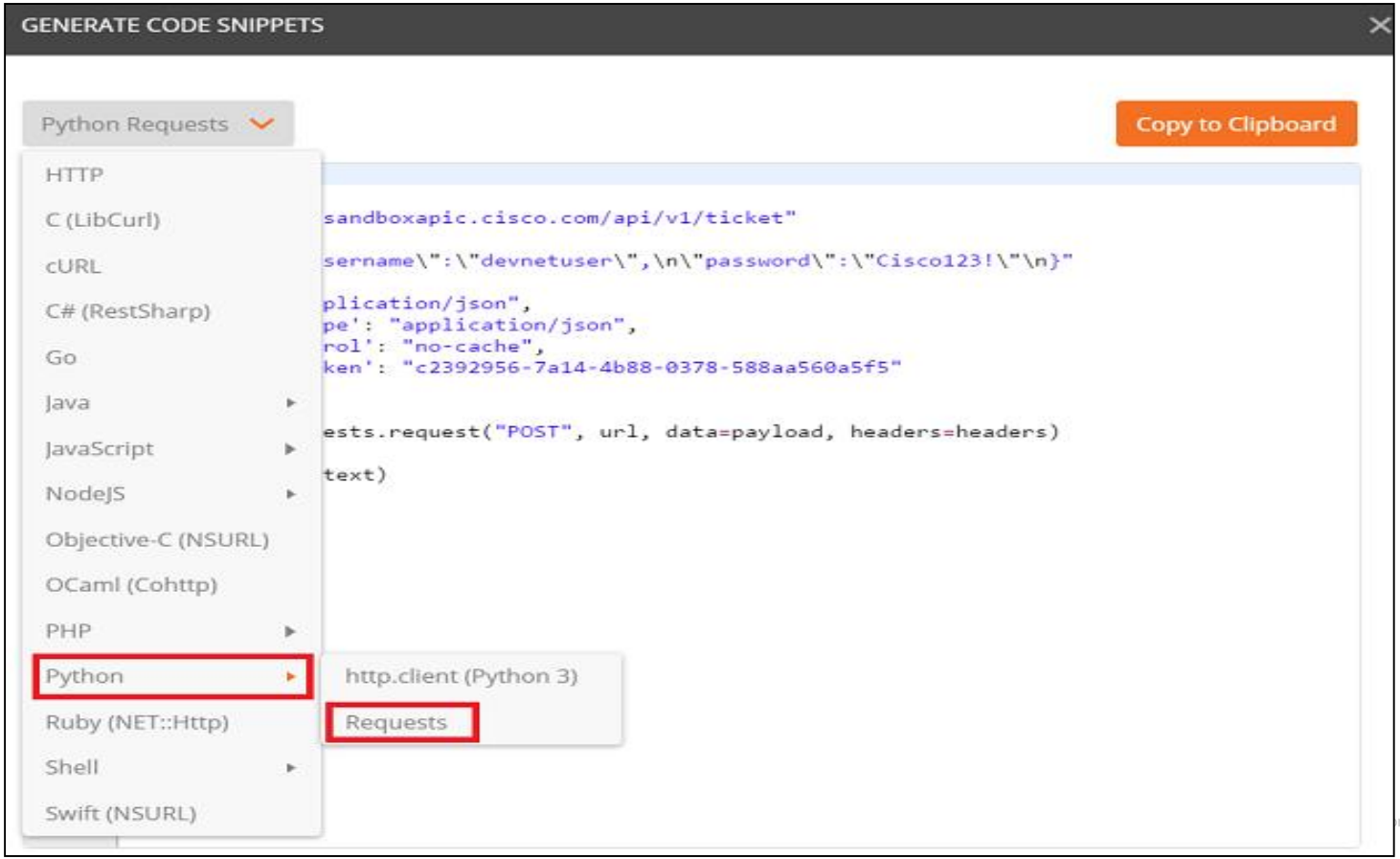
APIC-EM – List of Hosts



Using Postman to Generate Code



Selecting the Code to Generate



Generated Python Requests Code

GENERATE CODE SNIPPETS

Python Requests

Copy to Clipboard

```
import requests

url = "https://198.18.129.100/api/v1/ticket"

payload = "{\"username\":\"admin\",\n\"password\":\"C1sco12345\"\n}"
headers = {
    'cont': "application/json",
    'content-type': "application/json",
    'cache-control': "no-cache",
    'postman-token': "90f57fc2-ade2-2884-c133-ec6aa2f479f3"
    }

response = requests.request("POST", url, data=payload, headers=headers)

print(response.text)
```

REST Demo – Using Postman

- Get Hosts
  - Method: GET
  - Headers: ‘X-Auth-Token’ (insert your ticket value)
  - URL: http://<APIC-EMController>/api/v1/host

- Get Devices
  - Method: GET
  - Headers: ‘X-Auth-Token’ (insert your ticket value)
  - URL: http://<APIC-EMController>/api/v1/network-device

- Get Users
  - Method: GET
  - Headers: ‘X-Auth-Token’ (insert your ticket value)
  - URL: http://<APIC-EMController>/api/v1/user

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APIC-EM with Python

First APIC-EM REST call from Python

```
import requests

import json

url = 'https://198.18.129.100/api/v1/ticket’

payload = {"username":“admin","password":"C1sco12345"}

header = {"content-type": "application/json”}

response= requests.post(url,data=json.dumps(payload), headers=header, verify=False)


print(response.text)
```


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Getting Ticket Function

```
apic_em_ip = "https://198.18.129.100/api/v1"

def get_token(url):
    api_call = "/ticket"
    payload = {"username": "admin", "password": "C1sco12345"}
    headers = {"content-type": "application/json"}
    url += api_call
    response = requests.post(url, data=json.dumps(payload),
        headers=headers, verify=False).json()

    return response["response"]["serviceTicket"]
```

Getting Network Device ID/Config Functions

```
def get_device_id(token, url):
    api_call = "/network-device"
    headers = {"X-AUTH-TOKEN": token}
    url += api_call
    response = requests.get(url, headers=headers, verify=False).json()
    for item in response['response']:
        if item['role'] == 'ACCESS':
            return item['id']
```

Q&A

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