
cisco Live!
Let's go
#CiscoLive

The bridge to possible

Don’t fear! Meraki Action Batch is here!

Subtitle goes here

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@Kareem_Isk

BRKCRT-1003

Cisco Webex App

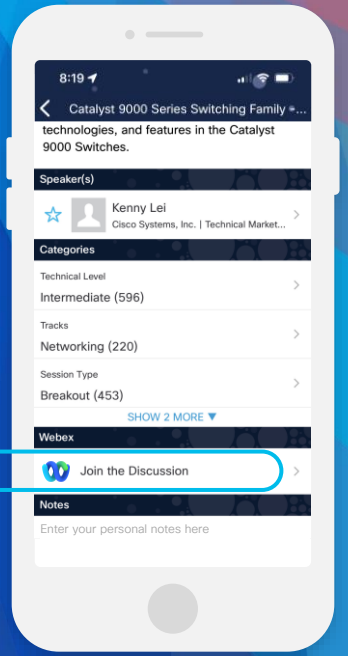
Questions?

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 by the speaker until June 9, 2023.



https://ciscolive.ciscoevents.com/ciscolivebot/#BRKCRT-1003

Agenda

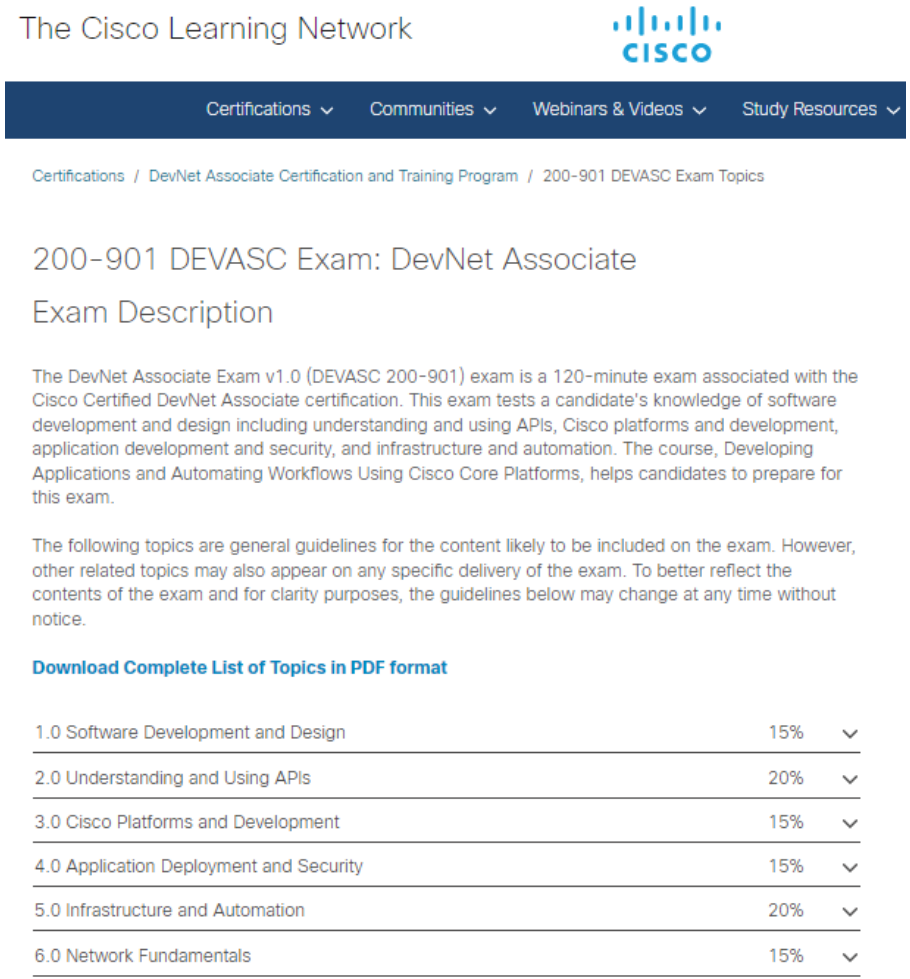
- Introduction to DEVASC
- Learn by Doing - Real-World Use Case
- Discover the Meraki Dashboard APIs
- Enter Meraki Action Batches
- Resources

Introduction to DEVASC

“DevNet professional, DEVASC and Automation skills Required”

Exam Blueprint

https://learningnetwork.cisco.com



The Cisco Learning Network

Certifications / DevNet Associate Certification and Training Program / 200-901 DEVASC Exam Topics

200-901 DEVASC Exam: DevNet Associate

Exam Description

The DevNet Associate Exam v1.0 (DEVASC 200-901) exam is a 120-minute exam associated with the Cisco Certified DevNet Associate certification. This exam tests a candidate's knowledge of software development and design including understanding and using APIs, Cisco platforms and development, application development and security, and infrastructure and automation. The course, Developing Applications and Automating Workflows Using Cisco Core Platforms, helps candidates to prepare for this exam.

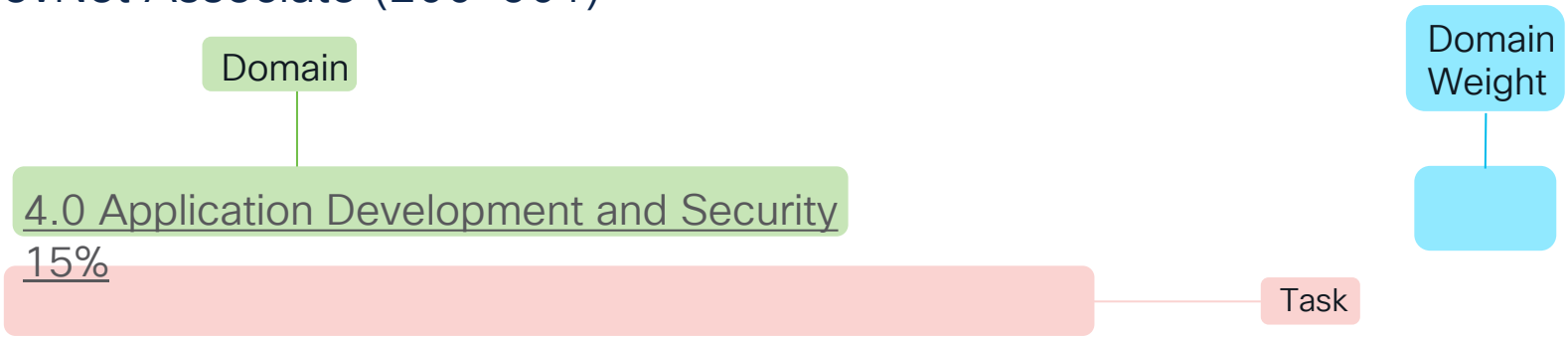
The following topics are general guidelines for the content likely to be included on the exam. However, other related topics may also appear on any specific delivery of the exam. To better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice.

Download Complete List of Topics in PDF format

1.0 Software Development and Design	15%
2.0 Understanding and Using APIs	20%
3.0 Cisco Platforms and Development	15%
4.0 Application Deployment and Security	15%
5.0 Infrastructure and Automation	20%
6.0 Network Fundamentals	15%

Interpret the Blueprint:

DevNet Associate (200-901)



4.1 **Describe** benefits of edge computing

4.2 **Identify** attributes of different application deployment models (private cloud, public cloud, hybrid cloud, and edge)

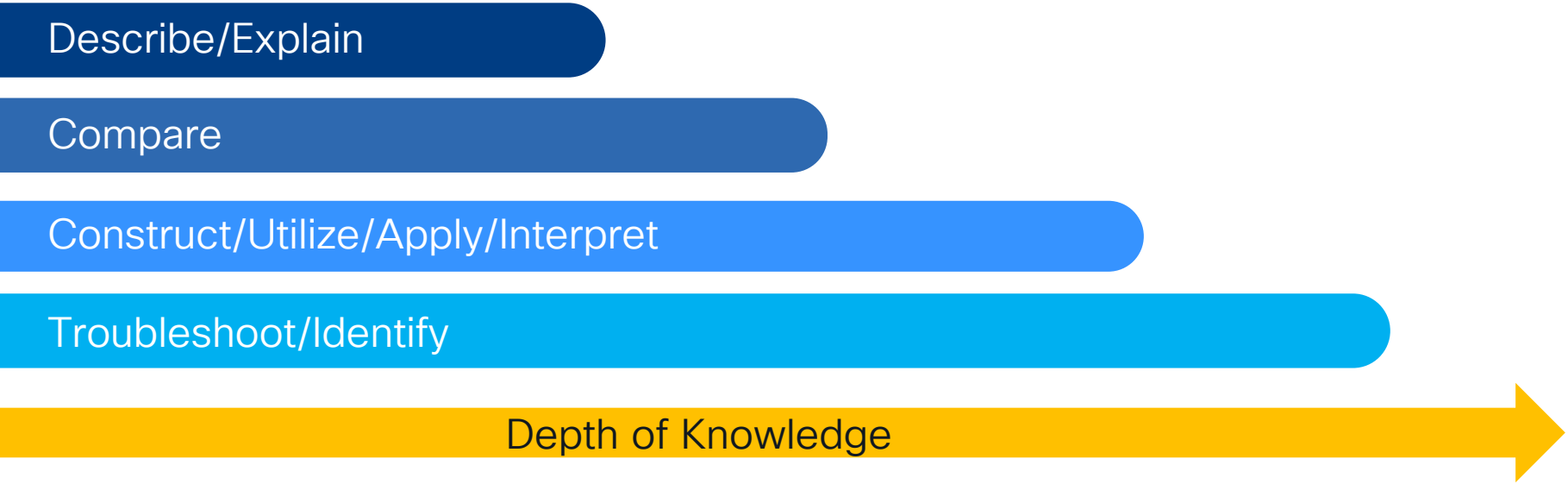
4.3 Identify the attributes of these application deployment types

Subtask

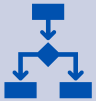
4.3.a Virtual machines

4.3.b Bare metal

Blueprint Verbs



Types of questions



Multiple choice

Drag and drop

Fill in the blanks

Meraki in DEVASC

https://learningnetwork.cisco.com

- @Describe Level
  - Overview of the Cisco Meraki platform
  - How to authenticate and authorize API requests to Cisco Meraki
  - Examples of API requests and responses using Postman
- @Construct Level
  - Build deployment using APIs
  - Automate deployment
  - Simplify with Action Batches

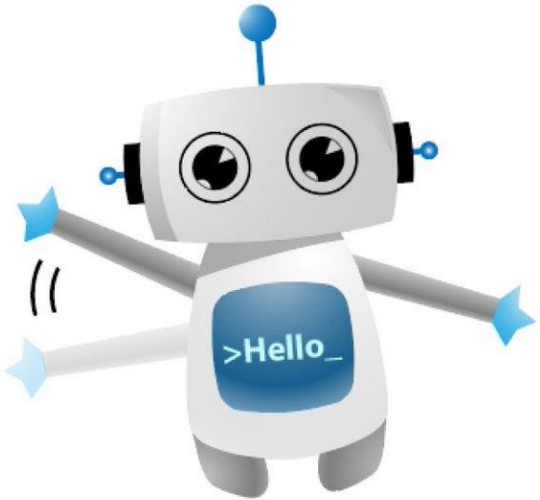
3.0 Cisco Platforms and Development 15%

- 3.1 Construct a Python script that uses a Cisco SDK given SDK documentation
- 3.2 Describe the capabilities of Cisco network management platforms and APIs (Meraki, Cisco DNA Center, ACI, Cisco SD-WAN, and NSO)
- 3.3 Describe the capabilities of Cisco compute management platforms and APIs (UCS Manager, UCS Director, and Intersight)
- 3.4 Describe the capabilities of Cisco collaboration platforms and APIs (Webex Teams, Webex devices, Cisco Unified Communication Manager including AXL and UDS interfaces, and Finesse)
- 3.5 Describe the capabilities of Cisco security platforms and APIs (Firepower, Umbrella, AMP, ISE, and ThreatGrid)
- 3.6 Describe the device level APIs and dynamic interfaces for IOS XE and NX-OS
- 3.7 Identify the appropriate DevNet resource for a given scenario (Sandbox, Code Exchange, support, forums, Learning Labs, and API documentation)
- 3.8 Apply concepts of model driven programmability (YANG, RESTCONF, and NETCONF) in a Cisco environment
- 3.9 Construct code to perform a specific operation based on a set of requirements and given API reference documentation such as these:
  - 3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Center, ACI, Cisco SD-WAN, or NSO
  - 3.9.b Manage spaces, participants, and messages in Webex Teams
  - 3.9.c Obtain a list of clients / hosts seen on a network using Meraki or Cisco DNA Center

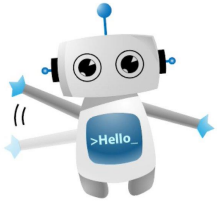
Use Case

Meraki Headless Deployment

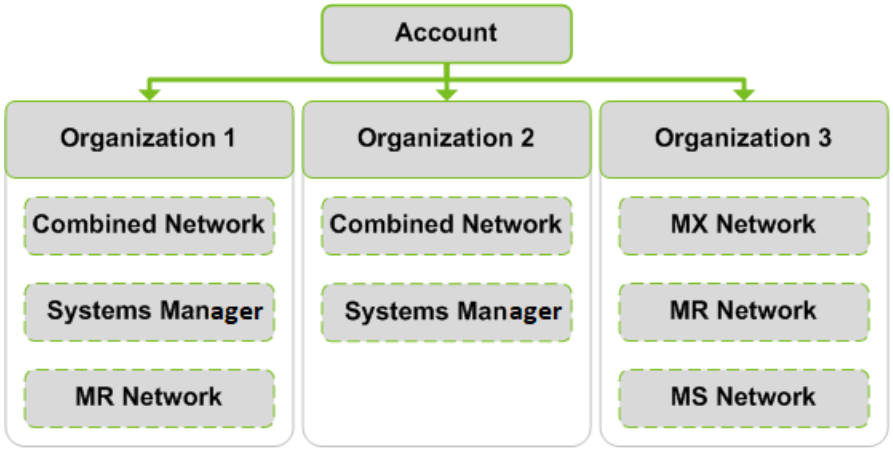
- Fris.co Inc., Devvie's company, is rapidly expanding its AI-run operations across multiple locations worldwide.
- A new site has been set up, and a human has been hired to unbox and connect the Meraki devices.
- Devvie's primary responsibility is to automate the site's creation, deploy newly added devices, and configure them while ensuring device connectivity.



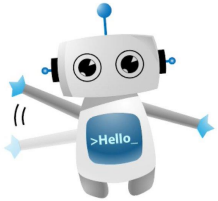
Dissecting our Use Case



1. Understand Meraki Dashboard Organization Hierarchy
   - **Organizations** contain **Networks** (Wireless, Switch, Security, Camera, Combined)
   - **Networks** contain Devices (Switches, APs, Cameras)



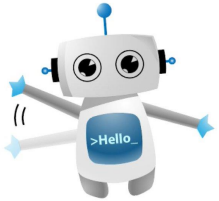
Dissecting our Use Case



2. Identify the Meraki Dashboard APIs Endpoint

API	Endpoint
Authenticate	Dashboard Token
Create Organization	POST /api/v1/organizations
Claim Into Organization	POST /api/v1/organizations/{organizationId}/claim
Create Organization Network	POST /api/v1/organizations/{organizationId}/networks
Claim Network Devices	POST /api/v1/networks/{networkId}/devices/claim
Configure Devices	POST Multiple Endpoints

Journey to DEVASC

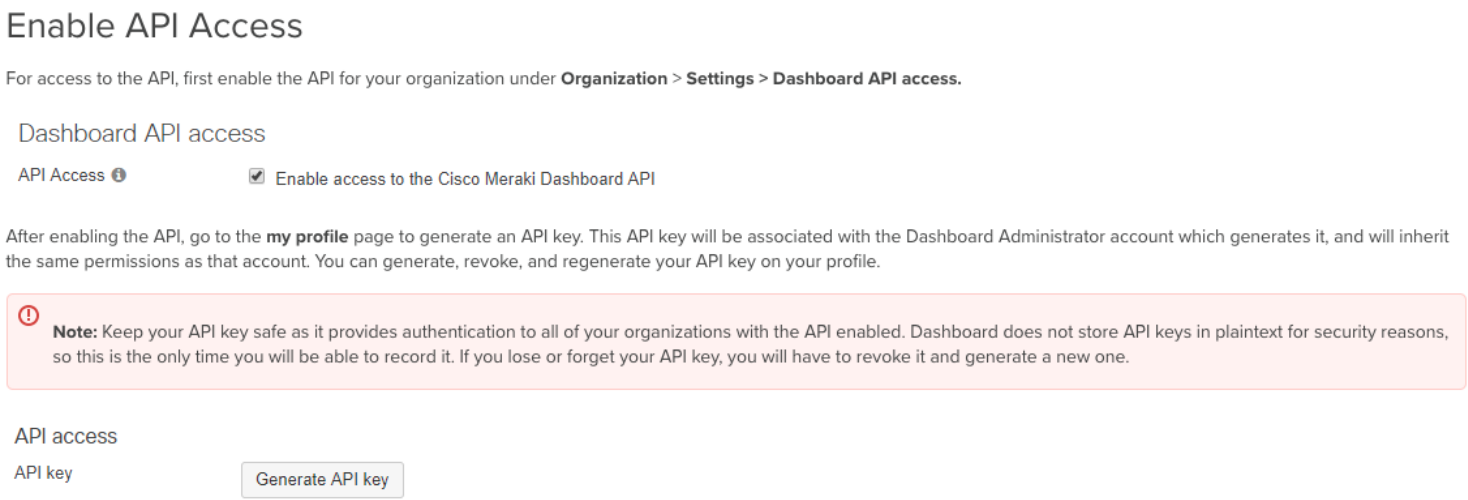


API
Authenticate
Create Organization POST /api/v1/organizations
Claim Into Organization POST /api/v1/organizations/{organizationId}/claim
Create Organization Network POST /api/v1/organizations/{organizationId}/networks
Configuration POST Multiple Endpoints

- 2.7 Utilize common API authentication mechanisms: basic, custom token, and API keys
- 2.6 Identify the parts of an HTTP response (response code, headers, body)
- 3.2 Describe the capabilities of Cisco network management platforms and APIs (Meraki, Cisco DNA Center, ACI, Cisco SD-WAN, and NSO)
- 3.9 Construct code to perform a specific operation based on a set of requirements and given API reference documentation such as these:
  - 3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Center, ACI, Cisco SD-WAN, or NSO
  - 3.9.b Manage spaces, participants, and messages in Webex Teams
  - 3.9.c Obtain a list of clients / hosts seen on a network using Meraki or Cisco DNA Center

Discover the Meraki Dashboard APIs

Authenticate



- Header
  - Using Token
  - Key “X-Cisco-Meraki-API-Key”
  - Value “{API Token}”

Create Organization

POST **Create A New Organization**

https://api.meraki.com/api/v1/organizations

Create a new organization

Body Parameters

Parameter	Type	Description
name	string	The name of the organization
management	object	Information about the organization's management system

AUTHORIZATION API Key

This request is using API Key from collection Meraki Dashboard API - v1.33.0

HEADERS

X-Cisco-Meraki-API-Key

Content-Type application/json

Claim Into Organization

POST **Claim A List Of Devices Licenses And Or Orders Into An Organization**

https://api.meraki.com/api/v1/organizations/:organizationId/claim

Claim a list of devices, licenses, and/or orders into an organization. When claiming by order, all devices and licenses in the order will be claimed; licenses will be added to the organization and devices will be placed in the organization's inventory.

AUTHORIZATION API Key

This request is using API Key from collection Meraki Dashboard API - v1.33.0

HEADERS

X-Cisco-Meraki-API-Key	
Content-Type	application/json

PATH VARIABLES

organizationId	549236 (Required) Organization ID

Body raw

JSON Body

```
{
    "serials": [
        "Q2KN-8W8A-B7D2",
        "Q2DK-S376-E76E",
        "Q2LD-NKG6-BPWC",
        "Q2LD-TN2Q-ZC72",
        "Q2DD-SMZ6-5FDK",
        "Q2AT-JGZ9-HW3U”
    ]
}
```

Claim Network Devices

POST **Create A Network**

https://api.meraki.com/api/v1/organizations/:organizationId/networks

Create a network

Body Parameters

Parameter	Type	Description
name	string	The name of the new network
productTypes	array	The product type(s) of the new network. If more than one type is included, the network will be a combined network.
tags	array	A list of tags to be applied to the network
timeZone	string	The timezone of the network. For a list of allowed timezones, please see the 'TZ' column in the table in this article.
copyFromNetworkId	string	The ID of the network to copy configuration from. Other provided parameters will override the copied configuration, except type which must match this network's type exactly.
notes	string	Add any notes or additional information about this network here.

JSON Body

```
{
  "name": "Main Office",
  "productTypes": [
    "appliance",
    "switch",
    "wireless"
  ],
  "timeZone": "America/Los_Angeles",
  "notes": "office network, restricted to humans"
}
```

Configure our new site

POST Create A New Dashboard Administrator

https://api.meraki.com/api/v1/organizations/:organizationId/admins

PUT Update A Switch Port

https://api.meraki.com/api/v1/devices/:serial/switch/ports/:portId

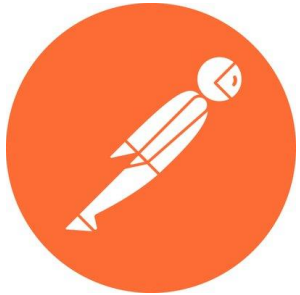
PUT Update The Attributes Of An MR SSID

https://api.meraki.com/api/v1/networks/:networkId/wireless/ssids/:number

Update the attributes of an MR SSID

What are we going to do?

- Postman
  - Build the use case using Postman
  - Interact with the APIs and see results
  - Learn how to use Postman (DEVASC)
- Code
  - Walkthrough Python Code
  - Interact with APIs using Requests (DEVASC)
  - Leverage Python SDK (DEVASC)



Let’s build it!

Meraki Action Batches

Efficient Network Deployment

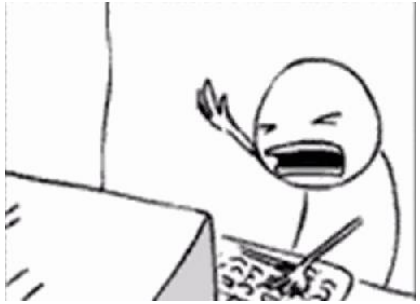
- Imagine Fris.co had to deploy:
  - 10k Security Appliances
  - 50k Access Points
  - 50K camera
  - 15K Switches

    125K Devices total

    6 Organization

    12 Network Admins

- ~10 API calls per device
  - @125K Devices
  - 1.25M API calls total



Action Batches
To the rescue!

- Condense 100 API requests into one action batch
- Batches can be run asynchronously and in parallel
- Each batch is atomic (all or nothing, no partial success)
- API-only feature! (Yay, DEVASC)

Creating an Action Batch

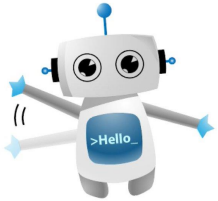
- **POST** request containing an array of resources

PARAMETERS

Parameter	Description
confirmed	Set to true for immediate execution. Set to false if the action should be previewed before executing.
synchronous	Force the batch to run synchronous. There can be at most 20 actions in synchronous batch.
actions	A set of changes to make as part of this action
resource	Unique identifier for the resource to be acted on
operation	The operation to be run on the resource, such as "**create**", "**update**", "**destroy**", etc
body	The body of the action. Example: `{"tags": tags, "type": "access", "vlan": vlan}`

List of supported resources

Action Batch-fy Fris.co



API	Endpoint
Create Organization	POST /api/v1/organizations
Create Action Batches	POST /api/v0/organizations/{organizationId}/actionBatches

Action Batch	Resource	Operation
Create Network	/organizations/{organizationId}/networks	create
Claim Devices Into Network	/organizations/{organizationId}/networks	claim

Let’s build it!

Construct question

2.9 Construct a Python script that calls a REST API using the requests library

Drag and drop the code from the bottom onto the box where the code is missing to retrieve a list of organizations configured in the Meraki organization. Not all options are used.

```
import [          ]
MERAKI_API_KEY = '6bec40cf957de430a6f1f2baa056b99a4fac9ea0'
base_url = "https://api.meraki.com/api/v1"
endpoint = "/organizations"
header = {"X-Cisco-Meraki-API-Key": MERAKI_API_KEY}
orgs = requests.[          ](url=base_url+endpoint, headers=header)
[          ] = json.loads(orgs.text)
pprint(orgs)
```

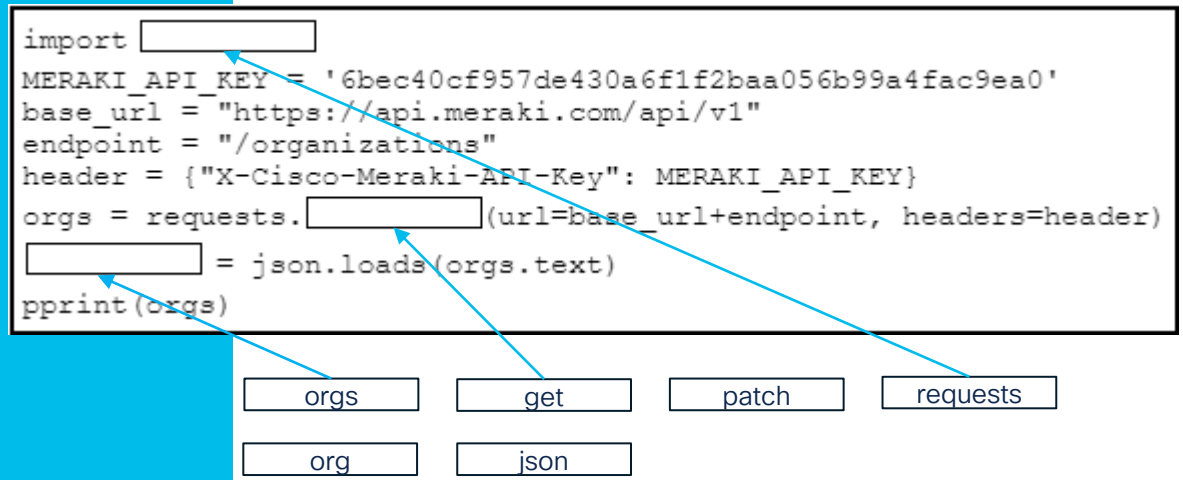
orgs | get | patch | requests

org | json

Construct question

2.9 Construct a Python script that calls a REST API using the requests library

Drag and drop the code from the bottom onto the box where the code is missing to retrieve a list of organizations configured in the Meraki organization. Not all options are used.



Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

Drag and drop the code from the bottom onto the box where the code is missing to retrieve a list of devices in the Meraki organization. Not all options are used.

```
import requests
base_url = "https://api.meraki.com/api/v1"
[          ] = {"X-Cisco-Meraki-API-Key": MERAKI_API_KEY}
def get_device_list():
    for org in orgs:
        endpoint = "/organizations/{}/devices".format(org['id'])
        print([          ])
        resp = requests.get(url=base_url + endpoint, headers=header)
        [          ] = json.loads(resp.text)
        pprint(device)
if __name__ == "__main__":
    get_device_list()
```

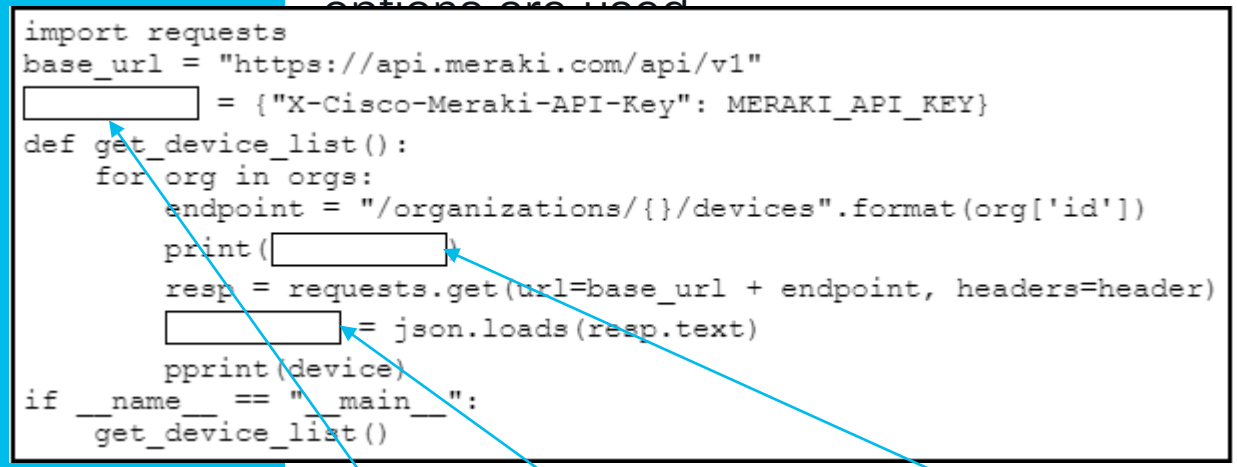
header | device | auth | endpoint

orgs | list

Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

Drag and drop the code from the bottom onto the box where the code is missing to retrieve a list of devices in the Meraki organization. Not all options are used.



header | device | auth | endpoint

orgs | list

Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

Describe the hierarchy of a Meraki Dashboard site

A. Organization → Network → Devices

B. Organization → Devices → Configuration

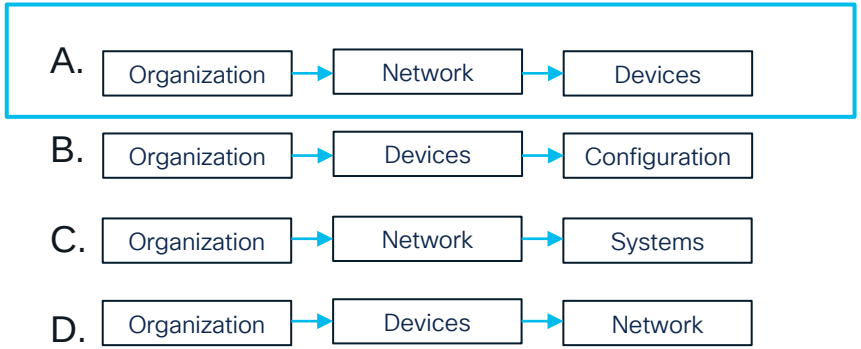
C. Organization → Network → Systems

D. Organization → Devices → Network

Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

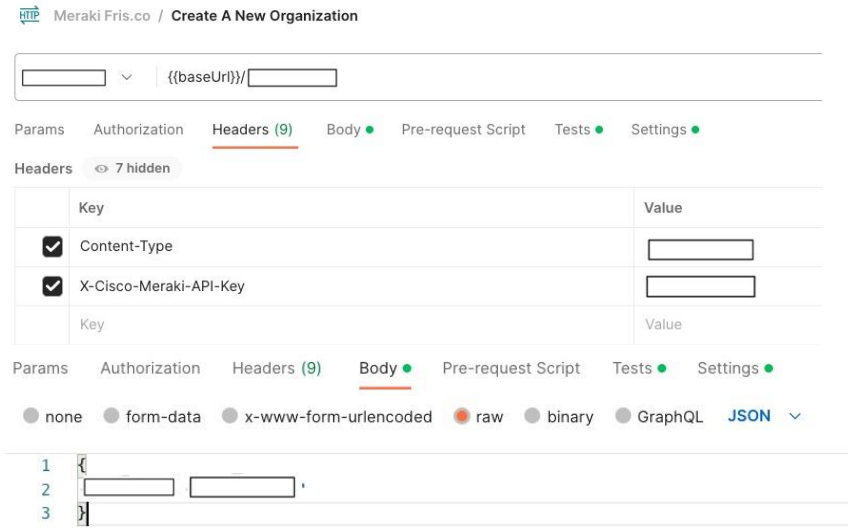
Describe the hierarchy of a Meraki site



Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

Construct an API call in Postman to programmatically deploy a Meraki Organization



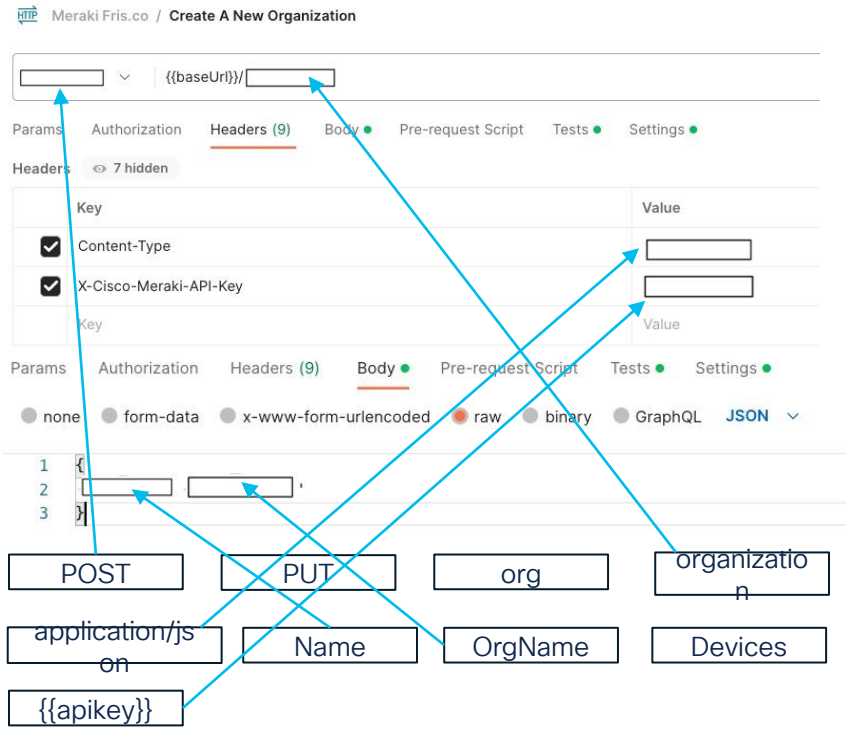
POST | PUT | org | organizatio n

application/js on | Name | OrgName | Devices

Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

Construct an API call in Postman to programmatically deploy a Meraki Organization



Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

Refer to the Exhibit below, which answer best describes this Meraki A

```
import meraki

# Defining your API key as a variable in source code is not recommendec
API_KEY = '6bec40cf957de430a6f1f2baa056b99a4fac9ea0'
# Instead, use an environment variable as shown under the Usage sectior
# @ https://github.com/meraki/dashboard-api-python/

dashboard = meraki.DashboardAPI(API_KEY)

organization_id = '549236'
actions = [{'resource': '/devices/QXXX-XXXX-XXXX/switch/ports/3', 'oper

response = dashboard.organizations.createOrganizationActionBatch(
    organization_id, actions,
    confirmed=True,
    synchronous=True
)

print(response)
```

A. This action batch is NOT Atomic.

B. Results will be returned in order received

C. This actions batch Resource a switch port

D. Action batch is already created

Construct question

3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Centre, ACI, Cisco SD-WAN, or NSO SDWAN

Refer to the Exhibit below, which answer best describes this Meraki A

```python
import meraki

# Defining your API key as a variable in source code is not recommendec
API_KEY = '6bec40cf957de430a6f1f2baa056b99a4fac9ea0'
# Instead, use an environment variable as shown under the Usage sectior
# @ https://github.com/meraki/dashboard-api-python/

dashboard = meraki.DashboardAPI(API_KEY)

organization_id = '549236'
actions = [{'resource': '/devices/QXXX-XXXX-XXXX/switch/ports/3', 'oper

response = dashboard.organizations.createOrganizationActionBatch(
    organization_id, actions,
    confirmed=True,
    synchronous=True
)

print(response)
```

A. This action batch is NOT Atomic.

B. Results will be returned in order received

C. This actions batch Resource configures switchport

D. Action batch is already created

Resources

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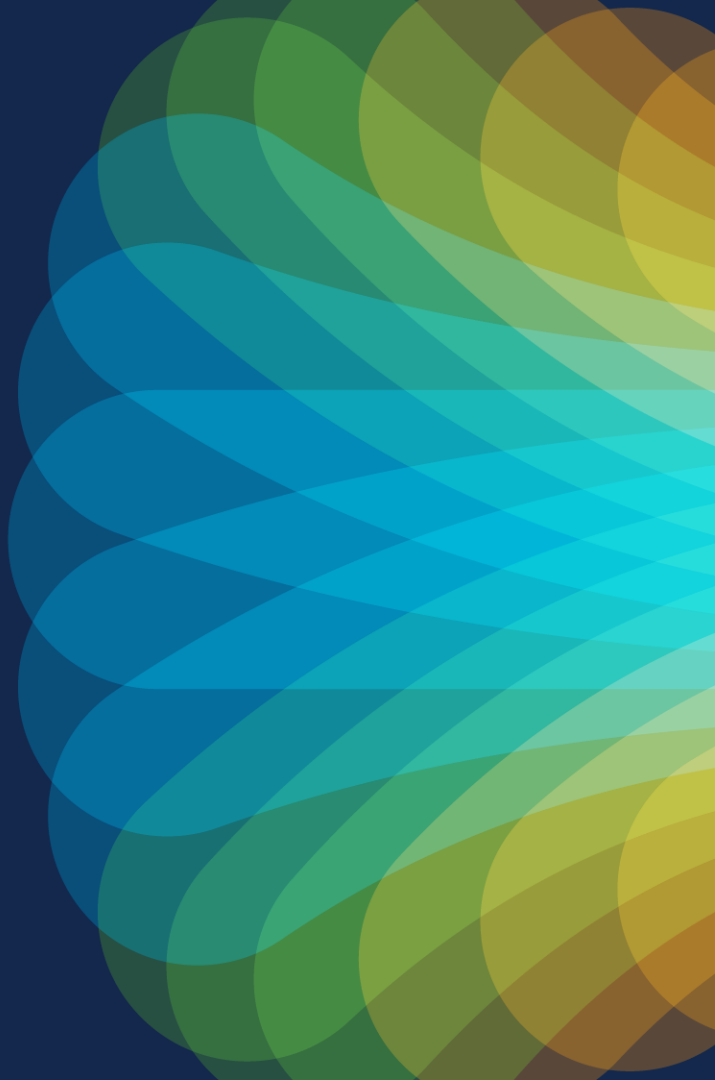
Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand

The bridge to possible

Thank you



Cisco Live
Challenge

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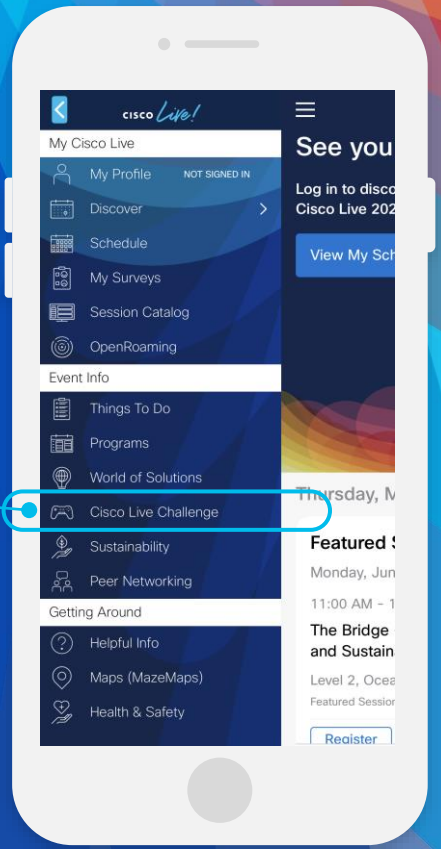
Get points for attending this session!

How:

1. Open the Cisco Events App.
2. Click on 'Cisco Live Challenge' in the side menu.
3. Click on View Your Badges at the top.
4. Click the + at the bottom of the screen and scan the QR code:

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Let's go
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