

The background is a vibrant, abstract graphic. It features a central bright white light source from which numerous colorful rays emanate, creating a sunburst or starburst effect. The rays transition through a spectrum of colors: yellow, orange, red, pink, purple, blue, and green. Overlaid on this are large, soft, wavy shapes in shades of orange, red, and yellow, giving the impression of clouds or flowing liquid. The overall composition is dynamic and energetic.

cisco *Live!*

Let's go

#CiscoLive



The bridge to possible

Agile Management of Webex Calling

There's an API for that

Johannes Krohn, Principal Technical Marketing Engineer
BRKCOL-3015



#CiscoLive

Cisco Webex App

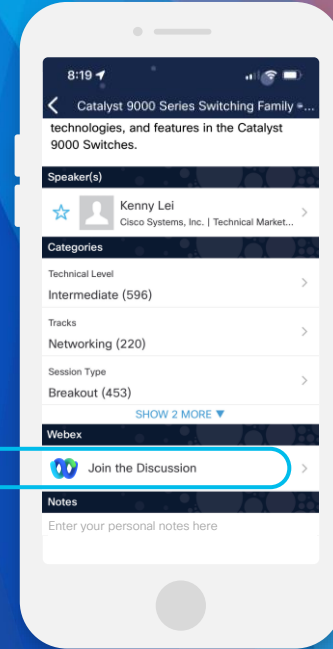
Questions?

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/#BRKCOL-3015>

Agenda

- Why APIs?
- Coverage/Capabilities
- Getting started
- Use cases/Examples
- Closing

Why APIs?



API, What, Where, and Why?

- Definition: .. is a set of subroutine definitions, protocols, and tools for building application software. In general terms, it is a set of clearly defined methods of communication between various software components. .. Documentation for the API is usually provided to facilitate usage.”¹
- APIs
 - Enabler for open systems integration
 - Universally available
 - Unleash developer innovation



Webex Calling Provisioning Methods

	Control Hub	CSV	API
Ease of Use	+++	++	+
Speed	+	+++	+++
Customization		+	+++

Coverage / Capabilities



Webex APIs

- Documentation: <http://developer.webex.com>
- Various APIs available:
- Admin (licenses, locations, memberships, people, ..)
- Calling (call control, locations, people, org/location settings, ...)
- Devices (configuration, places, workspace locations, xAPI, ...)
- Meetings (invitees, participants, preferences, ...)
- ...
- OAuth access token used for authorization

Webex APIs

- + Admin
- + Calling
- + Contact Center
- + Devices
- + Meetings
- + Messaging
- + Webex Assistant Skills
- + FedRAMP
- + Full API Reference

Webex Calling API capabilities

- Provisioning
 - Users (incl. calling entitlements), locations (r/o), call pickups, call queues, hunt groups, auto attendant, call parks, schedules, voice messaging settings, ...
 - person settings: barge, call forwarding, call intercept, call recording, caller ID, voicemail settings, ...
 - Coverage continuously growing*
- Call Control
 - Dial, answer, reject, hangup, hold/resume, divert, transfer, park/retrieve, start/stop/pause/resume recording, DTMF, push, pickup, barge
- Webhook Notifications/Events
 - Voice messages
 - Call events

*Check <https://help.webex.com/en-us/article/rdmb0/What's-new-in-Webex-Calling> and <https://developer.webex.com/> for updates

References:

<https://developer.webex.com/docs/webex-calling>
<https://developer.webex.com/blog/calling-apis-overview>

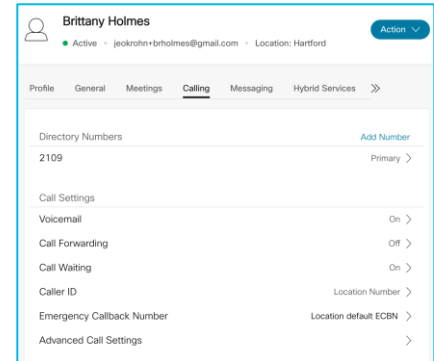
Webex Calling Provisioning APIs

- Locations, <https://developer.webex.com/docs/api/v1/locations>
 - List locations
 - Get location details
 - Create/Update locations
 - Delete: not possible
- People, <https://developer.webex.com/docs/api/v1/people>
 - List
 - CRUD
 - `callingData` parameter to access calling data*

Webex Calling Provisioning APIs

Calling	Numbers	Locations	Call Routing	Features	PSTN Orders	Service Settings	Client Settings
<u>Auto Attendant</u>	Call Park Extension	Call Park Group	Call Pick-up	Call Queue	DECT Network	Hunt Group	Single Number Reach
Paging Group	Receptionist Client	Virtual Extension	Voicemail Group				

- Organization Settings,
<https://developer.webex.com/docs/api/v1/webex-calling-organization-settings>
- Calling features found in Feature tab in Control Hub
- Person Settings,
<https://developer.webex.com/docs/api/v1/webex-calling-person-settings>
- Settings found in person's Calling tab in Control Hub



Webex Calling Voice Messaging APIs

- Voice Messaging,
<https://developer.webex.com/docs/api/v1/webex-calling-voice-messaging>
- Handle voicemail and MWI
- User access only; no admin access
- Message summary, list messages, delete message, mark read/unread

GET	https://webexapis.com/v1/telephony/voiceMessages/summary	Get Message Summary
GET	https://webexapis.com/v1/telephony/voiceMessages	List Messages
DELETE	https://webexapis.com/v1/telephony/voiceMessages/{messageId}	Delete Message
POST	https://webexapis.com/v1/telephony/voiceMessages/markAsRead	Mark As Read
POST	https://webexapis.com/v1/telephony/voiceMessages/markAsUnread	Mark As Unread

Webex Calling Call Controls

- Actions
 - Dial, answer, reject, hangup, hold/resume, divert, transfer, park/retrieve, start/stop/pause/resume recording, DTMF, push, pickup, barge
- Management
 - List, get details, call history
 - List/Details use common call object
- Requires user access token
 - No org level (admin) operations

Method	Description
POST https://webexapis.com/v1/telephony/calls/dial	Dial
POST https://webexapis.com/v1/telephony/calls/answer	Answer
POST https://webexapis.com/v1/telephony/calls/reject	Reject
POST https://webexapis.com/v1/telephony/calls/hangup	Hangup
POST https://webexapis.com/v1/telephony/calls/hold	Hold
POST https://webexapis.com/v1/telephony/calls/resume	Resume
POST https://webexapis.com/v1/telephony/calls/divert	Divert
POST https://webexapis.com/v1/telephony/calls/transfer	Transfer
POST https://webexapis.com/v1/telephony/calls/park	Park
POST https://webexapis.com/v1/telephony/calls/retrieve	Retrieve
POST https://webexapis.com/v1/telephony/calls/startRecording	Start Recording
POST https://webexapis.com/v1/telephony/calls/stopRecording	Stop Recording
POST https://webexapis.com/v1/telephony/calls/pauseRecording	Pause Recording
POST https://webexapis.com/v1/telephony/calls/resumeRecording	Resume Recording
POST https://webexapis.com/v1/telephony/calls/transmitDtmf	Transmit DTMF
POST https://webexapis.com/v1/telephony/calls/push	Push
POST https://webexapis.com/v1/telephony/calls/pickup	Pickup
POST https://webexapis.com/v1/telephony/calls/bargeIn	Barge In
GET https://webexapis.com/v1/telephony/calls	List Calls
GET https://webexapis.com/v1/telephony/calls/{callId}	Get Call Details
GET https://webexapis.com/v1/telephony/calls/history	List Call History

Webhook Notifications/Events

- Webhook API to manage webhooks:
<https://developer.webex.com/docs/api/v1/webhooks>
- Resource: telephony_calls
- Events: created, updated, deleted

<https://developer.webex.com/docs/webhooks>

Telephony_call event example

```
{
  "id": "Y2lzY2...wMTc5",
  "name": "d9c193c3-4787-4726-b9fa-6acff173e15a",
  "targetUrl": "https://c780-149-249-133-109.ngrok.io/callevnt/Y2lzY29...ZWizZGE",
  "resource": "telephony_calls",
  "event": "created",
  "orgId": "Y2lz...mUzZTc",
  "createdBy": "Y2lz...ZGE",
  "appId": "Y2lzY29zc...5NzZlZWQ0ODM1",
  "ownedBy": "creator",
  "status": "active",
  "created": "2022-03-18T14:53:51.669Z",
  "actorId": "Y2lzY2...2FjZWizZGE",
  "data": {
    "eventType": "received",
    "eventTimestamp": "2022-03-18T14:54:02.442Z",
    "callId": "Y2lzY2...AxNDYxOTow",
    "callSessionId": "Zjg1OWExYTytNDI5NS00OTU0LWEwYzktMDY0MjFjOTY5Mzk3",
    "personality": "terminator",
    "state": "alerting",
    "remoteParty": {
      "name": "Henry Green",
      "number": "7101",
      "personId": "Y2lzY29zc...zNTg",
      "privacyEnabled": false,
      "callType": "location"
    },
    "appearance": 1,
    "created": "2022-03-18T14:54:02.440Z"
  }
}
```

Webhook ID

Webhook name

Target URL

Resource "telephony_calls" → call event

Created → new call

Id of app used to create the webhook

Information about the actual call

Webex Calling APIs Overview

PROVISIONING

CALL CONTROL

ANALYTICS & REPORTING

Customer Journey

Setup, Onboard, Manage

Call, Meet, Collaborate

Achieve Customer Success

- Manage users, phone #s, locations, & services
- Assign licenses
- Create and manage location features

- Place, answer, hang up calls
- Stop / start / pause recording
- Transmit DTMF digits
- List active calls / get history

- Detailed call records
- Onboarding, usage, & quality reporting
- Automated reporting setup

- Installation, activation, & onboarding
- Ongoing services management & care
- Self-service via partner portal

- Custom enterprise calling integrations
- Cloud business platform integration
- Custom app development

- User training & adoption services
- Business process design & optimization
- Vertical solutions design & oversight

Representative Tasks

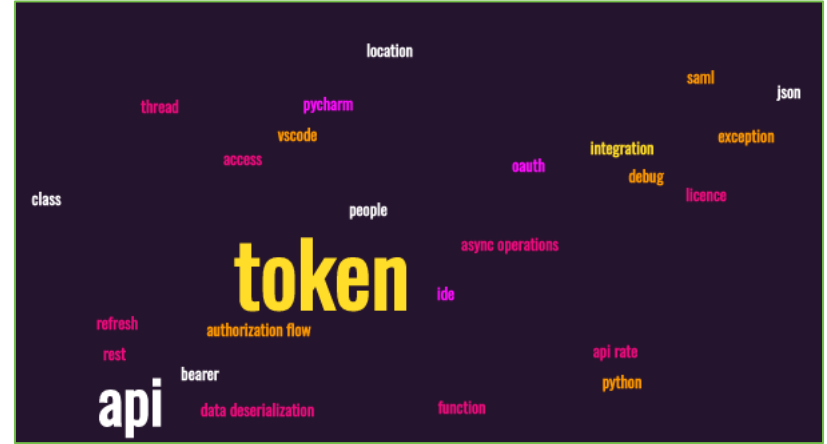
Sample Solutions

Getting Started



Using Webex APIs

- Documentation at: <https://developer.webex.com/>
- But: Steep learning curve
- A lot of concepts to master
- SDK helps to abstract from the “dirty details”



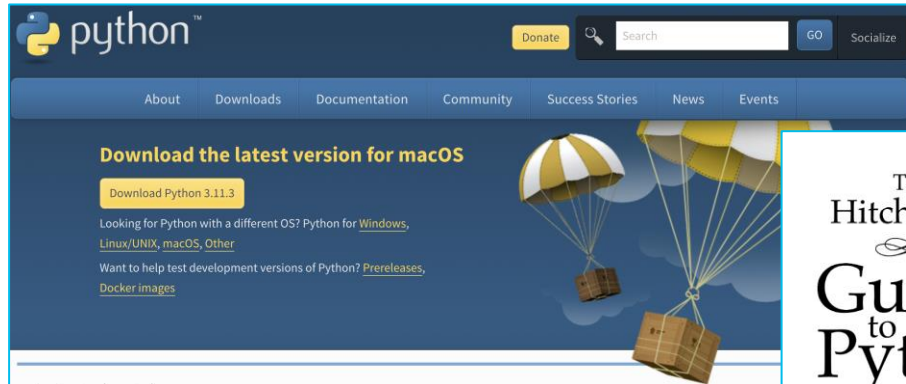
Developer Sandbox

- Sandbox
 - playground to test API calls
 - Avoid impact on production org
- Limited to 10 users
- Allows to test capabilities not available w/ Webex free plans
- No Cisco PSTN
 - Can add Local Gateway for PSTN access
 - Working on a solution to get PSTN added to sandbox

<https://developer.webex.com/docs/developer-sandbox-guide>

Installing Python

- Installers are available at <https://www.python.org/downloads/>
- Mac tip: install Python via Homebrew: <https://docs.python-guide.org/starting/install3/osx/>
 - Avoids issues with GNU readline (for example when using <https://pypi.org/project/cmd2/>)



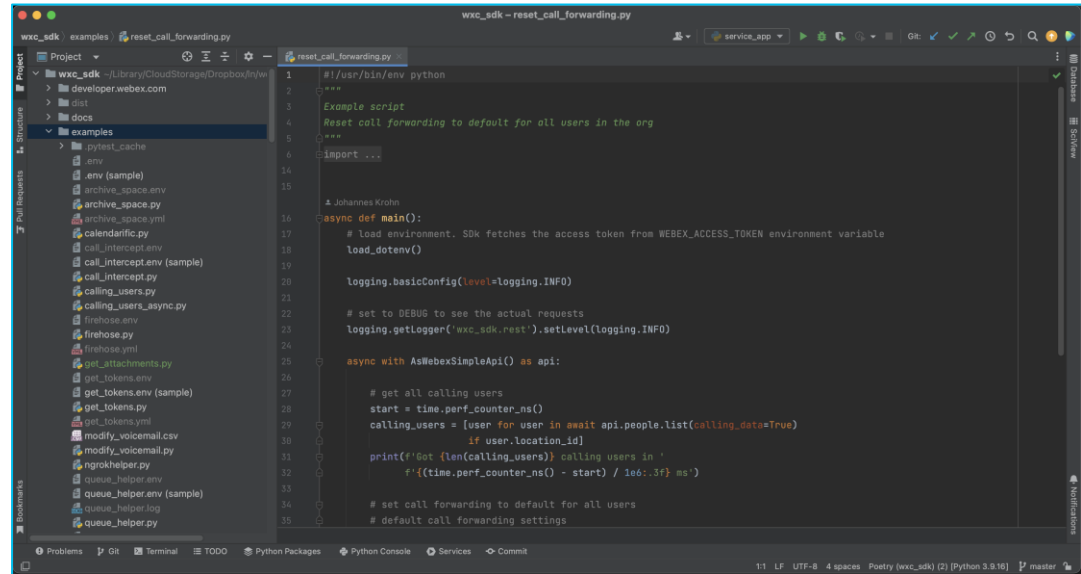
Tools

IDE – Integrated Development Environment

- Helps to develop and test your application

- Features

- GUI
- Editor
- Build automation
- Syntax highlighting
- Debugger
- Integration w/ revision control system (e.g. Git)
- ...



Syntax Highlighting

- What Do you prefer?
- This?

```
def get_attachments():  
    def assert_folder(p_state, base_path, room_id, room_folder):  
        ''' make sure that the folder is created for the room  
        '''  
        if not os.path.lexists(base_path):  
            # base directory needs to be created  
            logging.debug('Base directory %s does not exist' % base_path)  
            os.mkdir(base_path)  
  
        full_path = os.path.join(base_path, room_folder)  
  
        if room_id not in p_state:  
            p_state[room_id] = {}  
            room_state = p_state[room_id]  
  
        if 'folder' not in room_state:  
            logging.debug('No previous folder for room %s' % room_folder)  
            # the folder for this room hasn't been created before  
            i = 0  
            base_folder = room_folder  
            while True:  
                full_path = os.path.join(base_path, room_folder)  
                try:  
                    os.mkdir(full_path)  
                    logging.debug('Created folder %s' % full_path)  
                except FileExistsError:
```

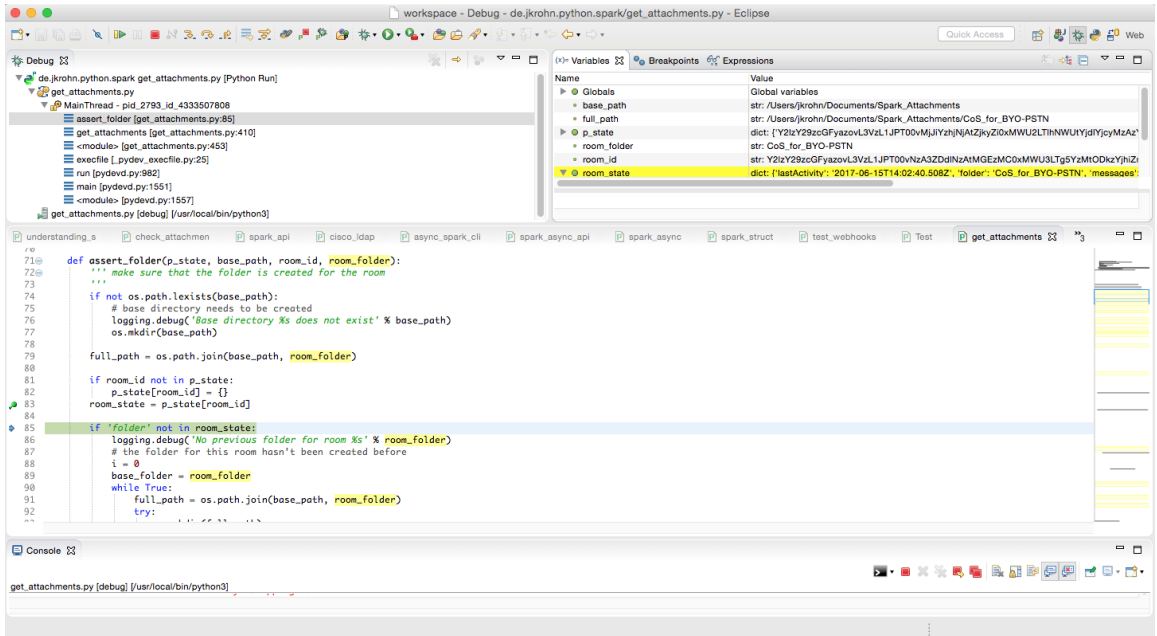

Syntax Highlighting

- What Do you prefer?
- Or this?

```
def get_attachments():  
  
def assert_folder(p_state, base_path, room_id, room_folder):  
    """ make sure that the folder is created for the room  
    """  
    if not os.path.lexists(base_path):  
        # base directory needs to be created  
        logging.debug('Base directory %s does not exist' % base_path)  
        os.mkdir(base_path)  
  
    full_path = os.path.join(base_path, room_folder)  
  
    if room_id not in p_state:  
        p_state[room_id] = {}  
        room_state = p_state[room_id]  
  
    if 'folder' not in room_state:  
        logging.debug('No previous folder for room %s' % room_folder)  
        # the folder for this room hasn't been created before  
        i = 0  
        base_folder = room_folder  
        while True:  
            full_path = os.path.join(base_path, room_folder)  
            try:  
                os.mkdir(full_path)  
                logging.debug('Created folder %s' % full_path)  
            except FileExistsError:
```

Live Debugger

- Live Debugger allows to
 - Set breakpoints
 - Check variables
 - Evaluate expressions
- Essential for effective SW development



IDEs for Python

- [IDLE \(Standard IDE\)](#)
- [PyCharm](#)
- [VS Code](#)
- [PythonAnywhere](#)
- [Cloud9 \(AWS\)](#)



PyCharm



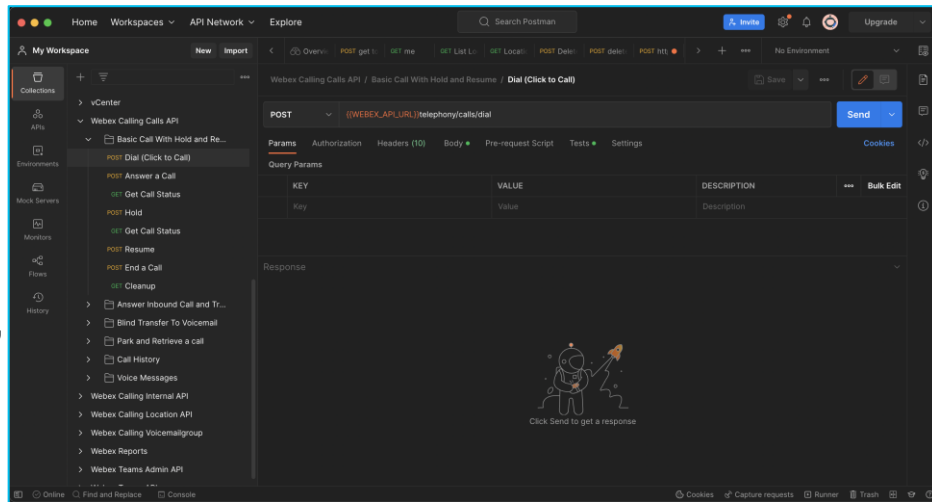
pythonanywhere





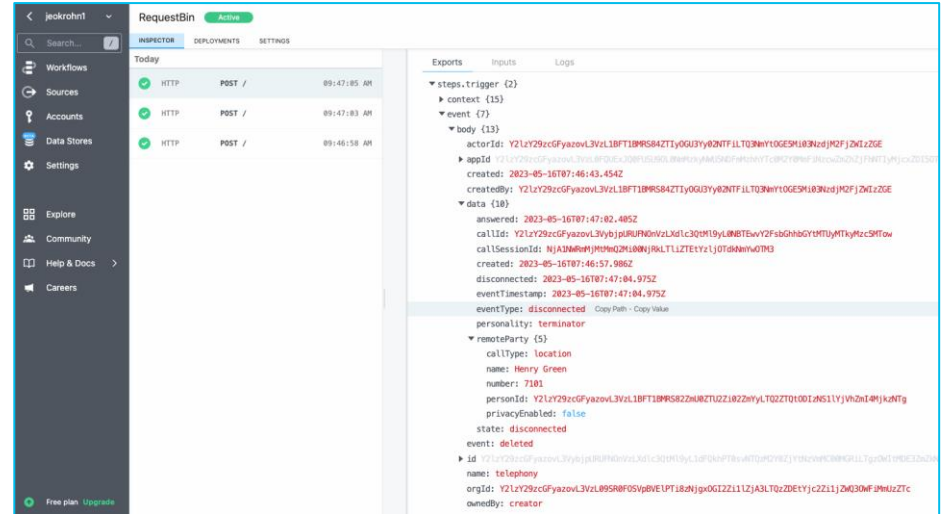
Postman: Test APIs

- Share, test, document & monitor APIs
- Easily test API calls
- Generate code (Python, curl, ..)
- Create collections
- Available for Mac, Windows, Linux, and Chrome apps
- <https://www.getpostman.com/>
- Postman collection for Webex Teams:
<https://github.com/CiscoDevNet/postman-webex>



RequestBin: See Webhooks in Action

- Free service: <https://pipedream.com/requestbin>
- Creates unique URL
- Use case: Webex webhook pointing to Requestbin to test webhook operation
- Provides real-time view on requests hitting the URL



GitHub

- Git repository hosting service
- Offers
 - Revision control
 - Source code management
- THE place to share your code



Consuming APIs

Calling a Webex API Endpoint

Listing Webex Calling Locations

List Locations

List locations for an organization.
Use query parameters to filter the response.
Long result sets will be split into [pages](#).

GET /v1/locations

```
11 def main():
12     # load .env file
13     load_dotenv()
14
15     # after reading .env file all variables defined in the file are accessible as environment variables
16     access_token = os.getenv('WEBEX_TOKEN')
17     if access_token is None:
18         raise
19
20     url = 'https://webexapis.com/v1/locations'
21     with requests.Session() as session:
22         headers = {'Authorization': f'Bearer {access_token}'}
23         response = session.get(url=url, headers=headers)
24         response.raise_for_status()
25         data = response.json()
26         print(f'{len(data["items"])} locations found')
27         for location in data['items']:
28             print(location)
29
30     # look for locations in California
31     ca_locations = [location for location in data['items']
32                     if location['address']['state'] == 'CA']
33     print(f'{len(ca_locations)} locations in CA')
34     print(', '.join(loc['name'] for loc in ca_locations))
```

URL of the endpoint

Session() from requests module is used

Fabricate the Authorization header

Call the endpoint

Check for errors

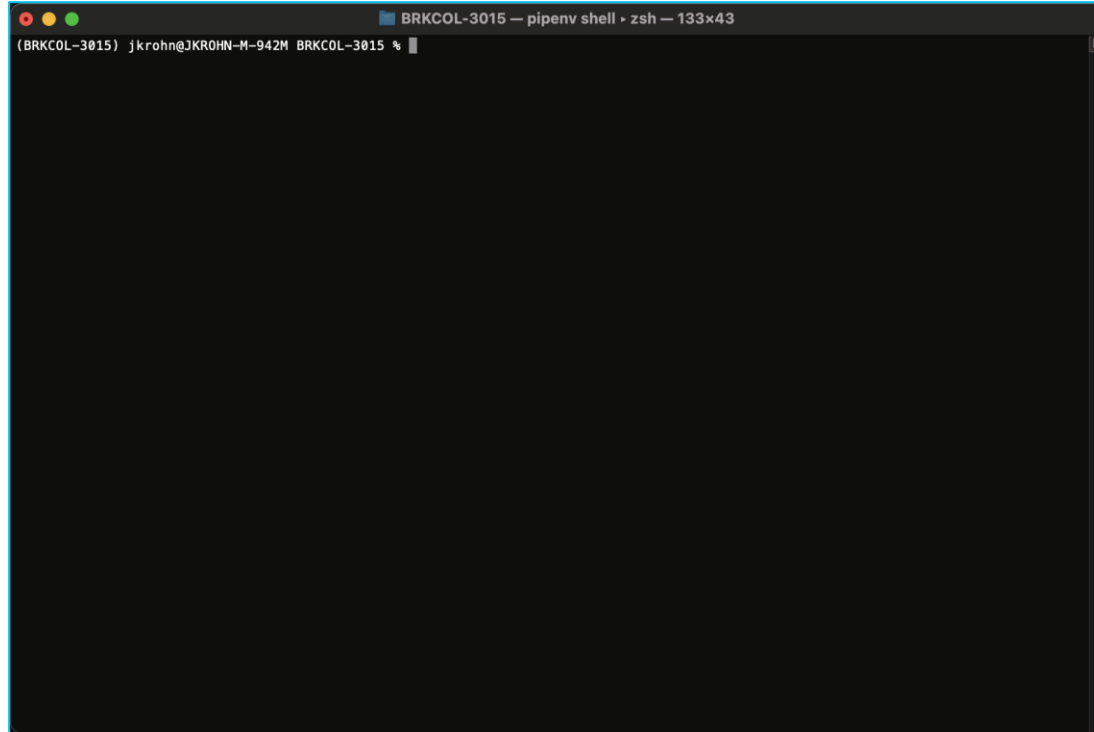
Parse the JSON response into a dict

Accessing the response values as dict keys

https://github.com/jeokrohn/BRKCOL-3015/blob/main/list_locations_direct.py

Calling a Webex API Endpoint

Listing Webex Calling Locations



Calling a Webex API Endpoint

Listing Webex Calling Locations

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17     if access_token is None
18         raise
19
20     url = 'https://webexapi
21     with requests.Session()
22         headers = {'Authori
23         response = session.
24         response.raise_for_
25         data = response.js
26         print(f'{len(data["
27         for location in dat
28             print(location)
29
30     # look for locations in California
31     ca_locations = [location for location in data['items']
32                     if location['address']['state'] == 'CA']
33     print(f'{len(ca_locations)} locations in CA')
34     print(', '.join(loc['name'] for loc in ca_locations))
```

That was easy, but..

- Accessing dictionary values by key is hard and error prone
- Missing handling of 429 responses (throttling)
- Missing pagination handling
- Handling of additional parameters (name, id)

There has to be a better way?!

wxc_sdk: SDK for Webex Calling APIs

- PyPi: <https://pypi.org/project/wxc-sdk/>
- Homepage: https://github.com/jeokrohn/wxc_sdk
- Documentation: <https://wxc-sdk.readthedocs.io/en/latest/>
- Simple SDK to work with Webex APIs
 - Focus on Webex Calling specific endpoints ... and more
- Takes care of all the “ugly” stuff
 - JSON (de-)serialisation, authentication, 429 retries,
 - Pagination, ...
 - Logging
- Python objects for all API objects
 - Tab completion → efficient coding
- Actively maintained
 - New API endpoints will be added continuously
- Foundation for your provisioning automation and other projects around Webex Calling

```
#!/usr/bin/env python
"""
Demonstration of how to call a Webex API endpoint using the SDK
"""
import os

import wxc_sdk
from dotenv import load_dotenv

def main():
    load_dotenv()

    # after reading .env file all variables defined in the file are accessible as environment variables
    access_token = os.getenv('WEBEX_TOKEN')

    with wxc_sdk.WebexSimpleApi(tokens=access_token) as api:
        locations = list(api.locations.list())
        print(f'{len(locations)} locations found')
        for location in locations:
            print(location)

        ca_locations = [location for location in locations
                        if location.address.state == 'CA']
        print()
        print(f'{len(ca_locations)} locations in CA')
        print(', '.join(loc.name for loc in ca_locations))

if __name__ == '__main__':
    main()
```

Calling a Webex API Endpoint

Listing Webex Calling Locations using the SDK

```
#!/usr/bin/env python
"""
Demonstration of how to call a Webex API endpoint using the SDK
"""
import os

import wxc_sdk
from dotenv import load_dotenv

def main():
    load_dotenv()

    # after reading .env file all variables defined in the file are accessible as environment variables
    access_token = os.getenv('WEBEX_TOKEN')

    with wxc_sdk.WebexSimpleApi(tokens=access_token) as api:
        locations = list(api.locations.list())
        print(f'{len(locations)} locations found')
        for location in locations:
            print(location)

        ca_locations = [location for location in locations
                        if location.address.state == 'CA']
        print()
        print(f'{len(ca_locations)} locations in CA')
        print(', '.join(loc.name for loc in ca_locations))

if __name__ == '__main__':
    main()
```

→ The API object

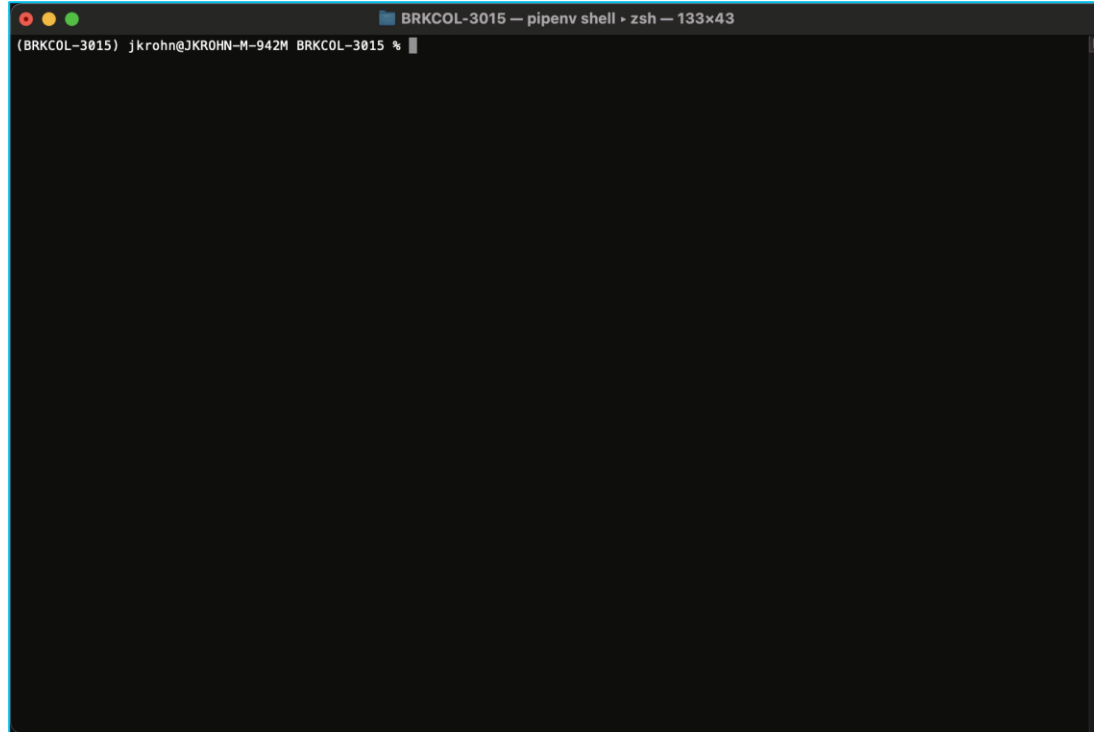
→ Get list of locations

→ Access data using attributes
of Python classes

https://github.com/jeokrohn/BRKCOL-2015/blob/main/list_locations_sdk.py

Calling a Webex API Endpoint

Listing Webex Calling Locations using the SDK



wxc_sdk: Comprehensive Coverage

- SDK covers all Webex Calling specific API endpoints
- Additionally:
 - Licenses, memberships, messages, people, teams, team memberships, webhooks, ...
- Easy token management

The screenshot displays the documentation for the `wxc_sdk` package. On the left, a sidebar lists various API endpoints under the `WebexSimpleApi` class, including `attachment_actions`, `cdr`, `devices`, `events`, `groups`, `licenses`, `locations`, `meetings`, `membership`, `messages`, `organizations`, `person_settings`, `people`, `reports`, `rooms`, `room_tabs`, `teams`, `team_memberships`, `telephony`, `webhook`, and `workspaces`. The main content area shows the package description: "Simple SDK for Webex APIs with focus on Webex Calling specific endpoints". It includes the class definition `wxc_sdk.WebexSimpleApi` with parameters `tokens` and `concurrent_requests`. Below this, it lists the main API object and its parameters, followed by links to specific API classes like `AttachmentActionsApi`, `DetailedCDRApi`, `DevicesApi`, and `EventsApi`.

<https://wxc-sdk.readthedocs.io/en/latest/>

Tokens

Tokens

Why and How?

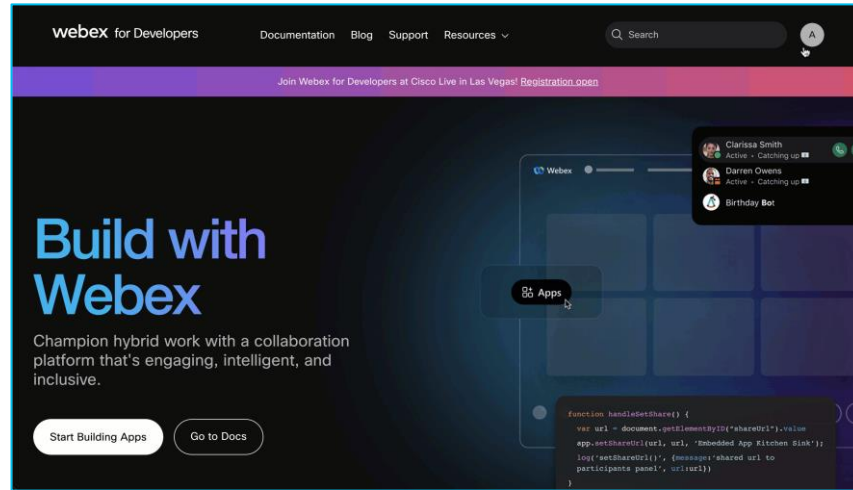
- Access tokens are required to authorize API access
- .. Can be obtained in different ways:
 - Personal access token (developer token)
 - Integration (OAuth2 authorization flow)
 - Service App
- **NEVER(!!!) store tokens in your source files**
- **NEVER(!!!) push tokens to GitHub repositories**
- **NEVER(!!!) share tokens in any shape or form**
- Best practice:
 - In your code read access token from environment variable
 - Use `dotenv.loadenv()` to load `.env` file with environment variables
 - Exclude `.env` from version control (Git) by adding exclusion in `.gitignore`
 - Integration tokens can be cached in local files .. but make sure to restrict access and not push to GitHub

```
GET https://webexapis.com/v1/people
User-Agent: python-requests/2.30.0
Accept-Encoding: gzip, deflate
Accept: */*
Connection: keep-alive
Authorization: Bearer MGY4MzNjNzgt***
content-type: application/json; charset=utf-8
```

<https://developer.webex.com/docs/getting-started>

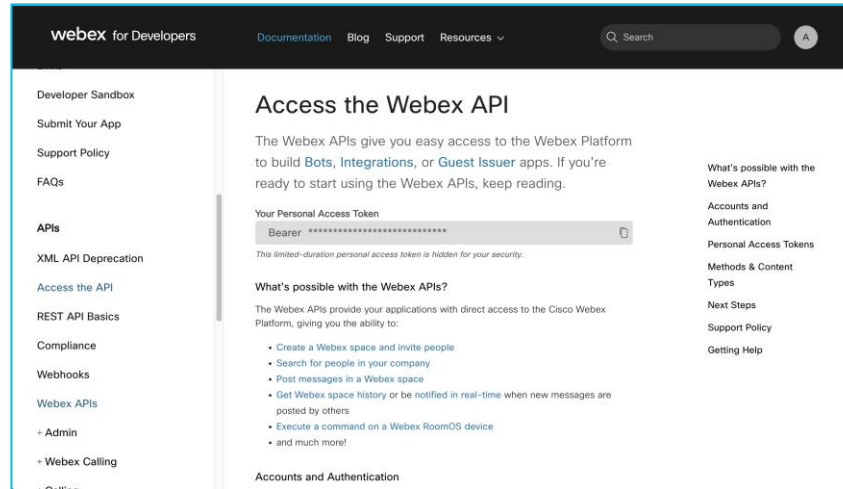
Personal Access Token

- From developer.webex.com
- Limited lifetime (12 h)
- Should NEVER be used in production
- Testing only



Personal Access Token

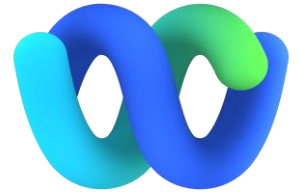
- From developer.webex.com
- Limited lifetime (12 h)
- Should NEVER be used in production
- Testing only



Integration – The Better Way to Obtain Tokens

- Act on behalf of a Webex user
 - Access equivalent to a real Webex User (limited by authorized scopes)
- Invoke Webex APIs on behalf of user
- Requires authorization of integration by user
 - OAuth Grant Flow to authenticate user and ask for authorization
 - User approves authorization levels (scopes) requested by the integration
- Each Integration has a client ID, client secret and redirect URI
- Documentation: <https://developer.webex.com/docs/integrations>

OAuth Authorization Code Flow



1. Application Requests *auth code*

Browser redirect to Webex Authentication

2. Webex returns the *auth code* to application

Browser redirect to Application

3. Request an *access token*

HTTP GET request to Webex API

4. Application gets *access token* and *refresh token*

HTTP GET response from Webex API

Integration Tokens in Scripts Using wxc_sdk

- `wxc_sdk` offers an easy way to work with cached tokens in scripts
- Cache tokens in YAML file
- Get tokens from OAuth flow redirecting to <http://localhost:6001/redirect>
- Spin up temporary (primitive) server to handle final step of OAuth flow

Prepare integration based on values read from environment

Read, create, refresh, cache tokens

```
access_token: ZGVlY2***
expires_at: '2023-05-30T14:35:37.246110+00:00'
refresh_token: NTlk***
refresh_token_expires_at: '2023-08-14T14:08:57.246110+00:00'
token_type: Bearer
```

```
#!/usr/bin/env python
"""
Demonstration of how to call a Webex API endpoint using the SDK with cached integration tokens
"""
import os
from os.path import splitext, basename

from dotenv import load_dotenv

from wxc_sdk import WebexSimpleApi
from wxc_sdk.integration import Integration
from wxc_sdk.scopes import parse_scopes


def get_tokens():
    """
    get (cached) integration tokens
    """
    env_vars = ('INTEGRATION_CLIENT_ID', 'INTEGRATION_CLIENT_SECRET', 'INTEGRATION_SCOPES')
    if not all(os.getenv(s) for s in env_vars):
        raise KeyError(f'Not all required environment variables ({", ".join(env_vars)}) defined.')

    client_id = os.getenv('INTEGRATION_CLIENT_ID')
    client_secret = os.getenv('INTEGRATION_CLIENT_SECRET')
    scopes = parse_scopes(os.getenv('INTEGRATION_SCOPES'))
    integration = Integration(client_id=client_id,
                             client_secret=client_secret,
                             scopes=scopes,
                             redirect_url='http://localhost:6001/redirect')

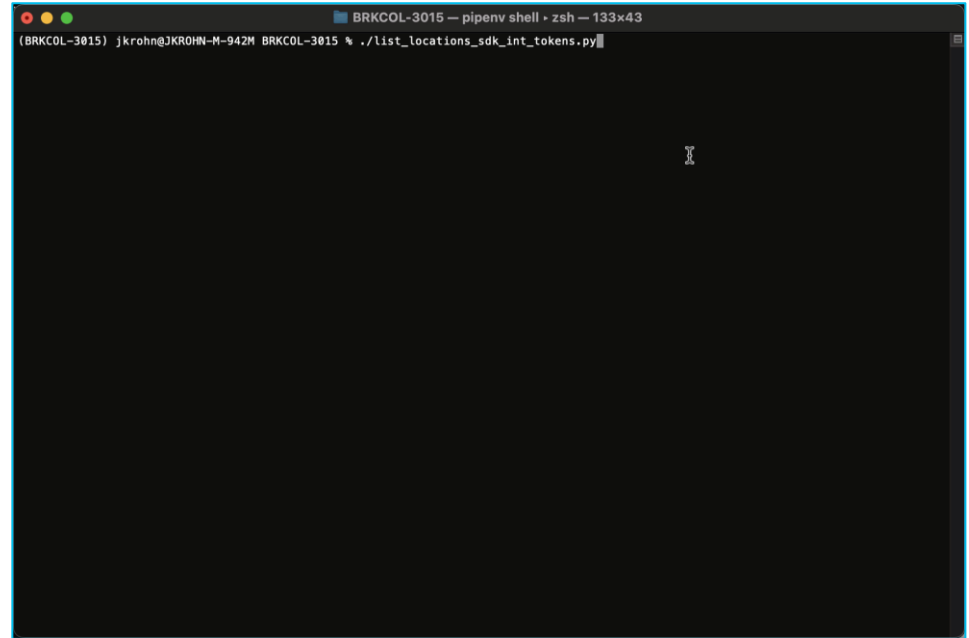
    yaml_path = f'{splitext(basename(__file__))[0]}.yaml'
    tokens = integration.get_cached_tokens_from_yaml(yaml_path=yaml_path)

    return tokens
```

https://github.com/jeokrohn/BRKCOL-3015/blob/main/list_locations_sdk_int_tokens.py

Integration Tokens in Scripts Using wxc_sdk

- Without cached tokens OAuth flow gets initiated
- Auth code exchanged for tokens
- Tokens are cached
- Next execution uses cached tokens

A terminal window titled "BRKCOL-3015 — pipenv shell • zsh — 133x43". The prompt shows the user is "jkrohn@JKROHN-M-942M" on the "BRKCOL-3015" host. The command being executed is `./list_locations_sdk_int_tokens.py`. The terminal output is currently blank, with a cursor visible on the line.

```
BRKCOL-3015 — pipenv shell • zsh — 133x43
(BRKCOL-3015) jkrohn@JKROHN-M-942M BRKCOL-3015 % ./list_locations_sdk_int_tokens.py
```

https://github.com/jeokrohn/BRKCOL-3015/blob/main/list_locations_sdk_int_tokens.py

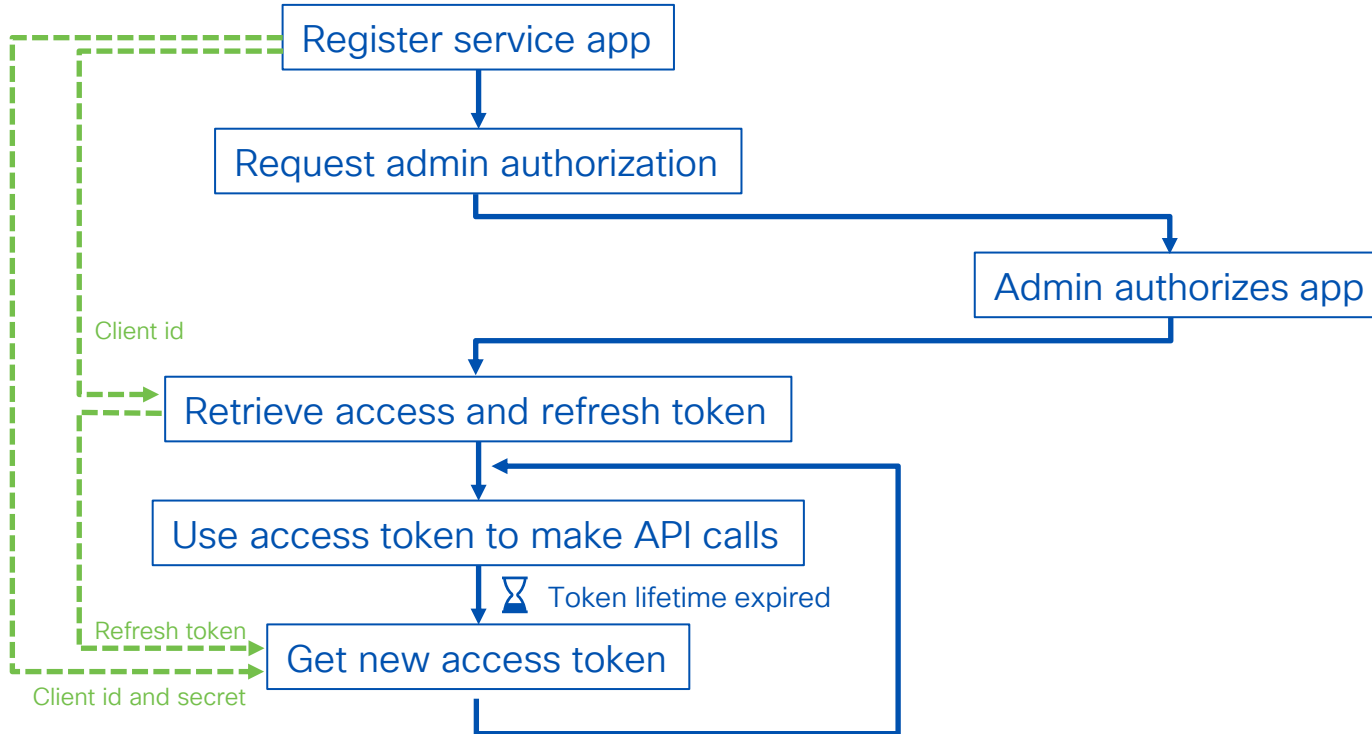
Service Apps

- Machine account
- Request admin permission independent of user account
- Use cases
 - Provisioning
 - Reporting
 - Scheduling systems
 - ...
- Similar to integrations .. but no user specific authorization flow

Using Service App Tokens

Developer

Admin



Using Service App Tokens

Developer

Admin

Register service app

Request a

Client id

Retrieve acc

Use access to

Refresh token

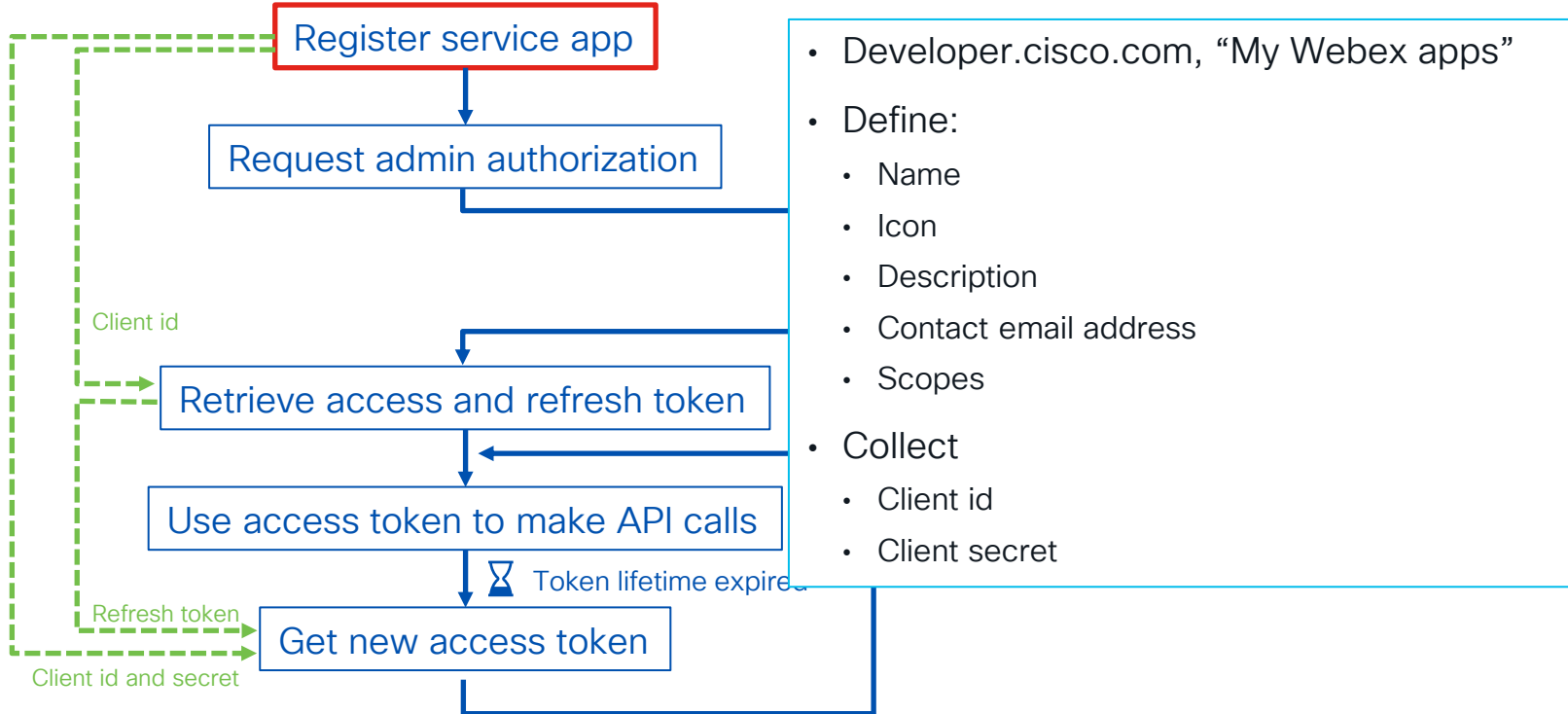
Get new

Client id and secret

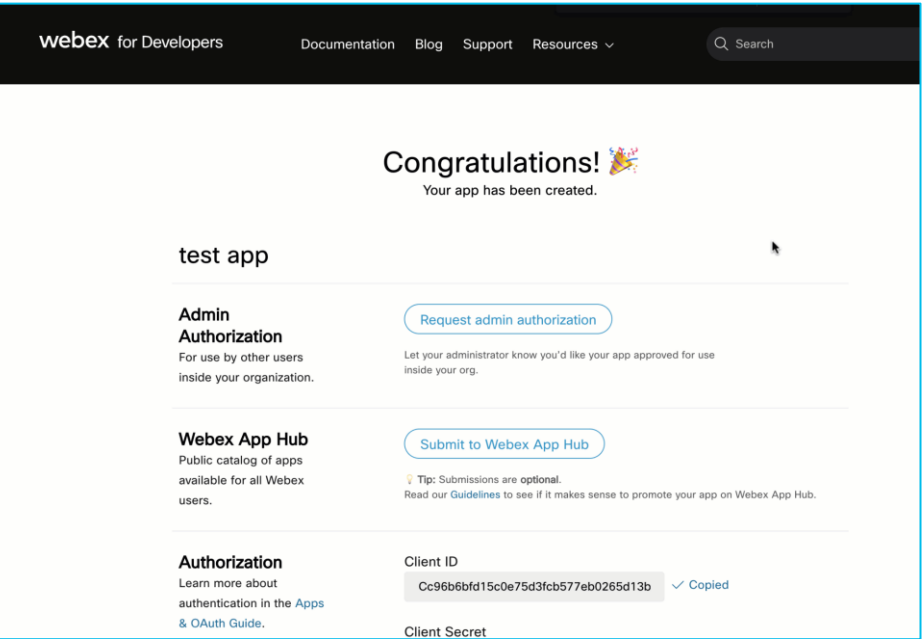
Using Service App Tokens

Developer

Admin



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Using Service App Tokens

Developer

Admin

webex Control Hub

Search

Overview

Getting Started Guide

Alerts center

MONITORING

Analytics

Troubleshooting

Reports

MANAGEMENT

Customers

Users

Groups

Locations

Workspaces

Devices

Apps

jkrohn-sandbox.wbx.ai

Set up emergency call settings for US locations in your organization to meet the requirements defined for your state and federal regulations.

Overview

Getting Started Guide

37 %

3 of 8 tasks completed

[View the Getting Started Guide and the recommended tasks](#)

Updates

Update your services to the new Webex experience. [Learn more](#)

Update Webex Meetings to the ne...

New offers

Allow everyone in your organization to host a Webex Meeting with a Basic Meetings license. [Learn more](#)

Onboarding

33 Total users

There is no CSV upload within 180 days

Potential new users: 10

[Review](#) [Enable directory sync](#)

Webex services ALL ONLINE

Webex, Calling, Meetings, Hybrid Services, Control Hub, Developer API, Room Devices, Contact Center

Devices

8 Total devices

Online 3, Online with issues 0, Offline 5, Expired 0

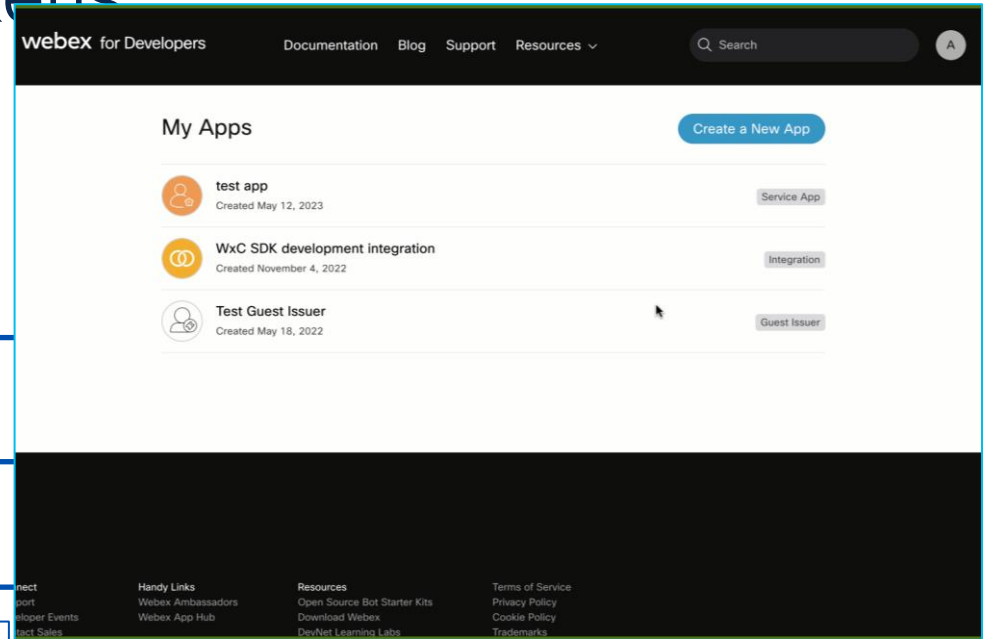
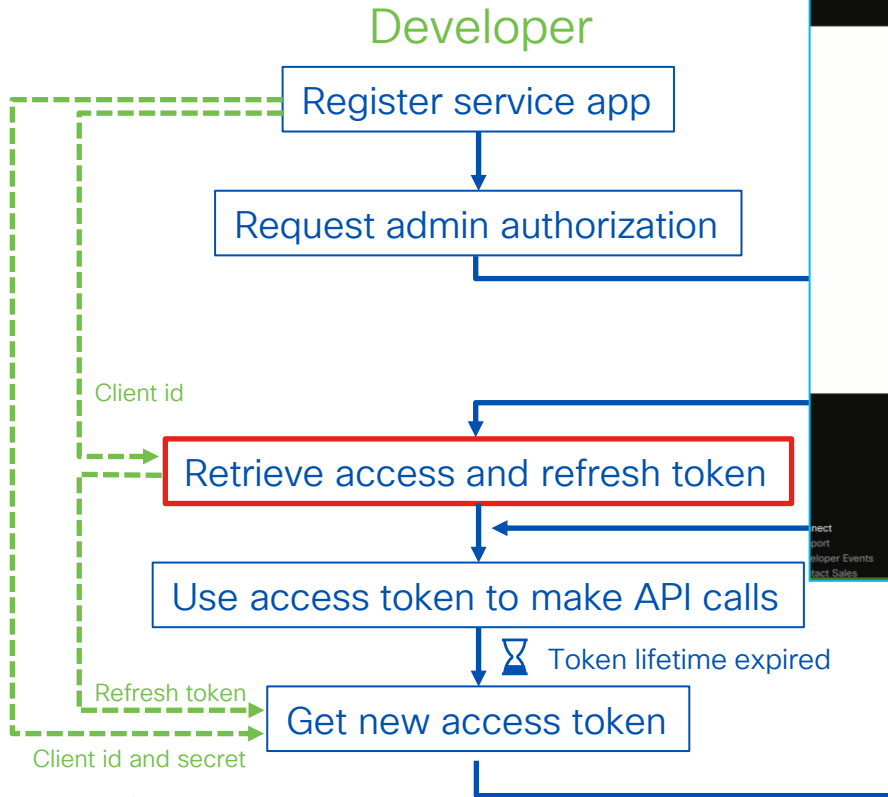
Admin authorizes app

- “Apps” section in Control Hub
- Review scopes
- Authorizing user is documented

Get new access token

Client id and secret

Using Service App Tokens

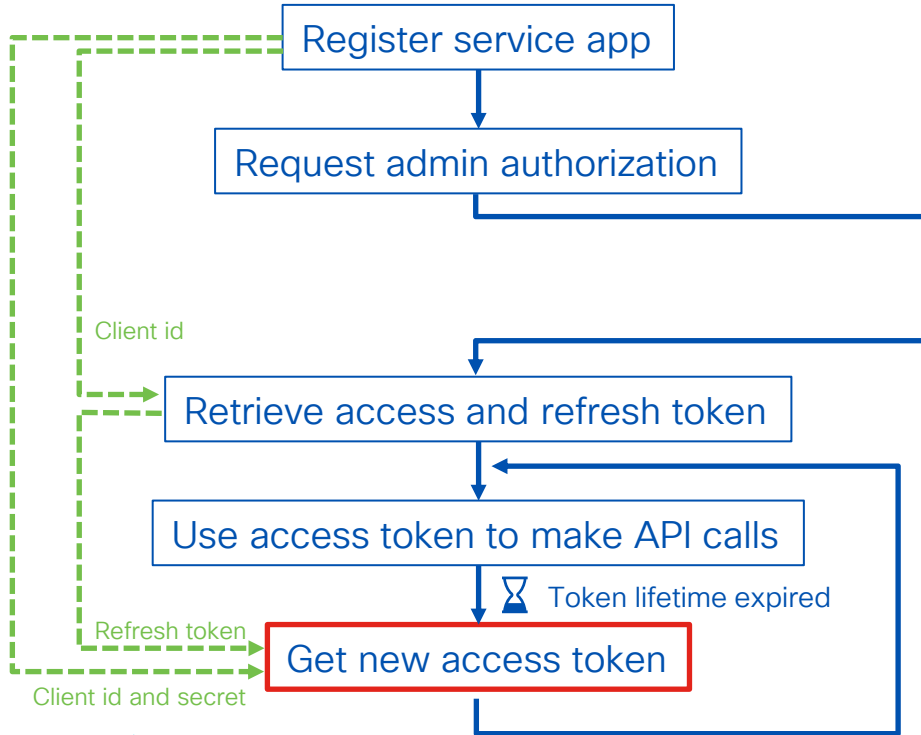


- Developer requests tokens for authorized org
- Client secret needed to authorize the request

Using Service App Tokens

Developer

Admin



- When getting close to token lifetime
- New access token can be obtained using the refresh token

```
POST https://webexapis.com/v1/access_token
Content-Type: application/x-www-form-urlencoded
--- body ---
grant_type: refresh_token
client_id: ***
client_secret: ***
refresh_token: ***
Response
Content-Type: application/json
--- response body ---
{
  "access_token": "****",
  "expires_in": 1209599,
  "refresh_token": "****",
  "refresh_token_expires_in": 7775954,
  "token_type": "Bearer",
  "scope": "spark:kms ..."
}
```

Token Overview

	Developer Token	Integration Token	Service App Token
How to get	From developer.webex.com	Requires OAuth auth code authorization flow, web server required	Service app access to org granted by org admin. Service app owner creates token on developer.webex.com
Granular Access Control	No, always has all scopes	Set of scopes assigned to integration	Set of scopes assigned to service app
Actor	Owner of developer token	User granting authorization	Service app
Lifetime	12 hrs	Access token: 14 d Refresh token: 90 d (extended when getting new access token)	
Use cases	Development, Tests	(Web) applications acting on behalf of user	(Web) services explicitly authorized by org admin

Use Cases / Examples



Use Cases

- Scripts
 - Bulk Provisioning: user, calling features, ...
 - Validation: check/verify settings; scripting saves you from navigating through individual menus in ControlHub
 - Automation reduces the risk of errors in repetitive tasks
 - CLI tools
- Integration with existing enterprise management systems/tools
- Backend for web services (portal applications)

SDK Examples

- Examples available at:

<https://wxc-sdk.readthedocs.io/en/latest/examples.html>

https://github.com/jeokrohn/wxc_sdk/tree/master/examples

```
(wxc-sdk-NNVrdgRm-py3.9) jkrohn@JKROHN-M-942M examples % ./reset_call_forwarding.py
```

```
api = WebexSimpleApi()

# get all calling users
start = time.perf_counter_ns()
calling_users = [user for user in api.people.list(calling_data=True)
                  if user.location_id]
print(f'Got {len(calling_users)} calling users in '
      f'{(time.perf_counter_ns() - start) / 1e6:.3f} ms')

# set call forwarding to default for all users
with ThreadPoolExecutor() as pool:
    # default call forwarding settings
    forwarding = PersonForwardingSetting.default()

    # schedule update for each user and wait for completion
    start = time.perf_counter_ns()
    list(pool.map(
        lambda user: api.person_settings.forwarding.configure(person_id=user.person_id,
                                                                forwarding=forwarding),
        calling_users))
    print(f'Reset call forwarding to default for {len(calling_users)} users in '
          f'{(time.perf_counter_ns() - start) / 1e6:.3f} ms')
```

Examples

- `queue_helper.py`: read/update call queue join state of users
- `call_intercept.py`: read/update call intercept settings of a user
- `us_holidays_async.py`: create schedule with US holidays for all US location
- `reset_call_forwarding.py`: reset call forwarding settings for all users
- `users_wo_devices.py`: identify users without devices
- `catch_tns.py`: pool unassigned TNs on hunt groups to catch calls to unassigned TNs

Example: User Web Portal

User Web Portal

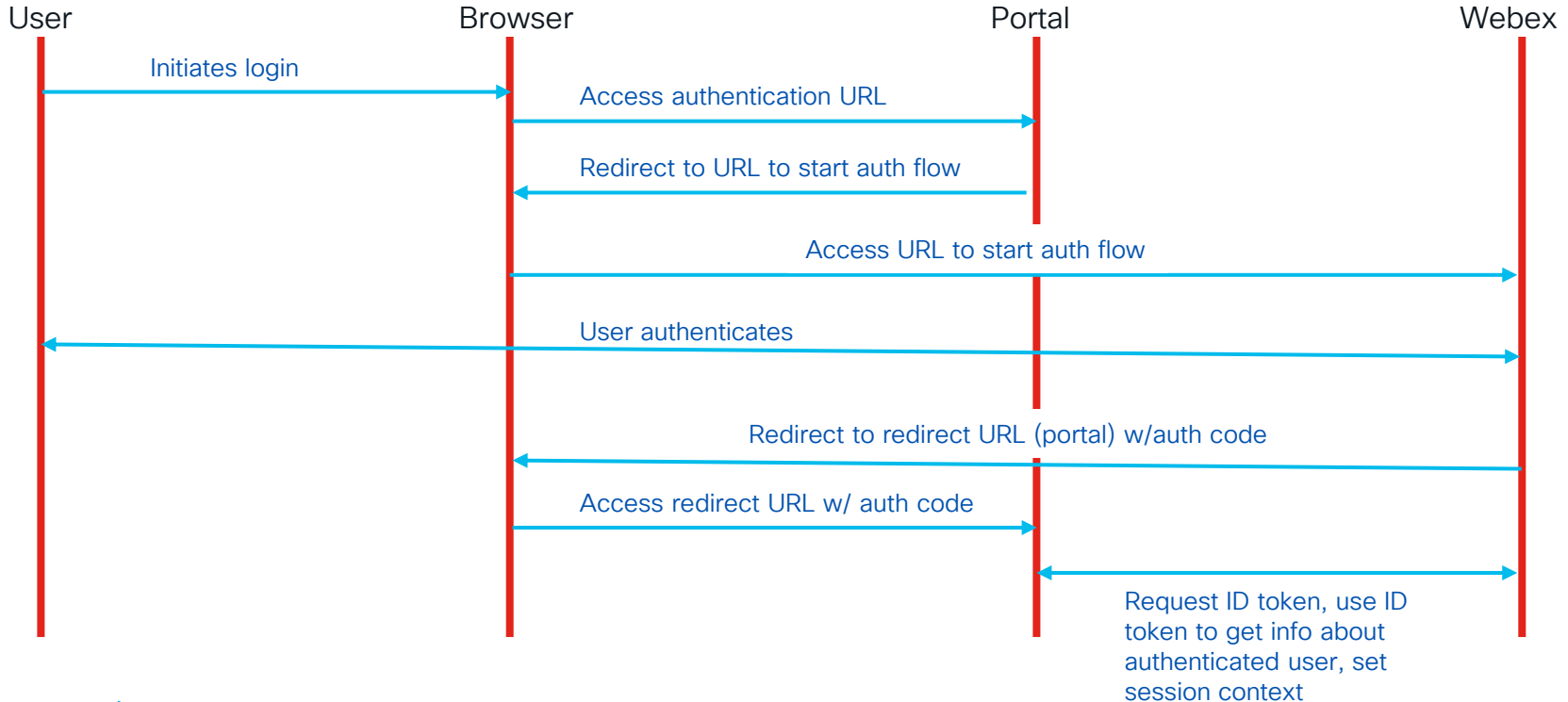
- Only a limited set of configuration options is available for users on settings.webex.com
- User portal can expose additional options (which usually require admin privileges)
- Perfect example for using service app tokens
 - User does not have the required privileges → integration token granted by user not sufficient

Concepts

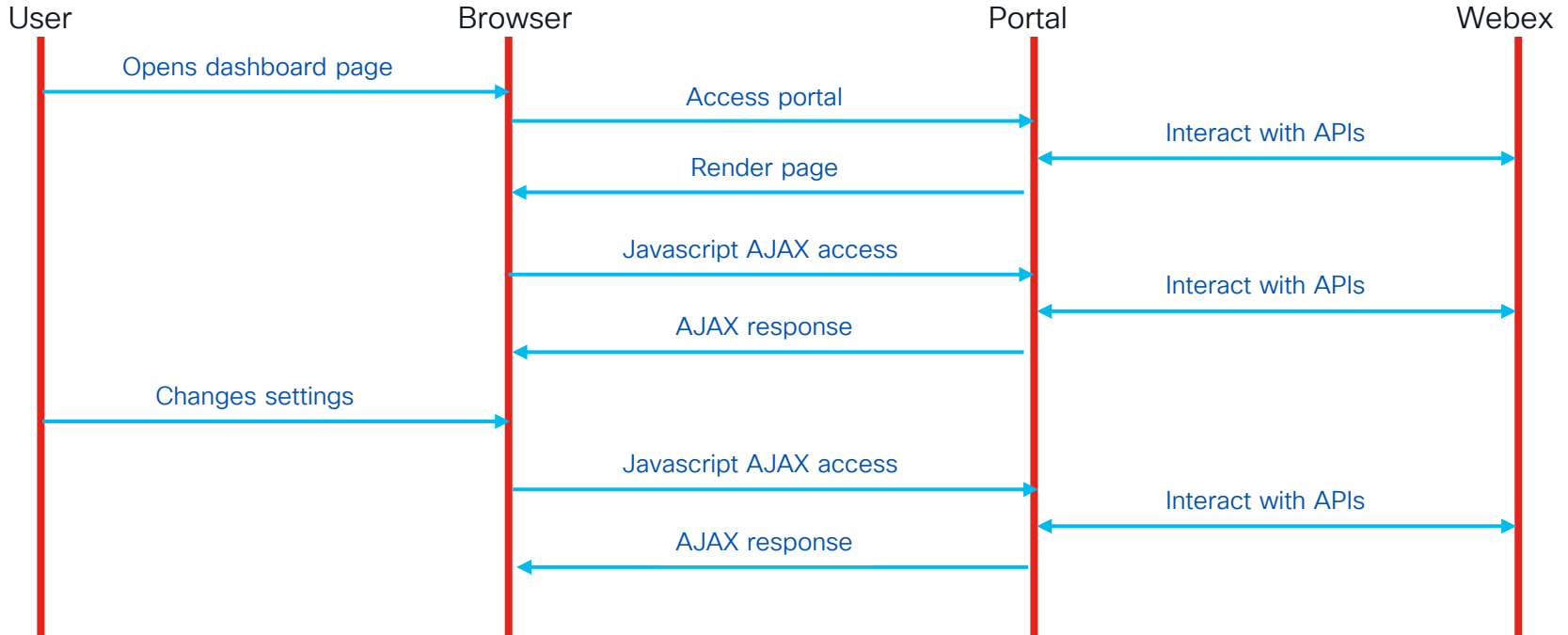
- Web based portal
- Authenticate users using “Login with Webex”
- For provisioning operations portal uses service app tokens
- Browser only interacts with portal endpoints
 - Includes Javascript Ajax access
 - Portal acts as proxy between browser and Webex APIs

<https://developer.webex.com/docs/login-with-webex>
<https://github.com/jeokrohn/BRKCOL-3015>

Login with Webex



Portal Transactions



Demo Web App

Disclaimer, Where to Go Next

- Demo code is not “production ready”
 - Missing token lifetime monitoring
 - Filesystem based session backend
 - ...
- Where to go next
 - Add roles: can be based on groups in Webex
 - Additional functions: manage devices, bulk update, ...

Closing



References

- Webex for Developers: <https://developer.webex.com/>
- Examples for the session on GitHub
<https://github.com/jeokrohn/BRKCOL-3015>
- Python SDK: <https://pypi.org/project/wxc-sdk/>
- SDK Examples available at:
<https://wxc-sdk.readthedocs.io/en/latest/examples.html>
https://github.com/jeokrohn/wxc_sdk/tree/master/examples
- Call control bot: <https://wxc-callcontrol.readthedocs.io/en/latest/>

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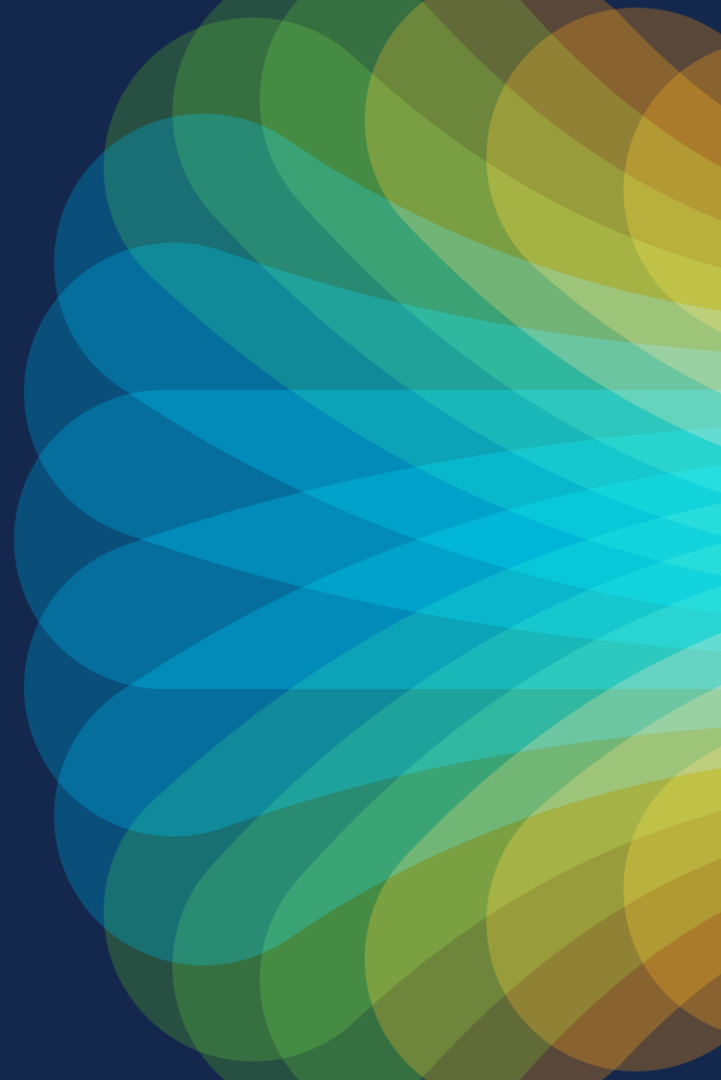


The bridge to possible

Thank you



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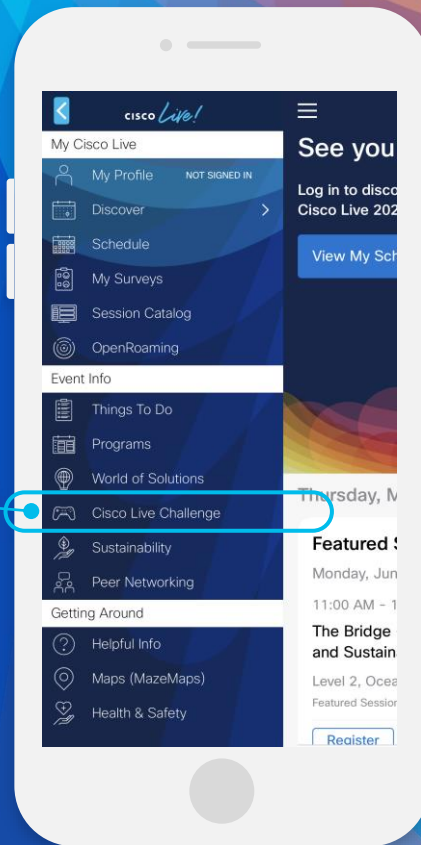
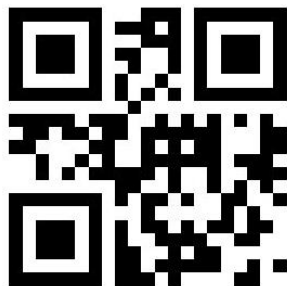


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- 4 Click the + at the bottom of the screen and scan the QR code:



The background features a vibrant, multi-colored abstract design. On the left, there are overlapping, wavy bands of color in shades of red, orange, yellow, and green. On the right, a bright white light source emits a series of colorful rays in shades of blue, cyan, and yellow, creating a sunburst effect. The overall composition is dynamic and energetic.

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Let's go

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