Microsoft Azure Tutorial

Cloud Service Models

1. Infrastructure-as-a-service (IaaS)
2. Platform-as-a-service (PaaS)
3. Software-as-a-service (SaaS)

Infrastructure-as-a-service (IaaS)

- Close to complete control over the hardware
- Cloud provider keeps the hardware up to date for you
- You are responsible for operating system maintenance and network configs
- Consumption based (pay only for what you use)
- Expert Support

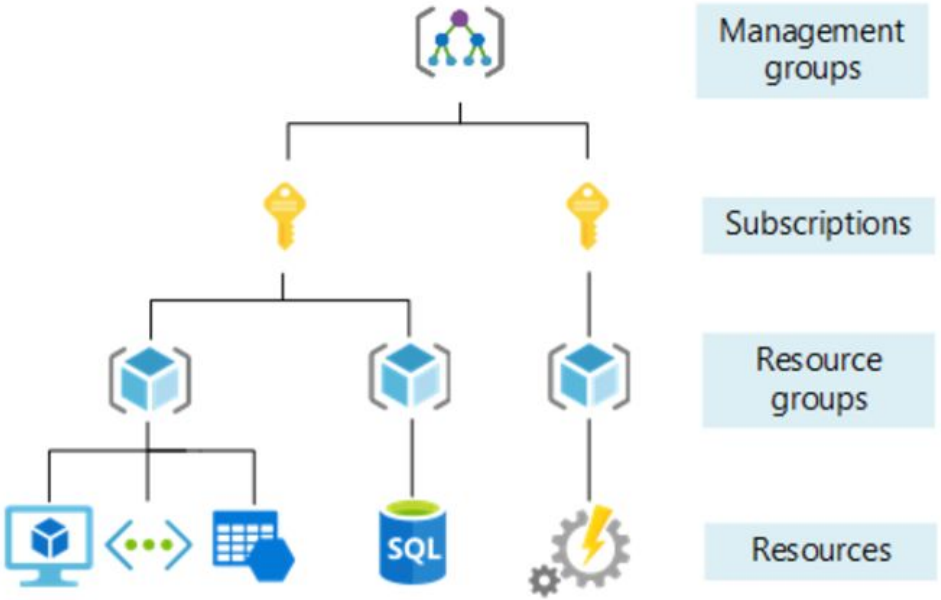
Platform-as-a-service (PaaS)

- Cloud service provider manages the VMs and networking resources
- You can deploy your apps (e.g. web app) directly without worrying about the hardware and software requirements
- Your mission is to only focus in your application development
- Need to make sure the environment suits your app requirements

Software-as-a-service (SaaS)

- Offers a complete software solution that runs completely on the cloud
- Examples:
  - Office 365
  - Google suit
  - Google Colab
  - Grammerly

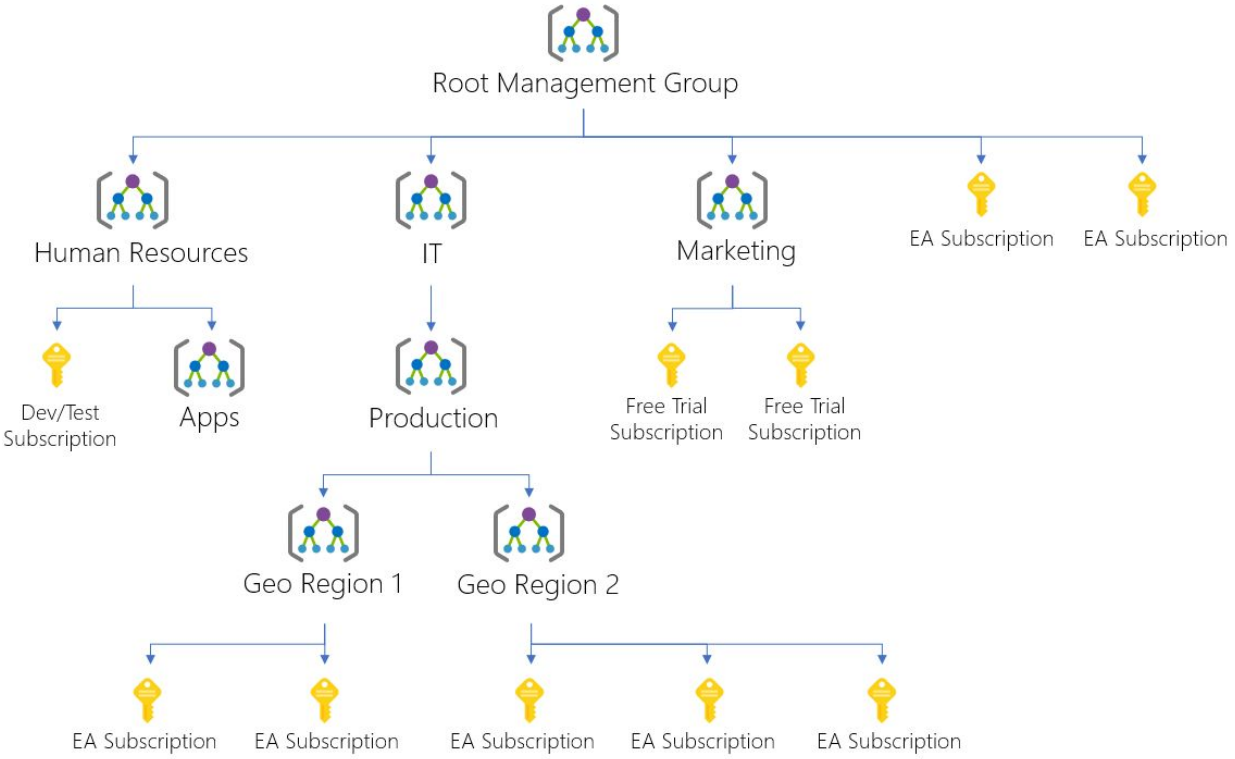
Azure Architectural Components



Azure Architectural Components

- Resources
  - Instances of the services you create (e.g. VMs, web apps, storage, Databases, …)
- Resource Group
  - Collection of related resources that we combine together for easy management
  - E.g. Web app service with a SQL database service
  - You may create a separate resource group for your testing environment and another for production etc.
- Subscriptions
  - Azure account can have multiple subscriptions
  - Strategy based on environment (e.g. subscription for dev differs from staging differs from production)
- Management Group
  - Help manage access policy for multiple subscriptions
  - All subscriptions inherit the conditions of its parent management group

Azure Architectural Components



Azure Services

1. Compute
2. Storage
3. Databases
4. Networking

Azure Services - Compute

- Virtual Machines
  - Get a cloud machine on demand with required hardware and software specs
  - Can be used as a server for your web application
- Virtual Desktops
  - Provides a desktop for users
  - Helpful to provide the environment and software used by employees
- App service
  - Helpful to deploy your app without worrying about the hardware or the underlying software
  - Auto scale the resources to meet the application needs
- Containers
  - Create orchestrators using Kubernetes
  - Useful when you need to create several instances without worrying about the OS or hardware

Azure Services - Storage

- File Storage
  - Fully managed file shares in the cloud
- Disk Storage
  - Provides disks to be used for VMs
  - Many available sizes to choose from
  - Many performance levels from SSD to HDD
- Blob Storage
  - Unstructured storage (can hold any type of data)

Azure Services - Database

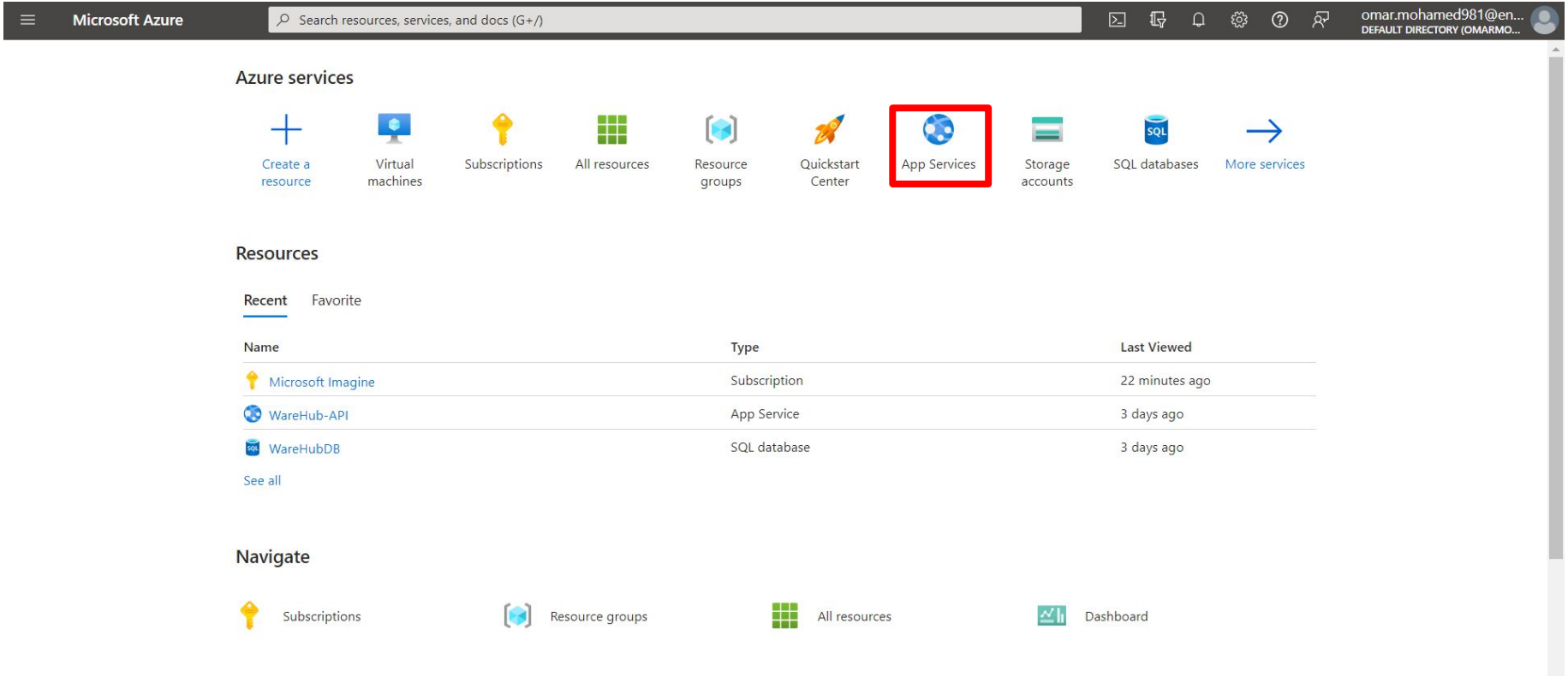
- SQL Server
- NoSQL
  - Cosmos API for MongoDB
- MySQL
- PostgreSQL

Azure Services - Networking

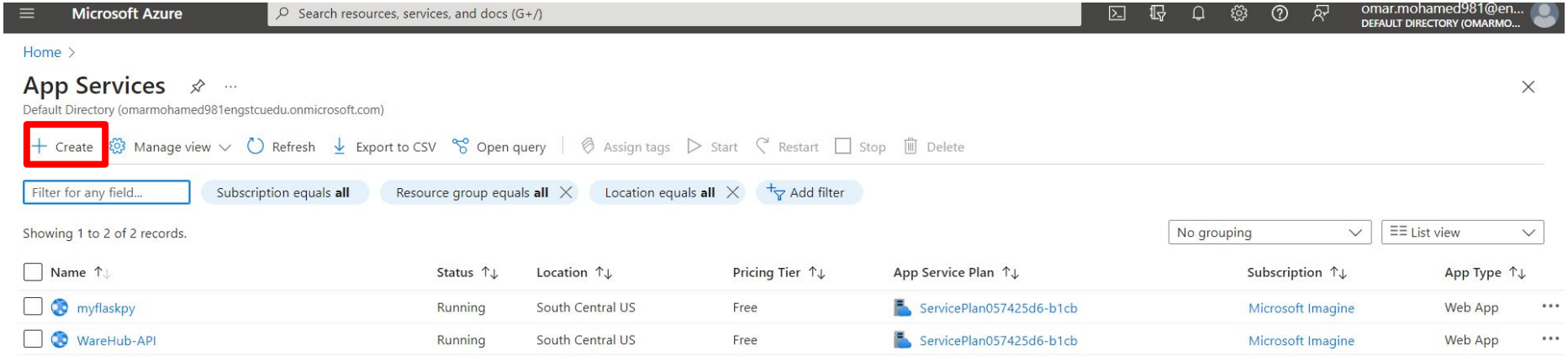
- Virtual Networks
  - Keep your existing IP addressing scheme
  - Secure data transfers
  - Enable resources such as VMs, web apps, databases to communicate with each other
- VPN Gateways
  - Encrypted tunnels to connect with other networks
- ExpressRoute
  - Connect your network to Microsoft cloud over a private connection
  - Don’t go over public internet
  - Reliable - fast - consistent latency

Exercise

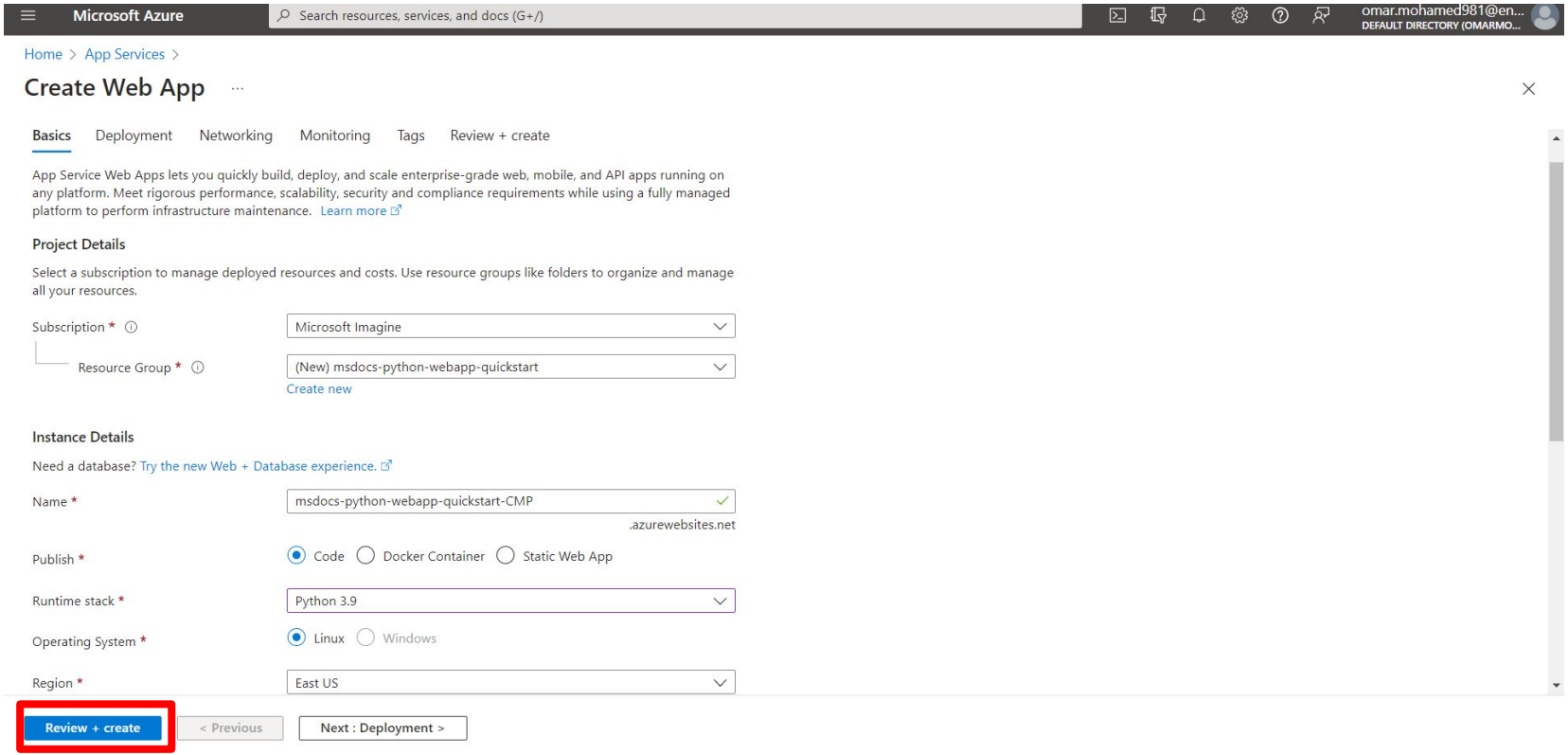
Create a Web App



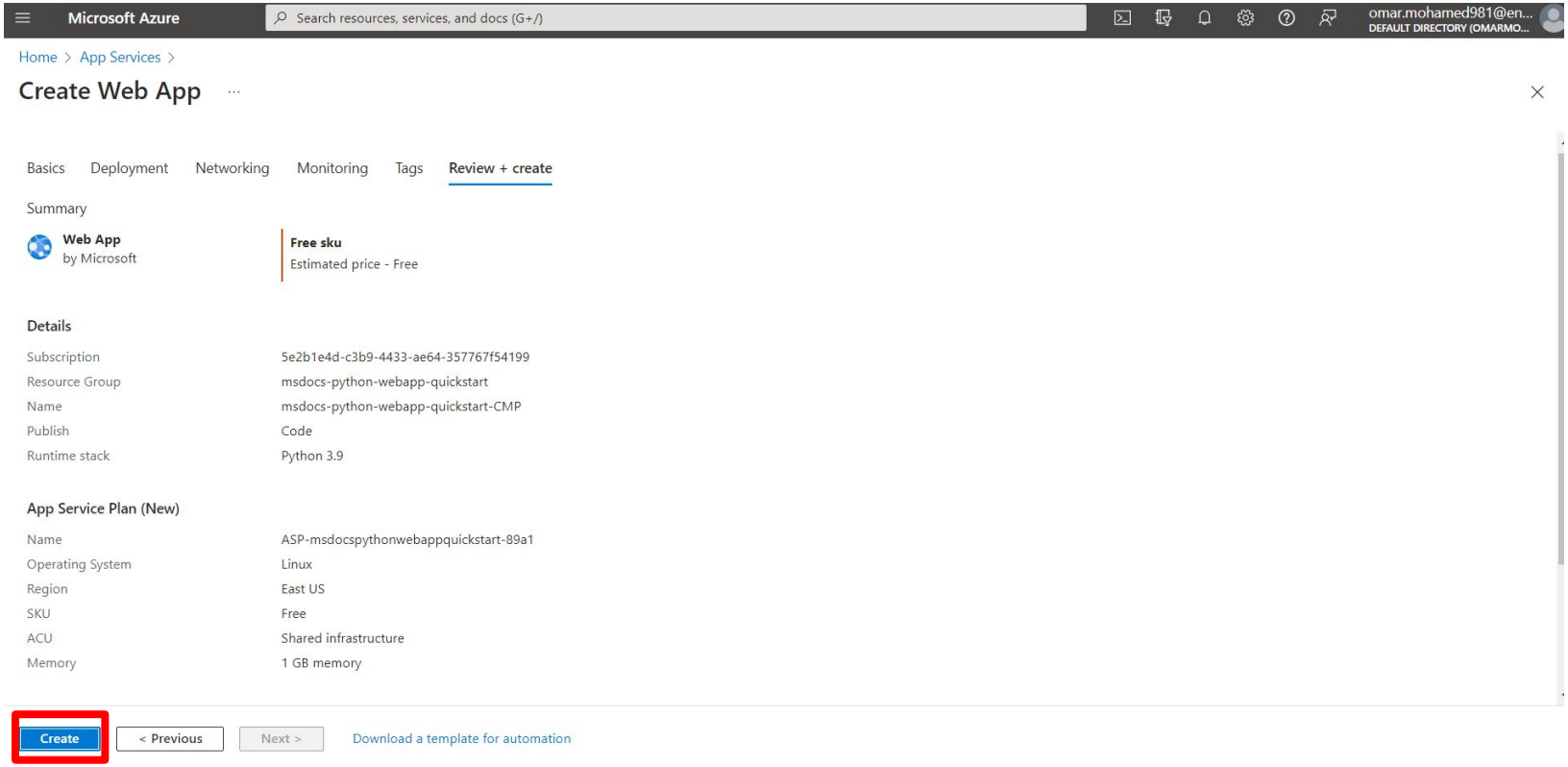
Create a Web App



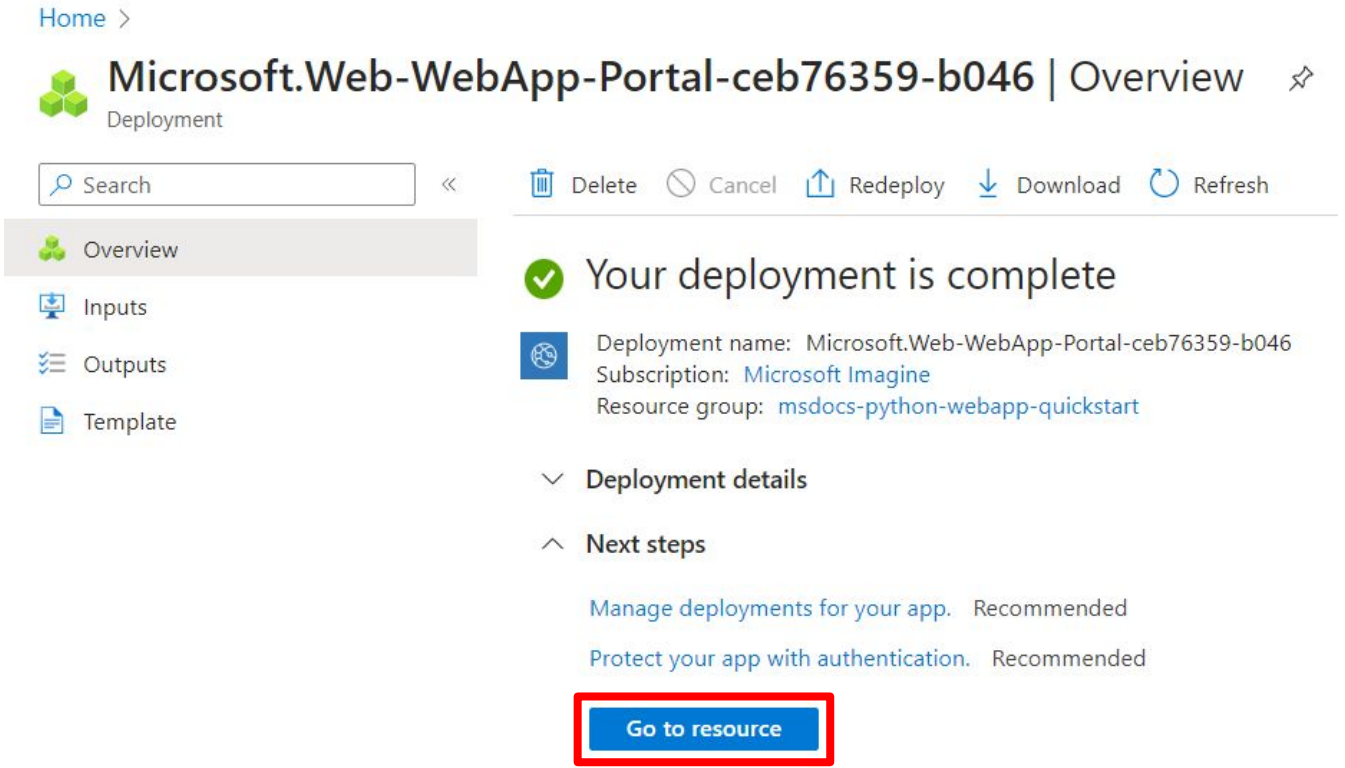
Create a Web App



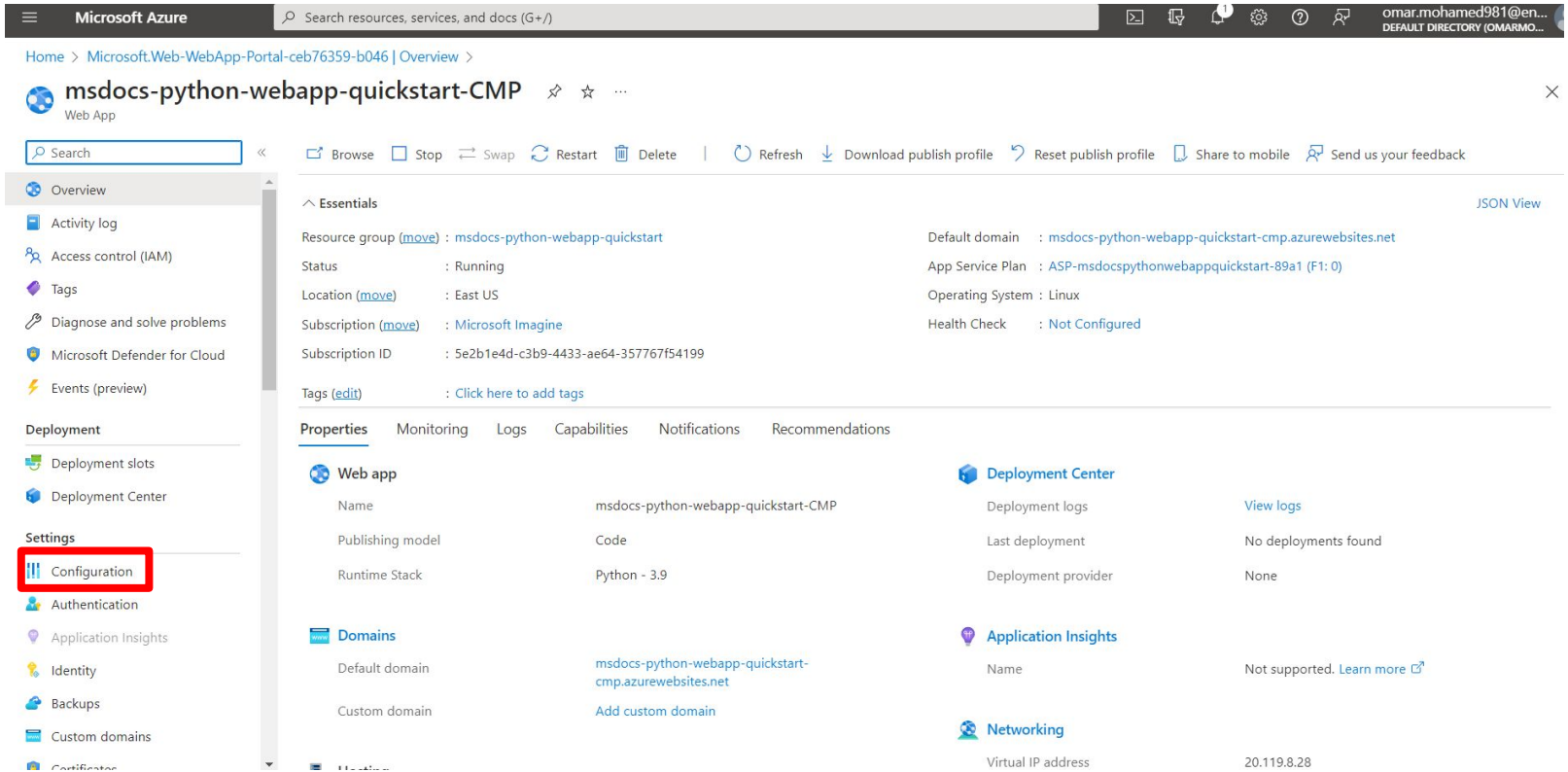
Create a Web App



Create a Web App

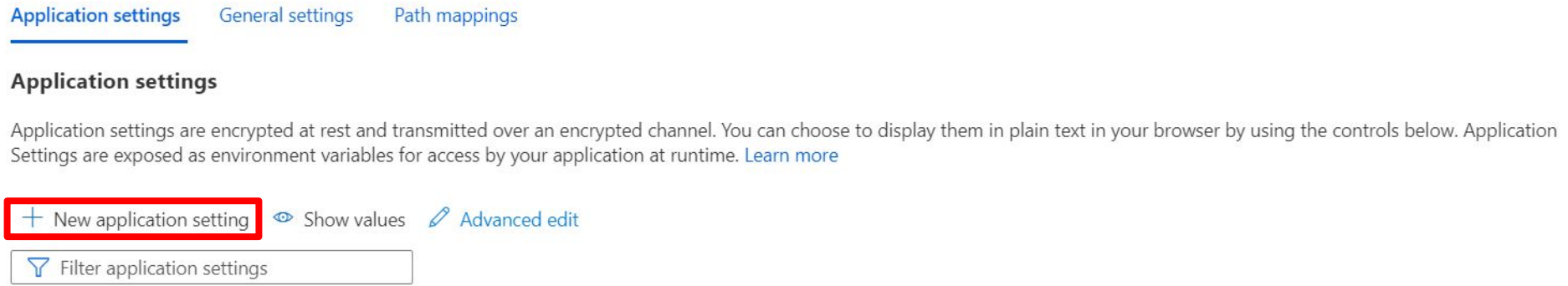


Create a Web App

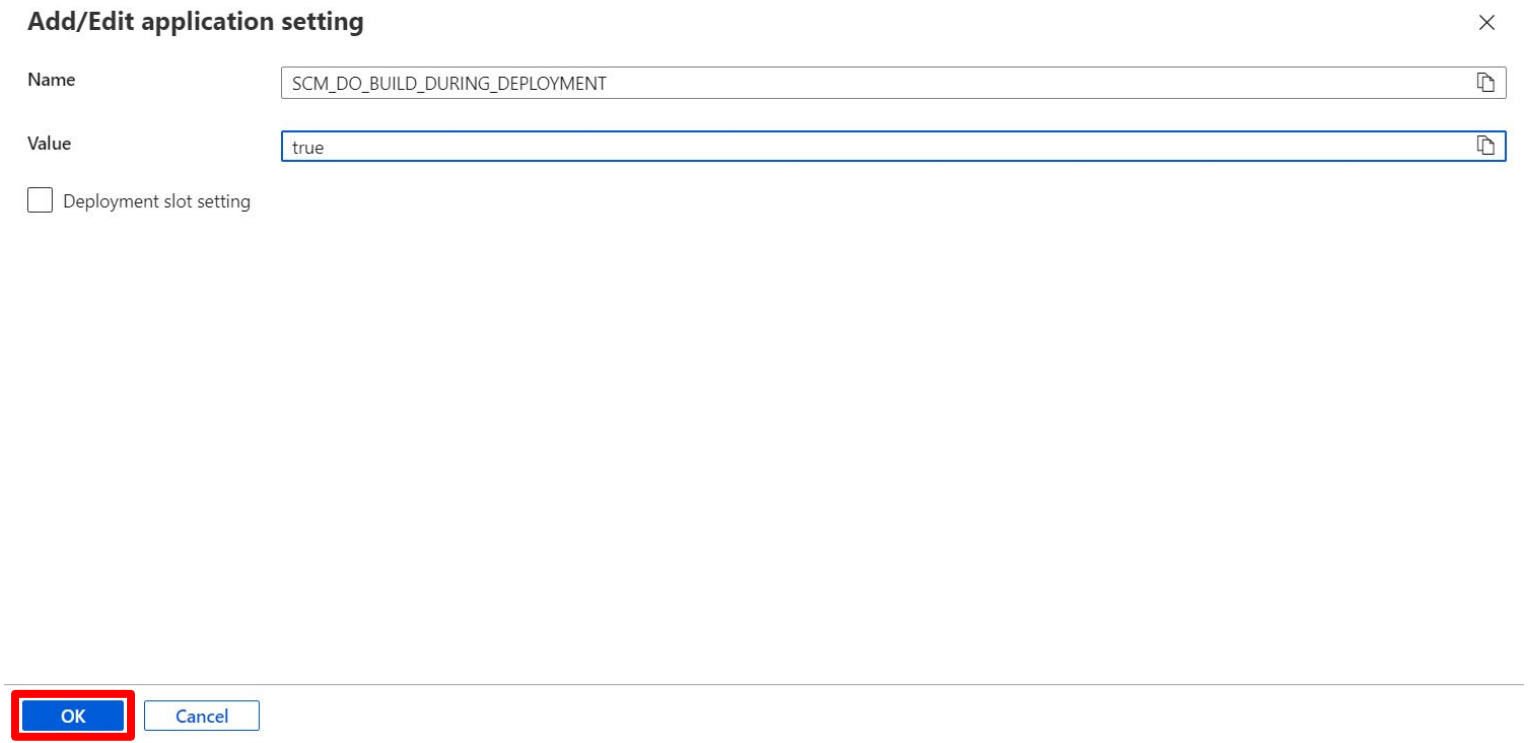


Create a Web App

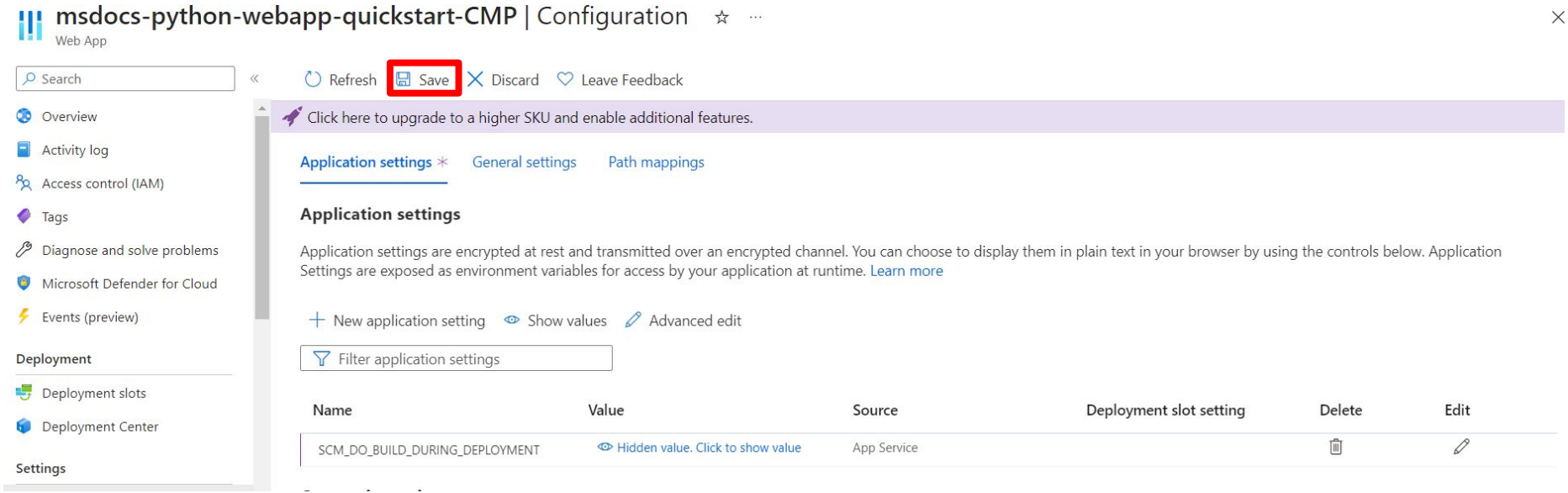
We will use deployment by zip file and to do so we need to enable azure build automation to install any necessary packages.



Create a Web App



Create a Web App

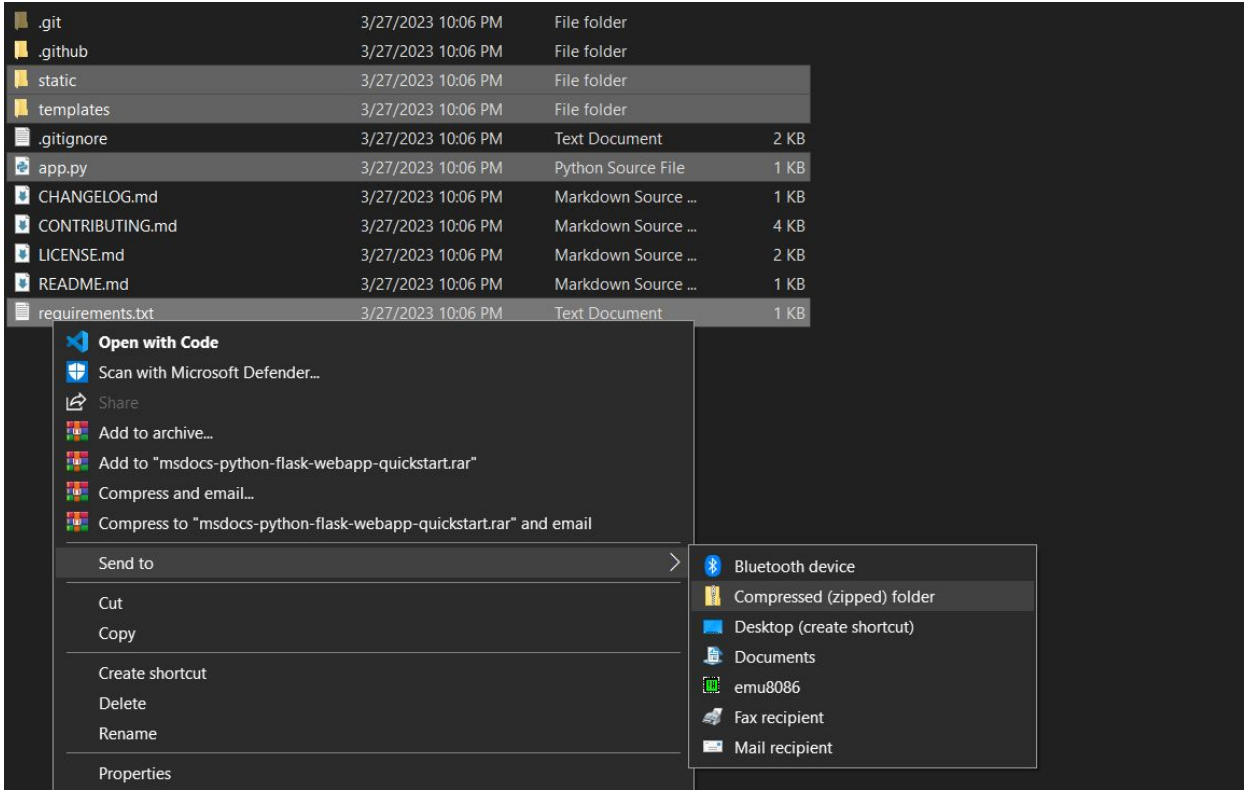


Create a Web App

Clone this repository:

https://github.com/Azure-Samples/msdocs-python-flask-webapp-quickstart

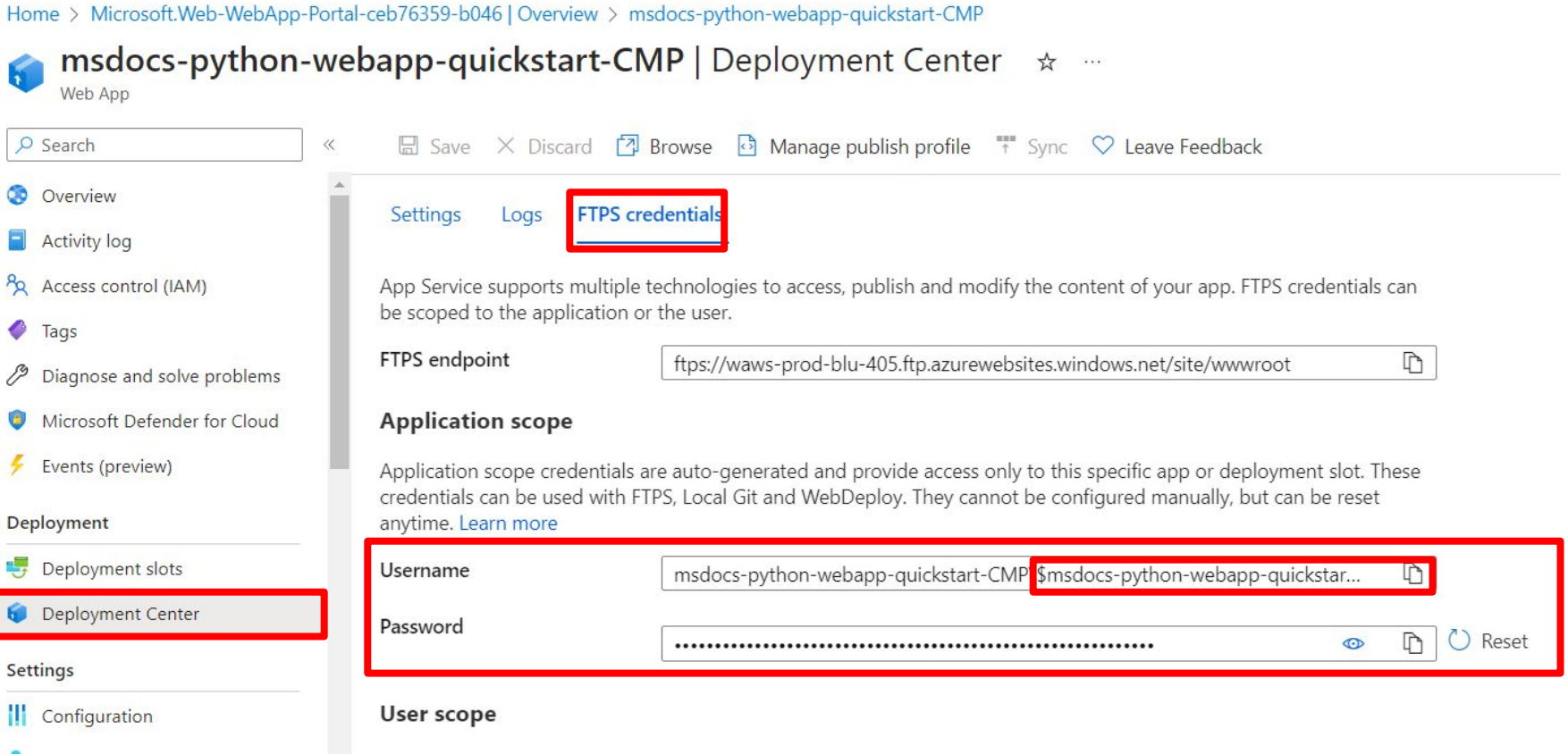
Create a Web App



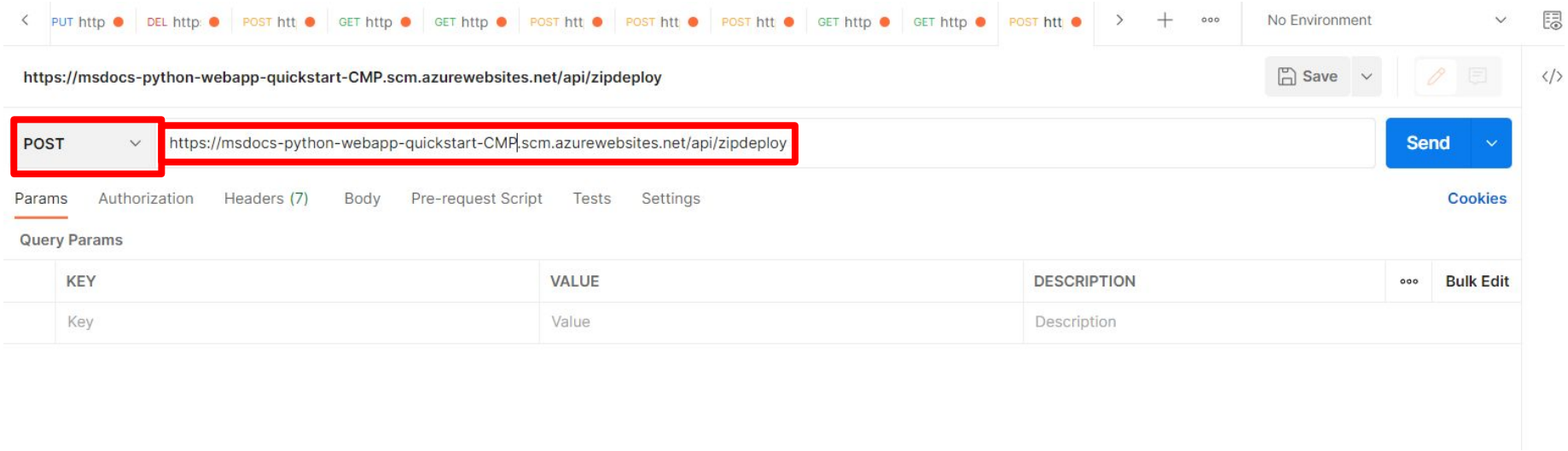
Create a Web App

To upload our zip file, we will use postman and for this you will need the app deployment username and password

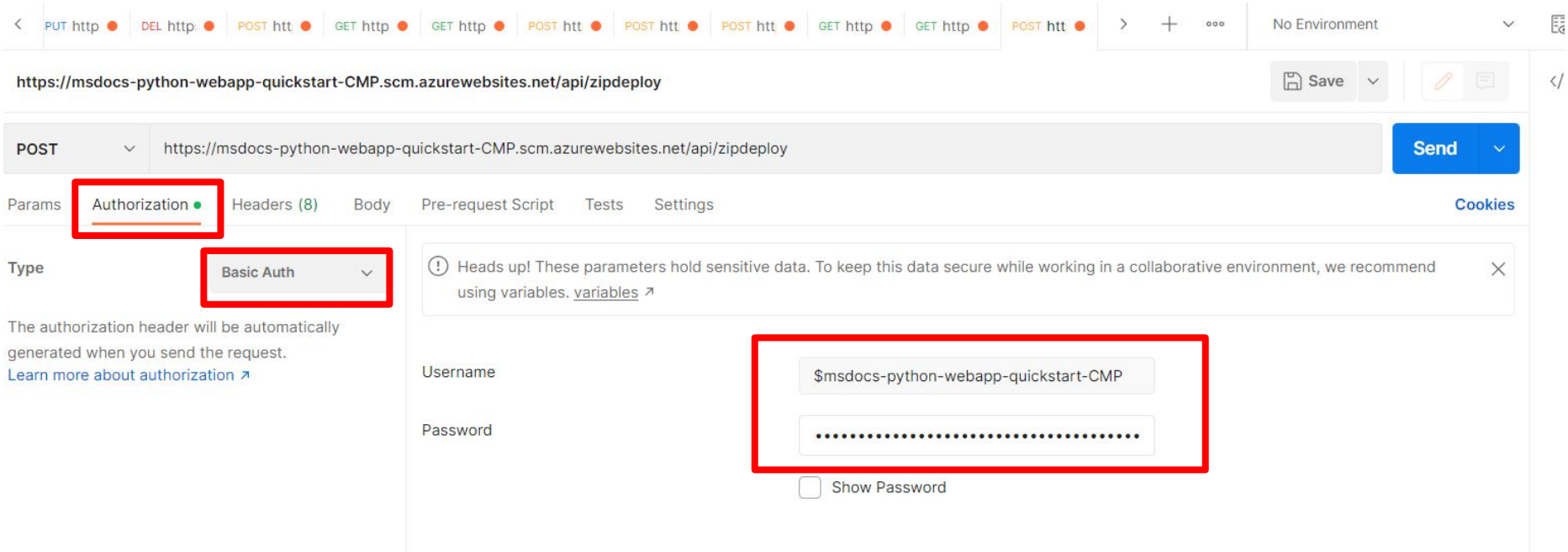
Create a Web App



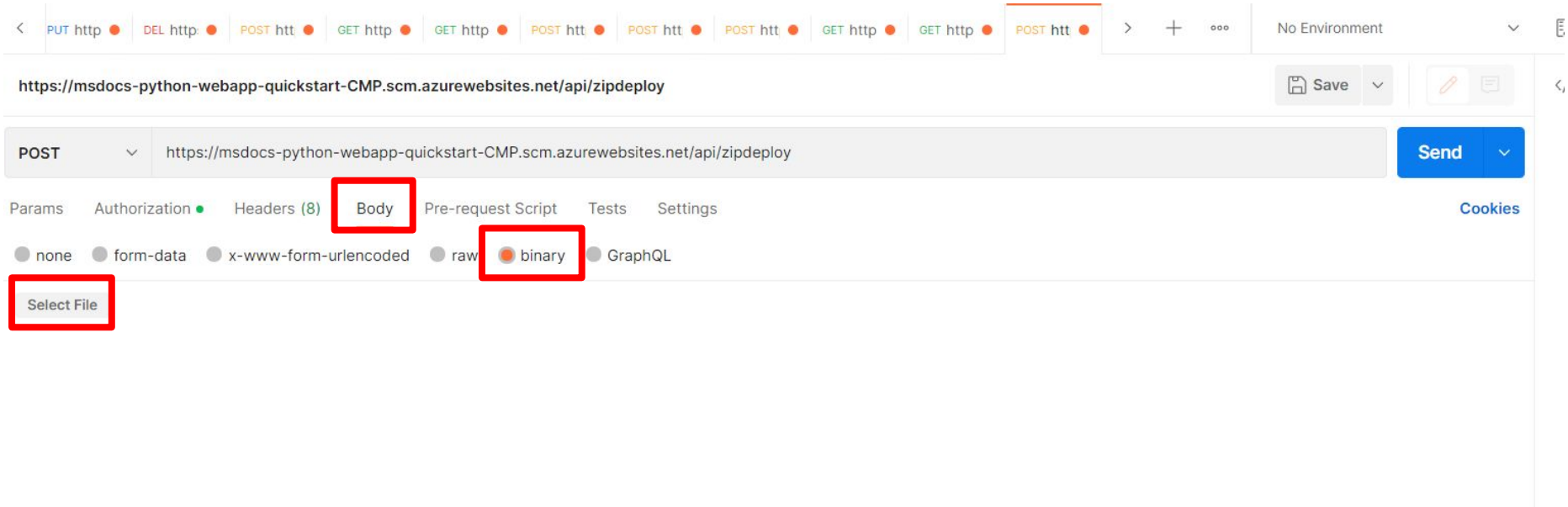
Create a Web App



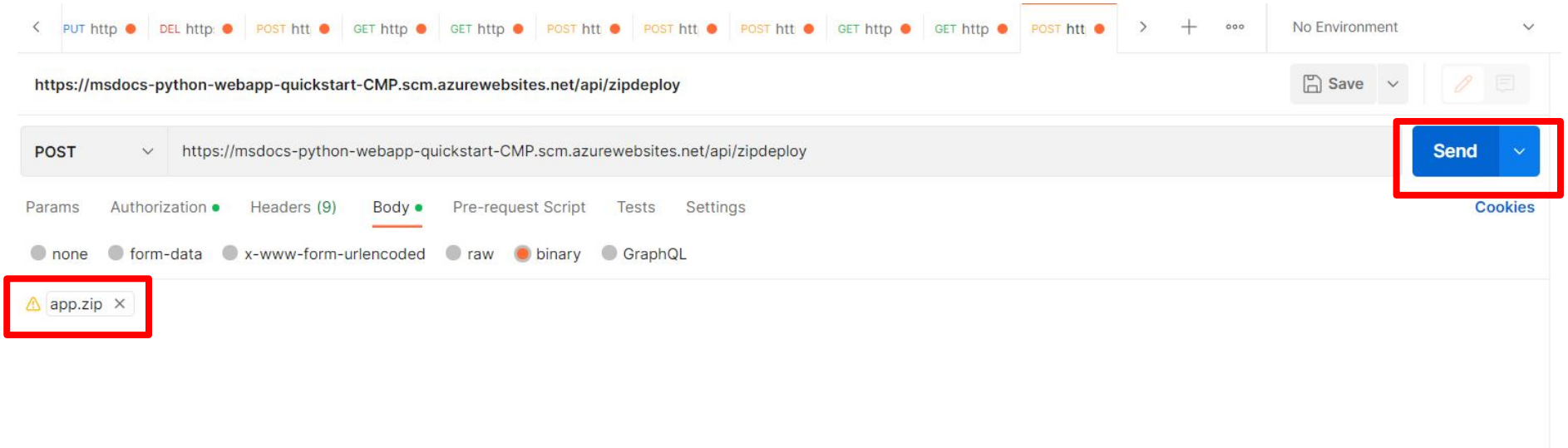
Create a Web App



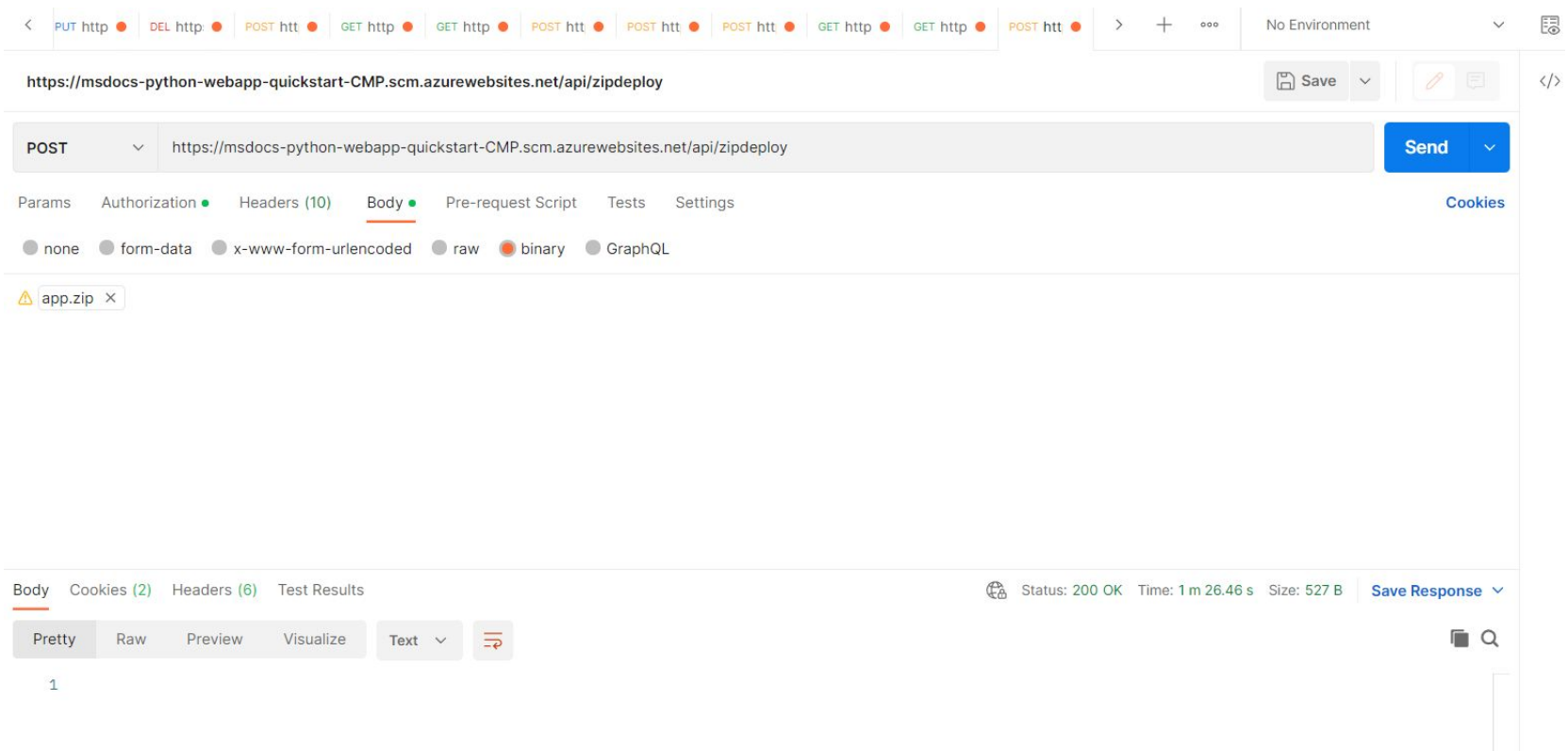
Create a Web App



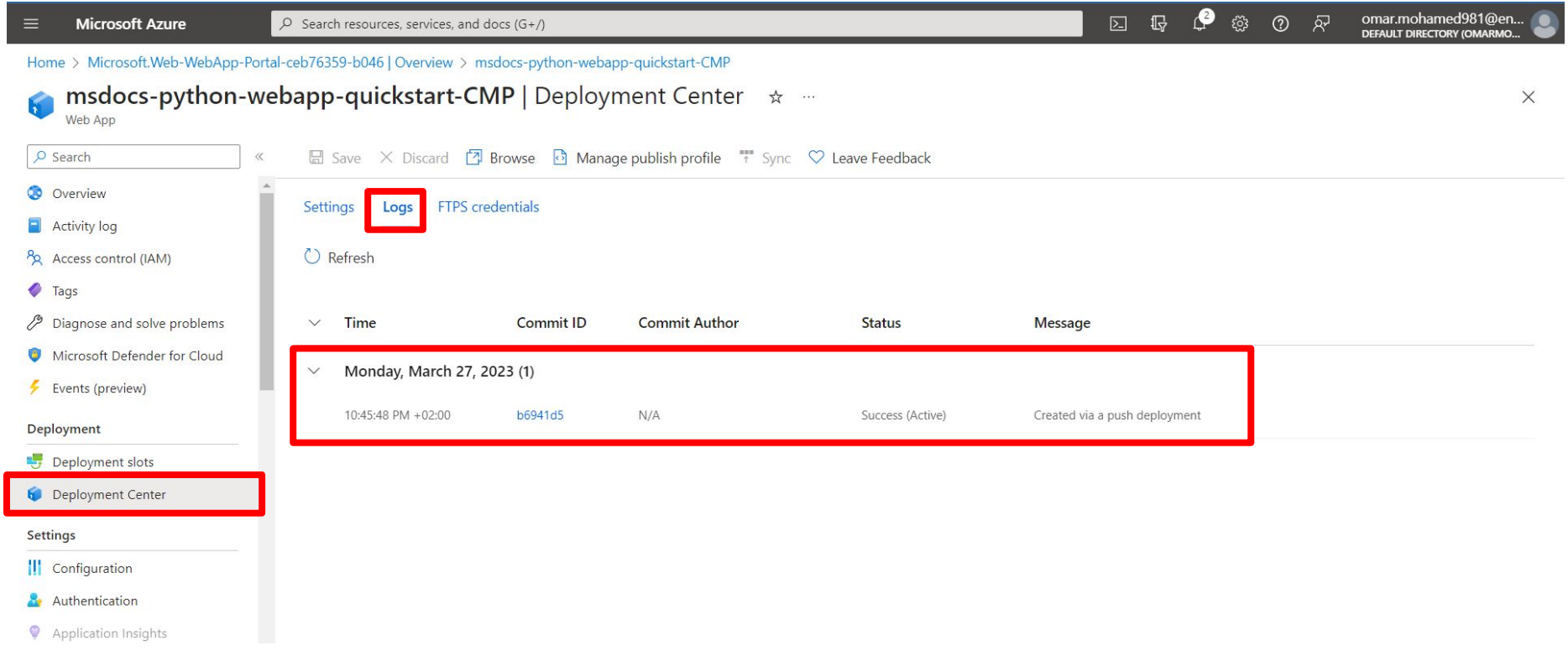
Create a Web App



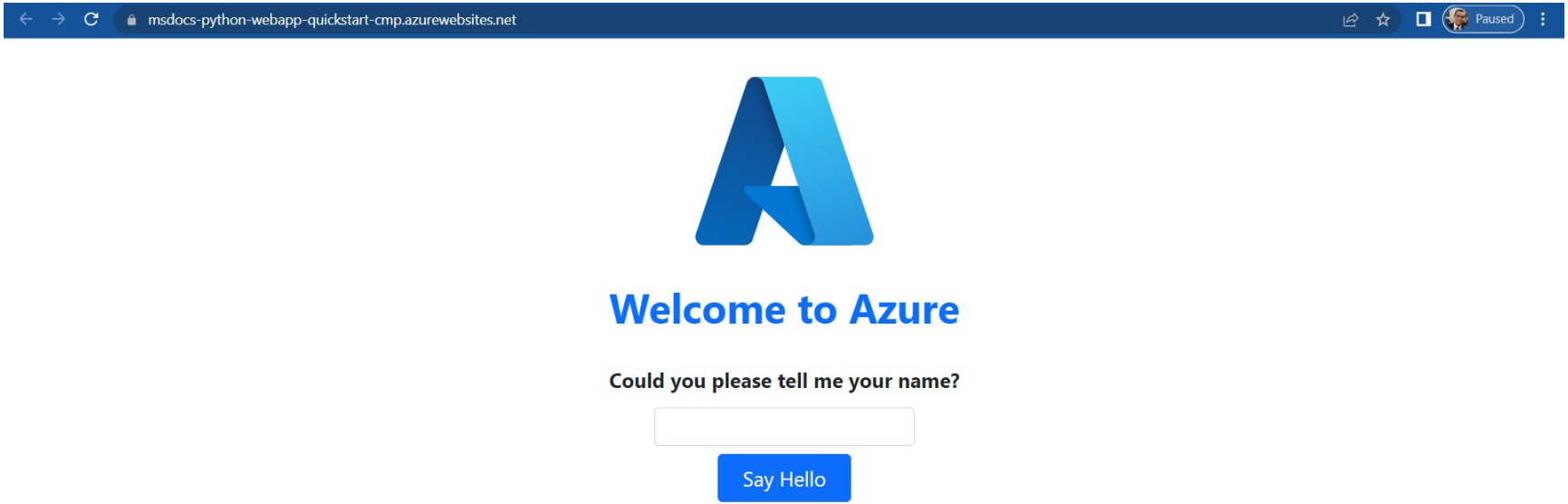
Create a Web App



Create a Web App



Create a Web App



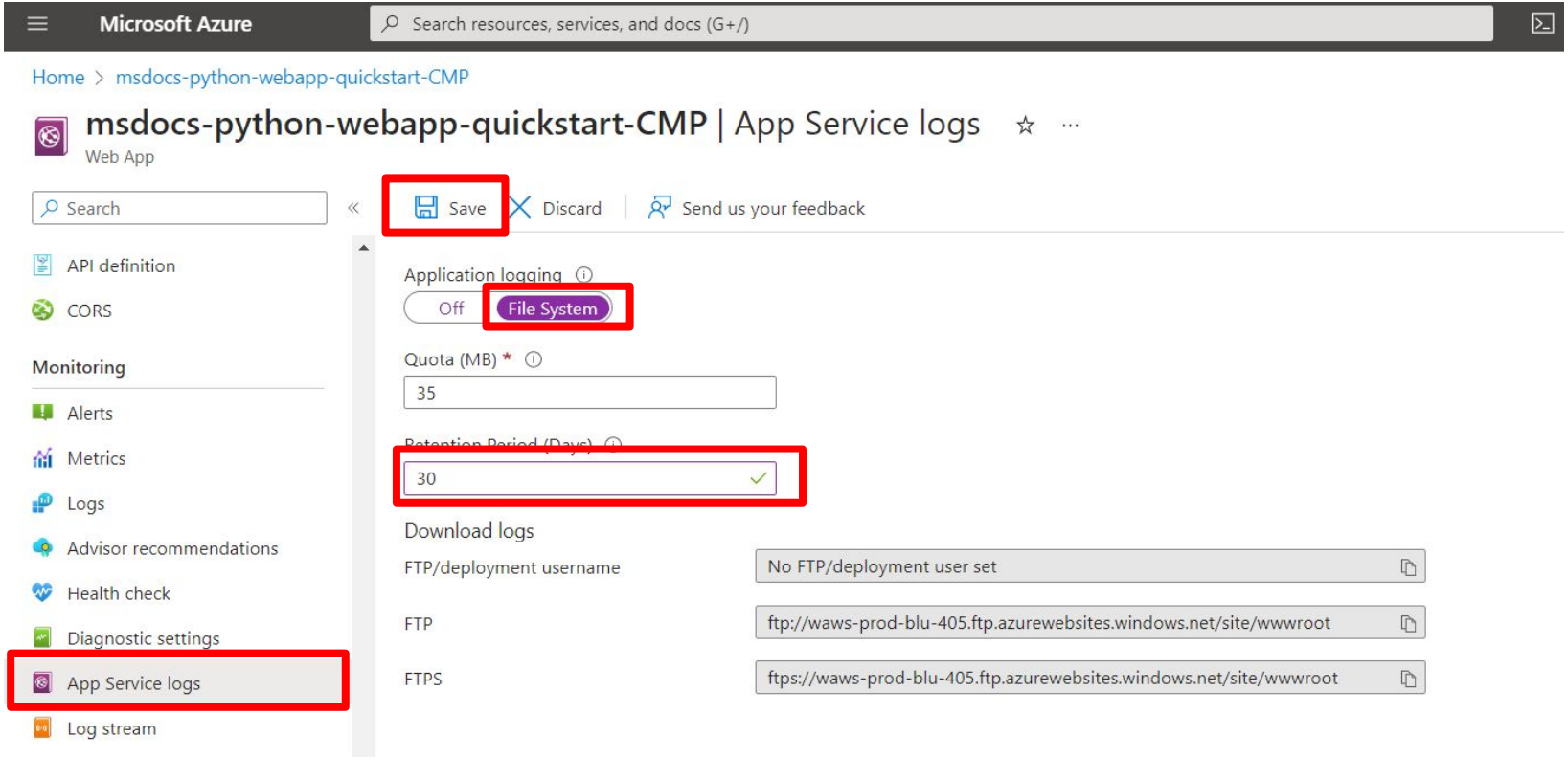
Create a Web App

```
from datetime import datetime      David Berry, 16 months ago • Initial check in …
from flask import Flask, render_template, request, redirect, url_for, send_from_directory
app = Flask(__name__)


@app.route('/')
def index():
   print('Request for index page received')
   return render_template('index.html')

@app.route('/favicon.ico')
def favicon():
    return send_from_directory(os.path.join(app.root_path, 'static'),
                               'favicon.ico', mimetype='image/vnd.microsoft.icon')

@app.route('/hello', methods=['POST'])
def hello():
   name = request.form.get('name')

   if name:
       print('Request for hello page received with name=%s' % name)
       return render_template('hello.html', name = name)
   else:
       print('Request for hello page received with no name or blank name -- redirecting')
       return redirect(url_for('index'))


if __name__ == '__main__':
   app.run()
```

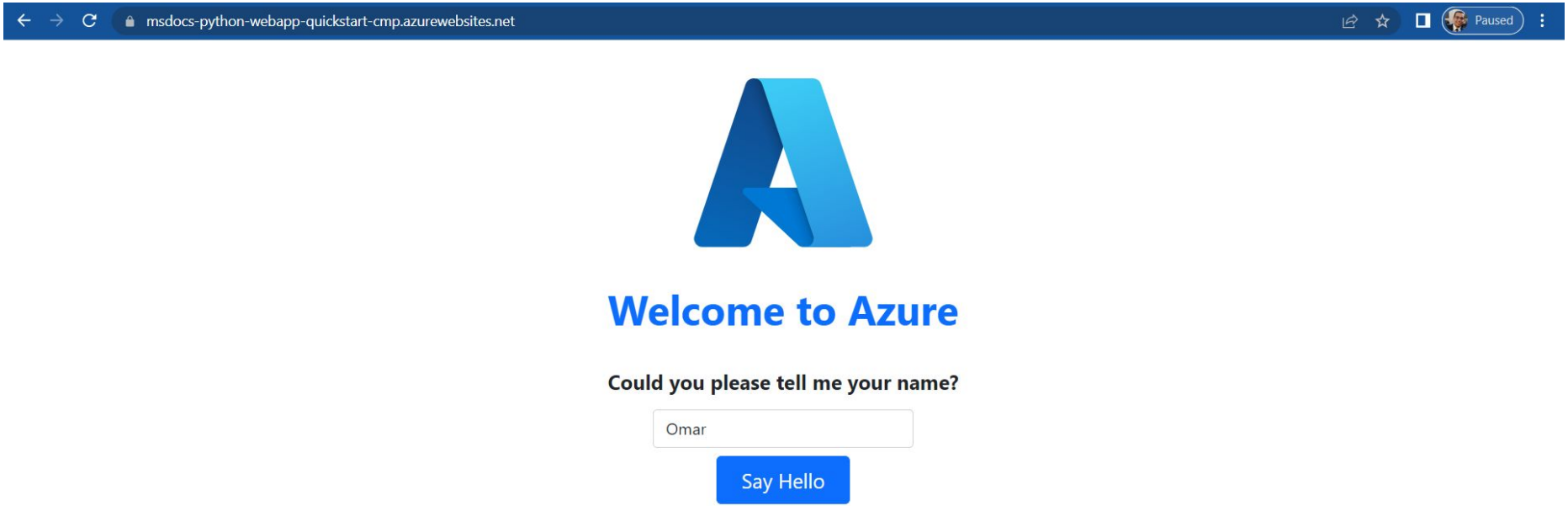
Create a Web App

Every web application has some sort of logging. To view these logs in azure we need to enable logging

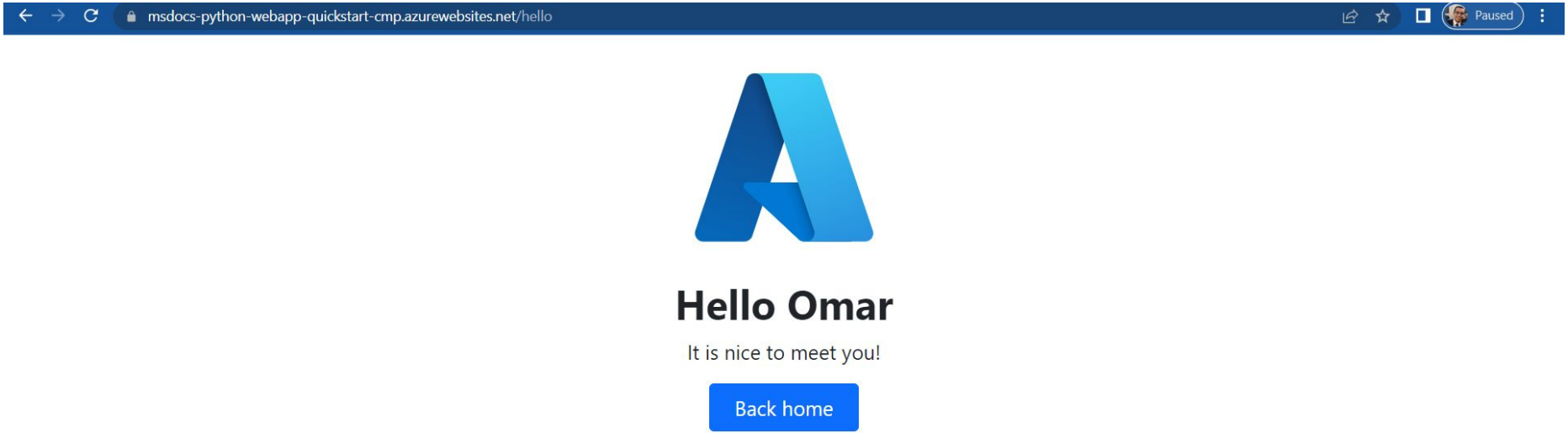
Create a Web App



Create a Web App



Create a Web App



msdocs-python-webapp-quickstart-CMP | Log stream

Web App

Search

API definition
CORS

Monitoring
Alerts
Metrics
Logs
Advisor recommendations
Health check
Diagnostic settings
App Service logs
Log stream

Automation
Tasks (preview)
Export template

Support + troubleshooting
Resource health
New Support Request

Reconnect | Copy | Pause | Clear

```
2023-03-27T21:01:02.803Z INFO  - Starting container for site
2023-03-27T21:01:02.805Z INFO  - docker run -d --expose=8000 --name msdocs-python-webapp-quickstart-cmp_1_962816e2 -e WEBSITE_SITE_NAME=msdocs-python-webapp-quickstart-CMP -e WEBSITE_AUTH_ENABLED=False -e WEBSITE_ROLE_INSTANCE_ID=0 -e WEBSITE_HOSTNAME=msdocs-python-webapp-quickstart-cmp.azurewebsites.net -e WEBSITE_INSTANCE_ID=c1e4a54d81d826a769e7253a68aeff879449c258d99c889b0905d6d97cdc5a15 -e HTTP_LOGGING_ENABLED=1 -e WEBSITE_USE_DIAGNOSTIC_SERVER=True appsvc/python:3.9_20230116.1.tuxprod

2023-03-27T21:01:12.760Z INFO  - Initiating warmup request to container msdocs-python-webapp-quickstart-cmp_1_962816e2 for site msdocs-python-webapp-quickstart-cmp
2023-03-27T21:01:28.727Z INFO  - Waiting for response to warmup request for container msdocs-python-webapp-quickstart-cmp_1_962816e2. Elapsed time = 15.9672574 sec
2023-03-27T21:01:36.857Z INFO  - Container msdocs-python-webapp-quickstart-cmp_1_962816e2 for site msdocs-python-webapp-quickstart-cmp initialized successfully and is ready to serve requests.
2023-03-27T21:02:59.509140976Z Request for index page received
2023-03-27T21:02:59.509231012Z 169.254.129.1 - - [27/Mar/2023:21:02:59 +0000] "GET / HTTP/1.1" 200 1469 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/111.0.0.0 Safari/537.36"
2023-03-27T21:02:59.909024045Z 169.254.129.1 - - [27/Mar/2023:21:02:59 +0000] "GET /static/bootstrap/css/bootstrap.min.css HTTP/1.1" 200 0 "https://msdocs-python-webapp-quickstart-cmp.azurewebsites.net/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/111.0.0.0 Safari/537.36"
2023-03-27T21:02:59.943078441Z 169.254.129.1 - - [27/Mar/2023:21:02:59 +0000] "GET /static/images/azure-icon.svg HTTP/1.1" 200 0 "https://msdocs-python-webapp-quickstart-cmp.azurewebsites.net/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/111.0.0.0 Safari/537.36"

2023-03-27T21:03:08.621416569Z Request for hello page received with name=Omar
2023-03-27T21:03:08.621485271Z 169.254.129.1 - - [27/Mar/2023:21:03:08 +0000] "POST /hello HTTP/1.1" 200 803 "https://msdocs-python-webapp-quickstart-cmp.azurewebsites.net/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/111.0.0.0 Safari/537.36"
2023-03-27T21:03:09.464736829Z 169.254.129.1 - - [27/Mar/2023:21:03:09 +0000] "GET /static/images/azure-icon.svg HTTP/1.1" 304 0 "https://msdocs-python-webapp-quickstart-cmp.azurewebsites.net/hello" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/111.0.0.0 Safari/537.36"
2023-03-27T21:03:09.484596399Z 169.254.129.1 - - [27/Mar/2023:21:03:09 +0000] "GET /static/bootstrap/css/bootstrap.min.css HTTP/1.1" 304 0 "https://msdocs-python-webapp-quickstart-cmp.azurewebsites.net/hello" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/111.0.0.0 Safari/537.36"
```