



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)



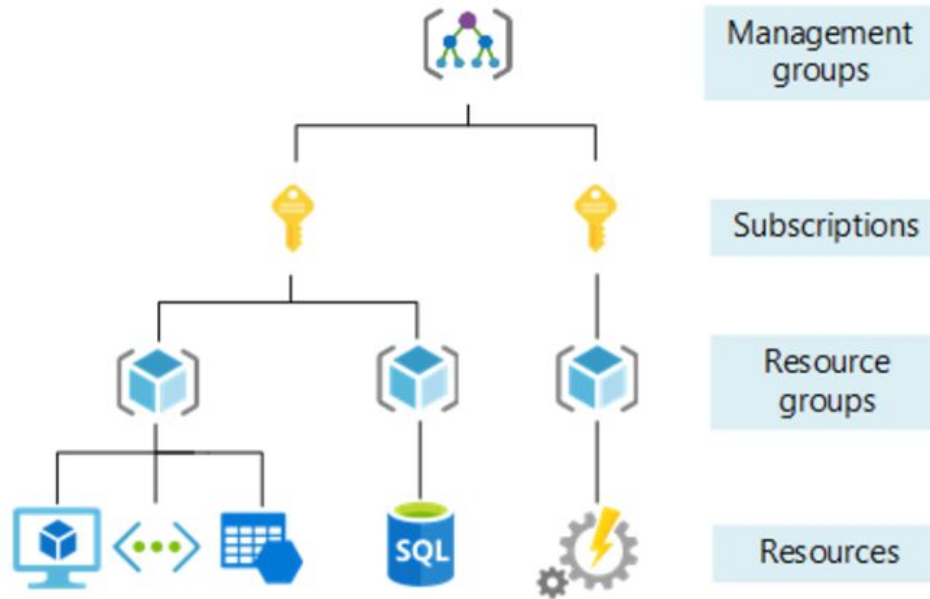
- Cloud service provider manages the VMs and networking resources
- You can deploy your apps (e.g. web app) directly without worrying about the hardware and software requirements
- Your mission is to only focus in your application development
- Need to make sure the environment suits your app requirements

Software-as-a-service (SaaS)



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

Azure Architectural Components

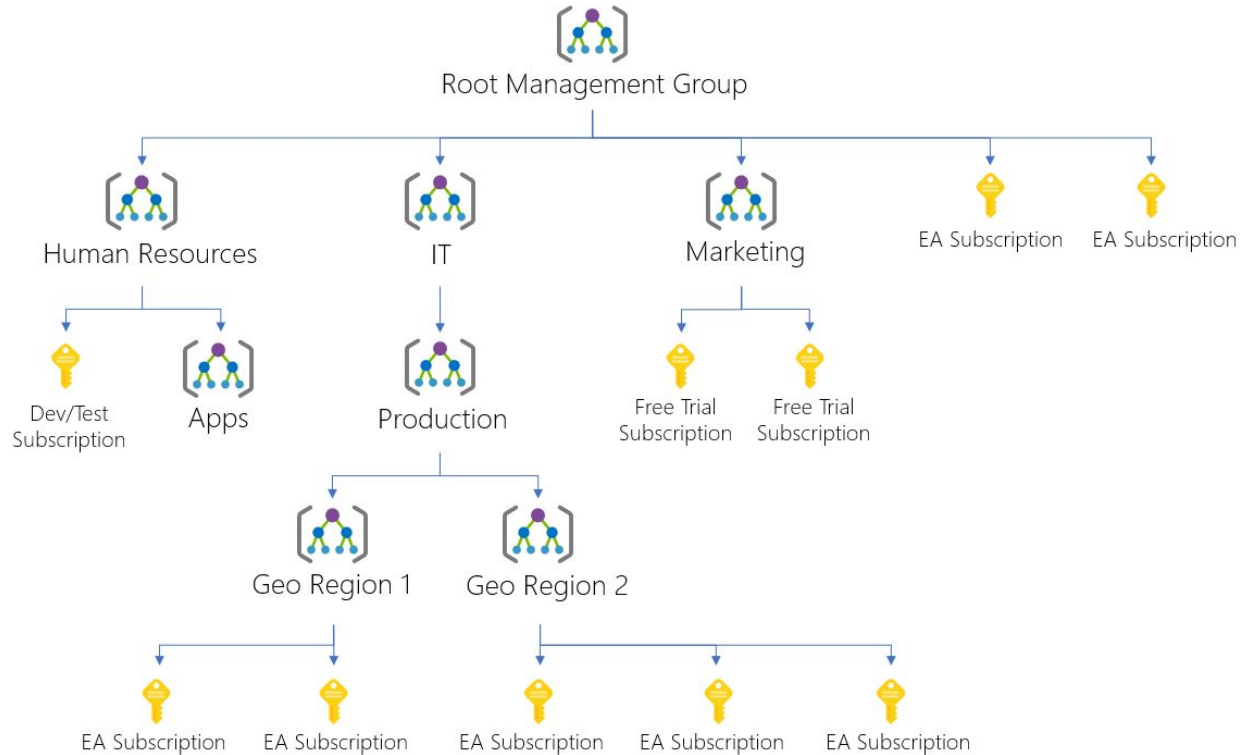


Azure Architectural Components



- 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


 Microsoft Azure





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Azure services



Create a resource



Virtual machines



Subscriptions



All resources



Resource groups


Quickstart Center


App Services





Storage accounts


SQL databases


More services


Resources


Recent Favorite


Name	Type	Last Viewed
 Microsoft Imagine	Subscription	22 minutes ago
 WareHub-API	App Service	3 days ago
 WareHubDB	SQL database	3 days ago


[See all](#)

Navigate


 Subscriptions

 Resource groups


 All resources

 Dashboard

Create a Web App

 Microsoft Azure

Search resources, services, and docs (G+)





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Home >


App Services


Default Directory (omarmohamed981engstcuedu.onmicrosoft.com)


 Create


 Manage view


 Refresh


 Export to CSV


 Open query

 Assign tags

 Start

 Restart

 Stop





 Delete

Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter

Showing 1 to 2 of 2 records.

No grouping







List view

<input type="checkbox"/> Name ↑↓	Status ↑↓	Location ↑↓	Pricing Tier ↑↓	App Service Plan ↑↓	Subscription ↑↓	App Type ↑↓
<input type="checkbox"/>  myflaskpy	Running	South Central US	Free	 ServicePlan057425d6-b1cb	Microsoft Imagine	Web App ...
<input type="checkbox"/>  WareHub-API	Running	South Central US	Free	 ServicePlan057425d6-b1cb	Microsoft Imagine	Web App ...

Create a Web App

Microsoft Azure

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Home > App Services >

Create Web App

Basics Deployment Networking Monitoring Tags Review + create

App Service Web Apps lets you quickly build, deploy, and scale enterprise-grade web, mobile, and API apps running on any platform. Meet rigorous performance, scalability, security and compliance requirements while using a fully managed platform to perform infrastructure maintenance. [Learn more](#)

Project Details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ

Microsoft Imagine

Resource Group * ⓘ

(New) msdocs-python-webapp-quickstart

Create new

Instance Details

Need a database? [Try the new Web + Database experience.](#)

Name *

msdocs-python-webapp-quickstart-CMP

.azurewebsites.net

Publish *

☒ Code ☐ Docker Container ☐ Static Web App

Runtime stack *

Python 3.9

Operating System *

☒ Linux ☐ Windows

Region *

East US

Review + create







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Create Web App ...

Basics

Deployment


Networking

Monitoring

Tags

Review + create

Summary

**Web App**
by Microsoft

Free sku
Estimated price - Free

Details

Subscription	5e2b1e4d-c3b9-4433-ae64-357767f54199
Resource Group	msdocs-python-webapp-quickstart
Name	msdocs-python-webapp-quickstart-CMP
Publish	Code
Runtime stack	Python 3.9

App Service Plan (New)

Name	ASP-msdocspythonwebappquickstart-89a1
Operating System	Linux
Region	East US
SKU	Free
ACU	Shared infrastructure
Memory	1 GB memory

Create

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[Download a template for automation](#)

Create a Web App

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Microsoft.Web-WebApp-Portal-ceb76359-b046 | Overview

Deployment



Delete



Cancel



Redeploy



Download



Refresh



Overview



Inputs



Outputs



Template



Your deployment is complete



Deployment name: Microsoft.Web-WebApp-Portal-ceb76359-b046

Subscription: [Microsoft Imagine](#)

Resource group: [msdocs-python-webapp-quickstart](#)



Deployment details



Next steps

[Manage deployments for your app.](#) Recommended







[Protect your app with authentication.](#) Recommended

[Go to resource](#)

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Web App



Search

«



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Stop

Swap

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Reset publish profile

Share to mobile

Send us your feedback

Overview

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Access control (IAM)

Tags

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Microsoft Defender for Cloud

Events (preview)

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Authentication

Application Insights

Identity

Backups

Custom domains

Container

Essentials

JSON View

Resource group [\(move\)](#) : msdocs-python-webapp-quickstart

Status : Running

Location [\(move\)](#) : East US

Subscription [\(move\)](#) : Microsoft Imagine

Subscription ID : 5e2b1e4d-c3b9-4433-ae64-357767f54199

Tags [\(edit\)](#) : [Click here to add tags](#)

Default domain : msdocs-python-webapp-quickstart-cmp.azurewebsites.net

App Service Plan : ASP-msdocspythonwebappquickstart-89a1 (F1: 0)

Operating System : Linux

Health Check : Not Configured

Properties

Monitoring

Logs

Capabilities

Notifications

Recommendations

Web app

Name : msdocs-python-webapp-quickstart-CMP

Publishing model : Code

Runtime Stack : Python - 3.9

Deployment Center

Deployment logs : [View logs](#)

Last deployment : No deployments found

Deployment provider : None

Domains

Default domain : msdocs-python-webapp-quickstart-cmp.azurewebsites.net

Custom domain : [Add custom domain](#)

Application Insights

Name : Not supported. [Learn more](#)

Networking

Virtual IP address : 20.119.8.28

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.

Application settings General settings Path mappings

Application settings

Application settings are encrypted at rest and transmitted over an encrypted channel. You can choose to display them in plain text in your browser by using the controls below. Application Settings are exposed as environment variables for access by your application at runtime. [Learn more](#)

 New application setting  Show values  Advanced edit

 Filter application settings

Create a Web App

Add/Edit application setting



Name

SCM_DO_BUILD_DURING_DEPLOYMENT



Value

true

☐

Deployment slot setting

OK

Cancel

Create a Web App

 msdocs-python-webapp-quickstart-CMP | Configuration ☆ ...

Search


« Refresh **Save** Discard Leave Feedback

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Microsoft Defender for Cloud
- Events (preview)

Deployment

- Deployment slots
- Deployment Center

Settings

 Click here to upgrade to a higher SKU and enable additional features.




Application settings * General settings Path mappings

Application settings

Application settings are encrypted at rest and transmitted over an encrypted channel. You can choose to display them in plain text in your browser by using the controls below. Application Settings are exposed as environment variables for access by your application at runtime. [Learn more](#)

+ New application setting Show values Advanced edit

Filter application settings

Name	Value	Source	Deployment slot setting	Delete	Edit
SCM_DO_BUILD_DURING_DEPLOYMENT	 Hidden value. Click to show value	App Service			

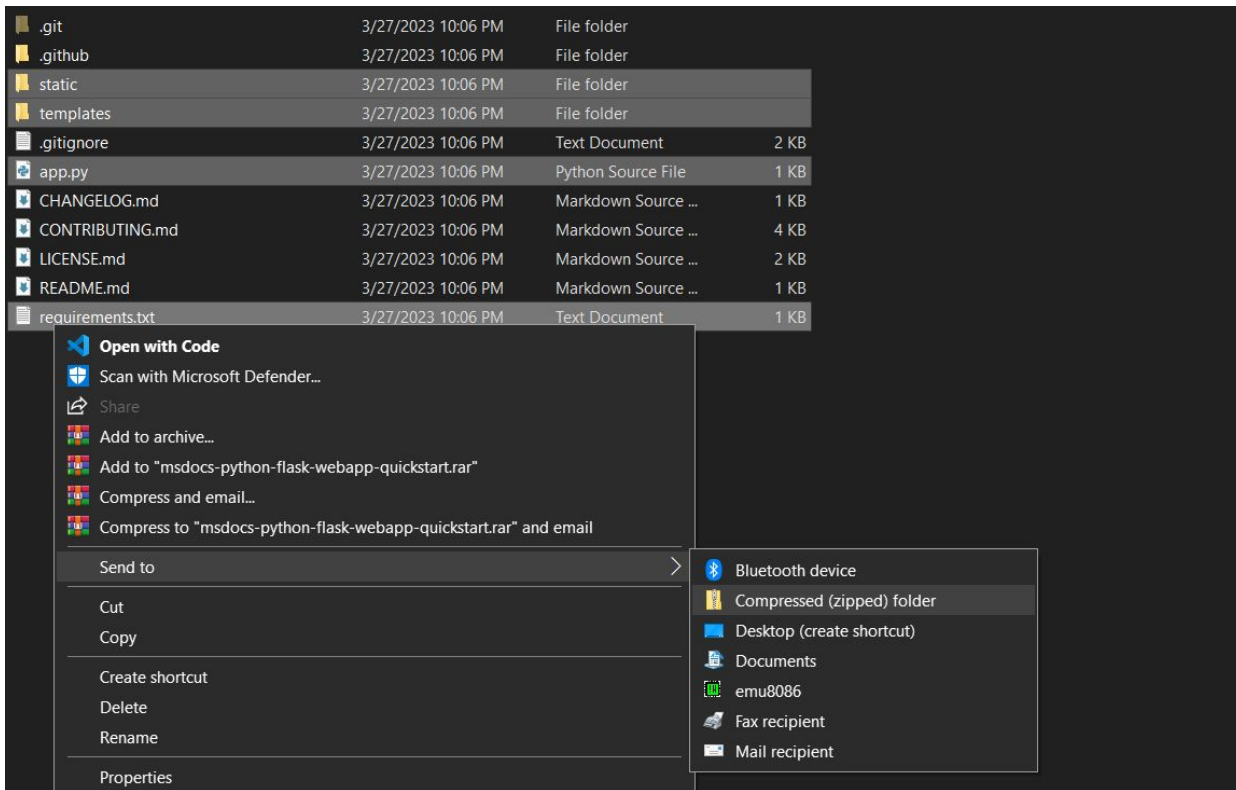
Create a Web App



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

Home > [Microsoft.Web-WebApp-Portal-ceb76359-b046 | Overview](#) > [msdocs-python-webapp-quickstart-CMP](#)



msdocs-python-webapp-quickstart-CMP | Deployment Center ☆ ...

Web App



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FTP credentials

App Service supports multiple technologies to access, publish and modify the content of your app. FTPS credentials can be scoped to the application or the user.

FTPS endpoint

Application scope

Application scope credentials are auto-generated and provide access only to this specific app or deployment slot. These credentials can be used with FTPS, Local Git and WebDeploy. They cannot be configured manually, but can be reset anytime. [Learn more](#)

Username

Password



Reset

User scope

Create a Web App

<

PUT http ●

DEL http ●

POST htt ●

GET http ●

GET http ●

POST htt ●

POST htt ●

POST htt ●

GET http ●

GET http ●

POST htt ●

>

+

...

No Environment

▼

🔖

https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy

📁 Save ▼

✎ 📄

</>

POST ▼

https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy

Send ▼

Params Authorization Headers (7) Body Pre-request Script Tests Settings Cookies

Query Params

KEY	VALUE	DESCRIPTION	...	Bulk Edit
Key	Value	Description		

Create a Web App

<

PUT http ●

DEL http ●

POST htt ●

GET http ●

GET http ●

POST htt ●

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GET http ●

GET http ●

POST htt ●

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+

...

No Environment

▼

📄

https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy

Save ▼

✎

🗨

</

POST ▼ https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy

Send ▼

Params

Authorization ●

Headers (8)

Body

Pre-request Script

Tests

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Type

Basic Auth ▼

The authorization header will be automatically generated when you send the request.
[Learn more about authorization](#) ➤⚠ Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. [variables](#) ➤

Username

\$msdocs-python-webapp-quickstart-CMP

Password

.....

☐ Show Password

Create a Web App

< PUT http ● DEL http ● POST htt ● GET http ● GET http ● POST htt ● POST htt ● POST htt ● GET http ● GET http ● POST htt ● > + ... No Environment ▼

https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy Save ▼

POST ▼ https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy Send ▼

Params Authorization ● Headers (8) **Body** Pre-request Script Tests Settings Cookies

☐ none ☐ form-data ☐ x-www-form-urlencoded ☐ raw ☒ **binary** ☐ GraphQL

Select File

Create a Web App



Navigation bar: < PUT http ● DEL http ● POST htt ● GET http ● GET http ● POST htt ● POST htt ● POST htt ● GET http ● GET http ● POST htt ● > + ... No Environment ▼

URL: `https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy` Save ▼ [Edit] [Comments]

POST ▼ `https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy` **Send** ▼

Params Authorization ● Headers (9) Body ● Pre-request Script Tests Settings

☐ none ☐ form-data ☐ x-www-form-urlencoded ☐ raw ☒ binary ☐ GraphQL

app.zip ×

Cookies

Create a Web App

The screenshot shows a REST client interface with a sequence of request history at the top. The active request is a POST to `https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy`. The interface includes tabs for Params, Authorization, Headers (10), Body, Pre-request Script, Tests, and Settings. The Body tab is selected, showing a file named `app.zip` with a warning icon. The bottom status bar indicates a successful response with status 200 OK, a time of 1 m 26.46 s, and a size of 527 B. The response body is currently empty, and the 'Pretty' view is selected.

< PUT http ● DEL http ● POST htt ● GET http ● GET http ● POST htt ● POST htt ● POST htt ● GET http ● GET http ● POST htt ● > + ∞ No Environment

`https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy` Save </>

POST `https://msdocs-python-webapp-quickstart-CMP.scm.azurewebsites.net/api/zipdeploy` Send

Params Authorization ● Headers (10) Body ● Pre-request Script Tests Settings Cookies

☐ none ☐ form-data ☐ x-www-form-urlencoded ☐ raw ☒ binary ☐ GraphQL

⚠ app.zip ×

Body Cookies (2) Headers (6) Test Results Status: 200 OK Time: 1 m 26.46 s Size: 527 B Save Response







Pretty Raw Preview Visualize Text

1

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Refresh

Time	Commit ID	Commit Author	Status	Message
Monday, March 27, 2023 (1)				
10:45:48 PM +02:00	b6941d5	N/A	Success (Active)	Created via a push deployment

Create a Web App



Welcome to Azure

Could you please tell me your name?

Say Hello

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

 Microsoft Azure

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 msdocs-python-webapp-quickstart-CMP | App Service logs ☆ ...

Web App

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D diagnostic settings

App Service logs

Log stream

Application logging ⓘ

Off **File System**

Quota (MB) * ⓘ

35

Retention Period (Days) ⓘ

30 ✓

Download logs

FTP/deployment username

No FTP/deployment user set

FTP

ftp://waws-prod-blu-405.ftp.azurewebsites.windows.net/site/wwwroot

FTPS

https://waws-prod-blu-405.ftp.azurewebsites.windows.net/site/wwwroot

Create a Web App



Welcome to Azure

Could you please tell me your name?

Say Hello

Create a Web App



msdocs-python-webapp-quickstart-cmp.azurewebsites.net/hello



Hello Omar

It is nice to meet you!

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

Web App

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Reconnect



Copy



Pause



Clear

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Export template

Support + troubleshooting

Resource health

New Support Request

```
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
2023-03-27T21:02:59.509225101Z 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"
```