Azure Function Apps

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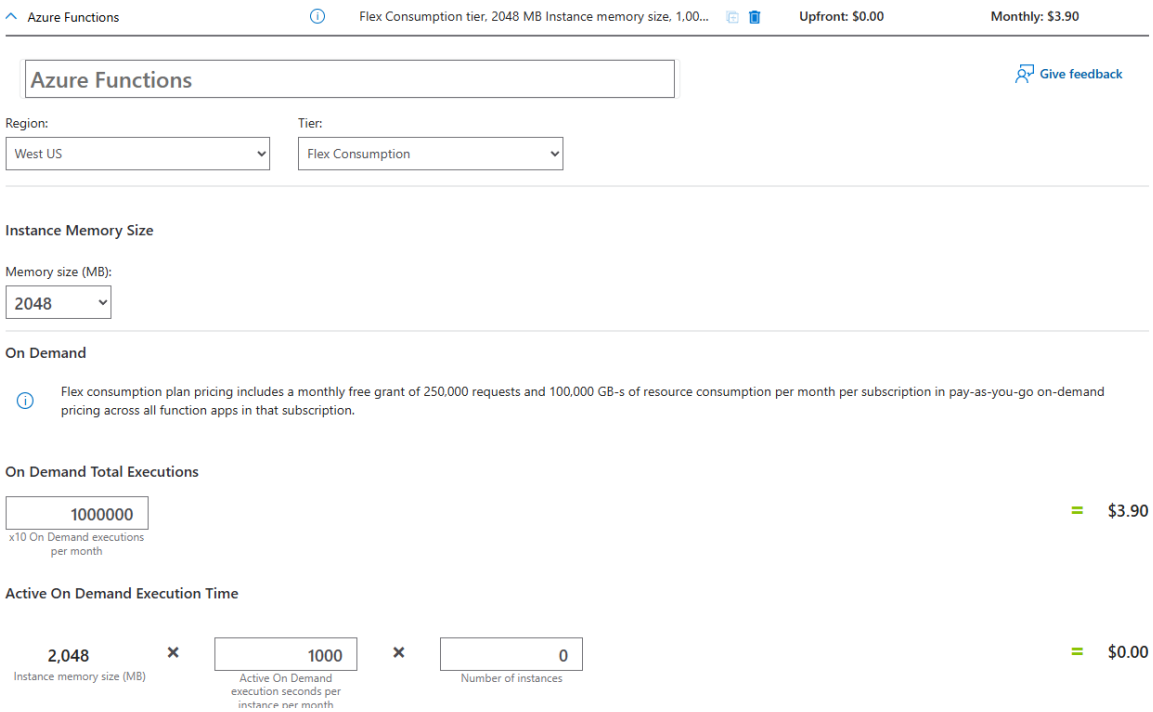
Azure Function Apps

Overview

- Service for running code scripts in the cloud
- Extension of App service
- Support many languages, e.g. C#, Java, JavaScript, Python, PowerShell, …
- Use your own dependencies
- Developed in VS Code or Portal
- Integration with GitHub or Azure DevOps
- Open source

Azure Function Apps

Pricing



https://azure.microsoft.com/en-us/pricing/calculator/

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How does it work

Core Triggers

- HTTP Trigger
- Timer Trigger
- Blob Trigger
- Queue Trigger

Messaging Triggers

Service Bus Trigger

Event Hub Trigger

…

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Bindings

Type	1.x[1]	2.x and later[2]	Trigger	Input	Output
Blob Storage	✓	✓	✓	✓	✓
Azure Cosmos DB	✓	✓	✓	✓	✓
Azure Data Explorer		✓		✓	✓
Azure SQL		✓	✓	✓	✓
Dapr[4]		✓	✓	✓	✓
Event Grid	✓	✓	✓		✓
Event Hubs	✓	✓	✓		✓
HTTP and webhooks	✓	✓	✓		✓
IoT Hub	✓	✓	✓		
Kafka[3]		✓	✓		✓
Mobile Apps	✓			✓	✓

https://learn.microsoft.com/en-us/azure/azure-functions/functions-triggers-bindings?tabs=isolated-process%2Cnode-v4%2Cpython-v2&pivots=programming-language-python

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Create function

```
# 1. Create a new directory for your function app and navigate into it
mkdir MyPythonFuncApp
cd MyPythonFuncApp

# 2. (Optional but recommended) Create and activate a Python virtual environment
python -m venv .venv
source .venv/bin/activate  # On Windows, use: .venv\Scripts\activate

# 3. Initialize the function app project for Python
func init --worker-runtime python
```

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Create function

```
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1>func init --worker-runtime python
Found Python version 3.13.5 (py).
The new Python programming model is generally available. Learn more at https://aka.ms/pythonprogrammingmodel
Writing requirements.txt
Writing .funcignore
Writing function_app.py
Writing .gitignore
Writing host.json
Writing local.settings.json
Writing C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1\.vscode\extensions.json
```

Azure Function Apps

Create function

```
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1>func new
Use the up/down arrow keys to select a template:
Blob trigger
CosmosDB trigger
Dapr Publish Output Binding
Dapr Service Invocation Trigger
Dapr Topic Trigger
Durable Functions Entity Trigger
Durable Functions Orchestration
Blob trigger (using EventGrid source)
EventGrid trigger
EventHub trigger
HTTP trigger
MCP trigger
MySQL trigger
Queue trigger
ServiceBus Queue trigger
ServiceBus Topic trigger
Timer Trigger
```

Azure Function Apps

Create trigger

```
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1>func new
Use the up/down arrow keys to select a template:Function Name: [http_trigger]
Use the up/down arrow keys to select a Auth Level:Appending to C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1\function_app.py
The function "http_trigger" was created successfully from the "HTTP trigger" template.
```

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Start function locally and test

```
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1>func start
Found Python version 3.13.5 (py).

Azure Functions Core Tools
Core Tools Version:       4.2.2+78afd8b84c8e31f0ddac570ba9e8128eefbd3d4a (64-bit)
Function Runtime Version: 4.1041.200.25360

[2025-11-06T17:22:28.477Z] Worker process started and initialized.

Functions:

        http_trigger:  http://localhost:7071/api/http_trigger

For detailed output, run func with --verbose flag.
[2025-11-06T17:22:32.963Z] Executing 'Functions.http_trigger' (Reason='This function was p
[2025-11-06T17:22:33.012Z] Executed 'Functions.http_trigger' (Succeeded, Id=14f1c434-d7da-
```

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Install Requirements

pip install –r requirements.txt

```
azure-functions
fastapi
uvicorn
pydantic
onnxruntime
Pillow
numpy
requests
```

requirements.txt

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Adapt function_app.py

```
import azure.functions as func
import json
import logging
import onnxruntime as ort
from PIL import Image
import numpy as np
import io
import requests


app = func.FunctionApp()


# Load ONNX model at module level
session = ort.InferenceSession(
    "bin_class_model.onnx",
    providers=["CPUExecutionProvider"],
)


@app.route(route="predict", auth_level=func.AuthLevel.ANONYMOUS)
def predict(req: func.HttpRequest) -> func.HttpResponse:
    logging.info('Python predict function processed a request.')


    # Get image_url from query params or request body
    image_url = req.params.get('image_url')
    if not image_url:
        try:
            req_body = req.get_json()
        except ValueError:
            pass
        else:
            image_url = req_body.get('image_url') if req_body else None


    if not image_url:
        return func.HttpResponse(
            json.dumps({"error": "image_url parameter is required"}),
            status_code=400,
            mimetype="application/json"
        )


    # Download image
    try:
        headers = {
            "User-Agent": "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/126.0.0.0 Safari/537.36",
            "Accept": "text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7",
            "Accept-Language": "en-US,en;q=0.9",
            "Referer": "https://www.google.com/",
            "Connection": "keep-alive",
```

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Test Endpoint

curl "http://127.0.0.1:7071/api/predict?image_url=https://upload.wikimedia.org/wikipedia/commons/8/8a/Muffin_NIH.jpg"

```
{"label": "chihuahua", "prob_chihuahua": 0.6972862305017932, "prob_muffin": 0.30271376949820683}
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI>
```

Azure Function Apps

Deploy to Cloud

```
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1>az login
Select the account you want to log in with. For more information on login with Azure CLI, see https://go.microsoft.com/fwlink/?linkid=2271136

Retrieving tenants and subscriptions for the selection...
The following tenants don't contain accessible subscriptions. Use `az login --allow-no-subscriptions` to have tenant level access.
258bd77a-7bbb-44db-855d-0833ab813c1b 'University of Warmia and Mazuria in Olsztyn'
f930300c-c97d-4019-be03-add650a171c4 'Fraunhofer'

[Tenant and subscription selection]

No     Subscription name     Subscription ID                       Tenant
-----  --------------------  ------------------------------------  --------------------------
[1] *  Azure subscription 1  9b8688c3-4700-4975-8bcf-8ad3a2248379  Gollnick Data Solutions GmbH

The default is marked with an *; the default tenant is 'Gollnick Data Solutions GmbH' and subscription is 'Azure subscription 1' (9b8688c3-4700-4975-8bcf-8ad3
a2248379).
```

Azure Function Apps

Deploy to Cloud

- Create resource group
- Create storage container

```
FUNCTION_APP_NAME="my-python-func-app-$(date +%s)" # Generates a unique name

az functionapp create \
    --resource-group $RESOURCE_GROUP_NAME \
    --consumption-plan-location $LOCATION \
    --os-type Linux \
    --runtime python \
    --runtime-version 3.10 \
    --functions-version 4 \
    --name $FUNCTION_APP_NAME \
    --storage-account $STORAGE_ACCOUNT_NAME
```

Command line

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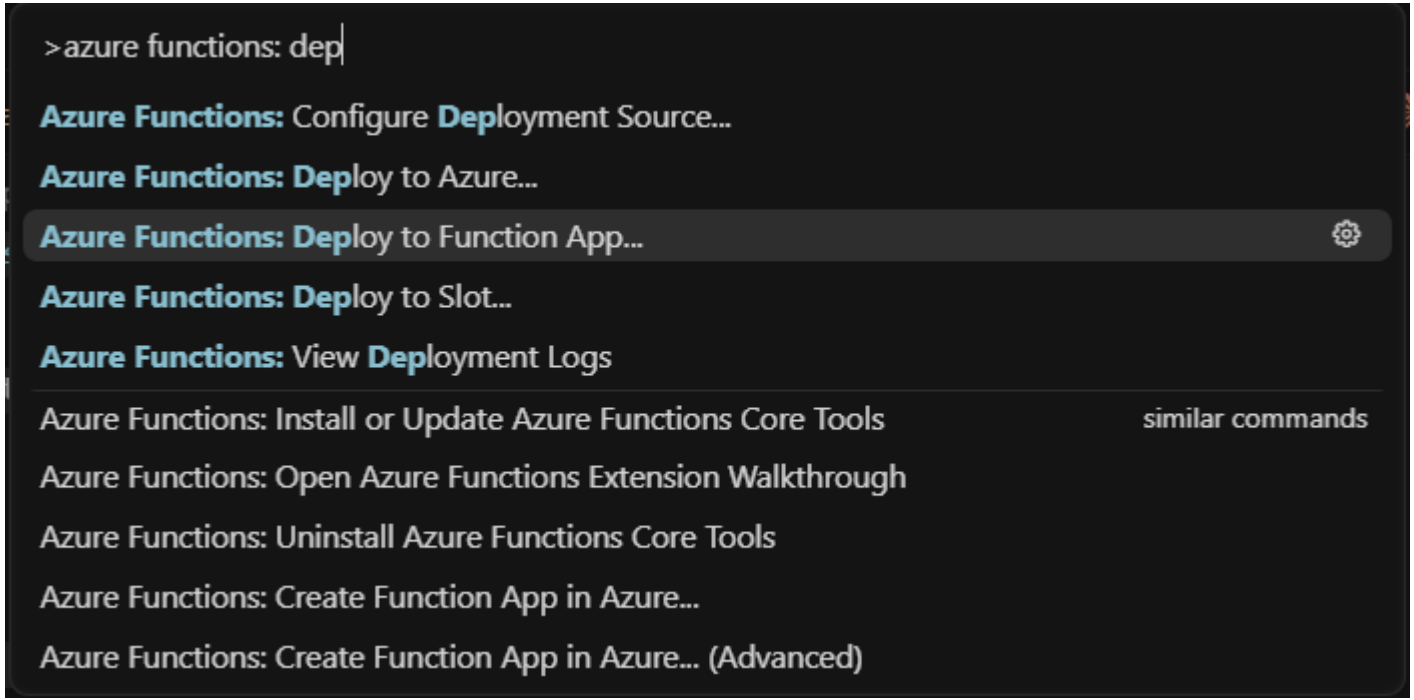
Deploy to Cloud



Using Azure functions extension

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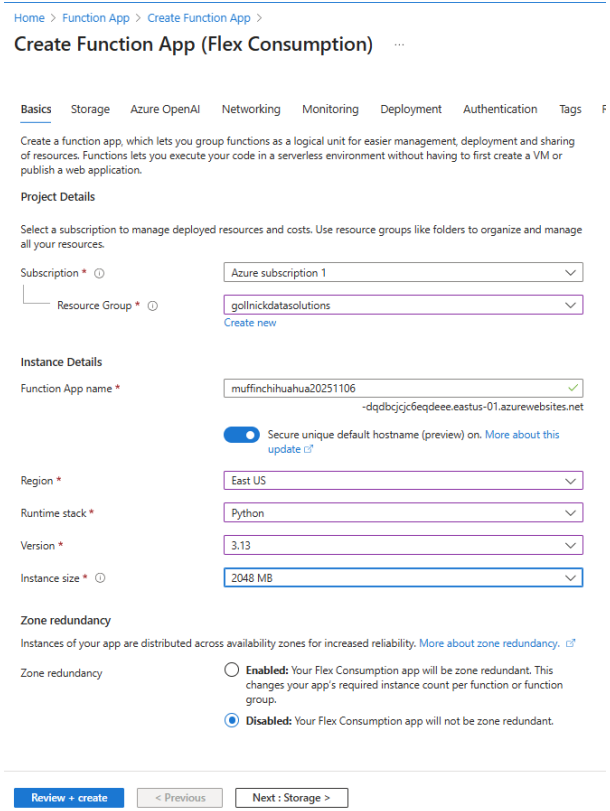
Deploy to Cloud



Using Azure Portal

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Deploy to Cloud

func azure functionapp publish muffinchihuahua20251106

```
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1>func azure functionapp publish muffinchihuahua20251106
Getting site publishing info...
[2025-11-06T17:52:53.040Z] Starting the function app deployment...
[2025-11-06T17:52:53.045Z] Creating archive for current directory...
Performing remote build for functions project.
```

Using CLI

Azure Function Apps

Test Deployment

curl --ssl-no-revoke "https://muffinchihuahua20251106-dqdbcjcjc6eqdeee.eastus-01.azurewebsites.net/api/predict?image_url=https://upload.wikimedia.org/wikipedia/commons/8/8a/Muffin_NIH.jpg"

```
(.venv) C:\Projects\LiveTrainings\Bildungsurlaub_AzureAI\scripts\azure_func1>curl --ssl-no-revoke "https://muffinchihuahua20251106-dqdbcjcjc6eqdeee.eastus-01.azurewebsites.net/api/predict?image_url=https://upload.wikimedia.org/wikipedia/commons/8/8a/Muffin_NIH.jpg"
{"label": "chihuahua", "prob_chihuahua": 0.6972862305017932, "prob_muffin": 0.30271376949820683}
```