**CI/CD Pipeline Setup Using Bash, Python, and Cron on an EC2 Instance**

**Step 1: Set Up a Simple HTML Project**

* Create a simple HTML file (index.html) locally or directly in your GitHub repository.
* Push the HTML project to a public GitHub repository.

git init

git add .

git commit -m "Initial commit"

git remote add origin https://github.com/username/my-html-project.git

git push -u origin main

Step 2: Set Up an AWS EC2 Instance with Nginx

* Launch an EC2 instance
* **SSH into the EC2 instance**:

ssh -i "your-key.pem" ec2-user@<ec2-public-ip>

* **Install Nginx**:

sudo yum install nginx -y # For Amazon Linux

sudo apt-get install nginx -y # For Ubuntu

* **Start and enable Nginx**:

sudo systemctl start nginx

sudo systemctl enable nginx

* **Update the Nginx configuration** to serve your HTML project:

Create a configuration file for your project:

sudo nano /etc/nginx/conf.d/html-project.conf

Add the following configuration:

server {

listen 80;

server\_name <your-ec2-public-ip>;

location / {

root /var/www/html/my-html-project;

index index.html;

}

}

Restart Nginx:

sudo systemctl restart nginx

* **Check Nginx logs for troubleshooting**:

sudo tail -f /var/log/nginx/error.log

Step 3: Write a Python Script to Check for New Commits

* **Create the Python script** to check for new commits:

sudo nano /home/ec2-user/check\_commits.py

* **Add the following code to check\_commits.py**:

import requests

import os

import sys

# GitHub repository details

REPO\_OWNER = 'Nikhil4498'

REPO\_NAME = 'my-html-project'

GITHUB\_API\_URL = f'https://api.github.com/repos/Nikhil4498/my-html-project/commits'

# File to store the last commit SHA

LAST\_COMMIT\_FILE = '/home/ec2-user/last\_commit.txt'

def get\_latest\_commit():

    response = requests.get(GITHUB\_API\_URL)

    if response.status\_code == 200:

        commits = response.json()

        return commits[0]['sha']

    else:

        print(f"Failed to fetch commits: {response.status\_code}")

        return None

def get\_stored\_commit():

    if os.path.exists(LAST\_COMMIT\_FILE):

        with open(LAST\_COMMIT\_FILE, 'r') as f:

            return f.read().strip()

    return None

def update\_stored\_commit(sha):

    with open(LAST\_COMMIT\_FILE, 'w') as f:

        f.write(sha)

def main():

    latest\_commit = get\_latest\_commit()

    if not latest\_commit:

        sys.exit(1)

    stored\_commit = get\_stored\_commit()

    if latest\_commit != stored\_commit:

        print("New changes detected")

        update\_stored\_commit(latest\_commit)

        sys.exit(0)

    else:

        print("No new changes")

        sys.exit(1)

if \_\_name\_\_ == "\_\_main\_\_":

    main()

* **Test the script** by running it manually:

python3 /home/ec2-user/check\_commits.py

Step 4: Write a Bash Script to Deploy the Code

* **Create the deployment script**:

sudo nano /home/ec2-user/deploy\_code.sh

* **Add the following code to deploy\_code.sh**:

#!/bin/bash

# This line tells the computer this is a bash script

REPO\_URL="https://github.com/Nikhil4498/my-html-project.git"

REPO\_DIR="/var/www/html/my-html-project"

WEBSITE\_DIR="/var/www/your\_website"

# These lines set up some information about where your files are

# Pull latest changes

cd $REPO\_DIR || exit

git pull origin main

# This part goes to your local copy of the website and gets the latest changes

# Copy files to website directory

rsync -av --delete $REPO\_DIR/ $WEBSITE\_DIR/

# This copies the new files to where Nginx can find them

# Restart Nginx

sudo systemctl restart nginx

# This restarts Nginx to make sure it sees the new files

echo "Website updated successfully"

# This prints a message saying the update is done

* **Make the script executable**:

chmod +x /home/ec2-user/deploy\_code.sh

Step 5: Set Up a Cron Job to Run the Python Script

* **Create a wrapper script** that runs both the Python and Bash scripts:

sudo nano /home/ec2-user/ci\_cd\_wrapper.sh

* **Add the following code**:

#!/bin/bash

# Run the Python script to check for changes

python3 /path/to/check\_github.py

# If the Python script exits with 0 (changes detected), run the update script

if [ $? -eq 0 ]; then

/path/to/update\_website.sh

Fi

* **Make the wrapper script executable**:

chmod +x /home/ec2-user/ci\_cd\_wrapper.sh

* **Set up a cron job** to run the script every 5 minutes:

crontab -e

* **Add the following line** to the cron file:

\*/5 \* \* \* \* /home/ec2-user/ci\_cd\_wrapper.sh >> /home/ec2-user/ci\_cd.log 2>&1

* **Save and exit** the cron editor.

To exit the crontab once you have added the entry click ESC and type :wq

**Step 6: Test the CI/CD Pipeline**

* **Make a change in your GitHub repository** by editing the index.html file and committing the change.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <meta http-equiv="X-UA-Compatible" content="ie=edge">

    <title>CI-CD PIPELINE</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            margin: 0;

            padding: 0;

            background-color: #f4f4f9;

            color: #333;

        }

        .container {

            text-align: center;

            padding: 50px;

        }

        .header {

            font-size: 36px;

            margin-bottom: 20px;

        }

        .description {

            font-size: 20px;

            margin-bottom: 40px;

        }

        .photo-container img {

            width: 100%;

            max-width: 800px;

            height: auto;

            border-radius: 10px;

            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);

        }

    </style>

</head>

<body>

    <div class="container">

        <h1 class="header">Welcome to My CI-CD PIPELINE Web Page, Made the change for 3rd time</h1>

        <p class="description">This is a simple HTML page with a great design and a beautiful photo.</p>

        <div class="photo-container">

            <img src="https://png.pngtree.com/thumb\_back/fh260/background/20240325/pngtree-abstract-technology-chip-processor-background-circuit-board-and-html-code-3d-image\_15677714.jpg" alt="Beautiful Scenery">

        </div>

        <p class="description">Feel free to customize this page with your own images and content!</p>

    </div>

</body>

</html>

* Wait for the cron job to detect the change, or manually run the wrapper script:

/home/ec2-user/ci\_cd\_wrapper.sh

* **Check the Nginx log** and the /home/ec2-user/ci\_cd.log file for deployment updates.

tail -f /home/ec2-user/ci\_cd.log