Setting Up AWS Cloud9 for Python Development: A Beginner’s Guide

Overview

In this guide, you’ll set up **AWS Cloud9**, a cloud-based integrated development environment (IDE), to write and run a simple "Hello, World" Python program. This setup introduces you to Python development in the AWS ecosystem, providing a scalable, secure, and accessible environment for coding. Whether you’re a beginner learning to code or an experienced developer exploring AWS tools, this lab helps you understand how to leverage Cloud9 for Python projects. By the end, you’ll have a functional IDE, a working Python script, and the skills to troubleshoot common issues—all hosted on AWS.

Why it’s useful: AWS Cloud9 eliminates the need for local setup, offering a preconfigured environment accessible from any browser. It’s perfect for learning, prototyping, or collaborating on code in real time.

Prerequisites

Before starting, ensure you have:

- **An AWS Account**: Sign up at aws.amazon.com if you don’t have one.
- **Basic Permissions**: Your AWS user needs access to Cloud9 and EC2 (Cloud9 runs on an EC2 instance). Attach the AWSCloud9User policy or use an admin role.
- **Web Browser**: Chrome, Firefox, or Edge for accessing the AWS Console.
- **No Local Tools Required**: Cloud9 includes Python and a terminal—no need to install anything locally.

Step-by-Step Guide

Step 1: Log In to AWS and Access Cloud9

- **What**: Sign into the AWS Management Console and locate Cloud9.
- **Why**: This is your entry point to the cloud IDE.
- **How**:
  1. Go to console.aws.amazon.com.
  2. In the search bar, type “Cloud9” and select it from the Services menu.
  3. If no environment exists, click **Create environment**. Otherwise, select an existing one (e.g., reStart-python-cloud9) and click **Open IDE**.
- **CLI Option**: To list environments, use:
  bash

CollapseWrapCopy

```
aws cloud9 list-environments
```

- **Tip**: If the IDE doesn't load, ensure pop-ups are enabled in your browser.

Step 2: Create a New Python File

- **What**: Set up a file to hold your Python code.
- **Why**: This file will contain your "Hello, World" script, teaching you file management in Cloud9.
- **How**:
    1. In the Cloud9 IDE, go to **File > New From Template > Python File**.
    2. An untitled file opens. Clear any default code.
    3. Click **File > Save As**, name it hello-world.py, and save it in /home/ec2-user/environment.
- **Code Snippet**:
  python
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  ```
  # Empty file ready for your code
  ```
- **Note**: The .py extension tells Cloud9 this is a Python script.

Step 3: Open a Terminal in Cloud9

- **What**: Access the built-in terminal to run commands.
- **Why**: The terminal lets you verify your environment and execute scripts.
- **How**:
    1. In Cloud9, click the **+** icon at the top and select **New Terminal**.
    2. Verify your directory with:
       bash
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       ```
       pwd
       ```
       Output: /home/ec2-user/environment.
    3. Check Python versions:
       bash
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       ```
       python3 --version
       ```
       Expected: Python 3.6.x or higher.
- **Why It Matters**: Ensures you're using Python 3, the modern standard.

Step 4: Write and Run Your "Hello, World" Program

- **What**: Code a simple Python script and execute it.
- **Why**: This confirms your setup works and introduces Python basics.
- **How**:

   1. Open hello-world.py from the left navigation pane.
   2. Add this code:
      python
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      ```
      print("Hello, World")
      ```
   3. Save the file (**File > Save**).
   4. Click the **Run** (Play) button at the top of the IDE.
   5. Check the bottom pane for output: Hello, World.
- **CLI Alternative**: Run it manually:
  bash
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  ```
  python3 hello-world.py
  ```
- **Visual Aid**: Imagine the IDE split into three: file tree (left), editor (center), and output (bottom).

Step 5: Clean Up (Optional)

- **What**: Stop or delete your Cloud9 environment.
- **Why**: Avoid unnecessary costs since Cloud9 runs on EC2.
- **How**:
   1. In the AWS Console, go to Cloud9 > Environments.
   2. Select your environment and click **Delete**.
- **CLI Option**:
  bash
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  ```
  aws cloud9 delete-environment --environment-id <your-env-id>
  ```

Real-World Use Cases

This Cloud9 setup isn't just for labs—it's a foundation for real projects:

1. **Web Development**: Host a Flask or Django app in Cloud9, then deploy it to AWS Elastic Beanstalk.
   - **Extension**: Add a requirements.txt and install dependencies with pip3.
2. **Team Collaboration**: Share your Cloud9 environment with colleagues for pair programming.
   - **How**: Use the "Share" feature in Cloud9.
3. **Data Science**: Write Python scripts to analyze datasets, integrating with AWS S3 for storage.
   - **Example**: Pull CSV files from S3 using boto3 and process them in Cloud9.

4. **CI/CD Pipelines**: Prototype scripts for AWS CodePipeline, testing automation workflows.

Troubleshooting

Issue 1: Cloud9 IDE Won’t Open

- **Symptoms**: Blank screen or "Access Denied".
- **Solution**:
    1. Check your IAM permissions—ensure AWSCloud9User is attached.
    2. Verify pop-ups are allowed in your browser settings.
    3. Debug with CloudWatch Logs: Go to **CloudWatch > Logs > /aws/cloud9/**.

Issue 2: Python Version Mismatch

- **Symptoms**: Running python --version shows Python 2.x, not 3.x.
- **Solution**:
    1. Use python3 explicitly:
       bash
       CollapseWrapCopy
       ```
       python3 hello-world.py
       ```
    2. Update the default alias in the terminal:
       bash
       CollapseWrapCopy
       ```
       alias python=python3
       ```

Issue 3: "Hello, World" Doesn’t Print

- **Symptoms**: No output or syntax errors.
- **Solution**:
    1. Check for typos in print("Hello, World").
    2. Ensure you saved the file before running.
    3. Run manually in the terminal to isolate IDE issues:
       bash
       CollapseWrapCopy
       ```
       python3 hello-world.py
       ```

Issue 4: Environment Not Found

- **Symptoms**: Can’t locate reStart-python-cloud9.
- **Solution**:

1. Create a new environment in Cloud9 with default settings.
2. Use the CLI to list environments:
   bash
   CollapseWrapCopy
   ```
   aws cloud9 list-environments
   ```

Conclusion & Best Practices

You’ve now set up AWS Cloud9, written a Python script, and learned to troubleshoot common issues. This foundation opens doors to coding in the cloud with AWS. For optimization:

- **Security**: Use IAM roles instead of long-lived credentials in Cloud9.
- **Scalability**: Pair Cloud9 with Auto Scaling EC2 instances for larger projects.
- **Efficiency**: Save reusable scripts in S3 to access across environments.

Explore more at AWS Cloud9 Documentation. Happy coding on AWSAISetup.com!