

Configuration Manual

MSc Research Project
M.Sc. Cloud Computing

Srishti.
Student ID: x23189053

School of Computing
National College of Ireland

Supervisor: Sudarshan Deshmukh

National College of Ireland
Project Submission Sheet
School of Computing



Student Name:	Srishti.
Student ID:	x23189053
Programme:	M.Sc. Cloud Computing
Year:	2024-25
Module:	MSc Research Project
Supervisor:	Sudarshan Deshmukh
Submission Due Date:	12/12/2024
Project Title:	Configuration Manual
Word Count:	520
Page Count:	7

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.

ALL internet material must be referenced in the bibliography section. Students are required to use the Referencing Standard specified in the report template. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action.

Signature:	Srishti.
Date:	12th December 2024

PLEASE READ THE FOLLOWING INSTRUCTIONS AND CHECKLIST:

Attach a completed copy of this sheet to each project (including multiple copies).	<input type="checkbox"/>
Attach a Moodle submission receipt of the online project submission , to each project (including multiple copies).	<input type="checkbox"/>
You must ensure that you retain a HARD COPY of the project , both for your own reference and in case a project is lost or mislaid. It is not sufficient to keep a copy on computer.	<input type="checkbox"/>

Assignments that are submitted to the Programme Coordinator office must be placed into the assignment box located outside the office.

Office Use Only	
Signature:	
Date:	
Penalty Applied (if applicable):	

Configuration Manual

Srishti.
x23189053

1 Introduction

This document will consist of all the steps and procedure which were performed to execute the research implementation, and could be used to reproduce the environment and the results.

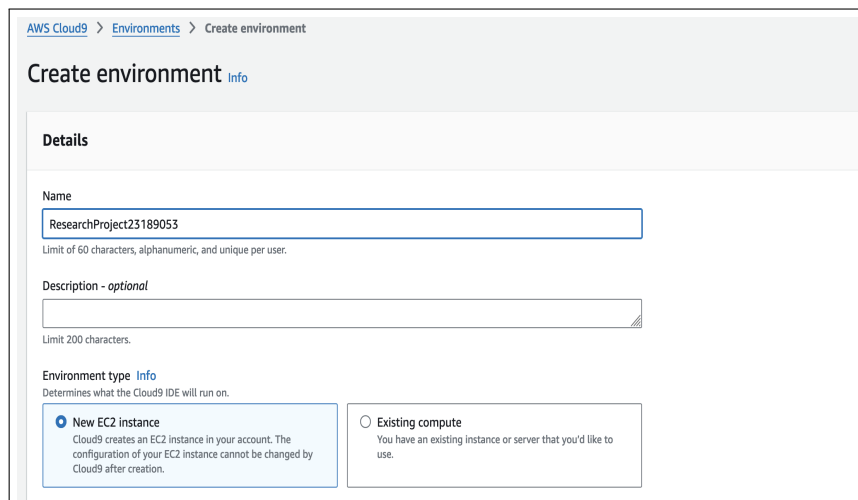
2 Setup on AWS Cloud

First navigate to **aws.amazon.com** and login with your credentials to create and configure all the resource on AWS Cloud.

2.1 AWS Cloud9 Configuration

The following steps will be performed to configure AWS cloud 9 :

- Search for Cloud9 in the search bar of AWS Management Console and click on Create New Environment and then give the name and select 'New EC2 instance' as shown in Figure 1.



The screenshot displays the 'Create environment' page in the AWS Cloud9 console. The breadcrumb navigation at the top reads 'AWS Cloud9 > Environments > Create environment'. The main heading is 'Create environment' with an 'Info' link. Below this is a 'Details' section. It contains a 'Name' field with the value 'ResearchProject23189053' and a note: 'Limit of 60 characters, alphanumeric, and unique per user.' There is also a 'Description - optional' text area with a note: 'Limit 200 characters.' Under the 'Environment type' section, there are two radio button options: 'New EC2 instance' (which is selected) and 'Existing compute'. The 'New EC2 instance' option has a description: 'Cloud9 creates an EC2 instance in your account. The configuration of your EC2 instance cannot be changed by Cloud9 after creation.' The 'Existing compute' option has a description: 'You have an existing instance or server that you'd like to use.'

Figure 1: Cloud 9 Configuration

- Then configure the EC2 settings as shown below in Figure 2 and choose Secure Shell as the connection method in the Network Settings.

New EC2 instance

Instance type [Info](#)
The memory and CPU of the EC2 instance that will be created for Cloud9 to run on.

☒ **t2.micro (1 GiB RAM + 1 vCPU)**
Free-tier eligible. Ideal for educational users and exploration.

☐ **t3.small (2 GiB RAM + 2 vCPU)**
Recommended for small web projects.

☐ **m5.large (8 GiB RAM + 2 vCPU)**
Recommended for production and most general-purpose development.

☐ **Additional instance types**
Explore additional instances to fit your need.

Platform [Info](#)
This will be installed on your EC2 instance. We recommend Amazon Linux 2023.

Amazon Linux 2

Timeout
How long Cloud9 can be inactive (no user input) before auto-hibernating. This helps prevent unnecessary charges.

30 minutes

Figure 2: Cloud 9 EC2 Configuration

- Once the environment is created we will connect our Git repository in the environment with the following commands which will also trigger the Code Pipeline
-
- `git init`
- `git remote add origin "GitHub Repo URL"`
- `git add .`
- `git commit -m "commit message"`
- `git push origin "branch-name"`

2.2 AWS Code Pipeline

Search for AWS Code Pipeline in the AWS Management Console and click on Create New Pipeline and perform the below steps

- In Create Options choose 'Create Custom Pipeline'
- Now in the Pipeline settings select the settings as shown below in Figure 3.
- Now to Add the Source Stage in the Pipeline we need to authenticate with our GitHub account and choose the repo configured in AWS Cloud 9 as shown in Figure 4. This will open a GitHub popup in the AWS Console for which pop ups should be enabled in the browser.

Choose pipeline settings [Info](#)

Step 2 of 6

Pipeline settings

Pipeline name
Enter the pipeline name. You cannot edit the pipeline name after it is created.

pipeline23189053

No more than 100 characters

Pipeline type

ⓘ You can no longer create V1 pipelines through the console. We recommend you use the V2 pipeline type with improved release safety, pipeline triggers, parameterized pipelines, and a new billing model.

Execution mode
Choose the execution mode for your pipeline. This determines how the pipeline is run.

☐ Superseded
A more recent execution can overtake an older one. This is the default.

☒ Queued (Pipeline type V2 required)
Executions are processed one by one in the order that they are queued.

☐ Parallel (Pipeline type V2 required)
Executions don't wait for other runs to complete before starting or finishing.

Service role

☐ New service role
Create a service role in your account

☒ Existing service role
Choose an existing service role from your account

Role ARN

arn:aws:iam::250738637992:role/service-role/AWSCodePipelineServiceRole-u: ✕

Figure 3: AWS Code Pipeline Configuration 1

Add source stage [Info](#)

Step 3 of 6

Source

Source provider
This is where you stored your input artifacts for your pipeline. Choose the provider and then provide the connection details.

GitHub (via OAuth app) ▼

Grant AWS CodePipeline access to your GitHub repository. This allows AWS CodePipeline to upload commits from GitHub to your pipeline.

Connected

✓ You have successfully configured the action with the provider. ✕

ⓘ The GitHub (via OAuth app) action is not recommended
The selected action uses OAuth apps to access your GitHub repository. This is no longer the recommended method. Instead, choose the GitHub (via GitHub App) action to access your repository by creating a connection. Connections use GitHub Apps to manage authentication and can be shared with other resources. [Learn more](#)

Repository

srishtikhurana-nci/SimpleApp ✕

Branch

main ✕

Change detection options
Choose a detection mode to automatically start your pipeline when a change occurs in the source code.

☐ GitHub webhooks (recommended)
Use webhooks in GitHub to automatically start my pipeline when a change occurs

☒ AWS CodePipeline
Use AWS CodePipeline to check periodically for changes

Figure 4: Adding Source in Code Pipeline

- Now to Add the Build Stage in the Pipeline we need to create a new Code Build Project and configure it as shown in Figure 5.

Developer Tools > CodeBuild > Build projects > Create build project

Continue to CodePipeline
Create a new CodeBuild build project and return to CodePipeline to finish configuring your pipeline.

Create build project

Project configuration

Project name
BuildProject23189053

A project name must be 2 to 255 characters. It can include the letters A-Z and a-z, the numbers 0-9, and the special characters - and _.

Public build access - optional
Public build access allows you to make the build results, including logs and artifacts, for this project available for the general public.

☐ Enable public build access

Additional configuration
Description, Build badge, Concurrent build limit, tags

Environment

Provisioning model info

☒ **On-demand**
Automatically provision build infrastructure in response to new builds.

☐ **Reserved capacity**
Use a dedicated fleet of instances for builds. A fleet's compute and environment type will be used for the project.

Environment image

☒ **Managed image**
Use an image managed by AWS CodeBuild

☐ **Custom image**
Specify a Docker image

Figure 5: Code Build Project

- Then Configure the build environment as shown below in Figure 6.
- Also configure the service role along with the custom buildspec file name for the build stage as shown in Figure 7.
- And finally enable the CloudWatch Logs as well for the Build Project.
- Once the Build project is configured, just select the name of the Build Project after choosing AWS Code Build as the provider.
- Also Select Build Type as Single Build and Artifacts from Source Stage.

Environment

Provisioning model [Info](#)

☒ On-demand
Automatically provision build infrastructure in response to new builds.

☐ Reserved capacity
Use a dedicated fleet of instances for builds. A fleet's compute and environment type will be used for the project.

Environment image

☒ Managed image
Use an image managed by AWS CodeBuild

☐ Custom image
Specify a Docker image

Compute

☒ EC2
Optimized for flexibility during action runs

☐ Lambda
Optimized for speed and minimizes the start up time of workflow actions

Operating system

Amazon Linux

Runtime(s)

Standard

Image

aws/codebuild/amazonlinux-x86_64-standard:5.0

Image version

Always use the latest image for this runtime version

☐ Use GPU-enhanced compute

Service role

☐ New service role
Create a service role in your account

☒ Existing service role
Choose an existing service role from your account

Figure 6: Code Build Environment

Service role

☐ New service role
Create a service role in your account

☒ Existing service role
Choose an existing service role from your account

Role ARN

arn:aws:iam::250738637992:role/service-role/CodeBuildServiceRole

☐ Allow AWS CodeBuild to modify this service role so it can be used with this build project

► Additional configuration

Timeout, privileged, certificate, VPC, compute type, environment variables, file systems, auto-retry, registry credential

Buildspec

Build specifications

☐ Insert build commands
Store build commands as build project configuration

☒ Use a buildspec file
Store build commands in a YAML-formatted buildspec file

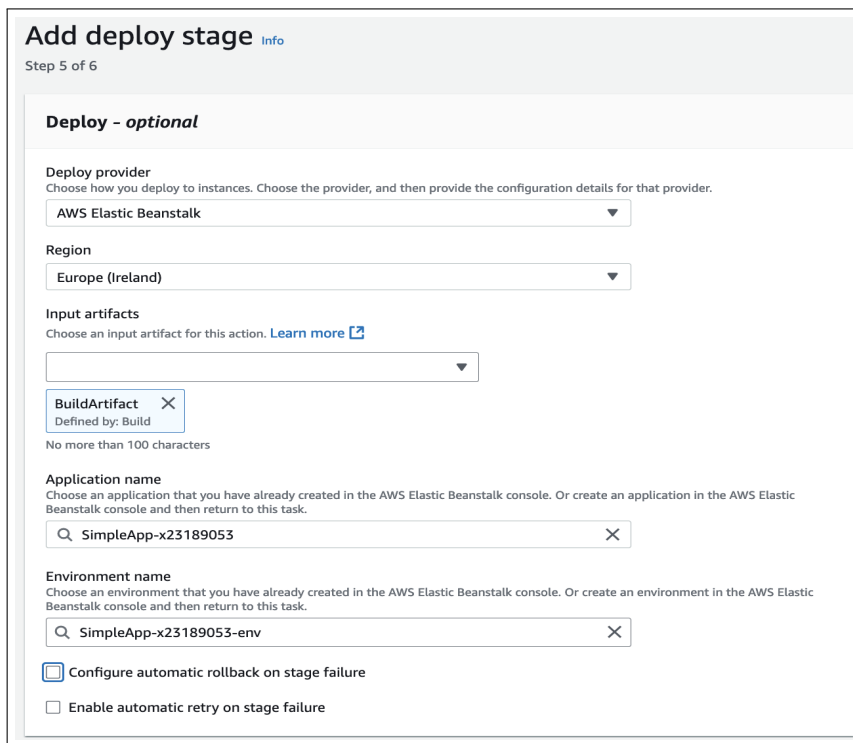
Buildspec name - optional

By default, CodeBuild looks for a file named buildspec.yml in the source code root directory. If your buildspec file uses a different name or location, enter its path from the source root here (for example, buildspec-two.yml or configuration/buildspec.yml).

buildspecWithoutGA.yml

Figure 7: Code Build Service Role and Buildspec

- After that configure the deploy stage as shown in Figure 8.



Add deploy stage [Info](#)

Step 5 of 6

Deploy - optional

Deploy provider
Choose how you deploy to instances. Choose the provider, and then provide the configuration details for that provider.

AWS Elastic Beanstalk ▼

Region
Europe (Ireland) ▼

Input artifacts
Choose an input artifact for this action. [Learn more](#) [🔗](#)

▼

BuildArtifact ✕
Defined by: Build

No more than 100 characters

Application name
Choose an application that you have already created in the AWS Elastic Beanstalk console. Or create an application in the AWS Elastic Beanstalk console and then return to this task.

SimpleApp-x23189053 ✕

Environment name
Choose an environment that you have already created in the AWS Elastic Beanstalk console. Or create an environment in the AWS Elastic Beanstalk console and then return to this task.

SimpleApp-x23189053-env ✕

☒ Configure automatic rollback on stage failure

☐ Enable automatic retry on stage failure

Figure 8: Configuration of Deploy Stage

2.3 AWS Lambda

Navigate to AWS Management Console Search and search for Lambda and click on create new Lambda Function. The configure the Lambda as shown below in Figure 9.

- Configure the name
- Choose Python 3.13 as the Runtime
- Choose the necessary service role
- Create Function

Create function [Info](#)

Choose one of the following options to create your function.

☒ **Author from scratch**
Start with a simple Hello World example.

☐ **Use a blueprint**
Build a Lambda application from sample code and configuration presets for common use cases.

☐ **Container image**
Select a container image to deploy for your function.

Basic information

Function name
Enter a name that describes the purpose of your function.

Function name must be 1 to 64 characters, must be unique to the Region, and can't include spaces. Valid characters are a-z, A-Z, 0-9, hyphens (-), and underscores (_).

Runtime [Info](#)
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.

Architecture [Info](#)
Choose the instruction set architecture you want for your function code.
☒ x86_64
☐ arm64

Permissions [Info](#)
By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.

▼ Change default execution role

Execution role
Choose a role that defines the permissions of your function. To create a custom role, go to the [IAM console](#).

☐ Create a new role with basic Lambda permissions
☒ Use an existing role
☐ Create a new role from AWS policy templates

Existing role
Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.

[View the x23189053-role-l6606z9k role](#) on the IAM console.

► Additional Configurations

Use additional configurations to set up code signing, function URL, tags, and Amazon VPC access for your function.

Cancel

Create function

Figure 9: AWS Lambda Function Configuration

7