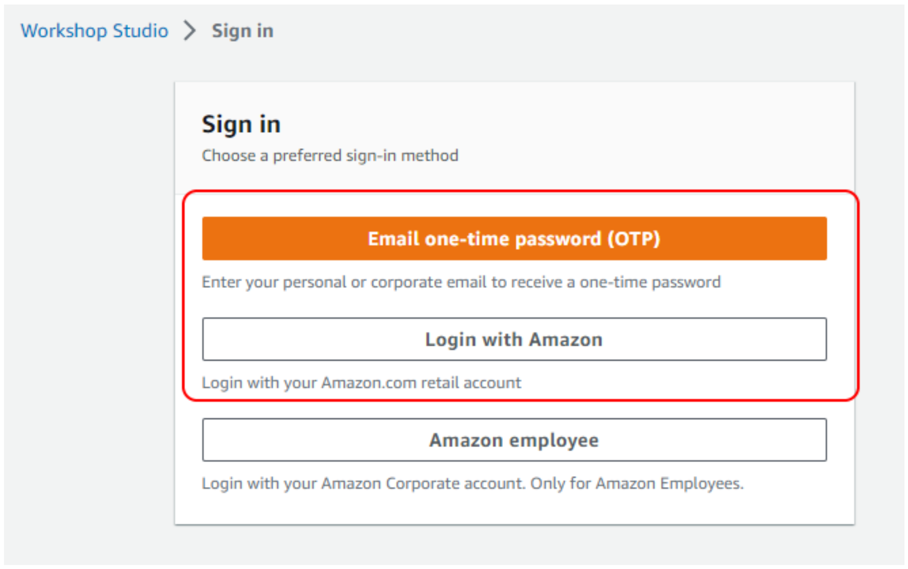
Developer Guide for Hackathon using NodeJS Language - Sep 2023

Introduction:

This document explains step by step how to use Apprunner and other AWS Services during the Hackathon for CITI developers, Also this showing a Sample code using **NodeJS Language** running on Apprunner .

Accessing AWS environment for the Hackathon

Navigate to the link provided to you by the instructor. If you do not have a specific URL for this event, you can navigate to https://catalog.us-east-1.prod.workshops.aws/join and you will be prompted for an event code later.
You will need to login to the environment using one of the two indicated methods below.



Sign in

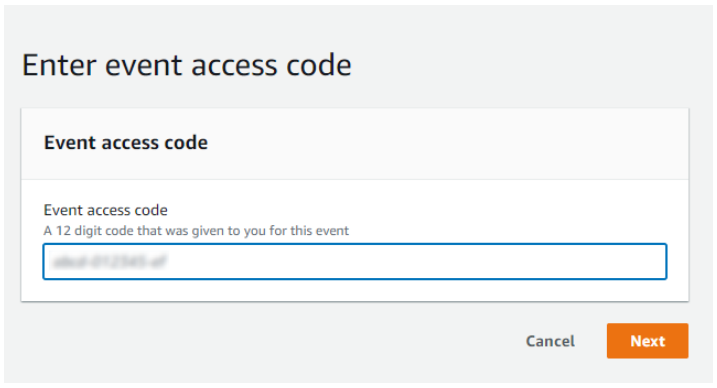
Choose a preferred sign-in method

Enter your personal or corporate email to receive a one-time password

Login with your Amazon.com retail account

Login with your Amazon Corporate account. Only for Amazon Employees.

If you are prompted for an event code, enter the value supplied by the lab instructor.



Enter event access code

Event access code

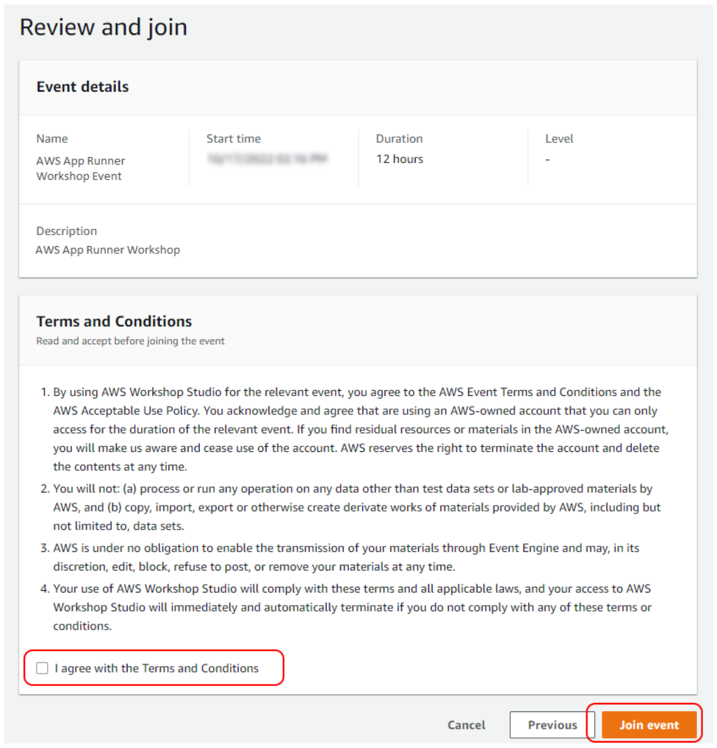
Event access code

A 12 digit code that was given to you for this event

[illegible]

Finish the login process

You will be prompted to accept the terms and conditions of the event. Read the page, and then select the **I agree with the Terms and Conditions** checkbox. Choose **Join event**.



Review and join

Event details

Name	Start time	Duration	Level
AWS App Runner Workshop Event	[illegible]	12 hours	-

Description

AWS App Runner Workshop

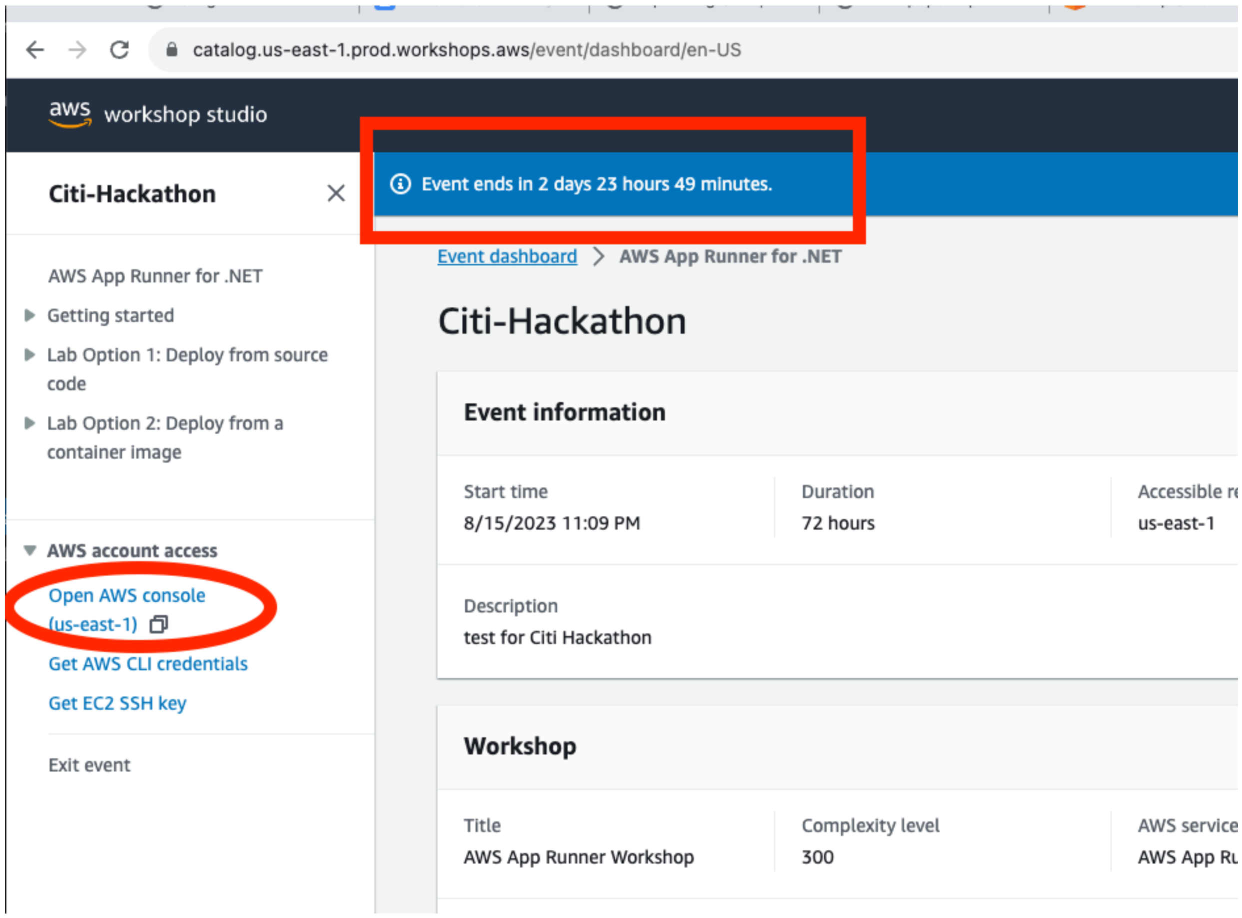
Terms and Conditions

Read and accept before joining the event

1. By using AWS Workshop Studio for the relevant event, you agree to the AWS Event Terms and Conditions and the AWS Acceptable Use Policy. You acknowledge and agree that are using an AWS-owned account that you can only access for the duration of the relevant event. If you find residual resources or materials in the AWS-owned account, you will make us aware and cease use of the account. AWS reserves the right to terminate the account and delete the contents at any time.
2. You will not: (a) process or run any operation on any data other than test data sets or lab-approved materials by AWS, and (b) copy, import, export or otherwise create derivate works of materials provided by AWS, including but not limited to, data sets.
3. AWS is under no obligation to enable the transmission of your materials through Event Engine and may, in its discretion, edit, block, refuse to post, or remove your materials at any time.
4. Your use of AWS Workshop Studio will comply with these terms and all applicable laws, and your access to AWS Workshop Studio will immediately and automatically terminate if you do not comply with any of these terms or conditions.

☐ I agree with the Terms and Conditions

The workshop dashboard will be shown. At any time, to log into the AWS console, choose the **Open AWS Console** link in the **AWS account access menu**.


catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US

aws workshop studio
Citi-Hackathon
AWS App Runner for .NET
Getting started
Lab Option 1: Deploy from source code
Lab Option 2: Deploy from a container image
AWS account access
Open AWS console (us-east-1)
Get AWS CLI credentials
Get EC2 SSH key
Exit event
Event dashboard > AWS App Runner for .NET

Event ends in 2 days 23 hours 49 minutes.

Citi-Hackathon

Event information

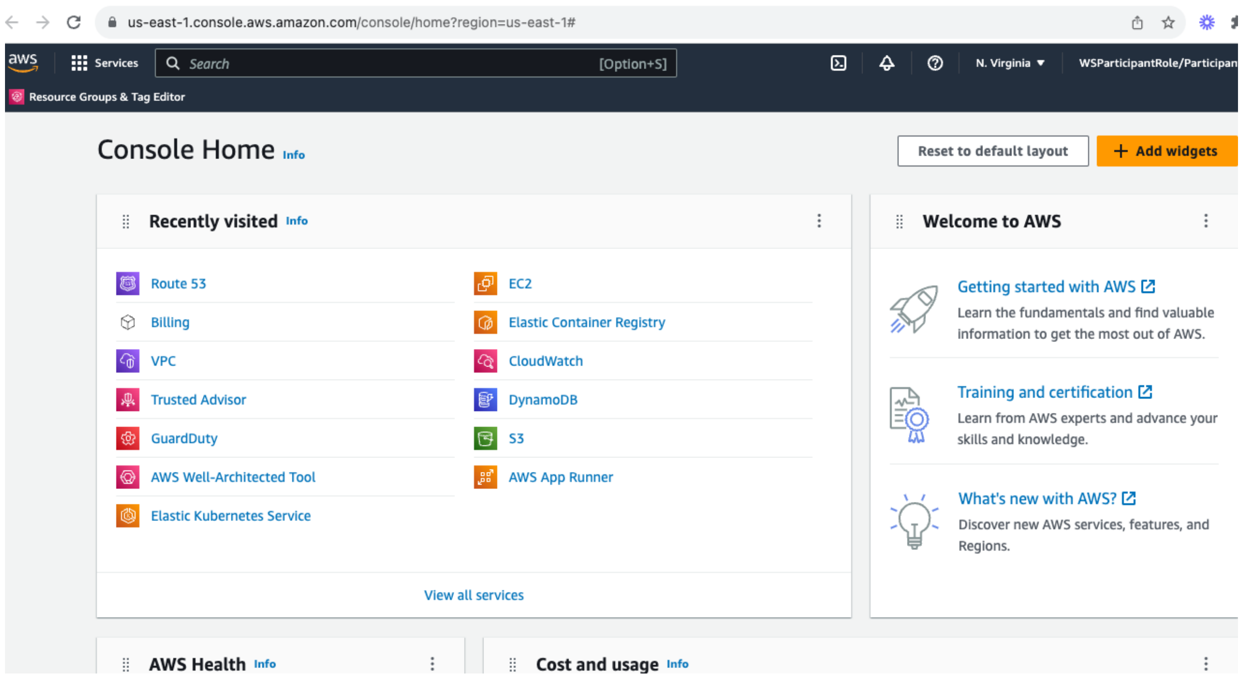
Start time: 8/15/2023 11:09 PM
Duration: 72 hours
Accessible re: us-east-1

Description: test for Citi Hackathon

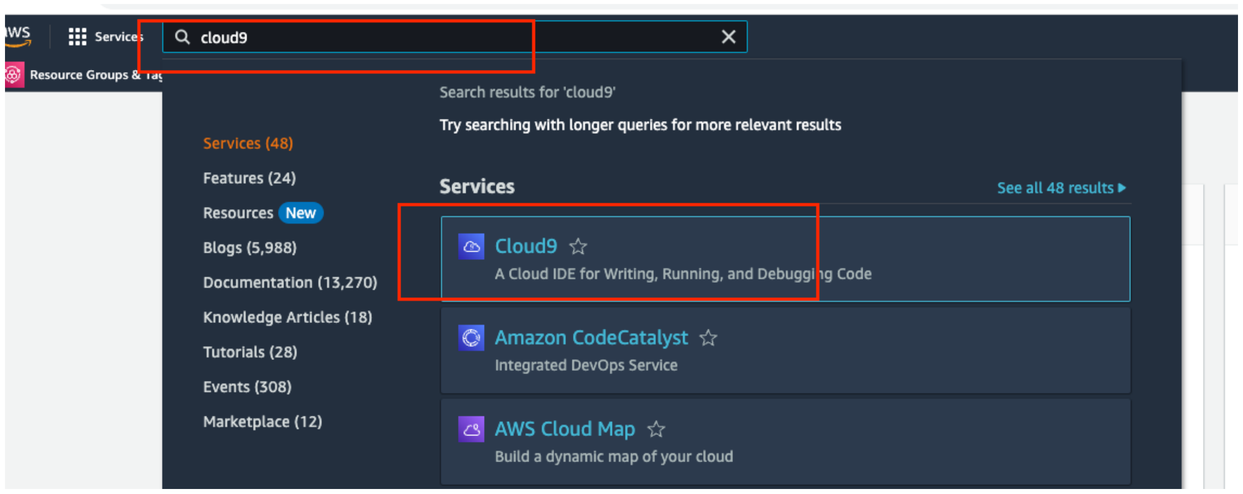
Workshop

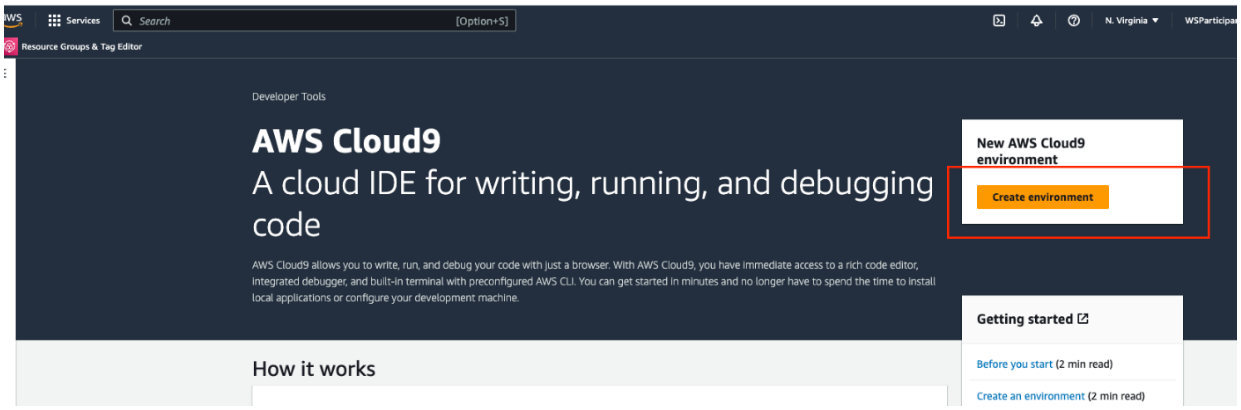
Title: AWS App Runner Workshop
Complexity level: 300
AWS service: AWS App Ru

Make sure you have access to AWS Services in the Console as shown below


us-east-1.console.aws.amazon.com/console/home?region=us-east-1#
Services
Search [Option+S]
N. Virginia
WSParticipantRole/Participan
Resource Groups & Tag Editor
Console Home Info
Reset to default layout
Add widgets
Recently visited Info
Route 53
EC2
Billing
Elastic Container Registry
VPC
CloudWatch
Trusted Advisor
DynamoDB
GuardDuty
S3
AWS Well-Architected Tool
AWS App Runner
Elastic Kubernetes Service
View all services
Welcome to AWS
Getting started with AWS
Learn the fundamentals and find valuable information to get the most out of AWS.
Training and certification
Learn from AWS experts and advance your skills and knowledge.
What's new with AWS?
Discover new AWS services, features, and Regions.
AWS Health Info
Cost and usage Info

Create a Cloud 9 Environment which will help on executing the AWS CLI commands and running big jobs (if needed) without disturbance





Developer Tools

AWS Cloud9

A cloud IDE for writing, running, and debugging code

AWS Cloud9 allows you to write, run, and debug your code with just a browser. With AWS Cloud9, you have immediate access to a rich code editor, integrated debugger, and built-in terminal with preconfigured AWS CLI. You can get started in minutes and no longer have to spend the time to install local applications or configure your development machine.

New AWS Cloud9 environment

Create environment

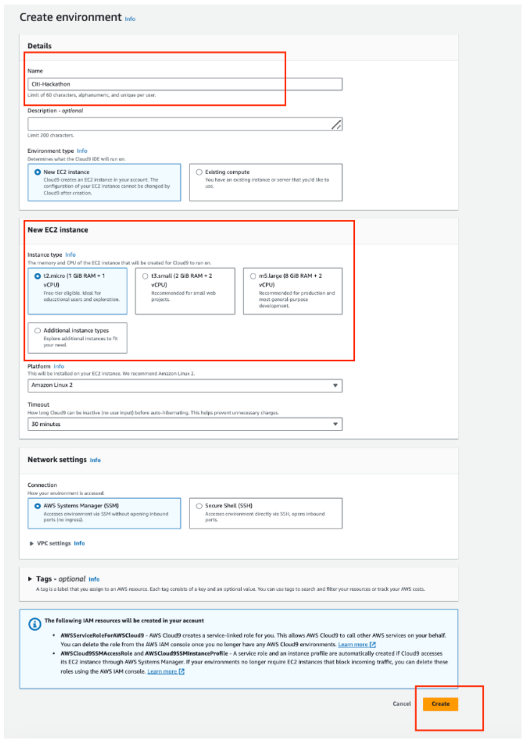
Getting started

Before you start (2 min read)

Create an environment (2 min read)

How it works

Give it a name and change the EC2 Instance size to be t3.small - Then Create the environment without changing any other configurations.



Create environment Info

Details

Name: Citi-Hackathon
Limit of 60 characters, alphanumeric, and unique per user.

Description - *optional*
Limit 200 characters.

Environment type Info
Determines what the Cloud9 IDE will run on.

[✓ New EC2 instance] Cloud9 creates an EC2 instance in your account. The configuration of your EC2 instance cannot be changed by Cloud9 after creation.
Existing compute: You have an existing instance or server that you'd like to use.

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 2.
Amazon Linux 2

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

Network settings Info

Connection
How your environment is accessed.

[✓ AWS Systems Manager (SSM)] Accesses environment via SSM without opening inbound ports (no ingress).
Secure Shell (SSH): Accesses environment directly via SSH, opens inbound ports.

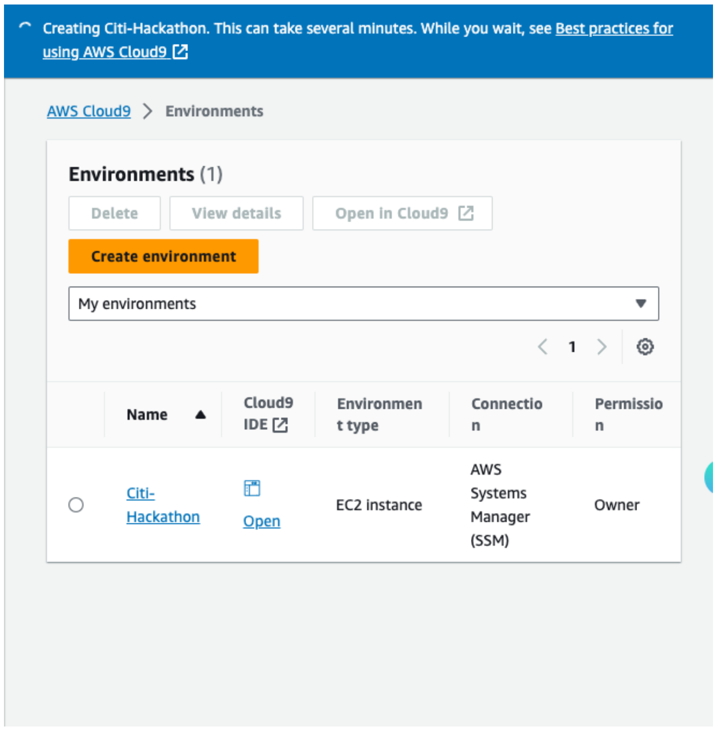
▸ VPC settings Info

▸ Tags - *optional* Info
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

The following IAM resources will be created in your account

- **AWSServiceRoleForAWSCloud9** - AWS Cloud9 creates a service-linked role for you. This allows AWS Cloud9 to call other AWS services on your behalf. You can delete the role from the AWS IAM console once you no longer have any AWS Cloud9 environments. Learn more
- **AWSCloud9SSMAccessRole** and **AWSCloud9SSMInstanceProfile** - A service role and an instance profile are automatically created if Cloud9 accesses its EC2 instance through AWS Systems Manager. If your environments no longer require EC2 instances that block incoming traffic, you can delete these roles using the AWS IAM console. Learn more

This can take couple of minutes to create your EC2 Instance for Cloud9

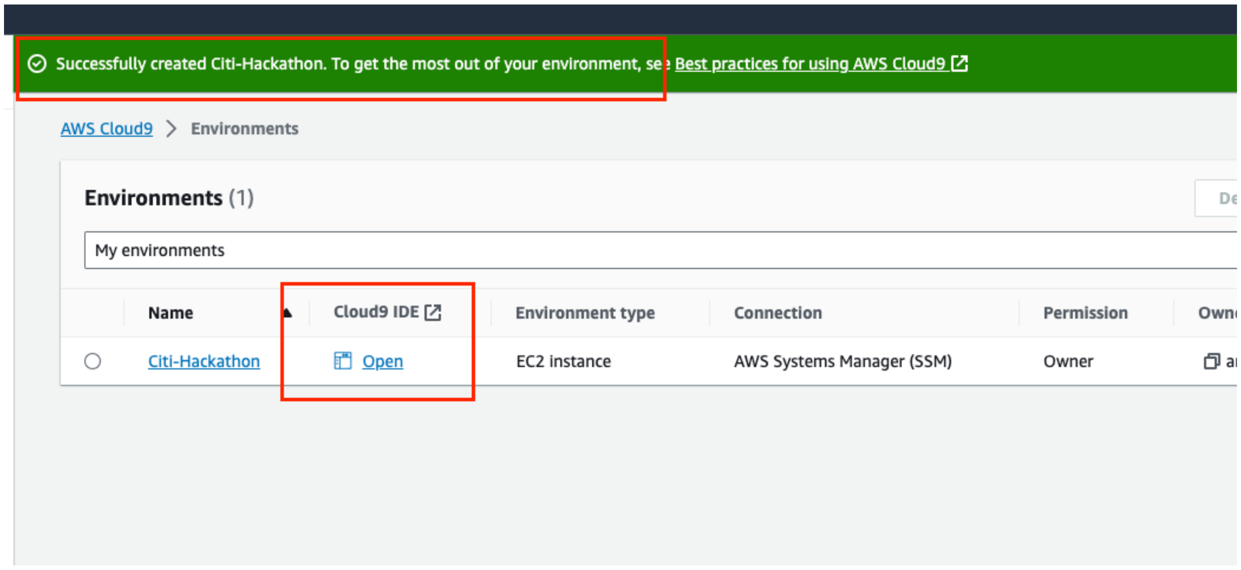

Creating Citi-Hackathon. This can take several minutes. While you wait, see Best practices for using AWS Cloud9

AWS Cloud9 > Environments

Environments (1)

	Name	Cloud9 IDE	Environment type	Connection	Permission
○	Citi-Hackathon	Open	EC2 instance	AWS Systems Manager (SSM)	Owner

Once creation completed Successfully, Click Open :

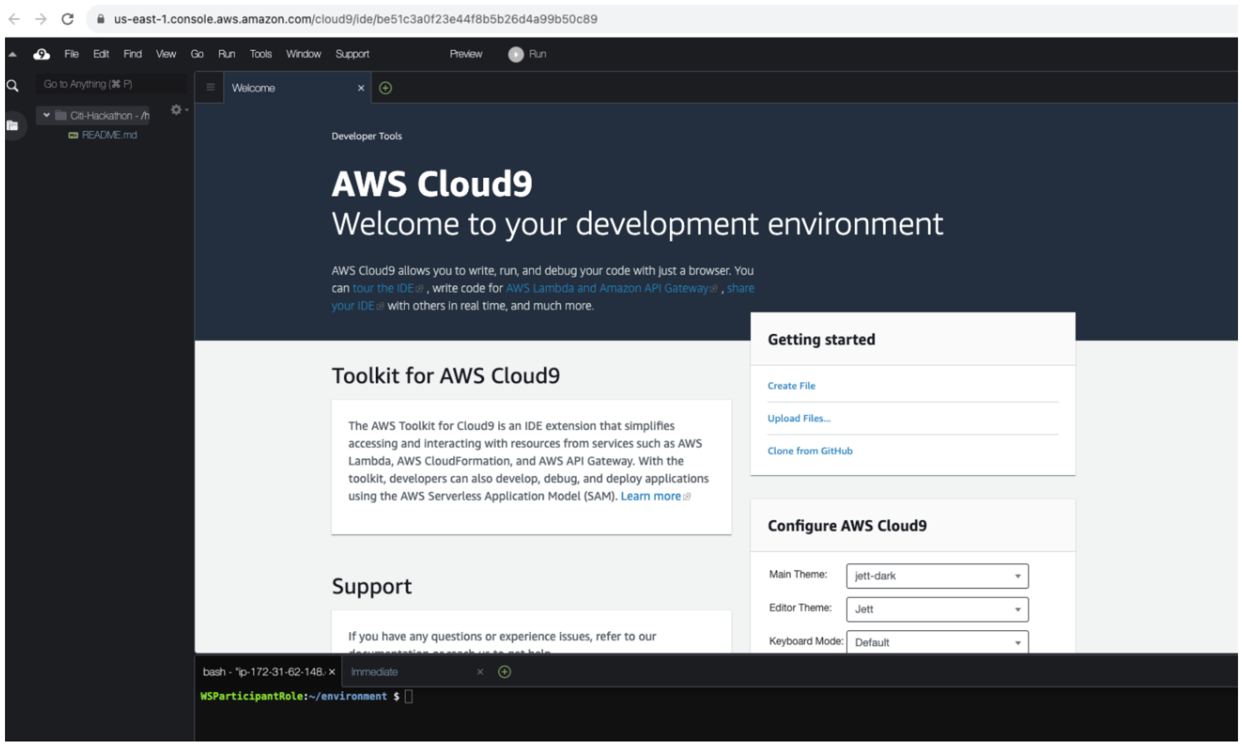

Successfully created Citi-Hackathon. To get the most out of your environment, see Best practices for using AWS Cloud9

AWS Cloud9 > Environments

Environments (1)

	Name	Cloud9 IDE	Environment type	Connection	Permission	Own
○	Citi-Hackathon	Open	EC2 instance	AWS Systems Manager (SSM)	Owner	ar

This is the Terminal of your Cloud9 Environment (Ec2 Instance)


us-east-1.console.aws.amazon.com/cloud9/ide/be51c3a0f23e44f8b5b26d4a99b50c89
File Edit Find View Go Run Tools Window Support Preview Run
Go to Anything (⌘ P)
Welcome
Citi-Hackathon - /h
README.md
Getting started
Create File
Upload Files...
Clone from GitHub
bash - "ip-172-31-62-148.
Immediate

Developer Tools

AWS Cloud9

Welcome to your development environment

AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.

Toolkit for AWS Cloud9

The AWS Toolkit for Cloud9 is an IDE extension that simplifies accessing and interacting with resources from services such as AWS Lambda, AWS CloudFormation, and AWS API Gateway. With the toolkit, developers can also develop, debug, and deploy applications using the AWS Serverless Application Model (SAM). Learn more

Support

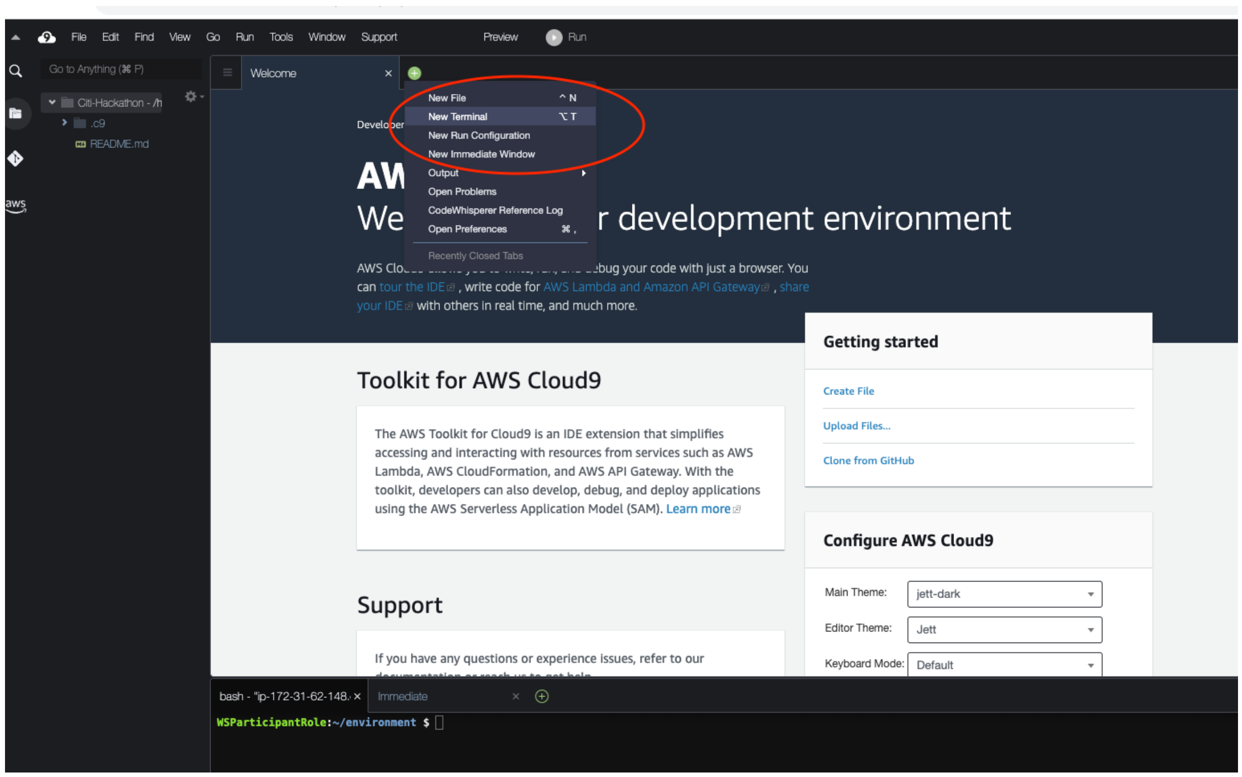
If you have any questions or experience issues, refer to our

Configure AWS Cloud9

Main Theme: jett-dark
Editor Theme: Jett
Keyboard Mode: Default

```
WSParticipantRole:~/environment $ 
```

You can open a new terminal using the green "+" sign as shown below:



Developer Tools

AWS Cloud9

Welcome to your development environment

AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.

Toolkit for AWS Cloud9

The AWS Toolkit for Cloud9 is an IDE extension that simplifies accessing and interacting with resources from services such as AWS Lambda, AWS CloudFormation, and AWS API Gateway. With the toolkit, developers can also develop, debug, and deploy applications using the AWS Serverless Application Model (SAM). Learn more

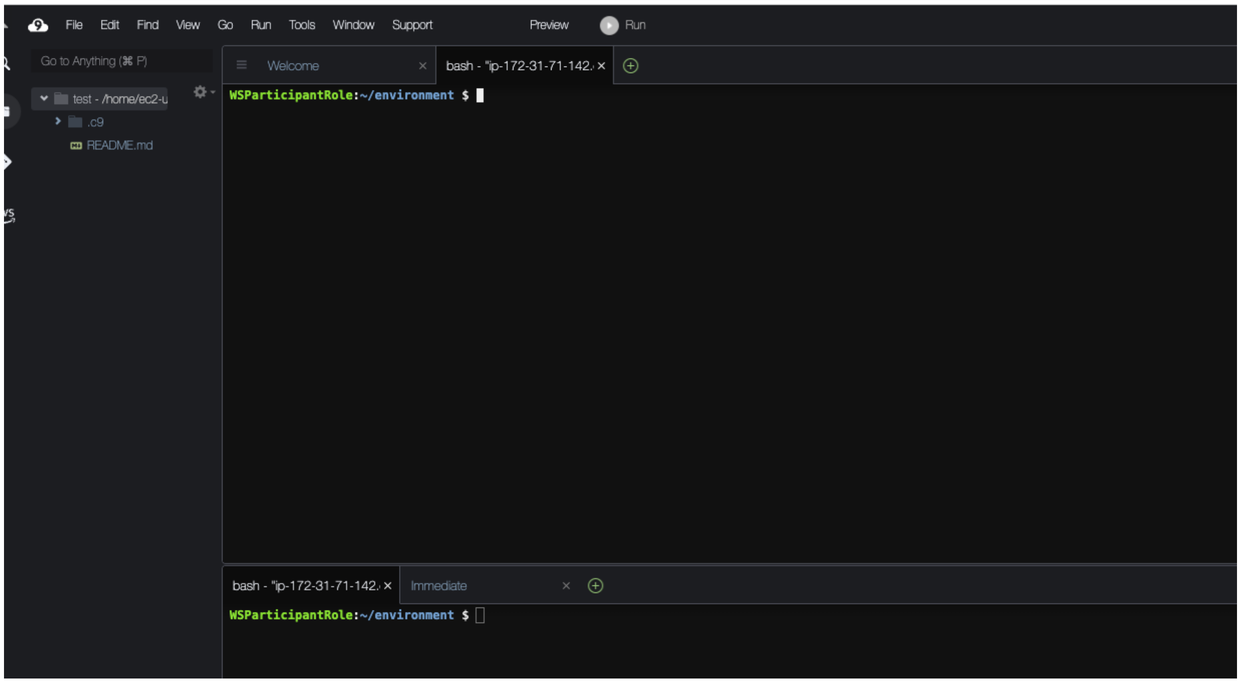
Support

If you have any questions or experience issues, refer to our

Configure AWS Cloud9

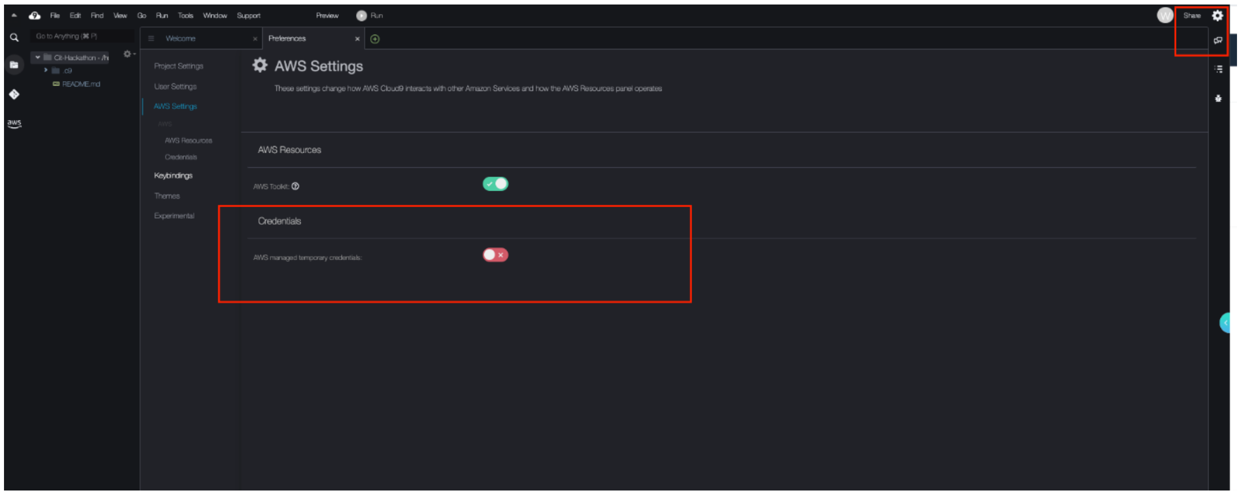
Main Theme: jett-dark
Editor Theme: Jett
Keyboard Mode: Default

```
WSParticipantRole:~/environment $ 
```


File Edit Find View Go Run Tools Window Support Preview Run
Go to Anything (⌘ P)
test - /home/ec2-u
.c9
README.md
Welcome
bash - "ip-172-31-71-142.
Immediate

```
WSParticipantRole:~/environment $
```

you need to disable the AWS Temporary credential from the Cloud9 machine from the machine Setting , you can find setting button on the up right corner then make sure AWS managed temporary credential is disabled as shown below:



AWS Settings

These settings change how AWS Cloud9 interacts with other Amazon Services and how the AWS Resources panel operates

AWS Resources

AWS Toolkit: on

Credentials

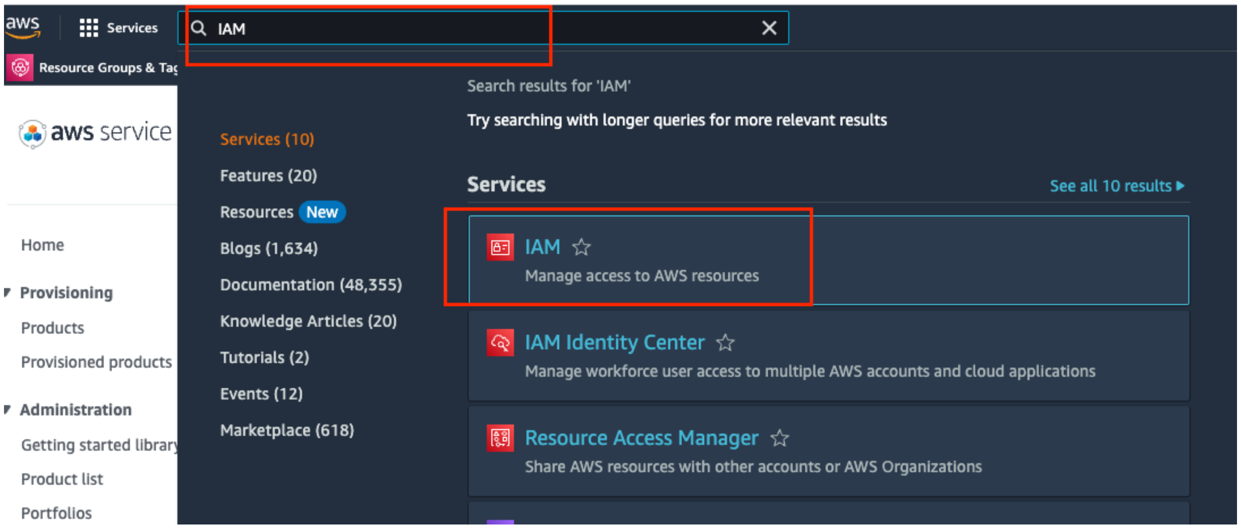
AWS managed temporary credentials: off

Now, We need to assign a proper IAM Permission to Cloud9 EC2 instance to be able to execute AWS CLI commands on other AWS Services like DynamoDB and S3

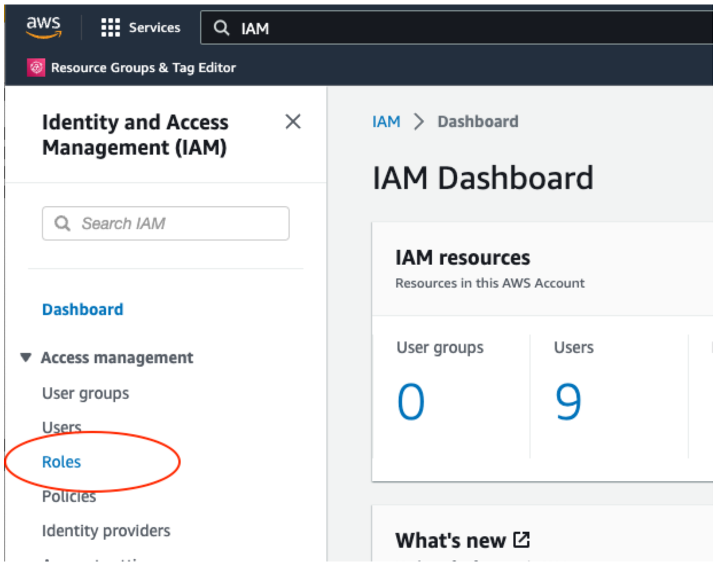
First you need to create Admin Role to attach it to Cloud9 :

Please Note: for the Demo purposes we choose the Full Access permissions for Cloud9 Ec2 instance but best practice here is to always give the least privilege permissions .

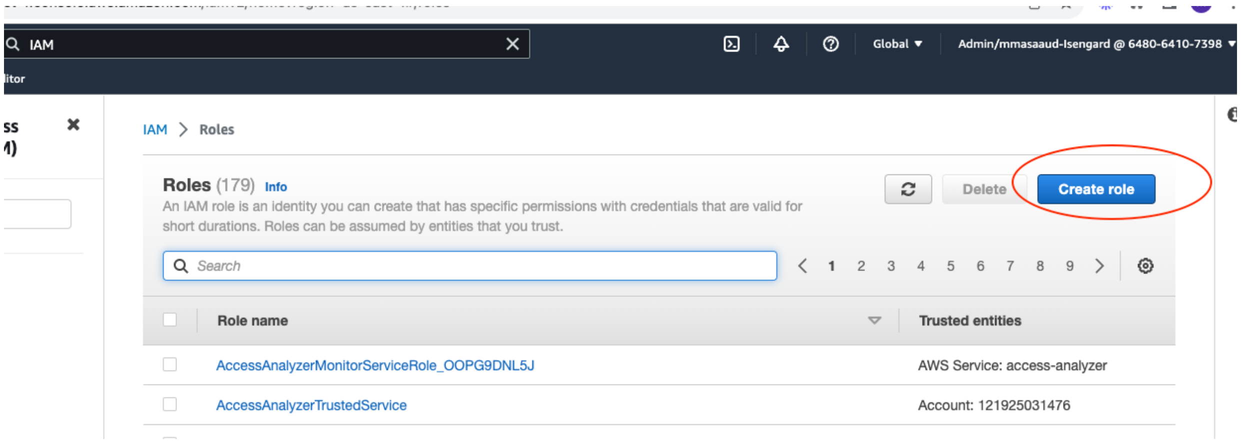
Go back to AWS console and Search for IAM on the Service search bar as below:



Go to Roles on the left side:



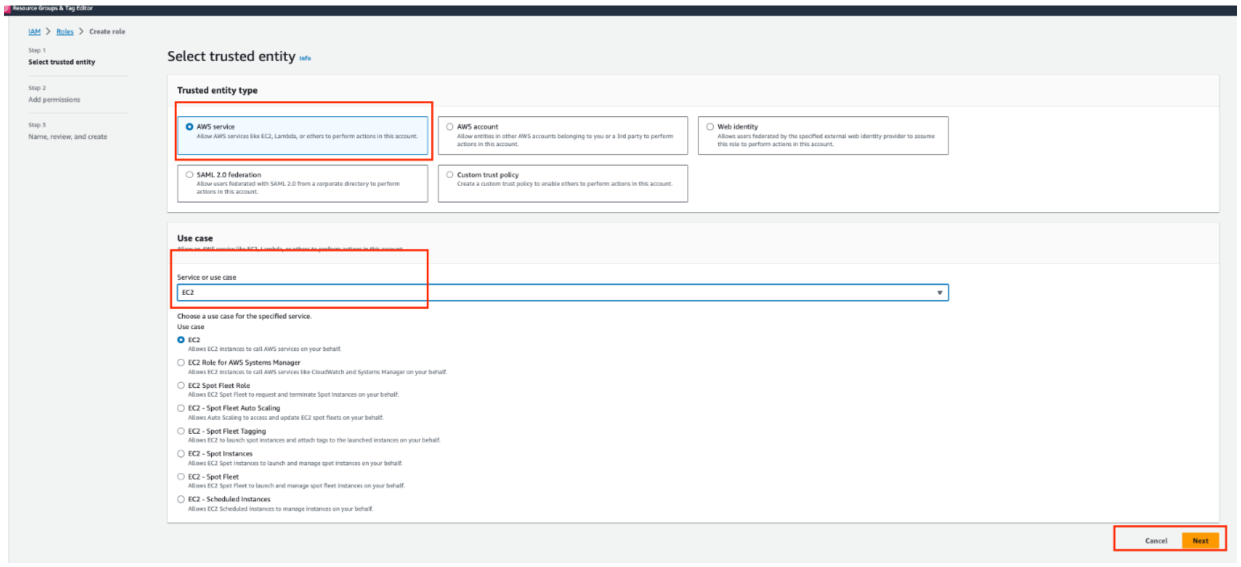
Then create a new role which will be attached to EC2 Instance:



Roles (179) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Role name	Trusted entities
AccessAnalyzerMonitorServiceRole_OOPG9DNL5J	AWS Service: access-analyzer
AccessAnalyzerTrustedService	Account: 121925031476



Select trusted entity Info

Trusted entity type

- [✓ AWS service] Allow AWS services like EC2, Lambda, or others to perform actions in this account.
- AWS account: Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
- Web identity: Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
- SAML 2.0 federation: Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
- Custom trust policy: Create a custom trust policy to enable others to perform actions in this account.

Use case

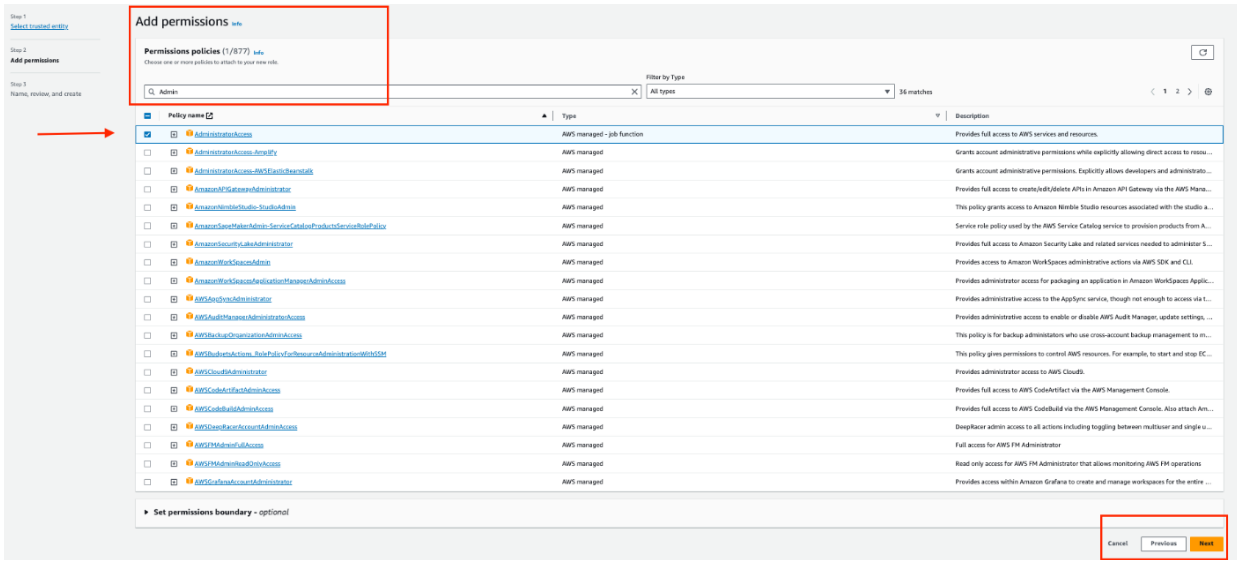
Allow an AWS service like EC2, Lambda, or others to perform actions in this account.

Service or use case: EC2

Choose a use case for the specified service.

Use case

- [✓ EC2] Allows EC2 instances to call AWS services on your behalf.
- EC2 Role for AWS Systems Manager: Allows EC2 instances to call AWS services like CloudWatch and Systems Manager on your behalf.
- EC2 Spot Fleet Role: Allows EC2 Spot Fleet to request and terminate Spot Instances on your behalf.
- EC2 - Spot Fleet Auto Scaling: Allows Auto Scaling to access and update EC2 spot fleets on your behalf.
- EC2 - Spot Fleet Tagging: Allows EC2 to launch spot instances and attach tags to the launched instances on your behalf.
- EC2 - Spot Instances: Allows EC2 Spot Instances to launch and manage spot instances on your behalf.
- EC2 - Spot Fleet: Allows EC2 Spot Fleet to launch and manage spot fleet instances on your behalf.
- EC2 - Scheduled Instances: Allows EC2 Scheduled Instances to manage instances on your behalf.



Add permissions

Permissions policies (1/877)

Choose one or more policies to attach to your new role.

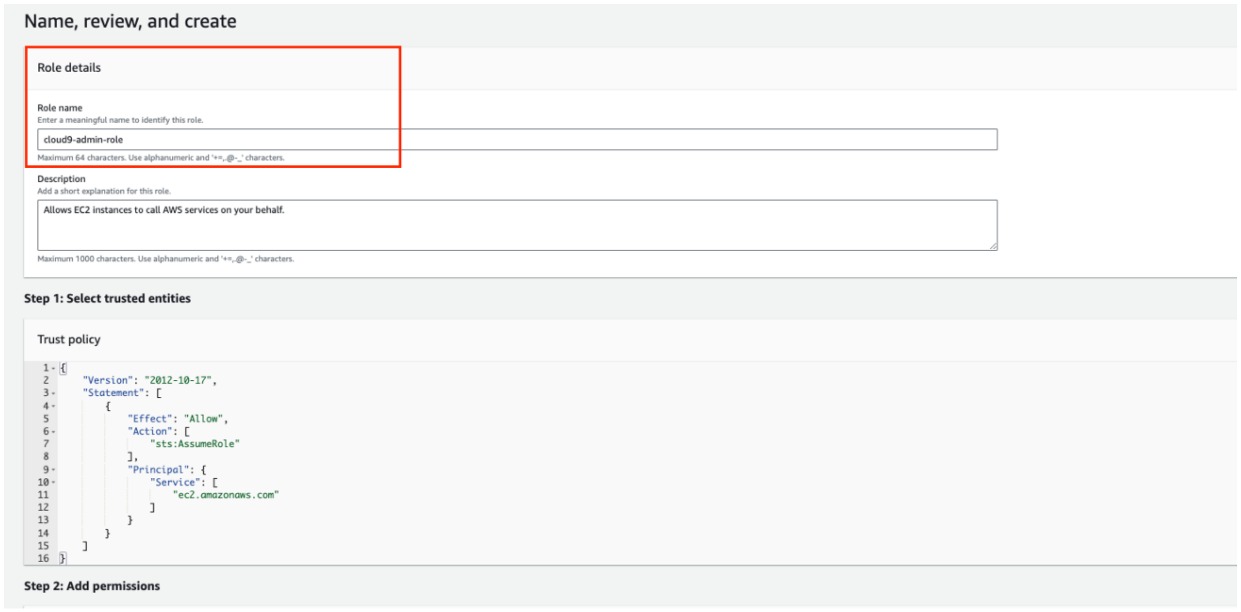
Admin

Filter by Type: All types — 36 matches

	Policy name	Type	Description
✓	AdministratorAccess	AWS managed - job function	Provides full access to AWS services and resources.
	AdministratorAccess-Amplify	AWS managed	Grants account administrative permissions while explicitly allowing direct access to resou...
	AdministratorAccess-AWSElasticBeanstalk	AWS managed	Grants account administrative permissions. Explicitly allows developers and administrato...
	AmazonAPIGatewayAdministrator	AWS managed	Provides full access to create/edit/delete APIs in Amazon API Gateway via the AWS Mana...
	AmazonNimbleStudio-StudioAdmin	AWS managed	This policy grants access to Amazon Nimble Studio resources associated with the studio a...
	AmazonSageMakerAdmin-ServiceCatalogProductsServiceRolePolicy	AWS managed	Service role policy used by the AWS Service Catalog service to provision products from A...
	AmazonSecurityLakeAdministrator	AWS managed	Provides full access to Amazon Security Lake and related services needed to administer S...
	AmazonWorkSpacesAdmin	AWS managed	Provides access to Amazon WorkSpaces administrative actions via AWS SDK and CLI.
	AmazonWorkSpacesApplicationManagerAdminAccess	AWS managed	Provides administrator access for packaging an application in Amazon WorkSpaces Applic...
	AWSAppSyncAdministrator	AWS managed	Provides administrative access to the AppSync service, though not enough to access via t...
	AWSAuditManagerAdministratorAccess	AWS managed	Provides administrative access to enable or disable AWS Audit Manager, update settings, ...
	AWSBackupOrganizationAdminAccess	AWS managed	This policy is for backup administators who use cross-account backup management to m...
	AWSBudgetsActions_RolePolicyForResourceAdministrationWithSSM	AWS managed	This policy gives permissions to control AWS resources. For example, to start and stop EC...
	AWSCloud9Administrator	AWS managed	Provides administrator access to AWS Cloud9.
	AWSCodeArtifactAdminAccess	AWS managed	Provides full access to AWS CodeArtifact via the AWS Management Console.
	AWSCodeBuildAdminAccess	AWS managed	Provides full access to AWS CodeBuild via the AWS Management Console. Also attach Am...
	AWSDeepRacerAccountAdminAccess	AWS managed	DeepRacer admin access to all actions including toggling between multiuser and single u...
	AWSFMAdminFullAccess	AWS managed	Full access for AWS FM Administrator
	AWSFMAdminReadOnlyAccess	AWS managed	Read only access for AWS FM Administrator that allows monitoring AWS FM operations
	AWSGrafanaAccountAdministrator	AWS managed	Provides access within Amazon Grafana to create and manage workspaces for the entire ...

▸ Set permissions boundary - *optional*

Give a Role Name (Please keep a record of that Role name as we need while assigning it to the Ec2 Instance for Cloud9 :



Name, review, and create

Role details

Role name
Enter a meaningful name to identify this role.

cloud9-admin-role

Maximum 64 characters. Use alphanumeric and '+=,.@-_' characters.

Description
Add a short explanation for this role.

Allows EC2 instances to call AWS services on your behalf.

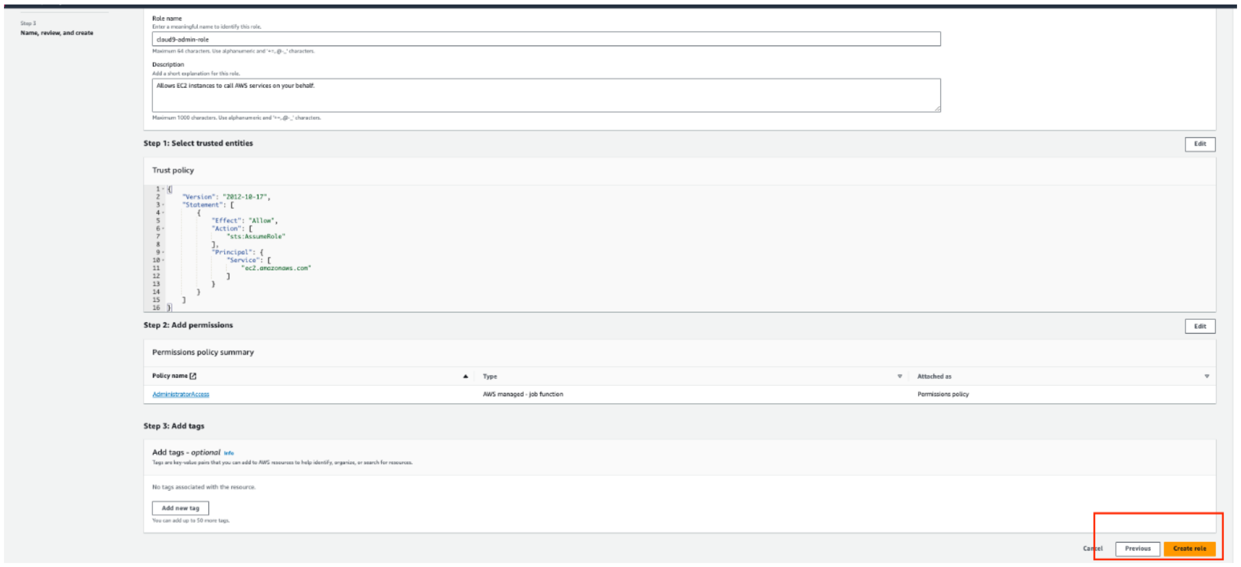
Maximum 1000 characters. Use alphanumeric and '+=,.@-_' characters.

Step 1: Select trusted entities

Trust policy

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "sts:AssumeRole"
            ],
            "Principal": {
                "Service": [
                    "ec2.amazonaws.com"
                ]
            }
        }
    ]
}
```

Step 2: Add permissions


Step 3
Name, review, and create

Role name
Enter a meaningful name to identify this role.
cloud9-admin-role
Maximum 64 characters. Use alphanumeric and '+=,.@-_' characters.

Description
Add a short explanation for this role.
Allows EC2 instances to call AWS services on your behalf.
Maximum 1000 characters. Use alphanumeric and '+=,.@-_' characters.

Step 1: Select trusted entities

Trust policy

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "sts:AssumeRole"
            ],
            "Principal": {
                "Service": [
                    "ec2.amazonaws.com"
                ]
            }
        }
    ]
}
```

Step 2: Add permissions

Permissions policy summary

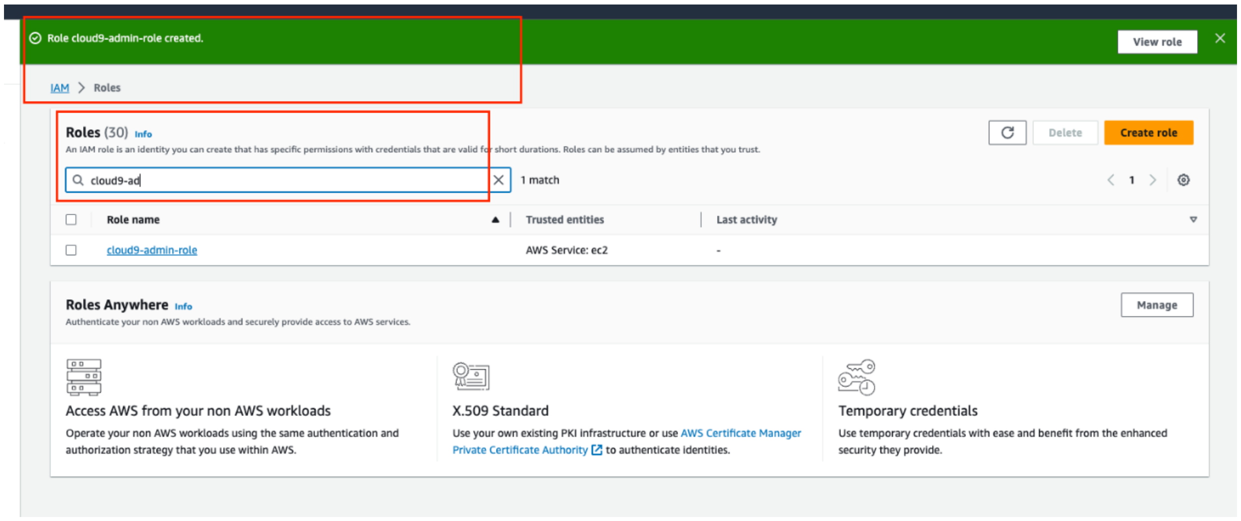
Policy name	Type	Attached as
AdministratorAccess	AWS managed - job function	Permissions policy

Step 3: Add tags

Add tags - *optional* Info
Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources.

No tags associated with the resource.
You can add up to 50 more tags.

To validate role creation please type in role name created on Search and make sure it got created Successfully


Role cloud9-admin-role created.

IAM > Roles

Roles (30) Info
An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

cloud9-ad
1 match

	Role name	Trusted entities	Last activity
☐	cloud9-admin-role	AWS Service: ec2	-

Roles Anywhere Info
Authenticate your non AWS workloads and securely provide access to AWS services.

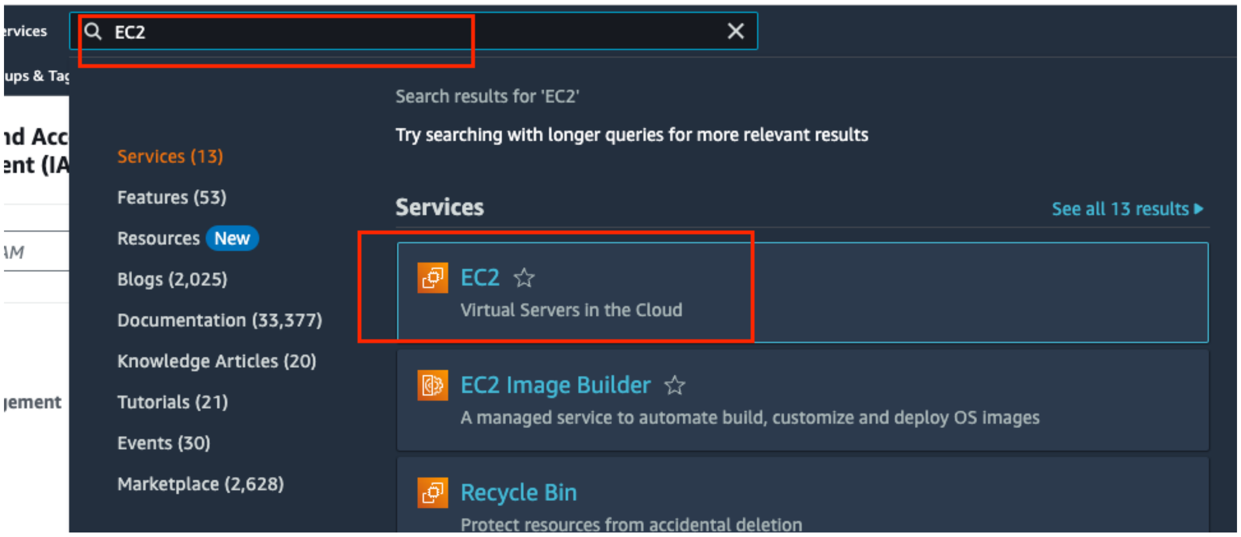
Access AWS from your non AWS workloads
Operate your non AWS workloads using the same authentication and authorization strategy that you use within AWS.

X.509 Standard
Use your own existing PKI infrastructure or use AWS Certificate Manager Private Certificate Authority to authenticate identities.

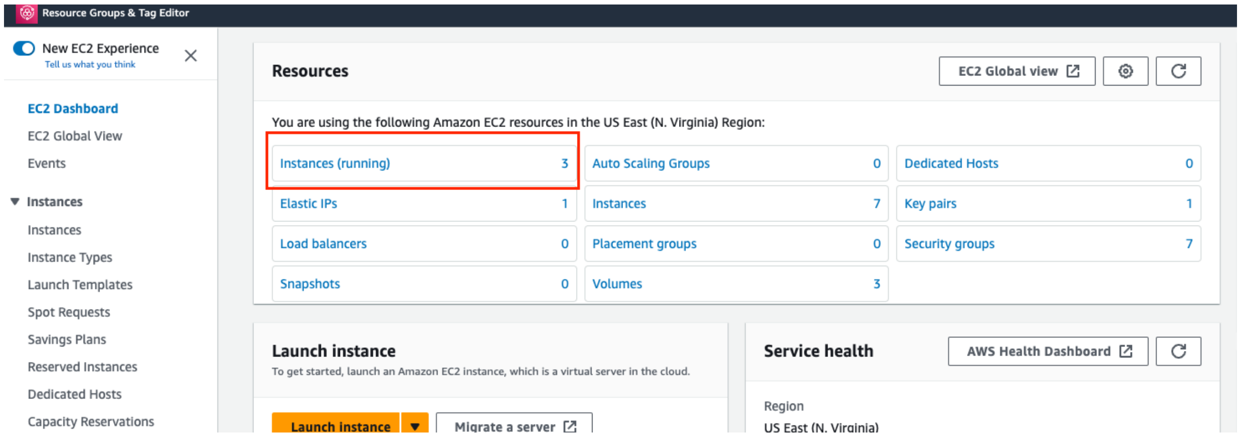
Temporary credentials
Use temporary credentials with ease and benefit from the enhanced security they provide.

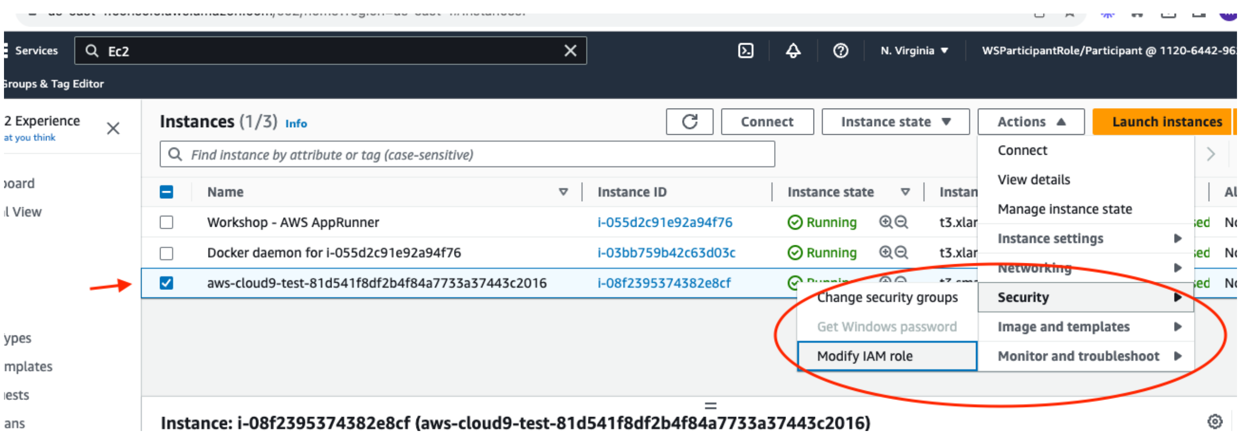
After creating the IAM Role you will need to attach it to the EC2 instance to enable Cloud9 to execute any AWS command needed based on the permissions you gave on that Role:

back to AWS Console and Look for EC2 as shown below :

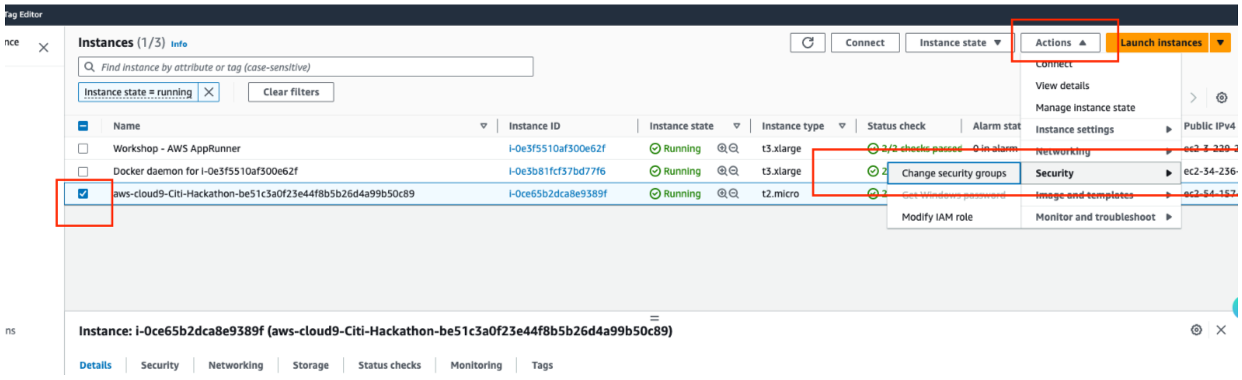


Click on the " Instance Running"





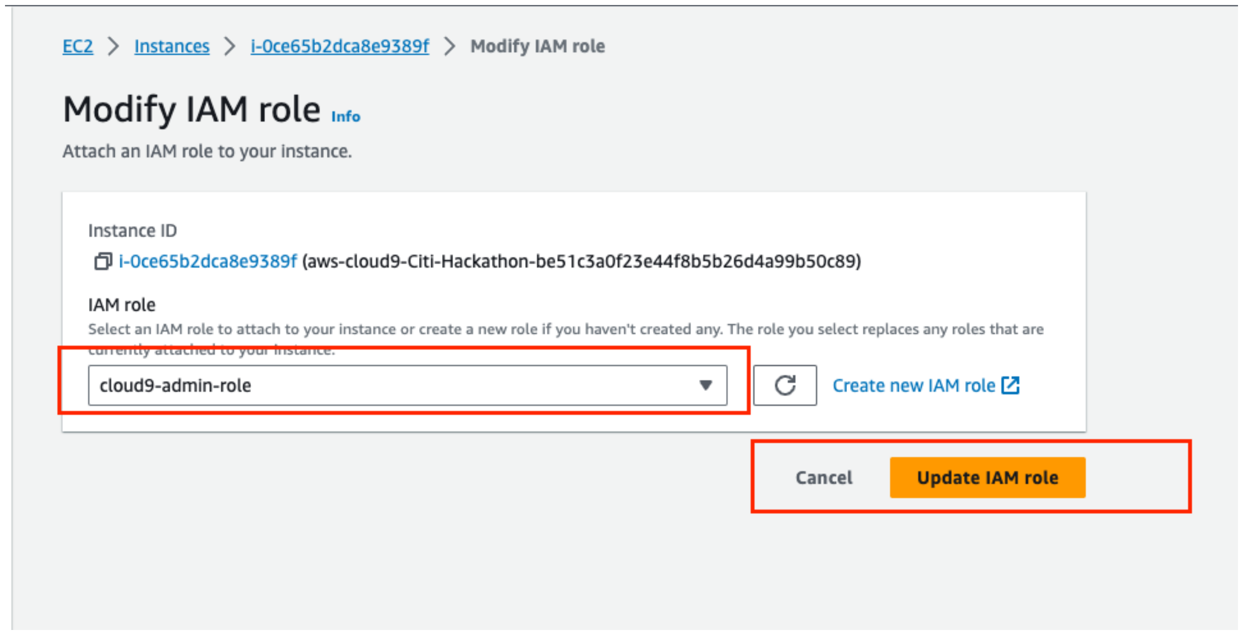
check the box for the EC2 instance related to Cloud9 then go to Security > Modify IAM Policy :



Name	Instance ID	Instance state	Instance type	Status check	Alarm stat	Public IPv4
Workshop - AWS AppRunner	i-0e3f5510af300e62f	Running	t3.xlarge	2/2 checks passed	0 in alarm	ec2-3-220-
Docker daemon for i-0e3f5510af300e62f	i-0e3b81fcf37bd77f6	Running	t3.xlarge	2		ec2-34-236-
aws-cloud9-Citi-Hackathon-be51c3a0f23e44f8b5b26d4a99b50c89	i-0ce65b2dca8e9389f	Running	t2.micro	2		ec2-54-157-

Instance: i-0ce65b2dca8e9389f (aws-cloud9-Citi-Hackathon-be51c3a0f23e44f8b5b26d4a99b50c89)

Select the newly created admin role and click Update IAM Role them Click on Update IAM Role :



Attach an IAM role to your instance.

Instance ID
i-0ce65b2dca8e9389f (aws-cloud9-Citi-Hackathon-be51c3a0f23e44f8b5b26d4a99b50c89)

IAM role
Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.

cloud9-admin-role

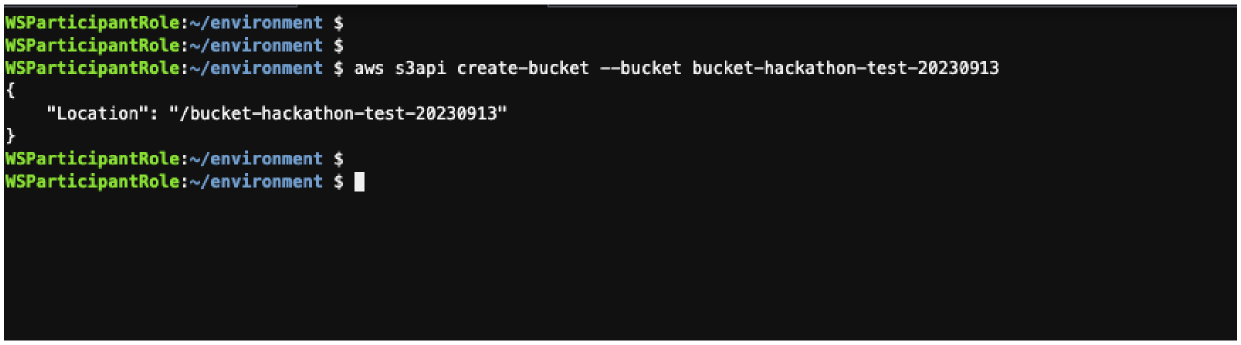
After assigning the Proper Permissions to the Cloud9 machine, you can now you can execute AWS commands from Cloud9 environment as shown below :

1- Create S3 Bucket

give example from random number to actual number , open up word or notepad and past that there to copy it on AWS CLI on Cloud9

S3 bucket name must be Globally unique, so please make sure to add random number or date to make it unique:

```
aws s3api create-bucket —bucket bucket-hackathon-test-<random number>
```



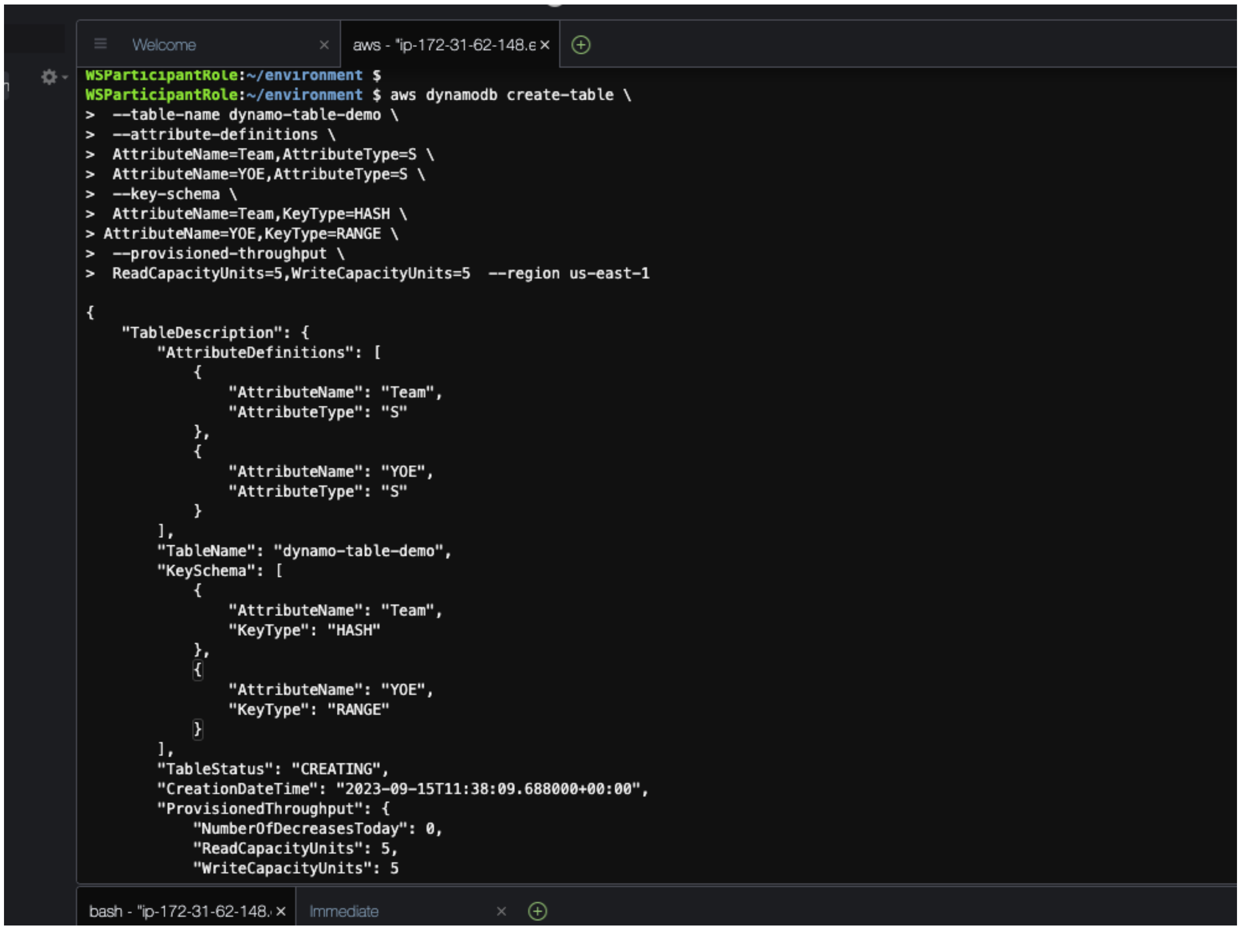
```
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $ aws s3api create-bucket --bucket bucket-hackathon-test-20230913
{
    "Location": "/bucket-hackathon-test-20230913"
}
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
```

2- Create dynamoDB table

For my Sample Code I'm using DynamoDB for my no-SQL Database, here is the command to create the table :

Note:
Please make sure to use the right region name while excusing that command below, for example I'm using us-east-1 so the command should be like below :

```
aws dynamodb create-table \
 --table-name dynamo-table-demo \
 --attribute-definitions \
AttributeName=Team,AttributeType=S \
AttributeName=YOE,AttributeType=S \
 --key-schema \
AttributeName=Team,KeyType=HASH \
AttributeName=YOE,KeyType=RANGE \
 --provisioned-throughput \
 ReadCapacityUnits=5,WriteCapacityUnits=5  --region us-east-1
```



```
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $ aws dynamodb create-table \
>  --table-name dynamo-table-demo \
>  --attribute-definitions \
>  AttributeName=Team,AttributeType=S \
>  AttributeName=YOE,AttributeType=S \
>  --key-schema \
>  AttributeName=Team,KeyType=HASH \
> AttributeName=YOE,KeyType=RANGE \
>  --provisioned-throughput \
>  ReadCapacityUnits=5,WriteCapacityUnits=5  --region us-east-1

{
    "TableDescription": {
        "AttributeDefinitions": [
            {
                "AttributeName": "Team",
                "AttributeType": "S"
            },
            {
                "AttributeName": "YOE",
                "AttributeType": "S"
            }
        ],
        "TableName": "dynamo-table-demo",
        "KeySchema": [
            {
                "AttributeName": "Team",
                "KeyType": "HASH"
            },
            {
                "AttributeName": "YOE",
                "KeyType": "RANGE"
            }
        ],
        "TableStatus": "CREATING",
        "CreationDateTime": "2023-09-15T11:38:09.688000+00:00",
        "ProvisionedThroughput": {
            "NumberOfDecreasesToday": 0,
            "ReadCapacityUnits": 5,
            "WriteCapacityUnits": 5
```

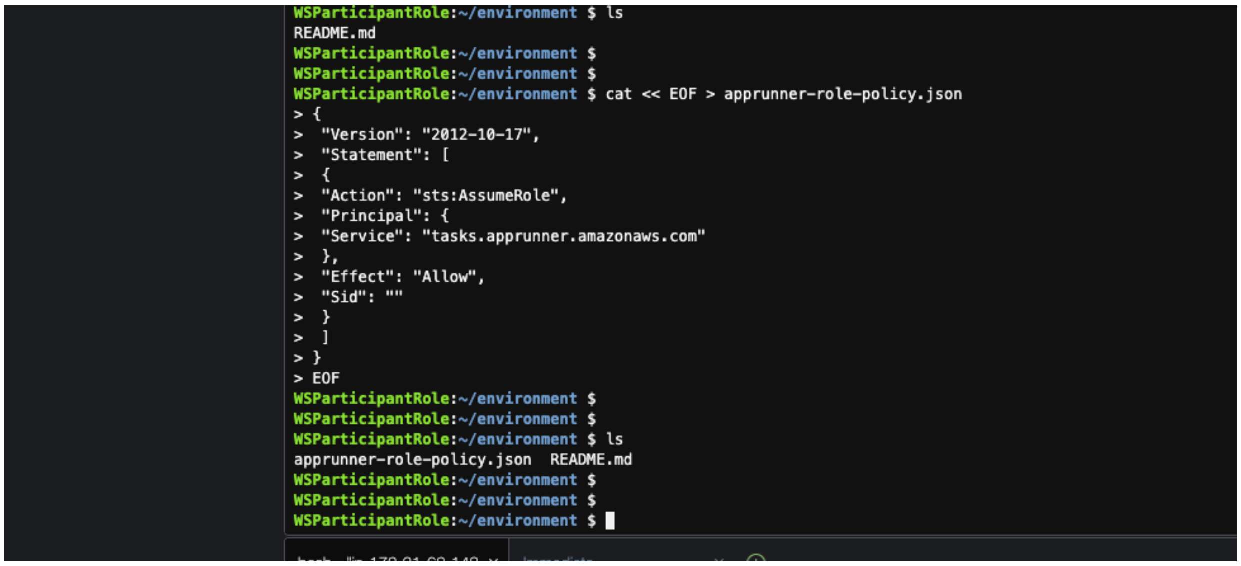
3- Create IAM Role for app Runner:

Please Note: for the Demo purposes we choose the Full Access permissions to DynamoDB , best practices is to give the least privilege permissions for AppRunner which enable it to execute the code on the targeted services.

Finally, We need to assign IAM Role for Apprunner Service to enable the service communicate with S3 and DynamoDB while running the code, please follow the steps below so Apprunner can communicate with your Github account and with other AWS Service :

```
cat << EOF > apprunner-role-policy.json
{
"Version": "2012-10-17",
"Statement": [
{
"Action": "sts:AssumeRole",
"Principal": {
"Service": "tasks.apprunner.amazonaws.com"
},
"Effect": "Allow",
"Sid": ""
}
]
}
```

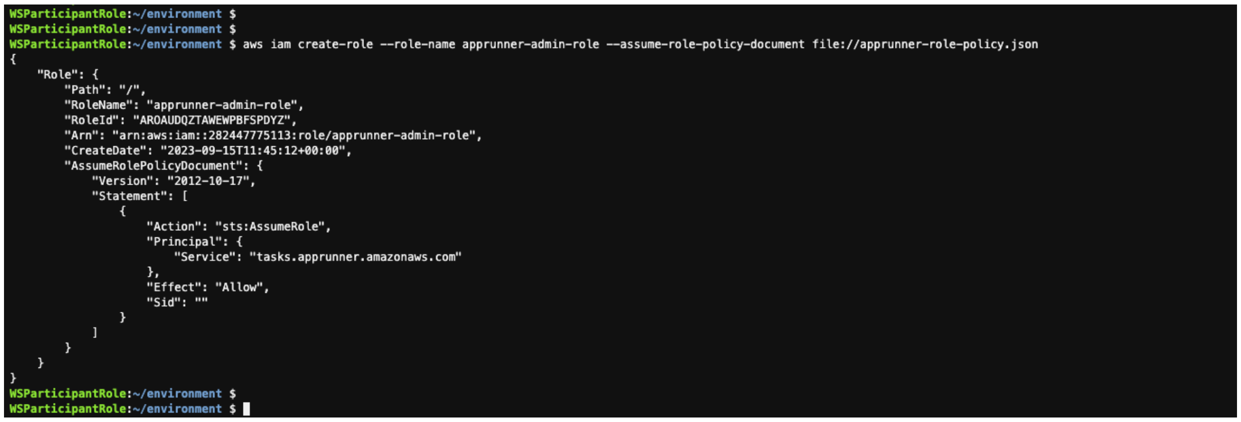
```
EOF
```



```
WSParticipantRole:~/environment $ ls
README.md
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $ cat << EOF > apprunner-role-policy.json
> {
>  "Version": "2012-10-17",
>  "Statement": [
>  {
>  "Action": "sts:AssumeRole",
>  "Principal": {
>  "Service": "tasks.apprunner.amazonaws.com"
>  },
>  "Effect": "Allow",
>  "Sid": ""
>  }
>  ]
> }
> EOF
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $ ls
apprunner-role-policy.json  README.md
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
```

Create IAM Assume Role for apprunner to enable it communicate with Github and other API as needed :

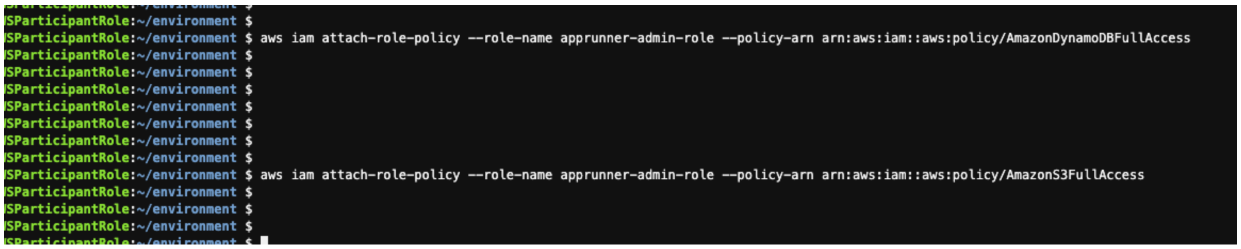
```
aws iam create-role --role-name apprunner-role --assume-role-policy-document file://ap
```



```
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $ aws iam create-role --role-name apprunner-admin-role --assume-role-policy-document file://apprunner-role-policy.json
{
    "Role": {
        "Path": "/",
        "RoleName": "apprunner-admin-role",
        "RoleId": "AROAUDQZTAWEWPBFSPDYZ",
        "Arn": "arn:aws:iam::282447775113:role/apprunner-admin-role",
        "CreateDate": "2023-09-15T11:45:12+00:00",
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                {
                    "Action": "sts:AssumeRole",
                    "Principal": {
                        "Service": "tasks.apprunner.amazonaws.com"
                    },
                    "Effect": "Allow",
                    "Sid": ""
                }
            ]
        }
    }
}
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
```

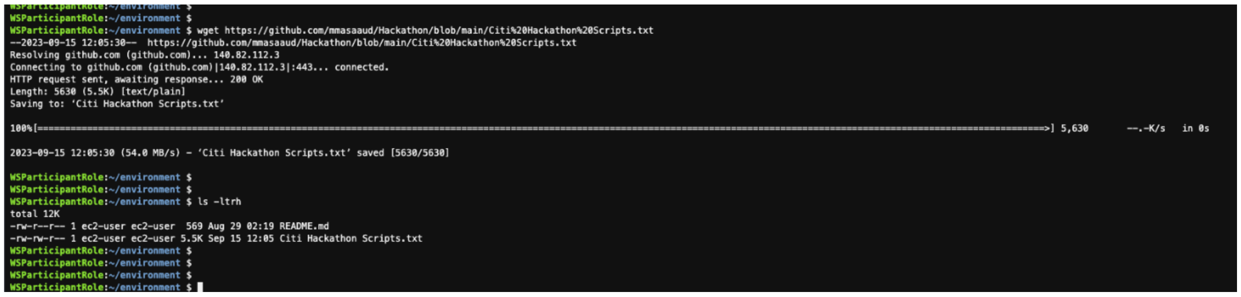
Give also permissions to APprunner to communicate with DynamoDB and S3 as We need it to run the code there

```
aws iam attach-role-policy --role-name apprunner-role --policy-arn arn:aws:iam::aws:po

aws iam attach-role-policy --role-name apprunner-role --policy-arn arn:aws:iam::aws:po
```



```
SParticipantRole:~/environment $
SParticipantRole:~/environment $ aws iam attach-role-policy --role-name apprunner-admin-role --policy-arn arn:aws:iam::aws:policy/AmazonDynamoDBFullAccess
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $ aws iam attach-role-policy --role-name apprunner-admin-role --policy-arn arn:aws:iam::aws:policy/AmazonS3FullAccess
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $
SParticipantRole:~/environment $
```

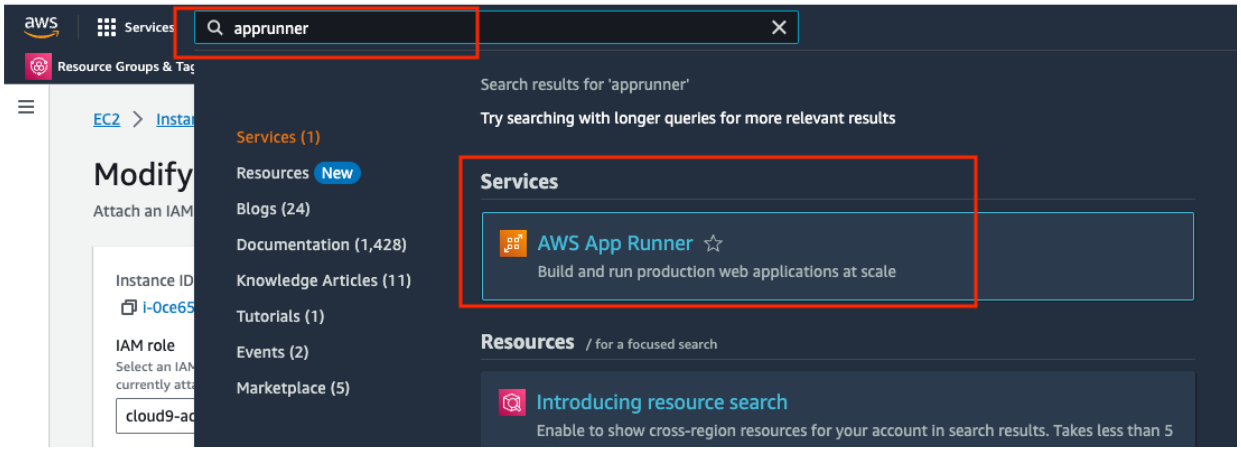
Optional Step You can also download all those commands executed previously from Github using the command below that might easier for copy/paste commands from there directly:



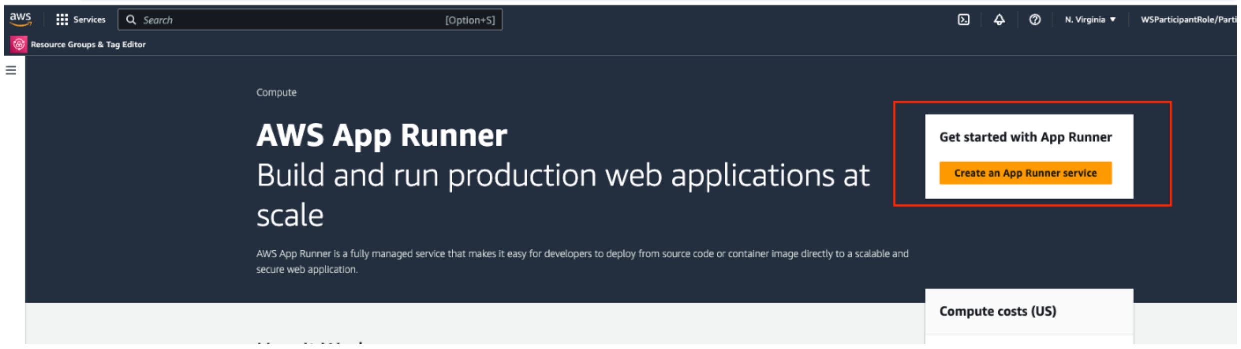
```
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $ wget https://github.com/mmasaaud/Hackathon/blob/main/Citi%20Hackathon%20Scripts.txt
--2023-09-15 12:05:30--  https://github.com/mmasaaud/Hackathon/blob/main/Citi%20Hackathon%20Scripts.txt
Resolving github.com (github.com)... 140.82.112.3
Connecting to github.com (github.com)|140.82.112.3|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 5630 (5.5K) [text/plain]
Saving to: 'Citi Hackathon Scripts.txt'

100%[=============================================================================================================================================================>] 5,630      --.-K/s   in 0s

2023-09-15 12:05:30 (54.0 MB/s) - 'Citi Hackathon Scripts.txt' saved [5630/5630]

WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $ ls -ltrh
total 12K
-rw-r--r-- 1 ec2-user ec2-user  569 Aug 29 02:19 README.md
-rw-rw-r-- 1 ec2-user ec2-user 5.5K Sep 15 12:05 Citi Hackathon Scripts.txt
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
WSParticipantRole:~/environment $
```

AppRunner Code execution :

Back to AWS Console and look for Apprunner Service on the search bar :


aws
Services
apprunner
Resource Groups & Tag
EC2
Insta
Modify
Attach an IAM
Instance ID
i-0ce65
IAM role
Select an IAM
currently att
cloud9-ac
Search results for 'apprunner'
Try searching with longer queries for more relevant results
Services (1)
Resources New
Blogs (24)
Documentation (1,428)
Knowledge Articles (11)
Tutorials (1)
Events (2)
Marketplace (5)
Services
AWS App Runner
Build and run production web applications at scale
Resources / for a focused search
Introducing resource search
Enable to show cross-region resources for your account in search results. Takes less than 5

Click on create a new Service :


Compute

AWS App Runner

Build and run production web applications at scale

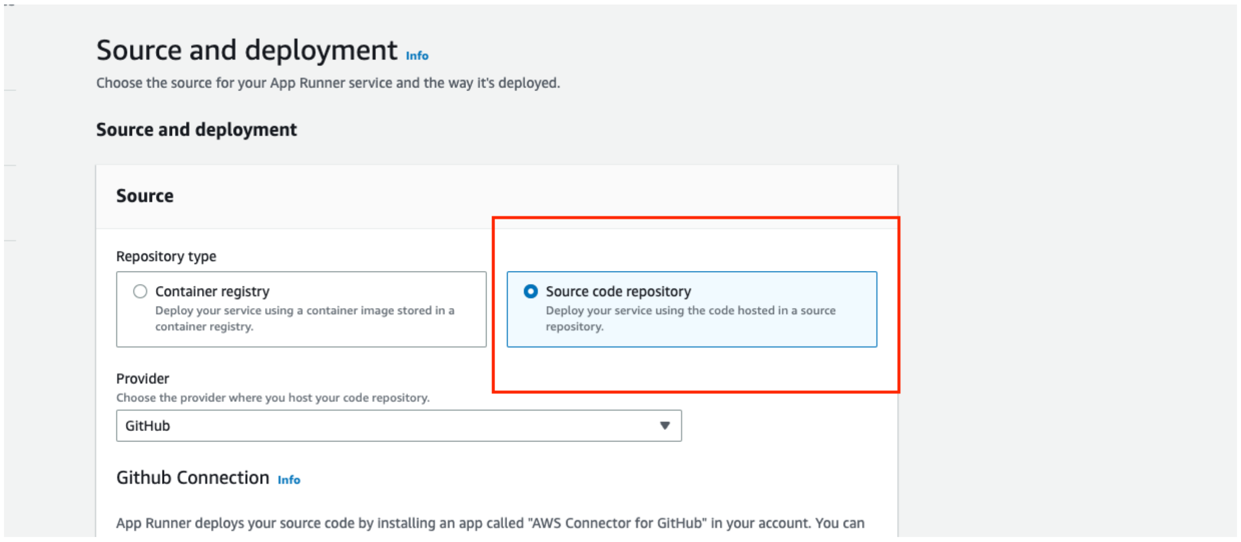
AWS App Runner is a fully managed service that makes it easy for developers to deploy from source code or container image directly to a scalable and secure web application.

Get started with App Runner

Create an App Runner service

Compute costs (US)

Choose your repository type either you can use the source code directly from your Github account or you can use it from a container image which you uploaded already to Amazon ECR, for the sample code I'm using Source Code repository directly from Github as shown below


Source and deployment Info

Choose the source for your App Runner service and the way it's deployed.

Source and deployment

Source

Repository type

( ) Container registry — Deploy your service using a container image stored in a container registry.

[✓ Source code repository] — Deploy your service using the code hosted in a source repository.

Provider

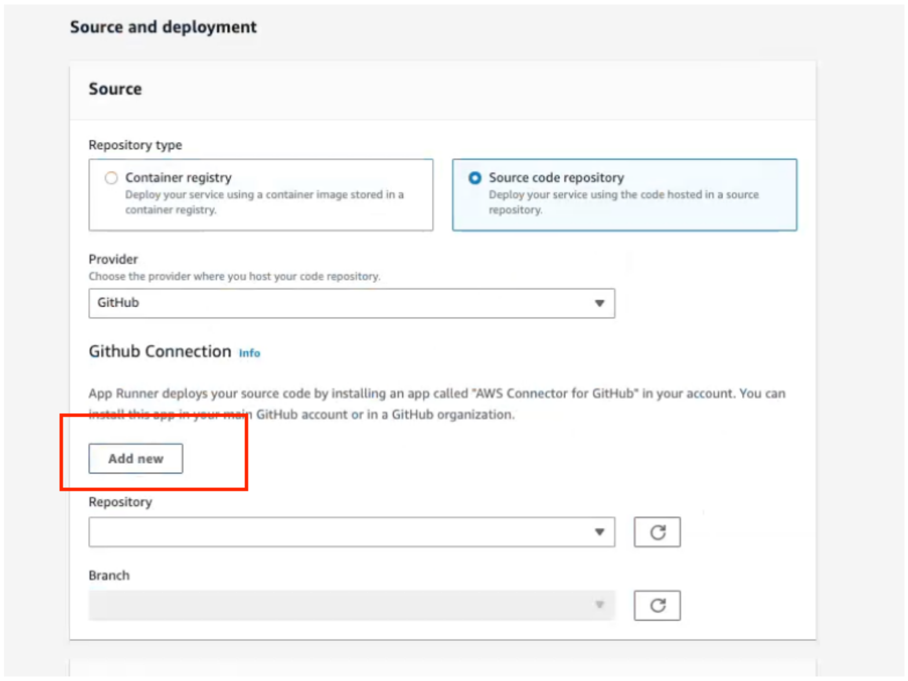
Choose the provider where you host your code repository.

GitHub

Github Connection Info

App Runner deploys your source code by installing an app called "AWS Connector for GitHub" in your account. You can

Then you need to give your Github credentials to Apprunner so it can access your repositories from Github as shown below:



Source and deployment

Source

Repository type

Container registry
Deploy your service using a container image stored in a container registry.

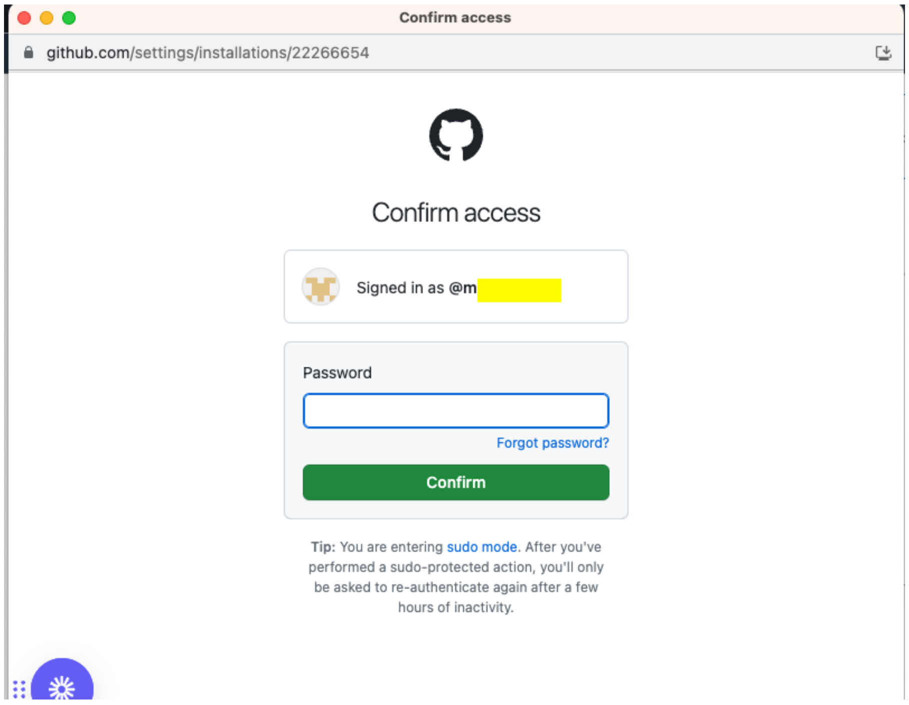
[✓ Source code repository
Deploy your service using the code hosted in a source repository.]

Provider
Choose the provider where you host your code repository.

GitHub

Github Connection Info

App Runner deploys your source code by installing an app called "AWS Connector for GitHub" in your account. You can install this app in your main GitHub account or in a GitHub organization.



Confirm access

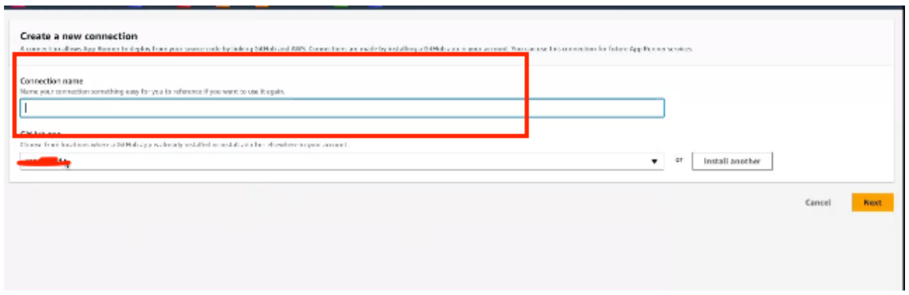
github.com/settings/installations/22266654

Confirm access

Signed in as @m[redacted]

Password

Tip: You are entering sudo mode. After you've performed a sudo-protected action, you'll only be asked to re-authenticate again after a few hours of inactivity.


Create a new connection

[illegible]

Connection name

Name your connection something easy for you to reference if you want to use it again.

[illegible]

[illegible]

[redacted]

For this Sample application repository, please use the Github link on the refrence section and fork the reporsatory into your personal account so you can create the Apprunner Service using that forked Repo.

After Choosing the required repository and the right branch, you would need to choose the Deployment Setting as shown below, you have two option:

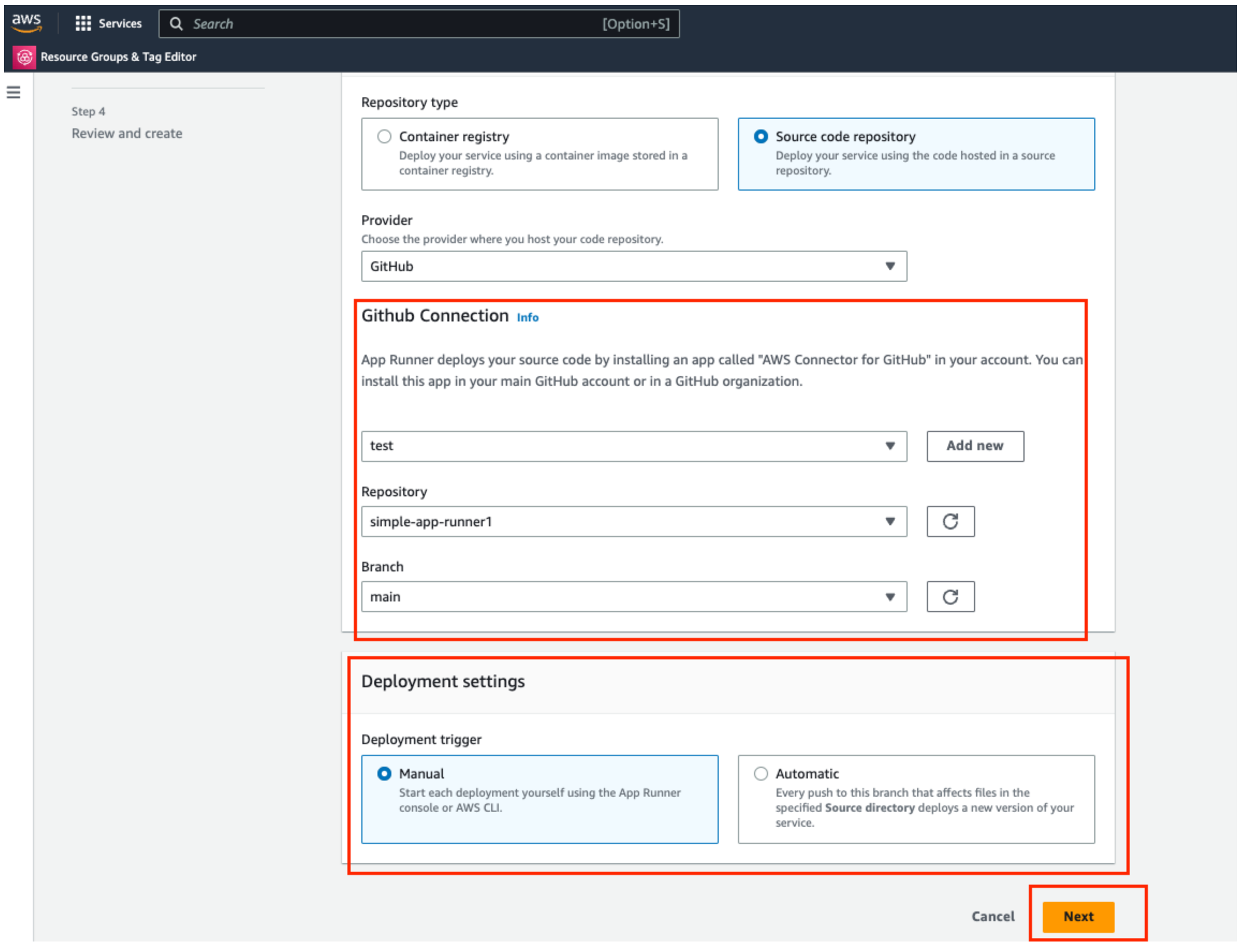
1- Manual:

Which will not reflect any changes happening on your repository unless you explicitly restart your service after you commit your code changes on Github.

2- Automatic:

This will instantly restart your running sevice once any changes committed on Github repository without any user interaction.

For more information please check out Deployment methods details. here:
https://docs.aws.amazon.com/apprunner/latest/dg/manage-deploy.html#:~:text=Deployment-,methods,-App%20Runner%20provides



Repository type

( ) Container registry
Deploy your service using a container image stored in a container registry.

(●) Source code repository
Deploy your service using the code hosted in a source repository.

Provider
Choose the provider where you host your code repository.
GitHub

Github Connection Info

App Runner deploys your source code by installing an app called "AWS Connector for GitHub" in your account. You can install this app in your main GitHub account or in a GitHub organization.

test

Add new

Repository
simple-app-runner1

Branch
main

Deployment settings

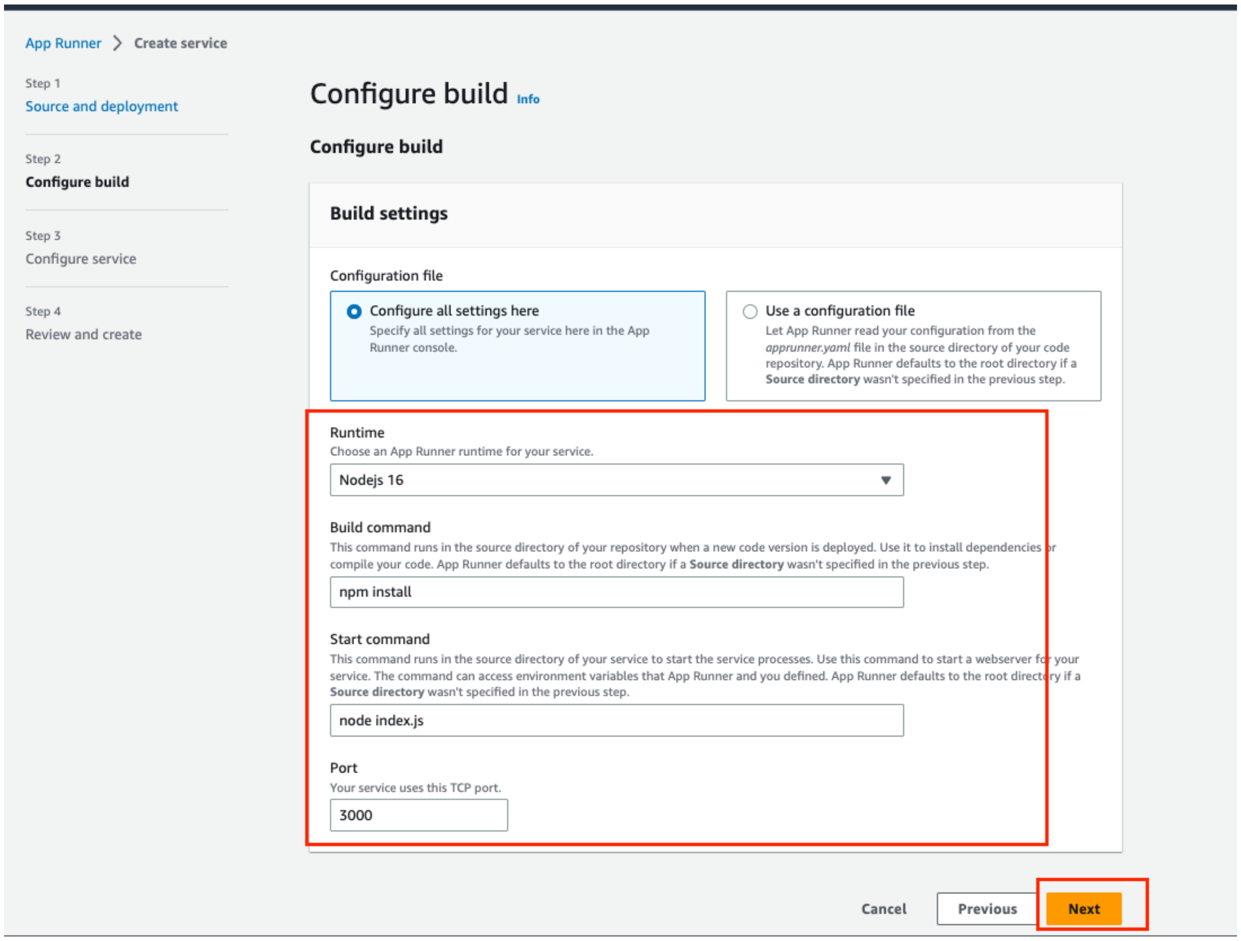
Deployment trigger

(●) Manual
Start each deployment yourself using the App Runner console or AWS CLI.

( ) Automatic
Every push to this branch that affects files in the specified **Source directory** deploys a new version of your service.

Cancel Next

Next step is to choose your Runtime configuration, Build Command, Start Command and port number based on the language used in your code, I'm using Java for that Sample code so my configurations like below:


App Runner > Create service

Step 1
Source and deployment

Step 2
Configure build

Step 3
Configure service

Step 4
Review and create

Configure build Info

Configure build

Build settings

Configuration file

[✓ Configure all settings here] Specify all settings for your service here in the App Runner console.

Use a configuration file — Let App Runner read your configuration from the *apprunner.yaml* file in the source directory of your code repository. App Runner defaults to the root directory if a **Source directory** wasn't specified in the previous step.

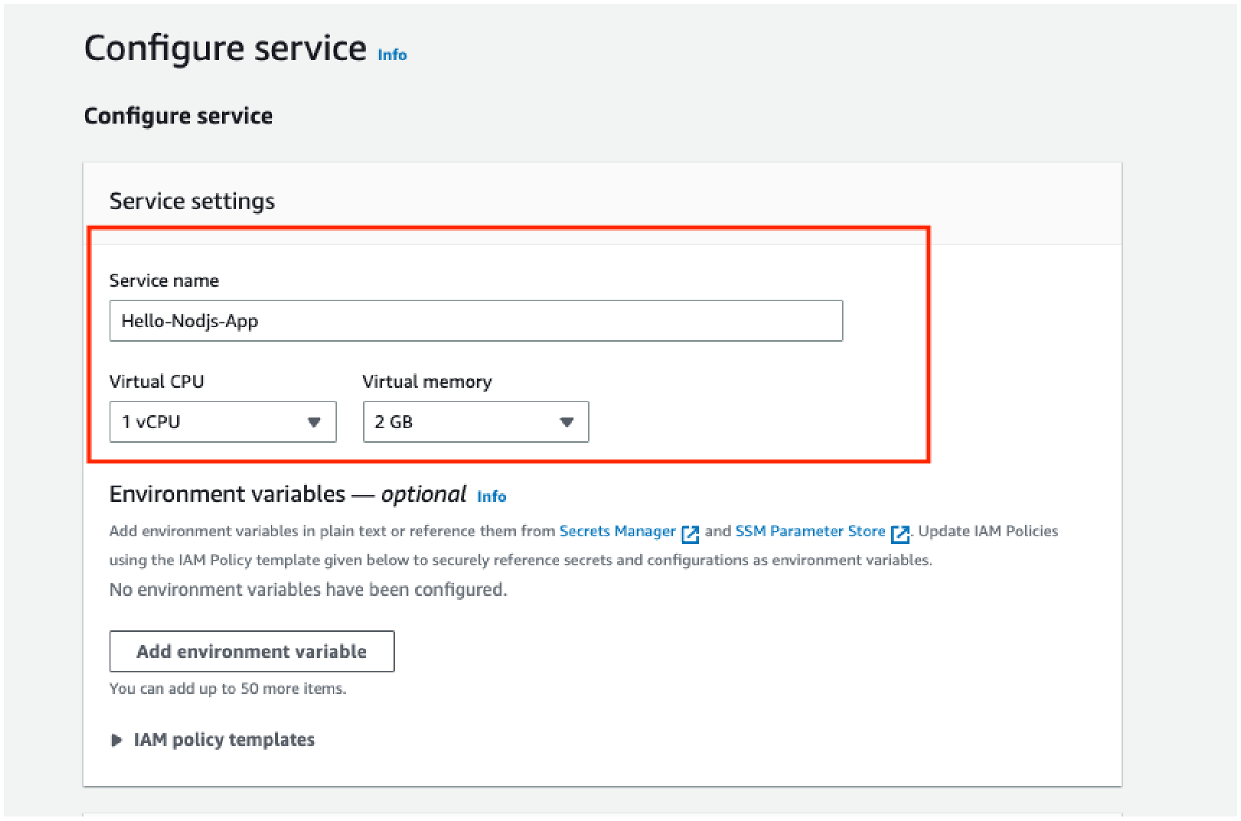
Runtime
Choose an App Runner runtime for your service.
Nodejs 16

Build command
This command runs in the source directory of your repository when a new code version is deployed. Use it to install dependencies or compile your code. App Runner defaults to the root directory if a **Source directory** wasn't specified in the previous step.
npm install

Start command
This command runs in the source directory of your service to start the service processes. Use this command to start a webserver for your service. The command can access environment variables that App Runner and you defined. App Runner defaults to the root directory if a **Source directory** wasn't specified in the previous step.
node index.js

Port
Your service uses this TCP port.
3000

Give a service name and make sure it would have enough CPU and Memory to start your application, one of the main features of using Apprunner that it takes care of compute resources scalability without any manual interaction from the user so even if you have spikes happening apprunner will scale the resources accordingly based on the number of HTTP/HTTPS request received



Configure service Info

Configure service

Service settings

Service name

Hello-Nodjs-App

Virtual CPU

1 vCPU

Virtual memory

2 GB

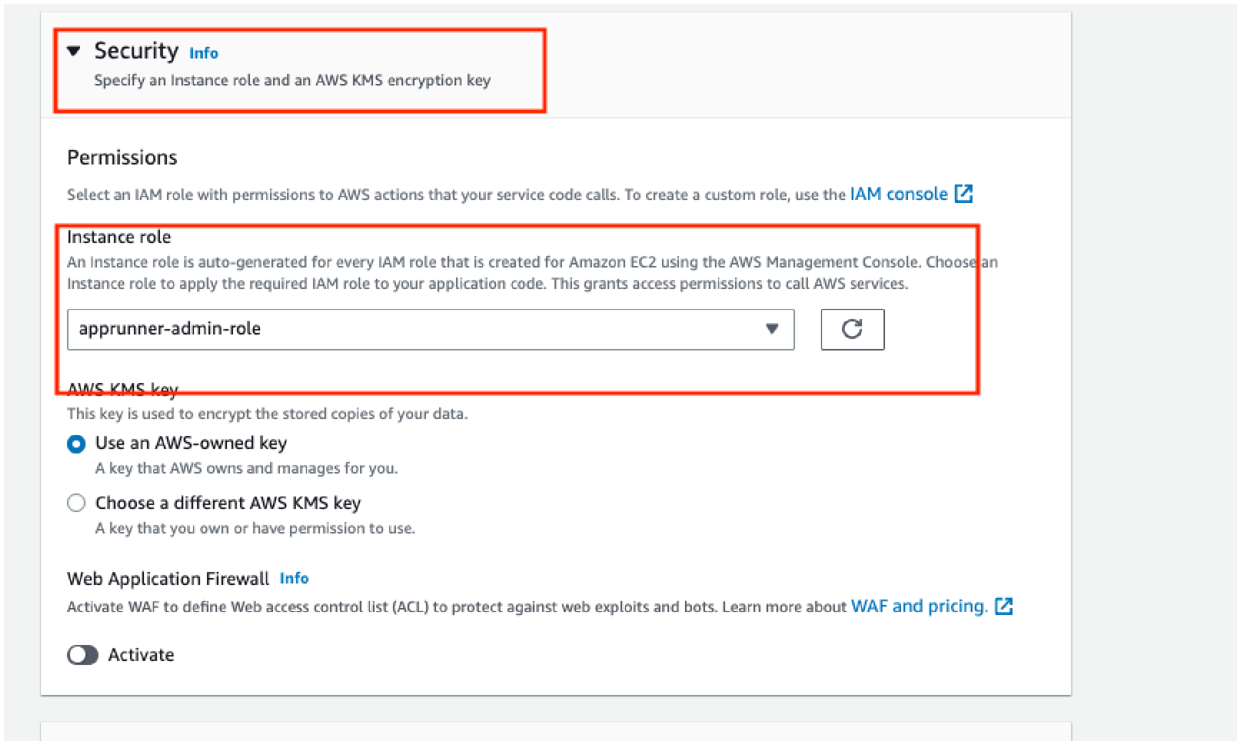
Environment variables — *optional* Info

Add environment variables in plain text or reference them from Secrets Manager and SSM Parameter Store. Update IAM Policies using the IAM Policy template given below to securely reference secrets and configurations as environment variables.

No environment variables have been configured.

You can add up to 50 more items.

Scroll down on the same page to the Security Section and make sure to choose the IAM Security Role we created in Cloud9 command line for Apprunner to give it access to S3 and DynamoDB



Security Info
Specify an Instance role and an AWS KMS encryption key

Permissions
Select an IAM role with permissions to AWS actions that your service code calls. To create a custom role, use the IAM console

Instance role
An Instance role is auto-generated for every IAM role that is created for Amazon EC2 using the AWS Management Console. Choose an Instance role to apply the required IAM role to your application code. This grants access permissions to call AWS services.

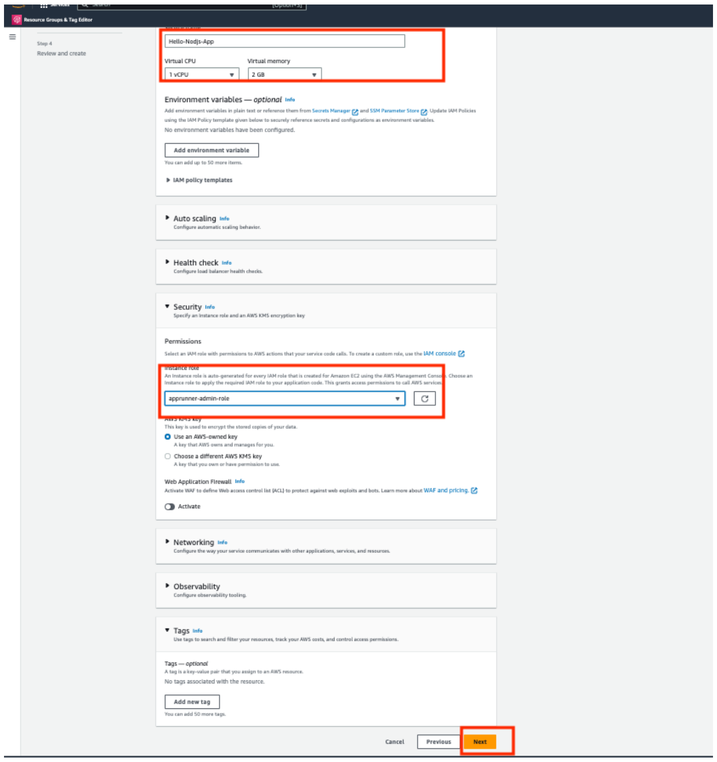
apprunner-admin-role

AWS KMS key
This key is used to encrypt the stored copies of your data.
Use an AWS-owned key
A key that AWS owns and manages for you.
Choose a different AWS KMS key
A key that you own or have permission to use.

Web Application Firewall Info
Activate WAF to define Web access control list (ACL) to protect against web exploits and bots. Learn more about WAF and pricing.

Activate

Finally, we will have to review the create the service if everything looks good as explained previously :



Resource Groups & Tag Editor

Step 4
Review and create

Hello-Nodjs-App
Virtual CPU: 1 vCPU
Virtual memory: 2 GB

Environment variables — *optional* Info
Add environment variables in plain text or reference them from Secrets Manager and SSM Parameter Store. Update IAM Policies using the IAM Policy template given below to securely reference secrets and configurations as environment variables.
No environment variables have been configured.
Add environment variable
You can add up to 50 more items.
IAM policy templates

Auto scaling Info
Configure automatic scaling behavior.

Health check Info
Configure load balancer health checks.

Security Info
Specify an Instance role and an AWS KMS encryption key

Permissions
Select an IAM role with permissions to AWS actions that your service code calls. To create a custom role, use the IAM console

Instance role
An Instance role is auto-generated for every IAM role that is created for Amazon EC2 using the AWS Management Console. Choose an Instance role to apply the required IAM role to your application code. This grants access permissions to call AWS services.
apprunner-admin-role

AWS KMS key
This key is used to encrypt the stored copies of your data.
Use an AWS-owned key
A key that AWS owns and manages for you.
Choose a different AWS KMS key
A key that you own or have permission to use.

Web Application Firewall Info
Activate WAF to define Web access control list (ACL) to protect against web exploits and bots. Learn more about WAF and pricing.
Activate

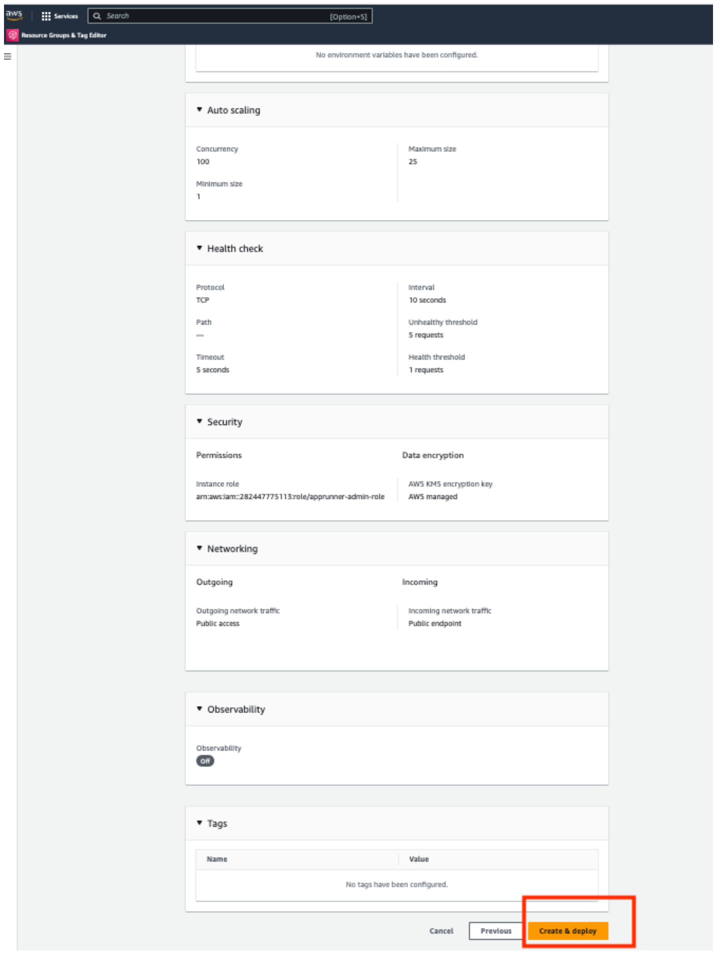
Networking Info
Configure the way your service communicates with other applications, services, and resources.

Observability
Configure observability tooling.

Tags Info
Use tags to search and filter your resources, track your AWS costs, and control access permissions.

Tags — *optional*
A tag is a key-value pair that you assign to an AWS resource.
No tags associated with the resource.
Add new tag
You can add 50 more tags.

Cancel Previous Next



No environment variables have been configured.

Auto scaling

Concurrency: 100	Maximum size: 25
Minimum size: 1	

Health check

Protocol: TCP	Interval: 10 seconds
Path: —	Unhealthy threshold: 5 requests
Timeout: 5 seconds	Health threshold: 1 requests

Security

Permissions	Data encryption
Instance role: arn:aws:iam::282447775113:role/apprunner-admin-role	AWS KMS encryption key: AWS managed

Networking

Outgoing	Incoming
Outgoing network traffic: Public access	Incoming network traffic: Public endpoint

Observability

Observability: Off

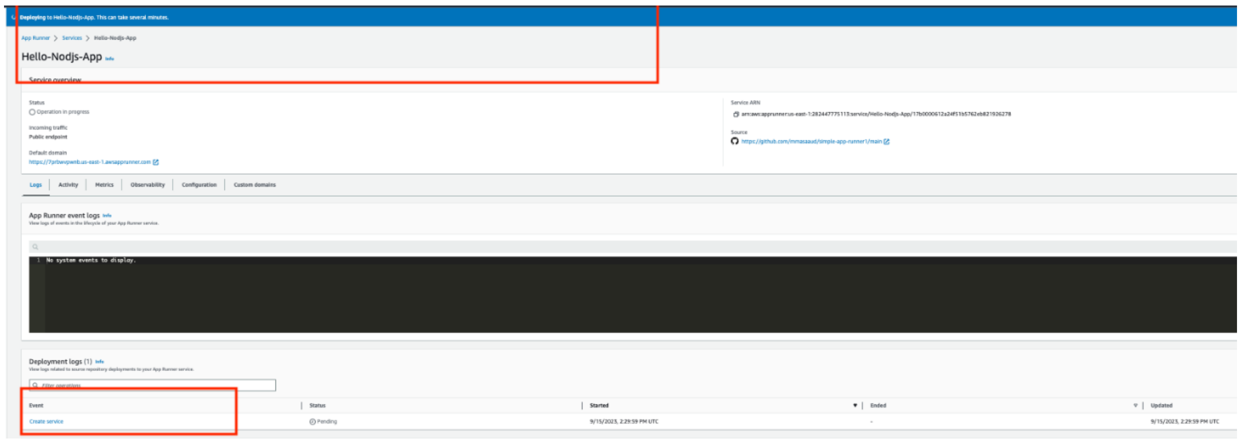
Tags

Name	Value

No tags have been configured.

This will take between 5-7 minute to create the service, you can also check the deployment log while deploying is taking place :

After few minutes, service created Successfully and you can access if from the default domain link, which will be created automatically as a part of service creation :



Deploying to Hello-Nodjs-App. This can take several minutes.

App Runner > Services > Hello-Nodjs-App

Hello-Nodjs-App

Service overview

Status: Operation in progress	Service ARN: arn:aws:apprunner:us-east-1:282447775113:service/Hello-Nodjs-App/17b0000612a24f51b5762eb821926278
Incoming traffic: Public endpoint	Source: https://github.com/mmasaaud/simple-app-runner1/main
Default domain: https://7prbwvpwnb.us-east-1.awsapprunner.com	

App Runner event logs

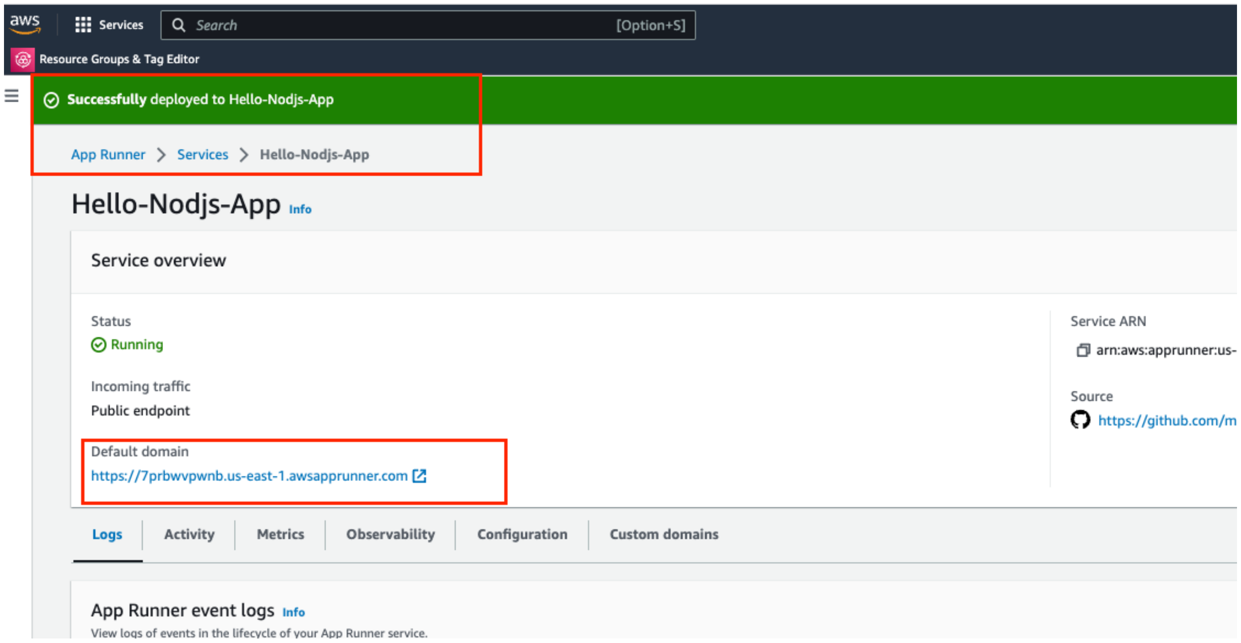
View logs of events in the lifecycle of your App Runner service.

```
No system events to display.
```

Deployment logs (1)

View logs related to source repository deployments to your App Runner service.

Event	Status	Started	Ended	Updated
Create service	Pending	9/15/2023, 2:29:59 PM UTC	-	9/15/2023, 2:29:59 PM UTC



Successfully deployed to Hello-Nodjs-App

App Runner > Services > Hello-Nodjs-App

Hello-Nodjs-App Info

Service overview

Status
Running

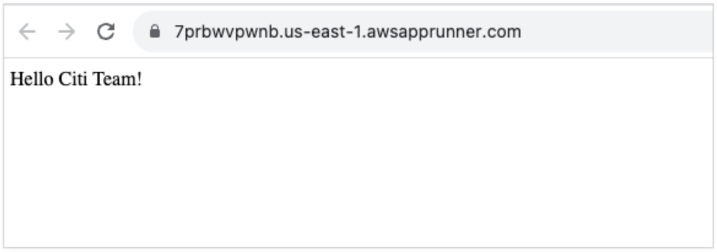
Incoming traffic
Public endpoint

Default domain
https://7prbwvpwnb.us-east-1.awsapprunner.com

Service ARN
arn:aws:apprunner:us-

Source
https://github.com/m

App Runner event logs Info
View logs of events in the lifecycle of your App Runner service.


7prbwvpwnb.us-east-1.awsapprunner.com

Hello Citi Team!

Importnat Links :

1- AWS SDK for Node.JS :
https://aws.amazon.com/developer/language/javascript/?intClick=dc_navbar

2- Github link for Sample Node.js app :
https://github.com/mmasaaud/simple-app-runner1

3- DynamoDB document :
https://us-east-2.console.aws.amazon.com/dynamodbv2/home?region=us-east-2#service

4- S3 document :
https://docs.aws.amazon.com/AmazonS3/latest/userguide/Welcome.html