

A simple tutorial to start working with AWS CodeCommit and CodeBuild creating and compiling a .NET 6 Web API

IMPORTANT NOTE!: AWS CodeBuild only works with .NET 6 but not it is not yet available for .NET 7 neither for .NET 8

1. Prerequisites

1.1. Grant AWSCodeCommitPowerUser permission to your user

Navigate to **AWS IAM** service and add permission to your user to work with AWS CodeCommit service

The screenshot shows the AWS Management Console home page. The top navigation bar includes the AWS logo, a search bar, and the user's profile. The main content area is divided into two columns. The left column, titled 'Console home', contains a 'Recently visited' section with a list of services: IAM (highlighted with a red box), AWS Cloud Map, Elastic Container Registry, CodeDeploy, Elastic Container Service, CodeBuild, and EC2 Image Builder. The right column, titled 'Applications', shows a 'Create application' button and a table with no applications listed. The table headers are Name, Description, Region, and Originating account. Below the table, there is a message 'No applications' and a 'Create application' button.

Click on **Users** menu option

The screenshot shows the AWS IAM Dashboard. The left sidebar contains the 'Identity and Access Management (IAM)' menu item, which is highlighted with a red box. Below it, the 'Users' option is also highlighted with a red box. The main content area displays the 'IAM Dashboard' with a 'Security recommendations' section showing two warnings: 'Add MFA for root user' and 'Add MFA for yourself'. The 'IAM resources' section at the bottom lists 'User groups', 'Users', 'Roles', 'Policies', and 'Identity providers'.

Identity and Access Management (IAM)

Search IAM

Dashboard

Access management

- User groups
- Users**
- Roles
- Policies
- Identity providers
- Account settings

Access reports

- Access Analyzer
- External access
- Unused access
- Analyzers and settings
- Credential report

IAM Dashboard

Security recommendations 2

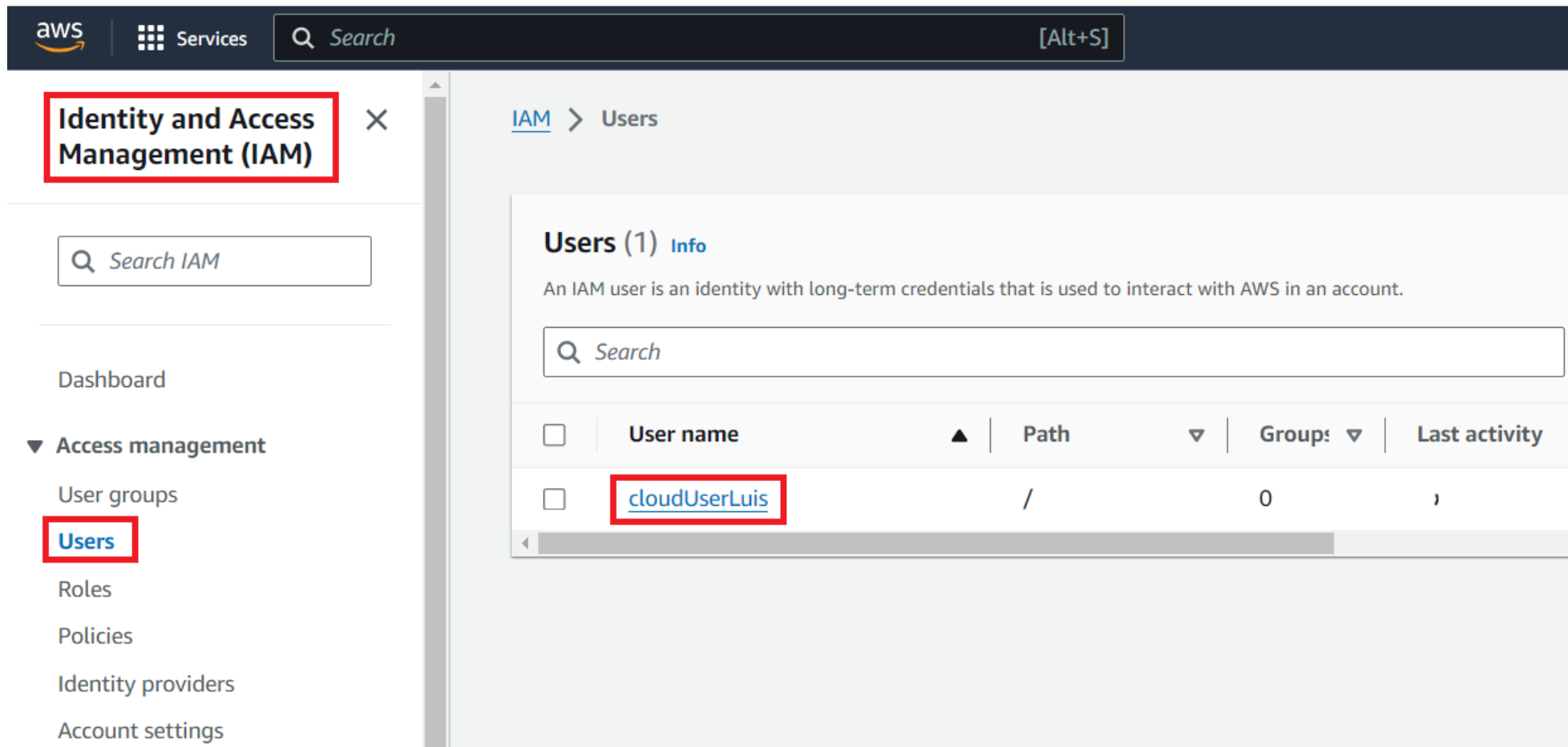
- Add MFA for root user**
Sign in as the root user (or contact your administrator) and register a multi-factor authentication (MFA) device for the root user to improve security for this account.
- Add MFA for yourself**
Add multi-factor authentication (MFA) for yourself to improve security for this account. **Add MFA**
- Your user, cloudUserLuis, does not have any active access keys that have been unused for more than a year.**
Deactivating or deleting unused access keys improves security.

IAM resources

Resources in this AWS Account

User groups	Users	Roles	Policies	Identity providers
-------------	-------	-------	----------	--------------------

Now we click on our user name, in my case "cloudUserLuis"



The screenshot shows the AWS IAM console interface. The left sidebar contains the navigation menu with 'Identity and Access Management (IAM)' and 'Users' highlighted. The main content area displays the 'Users (1)' page, which includes a search bar and a table of users. The table has columns for 'User name', 'Path', 'Group', and 'Last activity'. A single user, 'cloudUserLuis', is listed in the table.

<input type="checkbox"/>	User name	Path	Group	Last activity
<input type="checkbox"/>	cloudUserLuis	/	0	,

We grant "AWSCodeCommitPowerUser" permission to your user

The screenshot shows the AWS IAM console interface. The left sidebar contains navigation links for Identity and Access Management (IAM), including Dashboard, Access management, User groups, Users, Roles, Policies, Identity providers, Account settings, Access reports, and Related consoles. The main content area displays the details for the user 'cloudUserLuis'. The 'Summary' section shows the ARN, console access status (Enabled without MFA), and two active access keys. The 'Permissions policies (2)' section lists the policies attached to the user: 'AdministratorAccess' and 'AWSCodeCommitPowerUser'. The 'Permissions boundary' section is currently not set.

cloudUserLuis Info Delete

Summary

ARN
arn:aws:iam::550146943653:user/cloudUserLuis

Console access
Enabled without MFA

Access key 1
AKIAYAF2QFKS466HY5V3 - Active
Used today. 2 days old.

Access key 2
AKIAYAF2QFKSZG4VTTWM - Active
Used today. 2 days old.

Created
November 23, 2022, 16:54 (UTC+01:00)

Last console sign-in
Today

Permissions policies (2) Refresh Remove Add permissions

Permissions are defined by policies attached to the user directly or through groups.

Search Filter by Type
All types

<input type="checkbox"/>	Policy name	Type	Attached via
<input type="checkbox"/>	AdministratorAccess	AWS managed - job function	Directly
<input type="checkbox"/>	AWSCodeCommitPowerUser	AWS managed	Directly

Permissions boundary (not set)

1.2. Generate HTTPS Git credentials for AWS CodeCommit



The screenshot shows the AWS IAM console interface. The left sidebar contains navigation links for Identity and Access Management (IAM), Access management, Access reports, and Related consoles. The main content area displays the 'Account details' for the user 'cloudUserLuis'. Below this, the 'AWS CodeCommit credentials' tab is selected and highlighted with a red box. This tab shows the 'SSH public keys for AWS CodeCommit' section, which is currently empty. Below that, the 'HTTPS Git credentials for AWS CodeCommit' section is highlighted with a red box and shows a table with one entry for the user 'cloudUserLuis-at-550146943653' with a status of 'Active'.

Account details

User name: cloudUserLuis

User ARN: arn:aws:iam::550146943653:user/cloudUserLuis

AWS account ID: 550146943653

Canonical user ID: 5de4ddb673199fea39eb54a7368306071f23301db42c5a951a96e6c74783988b

AWS IAM credentials | **AWS CodeCommit credentials** | Amazon Keyspaces credentials

SSH public keys for AWS CodeCommit (0)

User SSH public keys to authenticate access to AWS CodeCommit repositories. You can have a maximum of five SSH public keys (active or inactive) at a time. [Learn more](#)


SSH Key ID	Uploaded	Status
No SSH public keys		


HTTPS Git credentials for AWS CodeCommit (1)

Generate a user name and password you can use to authenticate HTTPS connections to AWS CodeCommit repositories. You can have a maximum of 2 sets of credentials (active or inactive) at a time. [Learn more](#)

User name	Created	Status
cloudUserLuis-at-550146943653	42 minutes ago	Active

2. Create new code repository in AWS CodeCommit

 Services [Alt+S]



[Developer Tools](#) > [CodeCommit](#) > [Repositories](#) > **Create repository**

Create repository

Create a secure repository to store and share your code. Begin by typing a repository name and a description for your repository. Repository names are included in the URLs for that repository.

Repository settings

Repository name

100 characters maximum. Other limits apply.

Description - *optional*

1,000 characters maximum

Tags

☐ **Enable Amazon CodeGuru Reviewer for Java and Python - *optional***

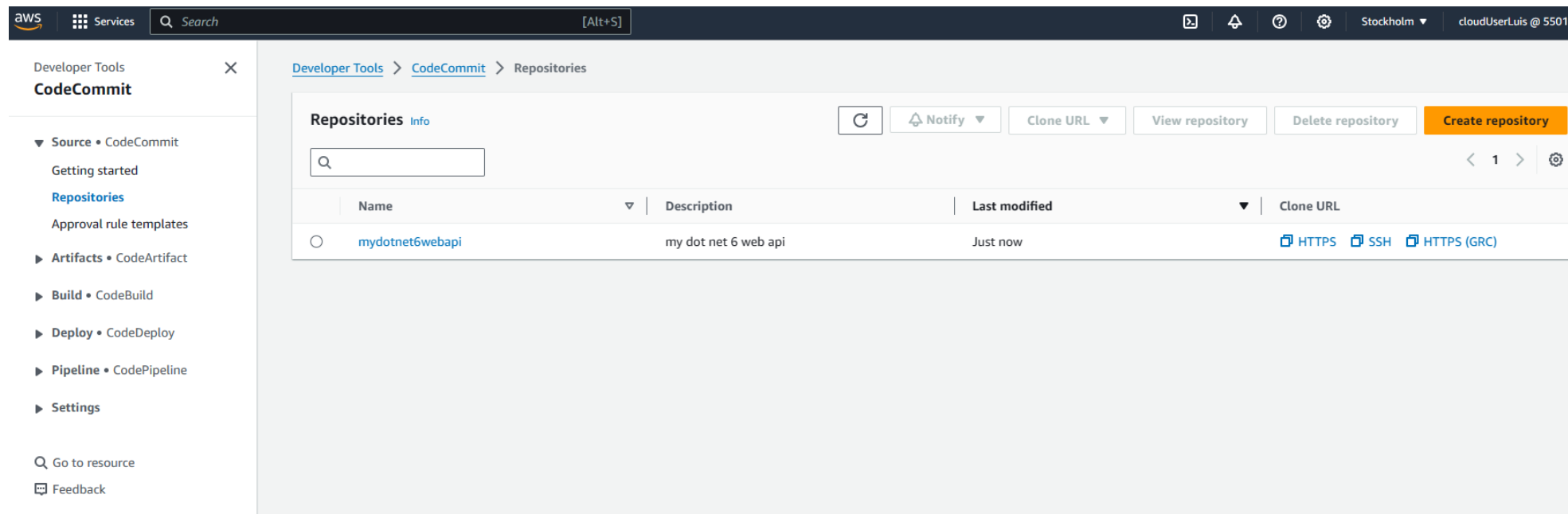
Get recommendations to improve the quality of the Java and Python code for all pull requests in this repository.

A service-linked role will be created in IAM on your behalf if it does not exist.

The screenshot shows the AWS CodeCommit console interface. At the top, there's a 'Cancel' button and an orange 'Create' button. Below this is a dark blue header bar with the 'CloudShell' logo and a 'Feedback' link. The main navigation bar includes the AWS logo, 'Services', a search bar, and user information 'cloudUserLuis @ 5501-'. On the left, a sidebar lists 'Developer Tools' with 'CodeCommit' selected, and other options like 'Source', 'Artifacts', 'Build', 'Deploy', 'Pipeline', and 'Settings'. The main content area shows a green success banner: 'Success Repository successfully created'. Below this, the breadcrumb trail is 'Developer Tools > CodeCommit > Repositories > mydotnet6webapi'. The repository name 'mydotnet6webapi' is displayed prominently. To the right of the name is a 'Clone URL' button. Under 'Connection steps', there are tabs for 'HTTPS', 'SSH', and 'HTTPS (GRC)'. The 'HTTPS' tab is active, showing three steps: 'Step 1: Prerequisites', 'Step 2: Git credentials', and 'Step 3: Clone the repository'. Step 3 includes a command box with the URL 'git clone https://git-codecommit.eu-north-1.amazonaws.com/v1/repos/mydotnet6webapi' and a 'Copy' button. At the bottom, there's an 'Additional details' section with a link to 'View documentation'.

This is the AWS CodeCommit repo we created:

git clone <https://git-codecommit.eu-north-1.amazonaws.com/v1/repos/mydotnet6webapi>



Developer Tools

CodeCommit

- Source • CodeCommit
 - Getting started
 - Repositories**
 - Approval rule templates
- Artifacts • CodeArtifact
- Build • CodeBuild
- Deploy • CodeDeploy
- Pipeline • CodePipeline
- Settings

Go to resource

Feedback

Developer Tools > CodeCommit > Repositories

Repositories [Info](#)

[Refresh](#) [Notify](#) [Clone URL](#) [View repository](#) [Delete repository](#) [Create repository](#)

	Name	Description	Last modified	Clone URL
<input type="radio"/>	mydotnet6webapi	my dot net 6 web api	Just now	HTTPS SSH HTTPS (GRC)


3. Create .NET 6 Web API in Visual Studio 2022


Run Visual Studio 2022 Community Edition and select the option **Create a new project**

Visual Studio 2022


Abrir recientes


▲ Hoy


 **WebAPIdotNET8.sln** 13/12/2023 21:55
C:\AWS CodeCommit\mywebapidonet8repo

 **WebAPIdotnet8.sln** 13/12/2023 21:53
C:\AWS CodeCommit\mywebapidonet8repo\WebAPIdotnet8


▲ Ayer

 **DeployAzureContainerInstance.sln** 12/12/2023 23:31
C:\...\DeployAzureContainerInstance

 **WebAPI.sln** 12/12/2023 21:30
C:\Azure SDK for .NET how to create an Azure Container Registry\WebAPI

 **HowToCreateAzureContainerRegistry.sln** 12/12/2023 21:30
C:\Azure SDK for .NET how to create an Azure Container Registry\WebAPI\WebAPI.sln

▲ Esta semana

 **WebAPI.sln** 11/12/2023 19:13
C:\AWS ECR+ECS Fargate .NET 8 Web API\WebAPI

Tareas iniciales



Clonar un repositorio

Obtiene código desde un repositorio en línea, como GitHub o Azure DevOps.



Abrir un proyecto o una solución

Abre un archivo .sln o proyecto de Visual Studio local.



Abrir una carpeta local

Navegar y editar el código en cualquier carpeta



Crear un proyecto

Creará un nuevo proyecto con la técnica de plantilla de código para comenzar.

[Continuar sin código →](#)

We select the Web API project template

Crear un proyecto

Buscar plantillas (Alt+S)



Plantillas de proyecto recientes

Todos los lenguajes

Todas las plataformas

Todos los tipos de proye...

ASP.NET Core Web API

C#

Aplicación de consola

C#

Azure Functions

C#

Aplicación .NET MAUI Blazor

C#

Razor Pages de ASP.NET Core de ejemplo.

C#

Linux

macOS

Windows

Nube

Servicio

Web



ASP.NET Core Web API

Una plantilla de proyecto para crear una API web RESTful utilizando controladores ASP.NET Core o API mínimas, con soporte opcional para OpenAPI y autenticación.

C#

Linux

macOS

Windows

API

Nube

Servicio

Web

Web API



API web ASP.NET Core (native AOT)

Una plantilla de proyecto para crear una API web RESTful utilizando las API mínimas de ASP.NET Core publicadas como native AOT.

C#

Linux

macOS

Windows

API

Nube

Servicio

Web

Web API



Biblioteca de clases

Proyecto para crear una biblioteca de clases para .NET o .NET Standard

C#

Android

Linux

macOS

Windows

Biblioteca



ASP.NET Core vacío

Una plantilla de proyecto vacía para crear una aplicación ASP.NET Core. Esta plantilla no incluye ningún contenido.

C#

Linux

macOS

Windows

Nube

Servicio

Web

Atrás

Siguiente

We set the solution name and location

Configure su nuevo proyecto

ASP.NET Core Web API

C#

Linux

macOS

Windows

API

Nube

Servicio

Web

Web API

Nombre del proyecto

WebAPIdotNET6

Ubicación

C:\AWS CodeCommit\mywebapidonet6repo\

...

Nombre de la solución ⓘ

WebAPIdotNET6

☒ Colocar la solución y el proyecto en el mismo directorio

Proyecto se creará en "C:\AWS CodeCommit\mywebapidonet6repo\WebAPIdotNET6"

Atrás

Siguiente

We select the options shown in the following picture

Información adicional

ASP.NET Core Web API

C#

Linux

macOS

Windows

API

Nube

Servicio

Web

Web API

Framework ⓘ

.NET 6.0 (Compatibilidad a largo plazo)

Authentication de campo ⓘ

Ninguno

☒ Configurar para HTTPS ⓘ☒ Habilitar Docker ⓘ

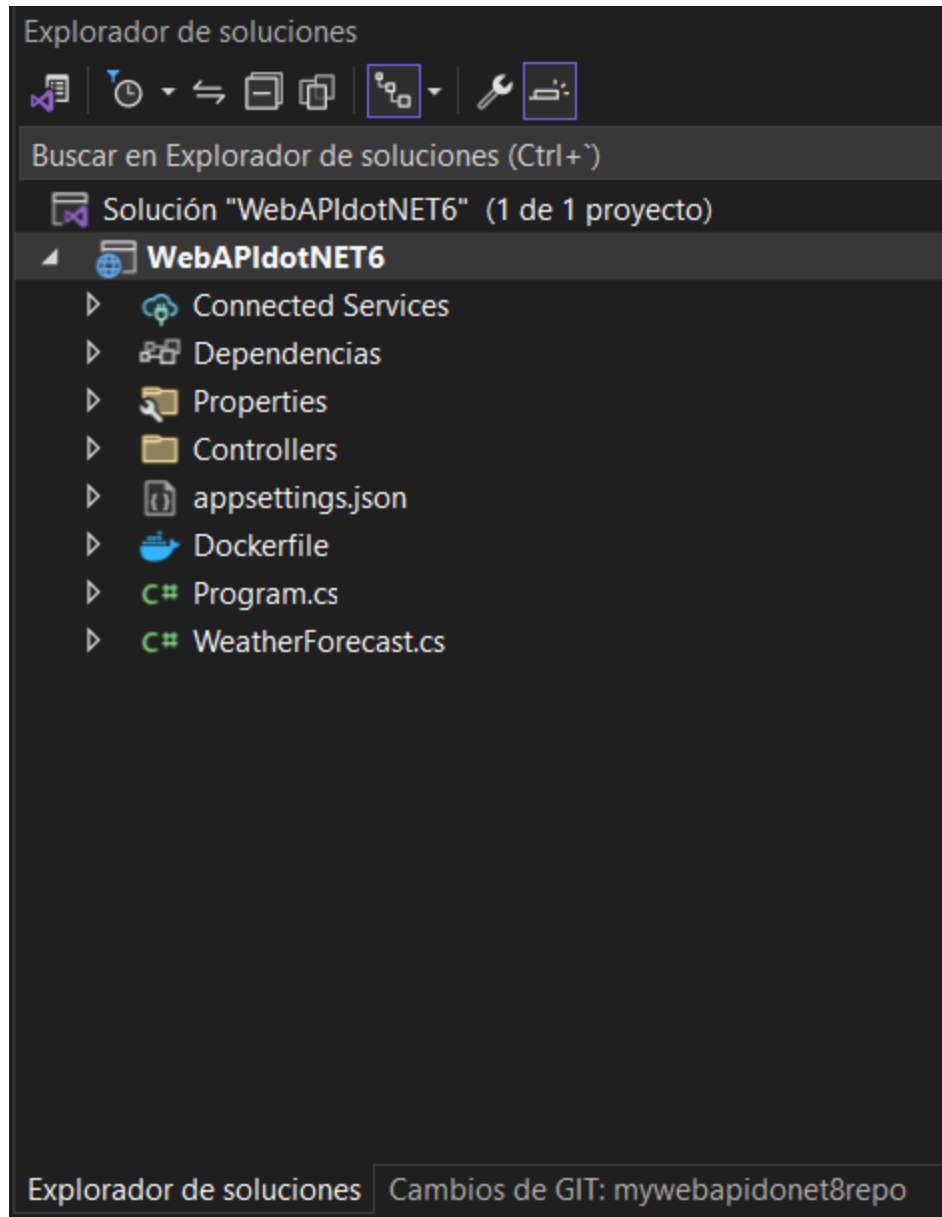
Sistema operativo de Docker ⓘ

Linux

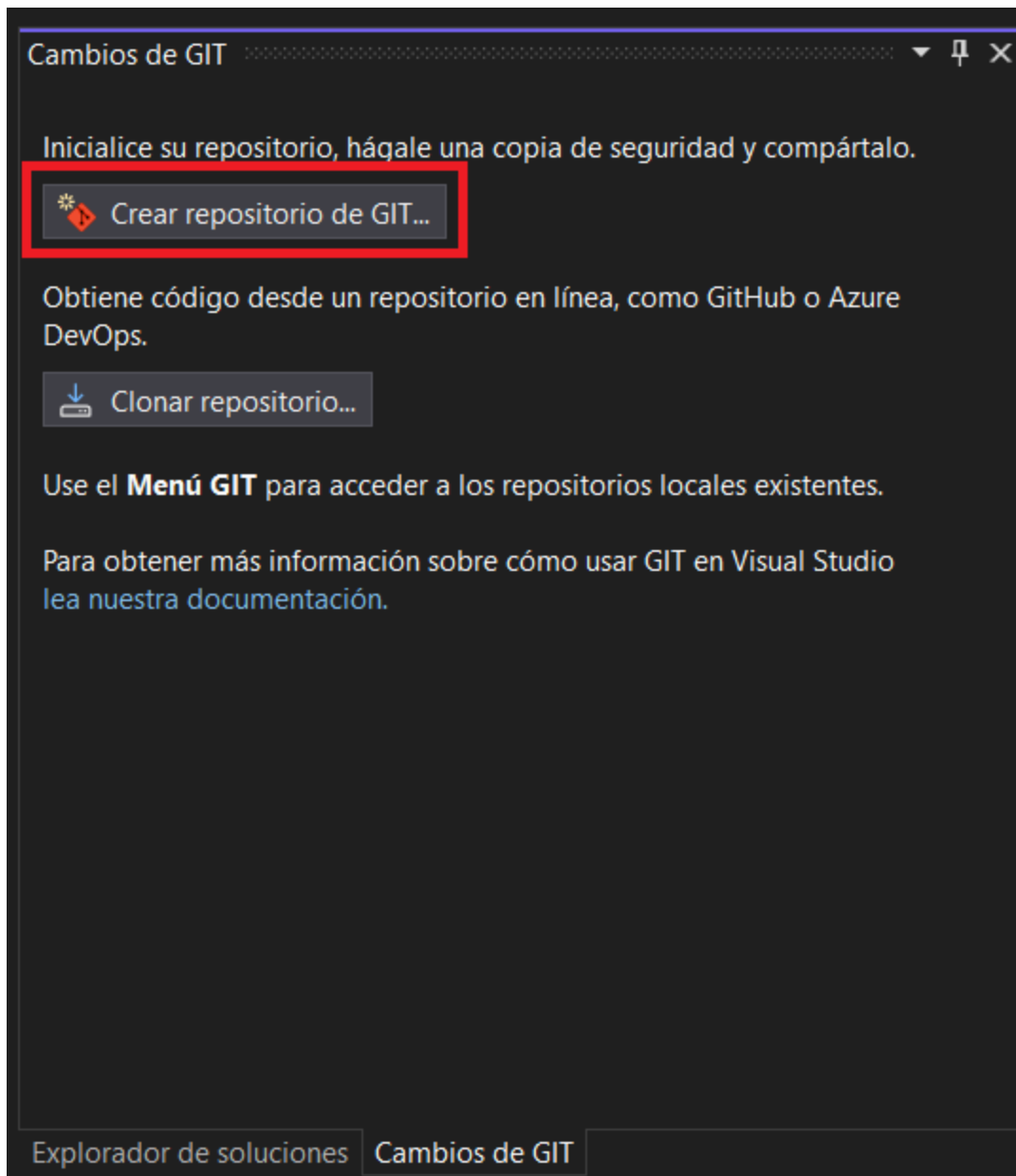
☒ Habilitar compatibilidad con OpenAPI ⓘ☐ No usar instrucciones de nivel superior ⓘ☒ Utilizar controladores ⓘ

Atrás

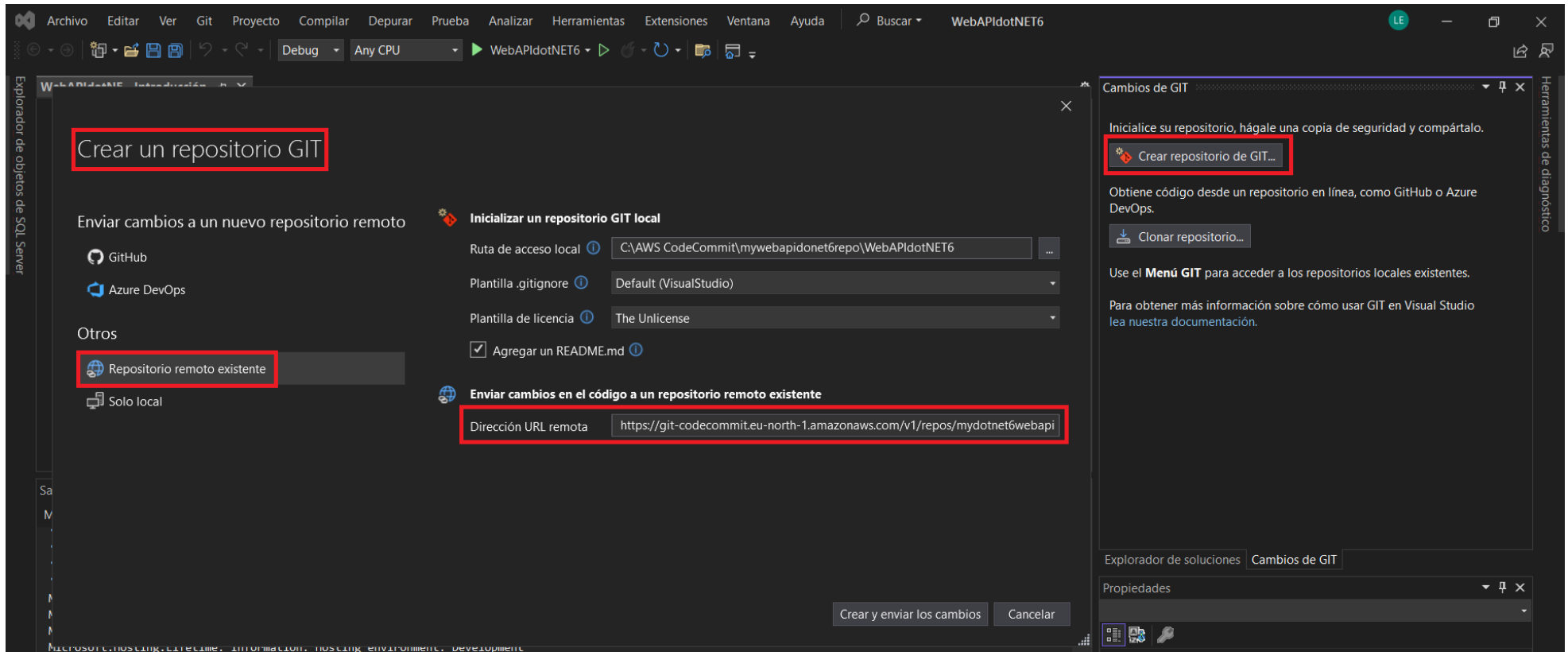
Crear



After creating the project we creat a new Git repo

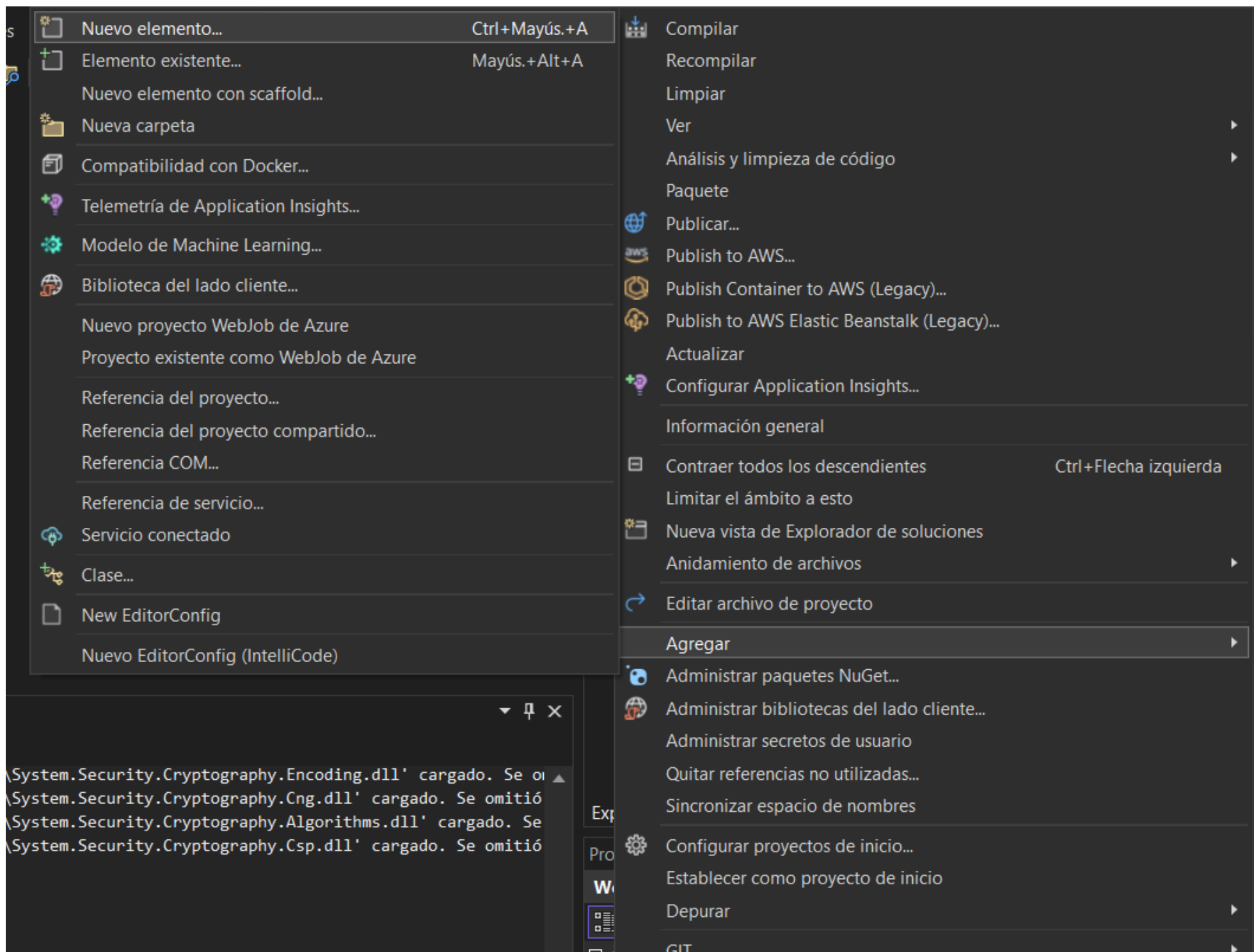


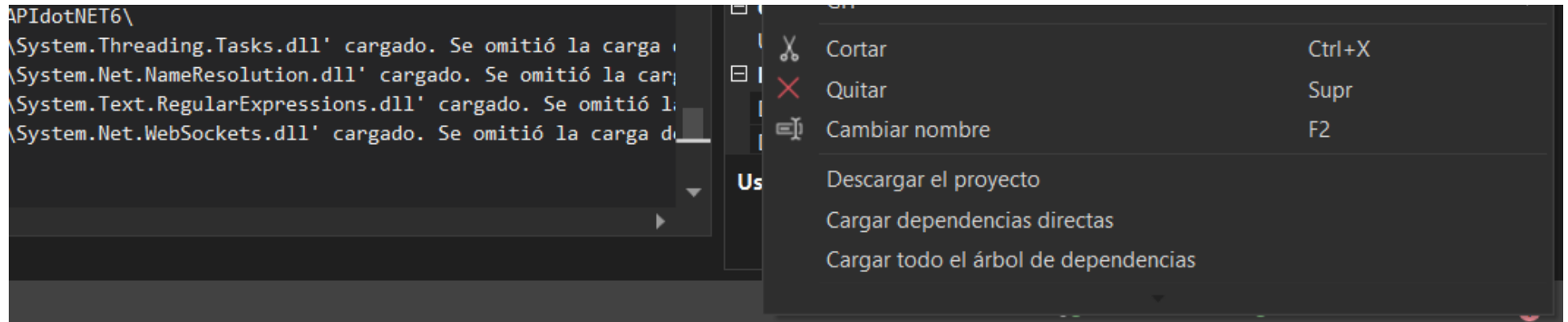
We copy the AWS CodeCommit repo URL in the Git repo URL: <https://git-codecommit.eu-north-1.amazonaws.com/v1/repos/mydotnet6webapi>

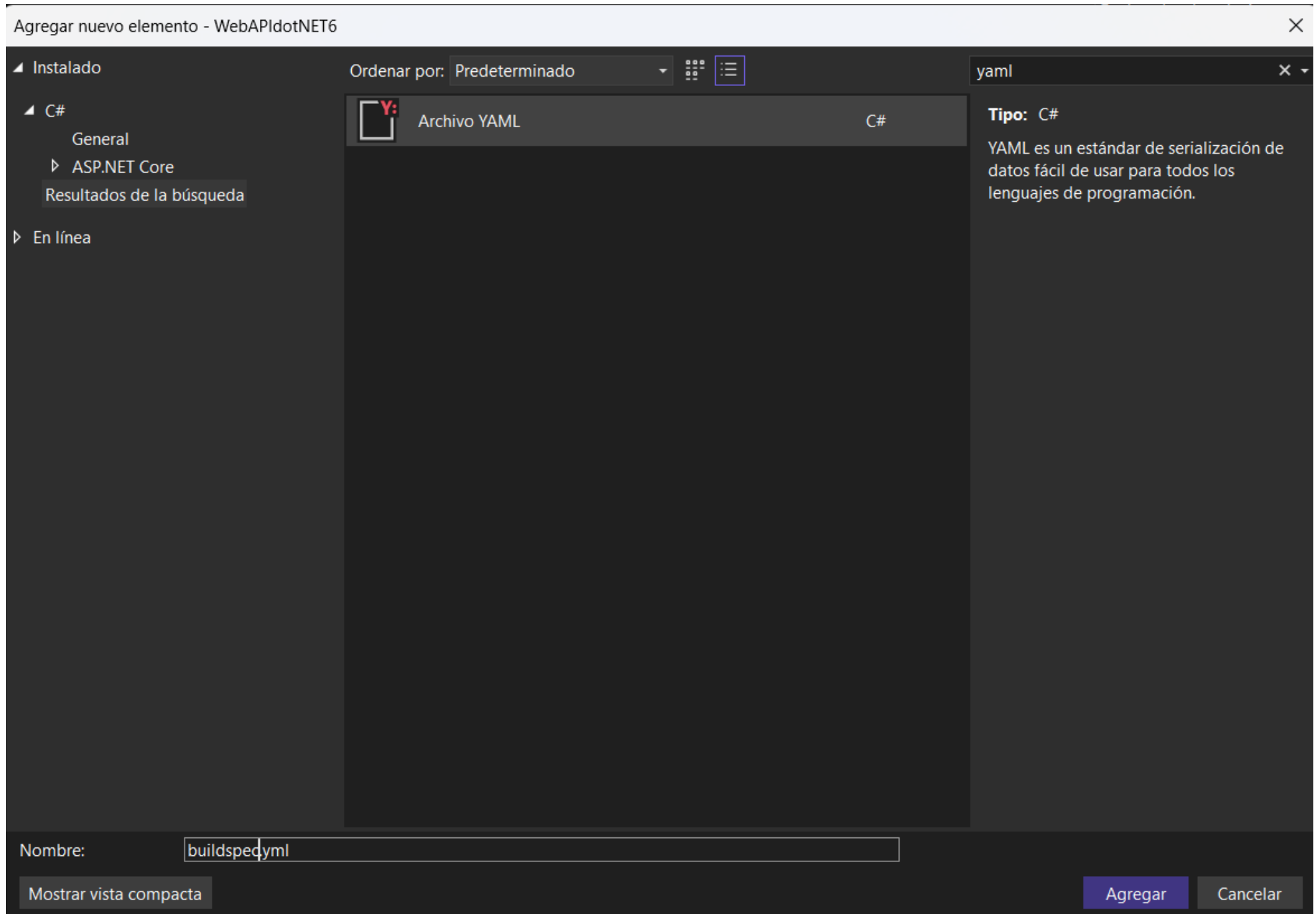


4. Add the buildspec.yml file to the Web API application

We add a new buildspec.yml file in our project







This is the **buildspec.yml** file source code

```
version: 0.2

phases:
  install:
    runtime-versions:
      dotnet: 6.0 # Updated to a supported version
  pre_build:
    commands:
      - echo Restoring solution
      - dotnet restore
  build:
    commands:
      - echo Build started on `date`
      - dotnet build -c Release
  post_build:
    commands:
      - echo Build completed on `date`
      - dotnet publish -c Release -o ./publish

artifacts:
  files:
    - '**/*'
  base-directory: './publish'

cache:
  paths:
    - '/root/.nuget/**/*'
```

5. Create AWS CodeBuild project

We press the "Create build project"


The screenshot shows the AWS CodeBuild console. The left sidebar contains the following navigation items:


- Developer Tools
- CodeBuild
 - Source • CodeCommit
 - Artifacts • CodeArtifact
 - Build • CodeBuild
 - Getting started
 - Build projects (selected)
 - Build history
 - Report groups
 - Report history
 - Account metrics
 - Deploy • CodeDeploy
 - Pipeline • CodePipeline
 - Settings
- Go to resource
- Feedback

The main content area is titled 'Build projects' and includes the following elements:

- Buttons: Refresh, Notify, Start build, View details, Edit, Delete build project, and Create build project.
- Search bar: A search input field with a magnifying glass icon.
- Table headers: Name, Source provider, Repository, Latest build status, Description, and Last Modified.
- Table content: A message stating 'No results' and 'There are no results to display.'

We set the AWS CodeBuild project name, we select the Source Provider AWS CodeCommit and finally we select the AWS CodeCommit repo

 Services [Alt+S]



Developer Tools > CodeBuild > Build projects > Create build project

Create build project

Project configuration

Project name

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 _.

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

Source

Add source

Source 1 - Primary

Source provider

Repository

Reference type

Choose the source version reference type that contains your source code.


☒ Branch

☐ Git tag


☐ Commit ID

Branch

Commit ID - *optional*

 CloudShell

Feedback

 Services [Alt+S]

Source

Add source

Source 1 - Primary

Source provider

AWS CodeCommit ▼

Repository

X

Reference type

Choose the source version reference type that contains your source code.

☒ Branch

☐ Git tag

☐ Commit ID

Branch

Choose a branch that contains the code to build.

master ▼

Commit ID - optional

Choose a commit ID. This can shorten the duration of your build.

Source version [Info](#)

refs/heads/master


3015913b we add the buildspec.yml file


► **Additional configuration**

Git clone depth, Git submodules

In this step we set the environment for building the solution. We select a Linux Ubuntu Virtual Machine.

We also create a new service role for CodeBuild.

 Services [Alt+S]



Environment

Environment image

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

☐ **Custom image**
Specify a Docker image

Operating system

Ubuntu ▼

Runtime(s)

Standard ▼

Image

aws/codebuild/standard:7.0 ▼

Image version

aws/codebuild/standard:7.0-23.07.28 ▼

Privileged

☐ Enable this flag if you want to build Docker images or want your builds to get elevated privileges

Service role


☒ **New service role**
Create a service role in your account


☐ **Existing service role**
Choose an existing service role from your account

**Role name**

Type your service role name

It is time to specify the building commands, for this purpose we created in the above steps a buildspec.yml file. Now we confirm we are going to use the buildspec.yml file for building our solution.

 Services [Alt+S]



Buildspec

Build specifications

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

☐ **Insert build commands**
Store build commands as build project configuration

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).

Batch configuration

You can run a group of builds as a single execution. Batch configuration is also available in advanced option when starting build.

☐ **Define batch configuration - optional**
You can also define or override batch configuration when starting a build batch.

Artifacts

Add artifact

Artifact 1 - Primary



Type


No artifacts ▼

You might choose no artifacts if you are running tests or pushing a Docker image to Amazon ECR.



We press the **Create build project** button

 Services [Alt+S]



Artifact 1 - Primary

Type

No artifacts ▼

You might choose no artifacts if you are running tests or pushing a Docker image to Amazon ECR.

► **Additional configuration**
Cache, encryption key

Logs

CloudWatch

☒ **CloudWatch logs - optional**
Checking this option will upload build output logs to CloudWatch.

Group name

Stream name

S3

☐ **S3 logs - optional**
Checking this option will upload build output logs to S3.



We press the **Start build** button

A screenshot of the AWS CodeBuild console showing the configuration and build history for a project named 'dotNET6WebAPI'.
Configuration:

Source provider	Primary repository	Artifacts upload location	Build badge
AWS CodeCommit	mydotnet6webapi	-	Disabled
Public builds	Disabled		

Build history:
The 'Build history' tab is selected. It shows a table with columns: Build run, Status, Build number, Source version, Submitter, Duration, and Completed. The table is currently empty, displaying 'No results' and 'There are no results to display.' Above the table are buttons for 'Stop build', 'View artifacts', 'View logs', 'Delete builds', and 'Retry build'.
Left sidebar: Contains navigation links for 'Developer Tools', 'CodeBuild', 'Source', 'Artifacts', 'Build', 'Deploy', 'Pipeline', and 'Settings'. The 'Build' section is expanded, showing 'Getting started', 'Build projects', 'Build project' (highlighted), 'Settings', 'Build history', 'Report groups', 'Report history', and 'Account metrics'.
Top bar: Includes the AWS logo, 'Services' menu, a search bar, and user information 'cloudUserLuis @ 5501-4'.

We can verify our solution was successfully built

aws

Services

Search

[Alt+S]

Stockholm

cloudUserLuis @ 5501-4

Developer Tools

CodeBuild

Source • CodeCommit

Artifacts • CodeArtifact

Build • CodeBuild

Getting started

Build projects

Build project

Settings

Build history

Report groups

Report history

Account metrics

Deploy • CodeDeploy

Pipeline • CodePipeline

Settings

Go to resource

Feedback

Developer Tools > CodeBuild > Build projects > dotNET6WebAPI > dotNET6WebAPI:677364ed-bfcc-4432-94ed-b2f878fe74e6

dotNET6WebAPI:677364ed-bfcc-4432-94ed-b2f878fe74e6

Stop build

Retry build

Build status

Status	Initiator	Build ARN	Resolved source version
Succeeded	cloudUserLuis	arn:aws:codebuild:eu-north-1:550146943653:build/dotNET6WebAPI:677364ed-bfcc-4432-94ed-b2f878fe74e6	3015913b11103cb215f31e1ff3f97be80bafda1
Start time	End time	Build number	
Dec 13, 2023 10:36 PM (UTC+1:00)	Dec 13, 2023 10:38 PM (UTC+1:00)	1	

Build logs | Phase details | Reports | Environment variables | Build details | Resource utilization

Showing the last 70 lines of the build log. [View entire log](#)

Tail logs

Show previous logs

```
1 [Container] 2023/12/13 21:38:19.668955 Waiting for agent ping
2 [Container] 2023/12/13 21:38:23.670538 Waiting for DOWNLOAD_SOURCE
3 [Container] 2023/12/13 21:38:29.206073 Phase is DOWNLOAD_SOURCE
4 [Container] 2023/12/13 21:38:29.208388 CODEBUILD_SRC_DIR=/codebuild/output/src3350828150/src/git-codecommit.eu-north-1.amazonaws.com/v1/repos/mydotnet6webapi
5 [Container] 2023/12/13 21:38:29.209070 YAML location is /codebuild/output/src3350828150/src/git-codecommit.eu-north-1.amazonaws.com/v1/repos/mydotnet6webapi/buildspec.yml
6 [Container] 2023/12/13 21:38:29.209377 No commands found for phase name: install
7 [Container] 2023/12/13 21:38:29.215573 Not setting HTTP client timeout for source type codecommit
8 [Container] 2023/12/13 21:38:29.215661 Processing environment variables
9 [Container] 2023/12/13 21:38:29.302274 Selecting 'dotnet' runtime version '6.0' based on manual selections...
10 [Container] 2023/12/13 21:38:29.303051 Running command echo "Installing .NET version 6.0 ..."
11 Installing .NET version 6.0 ...
12
13 [Container] 2023/12/13 21:38:29.327863 Moving to directory /codebuild/output/src3350828150/src/git-codecommit.eu-north-1.amazonaws.com/v1/repos/mydotnet6webapi
```

CloudShell

Feedback

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