NextWork.org

Package an App with CodeBuild

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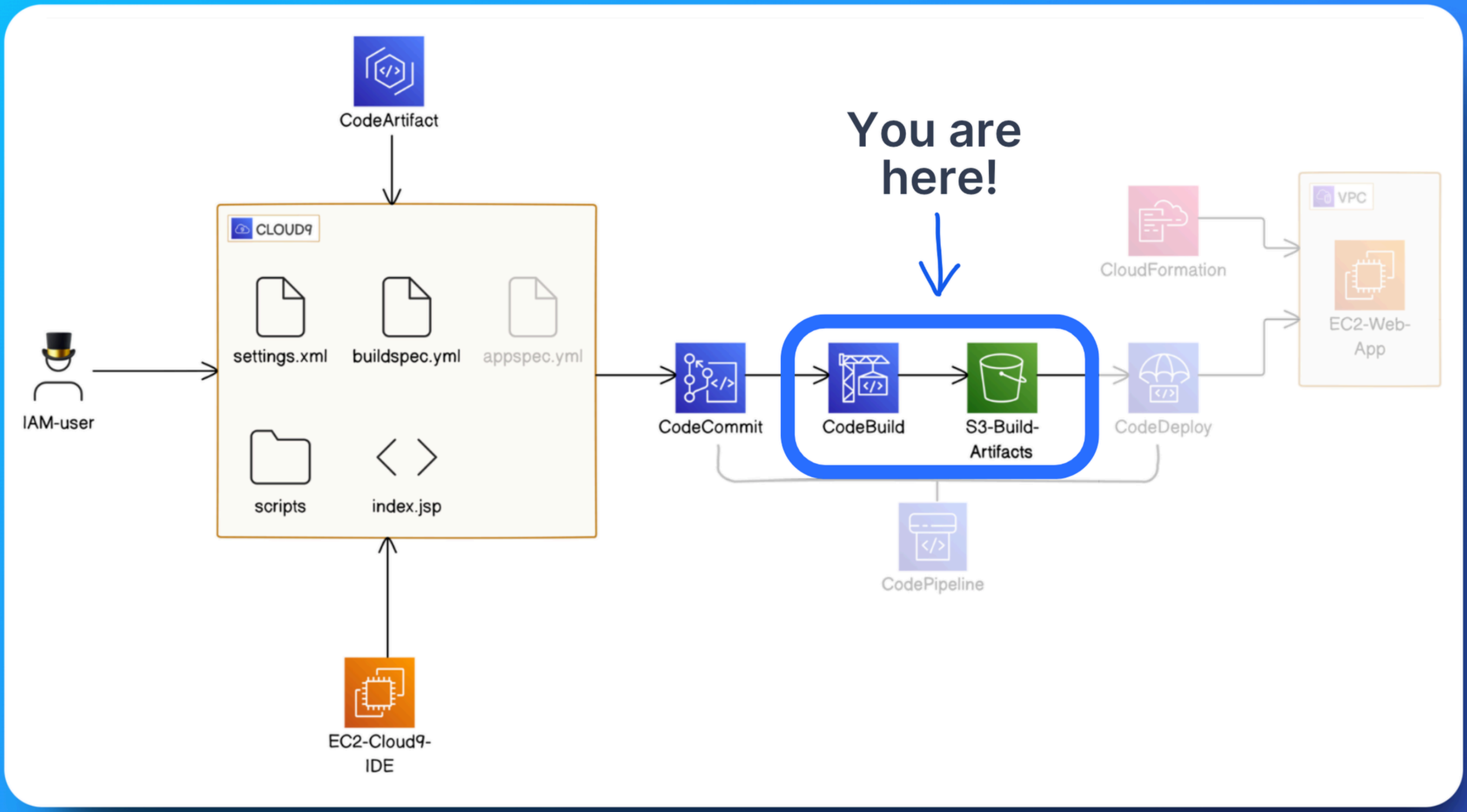

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Introducing AWS CodeBuild!

What it does & how it's useful

AWS CodeBuild is a fully managed build service in the cloud. CodeBuild compiles your source code, runs unit tests, and produces artifacts that are ready to deploy. CodeBuild eliminates the need to provision, manage, and scale your own build servers. It provides prepackaged build environments for popular programming languages and build tools such as Apache Maven, Gradle, and more.

How I'm using it in today's project

I'm using AWS CodeBuild in this project to automate the process of building and packaging my application. CodeBuild allows me to define build processes and dependencies, and it handles the environment setup and execution.

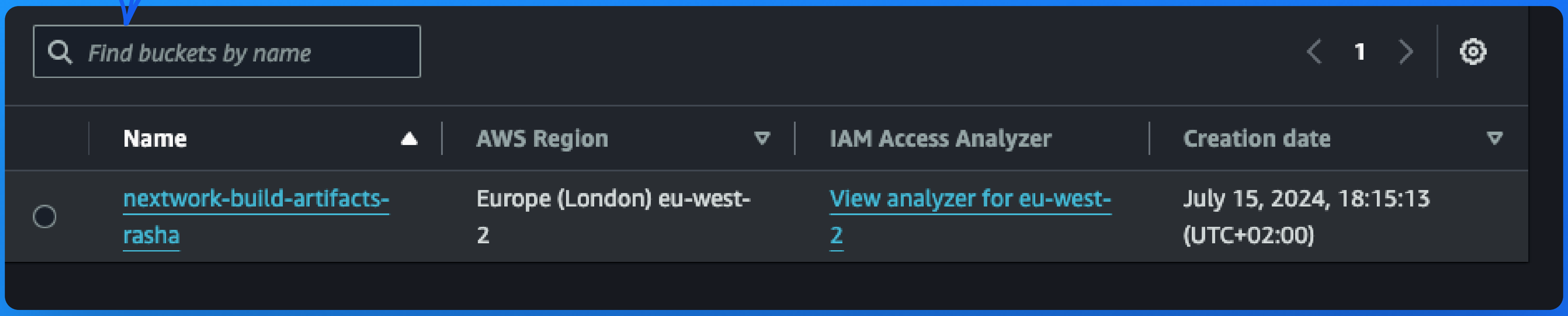
This project took me...

The entire project setup and build process took me approximately 2 hours to complete.

Set up an S3 bucket

- I started my project by creating an S3 bucket because it serves as a storage location for building artifacts and other resources needed during the build process.
- The key artifact that this S3 bucket will capture is called build-output.zip.
- This file is important because it contains the packaged application files and deployment assets generated by CodeBuild.

My S3 bucket!



	Name	AWS Region	IAM Access Analyzer	Creation date
○	nextwork-build-artifacts-rasha	Europe (London) eu-west-2	View analyzer for eu-west-2	July 15, 2024, 18:15:13 (UTC+02:00)

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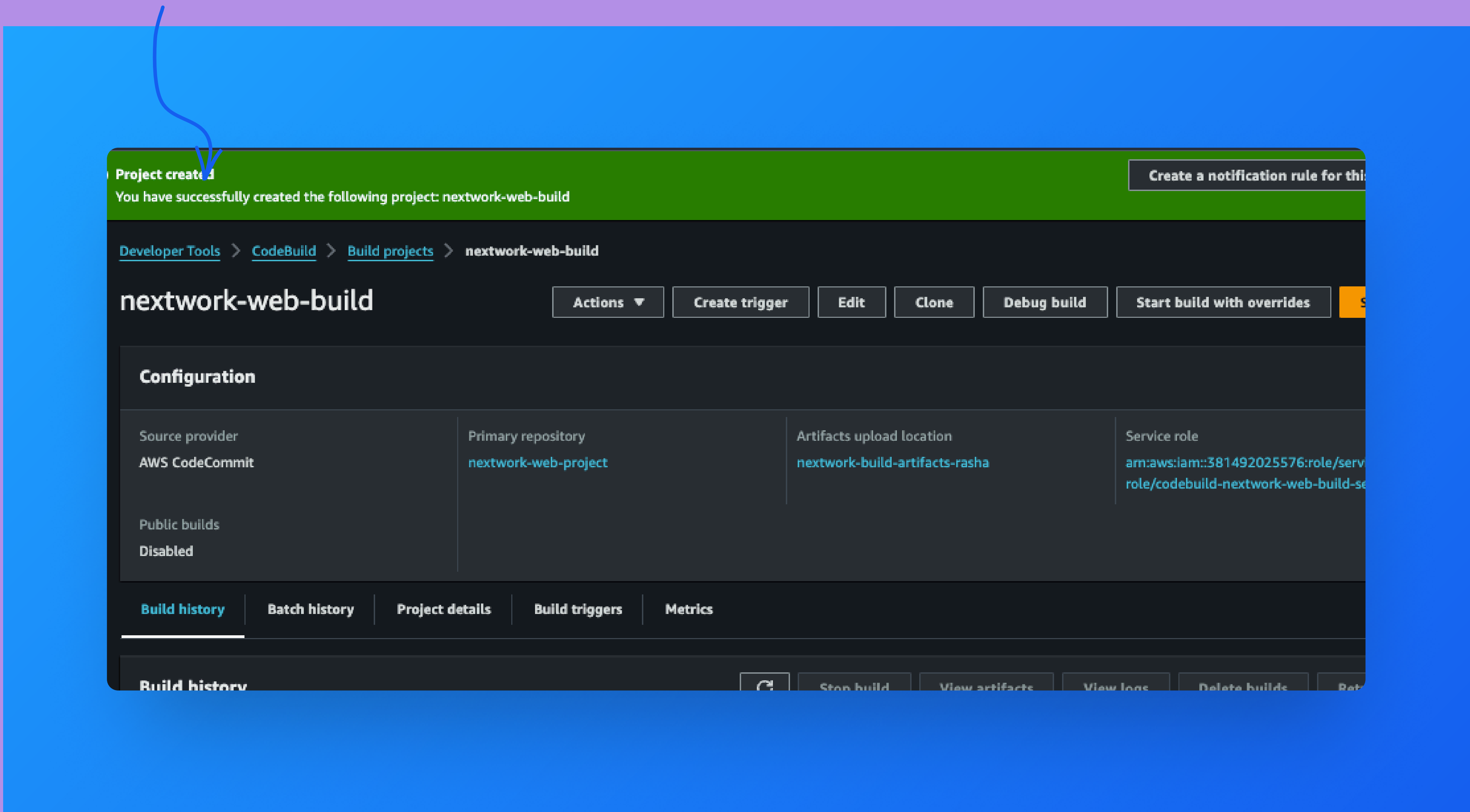
Set up a CodeBuild project

When creating a project in CodeBuild, there were 5 key configurations I set up:

1. Source, which means the location from which CodeBuild fetches the source code. I selected an AWS CodeCommit repository.
2. Environment, which means the build environment configuration. I selected a managed image with Amazon Linux 2.
3. Buildspec, which is a file that contains build commands and settings. I selected buildspec.yml.
4. Artifacts, which means the output files produced by the build. I selected nextwork-web-build.zip to be uploaded to S3.
5. **Logs, which means the logging configuration for build execution. I selected Amazon CloudWatch Logs for monitoring build progress and troubleshooting.**

My completed project ready for the first build!



Project created
You have successfully created the following project: nextwork-web-build

Developer Tools > CodeBuild > Build projects > nextwork-web-build

nextwork-web-build

Configuration

Source provider	Primary repository	Artifacts upload location	Service role
AWS CodeCommit	nextwork-web-project	nextwork-build-artifacts-rasha	arn:aws:iam::381492025576:role/serv role/codebuild-nextwork-web-build-se

Public builds
Disabled

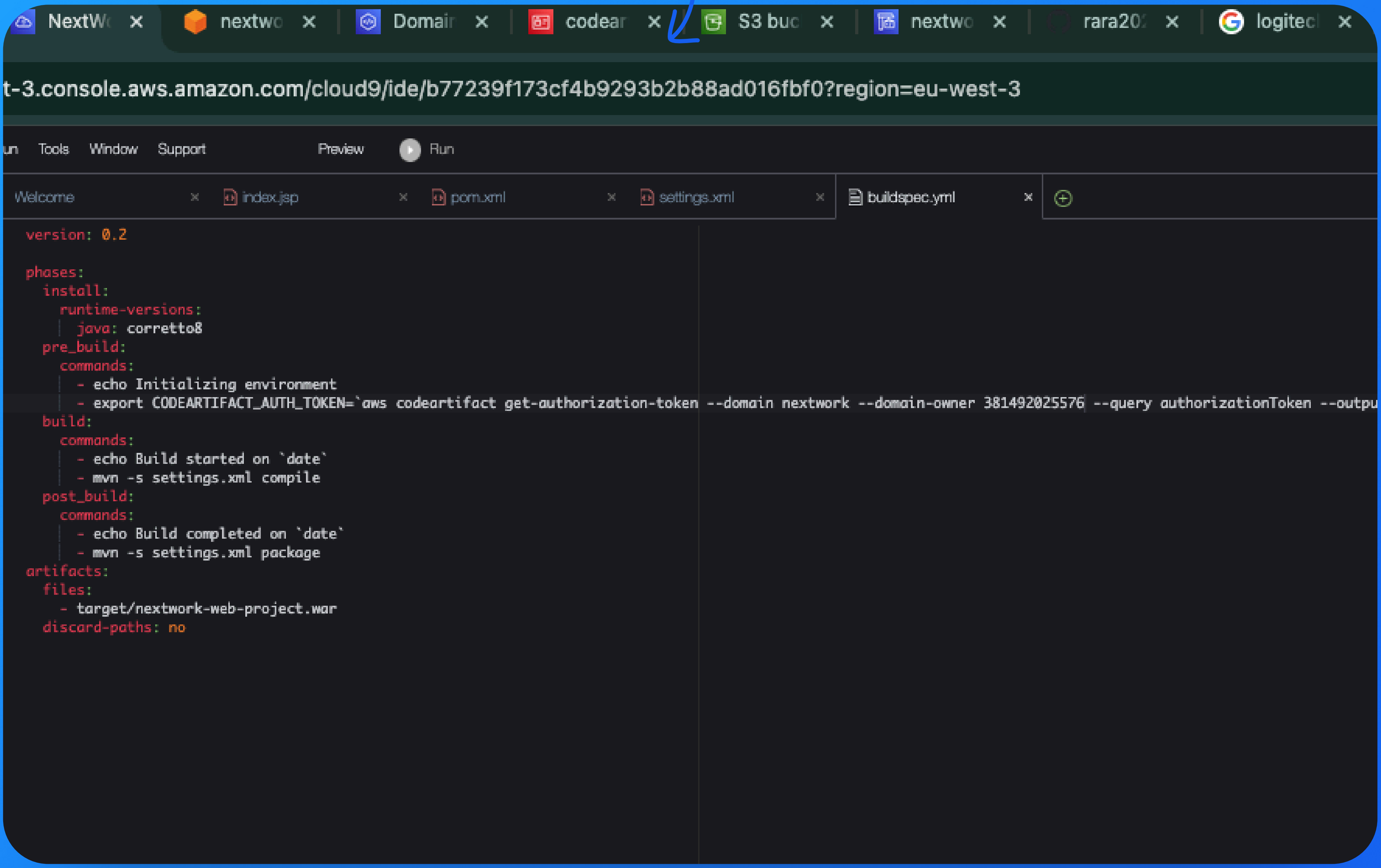
Build history

Create a buildspec.yml file

- I created a buildspec.yml file at the root of my code repository.
- This file contains four phases that tell our build environment what commands to run. These four phases are:

1. Install: Commands to install dependencies.
2. Pre_build: Commands to prepare the environment before the build.
3. Build: Commands to build the application.
4. Post_build: Commands to package and upload the build artifacts.

A peek into my buildspec.yml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un Tools Window Support Preview Run
Welcome
index.jsp
pom.xml
settings.xml
buildspec.yml

```yaml
version: 0.2

phases:
  install:
    runtime-versions:
      java: corretto8
  pre_build:
    commands:
      - echo Initializing environment
      - export CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --domain nextwork --domain-owner 381492025576 --query authorizationToken --outpu
  build:
    commands:
      - echo Build started on `date`
      - mvn -s settings.xml compile
  post_build:
    commands:
      - echo Build completed on `date`
      - mvn -s settings.xml package
artifacts:
  files:
    - target/nextwork-web-project.war
  discard-paths: no
```

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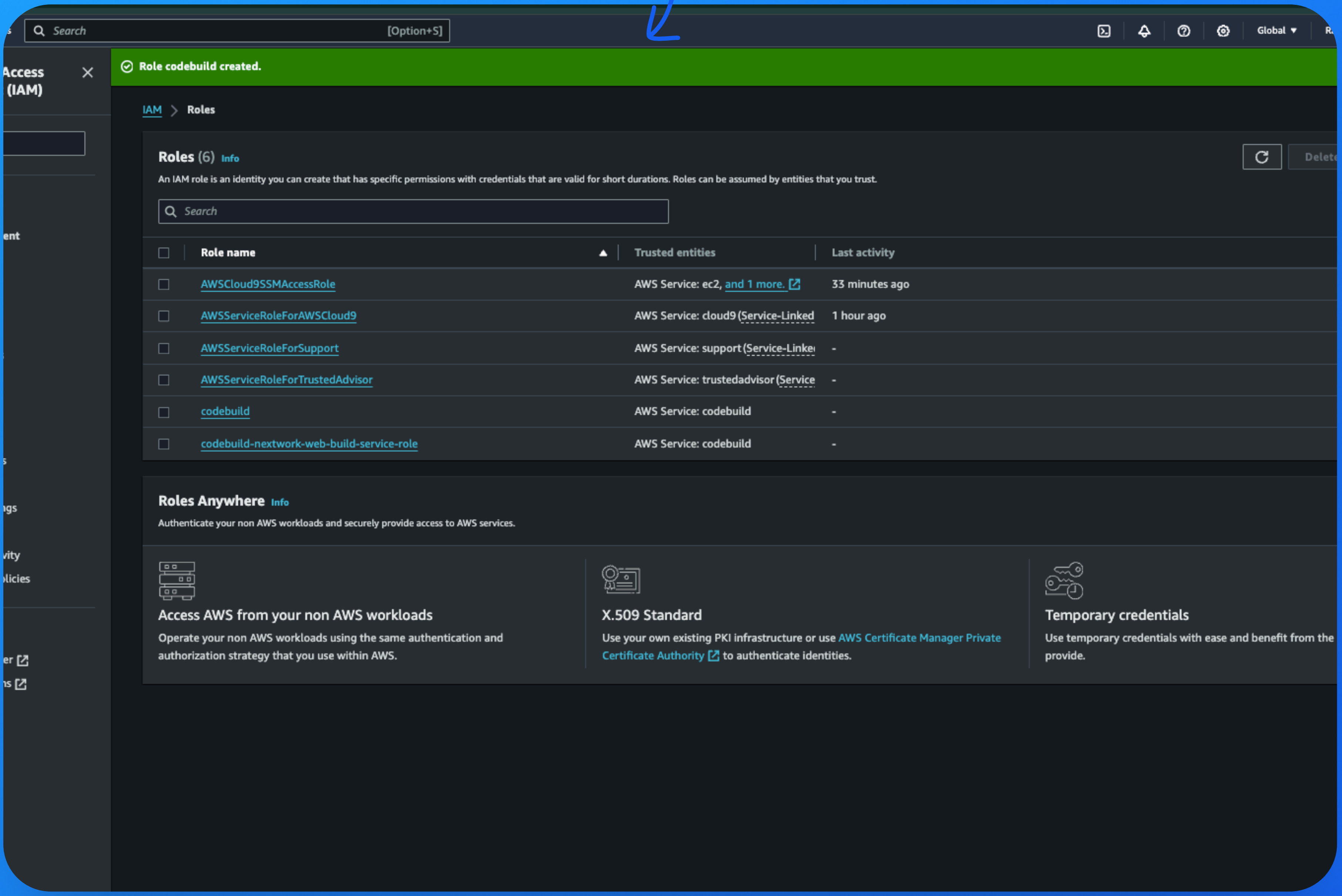
Edit CodeBuild’s IAM role

- Before I start building my web app project (exciting!), I modified my CodeBuild project’s service role first. This role was first created when I set up the CodeBuild project.
- I attached a new policy called codeartifact-nextwork-consumer-policy to my CodeBuild project’s IAM role. This means the role now has the necessary permissions to access S3 buckets, CloudWatch Logs, and other AWS resources needed for the build process.

Updating permission policies for my CodeBuild project’s IAM role.



Role codebuild created.

IAM > Roles

Roles (6) 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	Last activity
AWSCloud9SSMAccessRole	AWS Service: ec2, and 1 more.	33 minutes ago
AWSServiceRoleForAWSCloud9	AWS Service: cloud9 (Service-Linked	1 hour ago
AWSServiceRoleForSupport	AWS Service: support (Service-Linke	-
AWSServiceRoleForTrustedAdvisor	AWS Service: trustedadvisor (Service	-
codebuild	AWS Service: codebuild	-
codebuild-nextwork-web-build-service-role	AWS Service: codebuild	-

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 provide.

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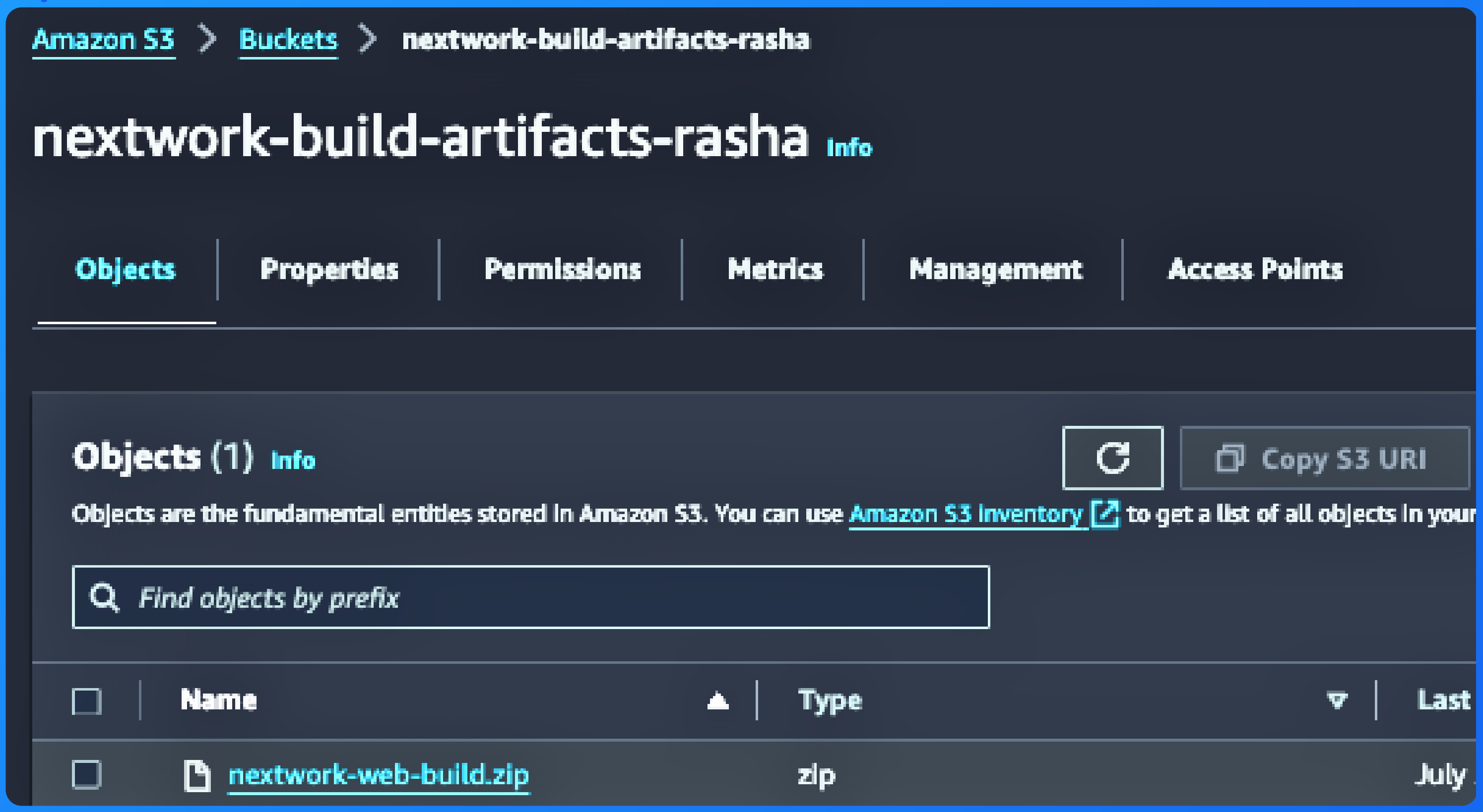
My first project build 💪

- To build my project, all I had to do was click the 'Start Build' button in the CodeBuild console.
- The build process in CodeBuild took approximately 10 minutes.
- Once the build is complete, I checked the S3 bucket. I saw the zip file , which verified that the build was completed successfully.

My completed project ready for the first build!



Amazon S3 > Buckets > nextwork-build-artifacts-rasha

nextwork-build-artifacts-rasha Info

Objects (1) Info

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your

Name	Type	Last
nextwork-web-build.zip	zip	July

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My key learnings

1 The build process, or ‘building’, means compiling source code, running tests, and creating deployment-ready artifacts.

2 The buildspec.yml file is used to define the build commands and phases for CodeBuild to follow during the build process.

3 Even though CodeBuild creates a new service role for my build environment, I still have to modify the role’s permission policies because the default role does not include permissions for all resources used in the build process.

4 One thing I didn’t expect was how quickly CodeBuild scaled to handle the build, even for complex projects.

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Bonus AWS cli & AWS CloudShell

- During that project, I also tried to use AWS cloudshell and the terminal to save time.
- For example the command :

aws sts get-caller-identity --query Account --output text is quite straightforward to get the AWS account ID

Create a Cloud9 Environment:

```
aws cloud9 create-environment-ec2 \
   --name "NextWorkIDE" \
   --description "Development environment for NextWork project" \
   --instance-type "t2.micro" \
   --automatic-stop-time-minutes 30 \
   --owner-arn arn:aws:iam::381492025576:user/Your-IAM-User \
   --image-id "resolve:ssm:/aws/service/cloud9/amis/amazonlinux-2-x86_64"
```

to create a codecommit repository:

```
aws codecommit create-repository --repository-name nextwork-web-project --repository-description "A web application for the NextWork home page." aws codecommit get-repository --repository-name "nextwork-web-project"
```

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Bonus AWS cli & AWS CloudShell

Create CodeArtifact Domain and Repository:

- **aws codeartifact create-domain --domain nextwork**
- **aws codeartifact create-repository --domain nextwork --repository maven-central-store**
- **aws codeartifact associate-external-connection --domain nextwork --repository maven-central-store --external-connection public:maven-central**
- **aws codeartifact create-repository --domain nextwork --repository nextwork-packages --upstreams repositoryName=maven-central-store --description "Packages for the NextWork web app"**