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Secure Packages with CodeArtifact

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The screenshot shows the AWS CodeArtifact interface within a web browser. The URL in the address bar is `aws.amazon.com/codeartifact/repositories/nextwork-devo.../packages`. The page displays a table of packages with columns for Package name and Namespace. The packages listed are:

Package name	Namespace
backport-util-concurrent	backport-util-concurrent
classworlds	classworlds
google	com.google
jsr305	com.google.code.findbugs
google-collections	com.google.collections
commons-cli	commons-cli
commons-logging-api	commons-logging
junit	junit

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Introducing Today's Project!

In this project, I will demonstrate how to set up code artifact to securely store code dependencies.

Key tools and concepts

'Services I used were ec2, AWS CodeArtifact and IAM Role and Policy. Key concepts I learnt includes package management lifecycle, environmental variables, CodeArtifact Domains, IAM Services among others

Project reflection

This project took me approximately 1hr. The most challenging part was compiling the maven app. It was most rewarding to go through several series of steps to trouble shoot issues as they come by along the way

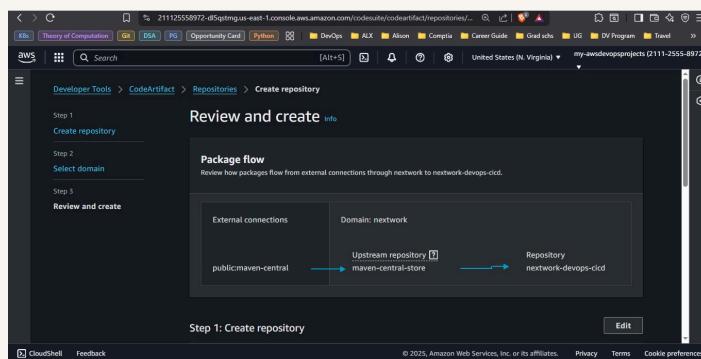
This project is part three of a series of DevOps projects where I'm building a CI/CD pipeline! I'll be working on the next project tonight.

CodeArtifact Repository

CodeArtifact is package repo for storing artifacts and it's dependencies. Engineering teams use artifact repositories for reliability, consistency and security.

A domain is a folder for centrally managing multiple repos belonging to the same organization or project. This ensures consistency, speed and convenience in applying security rules to the entire repos. My domain is nextwork

A CodeArtifact repository can have an upstream repository, which is like a backup or secondary library for the primary repo. My repository's upstream repository is Maven Central which is like the playstore of the java-world for most java libraries



CodeArtifact Security

Issue

To access CodeArtifact, i need an authorization token for the ec2. However, I ran into an error when retrieving a token because ec2 doesn't yet have permission to retrieve authorization tokens.

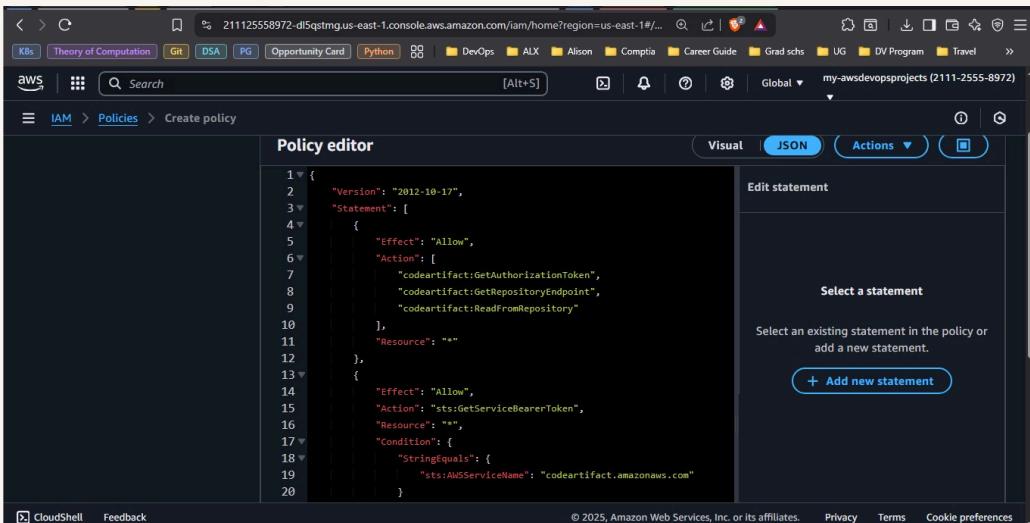
Resolution

To resolve the error with the security token, i wrote an IAM policy for authroization token among others, assigned it to IAM Role and attached it to the ec2 instance This resolved the error because ec2 is now authorized access AWS CodeArtifact.

It's security best practice to use IAM roles because it is provides fine grained or granular access to only services, users etc which requires those permissions.

The JSON policy attached to my role

The JSON policy I sets up (codeartifact:* actions) grants permission to get authentication token, locate repos and read packages from repos and (sts:GetServiceBearerToken) allows temporarily elevated access specifically for CodeArtifact ops.



The screenshot shows the AWS IAM Policy editor interface. The policy is defined in JSON format:

```
1 {  
2     "Version": "2012-10-17",  
3     "Statement": [  
4         {  
5             "Effect": "Allow",  
6             "Action": [  
7                 "codeartifact:GetAuthorizationToken",  
8                 "codeartifact:GetRepositoryEndpoint",  
9                 "codeartifact:ReadFromRepository"  
10            ],  
11            "Resource": "*"  
12        },  
13        {  
14            "Effect": "Allow",  
15            "Action": "sts:GetServiceBearerToken",  
16            "Resource": "",  
17            "Condition": {  
18                "StringEquals": {  
19                    "sts:AWSServiceName": "codeartifact.amazonaws.com"  
20                }  
21            }  
22        }  
23    ]  
24}
```

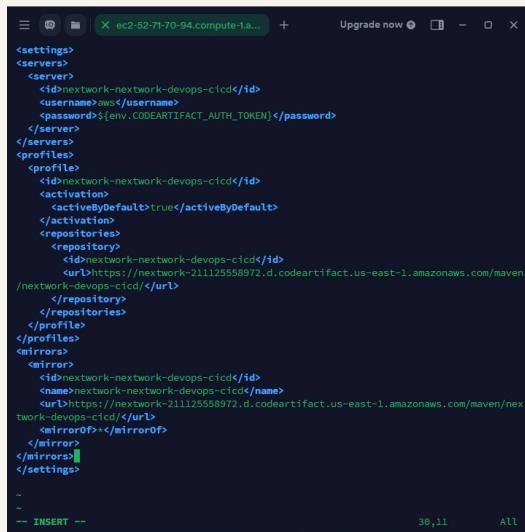
The policy grants permission to perform various actions on CodeArtifact resources and to temporarily assume a service role using the sts:GetServiceBearerToken action.

Maven and CodeArtifact

To test the connection between Maven and CodeArtifact, I compiled my web app using settings.xml

The settings.xml file configures Maven to via the CodeArtifact information to connect to CodeArtifact. It tells Maven, whenever you need to download a dependency, look in this CodeArtifact repository first, and here's how to authenticate yourself.

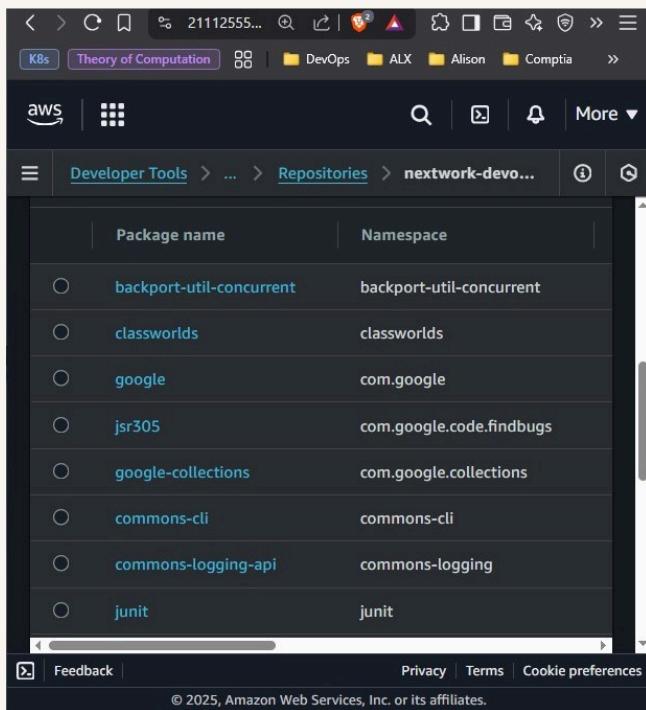
Compiling means translating project's code into a language that computers can understand and run. When you compile project, you're making sure everything is correctly set up and ready to turn into a working app



```
<settings>
<servers>
<server>
<id>nextwork-nextwork-devops-cicd</id>
<username>aws</username>
<password>$[env.CODEARTIFACT_AUTH_TOKEN]</password>
</server>
</servers>
<profiles>
<profile>
<id>nextwork-nextwork-devops-cicd</id>
<activation>
<activeByDefault>true</activeByDefault>
</activation>
<repositories>
<repository>
<id>nextwork-nextwork-devops-cicd</id>
<url>https://nextwork-211125558972.d.codeartifact.us-east-1.amazonaws.com/maven/nex
twork-devops-cicd</url>
</repository>
</repositories>
</profile>
</profiles>
<mirrors>
<mirror>
<id>nextwork-nextwork-devops-cicd</id>
<name>nextwork-nextwork-devops-cicd</name>
<url>https://nextwork-211125558972.d.codeartifact.us-east-1.amazonaws.com/maven/nex
twork-devops-cicd</url>
<mirrorOf></mirrorOf>
</mirror>
</mirrors>
</settings>
-
-
-- INSERT --
38 | 11      All
```

Verify Connection

After compiling, I checked out the terminal and maven has been built successfully. I noticed all the dependencies has been packaged in the packages panel of CodeArtifact





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