CodeArtifact

CodeArtifact User Guide

CodeArtifact: CodeArtifact User Guide

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What is AWS CodeArtifact?

CodeArtifact is a fully managed artifact repository service that makes it easy for organizations to securely store and share software packages used for application development. You can use CodeArtifact with popular build tools and package managers such as **NuGet**, **Maven**, **Gradle**, **npm**, **yarn**, **pip**, and **twine**.

CodeArtifact automatically scales when you ingest or publish new packages to your repositories. Because it's a fully managed service, the setup and operation of its infrastructure is done for you. Integration with AWS Key Management Service (AWS KMS) secures all assets in a domain with one AWS KMS key (KMS key) that either you manage or AWS manages for you.

For more information, see AWS CodeArtifact.

How does CodeArtifact work?

CodeArtifact stores software packages in repositories. Repositories are polyglot—a single repository can contain packages of any supported type. Every CodeArtifact repository is a member of a single CodeArtifact domain. We recommend that you use one production domain for your organization with one or more repositories. For example, each repository might be used for a different development team. Packages in your repositories can then be discovered and shared across your development teams.

To add packages to a repository, configure a package manager such as `npm` or `maven` to use the repository endpoint (URL). You can then use the package manager to publish packages to repository. You can also import open-source packages into a repository by configuring it with an external connection to a public repository such as npmjs, NuGet Gallery, Maven Central, or PyPI. For more information, see Add an external connection (p. 26).

You can make packages in one repository available to another repository in the same domain. To do this, configure one repository as an upstream of the other. All package versions available to the upstream repository are also available to the downstream repository. In addition, all packages that are available to the upstream repository through an external connection to a public repository are available to the downstream repository. For more information, see Working with upstream repositories in CodeArtifact (p. 38).

AWS CodeArtifact Concepts

Here are some concepts and terms to know when you use CodeArtifact.

Topics

Domain

Repositories are aggregated into a higher-level entity known as a *domain*. All package assets and metadata are stored in the domain, but they are consumed through repositories. A given package asset, such as a Maven JAR file, is stored once per domain, no matter how many repositories it's present in. All of the assets and metadata in a domain are encrypted with the same AWS KMS key (KMS key) stored in AWS Key Management Service (AWS KMS).

Each repository is a member of a single domain and can't be moved to a different domain.

The domain allows organizational policy to be applied across multiple repositories, such as which accounts can access repositories in the domain, and which public repositories can be used as sources of packages.

Although an organization can have multiple domains, we recommend a single production domain that contains all published artifacts so that teams can find and share packages across their organization.

Repository

A CodeArtifact *repository* contains a set of package versions (p. 2), each of which maps to a set of assets (p. 3). Repositories are polyglot—a single repository can contain packages of any supported type. Each repository exposes endpoints for fetching and publishing packages using tools like the **`nuget`** CLI, the **`npm`** CLI, the Maven CLI (**`mvn`**), and **`pip`**. You can create up to 1000 repositories per domain.

Package

A *package* is a bundle of software and the metadata that is required to resolve dependencies and install the software. In CodeArtifact, a package consists of a package name, an optional namespace (p. 3) such as `@types` in `@types/node`, a set of package versions, and package-level metadata such as npm tags.

AWS CodeArtifact supports npm (p. 84), PyPI (p. 96), Maven (p. 100), and NuGet (p. 113) package formats.

Package version

A *package version* identifies the specific version of a package, such as `@types/node 12.6.9`. The version number format and semantics vary for different package formats. For example, npm package versions must conform to the Semantic Versioning specification. In CodeArtifact, a package version consists of the version identifier, package version level metadata, and a set of assets.

Package version revision

A *package version revision* is a string that identifies a specific set of assets and metadata for a package version. Each time a package version is updated, a new package version revision is created. For example, you might publish a source distribution archive (**sdist**) for a Python package version, and later add a Python **wheel** that contains compiled code to the same version. When you publish the **wheel**, a new package version revision is created.

Upstream repository

One repository is *upstream* of another when the package versions in it can be accessed from the repository endpoint of the downstream repository, effectively merging the contents of the two repositories from the point of view of a client. CodeArtifact allows creating an upstream relationship between two repositories.

Asset

An *asset* is an individual file stored in CodeArtifact that is associated with a package version, such as an npm `.tgz` file or Maven POM and JAR files.

Package namespace

Some package formats support hierarchical package names to organize packages into logical groups and help avoid name collisions. For example, npm supports scopes, see the npm scopes documentation for more information. The npm package `@types/node` has a scope of `@types` and a name of `node`. There are many other package names in the `@types` scope. In CodeArtifact, the scope ("types") is referred to as the package namespace and the name ("node") is referred to as the package name. For Maven packages, the package namespace corresponds to the Maven groupID. The Maven package `org.apache.logging.log4j:log4j` has a groupID (package namespace) of `org.apache.logging.log4j` and the artifactID (package name) `log4j`. Some package formats such as PyPI don't support hierarchical names with a concept similar to npm scope or Maven groupID. Without a way to group package names, it can be more difficult to avoid name collisions.

How do I get started with CodeArtifact?

We recommend that you complete the following steps:

1. **Learn** more about CodeArtifact by reading the information in AWS CodeArtifact Concepts (p. 1).
2. **Set up** your AWS account, the AWS CLI, and an IAM user by following the steps in Setting up with AWS CodeArtifact (p. 4).
3. **Use** CodeArtifact by following the instructions in Getting started with CodeArtifact (p. 7).

Setting up with AWS CodeArtifact

If you've already signed up for Amazon Web Services (AWS), you can start using CodeArtifact immediately. You can open the CodeArtifact console, choose **Create a domain and repository**, and follow the steps in the launch wizard to create your first domain and repository.

If you haven't signed up for AWS yet, or need assistance creating your first domain and repository, complete the following tasks to get set up to use CodeArtifact:

Topics

Sign up for AWS

When you sign up for Amazon Web Services (AWS), your AWS account is automatically signed up for all services in AWS, including CodeArtifact. You are charged only for the services that you use. With CodeArtifact, you pay only for what you use.

If you already have an AWS account, skip to the next task, Install or upgrade and then configure the AWS CLI (p. 4). If you don't have an AWS account, use the following procedure to create one.

To create an AWS account

1. Open https://portal.aws.amazon.com/billing/signup.
2. Follow the online instructions.

   Part of the sign-up procedure involves receiving a phone call and entering a verification code on the phone keypad.

Install or upgrade and then configure the AWS CLI

To call CodeArtifact commands from the AWS Command Line Interface (AWS CLI) on a local development machine, you must install the AWS CLI.

If you have an older version of the AWS CLI installed, you must upgrade it so the CodeArtifact commands are available. CodeArtifact commands are available in the following AWS CLI versions.

1. **AWS CLI 1:** 1.18.77 and newer
2. **AWS CLI 2:** 2.0.21 and newer

To check the version, use the `aws --version` command.

To install and configure the AWS CLI

1. Install or upgrade the AWS CLI with the instructions in Installing the AWS Command Line Interface.

2. Configure the AWS CLI, with the **configure** command, as follows.

   ```
   aws configure
   ```

   When prompted, specify the AWS access key and AWS secret access key of the IAM user that you will use with CodeArtifact. When prompted for the default region name, specify the region where you will create the pipeline, such as `us-east-2`. When prompted for the default output format, specify `json`.

   Important
   When you configure the AWS CLI, you are prompted to specify an AWS Region. Choose one of the supported regions listed in Region and Endpoints in the *AWS General Reference*.

   For more information, see Configuring the AWS Command Line Interface and Managing Access Keys for IAM Users.
3. To verify the installation or upgrade, call the following command from the AWS CLI.

   ```
   aws codeartifact help
   ```

   If successful, this command displays a list of available CodeArtifact commands.

Next, you can create an IAM user and grant that user access to CodeArtifact. For more information, see Provision an IAM User (p. 5).

Provision an IAM User

Follow these instructions to prepare an IAM user to use CodeArtifact.

To provision an IAM user

1. Create an IAM user, or use one that is associated with your AWS account. For more information, see Creating an IAM User and Overview of AWS IAM Policies in the *IAM User Guide*.
2. Grant the IAM user access to CodeArtifact.

   - **Option 1:** Create a custom IAM policy. With a custom IAM policy, you can provide the minimum required permissions and change how long authentication tokens last. See Using identity-based policies for AWS CodeArtifact (p. 144) for more information and example policies.
   - **Option 2:** Use the `AWSCodeArtifactAdminAccess` AWS managed policy. The following snippet shows the contents of this policy.

     Important
     This policy grants access to all CodeArtifact APIs. We recommend that you always use the minimum permissions required to accomplish your task. For more information, see IAM Best Practices in the *IAM User Guide*.

   ```
   {
      "Version": "2012-10-17",
      "Statement": [
         {
            "Action": [
               "codeartifact:*"
            ],
            "Effect": "Allow",
            "Resource": "*"
         },
   ```

```
        {
           "Effect": "Allow",
           "Action": "sts:GetServiceBearerToken",
           "Resource": "*",
              "Condition": {
                 "StringEquals": {
                    "sts:AWSServiceName": "codeartifact.amazonaws.com"
                 }
              }
        }
      ]
}
```

The `sts:GetServiceBearerToken` permission is required to call the CodeArtifact `GetAuthorizationToken` API. This API returns a token that must be used when using a package manager such as `npm` or `pip` with CodeArtifact. To use a package manager with a CodeArtifact repository, your IAM user or role must Allow `sts:GetServiceBearerToken` as shown in the policy example above.

If you haven't installed the package manager or build tool that you plan to use with CodeArtifact, see Install your package manager or build tool (p. 6).

Install your package manager or build tool

If you have not already, install the package manager or build tool that you want to use with CodeArtifact.

- For npm, you can use the npm CLI or pnpm.
- For Maven, you can use either Maven (`mvn`) or Gradle.
- For Python, you can use `pip` to install packages and `twine` to upload packages to CodeArtifact.
- For NuGet, you can use the AWS Toolkit for Visual Studio Code in Visual Studio or the `nuget` or `dotnet` CLIs.

Getting started with CodeArtifact

In this getting started tutorial, you use CodeArtifact to create the following:

- A domain called `my-domain`.
- A repository called `my-repo` that is contained in `my-domain`.
- A repository called `npm-store` that is contained in `my-domain`. The `npm-store` has an external connection to the npm public repository. This connection is used to ingest an npm package into the `my-repo` repository.

Before starting this tutorial, we recommend that you review CodeArtifact AWS CodeArtifact Concepts (p. 1).

> **Note**
> This tutorial requires you to create resources that might result in charges to your AWS account. For more information, see CodeArtifact pricing.

Topics

Prerequisites

You can complete this tutorial using the AWS Management Console or the AWS Command Line Interface (AWS CLI). To follow the tutorial, you must first complete the following prerequisites:

- Complete the steps in Setting up with AWS CodeArtifact (p. 4).
- Install the npm CLI. For more information, see Downloading and installing Node.js and npm in the npm documentation.

Getting started using the console

Run the following steps to get started with CodeArtifact using the AWS Management Console. This guide uses the `npm` package manager, if you are using a different package manager, you will need to modify some of the following steps.

1. Sign in to the AWS Management Console and open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/start. For more information, see Setting up with AWS CodeArtifact (p. 4).
2. Choose **Create repository**.
3. In **Repository name**, enter **`my-repo`**.
4. (Optional) In **Repository Description**, enter an optional description for your repository.
5. In **Public upstream repositories**, select **npm-store** to create a repository connected to **npmjs** that is upstream from your `my-repo` repository.

   CodeArtifact assigns the name `npm-store` to this repository for you. All packages available in the upstream repository `npm-store` are also available to its downstream repository, `my-repo`.
6. Choose **Next**.
7. In **AWS account**, choose **This AWS account**.

8. In **Domain name**, enter **`my-domain`**.
9. Expand **Additional configuration**.
10. You must use an AWS KMS key (KMS key) to encrypt all assets in your domain. You can use an AWS managed key or a KMS key that you manage:

    - Choose **AWS managed key** if you want to use the default AWS managed key.
    - Choose **Customer managed key** if you want to use a KMS key that you manage. To use a KMS key that you manage, in **Customer managed key ARN**, search for and choose the KMS key.

    For more information, see AWS managed key and Customer managed key in the *AWS Key Management Service Developer Guide*.
11. Choose **Next**.
12. In **Review and create**, review what CodeArtifact is creating for you.

    - **Package flow** shows how `my-domain`, `my-repo`, and `npm-store` are related.
    - **Step 1: Create repository** shows details about `my-repo` and `npm-store`.
    - **Step 2: Select domain** shows details about `my-domain`.

    When you're ready, choose **Create repository**.
13. On the **my-repo** page, choose **View connection instructions**, and then choose **npm**.
14. Use the AWS CLI to run the `login` command shown under **Configure your npm client using this AWS CLI CodeArtifact command**.

    ```
    aws codeartifact login --tool npm --repository my-repo --domain my-domain --domain-
    owner 111122223333
    ```

    You should receive output confirming your login succeeded.

    ```
    Successfully configured npm to use AWS CodeArtifact repository https://my-
    domain-111122223333.d.codeartifact.us-east-2.amazonaws.com/npm/my-repo/
    Login expires in 12 hours at 2020-10-08 02:45:33-04:00
    ```

    If you receive the error `Could not connect to the endpoint URL`, make sure that your AWS CLI is configured and that your **Default region name** is set to the same region where you created your repository, see Configuring the AWS Command Line Interface.

    For more information, see Configure and use npm with CodeArtifact (p. 84)
15. Use the npm CLI to install an npm package. For example, to install the popular npm package `lodash`, use the following command.

    ```
    npm install lodash
    ```
16. Return to the CodeArtifact console. If your **my-repo** repository is open, refresh the page. Otherwise, in the navigation pane, choose **Repositories**, and then choose **my-repo**.

    Under **Packages**, you should see the npm library, or package, that you installed. You can choose the name of the package to view its version and status. You can choose its latest version to view package details such as dependencies, assets, and more.

    Note
    There may be a delay between when you install the package and when it is ingested into your repository.
17. To avoid further AWS charges, delete the resources that you used during this tutorial:

Note
You cannot delete a domain that contains repositories, so you must delete `my-repo` and `npm-store` before you delete `my-domain`.

a. From the navigation pane, choose **Repositories**.
b. Choose **npm-store**, choose **Delete**, and then follow the steps to delete the repository.
c. Choose **my-repo**, choose **Delete**, and then follow the steps to delete the repository.
d. From the navigation pane, choose **Domains**.
e. Choose **my-domain**, choose **Delete**, and then follow the steps to delete the domain.

Getting started using the AWS CLI

Run the following steps to get started with CodeArtifact using the AWS Command Line Interface (AWS CLI). For more information, see Install or upgrade and then configure the AWS CLI (p. 4). This guide uses the `npm` package manager, if you are using a different package manager, you will need to modify some of the following steps.

1. Use the AWS CLI to run the **create-domain** command.

```
aws codeartifact create-domain --domain my-domain
```

   JSON-formatted data appears in the output with details about your new domain.

```
{
    "domain": {
        "name": "my-domain",
        "owner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:domain/my-domain",
        "status": "Active",
        "createdTime": "2020-10-07T15:36:35.194000-04:00",
        "encryptionKey": "arn:aws:kms:us-west-2:111122223333:key/your-kms-key",
        "repositoryCount": 0,
        "assetSizeBytes": 0
    }
}
```

   If you receive the error `Could not connect to the endpoint URL`, make sure that your AWS CLI is configured and that your **Default region name** is set to the same region where you created your repository, see Configuring the AWS Command Line Interface.

2. Use the **create-repository** command to create a repository in your domain.

```
aws codeartifact create-repository --domain my-domain --domain-owner 111122223333 --
repository my-repo
```

   JSON-formatted data appears in the output with details about your new repository.

```
{
    "repository": {
        "name": "my-repo",
        "administratorAccount": "111122223333",
        "domainName": "my-domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my-domain/my-
repo",
        "upstreams": [],
        "externalConnections": []
    }
}
```

3. Use the **create-repository** command to create an upstream repository for your `my-repo` repository.

```
aws codeartifact create-repository --domain my-domain --domain-owner 111122223333 --
repository npm-store
```

JSON-formatted data appears in the output with details about your new repository.

```
{
    "repository": {
        "name": "npm-store",
        "administratorAccount": "111122223333",
        "domainName": "my-domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my-domain/npm-
store",
        "upstreams": [],
        "externalConnections": []
    }
}
```

4. Use the **associate-external-connection** command to add an external connection to the npm public repository to your `npm-store` repository.

```
aws codeartifact associate-external-connection --domain my-domain --domain-
owner 111122223333 --repository npm-store --external-connection "public:npmjs"
```

JSON-formatted data appears in the output with details about the repository and its new external connection.

```
{
    "repository": {
        "name": "npm-store",
        "administratorAccount": "111122223333",
        "domainName": "my-domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my-domain/npm-
store",
        "upstreams": [],
        "externalConnections": [
            {
                "externalConnectionName": "public:npmjs",
                "packageFormat": "npm",
                "status": "AVAILABLE"
            }
        ]
    }
}
```

For more information, see Add an external connection (p. 26).

5. Use the **update-repository** command to associate the `npm-store` repository as an upstream repository to the `my-repo` repository.

```
aws codeartifact update-repository --repository my-repo --domain my-domain --domain-
owner 111122223333 --upstreams repositoryName=npm-store
```

JSON-formatted data appears in the output with details about your updated repository, including its new upstream repository.

```
{
    "repository": {
        "name": "my-repo",
        "administratorAccount": "111122223333",
        "domainName": "my-domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my-domain/my-
repo",
        "upstreams": [
            {
                "repositoryName": "npm-store"
            }
        ],
        "externalConnections": []
    }
}
```

For more information, see Add, update, or remove upstream repositories (AWS CLI) (p. 39).

6. Use the **login** command to configure your npm package manager with your `my-repo` repository.

```
aws codeartifact login --tool npm --repository my-repo --domain my-domain --domain-
owner 111122223333
```

You should receive output confirming your login succeeded.

```
Successfully configured npm to use AWS CodeArtifact repository https://my-
domain-111122223333.d.codeartifact.us-east-2.amazonaws.com/npm/my-repo/
Login expires in 12 hours at 2020-10-08 02:45:33-04:00
```

For more information, see Configure and use npm with CodeArtifact (p. 84).

7. Use the npm CLI to install an npm package. For example, to install the popular npm package `lodash`, use the following command.

```
npm install lodash
```

8. Use the **list-packages** command to view the package you just installed in your `my-repo` repository.

Note
There may be a delay between when you install the package and when it is ingested into your repository.

```
aws codeartifact list-packages --domain my-domain --repository my-repo
```

JSON-formatted data appears in the output with the format and name of the package that you installed.

```
{
    "packages": [
        {
            "format": "npm",
            "package": "lodash"
        }
    ]
}
```

You now have three CodeArtifact resources:

- The domain `my-domain`.
- The repository `my-repo` that is contained in `my-domain`. This repository has an npm package available to it.
- The repository `npm-store` that is contained in `my-domain`. This repository has an external connection to the public npm repository and is associated as an upstream repository with the `my-repo` repository.

9. To avoid further AWS charges, delete the resources that you used during this tutorial:

   Note
   You cannot delete a domain that contains repositories, so you must delete `my-repo` and `npm-store` before you delete `my-domain`.

   a. Use the **delete-repository** command to delete the `npm-store` repository.

   ```
   aws codeartifact delete-repository --domain my-domain --domain-owner 111122223333
    --repository my-repo
   ```

   JSON-formatted data appears in the output with details about the deleted repository.

   ```
   {
       "repository": {
           "name": "my-repo",
           "administratorAccount": "111122223333",
           "domainName": "my-domain",
           "domainOwner": "111122223333",
           "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my-
   domain/my-repo",
           "upstreams": [
               {
                   "repositoryName": "npm-store"
               }
           ],
           "externalConnections": []
       }
   }
   ```

   b. Use the **delete-repository** command to delete the `npm-store` repository.

   ```
   aws codeartifact delete-repository --domain my-domain --domain-owner 111122223333
    --repository npm-store
   ```

   JSON-formatted data appears in the output with details about the deleted repository.

   ```
   {
       "repository": {
           "name": "npm-store",
           "administratorAccount": "111122223333",
           "domainName": "my-domain",
           "domainOwner": "111122223333",
           "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my-
   domain/npm-store",
           "upstreams": [],
           "externalConnections": [
               {
                   "externalConnectionName": "public:npmjs",
   ```

```
                "packageFormat": "npm",
                "status": "AVAILABLE"
            }
        ]
    }
}
```

c. Use the **delete-domain** command to delete the `my-domain` repository.

```
aws codeartifact delete-domain --domain my-domain --domain-owner 111122223333
```

JSON-formatted data appears in the output with details about the deleted domain.

```
{
    "domain": {
        "name": "my-domain",
        "owner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:domain/my-domain",
        "status": "Deleted",
        "createdTime": "2020-10-07T15:36:35.194000-04:00",
        "encryptionKey": "arn:aws:kms:us-west-2:111122223333:key/your-kms-key",
        "repositoryCount": 0,
        "assetSizeBytes": 0
    }
}
```

Working with repositories in CodeArtifact

These topics show you how to use the CodeArtifact CLI and API to create, list, update, and delete repositories.

Topics

Create a repository

You can create a repository using the CodeArtifact console or the AWS Command Line Interface (AWS CLI). When you create a repository, it does not contain any packages. Each repository is associated with the AWS account that you use when you create it. An AWS account can have up to 10,000 repositories. For more information on CodeArtifact service limits, see Quotas in AWS CodeArtifact (p. 168). You can delete repositories to make room for more.

Repositories are polyglot—a single repository can contain packages of any supported type.

A repository can have one or more CodeArtifact repositories associated with it as upstream repositories. This allows a package manager client to access the packages contained in more than one repository using a single URL endpoint. For more information, see Working with upstream repositories in CodeArtifact (p. 38).

Note
After you create a repository, you cannot change its name, associated AWS account, or domain.

Topics

Create a repository (console)

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the navigation pane, choose **Repositories**, and then choose **Create repository**.

3. For **Repository name**, enter a name for your repository.
4. (Optional) In **Repository description**, enter an optional description for your repository.
5. (Optional) In **Publish upstream repositories**, add intermediate repositories that connect your repositories to package authorities such as Maven Central or npmjs.com.
6. Choose **Next**.
7. In **AWS account**, choose **This AWS account** if you are signed in to the account that owns the domain. Choose **Different AWS account** if another AWS account owns the domain.
8. In **Domain**, choose the domain that the repository will be created in.

   If there are no domains in the account, you must create one. Enter the name for the new domain in **Domain name**.

   Expand **Additional configuration**.

   You must use an AWS KMS key (KMS key) to encrypt all assets in your domain. You can use an AWS managed key or a KMS key that you manage:

   - Choose **AWS managed key** if you want to use the default AWS managed key.
   - Choose **Customer managed key** if you want to use a KMS key that you manage. To use a KMS key that you manage, in **Customer managed key ARN**, search for and choose the KMS key.

   For more information, see AWS managed keys and customer managed key in the *AWS Key Management Service Developer Guide*.
9. Choose **Next**.
10. In **Review and create**, review what CodeArtifact is creating for you.

    - **Package flow** shows how your domain and repositories are connected.
    - **Step 1: Create repository** shows details about the repository and optional upstream repositories that will be created.
    - **Step 2: Select domain** shows details about `my_domain`.

    When you're ready, choose **Create repository**.

Create a repository (AWS CLI)

Use the `create-repository` command to create a repository in your domain.

```
aws codeartifact create-repository --domain my_domain --domain-owner 111122223333 --
repository my_repo --description "My new repository"
```

Example output:

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:region-id:111122223333:repository/my_domain/my_repo",
        "description": "My new repository",
        "upstreams": "[]",
        "externalConnections"" "[]"
    }
}
```

A new repository doesn't contain any packages. Each repository is associated with the AWS account that you're authenticated to when the repository is created. An AWS account can have a maximum of 100 repositories. Repositories that have been deleted with the `delete-repository` command don't count towards this limit.

Create a repository with tags

To create a repository with tags, add the `--tags` parameter to your `create-domain` command.

```
aws codeartifact create-repository --domain my_domain --domain-owner 111122223333 --
repository my_repo --tags key=k1,value=v1 key=k2,value=v2
```

Create a repository with an upstream repository

You can specify one or more upstream repositories when you create a repository.

```
aws codeartifact create-repository --domain my_domain --domain-owner 111122223333 --
repository my_repo \
  --upstreams repositoryName=my-upstream-repo --repository-description "My new repository"
```

Example output:

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:region-id:111122223333:repository/my_domain/my_repo",
        "description": "My new repository",
        "upstreams": [
            {
                "repositoryName": "my-upstream-repo"
            }
        ],
        "externalConnections"" "[]"
    }
}
```

Note
To create a repository with an upstream, you must have permission for the `AssociateWithDownstreamRepository` action on the upstream repository.

To add an upstream to a repository after it's been created, see Add, update, or remove upstream repositories (console) (p. 38) and Add, update, or remove upstream repositories (AWS CLI) (p. 39).

Connect to a repository

After you have configured your profile and credentials to authenticate to your AWS account, decide which repository to use in CodeArtifact. You have the following options:

- Create a repository. For more information, see Creating a Repository (p. 14).

- Use a repository that already exists in your account. You can use the `list-repositories` command to find the repositories created in your AWS account. For more information, see ??? (p. 18).
- Use a repository in a different AWS account. For more information, see Repository policies (p. 22).

Use a package manager client

After you know which repository you want to use, see one of the following topics.

- Using CodeArtifact with Maven (p. 100)
- Using CodeArtifact with npm (p. 84)
- Using CodeArtifact with NuGet (p. 113)
- Using CodeArtifact with Python (p. 96)

Delete a repository

You can delete a repository using the CodeArtifact console or the AWS CLI. After a repository has been deleted, you can no longer push packages to it or pull packages from it. All packages in the repository become permanently unavailable and cannot be restored. You can create a repository with the same name, but its contents will be empty.

Topics

- Delete a repository (console) (p. 17)
- Delete a repository (AWS CLI) (p. 17)

Delete a repository (console)

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the navigation pane, choose **Repositories**, then choose the repository that you want to delete.
3. Choose **Delete** and then follow the steps to delete the domain.

Delete a repository (AWS CLI)

Use the `delete-repository` command to delete a repository.

```
aws codeartifact delete-repository --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

Example output:

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "123456789012",
        "arn": "arn:aws:codeartifact:region-id:123456789012:repository/my_domain/my_repo",
        "description": "My new repository",
        "upstreams": [],
        "externalConnections": []
    }
}
```

List repositories

Use the commands in this topic to list repositories in an AWS account or domain.

List repositories in an AWS account

Use this command to list all of the repositories in your AWS account.

```
aws codeartifact list-repositories
```

Sample output:

```
{
    "repositories": [
        {
            "name": "repo1",
            "administratorAccount": "123456789012",
            "domainName": "my_domain",
            "domainOwner": "123456789012",
            "arn": "arn:aws:codeartifact:region-
id:123456789012:repository/my_domain/repo1",
            "description": "Description of repo1"
        },
        {
            "name": "repo2",
            "administratorAccount": "123456789012",
            "domainName": "my_domain",
            "domainOwner": "123456789012",
            "arn": "arn:aws:codeartifact:region-
id:123456789012:repository/my_domain/repo2",
            "description": "Description of repo2"

        },
        {
            "name": "repo3",
            "administratorAccount": "123456789012",
            "domainName": "my_domain2",
            "domainOwner": "123456789012",
            "arn": "arn:aws:codeartifact:region-
id:123456789012:repository/my_domain2/repo3",
            "description": "Description of repo3"
        }
    ]
}
```

You can paginate the response from `list-repositories` using the `--max-results` and `--next-token` parameters. For `--max-results`, specify an integer from 1 to 1000 to specify the number of results returned in a single page. Its default is 50. To return subsequent pages, run `list-repositories` again and pass the `nextToken` value received in the previous command output to `--next-token`. When the `--next-token` option is not used, the first page of results is always returned.

List repositories in the domain

Use `list-repositories-in-domain` to get a list of all the repositories in a domain.

```
aws codeartifact list-repositories-in-domain --domain my_domain --domain-owner 123456789012
 --max-results 3
```

The output shows that some of the repositories are administered by different AWS accounts.

```
{
    "repositories": [
        {
            "name": "repo1",
            "administratorAccount": "123456789012",
            "domainName": "my_domain",
            "domainOwner": "111122223333",
            "arn": "arn:aws:codeartifact:region-
id:111122223333:repository/my_domain/repo1",
            "description": "Description of repo1"
        },
        {
            "name": "repo2",
            "administratorAccount": "444455556666",
            "domainName": "my_domain",
            "domainOwner": "111122223333",
            "arn": "arn:aws:codeartifact:region-
id:111122223333:repository/my_domain/repo2",
            "description": "Description of repo2"
        },
        {
            "name": "repo3",
            "administratorAccount": "444455556666",
            "domainName": "my_domain",
            "domainOwner": "111122223333",
            "arn": "arn:aws:codeartifact:region-
id:111122223333:repository/my_domain/repo3",
            "description": "Description of repo3"
        }
    ]
}
```

You can paginate the response from `list-repositories-in-domain` using the `--max-results` and `--next-token` parameters. For `--max-results`, specify an integer from 1 to 1000 to specify the number of results returned in a single page. Its default is 50. To return subsequent pages, run `list-repositories-in-domain` again and pass the `nextToken` value received in the previous command output to `--next-token`. When the `--next-token` option is not used, the first page of results is always returned.

To output the repository names in a more compact list, try the following command.

```
aws codeartifact list-repositories-in-domain --domain my_domain --domain-owner 111122223333
 \
  --query 'repositories[*].[name]' --output text
```

Sample output:

```
repo1
repo2
repo3
```

The following example outputs the account ID in addition to the repository name.

```
aws codeartifact list-repositories-in-domain --domain my_domain --domain-owner 111122223333
  \
  --query 'repositories[*].[name,administratorAccount]' --output text
```

Sample output:

```
repo1 710221105108
repo2 710221105108
repo3 532996949307
```

For more information about the `--query` parameter, see ListRepositories in the *CodeArtifact API Reference*.

View or modify a repository configuration

You can view and update details about your repository using the CodeArtifact console or the AWS Command Line Interface (AWS CLI).

Note
After you create a repository, you cannot change its name, associated AWS account, or domain.

Topics

View or modify a repository configuration (console)

You can view details about and update your repository using the CodeArtifact console.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. In the navigation pane, choose **Repositories**, and then choose the repository name that you want to view or modify.
3. Expand **Details** to see the following:

   - The repository's domain. Choose the domain name to learn more about it.
   - The repository's resource policy. Choose **Apply a repository policy** to add one.
   - The repository's Amazon Resource Name (ARN).
   - If your repository has an external connection, you can choose the connection to learn more about it. A repository can have only one external connection. For more information, see Add an external connection (p. 26).
   - If your repository has upstream repositories, you can choose one to see its details. A repository can have up to 10 direct upstream repositories. For more information, see Working with upstream repositories in CodeArtifact (p. 38).

   Note
   A repository can have an external connection or upstream repositories, but not both.
4. In **Packages**, you can see any packages that are available to this repository. Choose a package to learn more about it.
5. Choose **View connection instructions**, and then choose a package manager to learn how to configure it with CodeArtifact.
6. Choose **Apply repository policy** to update or add a resource policy to your repository. For more information, see Repository policies (p. 22).

7. Choose **Edit** to add or update the following.

   - The repository description.
   - Tags associated with the repository.
   - If your repository has an external connection, you can change which public repository it connects to. Otherwise, you can add one or more existing repositories as upstream repositories. Arrange them in the order you want them prioritized by CodeArtifact when a package is requested. For more information, see Upstream repository priority order (p. 42).

View or modify a repository configuration (AWS CLI)

To view a repository's current configuration in CodeArtifact, use the `describe-repository` command.

```
aws codeartifact describe-repository --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

Example output:

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012,
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:region-id:111122223333:repository/my_domain/my_repo"
        "upstreams": [],
        "externalConnections": []
    }
}
```

Modify a repository upstream configuration

An upstream repository allows a package manager client to access the packages contained in more than one repository using a single URL endpoint. To add or change a repository's upstream relationship, use the `update-repository` command.

```
aws codeartifact update-repository --domain my_domain --domain-owner 111122223333 --
repository my_repo \
       --upstreams repositoryName=my-upstream-repo
```

Example output:

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012,
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:region-id:111122223333:repository/my_domain/my_repo"
        "upstreams": [
            {
                "repositoryName": "my-upstream-repo"
            }
        ],
        "externalConnections": []
    }
}
```

Note
To add an upstream repository, you must have permission for the `AssociateWithDownstreamRepository` action on the upstream repository.

To remove a repository's upstream relationship, use an empty list as the argument to the `--upstreams` option.

```
aws codeartifact update-repository --domain my_domain --domain-owner 111122223333 --
repository my_repo --upstreams []
```

Example output:

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012,
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:region-id:111122223333:repository/my_domain/my_repo"
        "upstreams": [],
        "externalConnections": []
    }
}
```

Repository policies

CodeArtifact uses resource-based permissions to control access. Resource-based permissions let you specify who has access to a repository and what actions they can perform on it. By default, only the repository owner has access to a repository. You can apply a policy document that allows other IAM principals to access your repository.

For more information, see Resource-Based Policies and Identity-Based Policies and Resource-Based Policies.

Create a resource policy to grant read access

A resource policy is a text file in JSON format. The file must specify a principal (actor), one or more actions, and an effect (`Allow` or `Deny`). For example, the following resource policy grants the account `123456789012` permission to download packages from the repository.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:ReadFromRepository"
            ],
            "Effect": "Allow",
            "Principal": {
                 "AWS": "arn:aws:iam::123456789012:root"
            },
            "Resource": "*"
        }
    ]
}
```

Because the policy is evaluated only for operations against the repository that it's attached to, you don't need to specify a resource. Because the resource is implied, you can set the `Resource` to `*`.

> **Note**
> The `codeartifact:ReadFromRepository` action can only be used on a repository resource. You cannot put a package's Amazon Resource Name (ARN) as a resource with `codeartifact:ReadFromRepository` as the action to allow read access to a subset of packages in a repository. A given principal can either read all the packages in a repository or none of them.

Because the only action specified in the repository is `ReadFromRepository`, users and roles from account `1234567890` can download packages from the repository. However, they can't perform other actions on them (for example, listing package names and versions). Typically, you grant permissions in the following policy in addition to `ReadFromRepository` because a user who downloads packages from a repository needs to interact with it in other ways too.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:DescribePackageVersion",
                "codeartifact:DescribeRepository",
                "codeartifact:GetPackageVersionReadme",
                "codeartifact:GetRepositoryEndpoint",
                "codeartifact:ListPackages",
                "codeartifact:ListPackageVersions",
                "codeartifact:ListPackageVersionAssets",
                "codeartifact:ListPackageVersionDependencies",
                "codeartifact:ReadFromRepository"
            ],
            "Effect": "Allow",
            "Principal": {
                 "AWS": "arn:aws:iam::123456789012:root"
            },
            "Resource": "*"
        }
    ]
}
```

Set a policy

After you create a policy document, use the `put-repository-permissions-policy` command to attach it to a repository:

```
aws codeartifact put-repository-permissions-policy --domain my_domain --domain-
owner 111122223333 \
          --repository my_repo --policy-document file:///PATH/TO/policy.json
```

When you call `put-repository-permissions-policy`, the resource policy on the repository is ignored when evaluating permissions. This ensures that the owner of a domain cannot lock themselves out of the repository, which would prevent them from being able to update the resource policy.

> **Note**
> You cannot grant permissions to another AWS account to update the resource policy on a repository using a resource policy, since the resource policy is ignored when calling put-repository-permissions-policy.

Sample output:

```
{
    "policy": {
        "resourceArn": "arn:aws:codeartifact:region-
id:111122223333:repository/my_domain/my_repo",
        "document": "{ ...policy document content...}",
        "revision": "MQlyyTQRASRU3HB58gBtSDHXG7Q3hvxxxxxxx="
    }
}
```

The output of the command contains the Amazon Resource Name (ARN) of the repository resource, the full contents of the policy document, and a revision identifier. You can pass the revision identifier to `put-repository-permissions-policy` using the `--policy-revision` option. This ensures that a known revision of the document is being overwritten, and not a newer version set by another writer.

Read a policy

Use the `get-repository-permissions-policy` command to read an existing version of a policy document. To format the output for readability, use the `--output` and `--query policy.document` together with the Python `json.tool` module.

```
aws codeartifact get-repository-permissions-policy --domain my_domain --domain-
owner 111122223333 \
          --repository my_repo --output text --query policy.document | python -m json.tool
```

Sample output:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
                "AWS": "arn:aws:iam::123456789012:root"
            },
            "Action": [
                "codeartifact:DescribePackageVersion",
                "codeartifact:DescribeRepository",
                "codeartifact:GetPackageVersionReadme",
                "codeartifact:GetRepositoryEndpoint",
                "codeartifact:ListPackages",
                "codeartifact:ListPackageVersions",
                "codeartifact:ListPackageVersionAssets",
                "codeartifact:ListPackageVersionDependencies",
                "codeartifact:ReadFromRepository"
            ],
            "Resource": "*"
        }
    ]
}
```

Delete a policy

Use the `delete-repository-permissions-policy` command to delete a policy from a repository.

```
aws codeartifact delete-repository-permissions-policy --domain my_domain --domain-
owner 111122223333 \
          --repository my_repo
```

The format of the output is the same as that of the `get-repository-permissions-policy` command.

Grant read access to principals

When you specify the root user of an account as the principal in a policy document, you grant access to all of the users and roles in that account. To limit access to selected users or roles, use their ARN in the `Principal` section of the policy. For example, use the following to grant read access to the IAM user `bob` in account `123456789012`.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:ReadFromRepository"
            ],
            "Effect": "Allow",
            "Principal": {
                 "AWS": "arn:aws:iam::123456789012:user/bob"
            },
            "Resource": "*"
        }
    ]
}
```

Grant write access to packages

The `codeartifact:PublishPackageVersion` action is used to control permission to publish new versions of a package. The resource used with this action must be a package. The format of CodeArtifact package ARNs is as follows.

```
arn:aws:codeartifact:region-id:111122223333:package/my_domain/my_repo/package-
format/package-namespace/package-name
```

The following example shows the ARN for an npm package with scope `@parity` and name `ui` in the `example-repo` repository in domain `my_domain`.

```
arn:aws:codeartifact:region-id:111122223333:package/my_domain/example-repo/npm/parity/ui
```

The ARN for an npm package without a scope has the empty string for the namespace field. For example, the following is the ARN for a package without a scope and with name `react` in the `example-repo` repository in domain `my_domain`.

```
arn:aws:codeartifact:region-id:111122223333:package/my_domain/example-repo/npm//react
```

The following policy grants account `123456789012` permission to publish versions of `@parity/ui` in the `example-repo` repository.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:PublishPackageVersion"
            ],
            "Effect": "Allow",
            "Principal": {
                "AWS": "arn:aws:iam::123456789012:root"
            },
            "Resource": "arn:aws:codeartifact:region-
id:111122223333:package/my_domain/example-repo/npm/parity/ui"
        }
    ]
}
```

Important
To grant permission to publish Maven and NuGet package versions, add the following permissions in addition to `codeartifact:PublishPackageVersion`.

1. NuGet: `codeartifact:ReadFromRepository` and specify the repository resource
2. Maven: `codeartifact:PutPackageMetadata`

Because this policy specifies a domain and repository as part of the resource, it allows publishing only when attached to that repository.

Grant write access to a repository

You can use wildcards to grant write permission for all packages in a repository. For example, use the following policy to grant an account permission to write to all packages in the `example-repo` repository.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:PublishPackageVersion"
            ],
            "Effect": "Allow",
            "Principal": {
                "AWS": "arn:aws:iam::123456789012:root"
            },
            "Resource": "*"
        }
    ]
}
```

Add an external connection

You can add a connection between a CodeArtifact repository and an external, public repository such as https://npmjs.com or the Maven Central repository. Then, when you request a package from the CodeArtifact repository that's not already present in the repository, the package can be fetched from the external connection. This makes it possible to consume open-source dependencies used by your application.

Topics

Add an external connection to a repository

To add an external connection to a CodeArtifact repository, use `associate-external-connection`.

```
aws codeartifact associate-external-connection --external-connection public:npmjs \
    --domain my_domain --domain-owner 111122223333 --repository my_repo
```

Example output:

```
{
    "repository": {
        "name": my_repo
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my_domain/my_repo",
        "description": "A description of my_repo",
        "upstreams": [],
        "externalConnections": [
            {
                "externalConnectionName": "public:npmjs",
                "packageFormat": "npm",
                "status": "AVAILABLE"
            }
        ]
    }
}
```

Note
A repository is limited to a single external connection only.

Supported external connection repositories

CodeArtifact supports an external connection to the following public repositories. To use the CodeArtifact CLI to specify an external connection, use the value in the **Name** column for the `--external-connection` parameter when you run the `associate-external-connection` command.

Repository type	Description	Name
npm	npm public registry	`public:npmjs`
Python	Python Package Index	`public:pypi`
Maven	Maven Central	`public:maven-central`
Maven	Google Android repository	`public:maven-googleandroid`

Repository type	Description	Name
Maven	Gradle plugins repository	`public:maven-gradleplugins`
Maven	CommonsWare Android repository	`public:maven-commonsware`
NuGet	NuGet Gallery	`public:nuget-org`

Remove an external connection

To remove an external connection, use `disassociate-external-connection`.

```
aws codeartifact disassociate-external-connection --external-connection public:npmjs \
    --domain my_domain --domain-owner 111122223333 --repository my_repo
```

Example output:

```
{
    "repository": {
        "name": my_repo
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:repository/my_domain/my_repo",
        "description": "A description of my_repo",
        "upstreams": [],
        "externalConnections": []
    }
}
```

Fetch npm packages from an external connection

After you add an external connection, configure your package manager to use your CodeArtifact repository. Use the following for **`npm`**.

```
aws codeartifact login --tool npm --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

Then, request the package from the public repository.

```
npm install lodash
```

After the package has been copied into your CodeArtifact repository, you can use the `list-packages` and `list-package-versions` commands to view it.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

Example output:

```
{
    "packages": [
        {
            "format": "npm",
            "package": "lodash"
        }
    ]
}
```

The `list-package-versions` command lists all versions of the package copied into your CodeArtifact repository. In some cases, this is all of the versions of the package in the external repository. In other cases, this is a subset of those versions. For more information, see npm ingestion behavior (p. 31).

```
aws codeartifact list-package-versions --domain my_domain --domain-owner 111122223333 --
repository my_repo --format npm --package lodash
```

Example output:

```
{
    "defaultDisplayVersion: "1.2.5"
    "format": "npm",
    "package": "lodash",
    "namespace": null,
    "versions": [
        {
            "version": "0.6.0",
            "revision": "REVISION-1-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        {
            "version": "0.4.2",
            "revision": "REVISION-2-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        {
            "version": "0.6.1",
            "revision": "REVISION-3-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        {
            "version": "0.4.0",
            "revision": "REVISION-4-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        }
    ]
}
```

Fetch Maven packages from an external connection

After you add an external connection, configure your build tool to use your CodeArtifact repository. For more information, see Use CodeArtifact with mvn (p. 105) and Use CodeArtifact with Gradle (p. 100). If you run either tool (for example, `gradle build`), packages are requested from Maven Central and stored in your CodeArtifact repository.

Restrict Maven dependency downloads to a CodeArtifact repository

If a package cannot be fetched from a configured repository, by default, the `mvn` command fetches it from Maven Central. Add the `mirrors` element to `settings.xml` to make `mvn` always use your CodeArtifact repository.

```
<settings>
  ...
    <mirrors>
      <mirror>
        <id>central-mirror</id>
        <name>CodeArtifact Maven Central mirror</name>
        <url>https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/
maven/my_repo/</url>
        <mirrorOf>central</mirrorOf>
      </mirror>
    </mirrors>
  ...
</settings>
```

If you add a `mirrors` element, you must also have a `pluginRepository` element in your `settings.xml` or `pom.xml`. The following example fetches application dependencies and Maven plugins from a CodeArtifact repository.

```
<settings>
...
  <profiles>
    <profile>
      <pluginRepositories>
        <pluginRepository>
          <id>codeartifact</id>
          <name>CodeArtifact Plugins</name>
          <url>https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/
maven/my_repo/</url>
          <releases>
            <enabled>true</enabled>
          </releases>
          <snapshots>
            <enabled>true</enabled>
          </snapshots>
        </pluginRepository>
      </pluginRepositories>
    </profile>
  </profiles>
...
</settings>
```

The following example fetches application dependencies from a CodeArtifact repository and fetches Maven plugins from Maven Central.

```
<profiles>
   <profile>
     <id>default</id>
     ...
     <pluginRepositories>
       <pluginRepository>
         <id>central-plugins</id>
         <name>Central Plugins</name>
         <url>https://repo.maven.apache.org/maven2/</url>
         <releases>
             <enabled>true</enabled>
         </releases>
         <snapshots>
             <enabled>true</enabled>
         </snapshots>
       </pluginRepository>
     </pluginRepositories>
   ....
```

```
  </profile>
</profiles>
```

npm ingestion behavior

When a package is requested from a repository with an external connection to https://npmjs.com, CodeArtifact ingests that package version and up to two versions of its direct and transitive dependencies. This reduces the time to ingest the dependency tree.

Each dependency has a specified version constraint. For example, the npm package version `webpack 4.41.2` specifies a dependency on `@babel/core` with a version constraint of `^7.7.2`. The caret (^) specifies that the latest minor or patch version is used (for example, `7.7.4` or `7.8.0`). When `webpack 4.41.2` is ingested, the most recent published version of `@babel/core` that satisfies the version constraint is ingested. If the version of `@babel/core` specified by the `latest` tag is different, it is also ingested. This logic applies to the direct and transitive dependencies of `@babel/core` and the direct and transitive dependencies of `webpack 4.41.2`.

If ingestion of a package is not complete in 40 seconds, a 404 error is returned to the client.

```
npm ERR! code E404
npm ERR! 404 Not Found - GET https://my_domain-111122223333.d.codeartifact.us-
west-2.amazonaws.com/npm/my_repo/lodash - Ingestion is in progress. Please try again later.
npm ERR! 404
npm ERR! 404  'lodash@^4.17.15' is not in the npm registry.
npm ERR! 404 You should bug the author to publish it (or use the name yourself!)
npm ERR! 404
npm ERR! 404 Note that you can also install from a
npm ERR! 404 tarball, folder, http url, or git url.

npm ERR! A complete log of this run can be found in:
npm ERR!     /Users/username/.npm/_logs/2019-09-22T01_47_43_155Z-debug.log
```

When this occurs, CodeArtifact is still copying packages from the external repository asynchronously. Retry the same command to complete the ingestion of the entire dependency tree.

Maven ingestion behavior

When a Maven package is requested from a repository with an external connection to Maven Central repository, CodeArtifact ingests all assets of the package version that follow the standard Maven asset naming conventions. The dependencies of a package version are not ingested until they are requested by the client (for example, `mvn`).

If ingestion of a required asset is not complete within 40 seconds, a 404 error is returned to the client. A timeout error during a Gradle build might look like the following.

```
> Could not resolve all files for configuration ':compileClasspath'.
  > Could not resolve org.mockito:mockito-core:3.1.0.
    Required by:
        project :
      > Could not resolve org.mockito:mockito-core:3.1.0.
         > Could not get resource 'https://my_domain.codeartifact.aws.a2z.com/
maven/my_domain/org/mockito/mockito-core/3.1.0/mockito-core-3.1.0.pom'.
            > Could not GET 'https://my_domain.codeartifact.aws.a2z.com/maven/my_domain/
org/mockito/mockito-core/3.1.0/mockito-core-3.1.0.pom'.
```

When this occurs, CodeArtifact is still copying packages from the external repository asynchronously. Retry the same command to complete the ingestion of the entire dependency tree.

CodeArtifact behavior when an external repository is not available

Occasionally, an external repository will experience an outage that means CodeArtifact cannot fetch packages from it, or fetching packages is much slower than normal. When this occurs, package versions already pulled from an external repository (e.g. **npmjs.com**) and stored in a CodeArtifact repository will continue to be available for download from CodeArtifact. However, packages that are not already stored in CodeArtifact may not be available, even when an external connection to that repository has been configured. For example, your CodeArtifact repository might contain the npm package version `lodash 4.17.19` because that's what you have been using in your application so far. When you want to upgrade to `4.17.20`, normally CodeArtifact will fetch that new version from **npmjs.com** and store it in your CodeArtifact repository. However, if **npmjs.com** is experiencing an outage this new version will not be available. The only workaround is to try again later once **npmjs.com** has recovered.

External repository outages can also affect publishing new package versions to CodeArtifact. In a repository with an external connection configured, CodeArtifact will not permit publishing a package version that is already present in the external repository, see Packages overview (p. 46) for more information. However, an external repository outage may in rare cases mean that CodeArtifact does not have up-to-date information on which packages and package versions are present in an external repository. In this case, CodeArtifact might permit a package version to be published that it would normally deny.

Availability of new package versions

For a package version in a public repository such as npmjs.com or the Python Package Index (PyPI) to be available through a CodeArtifact repository, it must first be added to a regional package metadata cache. This cache is maintained by CodeArtifact in each AWS region and contains metadata that describes the contents of supported public repositories. Because of this cache, there is a delay between when a new package version is published to a public repository and when it is available from CodeArtifact. This delay varies by package type.

For npm and NuGet packages, there may be a delay of up to 10 minutes from when a new package version is published to npmjs.com or nuget.org and when it is available for installation from a CodeArtifact repository. CodeArtifact automatically synchronizes metadata from these two repositories to ensure the cache is up-to-date.

For Python and Maven packages, there may be a delay of up to 3 hours from when a new package version is published to a public repository and when it is available for installation from a CodeArtifact repository. CodeArtifact will check for new versions of a package at most once every 3 hours. The first request for a given package name after the 3-hour cache lifetime has expired will cause all new versions of that package to be imported into the regional cache.

This means that for Python and Maven packages that are in common use, new versions will typically be imported every 3 hours because the high rate of requests means that the cache will often be updated as soon as the cache lifetime has expired. For infrequently used packages, the cache will not have the latest version until a version of the package is requested from a CodeArtifact repository. On the first request, only previously-imported versions will be available from CodeArtifact, but this request will cause the cache to be updated. On subsequent requests, the new versions of the package will have been added to the cache and will be available for download.

Tag a repository in CodeArtifact

Tags are key-value pairs associated with AWS resources. You can apply tags to your repositories in CodeArtifact. For information about CodeArtifact resource tagging, use cases, tag key and value constraints, and supported resource types, see Tagging resources (p. 167).

You can use the CLI to specify tags when you create a repository. You can use the console or CLI to add or remove tags, and update the values of tags in a repository. You can add up to 50 tags to each repository.

Topics

Tag repositories (CLI)

You can use the CLI to manage repository tags.

Topics

Add tags to a repository (CLI)

You can use the console or the AWS CLI to tag repositories.

To add a tag to a repository when you create it, see Create a repository (p. 14).

In these steps, we assume that you have already installed a recent version of the AWS CLI or updated to the current version. For more information, see Installing the AWS Command Line Interface.

At the terminal or command line, run the **tag-resource** command, specifying the Amazon Resource Name (ARN) of the repository where you want to add tags and the key and value of the tag you want to add.

> **Note**
> To get the ARN of the repository, run the `describe-repository` command:
>
> ```
> aws codeartifact describe-repository --domain my_domain --repository my_repo --
> query repository.arn
> ```

You can add more than one tag to a repository. For example, to tag a repository named *my_repo* in a domain named *my_domain* with two tags, a tag key named *key1* with the tag value of *value1*, and a tag key named *key2* with the tag value of *value2*:

```
aws codeartifact tag-resource --resource-arn arn:aws:codeartifact:us-
west-2:111122223333:repository/my_domain/my_repo --tags key=key1,value=value1
 key=key2,value=value2
```

If successful, this command has no output.

View tags for a repository (CLI)

Follow these steps to use the AWS CLI to view the AWS tags for a repository. If no tags have been added, the returned list is empty.

At the terminal or command line, run the **list-tags-for-resource** command.

Note
To get the ARN of the repository, run the `describe-repository` command:

```
aws codeartifact describe-repository --domain my_domain --repository my_repo --
query repository.arn
```

For example, to view a list of tag keys and tag values for a repository named *my_repo* in a domain named *my_domain* with the `arn:aws:codeartifact:us-west-2:111122223333:repository/my_domain/my_repo` ARN value:

```
aws codeartifact list-tags-for-resource --resource-arn arn:aws:codeartifact:us-
west-2:111122223333:repository/my_domain/my_repo
```

If successful, this command returns information similar to the following:

```
{
    "tags": {
        "key1": "value1",
        "key2": "value2"
    }
}
```

Edit tags for a repository (CLI)

Follow these steps to use the AWS CLI to edit a tag for a repository. You can change the value for an existing key or add another key.

At the terminal or command line, run the **tag-resource** command, specifying the ARN of the repository where you want to update a tag and specify the tag key and tag value.

Note
To get the ARN of the repository, run the `describe-repository` command:

```
aws codeartifact describe-repository --domain my_domain --repository my_repo --
query repository.arn
```

```
aws codeartifact tag-resource --resource-arn arn:aws:codeartifact:us-
west-2:111122223333:repository/my_domain/my_repo --tags key=key1,value=newvalue1
```

If successful, this command has no output.

Remove tags from a repository (CLI)

Follow these steps to use the AWS CLI to remove a tag from a repository.

Note
If you delete a repository, all tag associations are removed from the deleted repository. You do not have to remove tags before you delete a repository.

At the terminal or command line, run the **untag-resource** command, specifying the ARN of the repository where you want to remove tags and the tag key of the tag you want to remove.

Note
To get the ARN of the repository, run the `describe-repository` command:

```
aws codeartifact describe-repository --domain my_domain --repository my_repo --
query repository.arn
```

For example, to remove multiple tags on a repository named *my_repo* in a domain named *my_domain* with the tag keys *key1* and *key2*:

```
aws codeartifact untag-resource --resource-arn arn:aws:codeartifact:us-
west-2:111122223333:repository/my_domain/my_repo --tag-keys key1 key2
```

If successful, this command has no output. After removing tags, you can view the remaining tags on the repository using the `list-tags-for-resource` command.

Tag repositories (console)

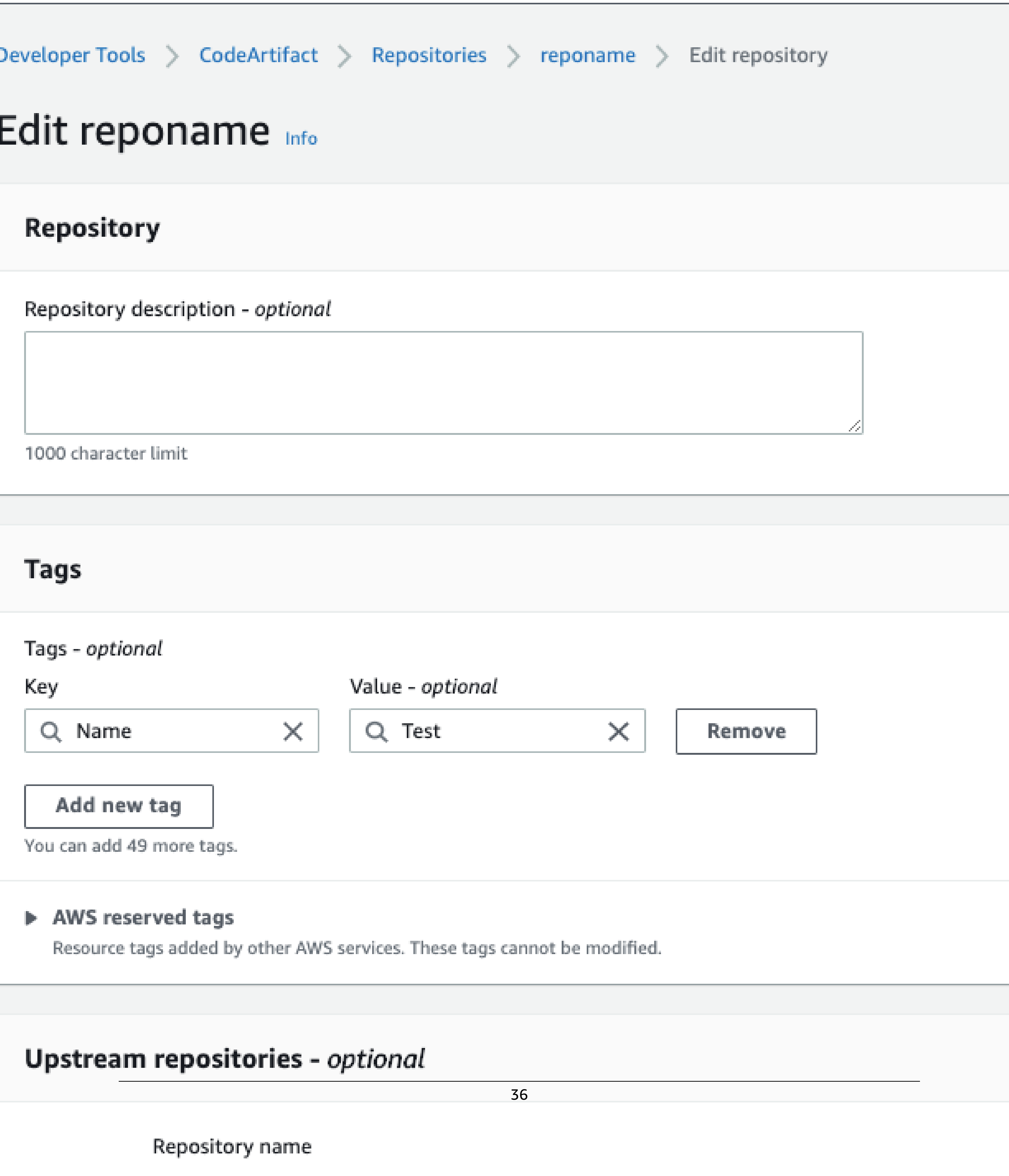
You can use the console or the CLI to tag resources.

Topics

Add tags to a repository (console)

You can use the console to add tags to an existing repository.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Repositories** page, choose the repository that you want to add tags to.
3. Expand the **Details** section.
4. Under **Repository tags**, if there are no tags on the repository, choose **Add repository tags**. If there are tags on the repository, choose **View and edit repository tags**.
5. Choose **Add new tag**.
6. In the **Key** and **Value** fields, enter the text for each tag you want to add. (The **Value** field is optional.) For example, in **Key**, enter **`Name`**. In **Value**, enter **`Test`**.



Developer Tools > CodeArtifact > Repositories > reponame > Edit repository

Edit reponame Info

Repository

Repository description - *optional*

1000 character limit

Tags

Tags - *optional*

Key	Value - *optional*	
Name	Test	Remove

Add new tag

You can add 49 more tags.

AWS reserved tags

Resource tags added by other AWS services. These tags cannot be modified.

Upstream repositories - *optional*

Repository name

7. (Optional) Choose **Add tag** to add more rows and enter more tags.
8. Choose **Update repository**.

View tags for a repository (console)

You can use the console to list tags for existing repositories.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Repositories** page, choose the repository where you want to view tags.
3. Expand the **Details** section.
4. Under **Repository tags**, choose **View and edit repository tags**.

   Note
   If there are no tags added to this repository, the console will read **Add repository tags**.

Edit tags for a repository (console)

You can use the console to edit tags that have been added to repository.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Repositories** page, choose the repository where you want to update tags.
3. Expand the **Details** section.
4. Under **Repository tags**, choose **View and edit repository tags**.

   Note
   If there are no tags added to this repository, the console will read **Add repository tags**.
5. In the **Key** and **Value** fields, update the values in each field as needed. For example, for the **`Name`** key, in **Value**, change **`Test`** to **`Prod`**.
6. Choose **Update repository**.

Remove tags from a repository (console)

You can use the console to delete tags from repositories.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Repositories** page, choose the repository where you want to remove tags.
3. Expand the **Details** section.
4. Under **Repository tags**, choose **View and edit repository tags**.

   Note
   If there are no tags added to this repository, the console will read **Add repository tags**.
5. Next to the key and value for each tag you want to delete, choose **Remove**.
6. Choose **Update repository**.

Working with upstream repositories in CodeArtifact

A repository can have other AWS CodeArtifact repositories as *upstream* repositories. This enables a package manager client to access the packages that are contained in more than one repository using a single repository endpoint. You can set upstream repositories using the AWS Management Console, the AWS Command Line Interface (AWS CLI), or the AWS CodeArtifact API.

If an upstream repository has an external connection to a public repository, the repositories that are downstream from it can pull packages from that public repository. For example, suppose that the repository `my_repo` has an upstream repository named `upstream`, and `upstream` has an external connection to a public npm repository. In this case, a package manager that is connected to `my_repo` can pull packages from the npm public repository.

You can add one or more upstream repositories to an AWS CodeArtifact repository using the AWS Management Console, AWS CLI, or SDK. To associate a repository with an upstream repository, you must have permission for the `AssociateWithDownstreamRepository` action on the upstream repository.

For more information, see Create a repository with an upstream repository (p. 16) and Add an external connection (p. 26).

Topics

Add, update, or remove upstream repositories (console)

To add an upstream repository using the CodeArtifact console:

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. In the navigation pane, choose **Domains**, and then choose the domain name that contains your repository.
3. Choose the name of your repository.
4. Choose **Edit**.
5. In **Upstream repositories**, click **Associate upstream repository** and add the repository to be added as an upstream repository.
6. Choose **Update repository**.

Note
This guide contains information about configuring other CodeArtifact repositories as upstream repositories. For information about configuring an external connection to public repositories like npmjs.com, Maven Central, or PyPI, see Add an external connection.

Add, update, or remove upstream repositories (AWS CLI)

You can add, update, or remove a CodeArtifact repository's upstream repositories using the AWS Command Line Interface (AWS CLI). To do this, use the `update-repository` command, and specify the upstream repositories using the `--upstreams` parameter.

Note
This guide contains information about configuring other CodeArtifact repositories as upstream repositories. For information about configuring an external connection to public repositories like npmjs.com, Maven Central, or PyPI, see Add an external connection.

The following command adds two upstream repositories to a repository named `my_repo` that is in a domain named `my_domain`. The order of the upstream repositories in the `--upstreams` parameter determines their search priority when CodeArtifact requests a package from the `my_repo` repository. For more information, see Upstream repository priority order (p. 42).

```
aws codeartifact update-repository --repository my_repo --domain my_domain --domain-
owner 111122223333 --upstreams repositoryName=upstream-1 repositoryName=upstream-2
```

The output contains the upstream repositories, as follows.

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-east-2:111122223333:repository/my_domain/my_repo",
        "upstreams": [
            {
                "repositoryName": "upstream-1"
            },
            {
                "repositoryName": "upstream-2"
            }
        ],
        "externalConnections": []
    }
}
```

To remove all upstream repositories from a repository, use the `update-repository` command and include `--upstreams` without an argument. The following removes upstream repositories from a repository named `my_repo` that is contained in a domain named `my_domain`.

```
aws codeartifact update-repository --repository my_repo --domain my_domain --domain-
owner 111122223333 --upstreams
```

The output shows that the list of `upstreams` is empty.

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-east-2:111122223333:repository/my_domain/my_repo",
        "upstreams": [],
        "externalConnections": []
    }
}
```

Requesting a package version with upstream repositories

When a client (for example, npm) requests a package version from a CodeArtifact repository named `my_repo` that has multiple upstream repositories, the following can occur:

- If `my_repo` contains the requested package version, it is returned to the client.
- If `my_repo` does not contain the requested package version, CodeArtifact looks for it in `my_repo`'s upstream repositories. If the package version is found, a reference to it is copied to `my_repo`, and the package version is returned to the client.
- If neither `my_repo` nor its upstream repositories contain the package version, an HTTP 404 `Not Found` response is returned to the client.

When you add upstream repositories using the `create-repository` or `update-repository` command, the order they are passed to the `--upstreams` parameter determines their priority when a package version is requested. Specify upstream repositories with `--upstreams` in the order that you want CodeArtifact to use when a package version is requested. For more information, see Upstream repository priority order (p. 42).

The maximum number of direct upstream repositories allowed for one repository is 10. The maximum number of repositories CodeArtifact looks in when a package version is requested is 25.

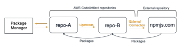
Package retention from upstream repositories

If a requested package version is found in an upstream repository, a reference to it is retained and is always available from the downstream repository. The retained package version is not affected by any of the following:

- Deleting the upstream repository.
- Disconnecting the upstream repository from the downstream repository.
- Deleting the package version from the upstream repository.
- Editing the package version in the upstream repository (for example, by adding a new asset to it).

Fetch packages through an upstream relationship

If a CodeArtifact repository has an upstream relationship with a repository that has an external connection, requests for packages not in the upstream repository are copied from the external repository. For example, consider the following configuration: a repository named `repo-A` has an upstream repository named `repo-B`. `repo-B` has an external connection to https://npmjs.com.



If `npm` is configured to use the `repo-A` repository, running `npm install` triggers the copying of packages from https://npmjs.com into `repo-B`. The versions installed are also pulled into `repo-A`. The following example installs `lodash`.

```
$ npm config get registry
https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/my-downstream-repo/
$ npm install lodash
+ lodash@4.17.20
added 1 package from 2 contributors in 6.933s
```

After running `npm install`, `repo-A` contains just the latest version (`lodash 4.17.20`) because that's the version that was fetched by `npm` from `repo-A`.

```
aws codeartifact list-package-versions --repository repo-A --domain my_domain \
            --domain-owner 111122223333 --format npm --package lodash
```

Example output:

```
{
    "package": "lodash",
    "format": "npm",
    "versions": [
        {
            "version": "4.17.15",
            "revision": "REVISION-1-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        }
    ]
}
```

Because `repo-B` has an external connection to https://npmjs.com, all the package versions that are imported from https://npmjs.com are stored in `repo-B`. These package versions could have been fetched by any downstream repository with an upstream relationship to `repo-B`.

The contents of `repo-B` provide a way to see all the packages and package versions imported from https://npmjs.com over time. For example, to see all the versions of the `lodash` package imported over time, you can use `list-package-versions`, as follows.

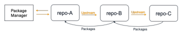
```
aws codeartifact list-package-versions --repository repo-B --domain my_domain \
            --domain-owner 111122223333 --format npm --package lodash --max-results 5
```

Example output:

```
{
    "package": "lodash",
    "format": "npm",
    "versions": [
        {
            "version": "0.10.0",
            "revision": "REVISION-1-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        {
            "version": "0.2.2",
            "revision": "REVISION-2-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        {
            "version": "0.2.0",
            "revision": "REVISION-3-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        {
            "version": "0.2.1",
            "revision": "REVISION-4-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        {
            "version": "0.1.0",
            "revision": "REVISION-5-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        }
    ],
    "nextToken": "eyJsaXN0UGFja2FnZVZlcnNpb25zVG9rZW4iOiIwLjIuMiJ9"
}
```

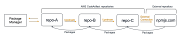
Package retention in intermediate repositories

CodeArtifact allows chaining upstream repositories. For example, `repo-A` can have `repo-B` as an upstream and `repo-B` can have `repo-C` as an upstream. This configuration makes the package versions in `repo-B` and `repo-C` available from `repo-A`.



When a package manager connects to repository `repo-A` and fetches a package version from repository `repo-C`, the package version will not be retained in repository `repo-B`. The package version will only be retained in the most-downstream repository, in this example, `repo-A`. It will not be retained in any intermediate repositories. This is also true for longer chains; for example if there were four repositories `repo-A`, `repo-B`, `repo-C`, and `repo-D` and a package manager connected to `repo-A` fetched a package version from `repo-D`, the package version would be retained in `repo-A` but not in `repo-B` or `repo-C`.

Package retention behavior is similar when pulling a package version from an external repository, except that the package version is always retained in the repository that has the external connection attached. For example, `repo-A` has `repo-B` as an upstream. `repo-B` has `repo-C` as an upstream, and `repo-C` also has **npmjs.com** configured as an external connection; see the followng diagram.



If a package manager connected to `repo-A` requests a package version, *lodash 4.17.20* for example, and the package version is not present in any of the three repositories, it will be fetched from **npmjs.com**. When *lodash 4.17.20* is fetched, it will be retained in `repo-A` as that is the most-downstream repository and `repo-C` as it has the external connection to **npmjs.com** attached. *lodash 4.17.20* will not be retained in `repo-B` as that is an intermediate repository.

Upstream repository priority order

When you request a package version from a repository with one or more upstream repositories, their priority corresponds to the order that they were listed when calling the `create-repository` or `update-repository` command. When the requested package version is found, the search stops, even if it didn't search all upstream repositories. For more information, see Add, update, or remove upstream repositories (AWS CLI) (p. 39).

Use the `describe-repository` command to see the priority order.

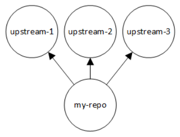
```
aws codeartifact describe-repository --repository my_repo --domain my_domain --domain-
owner 111122223333
```

The result might be the following. It shows that the upstream repository priority is `upstream-1` first, `upstream-2` second, and `upstream-3` third.

```
{
    "repository": {
        "name": "my_repo",
        "administratorAccount": "123456789012",
        "domainName": "my_domain",
        "domainOwner": "111122223333",
        "arn": "arn:aws:codeartifact:us-east-1:111122223333:repository/my_domain/my_repo",
        "description": "My new repository",
        "upstreams": [
            {
                "repositoryName": "upstream-1"
            },
            {
                "repositoryName": "upstream-2"
            },
            {
                "repositoryName": "upstream-3"
            }
        ],
        "externalConnections": []
    }
}
```

Simple priority order example

In the following diagram, the `my_repo` repository has three upstream repositories. The priority order of the upstream repositories is `upstream-1`, `upstream-2`, `upstream-3`.



A request for a package version in `my_repo` searches the repositories in the following order until it is found, or until an HTTP 404 `Not Found` response is returned to the client:

1. `my_repo`
2. `upstream-1`
3. `upstream-2`
4. `upstream-3`

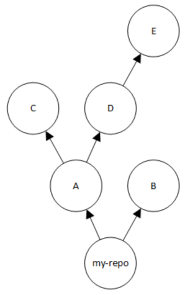
If the package version is found, the search stops, even if it didn't look in all upstream repositories. For example, if the package version is found in `upstream-1`, the search stops and CodeArtifact doesn't look in `upstream-2` or `upstream-3`.

When you use the AWS CLI command `list-package-versions` to list package versions in `my_repo`, it looks only in `my_repo`. It does not list package versions in upstream repositories.

Complex priority order example

If an upstream repository has its own upstream repositories, the same logic is used to find a package version before moving to the next upstream repository. For example, suppose that your `my_repo` repository has two upstream repositories, `A` and `B`. If repository `A` has upstream repositories, a request for a package version in `my_repo` first looks in `my_repo`, second in `A`, then in the upstream repositories of `A`, and so on.

In the following diagram, the `my_repo` repository contains upstream repositories. Upstream repository `A` has two upstream repositories, and `D` has one upstream repository. Upstream repositories at the same level in the diagram appear in their priority order, left to right (repository `A` has a higher priority order than repository `B`, and repository `C` has a higher priority order than repository `D`).



In this example, a request for a package version in `my_repo` looks in the repositories in the following order until it is found, or until a package manager returns an HTTP 404 `Not Found` response to the client:

1. `my_repo`
2. `A`
3. `C`
4. `D`
5. `E`
6. `B`

API behavior with upstream repositories

When you call certain CodeArtifact APIs on repositories that are connected to upstream repositories, the behavior may be different depending on if the packages or package versions are stored in the target repository or the upstream repository. The behavior of these APIs is documented here.

For more information on CodeArtifact APIs, see the CodeArtifact API Reference.

Most APIs that reference a package or package version will return a `ResourceNotFound` error if the specified package version is not present in the target repository. This is true even if the package or package version is present in an upstream repository. Effectively, upstream repositories are ignored when calling these APIs. These APIs are:

- DeletePackageVersions
- DescribePackageVersion
- GetPackageVersionAsset
- GetPackageVersionReadme
- ListPackages
- ListPackageVersionAssets
- ListPackageVersionDependencies
- ListPackageVersions
- UpdatePackageVersionsStatus

To demonstrate this behavior, we have two repositories: `target-repo` and `upstream-repo`. `target-repo` is empty and has `upstream-repo` configured as an upstream repository. `upstream-repo` contains the npm package `lodash`.

When calling the `DescribePackageVersion` API on `upstream-repo`, which contains the `lodash` package, we get the following output:

```
{
    "packageVersion": {
        "format": "npm",
        "packageName": "lodash",
        "displayName": "lodash",
        "version": "4.17.20",
        "summary": "Lodash modular utilities.",
        "homePage": "https://lodash.com/",
        "sourceCodeRepository": "https://github.com/lodash/lodash.git",
        "publishedTime": "2020-10-14T11:06:10.370000-04:00",
        "licenses": [
            {
                "name": "MIT"
            }
        ],
        "revision": "Ciqe5/9yicvkJT13b5/LdLpCyE6fqA7poa9qp+FilPs=",
        "status": "Published"
    }
```

When calling the same API on `target-repo`, which is empty but has `upstream-repo` configured as an upstream, we get the following output:

```
An error occurred (ResourceNotFoundException) when calling the DescribePackageVersion
 operation:
Package not found in repository. RepoId: repo-id, Package =
 PackageCoordinate{packageType=npm, packageName=lodash},
```

The `CopyPackageVersions` API behaves differently. By default, `CopyPackageVersions` API only copies package versions that are stored in the target repository. If a package version is stored in the upstream repository but not in the target repository, it will not be copied. To include package versions of packages that are stored only in the upstream repository, set the value of `includeFromUpstream` to `true` in your API request.

For more information on the `CopyPackageVersions` API, see Copy packages between repositories (p. 58).

Working with packages in CodeArtifact

These topics show you how to list, copy, delete, and search for packages using the CodeArtifact CLI and API.

Topics

Packages overview

A *package* is a bundle of software and the metadata that is required to resolve dependencies and install the software. In CodeArtifact, a package consists of a package name, an optional namespace (p. 3) such as `@types` in `@types/node`, a set of package versions, and package-level metadata such as npm tags.

Contents

Supported package formats

AWS CodeArtifact supports npm (p. 84), PyPI (p. 96), Maven (p. 100), and NuGet (p. 113) package formats.

Package publishing

You can publish new versions of any supported package format (p. 46) to a CodeArtifact repository using tools such as `npm`, `twine`, `Maven`, `Gradle`, `nuget`, and `dotnet`.

Publishing permissions

Your AWS Identity and Access Management (IAM) user or role must have permissions to publish to the destination repository. The following permissions are required to publish packages.

1. **Maven:** `codeartifact:PublishPackageVersion` and `codeartifact:PutPackageMetadata`
2. **npm:** `codeartifact:PublishPackageVersion`
3. **NuGet:** `codeartifact:PublishPackageVersion` and `codeartifact:ReadFromRepository`
4. **Python:** `codeartifact:PublishPackageVersion`

In the list of permissions above, your IAM policy must specify the `package` resource for the `codeartifact:PublishPackageVersion` and `codeartifact:PutPackageMetadata` permissions and it must specify the `repository` resource for the `codeartifact:ReadFromRepository` permission.

For more information about permissions in CodeArtifact, see AWS CodeArtifact permissions reference (p. 151).

Overwriting package assets

You can't republish a package asset that already exists with different content. For example, suppose that you already published a Maven package with a JAR asset `mypackage-1.0.jar`. You can't publish that asset again unless the checksum of the old and new assets are identical. To republish the same asset with new content, delete the package version using the **delete-package-versions** command first. Trying to republish the same asset name with different content will result in an HTTP 409 conflict error.

For package formats that support multiple assets (PyPI and Maven), you can add new assets with different names to an existing package version at any time, assuming that you have the required permissions. Because npm only supports a single asset per package version, to modify a published package version in any way, you must first delete it using **delete-package-versions**.

If you try to republish an asset that already exists (for example, `mypackage-1.0.jar`), and the content of the published asset and the new asset are identical, the operation will succeed because the operation is idempotent.

Publishing and upstream repositories

CodeArtifact doesn't allow publishing package versions that are present in reachable upstream repositories or public repositories. For example, suppose that you want to publish a Maven package `com.mycompany.mypackage:1.0` to a repository `myrepo`, and `myrepo` has an upstream repository with an external connection to Maven Central. If `com.mycompany.mypackage:1.0` is present in the upstream repository or in Maven Central, CodeArtifact rejects any attempt to publish to it in `myrepo` with a 409 conflict error. This helps prevent scenarios where you might accidentally publish a package with the same name and version as a package in an upstream repository, which can result in unexpected behavior.

You can still publish different versions of a package name that exists in an upstream repository. For example, if `com.mycompany.mypackage:1.0` is present in an upstream repository, but `com.mycompany.mypackage:1.1` is not, you can publish `com.mycompany.mypackage:1.1` to the downstream repository.

Private packages and public repositories

CodeArtifact does not publish packages stored in CodeArtifact repositories to public repositories such as npmjs.com or Maven Central. CodeArtifact imports packages from public repositories to a CodeArtifact repository, but it never moves packages in the other direction. Packages that you publish to CodeArtifact repositories remain private and are only available to the AWS accounts, roles, and users to which you have granted access.

Publishing patched package versions

Sometimes you might want to publish a modified package version, potentially one that is available in a public repository. For example, you might have found a bug in a critical application dependency called `mydep 1.1`, and you need to fix it sooner than the package vendor can review and accept the change. As described previously, CodeArtifact prevents you from publishing `mydep 1.1` in your CodeArtifact repository if the public repository is reachable from your CodeArtifact repository via upstream repositories and an external connection.

To work around this, publish the package version to a different CodeArtifact repository where the public repository isn't reachable. Then use the `copy-package-versions` API to copy the patched version of `mydep 1.1` to the CodeArtifact repository where you will consume it from.

Package version status

Every package version in CodeArtifact has a status that describes the current state and availability of the package version. You can change the package version status using both the AWS CLI and the console. For more information, see Update package version status (p. 66).

The following are possible values for package version status:

- **Published**: The package version is successfully published and can be requested using a package manager. The package version will be included in the output of the ListPackageVersions API and included in package versions lists returned to package managers, for example, in the output of `npm view <package-name> versions`. All assets of the package version are available from the repository.
- **Unfinished**: The last attempt to publish did not complete. Currently only Maven package versions can have a status of **Unfinished**. This can occur when the client uploads one or more assets for a package version but does not publish a `maven-metadata.xml` file for the package that includes that version. When a package version is **Unfinished**, it will not be included in the default output from the ListPackageVersions API.
- **Unlisted**: The package version's assets are available for download from the repository, but it is not included in the default output of the ListPackageVersions API. The package version is also not included in the list of versions returned to package managers. For example, for an npm package, the output of `npm view <package-name> versions` will not include the package version. This means that npm's dependency resolution logic will not select the package version because the version does not appear in the list of available versions. However, if the **Unlisted** package version is already referenced in an `npm package-lock.json` file, it can still be downloaded and installed, for example, when running `npm ci`.
- **Archived**: The package version's assets can no longer be downloaded. The package version will not appear in the default output of the ListPackageVersions API, and will not be included in the list of versions returned to package managers. Because the the assets are not available, consumption of the package version by clients is blocked. If your application build depends on a version that is updated to **Archived**, the build will break, assuming the package version has not been locally cached. You cannot use a package manager or build tool to re-publish an **Archived** package version because it is still present in the repository, but you can change the package version's status back to **Unlisted** or **Published** with the UpdatePackageVersionsStatus API.
- **Disposed**: The package version doesn't appear in listings and the assets cannot be downloaded from the repository. They key difference between **Disposed** and **Archived** is that with a status of **Disposed**, the assets of the package version will be permanently deleted by CodeArtifact. For this reason, you cannot move a package version from **Disposed** to **Archived**, **Unlisted**, or **Published**. The package

version can no longer be used because the assets have been deleted. Once a package version has been marked as **Disposed**, you will no longer be billed for storage of the package assets.

Apart from the states above, a package version can also be deleted with the DeletePackageVersions API. Once deleted, a package version is no longer in the repository and you can freely re-publish that package version using a package manager or build tool. Once a package version has been deleted, you will no longer be billed for storage of that package version's assets.

List package names

Use the `list-packages` command in CodeArtifact to get a list of all the package names in a repository. This command returns only the package names, not the versions.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

Sample output:

```
{
    "nextToken": "eyJidWNrZXRJZCI6I...",
    "packages": [
        {
            "package": "acorn",
            "format": "npm"
        },
        {
            "package": "acorn-dynamic-import",
            "format": "npm"
        },
        {
            "package": "ajv",
            "format": "npm"
        },
        {
            "package": "ajv-keywords",
            "format": "npm"
        },
        {
            "package": "anymatch",
            "format": "npm"
        },
        {
          "package": "ast",
          "namespace": "webassemblyjs",
          "format": "npm",

        }
    ]
}
```

List npm package names

To list only the names of npm packages, set the value of the `--format` option to `npm`.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo  \
    --format npm
```

To list npm packages in a namespace (npm *scope*), use the `--namespace` and `--format` options.

Important
The value for the `--namespace` option should not include the leading `@`. To search for the namespace `@types`, set the value to *`types`*.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo  \
    --format npm --namespace types
```

Sample output:

```
{
    "nextToken": "eyJidWNrZXRJZ...",
    "packages": [
        {
            "package": "3d-bin-packing",
            "namespace": "types",
            "format": "npm"

        },
        {
            "package": "a-big-triangle",
            "namespace": "types",
            "format": "npm"

        },
        {
            "package": "a11y-dialog",
            "namespace": "types",
            "format": "npm"

        }
    ]
}
```

List Maven package names

To list only the names of Maven packages, set the value of the `--format` option to `maven`. You must also specify the Maven group in the `--namespace` option.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo  \
    --format maven --namespace org.apache.commons
```

Sample output:

```
{
    "nextToken": "eyJidWNrZXRJZ...",
    "packages": [
        {
            "package": "commons-lang3",
            "namespace": "org.apache.commons",
            "format": "maven"

        },
        {
            "package": "commons-collections4",
            "namespace": "org.apache.commons",
            "format": "maven"

        },
        {
            "package": "commons-compress",
            "namespace": "org.apache.commons",
            "format": "maven"

        }
    ]
}
```

List Python package names

To list only the names of Python packages, set the value of the `--format` option to `pypi`.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo  \
    --format pypi
```

Filter by package name prefix

To return packages that begin with a specified string, you can use the `--package-prefix` option.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo  \
    --format npm --package-prefix pat
```

Sample output:

```
{
    "nextToken": "eyJidWNrZXRJZ...",
    "packages": [
        {
            "package": "path",
            "format": "npm"

        },
        {
            "package": "pat-test",
            "format": "npm"

        },
        {
            "package": "patch-math3",
            "format": "npm"

        }
    ]
}
```

Supported search option combinations

You can use the `--format`, `--namespace`, and `--package-prefix` options in any combination, except that `--namespace` can't be used by itself. For example, searching for all packages in the `@types` scope requires the `--format` option to be specified. Using `--namespace` by itself results in an error.

Using none of the three options is also supported by `list-packages` and will return all packages of all formats present in the repository.

Format output

You can use parameters that are available to all AWS CLI commands to make the `list-packages` response compact and more readable. Use the `--query` parameter to specify the format of each returned package version. Use the `--output` parameter to format the response as plaintext.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo \
  --output text --query 'packages[*].[package]'
```

Sample output:

```
accepts
array-flatten
body-parser
bytes
content-disposition
content-type
cookie
cookie-signature
```

For more information, see Controlling command output from the AWS CLI in the *AWS Command Line Interface User Guide*.

Defaults and other options

By default, the maximum number of results returned by `list-packages` is 100. You can change this result limit by using the `--max-results` option.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo --max-results 20
```

The maximum allowed value of `--max-results` is 1,000. To allow listing packages in repositories with more than 1,000 packages, `list-packages` supports pagination using the `nextToken` field in the response. If the number of packages in the repository is more than the value of `--max-results`, you can pass the value of `nextToken` to another invocation of `list-packages` to get the next page of results.

```
aws codeartifact list-packages --domain my_domain --domain-owner 111122223333 --
repository my_repo \
  --next-token rO0ABXNyAEdjb...
```

List package versions

Use the `list-package-versions` command in CodeArtifact to get a list of all of the versions of a package name in a repository.

```
aws codeartifact list-package-versions --package kind-of --domain my_domain --domain-
owner 111122223333 \
--repository my_repository --format npm
```

Sample output:

```
{
  "defaultDisplayVersion": "1.0.1",
  "format": "npm",
  "package": "kind-of",
  "versions": [
      {
          "version": "1.0.1",
          "revision": "REVISION-SAMPLE-1-C7F4S5E9B772FC",
          "status": "Published"
      },
      {
          "version": "1.0.0",
          "revision": "REVISION-SAMPLE-2-C752BEEF6D2CFC",
          "status": "Published"
      },
      {
          "version": "0.1.2",
          "revision": "REVISION-SAMPLE-3-654S65A5C5E1FC",
          "status": "Published"
      },
      {
          "version": "0.1.1",
          "revision": "REVISION-SAMPLE-1-C7F4S5E9B772FC"",
          "status": "Published"
      },
      {
          "version": "0.1.0",
          "revision": "REVISION-SAMPLE-4-AF669139B772FC",
          "status": "Published"
      }
  ]
}
```

You can add the `--status` parameter to the `list-package-versions` call to filter the results based on package version status. For more information on package version status, see Package version status (p. 48).

You can paginate the response from `list-package-versions` using the `--max-results` and `--next-token` parameters. For `--max-results`, specify an integer from 1 to 1000 to specify the number of results returned in a single page. Its default is 50. To return subsequent pages, run `list-package-versions` again and pass the `nextToken` value received in the previous command output to `--next-token`. When the `--next-token` option is not used, the first page of results is always returned.

The `list-package-versions` command does not list package versions in upstream repositories. However, references to package versions in an upstream repository that were copied to your repository during a package version request are listed. For more information, see Working with upstream repositories in CodeArtifact (p. 38).

Sort versions

`list-package-versions` can output versions sorted in descending order based on publish time (the most-recently published versions are listed first). Use the `--sort-by` parameter with a value of `PUBLISH_TIME`, as follows.

```
aws codeartifact list-package-versions --domain my_domain --domain-owner 111122223333 --
repository my_repository  \
--format npm --package webpack --max-results 5 --sort-by PUBLISHED_TIME
```

Sample output:

```
{

  "defaultDisplayVersion": "4.41.2",
  "format": "npm",
  "package": "webpack",
  "versions": [
      {
        "version": "5.0.0-beta.7",
        "revision": "REVISION-SAMPLE-1-C7F4S5E9B772FC",
        "status": "Published"
      },
      {
        "version": "5.0.0-beta.6",
        "revision": "REVISION-SAMPLE-2-C752BEEF6D2CFC",
        "status": "Published"
      },
      {
        "version": "5.0.0-beta.5",
        "revision": "REVISION-SAMPLE-3-654S65A5C5E1FC",
        "status": "Published"
      },
      {
        "version": "5.0.0-beta.4",
        "revision": "REVISION-SAMPLE-4-AF669139B772FC",
        "status": "Published"
      },
      {
        "version": "5.0.0-beta.3",
        "revision": "REVISION-SAMPLE-5-C752BEE9B772FC",
        "status": "Published"
      }
  ],
  "nextToken": "eyJsaXN0UGF...."
}
```

Default display version

The return value for `defaultDisplayVersion` depends on the package format:

- For Maven and PyPI packages, it's the most recently published package version.
- For npm packages, it's the version referenced by the `latest` tag. If the `latest` tag is not set, it's the most recently published package version.

Format output

You can use parameters that are available to all AWS CLI commands to make the `list-package-versions` response compact and more readable. Use the `--query` parameter to specify the format of each returned package version. Use `--output` parameter to format the response as plain text.

```
aws codeartifact list-package-versions --package my-package-name --domain my_domain --
domain-owner 111122223333 \
--repository my_repo --format npm --output text --query 'versions[*].[version]'
```

Sample output:

```
0.1.1
0.1.2
0.1.0
```

```
3.0.0
```

For more information, see Controlling Command Output from the AWS CLI in the *AWS Command Line Interface User Guide*.

List package version assets

An *asset* is an individual file (for example, an npm `.tgz` file or Maven POM or JAR file) stored in CodeArtifact that is associated with a package version. You can use the `list-package-version-assets` command to list the assets in each package version.

Run the `list-package-version-assets` command to return the following information about each asset in your AWS account and your current AWS Region:

- Its name.
- Its size, in bytes.
- A set of hash values used for checksum validation.

For example, use the following command to list the assets of the Python package `flatten-json`, version `0.1.7`.

```
aws codeartifact list-package-version-assets --domain my_domain --domain-owner 111122223333
 --repository my_repo\
    --format pypi --package flatten-json --package-version 0.1.7
```

The following shows the output.

```
{
    "format": "pypi",
    "package": "flatten-json",
    "version": "0.1.7",
    "versionRevision": "REVISION-SAMPLE-1-C7F4S5E9B772FC",
    "assets": [
        {
            "name": "flatten_json-0.1.7-py3-none-any.whl",
            "size": 31520,
            "hashes": {
                "MD5": "41bba98d5b9219c43089eEXAMPLE-MD5",
                "SHA-1": "69b215c25dd4cda1d997a786ec6EXAMPLE-SHA-1",
                "SHA-256": "43f24850b7b7b7d79c5fa652418518fbdf427e602b1edabe6EXAMPLE-
SHA-256",
                "SHA-512":
 "3947382ac2c180ee3f2aba4f8788241527c8db9dfe9f4b039abe9fc560aaf5a1fced7bd1e80a0dca9ce320d95f0864e0dec3a
SHA-512"
            }
        },
        {
            "name": "flatten_json-0.1.7.tar.gz",
            "size": 2865,
            "hashes": {
                "MD5": "41bba98d5b9219c43089eEXAMPLE-MD5",
                "SHA-1": "69b215c25dd4cda1d997a786ec6EXAMPLE-SHA-1",
                "SHA-256": "43f24850b7b7b7d79c5fa652418518fbdf427e602b1edabe6EXAMPLE-
SHA-256",
                "SHA-512":
 "3947382ac2c180ee3f2aba4f8788241527c8db9dfe9f4b039abe9fc560aaf5a1fced7bd1e80a0dca9ce320d95f0864e0dec3a
SHA-512"
```

```
            }
        }
    ]
}
```

To list the assets of the Maven package `commons-cli:commons-cli`:

```
aws codeartifact list-package-version-assets --domain my_domain --domain-owner 111122223333
 --repository my_repo \
    --format maven --package commons-cli --namespace commons-cli --package-version 1.0
```

The following shows the output.

```
{
    "format": "maven",
    "namespace": "commons-cli",
    "package": "commons-cli",
    "version": "1.0",
    "versionRevision": "REVISION-SAMPLE-55C752BEE9B772FC",
    "assets": [
        {
            "name": "commons-cli-1.0.jar",
            "size": 30117,
            "hashes": {
                "MD5": "41bba98d5b9219c43089eEXAMPLE-MD5",
                "SHA-1": "69b215c25dd4cda1d997a786ec6EXAMPLE-SHA-1",
                "SHA-256": "43f24850b7b7b7d79c5fa652418518fbdf427e602b1edabe6EXAMPLE-
SHA-256",
                "SHA-512":
 "3947382ac2c180ee3f2aba4f8788241527c8db9dfe9f4b039abe9fc560aaf5a1fced7bd1e80a0dca9ce320d95f0864e0dec3a
SHA-512"
            }
        },
        {
            "name": "commons-cli-1.0.pom",
            "size": 2105,
            "hashes": {
                "MD5": "41bba98d5b9219c43089eEXAMPLE-MD5",
                "SHA-1": "69b215c25dd4cda1d997a786ec6EXAMPLE-SHA-1",
                "SHA-256": "43f24850b7b7b7d79c5fa652418518fbdf427e602b1edabe6EXAMPLE-
SHA-256",
                "SHA-512":
 "3947382ac2c180ee3f2aba4f8788241527c8db9dfe9f4b039abe9fc560aaf5a1fced7bd1e80a0dca9ce320d95f0864e0dec3a
SHA-512"
            }
        },
        {
            "name": "maven-metadata.xml",
            "size": 119,
            "hashes": {
                "MD5": "41bba98d5b9219c43089eEXAMPLE-MD5",
                "SHA-1": "69b215c25dd4cda1d997a786ec6EXAMPLE-SHA-1",
                "SHA-256": "43f24850b7b7b7d79c5fa652418518fbdf427e602b1edabe6EXAMPLE-
SHA-256",
                "SHA-512":
 "3947382ac2c180ee3f2aba4f8788241527c8db9dfe9f4b039abe9fc560aaf5a1fced7bd1e80a0dca9ce320d95f0864e0dec3a
SHA-512"
            }
        }
    ]
}
```

An npm package always has a single asset with a name of `package.tgz`.

```
aws codeartifact list-package-version-assets --domain my_domain --domain-owner 111122223333
 --repository my_repo \
    --format npm --package webpack --package-version 4.9.2
```

The following shows the output.

```
{
    "format": "npm",
    "package": "webpack",
    "version": "4.9.2",
    "versionRevision": "REVISION-SAMPLE-55C752BEE9B772FC",
    "assets": [
        {
            "name": "package.tgz",
            "size": 242930,
            "hashes": {
                "MD5": "41bba98d5b9219c43089eEXAMPLE-MD5",
                "SHA-256": "43f24850b7b7b7d79c5fa652418518fbdf427e602b1edabe6EXAMPLE-
SHA-256",
                "SHA-512":
 "3947382ac2c180ee3f2aba4f8788241527c8db9dfe9f4b039abe9fc560aaf5a1fced7bd1e80a0dca9ce320d95f0864e0dec3a
SHA-512"
            }
        }
    ]
}
```

Download package version assets

An *asset* is an individual file (for example, an npm `.tgz` file or Maven POM or JAR file) stored in CodeArtifact that is associated with a package version. You can download package assets using the `get-package-version-assets` command. This allows you to retrieve assets without using a package manager client such as `npm` or `pip`. To download an asset you must provide the asset's name which can be obtained using the `list-package-version-assets` command, for more information see List package version assets (p. 55). The asset will be downloaded to local storage with a file name that you specify.

The following example downloads the *`guava-27.1-jre.jar`* asset from the Maven package *`com.google.guava:guava`* with version *`27.1-jre`*.

```
aws codeartifact get-package-version-asset --domain my_domain --domain-owner 111122223333
 --repository my_repo \
    --format maven --namespace com.google.guava --package guava --package-version 27.1-jre
 \
    --asset guava-27.1-jre.jar guava-27.1-jre.jar
```

The output of the command will be:

```
{
    "assetName": "guava-27.1-jre.jar",
    "packageVersion": "27.1-jre",
    "packageVersionRevision": "YGp9ck2tmy03PGSxioclfYzQ0BfTLR9zzhQJtERv62I="
}
```

In this example, the file name was specified as *`guava-27.1-jre.jar`* by the last argument in the command above, so the downloaded asset will be named *`guava-27.1-jre.jar`*.

Downloading assets using `get-package-version-asset` requires `codeartifact:GetPackageVersionAsset` permission on the package resource. For more information about resource-based permission policies, see Resource-based policies in the *AWS Identity and Access Management User Guide*.

Copy packages between repositories

You can copy package versions from one repository to another in CodeArtifact. This can be helpful for scenarios such as package promotion workflows or sharing package versions between teams or projects. The source and destination repositories must be in the same domain to copy package versions.

Required IAM permissions to copy packages

To copy package versions in CodeArtifact, the calling user must have the required IAM permissions and the resource-based policy attached to the source and destination repositories must have the required permissions. For more information about resource-based permissions policies and CodeArtifact repositories, see Repository policies (p. 22).

The user calling `copy-package-versions` must have the `ReadFromRepository` permission on the source repository and the `CopyPackageVersions` permission on the destination repository.

The source repository must have the `ReadFromRepository` permission and the destination repository must have the `CopyPackageVersions` permission assigned to the IAM account or user copying packages. The following policies are example repository policies to be added to the source repository or destination repository with the `put-repository-permissions-policy` command. Replace *`111122223333`* with the ID of the account calling `copy-package-versions`.

> **Note**
> Calling `put-repository-permissions-policy` will replace the current repository policy if one exists. You can use the `get-repository-permissions-policy` command to see if a policy exists, for more information see Read a policy (p. 24). If a policy does exist, you may want to add these permissions to it instead of replacing it.

Example source repository permissions policy

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:ReadFromRepository"
            ],
            "Effect": "Allow",
            "Principal": {
                 "AWS": "arn:aws:iam::111122223333:root"
            },
            "Resource": "*"
        }
    ]
}
```

Example destination repository permissions policy

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:CopyPackageVersions"
            ],
            "Effect": "Allow",
            "Principal": {
                 "AWS": "arn:aws:iam::111122223333:root"
            },
            "Resource": "*"
        }
    ]
}
```

Copy package versions

Use the `copy-package-versions` command in CodeArtifact to copy one or more package versions from a source repository to a destination repository in the same domain. The following example will copy versions 6.0.2 and 4.0.0 of an npm package named `my-package` from the `my_repo` repository to the `repo-2` repository.

```
aws codeartifact copy-package-versions --domain my_domain --domain-owner 111122223333 --
source-repository my_repo \
 --destination-repository repo-2 --package my-package --format npm \
 --versions 6.0.2 4.0.0
```

You can copy multiple versions of the same package name in a single operation. To copy versions of different package names, you must call `copy-package-versions` for each one.

The previous command will produce the following output, assuming both versions could be copied successfully.

```
{
   "successfulVersions": {
        "6.0.2": {
            "revision": "REVISION-1-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        },
        "4.0.0": {
            "revision": "REVISION-1-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        }
    },
    "failedVersions": {}
}
```

Copy a package from upstream repositories

Normally, `copy-package-versions` only looks in the repository specified by the `--source-repository` option for versions to copy. However, you can copy versions from both the source repository and its upstream repositories by using the `--include-from-upstream` option. If you use the CodeArtifact SDK, call the `CopyPackageVersions` API with the `includeFromUpstream` parameter set to true. For more information, see Working with upstream repositories in CodeArtifact (p. 38).

Copy a scoped npm package

To copy an npm package version in a scope, use the `--namespace` option to specify the scope. For example, to copy the package `@types/react`, use `--namespace types`. The `@` symbol must be omitted when using `--namespace`.

```
aws codeartifact copy-package-versions  --domain my_domain --domain-owner 111122223333 --
source-repository repo-1 \
 --destination-repository repo-2 --format npm --namespace my-namespace \
 --package my-package --versions 0.12.2
```

Copy Maven package versions

To copy Maven package versions between repositories, specify the package to copy by passing the Maven groupID with the `--namespace` option and the Maven artifactID with the `--name` option. For example, to copy a single version of `com.google.guava:guava`:

```
 aws codeartifact copy-package-versions --domain my_domain --domain-owner 111122223333  \
 --source-repository my_repo --destination-repository repo-2 --format maven --
namespace com.google.guava \
 --package guava --versions 27.1-jre
```

If the package version is copied successfully, the output will be similar to the following.

```
{
    "successfulVersions": {
        "27.1-jre": {
            "revision": "REVISION-1-SAMPLE-6C81EFF7DA55CC",
            "status": "Published"
        }
    },
    "failedVersions": {}
}
```

Versions that do not exist in the source repository

If you specify a version that does not exist in the source repository, the copy will fail. If some versions exist in the source repository and some do not, all versions will fail to copy. In the following example, version 0.2.0 of the `array-unique` npm package is present in the source repository, but version 5.6.7 is not:

```
aws codeartifact copy-package-versions --domain my_domain --domain-owner 111122223333 \
         --source-repository my_repo --destination-repository repo-2 --format npm \
         --package array-unique --versions 0.2.0 5.6.7
```

The output in this scenario will be similar to the following.

```
{
    "successfulVersions": {},
    "failedVersions": {
        "0.2.0": {
            "errorCode": "SKIPPED",
            "errorMessage": "Version 0.2.0 was skipped"
        },
        "5.6.7": {
            "errorCode": "NOT_FOUND",
            "errorMessage": "Could not find version 5.6.7"
        }
    }
}
```

The `SKIPPED` error code is used to indicate that the version was not copied to the destination repository because another version was not able to be copied.

Versions that already exist in the destination repository

When a package version is copied to a repository where it already exists, CodeArtifact compares its package assets and package version level metadata in the two repositories.

If the package version assets and metadata are identical in the source and destination repositories, a copy is not performed but the operation is considered successful. This means that `copy-package-versions` is idempotent. When this occurs, the version that was already present in both the source and destination repositories will not be listed in the output of `copy-package-versions`.

In the following example, two versions of the npm package `array-unique` are present in the source repository `repo-1`. Version 0.2.1 is also present in the destination repository `dest-repo` and version 0.2.0 is not.

```
aws codeartifact copy-package-versions --domain my_domain --domain-owner 111122223333 \
         --source-repository my_repo --destination-repository repo-2 --format npm --
package array-unique \
         --versions 0.2.1 0.2.0
```

The output in this scenario will be similar to the following.

```
{
    "successfulVersions": {
        "0.2.0": {
            "revision": "Yad+B1QcBq2kdEVrx1E1vSfHJVh8Pr61hBUkoWPGWX0=",
            "status": "Published"
        }
    },
    "failedVersions": {}
}
```

Version 0.2.0 is listed in `successfulVersions` because it was successfully copied from the source to destination repository. Version 0.2.1 is not shown in the output as it was already present in the destination repository.

If the package version assets or metadata differ in the source and destination repositories, the copy operation will fail. You can use the `--allow-overwrite` parameter to force an overwrite.

If some versions exist in the destination repository and some do not, all versions will fail to copy. In the following example, version 0.3.2 of the `array-unique` npm package is present in both the source and destination repositories, but the contents of the package version are different. Version 0.2.1 is present in the source repository but not the destination.

```
aws codeartifact copy-package-versions --domain my_domain --domain-owner 111122223333 \
         --source-repository my_repo --destination-repository repo-2 --format npm --
package array-unique \
         --versions 0.3.2 0.2.1
```

The output in this scenario will be similar to the following.

```
{
    "successfulVersions": {},
    "failedVersions": {
        "0.2.1": {
            "errorCode": "SKIPPED",
            "errorMessage": "Version 0.2.1 was skipped"
        },
        "0.3.2": {
            "errorCode": "ALREADY_EXISTS",
            "errorMessage": "Version 0.3.2 already exists"
        }
    }
}
```

Version 0.2.1 is marked as `SKIPPED` because it was not copied to the destination repository. Is was not copied because the copy of version 0.3.2 failed because it was already present in the destination repository, but not identical in the source and destination repositories.

Specifying a package version revision

A package version revision is a string that specifies a specific set of assets and metadata for a package version. You can specify a package version revision to copy package versions that are in a specific state. To specify a package version revision, use the `--version-revisions` parameter to pass one or more comma-separated package version and the package version revision pairs to the `copy-package-versions` command.

Note
You must specify the `--versions` or the `--version-revisions` parameter with `copy-package-versions`. You cannot specify both.

The following example will only copy version 0.3.2 of the package `my-package` if it is present in the source repository with package version revision `REVISION-1-SAMPLE-6C81EFF7DA55CC`.

```
aws codeartifact copy-package-versions --domain my_domain --domain-owner 111122223333 --
source-repository repo-1 \
 --destination-repository repo-2 --format npm --namespace my-namespace \
 --package my-package --version-revisions 0.3.2=REVISION-1-SAMPLE-6C81EFF7DA55CC
```

The following example copies two versions of package `my-package`, 0.3.2 and 0.3.13. The copy will only succeed if in the source repository version 0.3.2 of `my-package` has revision `REVISION-1-SAMPLE-6C81EFF7DA55CC` and version 0.3.13 has revision `REVISION-2-SAMPLE-55C752BEE772FC`.

```
aws codeartifact copy-package-versions --domain my_domain --domain-owner 111122223333 --
source-repository repo-1 \
 --destination-repository repo-2 --format npm --namespace my-namespace \
 --package my-package --version-revisions 0.3.2=REVISION-1-
SAMPLE-6C81EFF7DA55CC,0.3.13=REVISION-2-SAMPLE-55C752BEE772FC
```

To find the revisions of a package version, use the `describe-package-version` or the `list-package-versions` command.

For more information, see Package version revision (p. 2) and CopyPackageVersion in the *CodeArtifact API Reference*.

Copy npm packages

For more information about `copy-package-versions` behavior with npm packages, see npm tags and the CopyPackageVersions API (p. 93).

Delete a package version

You can delete one or more package versions at a time using the `delete-package-versions` command. The following deletes versions `4.0.0`, `4.0.1`, and `5.0.0` of the npm package named `my-package` in the `my_repo` in the `my_domain` domain:

```
aws codeartifact delete-package-versions --domain my_domain --domain-owner 111122223333 --
repository my_repo \
  --format npm --package my-package --versions 4.0.0 4.0.1 5.0.0
```

Sample output:

```
{
   "successfulVersions": {
      "4.0.0": {
         "revision": "oxwwYC9dDeuBoCt6+PDSwL6OMZ7rXeiXy44BM32Iawo=",
            "status": "Deleted"
      },
      "4.0.1": {
         "revision": "byaaQR748wrsdBaT+PDSwL6OMZ7rXeiBKM0551aqWmo=",
            "status": "Deleted"
      },
      "5.0.0": {
         "revision": "yubm34QWeST345ts+ASeioPI354rXeiSWr734PotwRw=",
            "status": "Deleted"
      }
   },
   "failedVersions": {}
}
```

You can confirm that the versions were deleted by running `list-package-versions` for the same package name:

```
aws codeartifact list-package-versions --domain my_domain --domain-owner 111122223333 --
repository my_repo \
   --format npm --package my-package
```

View and update package version details and dependencies

You can view information about a package version, including dependencies, in CodeArtifact. You can also update the status of a package version. For more information on package version status, see Package version status (p. 48).

View package version details

Use the `describe-package-version` command to view details about package versions. Package version details are extracted from a package when it is published to CodeArtifact. The details in different packages vary and depend on their formats and how much information their authors added to them.

Most information in the output of the `describe-package-version` command depends on the package format. For example, `describe-package-version` extracts an npm package's information from its `package.json` file. The revision is created by CodeArtifact. For more information, see Specifying a package version revision (p. 62).

Two package versions with the same name can be in the same repository if they each are in different namespaces. Use the optional `--namespace` parameter to specify a namespace. The following returns details about version `4.41.5` of an npm package named `webpack`.

```
aws codeartifact describe-package-version --domain my_domain --domain-owner 111122223333 --
repository my_repo \
--format npm --package webpack --package-version 4.41.5
```

The output might look like the following.

```
{
  "format": "npm",
  "package": "webpack",
  "displayName": "webpack",
  "version": "4.41.5",
  "summary": "Packs CommonJs/AMD modules for the browser. Allows ... further output omitted
 for brevity",
  "homePage": "https://github.com/webpack/webpack",
  "sourceCodeRepository": "https://github.com/webpack/webpack.git",
  "publishedTime": 1577481261.09,
  "licenses": [
    {
      "id": "license-id",
      "name": "license-name"
    }
  ],
  "revision": "REVISION-SAMPLE-55C752BEE9B772FC"
}
```

The following example returns details about version `1.2` of a Maven package named `commons-rng-client-api` that is in the `org.apache.commons` namespace and the `my_repo` repository.

```
aws codeartifact describe-package-version --domain my_domain --domain-owner 111122223333 --
repository my_repo \
--format maven --namespace org.apache.commons --package commons-rng-client-api --package-
version 1.2
```

The output might look like the following.

```
{
  "format": "maven",
  "namespace": "org.apache.commons",
  "package": "commons-rng-client-api",
  "displayName": "Apache Commons RNG Client API",
  "version": "1.2",
  "summary": "API for client code that uses random numbers generators.",
  "publishedTime": 1567920624.849,
  "licenses": [],
  "revision": "REVISION-SAMPLE-55C752BEE9B772FC"
}
```

The following example returns details about version `1.9.0` of a Python package named `pyhamcrest` that is in the `my_repo` repository.

```
aws codeartifact describe-package-version --domain my_domain --domain-owner 111122223333 --
repository my_repo \
--format pypi --namespace org.apache.commons --package pyhamcrest --package-version 1.9.0
```

The output might look like the following.

```
{
  "format": "pypi",
  "package": "PyHamcrest",
  "displayName": "PyHamcrest",
  "version": "1.9.0",
  "summary": "Hamcrest framework for matcher objects",
  "homePage": "https://github.com/hamcrest/PyHamcrest",
  "publishedTime": 1566002944.273,
  "licenses": [
    {
      "id": "license-id",
      "name": "license-name"
    }
  ],
  "revision": "REVISION-SAMPLE-55C752BEE9B772FC"
}
```

View package version dependencies

Use the `list-package-version-dependencies` command to get a list of a package version's dependencies. The following command lists the dependencies of an npm package named `my-package`, version `4.41.5`, in the `my_repo` repository, in the `my_domain` domain.

```
aws codeartifact list-package-version-dependencies --domain my_domain --domain-
owner 111122223333 --repository my_repo \
--format npm --package my-package --package-version 4.41.5
```

The output might look like the following.

```
{
  "dependencies": [
    {
      "namespace": "webassemblyjs",
      "package": "ast",
      "dependencyType": "regular",
      "versionRequirement": "1.8.5"
    },
    {
      "namespace": "webassemblyjs",
      "package": "helper-module-context",
      "dependencyType": "regular",
      "versionRequirement": "1.8.5"
    },
    {
      "namespace": "webassemblyjs",
      "package": "wasm-edit",
      "dependencyType": "regular",
      "versionRequirement": "1.8.5"
    }
  ],
  "versionRevision": "REVISION-SAMPLE-55C752BEE9B772FC"
}
```

View package version readme file

Some package formats, such as npm, include a `README` file. Use the `get-package-version-readme` to get the `README` file of a package version. The following command returns the `README` file of an npm package named `my-package`, version `4.41.5`, in the `my_repo` repository, in the `my_domain` domain.

```
aws codeartifact get-package-version-readme --domain my_domain --domain-owner 111122223333
 --repository my_repo \
--format npm --package my-package --package-version 4.41.5
```

The output might look like the following.

```
{
  "format": "npm",
  "package": "my-package",
  "version": "4.41.5"
  "readme": "<div align=\"center\">\n   <a href=\https://github.com/webpack/webpack\"> ...
 more content ... \n",
  "versionRevision": "REVISION-SAMPLE-55C752BEE9B772FC"
}
```

Update package version status

Every package version in CodeArtifact has a status that describes the current state and availability of the package version. You can change the package version status using both the AWS CLI and the console. For more information on package version status, including a list of the available statuses, see Package version status (p. 48).

Updating package version status

Setting the status of a package version allows controlling how a package version can be used without deleting it completely from the repository. For example, when a package version has a status of `Unlisted`, it can still be downloaded as normal, but it will not appear in package version lists returned to commands such as `npm view`. The UpdatePackageVersionsStatus API allows setting the package version status of multiple versions of the same package in a single API call. For a description of the different statuses, see Packages overview (p. 46).

Use the `update-package-versions-status` command to change the status of a package version to `Published`, `Unlisted`, or `Archived`. To see the required IAM permissions to use the command, see Required IAM permissions to update a package version status (p. 67). The following example sets the status of version 4.1.0 of the npm package `chalk` to `Archived`.

```
aws codeartifact update-package-versions-status —domain my_domain
 --domain-owner 111122223333 --repository my_repo --format npm --package chalk
--versions 4.1.0 --target-status Archived
```

Sample output:

```
{
    "successfulVersions": {
        "4.1.0": {
            "revision": "+Oz8skWbwY3k8M6SrNIqNj6bVH/ax+CxvkJx+No5j8I=",
            "status": "Archived"
        }
    },
    "failedVersions": {}
}
```

This example uses an npm package, but the command works identically for other formats. Multiple versions can be moved to the same target status using a single command, see the following example.

```
aws codeartifact update-package-versions-status --domain my_domain
 --domain-owner 111122223333 --repository my_repo --format npm --package chalk
--versions 4.1.0 4.1.1 --target-status Archived
```

Sample output:

```
{
    "successfulVersions": {
        "4.1.0": {
            "revision": "25/UjBleHs1DZewk+zozoeqH/R80Rc9gL1P8vbzVMJ4=",
            "status": "Archived"
        },
        "4.1.1": {
            "revision": "+Oz8skWbwY3k8M6SrNIqNj6bVH/ax+CxvkJx+No5j8I=",
            "status": "Archived"
        }
    },
    "failedVersions": {}
}
```

Note that once published, a package version cannot be moved back to the `Unfinished` state, so this status is not permitted as a value for the `--target-status` parameter. To move the package version to the `Disposed` state, use the `dispose-package-versions` command instead as described below.

Required IAM permissions to update a package version status

To call `update-package-versions-status` for a package, you must have the `codeartifact:UpdatePackageVersionsStatus` permission on the package resource. This means you can grant permission to call `update-package-versions-status` on a per-package basis. For example, an IAM policy that grants permission to call `update-package-versions-status` on the npm package *`chalk`* would include a statement like the following.

```
{
  "Action": [
    "codeartifact:UpdatePackageVersionsStatus"
  ],
  "Effect": "Allow",
  "Resource": "arn:aws:codeartifact:us-east-1:111122223333:package/my_domain/my_repo/npm//
chalk"
}
```

Updating status for a scoped npm package

To update the package version status of an npm package version with a scope, use the `--namespace` parameter. For example, to unlist version 8.0.0 of `@nestjs/core`, use the following command.

```
aws codeartifact update-package-versions-status --domain my_domain
 --domain-owner 111122223333 --repository my_repo --format npm --namespace nestjs
--package core --versions 8.0.0 --target-status Unlisted
```

Updating status for a Maven package

Maven packages always have a groupID, which is referred to as a namespace in CodeArtifact. Use the `--namespace` parameter to specify the Maven groupID when calling `update-package-versions-status`. For example, to archive version 2.13.1 of the Maven package `org.apache.logging.log4j:log4j`, use the following command.

```
aws codeartifact update-package-versions-status --domain my_domain
```

```
 --domain-owner 111122223333 --repository my_repo --format maven
--namespace org.apache.logging.log4j --package log4j
--versions 2.13.1 --target-status Archived
```

Specifying a package version revision

A package version revision is a string that specifies a specific set of assets and metadata for a package version. You can specify a package version revision to update the status of package versions that are in a specific state. To specify a package version revision, use the `--version-revisions` parameter to pass one or more comma-separated package versions and the package version revision pairs. The status of a package version will only be updated if the current revision of the package version matches the value specified.

Note

The `—-versions` parameter must also be defined when using the `--version-revisions` parameter.

```
aws codeartifact update-package-versions-status --domain my_domain
   --domain-owner 111122223333 --repository my_repo --format npm --package chalk
   --version-revisions "4.1.0=25/UjBleHs1DZewk+zozoeqH/R80Rc9gL1P8vbzVMJ4="
   --versions 4.1.0 --target-status Archived
```

To update multiple versions with a single command, pass a comma-separated list of version and version revision pairs to the `--version-revisions` options. The following example command defines two different package version and package version revision pairs.

```
aws codeartifact update-package-versions-status --domain my_domain
 --domain-owner 111122223333 --repository my_repo --format npm
 --package chalk
 --version-revisions "4.1.0=25/UjBleHs1DZewk+zozoeqH/
R80Rc9gL1P8vbzVMJ4=,4.0.0=E3lhBp0RObRTut4pkjV5c1AQGkgSA7Oxtil6hMMzelc="
 --versions 4.1.0 4.0.0 --target-status Published
```

Sample output:

```
{
    "successfulVersions": {
        "4.0.0": {
            "revision": "E3lhBp0RObRTut4pkjV5c1AQGkgSA7Oxtil6hMMzelc=",
            "status": "Published"
        },
        "4.1.0": {
            "revision": "25/UjBleHs1DZewk+zozoeqH/R80Rc9gL1P8vbzVMJ4=",
            "status": "Published"
        }
    },
    "failedVersions": {}
}
```

When updating multiple package versions, the versions passed to `--version-revisions` must be the same as the versions passed to `--versions`. If a revision is specified incorrectly, that version will not have its status updated.

Using the expected status parameter

The `update-package-versions-status` command provides the `--expected-status` parameter that supports specifying the expected current status of a package version. If the current status does not match the value passed to `--expected-status`, the status of that package version will not be updated.

For example, in *my_repo*, versions 4.0.0 and 4.1.0 of the npm package `chalk` currently have a status of `Published`. A call to `update-package-versions-status` that specifies an expected status of `Unlisted` will fail to update both package versions because of the status mismatch.

```
aws codeartifact update-package-versions-status --domain my_domain
--domain-owner 111122223333 --repository my_repo --format npm --package chalk
--versions 4.1.0 4.0.0 --target-status Archived --expected-status Unlisted
```

Sample output:

```
{
    "successfulVersions": {},
    "failedVersions": {
        "4.0.0": {
            "errorCode": "MISMATCHED_STATUS",
            "errorMessage": "current status: Published, expected status: Unlisted"
        },
        "4.1.0": {
            "errorCode": "MISMATCHED_STATUS",
            "errorMessage": "current status: Published, expected status: Unlisted"
        }
    }
}
```

Errors with individual package versions

There are multiple reasons why the status of a package version will not be updated when calling `update-package-versions-status`. For example, the package version revision may have been specified incorrectly, or the expected status does not match the current status. In these cases, the version will be included in the `failedVersions` map in the API response. If one version fails, other versions specified in the same call to `update-package-versions-status` might be skipped and not have their status updated. Such versions will also be included in the `failedVersions` map with an `errorCode` of `SKIPPED`.

In the current implementation of `update-package-versions-status`, if one or more versions cannot have their status changed, all other versions will be skipped. That is, either all versions are updated successfully or no versions are updated. This behavior is not guaranteed in the API contract; in the future, some versions might succeed while other versions fail in a single call to `update-package-versions-status`.

The following example command includes an version status update failure caused by a package version revision mismatch. That update failure causes another version status update call to be skipped.

```
aws codeartifact update-package-versions-status --domain my_domain
  --domain-owner 111122223333 --repository my_repo
  --format npm --package chalk
  --version-revisions "4.1.0=25/UjBleHs1DZewk+zozoeqH/
R80Rc9gL1P8vbzVMJ=,4.0.0=E3lhBp0RObRTut4pkjV5c1AQGkgSA7Oxtil6hMMzelc="
  --versions 4.1.0 4.0.0 --target-status Archived
```

Sample output:

```
{
    "successfulVersions": {},
    "failedVersions": {
        "4.0.0": {
            "errorCode": "SKIPPED",
            "errorMessage": "version 4.0.0 is skipped"
        },
        "4.1.0": {
            "errorCode": "MISMATCHED_REVISION",
            "errorMessage": "current revision: 25/UjBleHs1DZewk+zozoeqH/
R80Rc9gL1P8vbzVMJ4=, expected revision: 25/UjBleHs1DZewk+zozoeqH/R80Rc9gL1P8vbzVMJ="
        }
    }
}
```

Disposing of package versions

The `Disposed` package status has similar behavior to `Archived`, except that the package assets will be permanently deleted by CodeArtifact so that the domain owner's account will no longer be billed for the asset storage. To change the status of a package version to `Disposed`, use the `dispose-package-versions` command. This capability is separate from `update-package-versions-status` because disposing of a package version is not reversible. Because the package assets will be deleted, the version's status cannot be changed back to `Archived`, `Unlisted`, or `Published`. The only action that can be taken on a package version that has been disposed is for it to be deleted using the `delete-package-versions` command.

To call `dispose-package-versions` successfully, the calling IAM principal must have the `codeartifact:DisposePackageVersions` permission on the package resource.

The behavior of the `dispose-package-versions` command is similar to `update-package-versions-status`, including the behavior of the `--version-revisions` and `--expected-status` options that are described in the version revision (p. 68) and expected status (p. 68) sections. For example, the following command attempts to dispose a package version but fails due to a mismatched expected status.

```
aws codeartifact dispose-package-versions —domain my_domain --domain-owner 111122223333
--repository my_repo --format npm --package chalk --versions 4.0.0
--expected-status Unlisted
```

Sample output:

```
{
    "successfulVersions": {},
    "failedVersions": {
        "4.0.0": {
            "errorCode": "MISMATCHED_STATUS",
            "errorMessage": "current status: Published, expected status: Unlisted"
        }
    }
}
```

If the same command is run again with an `--expected-status` of `Published`, the disposal will succeed.

```
aws codeartifact dispose-package-versions —domain my_domain --domain-owner 111122223333
--repository my_repo --format npm --package chalk --versions 4.0.0
--expected-status Published
```

Sample output:

```
{
    "successfulVersions": {
        "4.0.0": {
            "revision": "E3lhBp0RObRTut4pkjV5c1AQGkgSA7Oxtil6hMMzelc=",
            "status": "Disposed"
        }
    },
    "failedVersions": {}
}
```

Working with domains in CodeArtifact

CodeArtifact *domains* make it easier to manage multiple repositories across an organization. You can use a domain to apply permissions across many repositories owned by different AWS accounts. An asset is stored only once in a domain, even if it's available from multiple repositories.

Although you can have multiple domains, we recommend a single production domain that contains all published artifacts so that your development teams can find and share packages. You can use a second preproduction domain to test changes to the production domain configuration.

These topics describe how to use the CLI and API to configure CodeArtifact domains.

Topics

Domain overview

When you're working with CodeArtifact, domains are useful for the following:

- **Deduplicated storage**: An asset only needs to be stored once in a domain, even if it's available in 2 or 2,000 repositories. That means you only pay for storage once.
- **Fast copying**: When you pull packages from an upstream CodeArtifact repository into a downstream or use the CopyPackageVersions API (p. 58), only metadata records must be updated. No assets are copied. This makes it fast to set up a new repository for staging or testing. For more information, see Working with upstream repositories in CodeArtifact (p. 38).
- **Easy sharing across repositories and teams**: All of the assets and metadata in a domain are encrypted with a single AWS KMS key (KMS key). You don't need to manage a key for each repository or grant multiple accounts access to a single key.
- **Apply policy across multiple repositories**: The domain administrator can apply policy across the domain. This includes restricting which accounts have access to repositories in the domain, and who can configure connections to public repositories to use as sources of packages. For more information, see Domain policies (p. 75).
- **Unique repository names**: The domain provides a namespace for repositories. Repository names only need to be unique within the domain. You should use meaningful names that are easy to understand.

Domain names must be unique within an account.

You cannot create a repository without a domain. When you use the CreateRepository (p. 14) API to create a repository, you must specify a domain name. You cannot move a repository from one domain to another.

A repository can be owned by the same AWS account that owns the domain, or a different account. If the owning accounts are different, the repository-owning account must be granted the `CreateRepository` permission on the domain resource. You can do this by adding a resource policy to the domain using the PutDomainPermissionsPolicy (p. 78) command.

Although an organization can have multiple domains, the recommendation is to have a single production domain that contains all published artifacts so that development teams can find and share packages across their organization. A second pre-production domain can be useful for testing changes to the production domain configuration.

Cross-account domains

Domain names only need to be unique within an account, which means there could be multiple domains within a region that have the same name. Because of this, if you want to access a domain that is owned by an account you are not authenticated to, you must provide the domain owner ID along with the domain name in both the CLI and the console. See the following CLI examples.

Access a domain owned by an account you are authenticated to:

When accessing a domain within the account you're authenticated to, you only need to specify the domain name. The following example lists packages in the *my_repo* repository in the *my_domain* domain that is owned by your account.

```
aws codeartifact list-packages --domain my_domain --repository my_repo
```

Access a domain owned by an account that you are not authenticated to:

When accessing a domain that is owned by an account that you're not authenticated to, you need to specify the domain owner as well as the domain name. The following example lists packages in the *other-repo* repository in the *other-domain* domain that is owned by an account that you are not authenticated to. Notice the addition of the `--domain-owner` parameter.

```
aws codeartifact list-packages --domain other-domain --domain-owner 111122223333 --
repository other-repo
```

Create a domain

You can create a domain using the CodeArtifact console or the AWS Command Line Interface (AWS CLI). When you create a domain, it does not contain any repositories. For more information, see Create a repository (p. 14).

Topics

Create a domain (console)

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. In the navigation pane, choose **Domains**, and then choose **Create domain**.
3. In **Name**, enter a name for your domain.

4. Expand **Additional configuration**.
5. You must use an AWS KMS key (KMS key) to encrypt all assets in your domain. You can use an AWS managed KMS key or a KMS key that you manage.

   - Choose **AWS managed key** if you want to use the default AWS managed key.
   - Choose **Customer managed key** if you want to use a KMS key that you manage. To use a KMS key that you manage, in **Customer managed key ARN**, search for and choose the KMS key.

   For more information, see AWS managed key and Customer managed key in the *AWS Key Management Service Developer Guide*.
6. Choose **Create domain**.

Create a domain (AWS CLI)

Use the `create-domain` command to create domain with the AWS CLI. You must use an AWS KMS key (KMS key) to encrypt all assets in your domain. You can use an AWS managed KMS key or a KMS key that you manage. If you use an AWS managed KMS key, do not use the `--encryption-key` parameter.

```
aws codeartifact create-domain --domain my_domain
```

JSON-formatted data appears in the output with details about your new domain.

```
{
    "domain": {
        "name": "my_domain",
        "owner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:domain/my_domain",
        "status": "Active",
        "encryptionKey": "arn:aws:kms:us-west-2:111122223333:key/your-kms-key",
        "repositoryCount": 0,
        "assetSizeBytes": 0,
        "createdTime": "2020-10-12T16:51:18.039000-04:00"
    }
}
```

If you use a KMS key that you manage, include its Amazon Resource Name (ARN) with the `--encryption-key` parameter.

```
aws codeartifact create-domain --domain my_domain --encryption-key arn:aws:kms:us-
west-2:111122223333:key/your-kms-key
```

JSON-formatted data appears in the output with details about your new domain.

```
{
    "domain": {
        "name": "my_domain",
        "owner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:domain/my_domain",
        "status": "Active",
        "encryptionKey": "arn:aws:kms:us-west-2:111122223333:key/your-kms-key",
        "repositoryCount": 0,
        "assetSizeBytes": 0,
        "createdTime": "2020-10-12T16:51:18.039000-04:00"
    }
}
```

Create a domain with tags

To create a domain with tags, add the `--tags` parameter to your `create-domain` command.

```
aws codeartifact create-domain --domain my_domain --tags key=k1,value=v1 key=k2,value=v2
```

Delete a domain

You can delete a domain using the CodeArtifact console or the AWS Command Line Interface (AWS CLI). You can't delete a domain that contains repositories. Before you delete the domain, you must first delete its repositories. For more information, see Delete a repository (p. 17).

Topics

Delete a domain (console)

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. In the navigation pane, choose **Domains**, then choose the domain that you want to delete.
3. Choose **Delete**.

Delete a domain (AWS CLI)

Use the **delete-domain** command to delete a domain.

```
aws codeartifact delete-domain --domain my_domain --domain-owner 111122223333
```

JSON-formatted data appears in the output with details about the deleted domain.

```
{
    "domain": {
        "name": "my_domain",
        "owner": "111122223333",
        "arn": "arn:aws:codeartifact:us-west-2:111122223333:domain/my_domain",
        "status": "Active",
        "encryptionKey": "arn:aws:kms:us-west-2:111122223333:key/your-kms-key",
        "repositoryCount": 0,
        "assetSizeBytes": 0,
        "createdTime": "2020-10-12T16:51:18.039000-04:00"
    }
}
```

Domain policies

CodeArtifact supports using resource-based permissions to control access. Resource-based permissions let you specify who has access to a resource and which actions they can perform on it. By default, only the AWS account that owns the domain can create and access repositories in the domain. You can apply a policy document to a domain to allow other IAM principals to access it.

For more information, see Policies and Permissions and Identity-Based Policies and Resource-Based Policies.

Topics

Enable cross-account access to a domain

A resource policy is a text file in JSON format. The file must specify a principal (actor), one or more actions, and an effect (`Allow` or `Deny`). To create a repository in a domain owned by another account, the principal must be granted the `CreateRepository` permission on the *domain* resource.

For example, the following resource policy grants the account `123456789012` permission to create a repository in the domain.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:CreateRepository"
            ],
            "Effect": "Allow",
            "Principal": {
                 "AWS": "arn:aws:iam::123456789012:root"
            },
            "Resource": "*"
        }
    ]
}
```

To allow creating repositories with tags, you must include the `codeartifact:TagResource` permission. This will also give the account access to add tags to the domain and all repositories in it.

Because the policy is evaluated only for operations against the domain it's attached to, you do not need to specify a resource. Because the resource is implied, the `Resource` can be set to `*`.

To access packages in a domain owned by another account, a principal must be granted the `GetAuthorizationToken` permission on the *domain resource*. This allows the domain owner to exercise control over which accounts can read the contents of repositories in the domain.

For example, the following resource policy grants the account `123456789012` permission to retrieve an auth token for any repository in the domain.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codeartifact:GetAuthorizationToken"
            ],
            "Effect": "Allow",
            "Principal": {
                 "AWS": "arn:aws:iam::123456789012:root"
            },
            "Resource": "*"
        }
    ]
}
```

Note
A principal who wants to fetch packages from a repository endpoint must be granted the `ReadFromRepository` permission on the repository resource in addition to the `GetAuthorizationToken` permission on the domain. Similarly, a principal who wants to publish packages to a repository endpoint must be granted the `PublishPackageVersion` permission in addition to `GetAuthorizationToken`.
For more information about the `ReadFromRepository` and `PublishPackageVersion` permissions, see Repository Policies (p. 22).

Domain policy example

When multiple accounts are using a domain, the accounts should be granted a basic set of permissions to allow full use of the domain. The following resource policy lists a set of permissions that allow full use of the domain.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "BasicDomainPolicy",
            "Action": [
                "codeartifact:GetDomainPermissionsPolicy",
                "codeartifact:ListRepositoriesInDomain",
                "codeartifact:GetAuthorizationToken",
                "codeartifact:DescribeDomain",
                "codeartifact:CreateRepository"
            ],
            "Effect": "Allow",
            "Resource": "*",
            "Principal": {
                "AWS": "arn:aws:iam::123456789012:root"
            }
        }
    ]
}
```

Note
You don't need to create a domain policy if a domain and all its repositories are owned by a single account and only need to be used from that account.

Domain policy example with AWS Organizations

You can use the `aws:PrincipalOrgID` condition key to grant access to an CodeArtifact domain from all accounts in your organization, as follows.

```
{
    "Version": "2012-10-17",
    "Statement": {
        "Sid": "DomainPolicyForOrganization",
        "Effect": "Allow",
        "Principal": "*",
        "Action": [
             "codeartifact:GetDomainPermissionsPolicy",
             "codeartifact:ListRepositoriesInDomain",
             "codeartifact:GetAuthorizationToken",
             "codeartifact:DescribeDomain",
             "codeartifact:CreateRepository"
        ],
        "Resource": "*",
        "Condition": {
            "StringEquals": { "aws:PrincipalOrgID":["o-xxxxxxxxxxx"]}
        }
    }
}
```

For more information about using the `aws:PrincipalOrgID` condition key, see AWS Global Condition Context Keys in the *IAM User Guide*.

Set a domain policy

You can use the `put-domain-permissions-policy` command to attach a policy to a domain.

```
aws codeartifact put-domain-permissions-policy --domain my_domain --domain-
owner 111122223333 \
 --policy-document file://</PATH/TO/policy.json>
```

When you call `put-domains-permissions-policy`, the resource policy on the domain is ignored when evaluting permissions. This ensures that the owner of a domain cannot lock themselves out of the domain, which would prevent them from being able to update the resource policy.

Note
You cannot grant permissions to another AWS account to update the resource policy on a domain using a resource policy, since the resource policy is ignored when calling put-domain-permissions-policy.

Sample output:

```
{
    "policy": {
        "resourceArn": "arn:aws:codeartifact:region-id:111122223333:domain/my_domain",
        "document": "{ ...policy document content...}",
        "revision": "MQlyyTQRASRU3HB58gBtSDHXG7Q3hvxxxxxxx="
    }
}
```

The output of the command contains the Amazon Resource Name (ARN) of the domain resource, the full contents of the policy document, and a revision identifier. The revision identifier can be passed to `put-domain-permissions-policy` using the `--policy-revision` option. This ensures that a known revision of the document is being overwritten, and not a newer version set by another writer.

Read a domain policy

To read an existing version of a policy document, use the `get-domain-permissions-policy` command. To format the output for readability, use the `--output` and `--query policy.document` together with the Python `json.tool` module, as follows.

```
aws codeartifact get-domain-permissions-policy --domain my_domain --domain-
owner 111122223333 \
   --output text --query policy.document | python -m json.tool
```

Sample output:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "BasicDomainPolicy",
            "Action": [
                "codeartifact:GetDomainPermissionsPolicy",
                "codeartifact:ListRepositoriesInDomain",
                "codeartifact:GetAuthorizationToken",
                "codeartifact:CreateRepository"
            ],
            "Effect": "Allow",
            "Resource": "*",
            "Principal": {
                "AWS": "arn:aws:iam::111122223333:root"
            }
        }
    ]
}
```

Delete a domain policy

Use the `delete-domain-permissions-policy` command to delete a policy from a domain.

```
aws codeartifact delete-domain-permissions-policy --domain my_domain --domain-
owner 111122223333
```

The format of the output is the same as that of the `get-domain-permissions-policy` and `delete-domain-permissions-policy` commands.

Tag a domain in CodeArtifact

Tags are key-value pairs associated with AWS resources. You can apply tags to your domains in CodeArtifact. For information about CodeArtifact resource tagging, use cases, tag key and value constraints, and supported resource types, see Tagging resources (p. 167).

You can use the CLI to specify tags when you create a domain. You can use the console or CLI to add or remove tags, and update the values of tags in a domain. You can add up to 50 tags to each domain.

Topics

Tag domains (CLI)

You can use the CLI to manage domain tags.

Topics

Add tags to a domain (CLI)

You can use the console or the AWS CLI to tag domains.

To add a tag to a domain when you create it, see Create a repository (p. 14).

In these steps, we assume that you have already installed a recent version of the AWS CLI or updated to the current version. For more information, see Installing the AWS Command Line Interface.

At the terminal or command line, run the **tag-resource** command, specifying the Amazon Resource Name (ARN) of the domain where you want to add tags and the key and value of the tag you want to add.

Note
To get the ARN of the domain, run the `describe-domain` command:

```
aws codeartifact describe-domain --domain my_domain --query domain.arn
```

You can add more than one tag to a domain. For example, to tag a domain named *`my_domain`* with two tags, a tag key named *`key1`* with the tag value of *`value1`*, and a tag key named *`key2`* with the tag value of *`value2`*:

```
aws codeartifact tag-resource --resource-arn arn:aws:codeartifact:us-
west-2:123456789012:domain/my_domain --tags key=key1,value=value1 key=key2,value=value2
```

If successful, this command has no output.

View tags for a domain (CLI)

Follow these steps to use the AWS CLI to view the AWS tags for a domain. If no tags have been added, the returned list is empty.

At the terminal or command line, run the **list-tags-for-resource** command with the Amazon Resource Name (ARN) of the domain.

Note
To get the ARN of the domain, run the `describe-domain` command:

```
aws codeartifact describe-domain --domain my_domain --query domain.arn
```

For example, to view a list of tag keys and tag values for a domain named *`my_domain`* with the `arn:aws:codeartifact:`*`us-west-2`*`:`*`123456789012`*`:domain/`*`my_domain`* ARN value:

```
aws codeartifact list-tags-for-resource --resource-arn arn:aws:codeartifact:us-
west-2:123456789012:domain/my_domain
```

If successful, this command returns information similar to the following:

```
{
    "tags": {
        "key1": "value1",
        "key2": "value2"
    }
}
```

Edit tags for a domain (CLI)

Follow these steps to use the AWS CLI to edit a tag for a domain. You can change the value for an existing key or add another key. You can also remove tags from a domain, as shown in the next section.

At the terminal or command line, run the **tag-resource** command, specifying the ARN of the domain where you want to update a tag and specify the tag key and tag value:

Note
To get the ARN of the domain, run the `describe-domain` command:

```
aws codeartifact describe-domain --domain my_domain --query domain.arn
```

```
aws codeartifact tag-resource --resource-arn arn:aws:codeartifact:us-
west-2:123456789012:domain/my_domain --tags key=key1,value=newvalue1
```

If successful, this command has no output.

Remove tags from a domain (CLI)

Follow these steps to use the AWS CLI to remove a tag from a domain.

Note
If you delete a domain, all tag associations are removed from the deleted domain. You do not have to remove tags before you delete a domain.

At the terminal or command line, run the **untag-resource** command, specifying the ARN of the domain where you want to remove tags and the tag key of the tag you want to remove.

Note
To get the ARN of the domain, run the `describe-domain` command:

```
aws codeartifact describe-domain --domain my_domain --query domain.arn
```

For example, to remove multiple tags on a domain named *`mydomain`* with the tag keys *`key1`* and *`key2`*:

```
aws codeartifact untag-resource --resource-arn arn:aws:codeartifact:us-
west-2:123456789012:domain/my_domain --tag-keys key1 key2
```

If successful, this command has no output. After removing tags, you can view the remaining tags on the repository using the `list-tags-for-resource` command.

Tag domains (console)

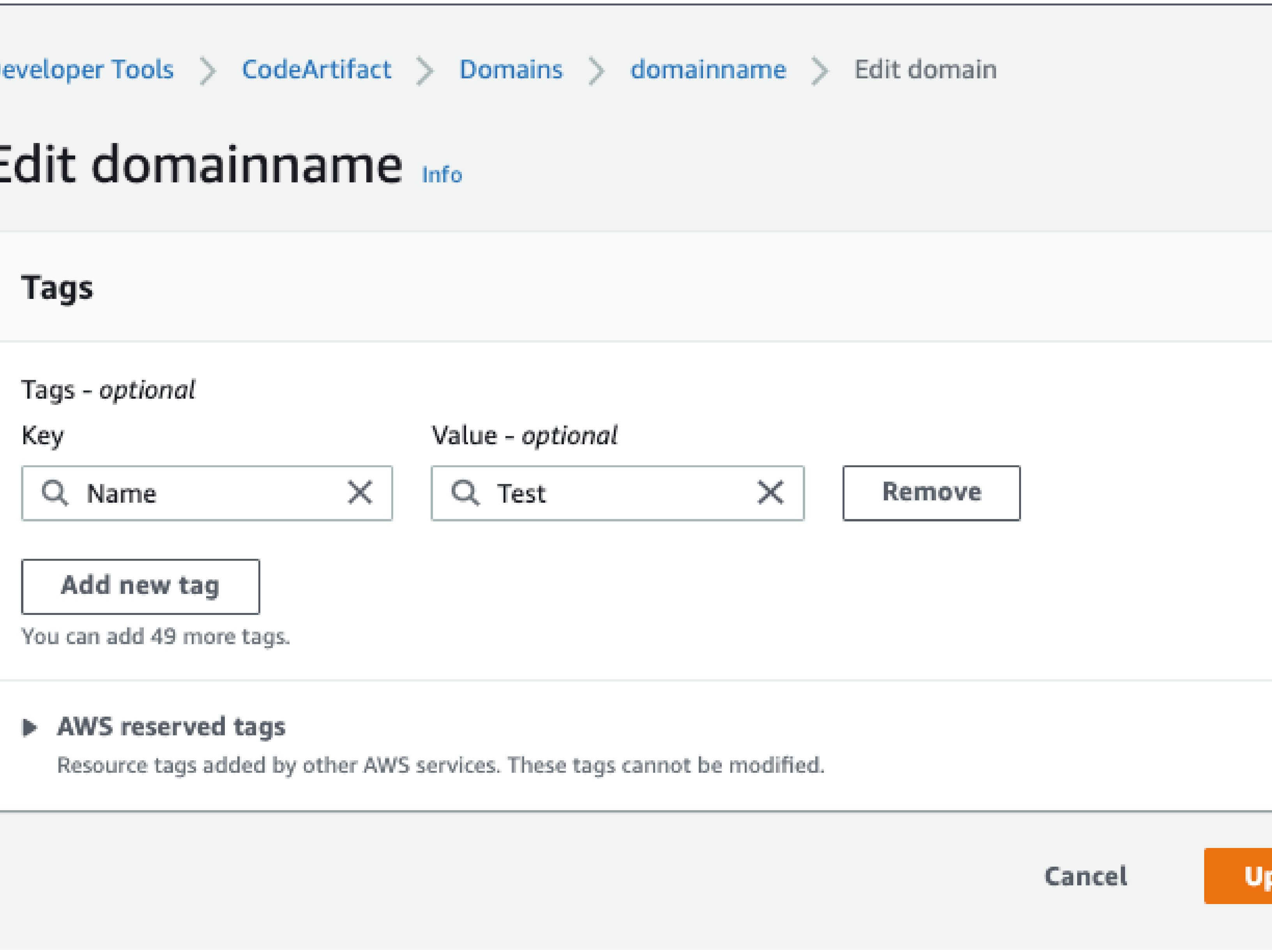
You can use the console or the CLI to tag resources.

Topics

Add tags to a domain (console)

You can use the console to add tags to an existing domain.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Domains** page, choose the domain that you want to add tags to.
3. Expand the **Details** section.
4. Under **Domain tags**, choose **Add domain tags** if there are no tags on the domain, or choose **View and edit domain tags** if there are.
5. Choose **Add new tag**.
6. In the **Key** and **Value** fields, enter the text for each tag you want to add. (The **Value** field is optional.) For example, in **Key**, enter `Name`. In **Value**, enter `Test`.


eveloper Tools > CodeArtifact > Domains > domainname > Edit domain
Edit domainname Info
Tags
Tags - optional
Key
Value - optional
Remove
Add new tag
You can add 49 more tags.
AWS reserved tags
Resource tags added by other AWS services. These tags cannot be modified.
Cancel
Up

Key: Name
Value: Test

7. (Optional) Choose **Add tag** to add more rows and enter more tags.

8. Choose **Update domain**.

View tags for a domain (console)

You can use the console to list tags for existing domains.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Domains** page, choose the domain where you want to view tags.
3. Expand the **Details** section.
4. Under **Domain tags**, choose **View and edit domain tags**.

   Note
   If there are no tags added to this domain, the console will read **Add domain tags**.

Edit tags for a domain (console)

You can use the console to edit tags that have been added to domain.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Domains** page, choose the domain where you want to update tags.
3. Expand the **Details** section.
4. Under **Domain tags**, choose **View and edit domain tags**.

   Note
   If there are no tags added to this domain, the console will read **Add domain tags**.
5. In the **Key** and **Value** fields, update the values in each field as needed. For example, for the **`Name`** key, in **Value**, change **`Test`** to **`Prod`**.
6. Choose **Update domain**.

Remove tags from a domain (console)

You can use the console to delete tags from domains.

1. Open the AWS CodeArtifact console at https://console.aws.amazon.com/codesuite/codeartifact/home.
2. On the **Domains** page, choose the domain where you want to remove tags.
3. Expand the **Details** section.
4. Under **Domain tags**, choose **View and edit domain tags**.

   Note
   If there are no tags added to this domain, the console will read **Add domain tags**.
5. Next to the key and value for each tag you want to delete, choose **Remove**.
6. Choose **Update domain**.

Using CodeArtifact with npm

These topics describe how to use npm, the Node.js package manager, with CodeArtifact.

Note
CodeArtifact supports `node v4.9.1` and later and `npm v5.0.0` and later.

Topics

Configure and use npm with CodeArtifact

After you create a repository in CodeArtifact, you can use the npm client to install and publish packages. The recommended method for configuring npm with your repository endpoint and authorization token is by using the `aws codeartifact login` command. You can also configure npm manually.

Contents

Configuring npm with the login command

Use the `aws codeartifact login` command to fetch credentials for use with npm.

Note
If you are accessing a repository in a domain that you own, you don't need to include `--domain-owner`. For more information, see Cross-account domains (p. 73).

```
aws codeartifact login --tool npm --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

This command makes the following changes to your ~/.npmrc file:

- Adds an authorization token after fetching it from CodeArtifact using your AWS credentials.
- Sets the npm registry to the repository specified by the `--repository` option.
- **For npm 6 and lower:** Adds `"always-auth=true"` so the authorization token is sent for every npm command.

The default authorization period after calling `login` is 12 hours, and `login` must be called to periodically refresh the token. For more information about the authorization token created with the `login` command, see Tokens created with the `login` command (p. 156).

Configuring npm without using the login command

You can configure npm with your CodeArtifact repository without the `aws codeartifact login` command by manually updating the npm configuration.

To configure npm without using the login command

1. In a command line, fetch a CodeArtifact authorization token and store it in an environment variable. npm will use this token to authenticate with your CodeArtifact repository.

   Note
   The following command is for macOS or Linux machines. For information on configuring environment variables on a Windows machine, see Pass an auth token using an environment variable (p. 158).

```
CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --domain my_domain --
domain-owner 111122223333 --query authorizationToken --output text`
```

2. Get your CodeArtifact repository's endpoint by running the following command. Your repository endpoint is used to point npm to your repository to install or publish packages.

   - Replace *my_domain* with your CodeArtifact domain name.
   - Replace *111122223333* with the AWS account ID of the owner of the domain. If you are accessing a repository in a domain that you own, you don't need to include `--domain-owner`. For more information, see Cross-account domains (p. 73).
   - Replace *my_repo* with your CodeArtifact repository name.

```
aws codeartifact get-repository-endpoint --domain my_domain --domain-owner 111122223333
 --repository my_repo --format npm
```

   The following URL is an example repository endpoint.

```
https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/my_repo/
```

   Important
   The registry URL must end with a forward slash (/). Otherwise, you cannot connect to the repository.

3. Use the `npm config set` command to set the registry to your CodeArtifact repository. Replace the URL with the repository endpoint URL from the previous step.

```
npm config set
 registry=https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
npm/my_repo/
```

4. Use the `npm config set` command to add your authorization token to your npm configuration.

```
npm config set //my_domain-111122223333.d.codeartifact.region.amazonaws.com/
npm/my_repo/:_authToken=$CODEARTIFACT_AUTH_TOKEN
```

   For npm 6 or lower: To make npm always pass the auth token to CodeArtifact, even for `GET` requests, set the `always-auth` configuration variable with `npm config set`.

```
npm config set //my_domain-111122223333.d.codeartifact.region.amazonaws.com/
npm/my_repo/:always-auth=true
```

Example npm configuration file (`.npmrc`)

The following is an example `.npmrc` file after following the preceding instructions to set the CodeArtifact registry endpoint, add an authentication token, and configure `always-auth`.

```
registry=https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/my-cli-
repo/
//my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/
my_repo/:_authToken=eyJ2ZX...
//my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/my_repo/:always-
auth=true
```

Running npm commands

After you configure the npm client, you can run npm commands. Assuming that a package is present in your repository or one of its upstream repositories, you can install it with `npm install`. For example, use the following to install the `lodash` package.

```
npm install lodash
```

Use the following command to publish a new npm package to a CodeArtifact repository.

```
npm publish
```

For information about how to create npm packages, see Creating Node.js Modules on the npm documentation website. For a list of npm commands supported by CodeArtifact, see npm Command Support (p. 89).

Verifying npm authentication and authorization

Invoking the `npm ping` command is a way to verify the following:

- You have correctly configured your credentials so that you can authenticate to an CodeArtifact repository.
- The authorization configuration grants you the `ReadFromRepository` permission.

The output from a successful invocation of `npm ping` looks like the following.

```
$ npm -d ping
npm info it worked if it ends with ok
npm info using npm@6.4.1
npm info using node@v9.5.0
npm info attempt registry request try #1 at 4:30:59 PM
npm http request GET https://<domain>.d.codeartifact.us-west-2.amazonaws.com/npm/shared/-/
ping?write=true
npm http 200 https:///npm/shared/-/ping?write=true
Ping success: {}
npm timing npm Completed in 716ms
npm info ok
```

The `-d` option causes npm to print additional debug information, including the repository URL. This information makes it easy to confirm that npm is configured to use the repository you expect.

Changing back to the default npm registry

Configuring npm with CodeArtifact sets the npm registry to the specified CodeArtifact repository. You can run the following command to set the npm registry back to its default registry when you're done connecting to CodeArtifact.

```
npm config set registry https://registry.npmjs.com/
```

Configure and use Yarn with CodeArtifact

After you create a repository, you can use the Yarn client to manage npm packages.

Note
`Yarn 1.X` reads and uses information from your npm configuration file (.npmrc), while `Yarn 2.X` does not. The configuration for `Yarn 2.X` must be defined in the .yarnrc.yml file.

Contents

Configure Yarn 1.X with the `aws codeartifact login` command

For `Yarn 1.X`, you can configure Yarn with CodeArtifact using the `aws codeartifact login` command. The `login` command will configure your ~/.npmrc file with your CodeArtifact repository endpoint information and credentials. With `Yarn 1.X`, `yarn` commands use the configuration information from the ~/.npmrc file.

To configure `Yarn 1.X` with the login command

1. If you haven't done so already, configure your AWS credentials for use with the AWS CLI, as described in Getting started with CodeArtifact (p. 7).
2. To run the `aws codeartifact login` command successfully, npm must be installed. See Downloading and installing Node.js and npm in the *npm documentation* for installation instructions.
3. Use the `aws codeartifact login` command to fetch CodeArtifact credentials and configure your ~/.npmrc file.

   - Replace *`my_domain`* with your CodeArtifact domain name.
   - Replace *`111122223333`* with the AWS account ID of the owner of the domain. If you are accessing a repository in a domain that you own, you don't need to include `--domain-owner`. For more information, see Cross-account domains (p. 73).
   - Replace *`my_repo`* with your CodeArtifact repository name.

   ```
   aws codeartifact login --tool npm --domain my_domain --domain-owner 111122223333 --
   repository my_repo
   ```

   The `login` command makes the following changes to your ~/.npmrc file:

- Adds an authorization token after fetching it from CodeArtifact using your AWS credentials.
- Sets the npm registry to the repository specified by the `--repository` option.
- **For npm 6 and lower:** Adds `"always-auth=true"` so the authorization token is sent for every npm command.

  The default authorization period after calling `login` is 12 hours, and `login` must be called to refresh the token periodically. For more information about the authorization token created with the `login` command, see Tokens created with the `login` command (p. 156).

4. **For npm 7.X** only, you must add `always-auth=true` to your ~/.npmrc file to use Yarn.

   - Open your ~/.npmrc file in a text editor and add `always-auth=true` on a new line.

You can use the `yarn config list` command to check that Yarn is using the correct configuration. After running the command, check the values in the `info npm config` section. The contents should look similar to the following snippet.

```
info npm config
{
  registry: 'https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/
my_repo/',
  '//my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/
my_repo/:_authToken': 'eyJ2ZXI...',
  'always-auth': true
}
```

Configure Yarn 2.X with the `yarn config set` command

The following procedure details how to configure `Yarn 2.X` by updating your `.yarnrc.yml` configuration from the command line with the `yarn config set` command.

To update the `yarnrc.yml` configuration from the command line

1. If you haven't done so already, configure your AWS credentials for use with the AWS CLI, as described in Getting started with CodeArtifact (p. 7).
2. Use the `aws codeartifact get-repository-endpoint` command to get your CodeArtifact repository's endpoint.

   - Replace *`my_domain`* with your CodeArtifact domain name.
   - Replace *`111122223333`* with the AWS account ID of the owner of the domain. If you are accessing a repository in a domain that you own, you don't need to include `--domain-owner`. For more information, see Cross-account domains (p. 73).
   - Replace *`my_repo`* with your CodeArtifact repository name.

   ```
   aws codeartifact get-repository-endpoint --domain my_domain --domain-owner 111122223333
    --repository my_repo --format npm
   ```
3. Update the `npmRegistryServer` value in your .yarnrc.yml file with your repository endpoint.

   ```
   yarn config set npmRegistryServer
    "https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/npm/my_repo/"
   ```

4. Fetch a CodeArtifact authorization token and store it in an environment variable.

   Note
   The following command is for macOS or Linux machines. For information on configuring environment variables on a Windows machine, see Pass an auth token using an environment variable (p. 158).

   - Replace *my_domain* with your CodeArtifact domain name.
   - Replace *111122223333* with the AWS account ID of the owner of the domain. If you are accessing a repository in a domain that you own, you don't need to include `--domain-owner`. For more information, see Cross-account domains (p. 73).
   - Replace *my_repo* with your CodeArtifact repository name.

   ```
   CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --domain my_domain --
   domain-owner 111122223333 --query authorizationToken --output text`
   ```

5. Use the `yarn config set` command to add your CodeArtifact authentication token to your .yarnrc.yml file. Replace the URL in the following command with your repository endpoint URL from Step 2.

   ```
   yarn config set
    'npmRegistries["https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
   npm/my_repo/"].npmAuthToken' "${CODEARTIFACT_TOKEN}"
   ```

6. Use the `yarn config set` command to set the value of `npmAlwaysAuth` to `true`. Replace the URL in the following command with your repository endpoint URL from Step 2.

   ```
   yarn config set
    'npmRegistries["https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
   npm/my_repo/"].npmAlwaysAuth' "true"
   ```

After configuring, your .yarnrc.yml configuration file should have contents similar to the following snippet.

```
npmRegistries:
  "https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/npm/my_repo/":
    npmAlwaysAuth: true
    npmAuthToken: eyJ2ZXI...

npmRegistryServer: "https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/
npm/my_repo/"
```

You can also use the `yarn config` command to check the values of `npmRegistries` and `npmRegistryServer`.

npm command support

The following sections summarize the npm commands that are supported, by CodeArtifact repositories, in addition to specific commands that are not supported.

Contents

Supported commands that interact with a repository

This section lists npm commands where the npm client makes one or more requests to the registry it's been configured with (for example, with `npm config set registry`). These commands have been verified to function correctly when invoked against a CodeArtifact repository.

Command	Description
bugs	Tries to guess the location of a package’s bug tracker URL, and then tries to open it.
ci	Installs a project with a clean slate.
deprecate	Deprecates a version of a package.
dist-tag	Modifies package distribution tags.
docs	Tries to guess the location of a package’s documentation URL, and then tries to open it using the `--browser` config parameter.
doctor	Runs a set of checks to ensure that your npm installation has what it needs to manage your JavaScript packages.
install	Installs a package.
install-ci-test	Installs a project with a clean slate and runs tests. Alias: `npm cit`. This command runs an `npm ci` followed immediately by an `npm test`.
install-test	Installs package and runs tests. Runs an `npm install` followed immediately by an `npm test`.
outdated	Checks the configured registry to see if any installed packages are currently outdated.
ping	Pings the configured or given npm registry and verifies authentication.
publish	Publishes a package version to the registry.
update	Guesses the location of a package’s repository URL, and then tries to open it using the `--browser` config parameter.
view	Displays package metadata. Can be used to print metadata properties.

Supported client-side commands

These commands don't require any direct interaction with a repository, so CodeArtifact does not need to do anything to support them.

Command	Description
bin	Displays the npm `bin` folder.

Command	Description
build	Builds a package.
cache	Manipulates the packages cache.
completion	Enables tab completion in all npm commands.
config	Updates the contents of the user and global `npmrc` files.
dedupe	Searches the local package tree and attempts to simplify the structure by moving dependencies further up the tree, where they can be more effectively shared by multiple dependent packages.
edit	Edits an installed package. Selects a dependency in the current working directory and opens the package folder in the default editor.
explore	Browses an installed package. Spawns a subshell in the directory of the installed package specified. If a command is specified, then it is run in the subshell, which then immediately terminates.
help	Gets help on npm.
help-search	Searches npm help documentation.
init	Creates a `package.json` file.
link	Symlinks a package folder.
ls	Lists installed packages.
pack	Creates a tarball from a package.
prefix	Displays prefix. This is the closest parent directory to contain a `package.json` file unless `-g` is also specified.
prune	Removes packages that are not listed on the parent package's dependencies list.
rebuild	Runs the `npm build` command on the matched folders.
restart	Runs a package's stop, restart, and start scripts and associated pre- and post- scripts.
root	Prints the effective `node_modules` folder to standard out.
run-script	Runs arbitrary package scripts.
shrinkwrap	Locks down dependency versions for publication.
uninstall	Uninstalls a package.

Unsupported commands

These npm commands are not supported by CodeArtifact repositories.

Command	Description	Notes
access	Sets the access level on published packages.	CodeArtifact uses a permission model that is different from the public npmjs repository.
adduser	Adds a registry user account	CodeArtifact uses a user model that is different from the public npmjs repository.
audit	Runs a security audit.	CodeArtifact does not currently vend security vulnerability data.
hook	Manages npm hooks, including adding, removing, listing, and updating.	CodeArtifact does not currently support any kind of change notification mechanism.
login	Authenticates a user. This is an alias for `npm adduser`.	CodeArtifact uses an authentication model that is different from the public npmjs repository. For information, see Authentication with npm (p. 84).
logout	Signs out of the registry.	CodeArtifact uses an authentication model that is different from the public npmjs repository. There is no way to sign out from a CodeArtifact repository, but authentication tokens expire after their configurable expiration time. The default token duration is 12 hours.
owner	Manages package owners.	CodeArtifact uses a permissions model that is different from the public npmjs repository.
profile	Changes settings on your registry profile.	CodeArtifact uses a user model that is different from the public npmjs repository.
search	Searches the registry for packages matching the search terms.	CodeArtifact supports limited search functionality with the list-packages (p. 49) command.
star	Marks your favorite packages.	CodeArtifact currently does not support any kind of favorites mechanism.
stars	Views packages marked as favorites.	CodeArtifact currently does not support any kind of favorites mechanism.

Command	Description	Notes
team	Manages organization teams and team memberships.	CodeArtifact uses a user and group membership model that is different from the public npmjs repository. For information, see Identities (Users, Groups, and Roles) in the *IAM User Guide*.
token	Manages your authentication tokens.	CodeArtifact uses a different model for getting authentication tokens. For information, see Authentication with npm (p. 84).
unpublish	Removes a package from the registry.	CodeArtifact does not support removing a package version from a repository using the npm client. You can use the delete-package-version (p. 62) command.
whoami	Displays the npm user name.	CodeArtifact uses a user model that is different from the public npmjs repository.

npm tag handling

npm registries support *tags*, which are string aliases for package versions. You can use tags to provide an alias instead of version numbers. For example, you might have a project with multiple streams of development and use a different tag (for example, `stable`, `beta`, `dev`, `canary`) for each stream. For more information, see dist-tag on the npm website.

By default, npm uses the `latest` tag to identify the current version of a package. `npm install` *`pkg`* (without `@`*`version`* or `@`*`tag`* specifier) installs the latest tag. Typically, projects use the latest tag for stable release versions only. Other tags are used for unstable or prerelease versions.

Edit tags with the npm client

The three `npm dist-tag` commands (`add`, `rm`, and `ls`) function identically in CodeArtifact repositories as they do in the default npm registry.

npm tags and the CopyPackageVersions API

When you use the `CopyPackageVersions` API to copy an npm package version, all tags aliasing that version are copied to the destination repository. When a version that is being copied has a tag that is also present in the destination, the copy operation sets the tag value in the destination repository to match the value in the source repository.

For example, say both repository S and repository D contain a single version of the `web-helper` package with the latest tag set as shown in this table.

Repository	Package name	Package tags
S	`web-helper`	*latest* (alias for version 1.0.1)

Repository	Package name	Package tags
D	`web-helper`	*latest* (alias for version 1.0.0)

`CopyPackageVersions` is invoked to copy `web-helper` 1.0.1 from S to D. After the operation is complete, the `latest` tag on `web-helper` in repository D aliases 1.0.1, not 1.0.0.

If you need to change tags after copying, use the `npm dist-tag` command to modify tags directly in the destination repository. For more information about the `CopyPackageVersions` API, see Copying Packages Between Repositories (p. 58).

npm tags and upstream repositories

When npm requests the tags for a package and versions of that package are also present in an upstream repository, CodeArtifact merges the tags before returning them to the client. For example, a repository named R has an upstream repository named U. The following table shows the tags for a package named `web-helper` that's present in both repositories.

Repository	Package name	Package tags
R	`web-helper`	*latest* (alias for version 1.0.0)
U	`web-helper`	*alpha* (alias for version 1.0.1)

In this case, when the npm client fetches the tags for the `web-helper` package from repository R, it receives both the *latest* and *alpha* tags. The versions the tags point to won't change.

When the same tag is present on the same package in both the upstream and downstream repository, CodeArtifact uses the tag that is present in the *upstream* repository. For example, suppose that the tags on *webhelper* have been modified to look like the following.

Repository	Package name	Package tags
R	`web-helper`	*latest* (alias for version 1.0.0)
U	`web-helper`	*latest* (alias for version 1.0.1)

In this case, when the npm client fetches the tags for package *web-helper* from repository R, the *latest* tag will alias the version *1.0.1* because that's what's in the upstream repository. This makes it easy to consume new package versions in an upstream repository that are not yet present in a downstream repository by running `npm update`.

Using the tag in the upstream repository can be problematic when publishing new versions of a package in a downstream repository. For example, say that the latest tag on the package *web-helper* is the same in both R and U.

Repository	Package name	Package tags
R	`web-helper`	*latest* (alias for version 1.0.1)
U	`web-helper`	*latest* (alias for version 1.0.1)

When version 1.0.2 is published to R, npm updates the *latest* tag to 1.0.2.

Repository	Package name	Package tags
R	`web-helper`	*latest* (alias for version 1.0.2)
U	`web-helper`	*latest* (alias for version 1.0.1)

However, the npm client never sees this tag value because the value of *latest* in U is 1.0.1. Running `npm install` against repository R immediately after publishing 1.0.2 installs 1.0.1 instead of the version that was just published. To install the most recently published version, you must specify the exact package version, as follows.

```
npm install web-helper@1.0.2
```

Support for npm-compatible package managers

These other package managers are compatible with CodeArtifact and work with the npm package format and npm wire protocol:

- pnpm package manager. The latest version confirmed to work with CodeArtifact is 3.3.4, which was released on May 18, 2019.
- Yarn package manager. The latest version confirmed to work with CodeArtifact is 1.21.1, which was released on December 11, 2019.

Using CodeArtifact with Python

These topics describe how to use `pip`, the Python package manager, and `twine`, the Python package publishing utility, with CodeArtifact.

Topics

Configure clients with the login command

After you create a repository, you can use the `pip` client to install packages and the `twine` client to publish packages.

First, configure your AWS credentials for use with the AWS CLI, as described in Getting started with CodeArtifact (p. 7). Then, use the CodeArtifact `login` command to fetch credentials for use with `pip` or `twine`.

> **Note**
> If you are accessing a repository in a domain that you own, you don't need to include `--domain-owner`. For more information, see Cross-account domains (p. 73).

To configure pip, run the following command.

```
aws codeartifact login --tool pip --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

To configure twine, run the following command.

```
aws codeartifact login --tool twine --domain my_domain --domain-owner 111122223333 --
repository my_repo
```

`login` fetches an authorization token from CodeArtifact using your AWS credentials.

Depending on the value of the `--tool` option, the login command will:

- Configure `pip` for use with CodeArtifact by editing `~/.config/pip/pip.conf` to set the `index-url` to the repository specified by the `--repository` option.
- Configure `twine` for use with CodeArtifact by editing `~/.pypirc` to create an `index-server` section for the repository specified by the `--repository` option.

The default authorization period after calling `login` is 12 hours, and `login` must be called to periodically refresh the token. For more information about the authorization token created with the `login` command, see Tokens created with the `login` command (p. 156).

Configure pip without the login command

If you cannot use the `login` command to configure `pip`, you can use `pip config`.

1. Use the AWS CLI to fetch a new authorization token.

   Note
   If you are accessing a repository in a domain that you own, you do not need to include the `--domain-owner`. For more information, see Cross-account domains (p. 73).

```
CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --domain my_domain --
domain-owner 111122223333 --query authorizationToken --output text`
```

2. Use `pip config` to set the CodeArtifact registry URL and credentials.

```
pip config set global.index-url https://aws:
$CODEARTIFACT_AUTH_TOKEN@my_domain-111122223333.d.codeartifact.region.amazonaws.com/
pypi/my_repo/simple/
```

Important
The registry URL must end with a forward slash (/). Otherwise, you cannot connect to the repository.

Example pip configuration file

The following is an example of a `pip.conf` file after setting the CodeArtifact registry URL and credentials.

```
[global]
index-url = https://aws:eyJ2ZX...@my_domain-111122223333.d.codeartifact.us-
west-2.amazonaws.com/pypi/my_repo/simple/
```

Configure twine without the login command

If you cannot use the `login` command to configure `twine`, you can use the `~/.pypirc` file or environment variables. To use the `~/.pypirc` file, add the following entries to it. The password must be an auth token acquired by the `get-authorization-token` API.

```
[distutils]
index-servers =
 codeartifact
[codeartifact]
repository = https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/
pypi/my_repo/
password = auth-token
username = aws
```

To use environment variables, do the following.

Note
If you are accessing a repository in a domain that you own, you do not need to include the `--domain-owner`. For more information, see Cross-account domains (p. 73).

```
export TWINE_USERNAME=aws
export TWINE_PASSWORD=`aws codeartifact get-authorization-token --domain my_domain --
domain-owner 111122223333 --query authorizationToken --output text`
export TWINE_REPOSITORY_URL=`aws codeartifact get-repository-endpoint --domain my_domain --
domain-owner 111122223333 --repository my_repo --format pypi --query repositoryEndpoint --
output text`
```

Run pip

To run `pip` commands, you must configure `pip` with CodeArtifact. For more information, see Configure clients with the login command (p. 96).

Assuming that a package is present in your repository or one of its upstream repositories, you can install it with `pip install`. For example, use the following command to install the `requests` package.

```
pip install requests
```

Use the `-i` option to temporarily revert to installing packages from https://pypi.org instead of your CodeArtifact repository.

```
pip install -i https://pypi.org/simple requests
```

Run twine

Before using `twine` to publish Python package assets, you must first configure CodeArtifact permissions and resources.

1. Follow the steps in the Setting up with AWS CodeArtifact (p. 4) section to configure your AWS account, tools, and permissions.
2. Configure `twine` by following the steps in Configure clients with the login command (p. 96).

After you configure `twine`, you can run `twine` commands. Use the following command to publish Python package assets.

```
twine upload --repository codeartifact mypackage-1.0.tgz
```

For information about how to build and package your Python application, see Generating Distribution Archives on the Python Packaging Authority website.

Python compatibility

CodeArtifact supports PyPI's `Legacy` APIs, except the `simple` API. CodeArtifact does not support PyPI's `XML-RPC` or `JSON` APIs.

For more information, see the following on the Python Packaging Authority's GitHub repository.

- Legacy API
- XML-RPC API
- JSON API

pip command support

The following sections summarize the pip commands that are supported, by CodeArtifact repositories, in addition to specific commands that are not supported.

Topics

Supported commands that interact with a repository

This section lists `pip` commands where the `pip` client makes one or more requests to the registry it's been configured with. These commands have been verified to function correctly when invoked against a CodeArtifact repository.

Command	Description
install	Install packages.
download	Download packages.

CodeArtifact does not implement `pip search`. If you have configured `pip` with a CodeArtifact repository, running `pip search` will search and show packages from PyPI.

Supported client-side commands

These commands don't require any direct interaction with a repository, so CodeArtifact does not need to do anything to support them.

Command	Description
uninstall	Uninstall packages.
freeze	Output installed packages in requirements format.
list	List installed packages.
show	Show information about installed packages.
check	Verify installed packages have compatible dependencies.
config	Manage local and global configuration.
wheel	Build wheels from your requirements.
hash	Compute hashes of package archives.
completion	Helps with command completion.
debug	Show information useful for debugging.
help	Show help for commands.

Using CodeArtifact with Maven

The Maven repository format is used by many different languages, including Java, Kotlin, Scala, and Clojure. It's supported by many different build tools, including Maven, Gradle, Scala SBT, Apache Ivy, and Leiningen.

We have tested and confirmed compatibility with CodeArtifact for the following versions:

- Latest **Maven** version: 3.6.3.
- Latest **Gradle** version: 6.4.1. 5.5.1 has also been tested.

Topics

Use CodeArtifact with Gradle

After you have the CodeArtifact auth token in an environment variable as described in Pass an auth token using an environment variable (p. 158), follow these instructions to consume Maven packages from, and publish new packages to, a CodeArtifact repository.

Topics

Fetch dependencies

To fetch dependencies from CodeArtifact in a Gradle build, add a `maven` section to the `repositories` section in the project `build.gradle` file.

```
maven {
         url 'https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
maven/my_repo/'
         credentials {
             username "aws"
             password System.env.CODEARTIFACT_AUTH_TOKEN
         }
}
```

The `url` in the sample above is your CodeArtifact repository's endpoint. Gradle uses the endpoint to connect to your repository. In the sample, `my_domain` is the name of your domain, `111122223333` is the ID of the owner of the domain, and `my_repo` is the name of your repository. You can retrieve a repository's endpoint by using the `get-repository-endpoint` AWS CLI command.

For example, with a repository named *my_repo* inside a domain named *my_domain*, the command is as follows:

```
aws codeartifact get-repository-endpoint --domain my_domain --domain-owner 111122223333 --
repository my_repo --format maven
```

The `get-repository-endpoint` command will return the repository endpoint:

```
url 'https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/maven/my_repo/'
```

To use the CodeArtifact repository as the only source for your project dependencies, remove any other sections in `repositories` from `build.gradle`. If you have more than one repository, Gradle searches each repository for dependencies in the order they are listed.

After you configure the repository, you can add project dependencies to the `dependencies` section with standard Gradle syntax.

```
dependencies {
    implementation 'com.google.guava:guava:27.1-jre'
    implementation 'commons-cli:commons-cli:1.4'
    testImplementation 'org.testng:testng:6.14.3'
}
```

Fetch plugins

By default Gradle will resolve plugins from the public Gradle Plugin Portal. To pull plugins from a CodeArtifact repository, add a `pluginManagement` block to your `settings.gradle` file. The `pluginManagement` block must appear before any other statements in `settings.gradle`:

```
pluginManagement {
    repositories {
        maven {
            name 'my_repo'
            url 'https://my_domain-111122223333.codeartifact.region.amazonaws.com/
maven/my_repo/'
            credentials {
                username 'aws'
                password System.env.CODEARTIFACT_AUTH_TOKEN
            }
        }
    }
}
```

This will ensure that Gradle resolves plugins from the specified repository. The repository must have an upstream repository with an external connection to the Gradle Plugin Portal (e.g. `gradle-plugins-store`) so that commonly-required Gradle plugins are available to the build. For more information, see the Gradle documentation.

Publish artifacts

This section describes how to publish a Java library built with Gradle to a CodeArtifact repository.

First, add the `maven-publish` plugin to the `plugins` section of the project's `build.gradle` file.

```
plugins {
    id 'java-library'
    id 'maven-publish'
}
```

Next, add a `publishing` section to the project `build.gradle` file.

```
publishing {
    publications {
        mavenJava(MavenPublication) {
            groupId = 'group-id'
            artifactId = 'artifact-id'
            version = 'version'
            from components.java
        }
    }
    repositories {
        maven {
            url 'https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
maven/my_repo/'
            credentials {
                username "aws"
                password System.env.CODEARTIFACT_AUTH_TOKEN
            }
        }
    }
}
```

The `maven-publish` plugin generates a POM file based on the `groupId`, `artifactId`, and `version` specified in the `publishing` section.

After these changes to `build.gradle` are complete, run the following command to build the project and upload it to the repository.

```
./gradlew publish
```

Use `list-package-versions` to check that the package was successfully published.

```
aws codeartifact list-package-versions --domain my_domain --domain-owner 111122223333 --
repository my_repo --format maven\
  --namespace com.company.framework --package my-package-name
```

Sample output:

```
{
    "format": "maven",
    "namespace": "com.company.framework",
    "package": "example",
    "versions": [
        {
            "version": "1.0",
            "revision": "REVISION-SAMPLE-1-C7F4S5E9B772FC",
            "status": "Published"
        }
    ]
}
```

For more information, see these topics on the Gradle website:

- Building Java Libraries
- Publishing a project as a module

Run a Gradle build in IntelliJ IDEA

You can run a Gradle build in IntelliJ IDEA that pulls dependencies from CodeArtifact. To authenticate with CodeArtifact, you must provide Gradle with a CodeArtifact authorization token. There are three methods to provide an auth token.

- Method 1: Storing the auth token in `gradle.properties`. Use this method if you are able to overwrite or add to the contents of the `gradle.properties` file.
- Method 2: Storing the auth token in a separate file. Use this method if you do not want to modify your `gradle.properties` file.
- Method 3: Generating a new auth token for each run by running `aws` as an inline script in `build.gradle`. Use this method if you want the Gradle script to fetch a new token on each run. The token won't be stored on the file system.

Token stored in gradle.properties

Method 1: Storing the auth token in `gradle.properties`

Note
The example shows the `gradle.properties` file located in `GRADLE_USER_HOME`.

1. Update your `build.gradle` file with the following snippet:

```
repositories {
    maven {
             url
 'https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
maven/my_repo/'
             credentials {
                 username "aws"
                 password "$codeartifactToken"
             }
    }
}
```

2. To fetch plugins from CodeArtifact, add a `pluginManagement` block to your `settings.gradle` file. The `pluginManagement` block must appear before any other statements in `settings.gradle`.

```
pluginManagement {
    repositories {
        maven {
            name 'my_repo'
            url 'https://my_domain-111122223333.codeartifact.region.amazonaws.com/
maven/my_repo/'
            credentials {
                username 'aws'
                password "$codeartifactToken"
            }
        }
    }
}
```

3. Fetch a CodeArtifact auth token:

```
export CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --
domain my_domain --domain-owner 111122223333 --query authorizationToken --output
 text --profile profile-name`
```

4. Write the auth token into the `gradle.properties` file:

   ```
   echo "codeartifactToken=$CODEARTIFACT_AUTH_TOKEN" > ~/.gradle/gradle.properties
   ```

Token stored in separate file

Method 2: Storing the auth token in a separate file

1. Update your `build.gradle` file with the following snippet:

   ```
   def props = new Properties()
   file("file").withInputStream { props.load(it) }

   repositories {

       maven {
                url
    'https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
   maven/my_repo/'
                credentials {
                    username "aws"
                    password props.getProperty("codeartifactToken")
                }
       }
   }
   ```

2. To fetch plugins from CodeArtifact, add a `pluginManagement` block to your `settings.gradle` file. The `pluginManagement` block must appear before any other statements in `settings.gradle`.

   ```
   pluginManagement {
       def props = new Properties()
       file("file").withInputStream { props.load(it) }
       repositories {
           maven {
               name 'my_repo'
               url 'https://my_domain-111122223333.codeartifact.region.amazonaws.com/
   maven/my_repo/'
               credentials {
                   username 'aws'
                   password props.getProperty("codeartifactToken")
               }
           }
       }
   }
   ```

3. Fetch a CodeArtifact auth token:

   ```
   export CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --
   domain my_domain --domain-owner 111122223333 --query authorizationToken --output
    text --profile profile-name`
   ```

4. Write the auth token into the file that was specified in your `build.gradle` file:

   ```
   echo "codeartifactToken=$CODEARTIFACT_AUTH_TOKEN" > file
   ```

Token generated for each run in build.gradle

Method 3: Generating a new auth token for each run by running `aws` as an inline script in `build.gradle`

1. Update your `build.gradle` file with the following snippet:

```
def codeartifactToken = "aws codeartifact get-authorization-token --
domain my_domain --domain-owner 111122223333 --query authorizationToken --output
 text --profile profile-name".execute().text
    repositories {
        maven {
            url
 'https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
maven/my_repo/'
            credentials {
                username "aws"
                password codeartifactToken
            }
        }
    }
```

2. To fetch plugins from CodeArtifact, add a `pluginManagement` block to your `settings.gradle` file. The `pluginManagement` block must appear before any other statements in `settings.gradle`.

```
pluginManagement {
    def codeartifactToken = "aws codeartifact get-authorization-token --
domain my_domain --domain-owner 111122223333 --query authorizationToken --output
 text --profile profile-name".execute().text
    repositories {
        maven {
            name 'my_repo'
            url 'https://my_domain-111122223333.codeartifact.region.amazonaws.com/
maven/my_repo/'
            credentials {
                username 'aws'
                password codeartifactToken
            }
        }
    }
}
```

Use CodeArtifact with mvn

You use the `mvn` command to execute Maven builds. This section shows how to configure `mvn` to use a CodeArtifact repository.

After you have the CodeArtifact auth token in an environment variable as described in Passing an Auth Token Using an Environment Variable (p. 158), follow these instructions to consume Maven packages from, and publish new packages to, a CodeArtifact repository.

Topics

Fetch dependencies

To configure `mvn` to fetch dependencies from a CodeArtifact repository, you must edit the Maven configuration file, `settings.xml`, and optionally, your project's POM.

1. In `settings.xml` (typically found at `~/.m2/settings.xml`), add a `<servers>` section with a reference to the `CODEARTIFACT_AUTH_TOKEN` environment variable so that Maven passes the token in HTTP requests.

```
<settings>
...
    <servers>
        <server>
            <id>codeartifact</id>
            <username>aws</username>
            <password>${env.CODEARTIFACT_AUTH_TOKEN}</password>
        </server>
    </servers>
...
</settings>
```

2. Add the URL endpoint for your CodeArtifact repository in a `<repository>` element. You can do this in `settings.xml` or your project's POM file.

   You can retrieve your repository's endpoint by using the `get-repository-endpoint` AWS CLI command.

   For example, with a repository named *`my_repo`* inside a domain named *`my_domain`*, the command is as follows:

```
aws codeartifact get-repository-endpoint --domain my_domain --repository my_repo --
format maven
```

   The `get-repository-endpoint` command will return the repository endpoint:

```
url 'https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/
maven/my_repo/'
```

   Add the repository endpoint to `settings.xml` as follows.

```
<settings>
...
    <profiles>
        <profile>
            <id>default</id>
            <repositories>
                <repository>
                    <id>codeartifact</id>
                    <url>https://my_domain-111122223333.d.codeartifact.us-
west-2.amazonaws.com/maven/my_repo/</url>
                </repository>
            </repositories>
        </profile>
    </profiles>
    <activeProfiles>
        <activeProfile>default</activeProfile>
    </activeProfiles>
    ...
</settings>
```

Or, you can add the `<repositories>` section to a project POM file to use CodeArtifact for that project only.

```
<project>
...
    <repositories>
        <repository>
            <id>codeartifact</id>
            <name>codeartifact</name>
            <url>https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/
maven/my_repo/</url>
        </repository>
    </repositories>
...
</project>
```

Important
You can use any value in the `<id>` element, but it must be the same in both the `<server>` and `<repository>` elements. This enables the specified credentials to be included in requests to CodeArtifact.

After you make these configuration changes, you can build the project.

```
mvn compile
```

Maven logs the full URL of all the dependencies it downloads to the console.

```
[INFO] ------------------< com.example.example:myapp >-------------------
[INFO] Building myapp 1.0
[INFO] --------------------------------[ jar ]---------------------------------
Downloading from codeartifact: https://<domain>.d.codeartifact.us-west-2.amazonaws.com/
maven/myrepo/commons-cli/commons-cli/1.4/commons-cli-1.4.pom
Downloaded from codeartifact: https://<domain>.d.codeartifact.us-west-2.amazonaws.com/
maven/myrepo/commons-cli/commons-cli/1.4/commons-cli-1.4.pom (11 kB at 3.9 kB/s)
Downloading from codeartifact: https://<domain>.d.codeartifact.us-west-2.amazonaws.com/
maven/myrepo/org/apache/commons/commons-parent/42/commons-parent-42.pom
Downloading from codeartifact: https://<domain>.d.codeartifact.us-west-2.amazonaws.com/
maven/myrepo/org/apache/commons/commons-parent/42/commons-parent-42.pom
Downloaded from codeartifact: https://<domain>.d.codeartifact.us-west-2.amazonaws.com/
maven/myrepo/org/apache/commons/commons-parent/42/commons-parent-42.pom (68 kB at 123 kB/s)
Downloading from codeartifact: https://<domain>.d.codeartifact.us-west-2.amazonaws.com/
maven/myrepo/commons-cli/commons-cli/1.4/commons-cli-1.4.jar
Downloaded from codeartifact: https://<domain>.d.codeartifact.us-west-2.amazonaws.com/
maven/myrepo/commons-cli/commons-cli/1.4/commons-cli-1.4.jar (54 kB at 134 kB/s)
```

Publish artifacts

To publish a Maven artifact with `mvn` to a CodeArtifact repository, you must also edit `~/.m2/settings.xml` and the project POM.

1. Add a `<servers>` section to `settings.xml` with a reference to the `CODEARTIFACT_AUTH_TOKEN` environment variable so that Maven passes the token in HTTP requests.

```
<settings>
...
    <servers>
        <server>
```

```
            <id>codeartifact</id>
            <username>aws</username>
            <password>${env.CODEARTIFACT_AUTH_TOKEN}</password>
        </server>
    </servers>
...
</settings>
```

2. Add a `<distributionManagement>` section to your project's `pom.xml`.

```
<project>
...
     <distributionManagement>
         <repository>
             <id>codeartifact</id>
             <name>codeartifact</name>
             <url>https://my_domain-111122223333.d.codeartifact.us-
west-2.amazonaws.com/maven/my_repo/</url>
         </repository>
     </distributionManagement>
...
</project>
```

After you make these configuration changes, you can build the project and publish it to the specified repository.

```
mvn deploy
```

Use `list-package-versions` to check that the package was successfully published.

```
aws codeartifact list-package-versions --domain my_domain --domain-owner 111122223333 --
repository my_repo --format maven \
  --namespace com.company.framework --package my-package-name
```

Sample output:

```
{
    "defaultDisplayVersion": null,
    "format": "maven",
    "namespace": "com.company.framework",
    "package": "my-package-name",
    "versions": [
        {
            "version": "1.0",
            "revision": "REVISION-SAMPLE-1-C7F4S5E9B772FC",
            "status": "Published"
        }
    ]
}
```

Publish third-party artifacts

You can publish third-party Maven artifacts to a CodeArtifact repository with `mvn deploy:deploy-file`. This can be helpful to users that want to publish artifacts and only have JAR files and don't have access to package source code or POM files.

The `mvn deploy:deploy-file` command will generate a POM file based on the information passed in the command line.

Publish third-party Maven artifacts

1. Create a `~/.m2/settings.xml` file with the following contents:

```
<settings>
    <servers>
        <server>
            <id>codeartifact</id>
            <username>aws</username>
            <password>${env.CODEARTIFACT_AUTH_TOKEN}</password>
        </server>
    </servers>
</settings>
```

2. Fetch a CodeArtifact authorization token:

```
export CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --
domain my_domain --domain-owner 111122223333 --query authorizationToken --output text
 --profile profile-name
```

3. Run the `mvn deploy:deploy-file` command:

```
mvn deploy:deploy-file -DgroupId=commons-cli          \
-DartifactId=commons-cli       \
-Dversion=1.4                  \
-Dfile=./commons-cli-1.4.jar   \
-Dpackaging=jar                \
-DrepositoryId=codeartifact    \
-Durl=https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/maven/repo-
name/
```

Note
The example above publishes `commons-cli 1.4`. Modify the groupId, artifactID, version, and file arguments to publish a different JAR.

These instructions are based on examples in the Guide to deploying 3rd party JARs to remote repository from the *Apache Maven documentation*.

For more information, see these topics on the Apache Maven Project website:

- Setting up Multiple Repositories
- Settings Reference
- Distribution Management
- Profiles

Publishing with curl

This section shows how to use the HTTP client `curl` to publish Maven artifacts to a CodeArtifact repository. Publishing artifacts with `curl` can be useful if you do not have or want to install the Maven client in your environments.

Publish a Maven artifact with `curl`

1. Fetch a CodeArtifact authorization token by following the steps in Pass an auth token using an environment variable (p. 158) and return to these steps.
2. Use the following `curl` command to publish the JAR to a CodeArtifact repository:

```
curl --request PUT https://my_domain-111122223333.d.codeartifact.us-
west-2.amazonaws.com/maven/my_repo/com/mycompany/app/my-app/1.0/my-app-1.0.jar \
     --user "aws:$CODEARTIFACT_AUTH_TOKEN" --header "Content-Type: application/octet-
stream" \
     --data-binary @target/my-app-1.0.jar
```

   In the sample above, `my_domain` is the name of your domain, `111122223333` is the ID of AWS account that owns the domain, and `my_repo` is the name of your repository.
3. Use the following `curl` command to publish the POM to a CodeArtifact repository:

```
curl --request PUT https://my_domain-111122223333.d.codeartifact.us-
west-2.amazonaws.com/maven/my_repo/com/mycompany/app/my-app/1.0/my-app-1.0.pom \
     --user "aws:$CODEARTIFACT_AUTH_TOKEN" --header "Content-Type: application/octet-
stream" \
     --data-binary @target/my-app-1.0.pom
```

4. At this point, the Maven artifact will be in your CodeArtifact repository with a status of `Unfinished`. To be able to consume the package, it must be in the `Published` state. You can move the package from `Unfinished` to `Published` by either uploading a `maven-metadata.xml` file to your package, or calling the UpdatePackageVersionsStatus API to change the status.

   a. Option 1: Use the following `curl` command to add a `maven-metadata.xml` file to your package:

```
curl --request PUT
 https://my_domain-111122223333.d.codeartifact.region.amazonaws.com/
maven/my_repo/com/mycompany/app/my-app/maven-metadata.xml \
     --user "aws:$CODEARTIFACT_AUTH_TOKEN" --header "Content-Type: application/
octet-stream" \
     --data-binary @target/maven-metadata.xml
```

   The following is an example of the contents of a `maven-metadata.xml` file:

```
<metadata modelVersion="1.1.0">
    <groupId>com.mycompany.app</groupId>
    <artifactId>my-app</artifactId>
    <versioning>
        <latest>1.0</latest>
        <release>1.0</release>
        <versions>
            <version>1.0</version>
        </versions>
        <lastUpdated>20200731090423</lastUpdated>
    </versioning>
</metadata>
```

   b. Option 2: Update the package status to `Published` with the `UpdatePackageVersionsStatus` API.

```
aws codeartifact update-package-versions-status \
    --domain my_domain \
    --domain-owner 111122223333 \
    --repository my_repo \
    --format maven \
    --namespace com.mycompany.app \
    --package my-app \
    --versions 1.0 \
    --target-status Published
```

If you only have an artifact's JAR file, you can publish a consumable package version to a CodeArtifact repository using `mvn`. This can be useful if you do not have access to the artifact's source code or POM. See Publish third-party artifacts (p. 108) for details.

Using Maven checksums

When a Maven artifact is published to an AWS CodeArtifact repository, the checksum associated with each *asset* or file in the package is used to validate the upload. Examples of assets are *jar*, *pom*, and *war* files. For each asset, the Maven artifact contains multiple checksum files that use the asset name with an additional extension, such as `md5` or `sha1`. For example, the checksum files for a file named `my-maven-package.jar` might be `my-maven-package.jar.md5` and `my-maven-package.jar.sh1`.

Note
Maven uses the term `artifact`. In this guide, a Maven package is the same as a Maven artifact. For more information, see AWS CodeArtifact package.

Every Maven artifact also contains a `maven-metadata.xml` file. This file must be uploaded for a publish to succeed. If a checksum mismatch is detected during the upload of any artifact file, the publish stops. This might prevent the `maven-metadata.xml` from being uploaded. When that happens, the status of the Maven artifact is set to `Unfinished`. You cannot download assets that are part of a package with this status.

Keep the following in mind in the event of a checksum mismatch when you publish a Maven package:

- If the checksum mismatch occurs before `maven-metadata.xml` is uploaded, the status of the package is not set to `Unfinished`. The package is not visible and its assets cannot be consumed. When this happens, try one of the following, and then try to download the asset again.
  - Run the command that publishes the Maven artifact again. This might work if a network issue corrupted the checksum file during download. If the network issue is resolved for the retry, the checksum matches and the download is successful.
  - If republishing the Maven artifact doesn't work, delete the package and then republish it. For more information, see DeletePackageVersions in the *AWS CodeArtifact API Reference*.
- If the checksum mismatch occurs after `maven-metadata.xml` is uploaded, the status of the package is set to `Published`. You can consume any asset from the package, including those with checksum mismatches. When you download an asset, the checksum generated by AWS CodeArtifact is downloaded with it. If the downloaded file is associated with a checksum mismatch, its downloaded checksum file might not match the checksum that was uploaded when the package was published.

Use Maven snapshots

A Maven *snapshot* is a special version of a Maven package that refers to the latest production branch code. It is a development version that precedes the final release version. You can identify a snapshot version of a Maven package by the suffix `SNAPSHOT` that is appended to the package version. For example, the snapshot of version `1.1` is `1.1-SNAPSHOT`. For more information, see What is a SNAPSHOT version? on the Apache Maven Project website.

AWS CodeArtifact supports publishing and consuming Maven snapshots. You can publish a Maven snapshot to an AWS CodeArtifact repository or, if you are directly connected, to an upstream repository. However, a snapshot version in both a repository and one of its upstream repositories is not supported. For example, if you upload a Maven package with version `1.2-SNAPSHOT` to your repository, CodeArtifact does not support uploading a Maven package with the same snapshot version to one of its upstream repositories. This scenario might return unpredictable results.

When a Maven snapshot is published, its previous version is preserved in a new version called a *build*. Each time a Maven snapshot is published, a new build version is created. All previous versions of a snapshot are maintained in its build versions. When a Maven snapshot is published, its status is set to `Published` and the status of the build that contains the previous version is set to `Unlisted`.

If you request a snapshot, the version with status `Published` is returned. This is always the most recent version of the Maven snapshot. You can also request a particular build of a snapshot. To see the build versions of a Maven snapshot, use ListPackageVersions and set the `status` parameter to `Unlisted`.

To delete all build versions of a Maven snapshot, use DeletePackageVersions and set the `expectedStatus` parameter to `Unlisted`.

Using CodeArtifact with NuGet

These topics describe how to consume and publish `NuGet` packages using CodeArtifact.

Note
AWS CodeArtifact only supports NuGet.exe version 4.8 and higher.

Topics

Use CodeArtifact with Visual Studio

You can consume packages from CodeArtifact directly in Visual Studio with the CodeArtifact Credential Provider. The credential provider simplifies the setup and authentication of your CodeArtifact repositories in Visual Studio and is available in the AWS Toolkit for Visual Studio.

Note
The AWS Toolkit for Visual Studio is not available for Visual Studio for Mac.

To configure and use NuGet with CLI tools, see Use CodeArtifact with the nuget or dotnet CLI (p. 114).

Topics

Configure Visual Studio with the CodeArtifact Credential Provider

The CodeArtifact Credential Provider simplifies the setup and continued authentication between CodeArtifact and Visual Studio. CodeArtifact authentication tokens are valid for a maximum of 12 hours. To avoid having to manually refresh the token while working in Visual Studio, the credential provider periodically fetches a new token before the current token expires.

Important
To use the credential provider, ensure that any existing AWS CodeArtifact credentials are cleared from your `nuget.config` file that may have been added manually or by running `aws codeartifact login` to configure NuGet previously.

Use CodeArtifact in Visual Studio with the AWS Toolkit for Visual Studio

1. Install the AWS Toolkit for Visual Studio using the following steps. The toolkit is compatible with Visual Studio 2017 and 2019 using these steps. AWS CodeArtifact does not support Visual Studio 2015 and earlier.

   1. The Toolkit for Visual Studio for Visual Studio 2017 and Visual Studio 2019 is distributed in the Visual Studio Marketplace. You can also install and update the toolkit within Visual Studio by using **Tools** ≫ **Extensions and Updates** (Visual Studio 2017) or **Extensions** ≫ **Manage Extensions** (Visual Studio 2019).
   2. After the toolkit has been installed, open it by choosing **AWS Explorer** from the **View** menu.
2. Configure the Toolkit for Visual Studio with your AWS credentials by following the steps in Providing AWS Credentials in the *AWS Toolkit for Visual Studio User Guide*.
3. (Optional) Set the AWS profile you want to use with CodeArtifact. If not set, CodeArtifact will use the default profile. To set the profile, go to **Tools > NuGet Package Manager > Select CodeArtifact AWS Profile**.
4. Add your CodeArtifact repository as a package source in Visual Studio.
   1. Navigate to your repository in the **AWS Explorer** window, right click and select `Copy NuGet Source Endpoint`.
   2. Use the **Tools > Options** command and scroll to **NuGet Package Manager**.
   3. Select the **Package Sources** node.
   4. Select **+**, edit the name, and paste the repository URL endpoint copied in Step 3a in the **Source** box, and select **Update**.
   5. Select the checkbox for your newly added package source to enable it.

      Note
      We recommend adding an external connection to **NuGet.org** to your CodeArtifact repository and disabling the **nuget.org** package source in Visual Studio. When using an external connection, all of the packages fetched from **NuGet.org** will be stored in your CodeArtifact repository. If **NuGet.org** becomes unavailable, your application dependencies will still be available for CI builds and local development. For more information about external connections, see Add an external connection (p. 26).
5. Restart Visual Studio for the changes to take effect.

After configuration, Visual Studio can consume packages from your CodeArtifact repository, any of its upstream repositories, or from NuGet.org if you have added an external connection. For more information about browsing and installing NuGet packages in Visual Studio, see Install and manage packages in Visual Studio using the NuGet Package Manager in the *NuGet documentation*.

Use the Visual Studio Package Manager console

The Visual Studio Package Manager console will not use the Visual Studio version of the CodeArtifact Credential Provider. To use it, you will have to configure the command-line credential provider. See Use CodeArtifact with the nuget or dotnet CLI (p. 114) for more information.

Use CodeArtifact with the nuget or dotnet CLI

You can use CLI tools like `nuget` and `dotnet` to publish and consume packages from CodeArtifact. This document provides information about configuring the CLI tools and using them to publish or consume packages.

Topics

- CodeArtifact Credential Provider reference (p. 119)

Configure the nuget or dotnet CLI

You can configure the nuget or dotnet CLI with a CodeArtifact Credential Provider, with the AWS CLI, or manually. Configuring NuGet with the credential provider is highly recommended for simplified setup and continued authentication.

Method 1: Configure with the CodeArtifact Credential Provider

The CodeArtifact Credential Provider simplifies the authentication and configuration of CodeArtifact with NuGet CLI tools. CodeArtifact authentication tokens are valid for a maximum of 12 hours. To avoid having to manually refresh the token while using the nuget or dotnet CLI, the credential provider periodically fetches a new token before the current token expires.

> **Important**
> To use the credential provider, ensure that any existing AWS CodeArtifact credentials are cleared from your `nuget.config` file that may have been added manually or by running `aws codeartifact login` to configure NuGet previously.

Install and configure the CodeArtifact Credential Provider for NuGet

dotnet

1. Download the AWS.CodeArtifact.NuGet.CredentialProvider tool from NuGet.org with the following `dotnet` command.

```
dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
```

2. Use the `codeartifact-creds install` command to copy the credential provider to the NuGet plugins folder.

```
dotnet codeartifact-creds install
```

3. (Optional): Set the AWS profile you want to use with the credential provider. If not set, the credential provider will use the default profile. For more information on AWS CLI profiles, see Named profiles.

```
dotnet codeartifact-creds configure set profile profile_name
```

nuget

Perform the following steps to use the NuGet CLI to install the CodeArtifact Credential Provider from an Amazon S3 bucket and configure it. The credential provider will use the default AWS CLI profile, for more information on profiles, see Named profiles.

1. Download AWS.CodeArtifact.NuGet.CredentialProvider.zip from an Amazon S3 bucket.
2. Unzip the file.
3. Copy the **AWS.CodeArtifact.NuGetCredentialProvider** folder from the **netfx** folder to `%user_profile%/.nuget/plugins/netfx/` on Windows or `~/.nuget/plugins/netfx` on Linux or MacOS.
4. Copy the **AWS.CodeArtifact.NuGetCredentialProvider** folder from the **netcore** folder to `%user_profile%/.nuget/plugins/netcore/` on Windows or `~/.nuget/plugins/netcore` on Linux or MacOS.

After you create a repository and configure the credential provider you can use the `nuget` or `dotnet` CLI tools to install and publish packages. For more information, see Consume NuGet packages from CodeArtifact (p. 118) and Publish NuGet packages to CodeArtifact (p. 118).

Method 2: Configure nuget or dotnet with the login command

The `codeartifact login` command in the AWS CLI adds a repository endpoint and authorization token to your NuGet configuration file enabling nuget or dotnet to connect to your CodeArtifact repository. This will modify the user-level NuGet configuration which is located at `%appdata%\NuGet\NuGet.Config` for Windows and `~/.config/NuGet/NuGet.Config` or `~/.nuget/NuGet/NuGet.Config` for Mac/Linux. For more information about NuGet configurations, see Common NuGet configurations.

Configure nuget or dotnet with the `login` command

1. Configure your AWS credentials for use with the AWS CLI, as described in Getting started with CodeArtifact (p. 7).
2. Ensure that the NuGet CLI tool (`nuget` or `dotnet`) has been properly installed and configured. For instructions, see the nuget or dotnet documentation.
3. Use the CodeArtifact `login` command to fetch credentials for use with NuGet.

   Note
   If you are accessing a repository in a domain that you own, you don't need to include `--domain-owner`. For more information, see Cross-account domains (p. 73).

   dotnet

   Important
   Linux and MacOS users: Because encryption is not supported on non-Windows platforms, your fetched credentials will be stored as plain text in your configuration file.

   ```
   aws codeartifact login --tool dotnet --domain my_domain --domain-owner 111122223333
    --repository my_repo
   ```

   nuget

   ```
   aws codeartifact login --tool nuget --domain my_domain --domain-owner 111122223333
    --repository my_repo
   ```

The login command will:

- Fetch an authorization token from CodeArtifact using your AWS credentials.
- Update your user-level NuGet configuration with a new entry for your NuGet package source. The source that points to your CodeArtifact repository endpoint will be called *`domain_name/repo_name`*.

The default authorization period after calling `login` is 12 hours, and `login` must be called to periodically refresh the token. For more information about the authorization token created with the `login` command, see Tokens created with the `login` command (p. 156).

After you create a repository and configure authentication you can use the `nuget`, `dotnet`, or `msbuild` CLI clients to install and publish packages. For more information, see Consume NuGet packages from CodeArtifact (p. 118) and Publish NuGet packages to CodeArtifact (p. 118).

Method 3: Configure nuget or dotnet without the login command

For manual configuration, you must add a repository endpoint and authorization token to your NuGet configuration file to enable nuget or dotnet to connect to your CodeArtifact repository.

Manually configure nuget or dotnet to connect to your CodeArtifact repository.

1. Determine your CodeArtifact repository endpoint by using the `get-repository-endpoint` AWS CLI command.

   ```
   aws codeartifact get-repository-endpoint --domain my_domain --domain-owner 111122223333
    --repository my_repo --format nuget
   ```

   Example output:

   ```
   {
      "repositoryEndpoint": "https://my_domain-111122223333.d.codeartifact.us-
   west-2.amazonaws.com/nuget/my_repo/"
   }
   ```

2. Get an authorization token to connect to your repository from your package manager by using the `get-authorization-token` AWS CLI command.

   ```
   aws codeartifact get-authorization-token --domain my_domain
   ```

   Example output:

   ```
   {
      "authorizationToken": "eyJ2I...viOw",
      "expiration": 1601616533.0
   }
   ```

3. Configure nuget or dotnet to use the repository endpoint from Step 1 and authorization token from Step 2. Note, you will need to append `/v3/index.json` to your repository endpoint.

   dotnet

      Linux and MacOS users: Because encryption is not supported on non-Windows platforms, you must add the `--store-password-in-clear-text` flag to the following command. Note that this will store your password as plain text in your configuration file.

      ```
      dotnet nuget add source https://my_domain-111122223333.d.codeartifact.us-
      west-2.amazonaws.com/nuget/my_repo/v3/index.json --name packageSourceName --
      password eyJ2I...viOw --username aws
      ```

   nuget

      ```
      nuget sources add -name domain_name/repo_name -Source
       https://my_domain-111122223333.d.codeartifact.us-west-2.amazonaws.com/nuget/my_repo/
      v3/index.json -password eyJ2I...viOw --username aws
      ```

   Example output:

```
Package source with Name: domain_name/repo_name added successfully.
```

Consume NuGet packages from CodeArtifact

Once you have configured NuGet with CodeArtifact, you can consume NuGet packages that are stored in your CodeArtifact repository or one of its upstream repositories.

To consume a package version from a CodeArtifact repository or one of its upstream repositories with `nuget` or `dotnet`, run the following command replacing *`packageName`* with the name of the package you want to consume and *`packageSourceName`* with the source name for your CodeArtifact repository in your NuGet configuration file. If you used the `login` command to configure your NuGet configuration, the source name is *`domain_name/repo_name`*.

dotnet

```
dotnet add package packageName --source packageSourceName
```

nuget

```
nuget install packageName -Source packageSourceName
```

To install a specific version of a package

dotnet

```
dotnet add package packageName --version 1.0.0 --source packageSourceName
```

nuget

```
nuget install packageName -Version 1.0.0 -Source packageSourceName
```

See Manage packages using the nuget.exe CLI or Install and manage packages using the dotnet CLI in the *Microsoft Documentation* for more information.

Consume NuGet packages from NuGet.org

You can consume NuGet packages from NuGet.org through a CodeArtifact repository by configuring the repository with an external connection to **NuGet.org**. Packages consumed from **NuGet.org** are ingested and stored in your CodeArtifact repository. For more information about adding external connections, see Add an external connection (p. 26).

Publish NuGet packages to CodeArtifact

Once you have configured NuGet with CodeArtifact, you can use `nuget` or `dotnet` to publish package versions to CodeArtifact repositories.

To push a package version to a CodeArtifact repository, run the following command with the full path to your `.nupkg` file and the source name for your CodeArtifact repository in your NuGet configuration file. If you used the `login` command to configure your NuGet configuration, the source name is `domain_name/repo_name`.

Note
You can create a NuGet package if you do not have one to publish. For more information, see Package creation workflow in the *Microsoft documentation*.

dotnet

```
dotnet nuget push path/to/nupkg/SamplePackage.1.0.0.nupkg --source packageSourceName
```

nuget

```
nuget push path/to/nupkg/SamplePackage.1.0.0.nupkg -Source packageSourceName
```

CodeArtifact Credential Provider reference

The CodeArtifact Credential Provider makes it easy to configure and authenticate NuGet with your CodeArtifact repositories.

CodeArtifact Credential Provider commands

This section includes the list of commands for the CodeArtifact Credential Provider. These commands must be prefixed with `dotnet codeartifact-creds` like the following example.

```
dotnet codeartifact-creds command
```

- `configure set profile profile`: Configures the credential provider to use the provided AWS profile.
- `configure unset profile`: Removes the configured profile if set.
- `install`: Copies the credential provider to the `plugins` folder.
- `install --profile profile`: Copies the credential provider to the `plugins` folder and configures it to use the provided AWS profile.
- `uninstall`: Uninstalls the credential provider. This does not remove the changes to the configuration file.
- `uninstall --delete-configuration`: Uninstalls the credential provider and removes all changes to the configuration file.

CodeArtifact Credential Provider logs

To enable logging for the CodeArtifact Credential Provider, you must set the log file in your environment. The credential provider logs contain helpful debugging information such as:

- The AWS profile used to make connections
- Any authentication errors
- If the endpoint provided is not a CodeArtifact URL

Set the CodeArtifact Credential Provider log file

```
export AWS_CODEARTIFACT_NUGET_LOGFILE=/path/to/file
```

After the log file is set, any `codeartifact-creds` command will append its log output to the contents of that file.

NuGet compatibility

This guide contains information about CodeArtifact's compatibility with different NuGet tools and versions.

Topics

General NuGet compatibility

AWS CodeArtifact supports NuGet 4.8 and higher.

AWS CodeArtifact only supports V3 of the NuGet HTTP protocol. This means that some CLI commands that rely V2 of the protocol are not supported. See the nuget.exe command support (p. 120) section for more information.

AWS CodeArtifact does not support PowerShellGet 2.x.

NuGet command line support

AWS CodeArtifact supports the NuGet (`nuget.exe`) and .NET Core (`dotnet`) CLI tools.

nuget.exe command support

Because CodeArtifact only supports V3 of NuGet's HTTP protocol, the following commands will not work when used against CodeArtifact resources:

- `list`: The `nuget list` command displays a list of packages from a given source. To get a list of packages in a CodeArtifact repository, you can use the List package names (p. 49) command from the AWS CLI.

Using CodeArtifact with CodeBuild

These topics describe how to use packages in a CodeArtifact repository in an AWS CodeBuild build project.

Topics

Using npm packages in CodeBuild

The following steps have been tested with the operating systems listed in Docker images provided by CodeBuild.

Set up permissions with IAM roles

These steps are required when using npm packages from CodeArtifact in CodeBuild.

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.
2. In the navigation pane, choose **Roles**. On the **Roles** page, edit the role used by your CodeBuild build project. This role must have the following permissions.

```
{
  "Version": "2012-10-17",
  "Statement": [
      {
          "Effect": "Allow",
          "Action": [ "codeartifact:GetAuthorizationToken",
                      "codeartifact:GetRepositoryEndpoint",
                      "codeartifact:ReadFromRepository"
                      ],
          "Resource": "*"
      },
      {
          "Effect": "Allow",
          "Action": "sts:GetServiceBearerToken",
          "Resource": "*",
          "Condition": {
              "StringEquals": {
                  "sts:AWSServiceName": "codeartifact.amazonaws.com"
              }
          }
      }
  ]
}
```

Important
If you also want to use CodeBuild to publish packages, add the **`codeartifact:PublishPackageVersion`** permission.

For information, see Modifying a Role in the *IAM User Guide*.

Log in and use npm

To use npm packages from CodeBuild, run the `login` command from the `pre-build` section of your project's `buildspec.yaml` to configure `npm` to fetch packages from CodeArtifact. For more information, see Authentication with npm (p. 84).

After `login` has run successfully, you can run `npm` commands from the `build` section to install npm packages.

Linux

Note
It is only necessary to upgrade the AWS CLI with `pip3 install awscli --upgrade --user` if you are using an older CodeBuild image. If you are using the latest image versions, you can remove that line.

```
pre_build:
  commands:
    - pip3 install awscli --upgrade --user
    - aws codeartifact login --tool npm --domain my_domain --domain-owner 111122223333 --
repository my_repo
build:
  commands:
    - npm install
```

Windows

```
version: 0.2
phases:
  install:
    commands:
      - '[Net.ServicePointManager]::SecurityProtocol = "Tls12"; Invoke-WebRequest https://
awscli.amazonaws.com/AWSCLIV2.msi -OutFile $env:TEMP/AWSCLIV2.msi'
      - Start-Process -Wait msiexec "/i $env:TEMP\AWSCLIV2.msi /quiet /norestart"
  pre_build:
    commands:
      - '&"C:\Program Files\Amazon\AWSCLIV2\aws" codeartifact login --tool npm --
domain my_domain --domain-owner 111122223333 --repository my_repo'
  build:
    commands:
      - npm install
```

Using Python packages in CodeBuild

The following steps have been tested with the operating systems listed in the Docker images provided by CodeBuild.

Set up permissions with IAM roles

These steps are required when using Python packages from CodeArtifact in CodeBuild.

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.
2. In the navigation pane, choose **Roles**. On the **Roles** page, edit the role used by your CodeBuild build project. This role must have the following permissions.

```
{
  "Version": "2012-10-17",
  "Statement": [
      {
          "Effect": "Allow",
          "Action": [ "codeartifact:GetAuthorizationToken",
                      "codeartifact:GetRepositoryEndpoint",
                      "codeartifact:ReadFromRepository"
                      ],
          "Resource": "*"
      },
      {
          "Effect": "Allow",
          "Action": "sts:GetServiceBearerToken",
          "Resource": "*",
          "Condition": {
              "StringEquals": {
                  "sts:AWSServiceName": "codeartifact.amazonaws.com"
              }
          }
      }
  ]
}
```

Important
If you also want to use CodeBuild to publish packages, add the **`codeartifact:PublishPackageVersion`** permission.

For information, see Modifying a Role in the *IAM User Guide*.

Log in and use pip or twine

To use Python packages from CodeBuild, run the `login` command from the `pre-build` section of your project's `buildspec.yaml` file to configure `pip` to fetch packages from CodeArtifact. For more information, see Using CodeArtifact with Python (p. 96).

After `login` has run successfully, you can run `pip` commands from the `build` section to install or publish Python packages.

Linux

Note
It is only necessary to upgrade the AWS CLI with `pip3 install awscli --upgrade --user` if you are using an older CodeBuild image. If you are using the latest image versions, you can remove that line.

To install Python packages using `pip`:

```
pre_build:
  commands:
    - pip3 install awscli --upgrade --user
    - aws codeartifact login --tool pip --domain my_domain --domain-owner 111122223333 --
repository my_repo
build:
  commands:
    - pip install requests
```

To publish Python packages using `twine`:

```
pre_build:
  commands:
    - pip3 install awscli --upgrade --user
    - aws codeartifact login --tool twine --domain my_domain --domain-owner 111122223333 --
repository my_repo
build:
  commands:
    - twine upload --repository codeartifact mypackage
```

Windows

To install Python packages using `pip`:

```
version: 0.2
phases:
  install:
    commands:
      - '[Net.ServicePointManager]::SecurityProtocol = "Tls12"; Invoke-WebRequest https://
awscli.amazonaws.com/AWSCLIV2.msi -OutFile $env:TEMP/AWSCLIV2.msi'
      - Start-Process -Wait msiexec "/i $env:TEMP\AWSCLIV2.msi /quiet /norestart"
  pre_build:
    commands:
      - '&"C:\Program Files\Amazon\AWSCLIV2\aws" codeartifact login --tool pip --
domain my_domain --domain-owner 111122223333 --repository my_repo'
  build:
    commands:
      - pip install requests
```

To publish Python packages using `twine`:

```
version: 0.2
phases:
  install:
    commands:
      - '[Net.ServicePointManager]::SecurityProtocol = "Tls12"; Invoke-WebRequest https://
awscli.amazonaws.com/AWSCLIV2.msi -OutFile $env:TEMP/AWSCLIV2.msi'
      - Start-Process -Wait msiexec "/i $env:TEMP\AWSCLIV2.msi /quiet /norestart"
  pre_build:
    commands:
      - '&"C:\Program Files\Amazon\AWSCLIV2\aws" codeartifact login --tool twine --
domain my_domain --domain-owner 111122223333 --repository my_repo'
  build:
    commands:
      - twine upload --repository codeartifact mypackage
```

Using Maven packages in CodeBuild

Set up permissions with IAM roles

These steps are required when using Maven packages from CodeArtifact in CodeBuild.

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.

2. In the navigation pane, choose **Roles**. On the **Roles** page, edit the role used by your CodeBuild build project. This role must have the following permissions.

```
{
  "Version": "2012-10-17",
  "Statement": [
      {
          "Effect": "Allow",
          "Action": [ "codeartifact:GetAuthorizationToken",
                      "codeartifact:GetRepositoryEndpoint",
                      "codeartifact:ReadFromRepository"
                      ],
          "Resource": "*"
      },
      {
          "Effect": "Allow",
          "Action": "sts:GetServiceBearerToken",
          "Resource": "*",
          "Condition": {
              "StringEquals": {
                  "sts:AWSServiceName": "codeartifact.amazonaws.com"
              }
          }
      }
  ]
}
```

Important
If you also want to use CodeBuild to publish packages, add the **`codeartifact:PublishPackageVersion`** and **`codeartifact:PutPackageMetadata`** permissions.

For information, see Modifying a Role in the *IAM User Guide*.

Use gradle or mvn

To use Maven packages with `gradle` or `mvn`, store the CodeArtifact auth token in an environment variable, as described in Pass an auth token in an environment variable (p. 158). The following is an example.

Note
It is only necessary to upgrade the AWS CLI with `pip3 install awscli --upgrade --user` if you are using an older CodeBuild image. If you are using the latest image versions, you can remove that line.

```
pre_build:
  commands:
    - pip3 install awscli --upgrade --user
    - export CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --
domain my_domain --domain-owner 111122223333 --query authorizationToken --output text`
```

To use Gradle:

If you referenced the `CODEARTIFACT_AUTH_TOKEN` variable in your Gradle `build.gradle` file as described in Using CodeArtifact with Gradle (p. 100), you can invoke your Gradle build from the `buildspec.yaml` `build` section.

```
build:
  commands:
    - gradle build
```

To use mvn:

You must configure your Maven configuration files (`settings.xml` and `pom.xml`) following the instructions in Using CodeArtifact with mvn (p. 105).

Using NuGet packages in CodeBuild

The following steps have been tested with the operating systems listed in the Docker images provided by CodeBuild.

Topics

Set up permissions with IAM roles

These steps are required when using NuGet packages from CodeArtifact in CodeBuild.

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.
2. In the navigation pane, choose **Roles**. On the **Roles** page, edit the role used by your CodeBuild build project. This role must have the following permissions.

```
{
  "Version": "2012-10-17",
  "Statement": [
      {
          "Effect": "Allow",
          "Action": [ "codeartifact:GetAuthorizationToken",
                      "codeartifact:GetRepositoryEndpoint",
                      "codeartifact:ReadFromRepository"
                      ],
          "Resource": "*"
      },
      {
          "Effect": "Allow",
          "Action": "sts:GetServiceBearerToken",
          "Resource": "*",
          "Condition": {
              "StringEquals": {
                  "sts:AWSServiceName": "codeartifact.amazonaws.com"
              }
          }
      }
  ]
}
```

Important
If you also want to use CodeBuild to publish packages, add the **`codeartifact:PublishPackageVersion`** permission.

For information, see Modifying a Role in the *IAM User Guide*.

Consume NuGet packages

To consume NuGet packages from CodeBuild, include the following in your project's `buildspec.yaml` file.

1. In the `install` section, install the CodeArtifact Credential Provider to configure command line tools such as `msbuild` and `dotnet` to build and publish packages to CodeArtifact.
2. In the `pre-build` section, add your CodeArtifact repository to your NuGet configuration.

See the following `buildspec.yaml` examples. For more information, see Using CodeArtifact with NuGet (p. 113).

After the credential provider is installed and your repository source is added, you can run NuGet CLI tool commands from the `build` section to consume NuGet packages.

Linux

To consume NuGet packages using `dotnet`:

```
version: 0.2

phases:
  install:
    runtime-versions:
      dotnet: latest
    commands:
      - export PATH="$PATH:/root/.dotnet/tools"
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      -  dotnet nuget add source -n codeartifact $(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)"v3/index.json"
  build:
    commands:
      - dotnet add packageName --source packageSourceName
```

Windows

To consume NuGet packages using `dotnet`:

```
version: 0.2

phases:
  install:
    commands:
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      - dotnet nuget add source -n codeartifact "$(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)v3/index.json"
  build:
    commands:
      - dotnet add packageName --source packageSourceName
```

Build with NuGet packages

To build with NuGet packages from CodeBuild, include the following in your project's `buildspec.yaml` file.

1. In the `install` section, install the CodeArtifact Credential Provider to configure command line tools such as `msbuild` and `dotnet` to build and publish packages to CodeArtifact.
2. In the `pre-build` section, add your CodeArtifact repository to your NuGet configuration.

See the following `buildspec.yaml` examples. For more information, see Using CodeArtifact with NuGet (p. 113).

After the credential provider is installed and your repository source is added, you can run NuGet CLI tool commands like `dotnet build` from the `build` section.

Linux

To build NuGet packages using `dotnet`:

```
version: 0.2

phases:
  install:
    runtime-versions:
      dotnet: latest
    commands:
      - export PATH="$PATH:/root/.dotnet/tools"
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      -  dotnet nuget add source -n codeartifact $(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)"v3/index.json"
  build:
    commands:
      - dotnet build
```

To build NuGet packages using `msbuild`:

```
version: 0.2

phases:
  install:
    runtime-versions:
      dotnet: latest
    commands:
      - export PATH="$PATH:/root/.dotnet/tools"
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      - dotnet nuget add source -n codeartifact $(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)"v3/index.json"
  build:
    commands:
      - msbuild -t:Rebuild -p:Configuration=Release
```

Windows

To build NuGet packages using `dotnet`:

```
version: 0.2

phases:
  install:
    commands:
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      - dotnet nuget add source -n codeartifact "$(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)v3/index.json"
  build:
    commands:
      - dotnet build
```

To build NuGet packages using `msbuild`:

```
version: 0.2

phases:
  install:
    commands:
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      - dotnet nuget add source -n codeartifact "$(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)v3/index.json"
  build:
    commands:
      - msbuild -t:Rebuild -p:Configuration=Release
```

Publish NuGet packages

To publish NuGet packages from CodeBuild, include the following in your project's `buildspec.yaml` file.

1. In the `install` section, install the CodeArtifact Credential Provider to configure command line tools such as `msbuild` and `dotnet` to build and publish packages to CodeArtifact.
2. In the `pre-build` section, add your CodeArtifact repository to your NuGet configuration.

See the following `buildspec.yaml` examples. For more information, see Using CodeArtifact with NuGet (p. 113).

After the credential provider is installed and your repository source is added, you can run NuGet CLI tool commands from the `build` section and publish your NuGet packages.

Linux

To publish NuGet packages using `dotnet`:

```
version: 0.2
```

```
phases:
  install:
    runtime-versions:
      dotnet: latest
    commands:
      - export PATH="$PATH:/root/.dotnet/tools"
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      - dotnet nuget add source -n codeartifact $(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)"v3/index.json"
  build:
    commands:
      - dotnet pack -o .
      - dotnet nuget push *.nupkg -s codeartifact
```

Windows

To publish NuGet packages using `dotnet`:

```
version: 0.2

phases:
  install:
    commands:
      - dotnet tool install -g AWS.CodeArtifact.NuGet.CredentialProvider
      - dotnet codeartifact-creds install
  pre_build:
    commands:
      - dotnet nuget add source -n codeartifact "$(aws codeartifact get-repository-endpoint
 --domain my_domain --domain-owner 111122223333 --repository my_repo --format nuget --query
 repositoryEndpoint --output text)v3/index.json"
  build:
    commands:
      - dotnet pack -o .
      - dotnet nuget push *.nupkg -s codeartifact
```

Dependency caching

You can enable local caching in CodeBuild to reduce the number of dependencies that need to be fetched from CodeArtifact for each build. For information, see Build Caching in AWS CodeBuild in the *AWS CodeBuild User Guide*. After you enable a custom local cache, add the cache directory to your project's `buildspec.yaml` file.

For example, if you are using `mvn`, use the following.

```
cache:
  paths:
    - '/root/.m2/**/*'
```

For other tools, use the cache folders shown in this table.

Tool	Cache directory
mvn	`/root/.m2/**/*`

Tool	Cache directory
`gradle`	`/root/.gradle/caches/**/*`
`pip`	`/root/.cache/pip/**/*`
`npm`	`/root/.npm/**/*`
`nuget`	`/root/.nuget/**/*`

Working with CodeArtifact events

CodeArtifact is integrated with Amazon EventBridge, a service that automates and responds to events, including changes in a CodeArtifact repository. You can create rules for events and configure what happens when an event matches a rule. EventBridge was formerly called CloudWatch Events.

The following actions can be triggered by an event:

- Invoking an AWS Lambda function.
- Activating an AWS Step Functions state machine.
- Notifying an Amazon SNS topic or an Amazon SQS queue.
- Starting a pipeline in AWS CodePipeline.

CodeArtifact creates an event when a package version is created, modified, or deleted. The following are examples of CodeArtifact events:

- Publishing a new package version (for example, by running `npm publish`).
- Adding a new asset to an existing package version (for example, by pushing a new JAR file to an existing Maven package).
- Copying a package version from one repository to another using `copy-package-versions`. For more information, see Copy packages between repositories (p. 58).
- Deleting a package version using `delete-package-version`. For more information, see Delete a package version (p. 62).
- Retaining a package version in a downstream repository when it has been fetched from an upstream repository. For more information, see Working with upstream repositories in CodeArtifact (p. 38).
- Ingesting a package version from an external repository into a CodeArtifact repository. For more information, see Add an external connection (p. 26).

Events are delivered to both the account that owns the domain and the account that administers the repository. For example, suppose that account `111111111111` owns the domain `my_domain`. Account `222222222222` creates a repository in `my_domain` called `repo2`. When a new package version is published to `repo2`, both accounts receive the EventBridge events. The domain-owning account (`111111111111`) receives events for all repositories in the domain. If a single account owns both the domain and the repository within it, only a single event is delivered.

The following topics describe the CodeArtifact event format. They show you how to configure CodeArtifact events, and how to use events with other AWS services. For more information, see Getting Started with Amazon EventBridge in the *Amazon EventBridge User Guide*.

Topics

CodeArtifact event format and example

The following are event fields and descriptions along with an example of a CodeArtifact event.

CodeArtifact event format

All CodeArtifact events include the following fields.

Event field	Description
version	The version of the event format. There is currently only a single version, `0`.
id	A unique identifier for the event.
detail-type	The type of event. This determines the fields in the `detail` object. The one `detail-type` currently supported is `CodeArtifact Package Version State Change`.
source	The source of the event. For CodeArtifact, it will be `aws.codeartifact`.
account	The account that owns the domain and repository that triggered the event.
time	The exact time the event was triggered.
region	The region where the event was triggered.
resources	A list that contains the ARN of the package that changed. The list contains one entry. For information about package ARN format, see Grant write access to packages (p. 25).
domainName	The domain that contains the repository that contains the package.
domainOwner	The AWS account ID of the owner of the domain.
repositoryName	The repository that contains the package.
packageFormat	The format of the package that triggered the event.
packageNamespace	The namespace of the package that triggered the event.
packageName	The name of the package that triggered the event.
packageVersion	The version of the package that triggered the event.
packageVersionState	The state of the package version when the event was triggered. Possible values are `Unfinished`, `Published`, `Unlisted`, `Archived`, and `Disposed`.
packageVersionRevision	A value that uniquely identifies the state of the assets and metadata of the package version when the event was triggered. If the package version is modified (for example, by adding

Event field	Description
	another JAR file to a Maven package), the `packageVersionRevision` changes.
changes.assetsAdded	The number of assets added to a package that triggered an event. Examples of an asset are a Maven JAR file or a Python wheel.
changes.assetsRemoved	The number of assets removed from a package that triggered an event.
changes.assetsUpdated	The number of assets modified in the package that triggered the event.
changes.metadataUpdated	A boolean value that is set to `true` if the event includes modified package-level metadata. For example, an event might modify a Maven `pom.xml` file.
changes.statusChanged	A boolean value that is set to `true` if the event's `packageVersionStatus` is modified(for example, if `packageVersionStatus` changes from `Unfinished` to `Published`).
operationType	Describes the high-level type of the package version change. The possible values are `Created`, `Updated`, and `Deleted`.
sequenceNumber	An integer that specifies an event number for a package. Each event on a package increments the `sequenceNumber` so events can be arranged sequentially. An event can increment the `sequenceNumber` by any integer number. **Note** EventBridge events might be received out of order. `sequenceNumber` can be used to determine their actual order.
eventDeduplicationId	An ID used to differentiate duplicate EventBridge events. In rare cases, EventBridge might trigger the same rule more than once for a single event or scheduled time. Or, it might invoke the same target more than once for a given triggered rule.

CodeArtifact event example

The following is an example of a CodeArtifact event that might be triggered when an npm package is published.

```
{
  "version":"0",
  "id":"73f03fec-a137-971e-6ac6-07c8ffffffff",
  "detail-type":"CodeArtifact Package Version State Change",
  "source":"aws.codeartifact",
  "account":"123456789012",
  "time":"2019-11-21T23:19:54Z",
  "region":"us-west-2",
  "resources":["arn:aws:codeartifact:us-west-2:111122223333:package/my_domain/myrepo/npm//
mypackage"],
  "detail":{
    "domainName":"my_domain",
    "domainOwner":"111122223333",
    "repositoryName":"myrepo",
    "packageFormat":"npm",
    "packageNamespace":null,
    "packageName":"mypackage",
    "packageVersion":"1.0.0",
    "packageVersionState":"Published",
    "packageVersionRevision":"0E5DE26A4CD79FDF3EBC4924FFFFFFFF",
    "changes":{
      "assetsAdded":1,
      "assetsRemoved":0,
      "metadataUpdated":true,
      "assetsUpdated":0,
      "statusChanged":true
    },
    "operationType":"Created",
    "sequenceNumber":1,
    "eventDeduplicationId":"2mEO0A2Ke07rWUTBXk3CAiQhdTXF4N94LNaT/ffffff="
  }
}
```

Use an event to start a CodePipeline execution

This example demonstrates how to configure an Amazon EventBridge rule so that an AWS CodePipeline execution starts when a package version in a CodeArtifact repository is published, modified, or deleted.

Topics

Configure EventBridge permissions

You must add permissions for EventBridge to use CodePipeline to invoke the rule that you create. To add these permissions using the AWS Command Line Interface (AWS CLI), follow step 1 in Create a CloudWatch Events Rule for a CodeCommit Source (CLI) in the *AWS CodePipeline User Guide*.

Create the EventBridge rule

To create the rule, use the `put-rule` command with the `--name` and `--event-pattern` parameters. The event pattern specifies values that are matched against the contents of each event. The target is triggered if the pattern matches the event. For example, the following pattern matches CodeArtifact events from the `myrepo` repository in the `my_domain` domain.

```
aws events put-rule --name MyCodeArtifactRepoRule --event-pattern \
    '{"source":["aws.codeartifact"],"detail-type":["CodeArtifact Package Version State
 Change"],
    "detail":{"domainName":["my_domain"],"domainOwner":["111122223333"],"repositoryName":
["myrepo"]}}'
```

Create the EventBridge rule target

The following command adds a target to the rule so that when an event matches the rule, a CodePipeline execution is triggered. For the `RoleArn` parameter, specify the Amazon Resource Name (ARN) of the role created earlier in this topic.

```
aws events put-targets --rule MyCodeArtifactRepoRule --targets \
  'Id=1,Arn=arn:aws:codepipeline:us-west-2:111122223333:pipeline-name,
  RoleArn=arn:aws:iam::123456789012:role/MyRole'
```

Use an event to run a Lambda function

This example shows you how to configure an EventBridge rule that starts an AWS Lambda function when a package version in a CodeArtifact repository is published, modified, or deleted.

For more information, see Tutorial: Schedule AWS Lambda Functions Using EventBridge in the *Amazon EventBridge User Guide*.

Topics

Create the EventBridge rule

To create a rule that starts a Lambda function, use the `put-rule` command with the `--name` and `--event-pattern` options. The following pattern specifies npm packages in the `@types` scope in any repository in the `my_domain` domain.

```
aws events put-rule --name "MyCodeArtifactRepoRule" --event-pattern \
  '{"source":["aws.codeartifact"],"detail-type":["CodeArtifact Package Version State
 Change"],
  "detail":{"domainName":["my_domain"],"domainOwner":["111122223333"],"packageNamespace":
["types"],"packageFormat":["npm"]}}'
```

Create the EventBridge rule target

The following command adds a target to the rule that runs the Lambda function when an event matches the rule. For the `arn` parameter, specify the Amazon Resource Name (ARN) of the Lambda function.

```
aws events put-targets --rule MyCodeArtifactRepoRule --targets \
  Id=1,Arn=arn:aws:lambda:us-west-2:111122223333:function:MyLambdaFunction
```

Configure EventBridge permissions

Use the `add-permission` command to grant permissions for the rule to invoke a Lambda function. For the `--source-arn` parameter, specify the ARN of the rule that you created earlier in this example.

```
aws lambda add-permission --function-name MyLambdaFunction \\
  --statement-id my-statement-id --action 'lambda:InvokeFunction' \\
  --principal events.amazonaws.com \\
  --source-arn arn:aws:events:us-west-2:111122223333:rule/MyCodeArtifactRepoRule
```

Security in CodeArtifact

Cloud security at AWS is the highest priority. As an AWS customer, you benefit from data centers and network architectures that are built to meet the requirements of the most security-sensitive organizations.

Security is a shared responsibility between AWS and you. The shared responsibility model describes this as security *of* the cloud and security *in* the cloud:

- **Security of the cloud** – AWS is responsible for protecting the infrastructure that runs AWS services in the AWS Cloud. AWS also provides you with services that you can use securely. Third-party auditors regularly test and verify the effectiveness of our security as part of the AWS Compliance Programs. To learn about the compliance programs that apply to CodeArtifact, see AWS Services in Scope by Compliance Program.
- **Security in the cloud** – Your responsibility is determined by the AWS service that you use. You are also responsible for other factors including the sensitivity of your data, your company's requirements, and applicable laws and regulations.

This documentation helps you understand how to apply the shared responsibility model when using CodeArtifact. The following topics show you how to configure CodeArtifact to meet your security and compliance objectives. You also learn how to use other AWS services that help you to monitor and secure your CodeArtifact resources.

Topics

Data protection in AWS CodeArtifact

The AWS shared responsibility model applies to data protection in AWS CodeArtifact. As described in this model, AWS is responsible for protecting the global infrastructure that runs all of the AWS Cloud. You are responsible for maintaining control over your content that is hosted on this infrastructure. This content includes the security configuration and management tasks for the AWS services that you use. For more information about data privacy, see the Data Privacy FAQ. For information about data protection in Europe, see the AWS Shared Responsibility Model and GDPR blog post on the *AWS Security Blog*.

For data protection purposes, we recommend that you protect AWS account credentials and set up individual user accounts with AWS Identity and Access Management (IAM). That way each user is given only the permissions necessary to fulfill their job duties. We also recommend that you secure your data in the following ways:

- Use multi-factor authentication (MFA) with each account.
- Use SSL/TLS to communicate with AWS resources. We recommend TLS 1.2 or later.
- Set up API and user activity logging with AWS CloudTrail.
- Use AWS encryption solutions, along with all default security controls within AWS services.

- Use advanced managed security services such as Amazon Macie, which assists in discovering and securing personal data that is stored in Amazon S3.
- If you require FIPS 140-2 validated cryptographic modules when accessing AWS through a command line interface or an API, use a FIPS endpoint. For more information about the available FIPS endpoints, see Federal Information Processing Standard (FIPS) 140-2.

We strongly recommend that you never put confidential or sensitive information, such as your customers' email addresses, into tags or free-form fields such as a **Name** field. This includes when you work with CodeArtifact or other AWS services using the console, API, AWS CLI, or AWS SDKs. Any data that you enter into tags or free-form fields used for names may be used for billing or diagnostic logs. If you provide a URL to an external server, we strongly recommend that you do not include credentials information in the URL to validate your request to that server.

Data encryption

Encryption is an important part of CodeArtifact security. Some encryption, such as for data in transit, is provided by default and does not require you to do anything. Other encryption, such as for data at rest, you can configure when you create your project or build.

- **Encryption of data at rest** - All assets stored in CodeArtifact are encrypted by using AWS KMS keys (KMS keys). This includes all assets in all packages in all repositories. One KMS key is used for each domain to encrypt all its assets. By default, an AWS managed KMS key is used, so you do not need to create a KMS key. If you want, you can use a customer-managed KMS key that you create and configure. For more information, see Creating keys and AWS Key Management Service concepts in the *AWS Key Management Service User Guide*. You can specify a customer-managed KMS key when you create a domain. For more information, see Working with domains in CodeArtifact (p. 72).
- **Encryption of data in transit** - All communication between customers and CodeArtifact and between CodeArtifact and its downstream dependencies protected using TLS encryption.

Traffic privacy

You can improve the security of your CodeArtifact domains and the assets that they contain by configuring CodeArtifact to use an interface virtual private cloud (VPC) endpoint. To do this, you don't need an internet gateway, NAT device, or virtual private gateway. For more information, see Working with Amazon VPC endpoints (p. 160). For more information about AWS PrivateLink and VPC endpoints, see AWS PrivateLink and Accessing AWS Services Through PrivateLink.

Identity and access management in AWS CodeArtifact

Access to AWS CodeArtifact requires credentials. Those credentials must have permissions to access AWS resources, domains, and their repositories. The following sections describe how you can use AWS Identity and Access Management (IAM) and CodeArtifact to help secure access to your resources.

- Authentication (p. 139)
- Access control (p. 140)

Authentication

You can access AWS as any of the following types of identities:

- **AWS account root user** – When you sign up for AWS, you provide an email address and password that is associated with your AWS account. These are your *root credentials*, and they provide complete access to all of your AWS resources.

  Important
  For security reasons, we recommend that you use the root credentials only to create an administrator user, which is an IAM user with full permissions to your AWS account. Then, you can use this administrator user to create other IAM users and roles with limited permissions. For more information, see IAM Best Practices and Creating an Admin User and Group in the *IAM User Guide*.

- **IAM user** – An IAM user is simply an identity in your AWS account that has custom permissions (for example, permission to create domains and repositories in CodeArtifact). You can use an IAM user name and password to sign in to secure AWS webpages like the AWS Management Console, AWS Discussion Forums, or the AWS Support Center.

  In addition to a user name and password, you can also generate access keys for each user. You can use these keys when you access AWS services programmatically, either through one of the AWS SDKs or by using the AWS Command Line Interface (AWS CLI). The AWS SDKs and AWS CLI tools use the access keys to cryptographically sign your request. If you don't use the AWS tools, you must sign the request yourself. CodeArtifact supports Signature Version 4, a protocol for authenticating inbound API requests. For more information about authenticating requests, see the Signature Version 4 Signing Process in the *AWS General Reference*.

- **IAM role** – An IAM role is similar to an IAM user, but it is not associated with a specific person. An IAM role enables you to obtain temporary access keys that can be used to access AWS services and resources. IAM roles with temporary credentials are useful in the following situations:

  - **Federated user access** – Instead of creating an IAM user, you can use pre-existing user identities from AWS Directory Service, your enterprise user directory, or a web identity provider. These are known as *federated users*. AWS assigns a role to a federated user when access is requested through an identity provider. For more information about federated users, see Federated Users and Roles in the *IAM User Guide*.

  - **Cross-account access** – You can use an IAM role in your account to grant another AWS account permissions to access your account's resources. For an example, see Tutorial: Delegate Access Across AWS Accounts Using IAM Roles in the *IAM User Guide*. You can also grant cross-account access to a domain using resource-based policies. For more information, see Enable cross-account access to a domain (p. 76).

  - **AWS service access** – You can use an IAM role in your account to grant permissions to an AWS service to access your account's resources. For example, you can create a role that allows Amazon Redshift to access an Amazon S3 bucket on your behalf and then load data stored in the bucket into an Amazon Redshift cluster. For more information, see Creating a Role to Delegate Permissions to an AWS Service in the *IAM User Guide*.

  - **Applications running on Amazon EC2** – Instead of storing access keys in the Amazon EC2 instance for use by applications running on the instance and making AWS API requests, you can use an IAM role to manage temporary credentials for these applications. To assign an AWS role to an Amazon EC2 instance and make it available to all of its applications, you can create an instance profile that is attached to the instance. An instance profile contains the role and enables programs running on the Amazon EC2 instance to get temporary credentials. For more information, see Using Roles for Applications on Amazon EC2 in the *IAM User Guide*.

Access control

You can have valid credentials to authenticate your requests, but unless you have permissions, you cannot create or access AWS CodeArtifact resources. For example, you must have permissions to create, view, or delete repositories, associate a connection to an external public repository to a CodeArtifact repository, and to delete package versions.

The following sections describe how to manage permissions for CodeArtifact. We recommend that you read the overview first.

- Overview of managing access permissions to your AWS CodeArtifact resources (p. 141)
- Using identity-based policies for AWS CodeArtifact (p. 144)
- AWS CodeArtifact permissions reference (p. 151)

Overview of managing access permissions to your AWS CodeArtifact resources

Every AWS resource is owned by an AWS account, and permissions to create or access a resource are governed by permissions policies. An account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles).

> **Note**
> An account administrator (or administrator user) is a user with administrator privileges. For more information, see IAM Best Practices in the *IAM User Guide*.

When you grant permissions, you decide who is getting the permissions, the resources they can access, and the actions that can be performed on those resources.

Topics

AWS CodeArtifact resources and operations

In AWS CodeArtifact, the primary resource is a domain. In a policy, you use an Amazon Resource Name (ARN) to identify the resource the policy applies to. Repositories are also resources and have ARNs associated with them. For more information, see Amazon Resource Names (ARNs) in the *Amazon Web Services General Reference*.

Resource type	ARN format
Domain	`arn:aws:codeartifact:`*`region-ID`*`:`*`account-ID`*`:domain/`*`my_domain`*
Repository	`arn:aws:codeartifact:`*`region-ID`*`:`*`account-ID`*`:repository/`*`my_domain`*`/`*`my_repo`*
Package with a namespace	`arn:aws:codeartifact:`*`region-ID`*`:`*`account-ID`*`:package/`*`my_domain`*`/`*`my_repo`*`/`*`package-format`*`/`*`namespace`*`/`*`package-name`*
Package without a namespace	`arn:aws:codeartifact:`*`region-ID`*`:`*`account-ID`*`:package/`*`my_domain`*`/`*`my_repo`*`/`*`package-format`*`//`*`package-name`*
All CodeArtifact resources	`arn:aws:codeartifact:*`

Resource type	ARN format
All CodeArtifact resources owned by the specified account in the specified AWS Region	`arn:aws:codeartifact:region-ID:account-ID:*`

Note
Most AWS services treat a colon (:) or a forward slash (/) as the same character in ARNs. However, CodeArtifact uses an exact match in resource patterns and rules. Be sure to use the correct characters when you create event patterns so that they match the ARN syntax in the resource.

For example, you can indicate a specific domain (*myDomain*) in your statement using its ARN as follows.

```
"Resource": "arn:aws:codeartifact:us-east-2:123456789012:domain/myDomain"
```

To specify all resources, or if an API action does not support ARNs, use the wildcard character (*) in the `Resource` element as follows.

```
"Resource": "*"
```

To specify multiple resources in a single statement, separate their ARNs with commas, as follows.

```
"Resource": [
  "arn:aws:codeartifact:us-east-2:123456789012:domain/myDomain",
  "arn:aws:codeartifact:us-east-2:123456789012:domain/myOtherDomain"
]
```

CodeArtifact provides a set of operations to work with the CodeArtifact resources. For a list, see AWS CodeArtifact permissions reference (p. 151).

Understanding resource ownership

The AWS account owns the resources that are created in the account, regardless of who created the resources. Specifically, the resource owner is the AWS account of the principal entity (that is, the root account, an IAM user, or an IAM role) that authenticates the resource creation request. The following examples illustrate how this works:

- If you use the root account credentials of your AWS account to create a rule, your AWS account is the owner of the CodeArtifact resource.
- If you create an IAM user in your AWS account and grant permissions to create CodeArtifact resources to that user, the user can create CodeArtifact resources. However, your AWS account, to which the user belongs, owns the CodeArtifact resources.
- If you create an IAM role in your AWS account with permissions to create CodeArtifact resources, anyone who can assume the role can create CodeArtifact resources. Your AWS account, to which the role belongs, owns the CodeArtifact resources.

Managing access to resources

A permissions policy describes who has access to which resources.

Note
This section discusses the use of IAM in AWS CodeArtifact. It doesn't provide detailed information about the IAM service. For complete IAM documentation, see What Is IAM? in the

IAM User Guide. For information about IAM policy syntax and descriptions, see IAM JSON Policy Reference in the *IAM User Guide*.

Policies attached to an IAM identity are referred to as *identity-based policies* (IAM policies). Policies attached to a resource are referred to as *resource-based policies*. CodeArtifact supports identity-based (IAM policies) and resource-based policies.

Identity-based policies

You can attach policies to IAM identities.

- **Attach a permissions policy to a user or a group in your account** – To grant a user permissions to view domains and other AWS CodeArtifact resources in the AWS CodeArtifact console, you can attach a permissions policy to a user or group that the user belongs to.
- **Attach a permissions policy to a role (grant cross-account permissions)** – You can attach an identity-based permissions policy to an IAM role to grant cross-account permissions. For example, the administrator in Account A can create a role to grant cross-account permissions to another AWS account (for example, Account B) or an AWS service as follows:
  1. Account A administrator creates an IAM role and attaches a permissions policy to the role that grants permissions on resources in Account A.
  2. Account A administrator attaches a trust policy to the role identifying Account B as the principal who can assume the role.
  3. Account B administrator can then delegate permissions to assume the role to any users in Account B. Doing this allows users in Account B to create or access resources in Account A. The principal in the trust policy must also be an AWS service principal if you want to grant an AWS service permissions to assume the role.

  For more information about using IAM to delegate permissions, see Access Management in the *IAM User Guide*.

In CodeArtifact, identity-based policies are used to manage permissions to the resources related to artifact management. For example, you can control access to a domain.

You can create IAM policies to restrict the calls and resources that users in your account have access to, and then attach those policies to IAM users. For more information about how to create IAM roles and to explore example IAM policy statements for CodeArtifact, see Overview of managing access permissions to your AWS CodeArtifact resources (p. 141).

Specifying policy elements: Actions, effects, and principals

For each AWS CodeArtifact resource, the service defines a set of API operations. To grant permissions for these API operations, CodeArtifact defines a set of actions that you can specify in a policy. Some API operations can require permissions for more than one action in order to perform the API operation. For more information, see AWS CodeArtifact resources and operations (p. 141) and AWS CodeArtifact permissions reference (p. 151).

The following are the basic policy elements:

- **Resource** – You use an Amazon Resource Name (ARN) to identify the resource that the policy applies to.
- **Action** – You use action keywords to identify resource operations you want to allow or deny. For example, the `codeartifact:DeleteDomain;` permission gives the user permissions to perform the `DeleteDomain` operation.
- **Effect** – You specify the effect, either allow or deny, when the user requests the action. If you don't explicitly grant access to (allow) a resource, access is implicitly denied. You can also explicitly deny

access to a resource. You might do this to make sure that a user cannot access a resource, even if a different policy grants access.

- **Principal** – In identity-based policies (IAM policies), the user the policy is attached to is the implicit principal. For resource-based policies, you specify the user, account, service, or other entity that you want to receive permissions.

To learn more about IAM policy syntax and descriptions, see AWS IAM Policy Reference in the *IAM User Guide*.

For a table showing all of the CodeArtifact API actions and the resources they apply to, see the AWS CodeArtifact permissions reference (p. 151).

AWS Global Condition Context Keys

AWS CodeArtifact does not support the following AWS Global Condition Context Keys:

- Referer
- UserAgent

For more information on condition keys, see AWS Global Condition Context Keys.

Using identity-based policies for AWS CodeArtifact

This topic provides examples of identity-based policies that demonstrate how an account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles) and thereby grant permissions to perform operations on AWS CodeArtifact resources.

Important
We recommend that you first review the introductory topics that explain the basic concepts and options available to manage access to your CodeArtifact resources. For more information, see Overview of managing access permissions to your AWS CodeArtifact resources (p. 141).

Topics

Policy examples

The following IAM policy examples provide access to specific CodeArtifact actions and resources. Some policies include the `sts:GetServiceBearerToken` permission, which is required to call the `GetAuthorizationToken` API.

Allow a user to get information about repositories and domains

The following policy allows an IAM user or role to list and describe any type of CodeArtifact resource, including domains, repositories, packages, and assets. The policy also includes the `codeArtifact:ReadFromRepository` permission, which allows the principal to fetch packages from a CodeArtifact repository. It does not allow creating new domains or repositories and does not allow publishing new packages.

The `codeartifact:GetAuthorizationToken` and `sts:GetServiceBearerToken` permissions are required to call the `GetAuthorizationToken` API.

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "codeartifact:List*",
            "codeartifact:Describe*",
            "codeartifact:Get*",
            "codeartifact:Read*"
         ],
         "Resource": "*"
      },
      {
         "Effect": "Allow",
         "Action": "sts:GetServiceBearerToken",
         "Resource": "*",
         "Condition": {
            "StringEquals": {
               "sts:AWSServiceName": "codeartifact.amazonaws.com"
            }
         }
      }
   ]
}
```

Allow a user to get information about specific domains

The following shows an example of a permissions policy that allows a user to list domains only in the `us-east-2` region for account `123456789012` for any domain that starts with the name `my`.

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": "codeartifact:ListDomains",
         "Resource": "arn:aws:codeartifact:us-east-2:123456789012:domain/my*"
      }
   ]
}
```

Allow a user to get information about specific repositories

The following shows an example of a permissions policy that allows a user to get information about repositories that end with `test`, including information about the packages in them. The user will not be able to publish, create, or delete resources.

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "codeartifact:List*",
            "codeartifact:Describe*",
            "codeartifact:Get*",
            "codeartifact:Read*"
         ],
         "Resource": "arn:aws:codeartifact:*:*:repository/*/*test"
      },
      {
         "Effect": "Allow",
         "Action": [
            "codeartifact:List*",
            "codeartifact:Describe*"
         ],
         "Resource": "arn:aws:codeartifact:*:*:package/*/*test/*/*/*"
      },
      {
         "Effect": "Allow",
         "Action": "sts:GetServiceBearerToken",
         "Resource": "*",
         "Condition": {
            "StringEquals": {
               "sts:AWSServiceName": "codeartifact.amazonaws.com"
            }
         }
      },
      {
         "Effect": "Allow",
         "Action": "codeartifact:GetAuthorizationToken",
         "Resource": "*"
      }
   ]
}
```

Permissions required to use the AWS CodeArtifact console

A user who uses the AWS CodeArtifact console must have a minimum set of permissions that allows the user to describe other AWS resources for the AWS account. You must have permissions from the following services:

- AWS CodeArtifact
- AWS Key Management Service (AWS KMS)

If you create an IAM policy that is more restrictive than the minimum required permissions, the console won't function as intended.

AWS managed (predefined) policies for AWS CodeArtifact

AWS addresses many common use cases by providing standalone IAM policies that are created and administered by AWS. These AWS managed policies grant necessary permissions for common use cases so you can avoid having to investigate what permissions are needed. For more information, see AWS Managed Policies in the *IAM User Guide*.

The following AWS managed policies, which you can attach to users in your account, are specific to AWS CodeArtifact.

- `AWSCodeArtifactAdminAccess` – Provides full access to CodeArtifact including permissions to administrate CodeArtifact domains.

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Action": [
            "codeartifact:*"
         ],
         "Effect": "Allow",
         "Resource": "*"
      },
      {
         "Effect": "Allow",
         "Action": "sts:GetServiceBearerToken",
         "Resource": "*",
         "Condition": {
            "StringEquals": {
               "sts:AWSServiceName": "codeartifact.amazonaws.com"
            }
         }
      }
   ]
}
```

- `AWSCodeArtifactReadOnlyAccess` – Provides read-only access to CodeArtifact.

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Action": [
            "codeartifact:Describe*",
            "codeartifact:Get*",
            "codeartifact:List*",
            "codeartifact:ReadFromRepository"
         ],
         "Effect": "Allow",
         "Resource": "*"
      },
      {
         "Effect": "Allow",
         "Action": "sts:GetServiceBearerToken",
         "Resource": "*",
         "Condition": {
            "StringEquals": {
               "sts:AWSServiceName": "codeartifact.amazonaws.com"
            }
         }
      }
   ]
}
```

To create and manage CodeArtifact service roles, you must also attach the AWS managed policy named `IAMFullAccess`.

You can also create your own custom IAM policies to allow permissions for CodeArtifact actions and resources. You can attach these custom policies to the IAM users or groups that require those permissions.

Limit authorization token duration

Users must authenticate to CodeArtifact with authorization tokens to publish or consume package versions. Authorization tokens are valid only during their configured lifetime. Tokens have a default lifetime of 12 hours. For more information on authorization tokens, see AWS CodeArtifact authentication and tokens (p. 155).

When fetching a token, users can configure the lifetime of the token. Valid values for the lifetime of an authorization token are `0`, and any number between `900` (15 minutes) and `43200` (12 hours). A value of `0` will create a token with a duration equal to the user's role's temporary credentials.

Administrators can limit the valid values for the lifetime of an authorization token by using the `sts:DurationSeconds` condition key in the permissions policy attached to the user or group. If the user attempts to create an authorization token with a lifetime outside of the valid values, the token creation will fail.

The following example policies limit the possible durations of an authorization token created by CodeArtifact users.

Example policy: Limit token lifetime to exactly 12 hours (43200 seconds)

With this policy, users will only be able to create authorization tokens with a lifetime of 12 hours.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codeartifact:*",
            "Resource": "*"
        },
        {
            "Sid": "sts",
            "Effect": "Allow",
            "Action": "sts:GetServiceBearerToken",
            "Resource": "*",
            "Condition": {
                "NumericEquals": {
                    "sts:DurationSeconds": 43200
                },
                "StringEquals": {
                    "sts:AWSServiceName": "codeartifact.amazonaws.com"
                }
            }
        }
    ]
}
```

Example policy: Limit token lifetime between 15 minutes and 1 hour, or equal to the user's temporary credentials period

With this policy, users will be able to create tokens that are valid between 15 minutes and 1 hour. Users will also be able to create a token that lasts the duration of their role's temporary credentials by specifying `0` for `--durationSeconds`.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codeartifact:*",
            "Resource": "*"
        },
        {
            "Sid": "sts",
            "Effect": "Allow",
            "Action": "sts:GetServiceBearerToken",
            "Resource": "*",
            "Condition": {
                "NumericLessThanEquals": {
                    "sts:DurationSeconds": 3600
                },
                "StringEquals": {
                    "sts:AWSServiceName": "codeartifact.amazonaws.com"
                }
            }
        }
    ]
}
```

Using tags to control access to CodeArtifact resources

Conditions in IAM user policy statements are part of the syntax that you use to specify permissions to resources required by CodeArtifact actions. Using tags in conditions is one way to control access to resources and requests. For information about tagging CodeArtifact resources, see Tagging resources (p. 167). This topic discusses tag-based access control.

When you design IAM policies, you might be setting granular permissions by granting access to specific resources. As the number of resources that you manage grows, this task becomes more difficult. Tagging resources and using tags in policy statement conditions can make this task easier. You grant access in bulk to any resource with a certain tag. Then you repeatedly apply this tag to relevant resources, during creation or later.

Tags can be attached to the resource or passed in the request to services that support tagging. In CodeArtifact, resources can have tags, and some actions can include tags. When you create an IAM policy, you can use tag condition keys to control:

- Which users can perform actions on a domain or repository resource, based on tags that it already has.
- Which tags can be passed in an action's request.
- Whether specific tag keys can be used in a request.

For the complete syntax and semantics of tag condition keys, see Controlling Access Using Tags in the *IAM User Guide*.

The following examples demonstrate how to specify tag conditions in policies for CodeArtifact users.

Example 1: Limit actions based on tags in the request

The `AWSCodeArtifactAdminAccess` managed user policy gives users unlimited permission to perform any CodeArtifact action on any resource.

The following policy limits this power and denies unauthorized users permission to create repositories unless the request contains certain tags. To do that, it denies the `CreateRepository` action if the request does not specify a tag named `costcenter` with one of the values `1` or `2`. A customer's administrator must attach this IAM policy to unauthorized IAM users, in addition to the managed user policy.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Deny",
      "Action": "codeartifact:CreateRepository",
      "Resource": "*",
      "Condition": {
        "Null": {
          "aws:RequestTag/costcenter": "true"
        }
      }
    },
    {
      "Effect": "Deny",
      "Action": "codeartifact:CreateRepository",
      "Resource": "*",
      "Condition": {
          "ForAnyValue:StringNotEquals": {
              "aws:RequestTag/costcenter": [
                  "1",
                  "2"
              ]
          }
      }
    }
  ]
}
```

Example 2: Limit actions based on resource tags

The `AWSCodeArtifactAdminAccess` managed user policy gives users unlimited permission to perform any CodeArtifact action on any resource.

The following policy limits this power and denies unauthorized users permission to perform actions on repositories in specified domains. To do that, it denies some actions if the resource has a tag named `Key1` with one of the values `Value1` or `Value2`. (The `aws:ResourceTag` condition key is used to control access to the resources based on the tags on those resources.) A customer's administrator must attach this IAM policy to unauthorized IAM users, in addition to the managed user policy.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Deny",
      "Action": [
        "codeartifact:TagResource",
        "codeartifact:UntagResource",
        "codeartifact:DescribeDomain",
        "codeartifact:DescribeRepository",
        "codeartifact:PutDomainPermissionsPolicy",
        "codeartifact:PutRepositoryPermissionsPolicy",
        "codeartifact:ListRepositoriesInDomain",
        "codeartifact:UpdateRepository",
        "codeartifact:ReadFromRepository",
        "codeartifact:ListPackages",
        "codeartifact:ListTagsForResource"
      ],
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "aws:ResourceTag/Key1": ["Value1", "Value2"]
        }
      }
    }
  ]
}
```

Example 3: Allow actions based on resource tags

The following policy grants users permission to perform actions on, and get information about, repositories and packages in CodeArtifact.

To do that, it allows specific actions if the repository has a tag named `Key1` with the value `Value1`. (The `aws:RequestTag` condition key is used to control which tags can be passed in an IAM request.) The `aws:TagKeys` condition ensures tag key case sensitivity. This policy is useful for IAM users who don't have the `AWSCodeArtifactAdminAccess` managed user policy attached. The managed policy gives users unlimited permission to perform any CodeArtifact action on any resource.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "codeartifact:UpdateRepository",
        "codeartifact:DeleteRepository",
        "codeartifact:ListPackages",
        "codeartifact:ListPackageVersions"
      ],
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "aws:ResourceTag/Key1": "Value1"
        },
        "ForAllValues:StringEquals": {
          "aws:TagKeys": ["Key1"]
        }
      }
    }
  ]
}
```

Example 4: Allow actions based on tags in the request

The following policy grants users permission to create repositories in specified domains in CodeArtifact.

To do that, it allows the `CreateRepository` and `TagResource` actions if the create resource API in the request specifies a tag named `Key1` with the value `Value1`. (The `aws:RequestTag` condition key is used to control which tags can be passed in an IAM request.) The `aws:TagKeys` condition ensures tag key case sensitivity. This policy is useful for IAM users who don't have the `AWSCodeArtifactAdminAccess` managed user policy attached. The managed policy gives users unlimited permission to perform any CodeArtifact action on any resource.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "codeartifact:CreateRepository",
        "codeartifact:TagResource"
      ],
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "aws:RequestTag/Key1": "Value1"
        },
        "ForAllValues:StringEquals": {
          "aws:TagKeys": ["Key1"]
        }
      }
    }
  ]
}
```

AWS CodeArtifact permissions reference

You can use the following table as a reference when you are setting up Access control (p. 140) and writing permissions policies that you can attach to an IAM identity (identity-based policies).

You can use AWS-wide condition keys in your AWS CodeArtifact policies to express conditions. For a list, see IAM JSON Policy Elements Reference in the *IAM User Guide*.

You specify the actions in the policy's `Action` field. To specify an action, use the `codeartifact:` prefix followed by the API operation name (for example, `codeartifact:CreateDomain` and `codeartifact:AssociateExternalConnection`). To specify multiple actions in a single statement, separate them with commas (for example, `"Action": [ "codeartifact:CreateDomain", "codeartifact:AssociateExternalConnection" ]`).

Using wildcard characters

You specify an ARN, with or without a wildcard character (*), as the resource value in the policy's `Resource` field. You can use a wildcard to specify multiple actions or resources. For example, `codeartifact:*` specifies all CodeArtifact actions and `codeartifact:Describe*` specifies all CodeArtifact actions that begin with the word `Describe`.

Monitoring CodeArtifact

Monitoring is an important part of maintaining the reliability, availability, and performance of AWS CodeArtifact and your AWS solutions. You should collect monitoring data from all of the parts of your AWS solution so that you can more easily debug a multi-point failure, if one occurs. AWS provides the following for monitoring your CodeArtifact resources and for responding to potential incidents:

Topics

Logging CodeArtifact API calls with AWS CloudTrail

CodeArtifact is integrated with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in CodeArtifact. CloudTrail captures all API calls for CodeArtifact as events, including calls from package manager clients.

If you create a trail, you can enable continuous delivery of CloudTrail events to an Amazon Simple Storage Service (Amazon S3) bucket, including events for CodeArtifact. If you don't configure a trail, you can still view the most recent events in the CloudTrail console in **Event history**. Using the information collected by CloudTrail, you can determine the request that was made to CodeArtifact, the IP address from which the request was made, who made the request, when it was made, and additional details.

To learn more about CloudTrail, see the AWS CloudTrail User Guide.

CodeArtifact information in CloudTrail

CloudTrail is enabled on your AWS account when you create the account. When activity occurs in CodeArtifact, that activity is recorded in a CloudTrail event along with other AWS service events in **Event history**. You can view, search, and download recent events in your AWS account. For more information, see Viewing Events with CloudTrail Event History.

For an ongoing record of events in your AWS account, including events for CodeArtifact, create a *trail*. A trail enables CloudTrail to deliver log files to an Amazon S3 bucket. By default, when you create a trail in the console, the trail applies to all AWS Regions. The trail logs events from all Regions in the AWS partition and delivers the log files to the Amazon S3 bucket that you specify. You can also configure other AWS services to further analyze and act upon the event data collected in CloudTrail logs. For more information, see the following topics:

- Creating a Trail for Your AWS Account

- CloudTrail Supported Services and Integrations
- Configuring Amazon SNS Notifications for CloudTrail

When CloudTrail logging is enabled in your AWS account, API calls made to CodeArtifact actions are tracked in CloudTrail log files, where they are written with other AWS service records. CloudTrail determines when to create and write to a new file based on a time period and file size.

All CodeArtifact actions are logged by CloudTrail. For example, calls to the `ListRepositories` (in the AWS CLI, `aws codeartifact list-repositories`), `CreateRepository` (`aws codeartifact create-repository`), and `ListPackages` (`aws codeartifact list-packages`) actions generate entries in the CloudTrail log files, in addition to `npm` client commands such as `npm install` and `npm publish`. `npm` client commands typically make more than one HTTP request to the server. Each request generates a separate CloudTrail log event.

Cross-account delivery of CloudTrail logs

Up to three separate accounts receive CloudTrail logs for a single API call:

- The account that made the request—for example, the account that called `GetAuthorizationToken`.
- The repository administrator account—for example, the account that administers the repository that `ListPackages` was called on.
- The domain owner's account—for example, the account that owns the domain that contains the repository that an API was called on.

For APIs like `ListRepositoriesInDomain` that are actions against a domain and not a specific repository, only the calling account and the domain owner's account receive the CloudTrail log. For APIs like `ListRepositories` that are not authorized against any resource, only the account of the caller receives the CloudTrail log.

Understanding CodeArtifact log file entries

CloudTrail log files can contain one or more log entries. Each entry lists multiple JSON-formatted events. A log event represents a single request from any source and includes information about the requested action, the date and time of the action, request parameters, and so on. Log entries are not an ordered stack trace of the public API calls, so they do not appear in any specific order.

Topics

Example: A log entry for calling the GetAuthorizationToken API

A log entry created by `GetAuthorizationToken` includes the domain name in the `requestParameters` field.

```
{
  "eventVersion": "1.05",
  "userIdentity": {
      "type": "AssumedRole",
      "principalId": "AIDACKCEVSQ6C2EXAMPLE",
      "arn": "arn:aws:sts::123456789012:assumed-role/Console/example",
      "accountId": "123456789012",
      "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
      "sessionContext": {
          "attributes": {
              "mfaAuthenticated": "false",
              "creationDate": "2018-12-11T13:31:37Z"
          },
          "sessionIssuer": {
              "type": "Role",
              "principalId": "AIDACKCEVSQ6C2EXAMPLE",
              "arn": "arn:aws:iam::123456789012:role/Console",
              "accountId": "123456789012",
              "userName": "Console"
          }
      }
  },
  "eventTime": "2018-12-11T13:31:37Z",
  "eventSource": "codeartifact.amazonaws.com",
  "eventName": "GetAuthorizationToken",
  "awsRegion": "us-west-2",
  "sourceIPAddress": "205.251.233.50",
  "userAgent": "aws-cli/1.16.37 Python/2.7.10 Darwin/16.7.0 botocore/1.12.27",
  "requestParameters": {
      "domainName": "example-domain"
      "domainOwner": "123456789012"
  },
  "responseElements": {
      "sessionToken": "HIDDEN_DUE_TO_SECURITY_REASONS"
  },
  "requestID": "6b342fc0-5bc8-402b-a7f1-ffffffffffff",
  "eventID": "100fde01-32b8-4c2b-8379-ffffffffffff",
  "readOnly": false,
  "eventType": "AwsApiCall",
  "recipientAccountId": "123456789012"
}
```

Example: A log entry for fetching an npm package version

Requests made by the **`npm`** client have additional data logged including the domain name, repository name, and package name in the `requestParameters` field. The URL path and HTTP method are logged in the `additionalEventData` field.

```
{
   "eventVersion": "1.05",
   "userIdentity": {
       "type": "AssumedRole",
       "principalId": "AIDACKCEVSQ6C2EXAMPLE",
       "arn": "arn:aws:sts::123456789012:assumed-role/Console/example",
       "accountId": "123456789012",
       "accessKeyId": "ASIAIJIOBJIBSREXAMPLE",
       "sessionContext": {
           "attributes": {
               "mfaAuthenticated": "false",
               "creationDate": "2018-12-17T02:05:16Z"
           },
           "sessionIssuer": {
               "type": "Role",
               "principalId": "AIDACKCEVSQ6C2EXAMPLE",
               "arn": "arn:aws:iam::123456789012:role/Console",
               "accountId": "123456789012",
               "userName": "Console"
           }
       }
   },
   "eventTime": "2018-12-17T02:05:46Z",
   "eventSource": "codeartifact.amazonaws.com",
   "eventName": "ReadFromRepository",
   "awsRegion": "us-west-2",
   "sourceIPAddress": "205.251.233.50",
   "userAgent": "AWS Internal",
   "requestParameters": {
       "domainName": "example-domain",
       "domainOwner": "123456789012",
       "repositoryName": "example-repo",
       "packageName": "lodash",
       "packageFormat": "npm",
       "packageVersion": "4.17.20"
   },
   "responseElements": null,
   "additionalEventData": {
       "httpMethod": "GET",
       "requestUri": "/npm/lodash/-/lodash-4.17.20.tgz"
   },
   "requestID": "9f74b4f5-3607-4bb4-9229-ffffffffffff",
   "eventID": "c74e40dd-8847-4058-a14d-ffffffffffff",
   "readOnly": true,
   "eventType": "AwsApiCall",
   "recipientAccountId": "123456789012"
}
```

Compliance validation for AWS CodeArtifact

Third-party auditors assess the security and compliance of AWS services as part of multiple AWS compliance programs.

At present, AWS CodeArtifact is not in scope of any specific compliance programs.

For a list of AWS services in scope of specific compliance programs, see AWS Services in Scope by Compliance Program. For general information, see AWS Compliance Programs.

You can download third-party audit reports using AWS Artifact. For more information, see Downloading Reports in AWS Artifact in the *AWS Artifact User Guide*.

Your compliance responsibility when using CodeArtifact is determined by the sensitivity of your data, your company's compliance objectives, and applicable laws and regulations. If your use of CodeArtifact is subject to compliance with standards such as HIPAA, PCI, or FedRAMP, AWS provides resources to help:

- Security and Compliance Quick Start Guides – These deployment guides discuss architectural considerations and provide steps for deploying security- and compliance-focused baseline environments on AWS.
- Architecting for HIPAA Security and Compliance Whitepaper – This whitepaper describes how companies can use AWS to create HIPAA-compliant applications.
- AWS Compliance Resources – This collection of workbooks and guides might apply to your industry and location.
- AWS Config – This AWS service assesses how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- AWS Security Hub – This AWS service provides a comprehensive view of your security state within AWS that helps you check your compliance with security industry standards and best practices.

AWS CodeArtifact authentication and tokens

CodeArtifact requires users to authenticate with the service in order to publish or consume package versions. You must authenticate to the CodeArtifact service by creating an authorization token using your AWS credentials. In order to create an authorization token, you must have the correct permissions. For more information on CodeArtifact permissions, see Overview of managing access permissions to your AWS CodeArtifact resources (p. 141).

To fetch an authorization token from CodeArtifact, you must call the GetAuthorizationToken API. Using the AWS CLI, you can call `GetAuthorizationToken` with the `login` or `get-authorization-token` command.

- `aws codeartifact login` (npm, pip, and twine): This command makes it easy to configure common package managers to use CodeArtifact in a single step. Calling `login` fetches a token with `GetAuthorizationToken` and configures your package manager with the token and correct CodeArtifact repository endpoint.
- `aws codeartifact get-authorization-token`: For package managers not supported by `login`, you can call `get-authorization-token` directly and then configure your package manager with the token as required, for example, by adding it to a configuration file or storing it an environment variable.

CodeArtifact authorization tokens are valid for a default period of 12 hours. Tokens can be configured with a lifetime between 15 minutes and 12 hours. When the lifetime expires, you must fetch another token. The token lifetime begins after `login` or `get-authorization-token` is called.

If `login` or `get-authorization-token` is called while assuming a role, you can configure the lifetime of the token to be equal to the remaining time in the session duration of the role by setting the value of `--duration-seconds` to `0`. Otherwise, the token lifetime is independent of the maximum session duration of the role. For example, suppose that you call `sts assume-role` and specify a session duration of 15 minutes, and then call `login` to fetch a CodeArtifact authorization token. In this case, the token is valid for the full 12-hour period even though this is longer than the 15-minute session duration. For information about controlling session duration, see Using IAM Roles in the *IAM User Guide*.

Tokens created with the `login` command

The `aws codeartifact login` command will fetch a token with `GetAuthorizationToken` and configure your package manager with the token and correct CodeArtifact repository endpoint.

The following table describes the parameters for the `login` command.

Parameter	Required	Description
`--tool`	Yes	The package manager to authenticate to. Possible values are `npm`, `pip`, and `twine`.
`--domain`	Yes	The domain name that the repository belongs to.
`--domain-owner`	No	The ID of the owner of the domain. This parameter is required if accessing a domain that is owned by an AWS account that you are not authenticated to. For more information, see Cross-account domains (p. 73).
`--repository`	Yes	The name of the repository to authenticate to.
`--duration-seconds`	No	The time, in seconds, that the login information is valid. The minimum

Parameter	Required	Description
		value is 900* and maximum value is 43200.
`--namespace`	No	Associates a namespace with your repository tool.
`--dry-run`	No	Only print the commands that would be executed to connect your tool with your repository without making any changes to your configuration.
*A value of 0 is also valid when calling `login` while assuming a role. Calling `login` with `--duration-seconds 0` creates a token with a lifetime equal to the remaining time in the session duration of an assumed role.		

The following example shows how to fetch an authorization token with the `login` command.

```
aws codeartifact login --tool npm | pip | twine --domain my_domain --domain-
owner 111122223333 --repository my_repo
```

For specific guidance on how to use the `login` command with npm, see Configure and use npm with CodeArtifact (p. 84). For Python, see Configure clients with the login command (p. 96).

Tokens created with the `GetAuthorizationToken` API

You can call `get-authorization-token` to fetch an authorization token from CodeArtifact.

```
aws codeartifact get-authorization-token --domain my_domain --domain-owner 111122223333 --
query authorizationToken --output text
```

You can change how long a token is valid using the `--duration-seconds` argument. The minimum value is 900 and the maximum value is 43200. The following example creates a token that will last for 1 hour (3600 seconds).

```
aws codeartifact get-authorization-token --domain my_domain --domain-owner 111122223333 --
query authorizationToken --output text --duration-seconds 3600
```

If calling `get-authorization-token` while assuming a role the token lifetime is independent of the maximum session duration of the role. You can configure the token to expire when the assumed role's session duration expires by setting `--duration-seconds` to 0.

```
aws codeartifact get-authorization-token --domain my_domain --domain-owner 111122223333 --
query authorizationToken --output text --duration-seconds 0
```

See the following documentation for more information:

- For guidance on tokens and environment variables, see Pass an auth token using an environment variable (p. 158).
- For Python users, see Configure pip without the login command (p. 97) or Configure twine without the login command (p. 97).
- For Maven users, see Use CodeArtifact with Gradle (p. 100) or Use CodeArtifact with mvn (p. 105).

- For npm users, see Configuring npm without using the login command (p. 85).

Pass an auth token using an environment variable

AWS CodeArtifact uses authorization tokens vended by the `GetAuthorizationToken` API to authenticate and authorize requests from build tools such as Maven and Gradle. For more information on these auth tokens, see Tokens created with the `GetAuthorizationToken` API (p. 157).

You can store these auth tokens in an environment variable that can be read by a build tool to obtain the token it needs to fetch packages from a CodeArtifact repository or publish packages to it.

For security reasons, this approach is preferable to storing the token in a file where it might be read by other users or processes, or accidentally checked into source control.

1. Configure your AWS credentials as described in Install or upgrade and then configure the AWS CLI (p. 4).
2. Set the `CODEARTIFACT_AUTH_TOKEN` environment variable:

   Note
   In some scenarios, you don't need to include the `--domain-owner` argument. For more information, see Cross-account domains (p. 73).

   - macOS or Linux:

   ```
   export CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --
   domain my_domain --domain-owner 111122223333 --query authorizationToken --output
    text`
   ```

   - Windows (using default command shell):

   ```
   for /f %i in ('aws codeartifact get-authorization-token --domain my_domain --
   domain-owner 111122223333 --query authorizationToken --output text') do set
    CODEARTIFACT_AUTH_TOKEN=%i
   ```

   - Windows PowerShell:

   ```
   $env:CODEARTIFACT_AUTH_TOKEN = aws codeartifact get-authorization-token --
   domain my_domain --domain-owner 111122223333 --query authorizationToken --output text
   ```

Revoking CodeArtifact authorization tokens

When an authenticated user creates a token to access CodeArtifact resources, that token lasts until its customizable access period has ended. The default access period is 12 hours. In some circumstances, you might want to revoke access to a token before the access period has expired. You can revoke access to CodeArtifact resources by following these instructions.

If you created the access token using temporary security credentials, such as *assumed roles* or *federated user access*, you can revoke access by updating an IAM policy to deny access. For information, see Disabling Permissions for Temporary Security Credentials in the *IAM User Guide*.

If you used long-term IAM user credentials to create the access token, you must modify the user's policy to deny access, or delete the IAM user. For more information, see Changing Permissions for an IAM User or Deleting an IAM User.

If you used an account root user's credentials to call `GetAuthorizationToken`, you can't invalidate the authorization token before it expires because the root user doesn't have a permissions policy.

Resilience in AWS CodeArtifact

The AWS global infrastructure is built around AWS Regions and Availability Zones. AWS Regions provide multiple physically separated and isolated Availability Zones, which are connected with low-latency, high-throughput, and highly redundant networking. AWS CodeArtifact operates in multiple Availability Zones and stores artifact data and metadata in Amazon S3 and Amazon DynamoDB. Your encrypted data is redundantly stored across multiple facilities and multiple devices in each facility, making it highly available and highly durable.

For more information about AWS Regions and Availability Zones, see AWS Global Infrastructure.

Infrastructure security in AWS CodeArtifact

As a managed service, AWS CodeArtifact is protected by the AWS global network security procedures that are described in the Amazon Web Services: Overview of Security Processes whitepaper.

You use AWS published API calls to access CodeArtifact through the network. Clients must support Transport Layer Security (TLS) 1.2 or later. Clients must also support cipher suites with perfect forward secrecy (PFS) such as Ephemeral Diffie-Hellman (DHE) or Elliptic Curve Ephemeral Diffie-Hellman (ECDHE). Most modern systems such as Java 7 and later support these modes.

Requests must be signed by using an access key ID and a secret access key that is associated with an IAM principal. Or you can use the AWS Security Token Service (AWS STS) to generate temporary security credentials to sign requests.

Working with Amazon VPC endpoints

You can configure CodeArtifact to use an interface virtual private cloud (VPC) endpoint to improve the security of your VPC.

VPC endpoints use AWS PrivateLink, a service that makes it possible for you to access CodeArtifact APIs through private IP addresses. AWS PrivateLink restricts all network traffic between your VPC and CodeArtifact to the AWS network. When you use an interface VPC endpoint, you don't need an internet gateway, NAT device, or virtual private gateway. For more information, see VPC Endpoints in the *Amazon Virtual Private Cloud User Guide*.

Important

- VPC endpoints do not support cross-AWS Region requests. Make sure that you create your endpoint in the same AWS Region where you plan to issue your API calls to CodeArtifact.
- VPC endpoints only support Amazon-provided DNS through Amazon Route 53. If you want to use your own DNS, you can use conditional DNS forwarding. For more information, see DHCP Option Sets in the *Amazon Virtual Private Cloud User Guide*.
- The security group attached to the VPC endpoint must allow incoming connections on port 443 from the private subnet of the VPC.

Topics

Create VPC endpoints for CodeArtifact

To create virtual private cloud (VPC) endpoints for CodeArtifact, use the Amazon EC2 `create-vpc-endpoint` AWS CLI command. For more information, see Interface VPC Endpoints (AWS PrivateLink) in the *Amazon Virtual Private Cloud User Guide*.

Two VPC endpoints are required so that all requests to CodeArtifact are in the AWS network. The first endpoint is used to call CodeArtifact APIs (for example, `GetAuthorizationToken` and `CreateRepository`).

```
com.amazonaws.region.codeartifact.api
```

The second endpoint is used to access CodeArtifact repositories using package managers and build tools (for example, npm and Gradle).

```
com.amazonaws.region.codeartifact.repositories
```

The following command creates an endpoint to access CodeArtifact repositories.

```
aws ec2 create-vpc-endpoint --vpc-id vpcid --vpc-endpoint-type Interface \
  --service-name com.amazonaws.region.codeartifact.api --subnet-ids subnetid \
  --security-group-ids groupid --no-private-dns-enabled
```

The following command creates an endpoint to access package managers and build tools.

```
aws ec2 create-vpc-endpoint --vpc-id vpcid --vpc-endpoint-type Interface \
  --service-name com.amazonaws.region.codeartifact.repositories --subnet-ids subnetid \
  --security-group-ids groupid --private-dns-enabled
```

Note
When you create a `codeartifact.repositories` endpoint, you must create a private DNS hostname using the `--private-dns-enabled` option. However, because multiple private DNS hostnames are not currently supported for the `codeartifact.api` and `codeartifact.repositories` endpoints, use the `--no-private-dns-enabled` option for `codeartifact.api`.

Create the Amazon S3 gateway endpoint

CodeArtifact uses Amazon Simple Storage Service (Amazon S3) to store package assets. To pull packages from CodeArtifact, you must create a gateway endpoint for Amazon S3. When your build or deployment process downloads packages from CodeArtifact, it must access CodeArtifact to get package metadata and Amazon S3 to download package assets (for example, Maven `.jar` files).

To create the Amazon S3 gateway endpoint for CodeArtifact, use the Amazon EC2 `create-vpc-endpoint` AWS CLI command. When you create the endpoint, you must select the route tables for your VPC. For more information, see Gateway VPC Endpoints in the *Amazon Virtual Private Cloud User Guide*.

The following command creates an Amazon S3 endpoint.

```
aws ec2 create-vpc-endpoint --vpc-id vpcid --service-name com.amazonaws.region.s3 \
  --route-table-ids routetableid
```

Minimum Amazon S3 bucket permissions for AWS CodeArtifact

The Amazon S3 gateway endpoint uses an IAM policy document to limit access to the service. To allow only the minimum Amazon S3 bucket permissions for CodeArtifact, restrict access to the Amazon S3 bucket that CodeArtifact uses when you create the IAM policy document for the endpoint.

The following table describes the Amazon S3 buckets you should reference in your policies to allow access to CodeArtifact in each region.

Region	Amazon S3 Bucket ARN
us-east-1	arn:aws:s3:::assets-193858265520-us-east-1
us-east-2	arn:aws:s3:::assets-250872398865-us-east-2
us-west-2	arn:aws:s3:::assets-787052242323-us-west-2
eu-west-1	arn:aws:s3:::assets-438097961670-eu-west-1

Region	Amazon S3 Bucket ARN
eu-west-2	arn:aws:s3:::assets-247805302724-eu-west-2
eu-west-3	arn:aws:s3:::assets-762466490029-eu-west-3
eu-north-1	arn:aws:s3:::assets-611884512288-eu-north-1
eu-south-1	arn:aws:s3:::assets-484130244270-eu-south-1
eu-central-1	arn:aws:s3:::assets-769407342218-eu-central-1
ap-northeast-1	arn:aws:s3:::assets-660291247815-ap-northeast-1
ap-southeast-1	arn:aws:s3:::assets-421485864821-ap-southeast-1
ap-southeast-2	arn:aws:s3:::assets-860415559748-ap-southeast-2
ap-south-1	arn:aws:s3:::assets-681137435769-ap-south-1

You can use the `aws codeartifact describe-domain` command to fetch the Amazon S3 bucket used by a CodeArtifact domain.

```
aws codeartifact describe-domain --domain mydomain
```

```
{
  "domain": {
    "name": "mydomain",
    "owner": "111122223333",
    "arn": "arn:aws:codeartifact:us-west-2:111122223333:domain/mydomain",
    "status": "Active",
    "createdTime": 1583075193.861,
    "encryptionKey": "arn:aws:kms:us-west-2:111122223333:key/a73que8sq-ba...",
    "repositoryCount": 13,
    "assetSizeBytes": 513830295,
    "s3BucketArn": "arn:aws:s3:::assets-787052242323-us-west-2"
  }
}
```

Example

The following example illustrates how to provide access to the Amazon S3 buckets required for CodeArtifact operations in the `us-east-1` region. For other regions, update the `Resource` entry with the correct permission ARN for your region based on the table above.

```
{
  "Statement": [
    {
      "Sid": "Access-to-specific-bucket-only",
      "Principal": "*",
      "Action": [
        "s3:GetObject"
      ],
      "Effect": "Allow",
      "Resource": ["arn:aws:s3:::assets-193858265520-us-east-1/*"]
    }
  ]
}
```

Use CodeArtifact from a VPC

Because the `com.amazonaws.region.codeartifact.api` endpoint uses a hostname different from the default hostname used by CodeArtifact, you must override the hostname when you use the CodeArtifact AWS CLI or SDK.

Run the following command to find a VPC endpoint to use to override the hostname.

```
$ aws ec2 describe-vpc-endpoints --filters Name=service-
name,Values=com.amazonaws.region.codeartifact.api \
  --query 'VpcEndpoints[*].DnsEntries[*].DnsName'
```

The output looks like the following.

```
[
  [
    "vpce-0743fe535b883ffff-76ddffff.api.codeartifact.us-west-2.vpce.amazonaws.com",
    "vpce-0743fe535b883ffff-76edffff-us-west-2a.api.codeartifact.us-
west-2.vpce.amazonaws.com",
  ]
]
```

In this example, you can use either hostname to override the `com.amazonaws.region.codeartifact.api` endpoint.

If you use the CodeArtifact AWS CLI, pass the hostname to the `--endpoint-url` parameter, as in the following example.

```
aws codeartifact login --tool npm --domain mydomain --domain-owner 111122223333 --
repository myrepo --endpoint-url VPC_endpoint
```

If you use the SDK, consult your SDK documentation to learn how to override a hostname. How to do this varies by the language that you use.

Create a VPC endpoint policy for CodeArtifact

To create a VPC endpoint policy for CodeArtifact, specify the following:

- The principal that can perform actions.
- The actions that can be performed.
- The resources that can have actions performed on them.

The following example policy specifies that principals in the account 123456789012 can call the `GetAuthorizationToken` API and fetch packages from a CodeArtifact repository.

```
{
  "Statement": [
    {
      "Action": [
        "codeartifact:GetAuthorizationToken",
        "codeartifact:GetRepositoryEndpoint",
        "codeartifact:ReadFromRepository",
        "sts:GetServiceBearerToken"
      ],
      "Effect": "Allow",
      "Resource": "*",
      "Principal": {
         "AWS": "arn:aws:iam::123456789012:root"
       }
    }
  ]
}
```

Creating CodeArtifact resources with AWS CloudFormation

CodeArtifact is integrated with AWS CloudFormation, a service that helps you model and set up your AWS resources so that you can spend less time creating and managing your resources and infrastructure. You create a template that describes all the AWS resources that you want (like domains or repositories), and AWS CloudFormation takes care of provisioning and configuring those resources for you.

When you use AWS CloudFormation, you can reuse your template to set up your CodeArtifact resources consistently and repeatedly. Just describe your resources once and then provision the same resources over and over in multiple accounts and AWS Regions.

CodeArtifact and AWS CloudFormation templates

To provision and configure resources for CodeArtifact and related services, you must understand AWS CloudFormation templates. Templates are formatted text files in JSON or YAML. These templates describe the resources that you want to provision in your AWS CloudFormation stacks. If you're unfamiliar with JSON or YAML, you can use AWS CloudFormation Designer to help you get started with AWS CloudFormation templates. For more information, see What is AWS CloudFormation Designer? in the *AWS CloudFormation User Guide*.

CodeArtifact supports creating domains and repositories in AWS CloudFormation. For more information, including examples of JSON and YAML templates for domains and repositories, see AWS::CodeArtifact::Domain and AWS::CodeArtifact::Repository.

Learn more about AWS CloudFormation

To learn more about AWS CloudFormation, see the following resources:

- AWS CloudFormation
- AWS CloudFormation User Guide
- AWS CloudFormation Command Line Interface User Guide

Troubleshooting

The following information might help you troubleshoot common issues with CodeArtifact.

I cannot view notifications

Problem: When you are in the Developer Tools console and choose **Notifications** under **Settings**, you see a permissions error.

Possible fixes: While notifications are a feature of the Developer Tools console, CodeArtifact does not currently support notifications. None of the managed policies for CodeArtifact include permissions that allow users to view or manage notifications. If you use other services in the Developer Tools console, and those services support notifications, the managed policies for those services include the permissions required to view and manage notifications for those services.

Tagging resources

A *tag* is a custom attribute label that you or AWS assigns to an AWS resource. Each AWS tag has two parts:

- A *tag key* (for example, `CostCenter`, `Environment`, `Project`, or `Secret`). Tag keys are case sensitive.
- An optional field known as a *tag value* (for example, `111122223333`, `Production`, or a team name). Omitting the tag value is the same as using an empty string. Like tag keys, tag values are case sensitive.

Together these are known as key-value pairs.

Tags help you identify and organize your AWS resources. Many AWS services support tagging, so you can assign the same tag to resources from different services to indicate that the resources are related. For example, you can assign the same tag to a repository that you assign to an AWS CodeBuild project.

For tips on using tags, see the AWS Tagging Strategies post on the *AWS Answers* blog.

You can tag the following resource types in CodeArtifact:

- Tag a repository in CodeArtifact (p. 32)
- Tag a domain in CodeArtifact (p. 79)

You can use the console, AWS CLI, CodeArtifact APIs, or AWS SDKs to:

- Add tags to a domain or repository when you create it*.
- Add, manage, and remove tags for a domain or repository.

* You cannot add tags to a domain or repository when you create it in the console.

In addition to identifying, organizing, and tracking your resource with tags, you can use tags in IAM policies to help control who can view and interact with your resource. For examples of tag-based access policies, see Using tags to control access to CodeArtifact resources (p. 149)

Quotas in AWS CodeArtifact

The following table describes resource quotas in CodeArtifact. To view the resource quotas along with the list of service endpoints for CodeArtifact, see AWS service quotas in the *Amazon Web Services General Reference*.

You can request a service quota increase for the following CodeArtifact resource quotas. For more information about requesting a service quota increase, see AWS Service Quotas.

Name	Default	Adjustable
Asset file size maximum	1 Gigabytes	No
Assets per package version maximum	100	No
CopyPackageVersions maximum requests per second	5	No
Direct upstream repository maximum	10	No
Domains per AWS account maximum	10	No
GetAuthorizationToken maximum requests per second	40	No
GetPackageVersionAsset maximum requests per second	50	No
ListPackageVersionAssets maximum requests per second	20	No
ListPackageVersions maximum requests per second	200	No
ListPackages maximum requests per second	200	No
Maximum requests per second using a single authentication token.	800	No
Repositories per domain maximum	1,000	No
Repository maximum read requests per second from a single AWS account	800	No
Repository maximum read requests per second from multiple AWS accounts	800	No
Repository maximum write requests per second from a single AWS account	100	No
Repository maximum write requests per second from multiple AWS accounts	100	No
Requests without authentication token per IP address maximum	600	No
Upstream repository search maximum	25	No

AWS CodeArtifact user guide document history

Latest documentation update: August 25, 2021

update-history-change	update-history-description	update-history-date
Added in-depth documentation for updating the status of package versions (p. 169)	Expanded the update package version status documentation into its own topic. Added documentation for updating a package version's status, including required IAM permissions, example AWS CLI commands for various scenarios, and possible errors. See Update package version status (p. 66) for more information.	September 1, 2021
Updated the copy package versions documentation with more in-depth permissions information (p. 169)	Added more information about the required IAM and resource-based policy permissions for calling the `aws codeartifact copy-package-versions` command to copy package versions from one repository to another within the same domain in CodeArtifact. Along with more information, there are now examples of the required resource-based policies for the source and destination repository. See Required IAM permissions to copy packages (p. 58) for more information.	August 25, 2021
Updated documentation for running a Gradle build in IntelliJ IDEA (p. 169)	Updated the documentation for running a Gradle build in IntelliJ IDEA with steps for configuring Gradle to fetch plugins from CodeArtifact. Also added an option to create a new CodeArtifact authorization token for each new run with an inline call to `aws codeartifact get-authorization-token`. See Run a Gradle build in IntelliJ IDEA (p. 103) for more information.	August 23, 2021

Added documentation for configuring and using Yarn with AWS CodeArtifact (p. 169)	Added documentation for configuring and using Yarn 1.X and Yarn 2.X to manage npm packages with CodeArtifact. See Configure and use Yarn with CodeArtifact (p. 87) for more information.	July 30, 2021
AWS CodeArtifact now supports NuGet packages (p. 169)	CodeArtifact users can now publish and consume NuGet packages. Added documentation for configuring and using both Visual Studio and NuGet command line tools like `nuget` and `dotnet` with CodeArtifact repositories. See Using CodeArtifact with NuGet (p. 113) for more information.	November 19, 2020
Tagging resources in AWS CodeArtifact (p. 169)	Added documentation about tagging repositories and domains in AWS CodeArtifact. See Tagging resources (p. 167).	October 30, 2020
CodeArtifact now supports AWS CloudFormation (p. 169)	CodeArtifact users can now use AWS CloudFormation templates to create CodeArtifact repositories and domains. See Creating CodeArtifact resources with AWS CloudFormation (p. 165) for more information and to get started.	October 8, 2020
Add information about creating Amazon S3 gateway endpoints to use CodeArtifact with Amazon VPC (p. 169)	Added information about creating Amazon S3 gateway endpoints with the Amazon EC2 AWS CLI command. This documentation also contains information about the specific permissions that CodeArtifact requires to be used with Amazon VPC environments. See Create the Amazon S3 gateway endpoint (p. 161).	August 12, 2020
Publishing Maven artifacts with curl and publishing third-party Maven artifacts (p. 169)	Added guidance for Publishing with curl (p. 109) and Publish third-party artifacts (p. 108).	August 10, 2020
General Availability (GA) release (p. 169)	Initial version of the CodeArtifact User Guide.	June 10, 2020