AWS CodeDeploy

AWS CodeDeploy is a fully managed deployment service provided by Amazon Web Services (AWS) that automates the process of deploying applications to various computing services, such as Amazon EC2, AWS Lambda, and on-premises servers. It enables you to easily manage, control, and track application deployments, ensuring that they occur reliably with minimal downtime.

Key Features of AWS CodeDeploy:

1. **Automated Deployments**:
    - Automates application deployments to any instance, eliminating the need for manual updates.
    - Supports rolling, blue/green, and canary deployments to minimize downtime and reduce risk.
2. **Supports Multiple Compute Services**:
    - Can deploy to Amazon EC2 instances, AWS Lambda functions, and on-premises servers.
3. **Customizable Deployment Configurations**:
    - Allows for flexible deployment configurations, such as rolling updates, where updates are gradually rolled out to a fleet of instances.
    - Can also specify custom deployment strategies, such as blue/green deployments or canary deployments.
4. **Monitoring and Rollback**:
    - Integrates with Amazon CloudWatch to monitor the status of deployments.
    - Allows automatic rollback if a deployment fails or doesn't meet specified criteria.
5. **Platform Agnostic**:
    - Works with applications developed in various languages and environments, including Java, Node.js, .NET, PHP, Python, and Ruby.
6. **Integration with CI/CD Pipelines**:
    - Easily integrates with other AWS services like CodePipeline, CodeBuild, and third-party CI/CD tools like Jenkins, enabling continuous delivery of applications.
7. **Detailed Reporting**:
    - Provides detailed logs and reports on deployment activities, enabling better understanding and troubleshooting of deployment processes.
8. **Security and Access Management**:

    - Uses AWS Identity and Access Management (IAM) roles and policies to control who can perform actions on your deployments and the resources that CodeDeploy can interact with.

Basic Workflow of AWS CodeDeploy:

1. **Create a Deployment Application**:
    - Define your application and specify the repository where the application source code resides.
2. **Create a Deployment Group**:
    - Define a group of EC2 instances, Lambda functions, or on-premises servers where the application will be deployed.
    - Configure deployment settings like type (in-place or blue/green) and monitoring alarms.
3. **Create a Deployment**:
    - Specify the application version to deploy, the deployment group, and any additional deployment options.
4. **Monitor Deployment**:
    - Track the progress of the deployment in real-time through the AWS Management Console or CloudWatch logs.
5. **Rollback if Necessary**:
    - If the deployment fails or does not meet the specified criteria, you can automatically or manually rollback to the previous version.

Use Cases for AWS CodeDeploy:

- **Rolling Out New Features**: Deploy new features gradually to ensure they work as expected before being released to all users.
- **Blue/Green Deployments**: Deploy new versions of applications side by side with old versions to test in production before fully switching over.
- **Lambda Function Deployments**: Update serverless applications without downtime by deploying new versions of Lambda functions.
- **Hybrid Deployments**: Manage deployments across a hybrid environment, including both cloud-based and on-premises servers.

Would you like more details on any specific aspect of AWS CodeDeploy, such as a step-by-step guide to setting it up?

Setup Of AWS CodeDeploy

Here's a step-by-step guide to setting up AWS CodeDeploy for deploying an application to Amazon EC2 instances:

Prerequisites:

1. **AWS Account**: Ensure you have an AWS account.
2. **EC2 Instances**: Launch and configure EC2 instances with the necessary applications or services.
3. **IAM Roles**: Create IAM roles for your EC2 instances and for CodeDeploy to access your resources.

Step 1: Set Up an IAM Role for EC2 Instances

1. Go to the **IAM Console** in AWS.
2. Click on **Roles** and then **Create Role**.
3. Choose **EC2** as the service that will use this role.
4. Attach the **AmazonEC2RoleforAWSCodeDeploy** policy to this role.
5. Give the role a name (e.g., `EC2CodeDeployRole`) and complete the creation process.
6. Attach this IAM role to your EC2 instances.

Step 2: Set Up an IAM Role for CodeDeploy

1. In the **IAM Console**, go to **Roles** and **Create Role**.
2. Choose **CodeDeploy** as the service that will use this role.
3. Attach the **AWSCodeDeployRole** policy.
4. Name the role (e.g., `CodeDeployServiceRole`) and create it.

Step 3: Install CodeDeploy Agent on EC2 Instances

1. **Connect to your EC2 instances** via SSH.

Run the following commands to install the CodeDeploy agent:
For **Amazon Linux** or **Amazon Linux 2**:
bash
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```
sudo yum update -y
sudo yum install ruby -y
sudo yum install wget -y
cd /home/ec2-user
```

```
wget
https://aws-codedeploy-us-east-1.s3.us-east-1.amazonaws.com/latest/install
chmod +x ./install
sudo ./install auto
sudo service codedeploy-agent start
```

For **Ubuntu**:

bash

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```
sudo apt-get update
sudo apt-get install ruby -y
sudo apt-get install wget -y
cd /home/ubuntu
wget
https://aws-codedeploy-us-east-1.s3.us-east-1.amazonaws.com/latest/install
chmod +x ./install
sudo ./install auto
sudo service codedeploy-agent start
```

Ensure that the agent is running:

bash

Copy code

```
sudo service codedeploy-agent status
```

2.

Step 4: Create an Application in AWS CodeDeploy

1. Go to the **CodeDeploy Console** in AWS.
2. Click on **Create application**.
3. Provide an **Application name** (e.g., `MyWebApp`).
4. Choose **EC2/On-Premises** as the Compute Platform.
5. Click on **Create application**.

Step 5: Create a Deployment Group

1. In your created application, click on **Create deployment group**.
2. Provide a **Deployment group name** (e.g., `MyWebApp-DeploymentGroup`).

3. Select the **Service Role** created earlier (e.g., `CodeDeployServiceRole`).
4. In the **Environment configuration** section, choose whether to use EC2 instances or on-premises servers.
    - For EC2 instances, choose the **Auto Scaling group** or **Tag** that identifies the instances you want to deploy to.
5. Under **Deployment type**, choose either **In-place** or **Blue/Green**.
6. Under **Deployment settings**, select the appropriate options based on your needs.
7. Click **Create deployment group**.

Step 6: Create a Deployment

1. Click on **Create deployment** in the Deployment Group you just created.
2. Choose a **Revision type**:
    - **My application is stored in S3**: Specify the S3 bucket and object key.
    - **My application is stored in GitHub**: Authenticate with GitHub and select the repository and branch.
3. Choose a **Deployment configuration** (e.g., **CodeDeployDefault.OneAtATime** for one instance at a time).
4. Specify the **File type** and location for your **AppSpec file**.
5. Click **Create deployment**.

Step 7: Monitor and Verify Deployment

1. Go to the **Deployments** section under your application.
2. Monitor the progress and logs of the deployment in real-time.
3. Once the deployment is complete, verify that the application is running as expected on the EC2 instances.

Step 8: Optional - Set Up Automatic Rollbacks

1. In the **Deployment group settings**, you can configure automatic rollback settings.
2. Choose to roll back the deployment if it fails or doesn't meet certain criteria.

Step 9: Test Your Deployment

- Make changes to your application code and push the changes to the specified S3 bucket or GitHub repository.
- Create another deployment to test how CodeDeploy handles updates.

This setup should give you a fully functioning AWS CodeDeploy environment for deploying applications to EC2 instances. If you need more details on any specific part, feel free to ask!