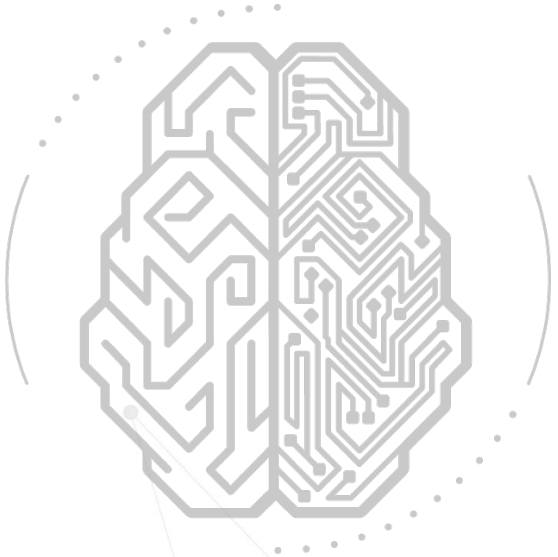
Cloud-Native Way of DevOps



Speaker

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AWS APN Ambassador

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Demo - Setup Jenkins Server & connect with Github

Provisioning Ec2

- Open the EC2 console
- From the navigation bar, choose AMIs.
- Select the AMI, and then choose Launch.
- Choose an instance type, and then choose Next: Configure Instance Details. Optionally select configuration details, such as associating an IAM role with the instance.
- Select Next: Add Storage.
- Select Next: Add Tags. You can add custom tags to your instance to help you categorize your resources.
- Select Next: Configure Security Group. You can associate a security group with your instance to allow or block traffic to the instance.
- Select Review and Launch. Review the instance details.
- Select an existing key pair or create a new key pair, select the acknowledge agreement box, and then choose Launch Instances.
- Choose View Instances to check the status of your instance.

Installing Jenkins

Step 1. Firstly, add Jenkins repository using wget, so that yum get to know where to install Jenkins from.

```
sudo yum install wget git
sudo amazon-linux-extras install java-openjdk11
sudo amazon-linux-extras install epel -y
```

Step 2. Now, let's add the Jenkins GPG key to our trusted keys, so that we will be able to verify/trust the files that are being sourced (while installing Jenkins)are from trusted site.

```
sudo wget -O /etc/yum.repos.d/jenkins.repo http://pkg.jenkins-ci.org/redhat/jenkins.repo
sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io.key
sudo yum install jenkins
sudo service jenkins start
```

Step 3. Make sure to open port 8080 (default port to which Jenkins listen):

Step 4. To unlock jenkins fetch the administrator password by typing following command:

```
sudo su && cat /var/lib/jenkins/secrets/initialAdminPassword
```

Step 5. Click on 'Install suggested plugins' in the customize Jenkins window.

Step 6. Create first admin user

Assignment - Deploy a Cloudformation which Ec2 with Nginx in it via Jenkins

Devops Technology Stack

CONTINUOUS INTEGRATION CONTINUOUS DELIVERY


AWS CodeCommit


AWS CodeBuild


AWS CodeDeploy


AWS CodePipeline

INFRASTRUCTURE & AUTOMATION


AWS CloudFormation


AWS OpsWorks


AWS System Manager


AWS CodeDeploy

MONITORING & SECURITY


Amazon CloudWatch


Amazon CloudTrail


Amazon X-Ray


Amazon Config


Amazon Inspector


AWS Trusted Advisor


AWS System Manager


AWS KMS

PLATFORM AS SERVICE


AWS Lambda


AWS Elastic Beanstalk


AWS Elastic Container Service


Amazon ECS for Kubernetes


AWS Fargate

AWS CloudFormation

Model and provision all your cloud infrastructure resources

Cloud Infrastructure Resources

AWS CloudFormation

Management
- Cross account & cross-region management
- Dependency management
- Preview changes to your environment
- Automates the provisioning and updating of your infrastructure in a safe and controlled manner

Extensibility
- Model, provision, and manage third party application resources
- Familiarity with programming languages
- Authoring with JSON/YAML

Key Benefits

Model it all

AWS CloudFormation allows you to model your entire infrastructure and application resources with either a text file or programming languages

Automate & deploy

AWS CloudFormation provisions your application resources in a safe, repeatable manner, allowing you to build and rebuild your infrastructure and applications, without having to perform manual actions

Codification

You can author infrastructure with any code editor, check it into a version control system, and review the files with team members before deploying into production.

Demo - Launch a Cloudformation

Amazon CloudWatch

Observability of your AWS resources and applications on AWS and on-premises

AWS resources and applications

Amazon CloudWatch

Collect
- Easily collect and store logs
- Built-in metrics
- Custom Metrics
- Collect and aggregate container metrics and logs

Monitor
- Unified operational view with dashboards
- High resolution alarms
- Logs and metrics correlation
- Application Insights for .NET and SQL Server applications
- Container monitoring insights
- Anomaly Detection
- ServiceLens
- Synthetics

Act
- Auto Scaling
- Automate response to operational changes with CloudWatch Events
- Alarm and automate actions on EKS, ECS, and k8s clusters

Analyze
- Granular data and extended retention
- Custom operations on metrics
- Analyze container metrics, logs, and traces
- Contributor Insights

Key Benefits

- **Observability on a single platform across applications and infrastructure**
- **Easiest way to collect metrics in AWS and on-premises**
- **Improve operational performance and resource optimization**
- **Get operational visibility and insight**
- **Derive actionable insights from logs**

AWS CloudTrail

Track user activity and API usage

AWS resources and applications

AWS CloudTrail

Multi-region configuration

Log file integrity validation & encryption

Monitoring and tracking
- Always on
- Logging Event history
- Receive Notifications

Insights
- Data events provide insights into the resource operations
- Management events provide insights into the management operations
- Identify unusual activity in your AWS accounts

Key Benefits

Simplified compliance

With AWS CloudTrail, simplify your compliance audits by automatically recording and storing event logs for actions made within your AWS account

Visibility into user and resource activity

AWS CloudTrail increases visibility into your user and resource activity by recording AWS Management Console actions and API calls

Security analysis and troubleshooting

Discover and troubleshoot security and operational issues by capturing a comprehensive history of changes that occurred in your AWS account within a specified period of time

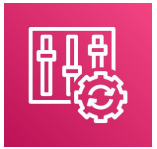
Security automation

AWS CloudTrail allows you track and automatically respond to account activity threatening the security of your AWS resources

AWS Config

Record and evaluate configurations of your AWS resources

Configurations of your AWS resources



AWS Config

Audit
- Multi-account, multi-region data aggregation
- Cloud governance dashboard
- Conformance packs to manage compliance of your AWS resource configuration at scale

Evaluate
- Configuration snapshots
- Configuration history of AWS resources
- Configuration history of software
- Resource relationships tracking

Integrations
- Configurable and customizable rules-
- Partner solutions that integrate with AWS Config
- Integrations with other services
- Publish the configuration of third-party resources into AWS Config

Key Benefits

- **Continuously monitor and record configuration changes of your AWS resources**
- **Continuously audit and assess the overall compliance of your AWS resource configurations**
- **Track the relationships among resources and review resource dependencies**
- **Simplify troubleshooting by capturing history of AWS resource configuration changes**
- **Enterprise-wide compliance monitoring**
- **Support for third-party resources**

AWS Elastic Beanstalk

An easy-to-use service for deploying and scaling web applications and services

Web Applications and Services

AWS Elastic Beanstalk

Wide Selection of Application Platforms & Deployment Options

Monitoring Application Health, Logging, and Tracing

Operations
- Management and Updates
- Customization of AWS Resources
- Scaling

Key Benefits

Fast and simple to begin

Elastic Beanstalk automatically handles the deployment details of capacity provisioning, load balancing, auto-scaling, and application health monitoring

Continuous Scaling

Elastic Beanstalk automatically scales your application up and down based on your application's specific need using easily adjustable Auto Scaling settings

Enhance Developer productivity

Elastic Beanstalk provisions and operates the infrastructure and manages the application stack for you, so you don't have to spend the time or develop the expertise

Complete resource control

Elastic Beanstalk lets you retain full control over the AWS resources powering your application.

AWS Lambda

Run code without thinking about servers

Provide your own code

AWS Lambda

Administration
- Completely automated administration
- Built-in fault tolerance
- Automatic scaling
- Orchestrate multiple functions
- Fine grained control over performance

Compatibility
- Extend other AWS services with custom logic
- Connect to relational databases

Integrations
- Build custom back-end services
- Integrated security model
- Flexible resource model

Key Benefits

Serverless Architecture - Zero administration

AWS Lambda is serverless, so there is no infrastructure to manage.

Continuous Scaling

AWS Lambda automatically scales your application by running code in response to each trigger

Pay for what you consume

With AWS Lambda, you are charged for every 100ms your code executes and the number of times your code is triggered

Consistent Performance

With AWS Lambda, you can optimize your code execution time by choosing the right memory size for your function

Demo - Deploy a Lambda Function

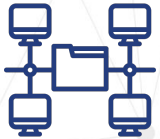
Amazon CodeCommit

Securely host highly scalable private Git repositories. Collaborate on code.

AWS CodeCommit Features

Encryption

Access Control using IAM



Unlimited Repositories

Easy Access and Integration

Notifications and Custom Scripts

AWS CodeCommit Benefits

Fully managed

Secure

High Availability and Durability

Collaborate on code

Faster development lifecycle

Use your existing tools

AWS CodeBuild

Build and test code with continuous scaling

Source Code

AWS CodeBuild

Continuous integration and delivery workflows

Security Monitoring and permissions
- Set granular controls over access
- Monitoring and Alerts

Build and test your code
- Preconfigured build environments
- Customize build environments

Configurable settings
- Specify build commands
- Select compute type
- Choose source integrations

Key Benefits

Fully managed build service

AWS CodeBuild eliminates the need to set up, patch, update, and manage your own build servers and software

Continuous scaling

AWS CodeBuild scales up and down automatically to meet your build volume

Pay as you go

With AWS CodeBuild, you are charged based on the number of minutes it takes to complete your build

Extensible

You can bring your own build tools and programming runtimes to use with AWS CodeBuild

AWS CodeDeploy

Automate code deployments to maintain application uptime

Software and Applications

AWS CodeDeploy

Instance deployments
- Repeatable deployments
- Automatic scaling
- On-premises deployments

Control
- Monitoring and control
- Deployment groups
- Deployment history
- Review defined events

Easy to adopt
- Language and architecture agnostic
- Tool chain integration

Updates, Tracking and Rollback
- Rolling and Blue/Green updates
- Deployment health tracking
- Stop and rollback

Key Benefits

Centralized control

AWS CodeDeploy allows you to easily launch and track the status of your application deployments through the AWS Management Console or the AWS CLI

Automated deployments

AWS CodeDeploy fully automates your software deployments, allowing you to deploy reliably and rapidly

Minimize downtime

AWS CodeDeploy helps maximize your application availability during the software deployment process

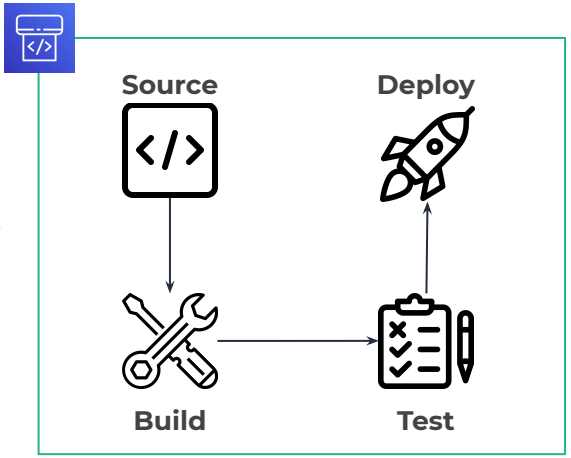
Easy to adopt

AWS CodeDeploy is platform and language agnostic and works with any application

AWS CodePipeline

Automate continuous delivery pipelines for fast and reliable updates

Application Lifecycle



AWS CodePipeline

- Workflow modeling
- AWS integrations
- Pre-built & Custom plugins
- Receive Notifications
- Declarative templates
- Access control

Key Benefits

Serverless Architecture - Zero administration

With AWS CodePipeline, you can immediately begin to model your software release process. There are no servers to provision or set up

Rapid delivery

AWS CodePipeline automates your software release process, allowing you to rapidly release new features to your users

Configurable workflow

AWS CodePipeline allows you to model the different stages of your software release process

Easy to integrate

AWS CodePipeline can easily be extended to adapt to your specific needs. You can use pre-built plugins or your own custom plugins in any step of your release process

THANK YOU