Continuous Delivery with CodePipeline

Overview

AWS CodePipeline enables continuous delivery by automating the entire software release process. It orchestrates source control, building, testing, and deployment into a seamless, event-driven workflow that ensures code is always ready for production.

Pipeline Architecture

- **Stages:** Logical divisions like Source, Build, Test, Deploy
- **Actions:** Tasks within each stage (compile, test, deploy)
- **Transitions:** Automated or manual gates between stages
- **Artifacts:** Files passed between stages (stored in S3)
- **Approvals:** Manual checkpoints for production deployments

Integration with AWS Services

- **AWS CodeCommit:** Source control and repository management
- **AWS CodeBuild:** Compiling, testing, and building applications
- **AWS CodeDeploy:** Automated deployments to EC2, ECS, Lambda
- **AWS CloudFormation:** Infrastructure as code deployments
- **Amazon S3:** Artifact storage and static website hosting
- **Amazon CloudWatch:** Monitoring, logging, and metrics

- **AWS X-Ray:** End-to-end tracing and debugging

Deployment Strategies

- **Blue/Green:** Zero-downtime deployments with traffic switching
- **Rolling:** Gradual updates to instance subsets
- **Canary:** Test with small percentage before full rollout
- **All-at-Once:** Fastest deployment with potential downtime

Benefits

- Faster delivery of software updates
- Increased consistency and reliability
- Reduced human errors through automation
- Improved scalability for projects of all sizes
- Enhanced developer productivity
- Quicker bug detection and resolution

Event-Driven Automation: CodePipeline automatically triggers pipeline executions when changes are detected in source repositories, ensuring continuous validation and deployment of the latest code.