

Welcome to Week 2

Cloud Accelerator Program

DevSecOps, CI & CD, and GitLab in AWS

 **Develop**Intelligence

A PLURALSIGHT COMPANY

Hello

HELLO
my name is

Allen Sanders
with DevelopIntelligence,
a Pluralsight Company.

About me...



- 27+ years in the industry
- 23+ years in teaching
- Certified Cloud architect
- Passionate about learning
- Also, passionate about Reese's Cups!



Agenda

- DevSecOps – what it is and why it is needed
- CI/CD as a capability / differentiator
- Native AWS services supporting CI/CD
- Using GitLab CI with AWS



How we're going to work together

- Slides and words to highlight key concepts
- Demos to bring those concepts “to life”
- Lab work (which will take place in sandboxes provided by “A Cloud Guru”) for hands-on reinforcement
- NOTE: I welcome being interrupted – if you need more info, or clarification, or anything else, just break in and ask. I am here to help you.



DevSecOps

The Mindset

DevSecOps

What is it?

Discipline that takes into consideration how People, Processes, and Tools Automation combine to ensure we have:

- Disciplined build of security into all phases of SDLC
- Just-in-time security assessment and testing
- Security as a “shared responsibility”

DevSecOps

Why is it important?

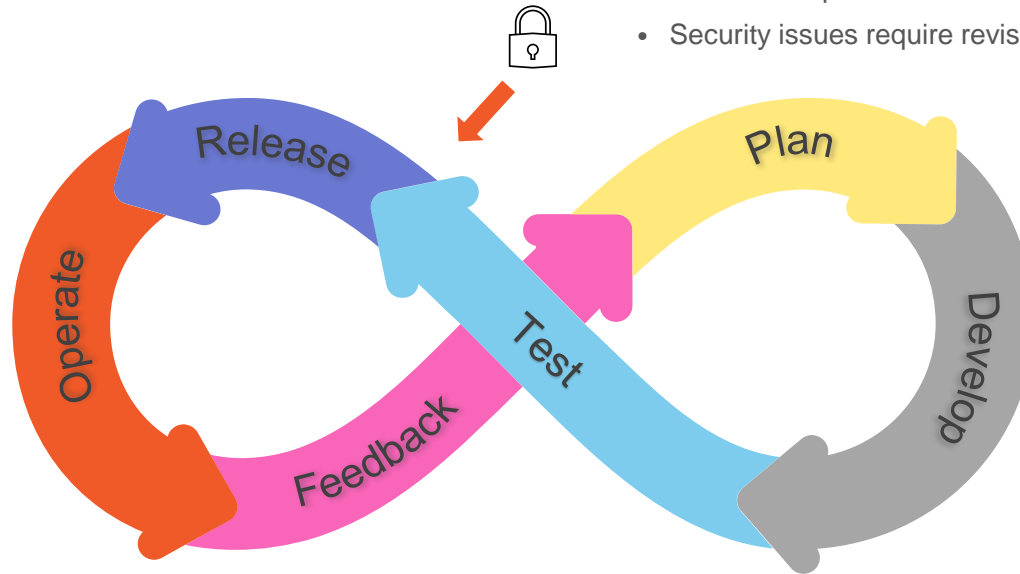
To maintain a competitive advantage:

- We need to deliver software quickly
- We need that software to have high quality
- We need that software to be secure

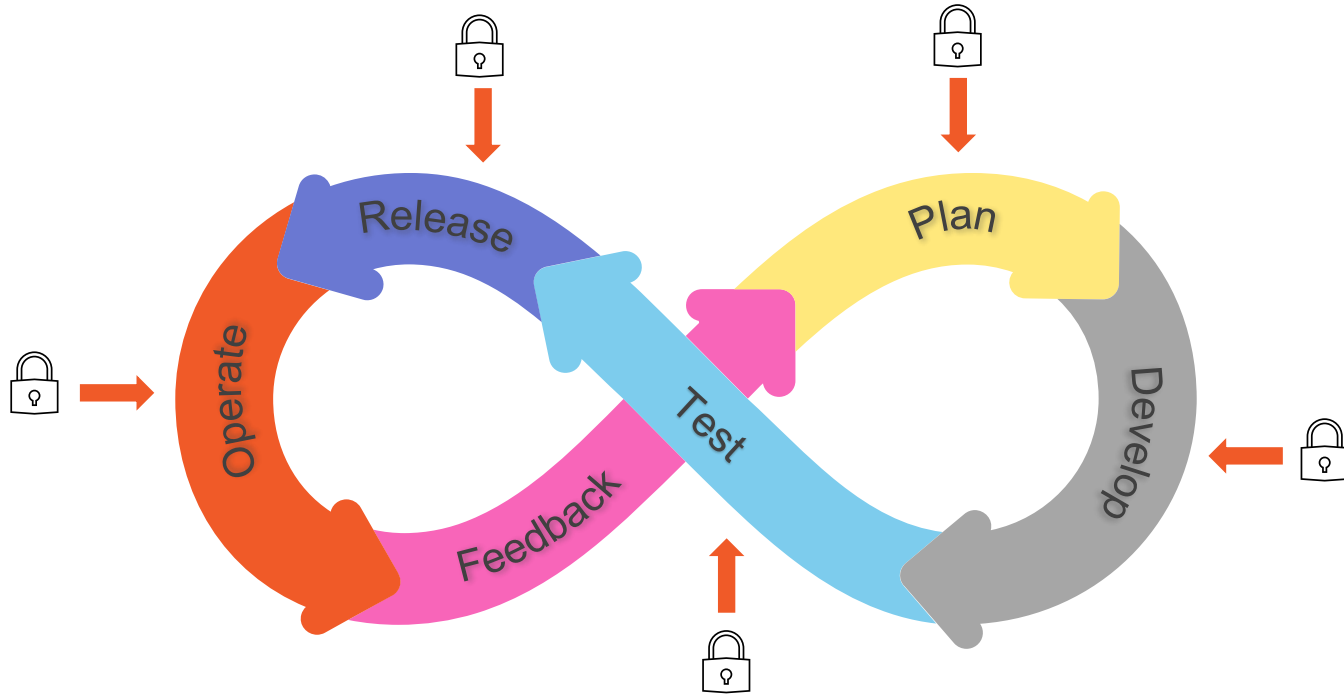
We want to merge speed & agility with security & quality!

Security in Software Engineering – The Traditional Way

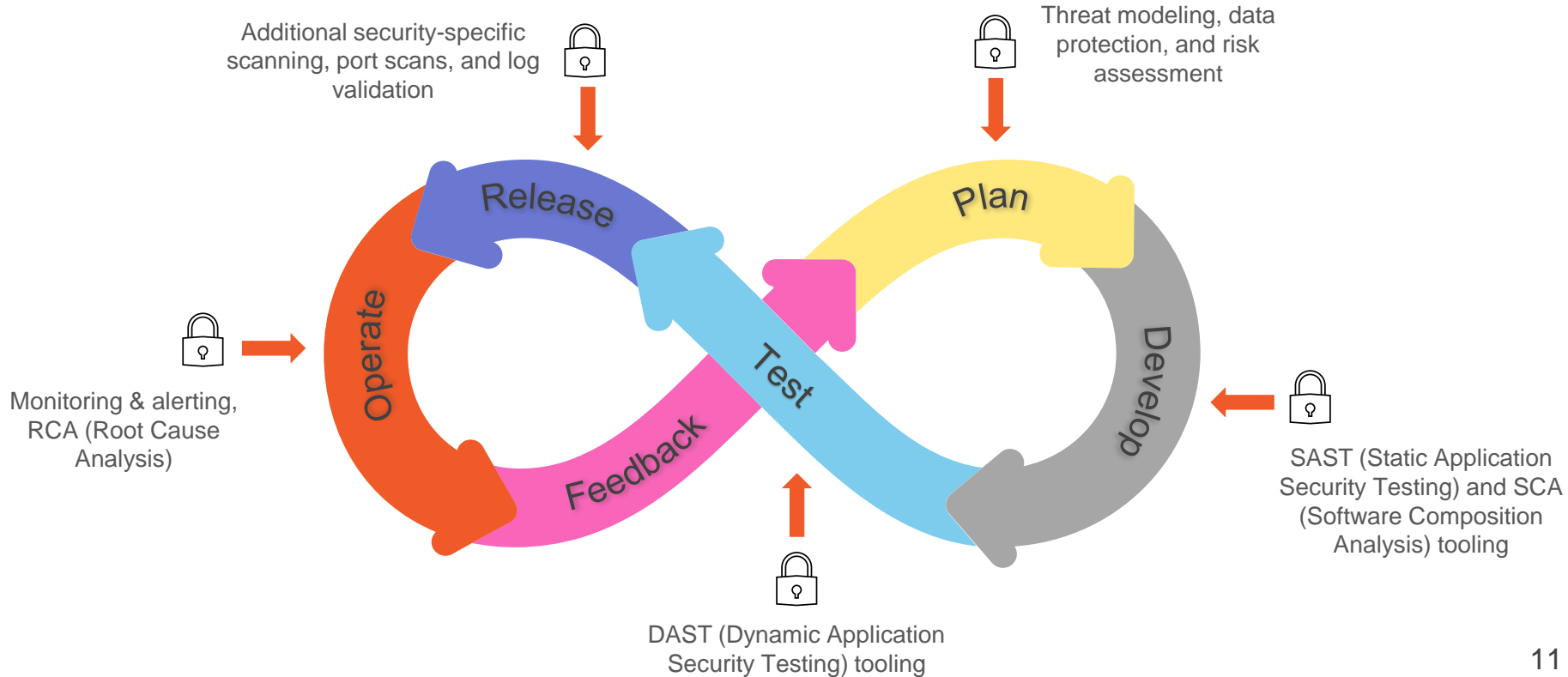
- Not enough time in schedule to absorb changes required to remediate
- Activities required to remediate may be complex
- Security issues require revisit of one or more previous phases



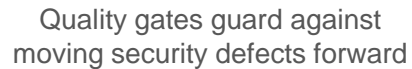
Security in Software Engineering – A Better Way



Security in Software Engineering – DevSecOps

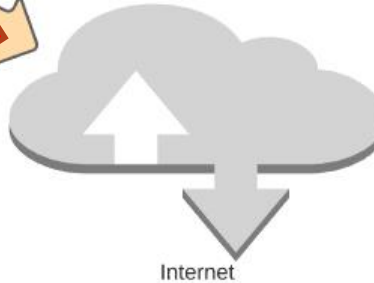


Security in Softw



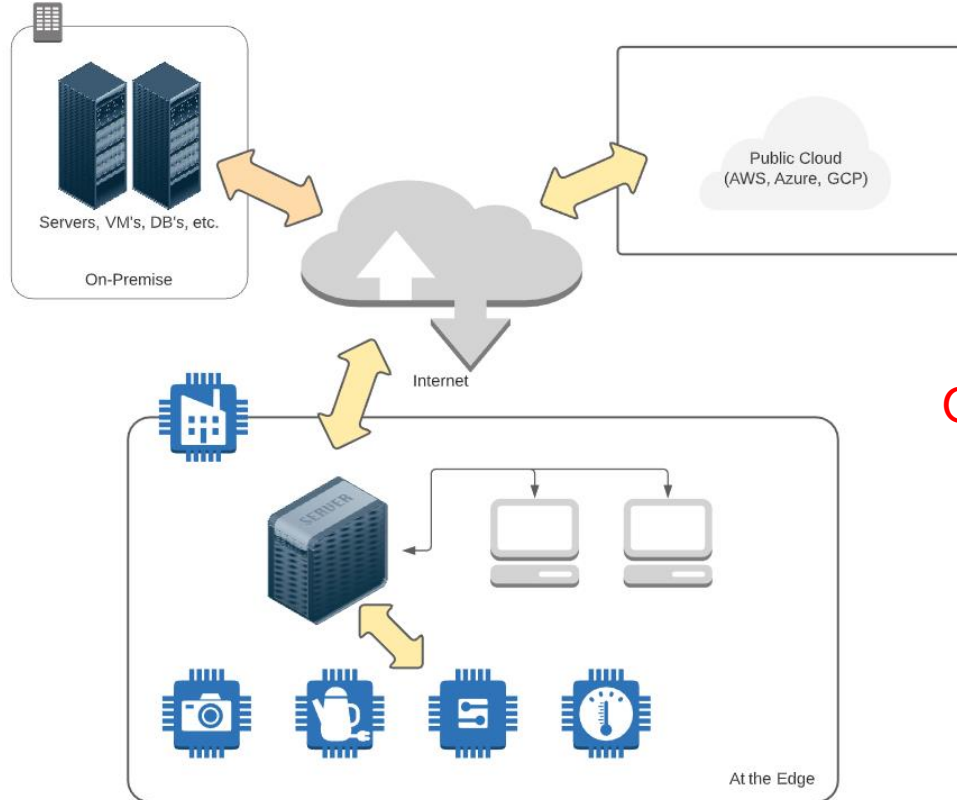
So...What About the Cloud?

On-Premise





Unless you decide to disconnect your enterprise and applications from the Internet, you're going to have security exposure that will have to be accounted for!

Hybrid Cloud



Attack surface
ONLY EXPANDS
– there is no
ignoring the
threats!!

So...What About the Cloud?

- For each AWS service type, we will have to remain CONTEXTUALLY vigilant!
- As we proceed throughout future weeks (and specific AWS services), we will review security best practices for each type
- This is a  , not a 

Securing AWS Resources

LAB:

Securing S3

Execute the “Hands-On” lab available at
<https://github.com/KernelGamut32/cloud-accel-aws-2024-public/tree/main/week02/labs/lab01>

LAB:

Amazon Guard Duty

Execute the “Hands-On” lab available at
<https://github.com/KernelGamut32/cloud-accel-aws-2024-public/tree/main/week02/labs/lab02>

LAB:

Amazon Security Hub

Execute the “Hands-On” lab available at
<https://github.com/KernelGamut32/cloud-accel-aws-2024-public/tree/main/week02/labs/lab03>

The background features a dark grey area with a fine white dotted pattern. A thick orange line runs horizontally across the top, turning vertically down on the right side. A thick pink line runs horizontally across the middle, turning vertically down on the left side. The text is positioned in the white space between these lines.

CI/CD as a Capability / Differentiator

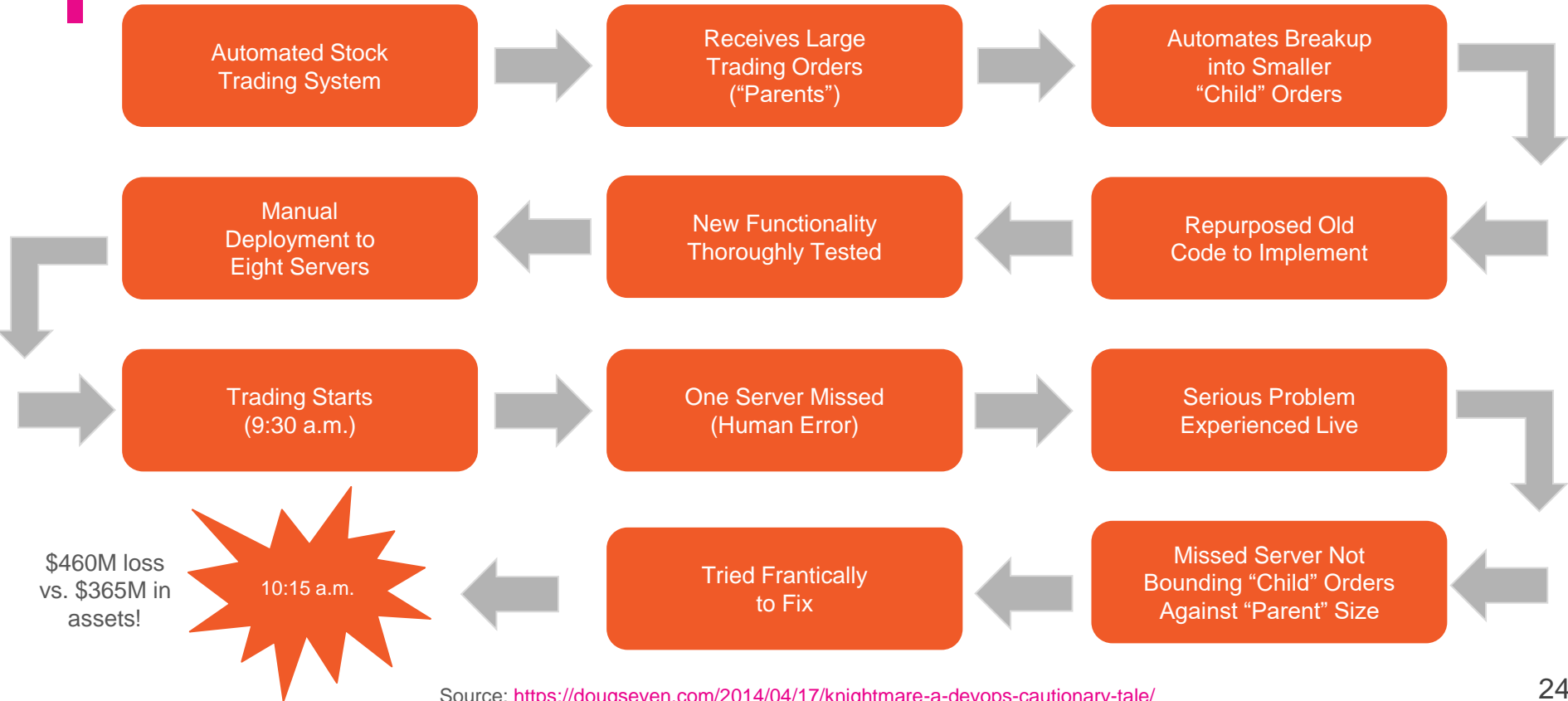
What a difference 45 minutes can make!!

How Long Does it Take for a Company to Go Bankrupt?



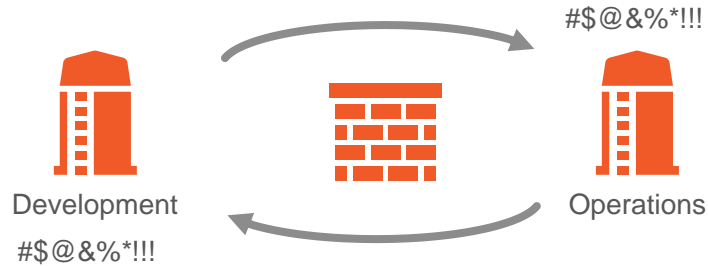
If the circumstances are right, it can happen in just 45 minutes!

Knight Capital Group – What Happened?



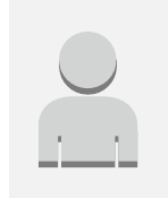
DevOps – What it is & why it's valuable

Approach Used In the “Olden” Times

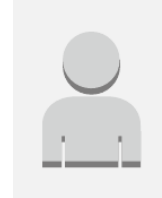


- Development & Operations siloes
- Lack of understanding of the other perspective
- Lack of communication & partnership
- “Fire and forget” engagement

DevOps – The New Way



Development



Operations

- Development & Operations work together
- Each understands & appreciates the position of the other
- Good communication, partnership, & collaboration
- Ongoing engagement – continuous improvement

DevOps – The Three Ways

The First Way: Flow/Systems Thinking



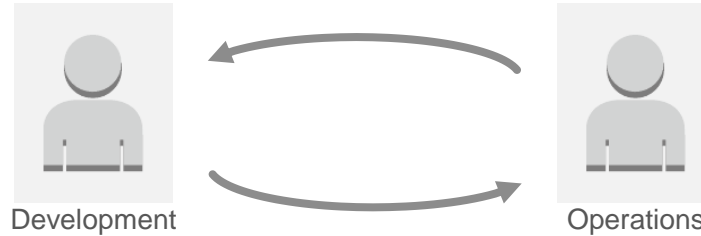
Source: Gene Kim

(<https://itrevolution.com/the-three-ways-principles-underpinning-devops/>)

- Holistic vs. siloed view – success is defined by the performance of the entire system vs. a specific team or individual
- Starts with requirements (defined by the business) and not called “done” until value is delivered to the customer
- Target outcomes:
 - Known defect never passed to downstream teams
 - Favor global performance vs. focusing on local optimization
 - Goal is increased flow (value)
 - Asking ourselves the question: “What don’t I know about our systems?”

DevOps – The Three Ways

The Second Way: Amplify Feedback Loops



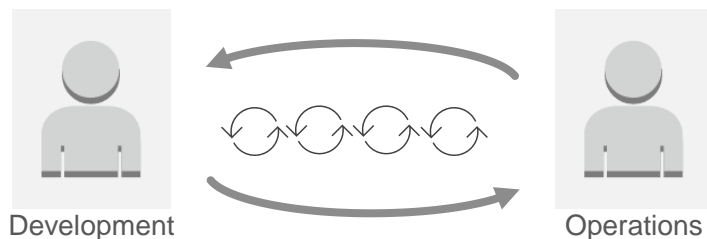
Source: Gene Kim

(<https://itrevolution.com/the-three-ways-principles-underpinning-devops/>)

- Create right-to-left feedback loops
- Shorten & amplify so information needed to make continuous improvements & continuous correction is readily available
- Target outcomes:
 - Understanding all customer perspectives (internal & external)
 - Responding to all customer concerns (internal & external)
 - Knowledge is power!

DevOps – The Three Ways

The Third Way: Culture of Continual Experimentation & Learning



Source: Gene Kim

(<https://itrevolution.com/the-three-ways-principles-underpinning-devops/>)

- Culture that fosters:
 - Continual experimentation, risk-taking, and learning from failure
 - Practice makes perfect!
- Target outcomes:
 - Allocating time for continual improvement (e.g., resolution of technical debt as a standard “category” of work)
 - Taking risks and seeing them pay off – No guts no glory!
 - Expecting failure & building resiliency into the process

AWS-Native Services for CI/CD

AWS CodeCommit

AWS CodeCommit



AWS CodeCommit

AWS CodeCommit is a fully-managed source control service that makes it easy for companies to host secure and highly scalable private Git repositories.

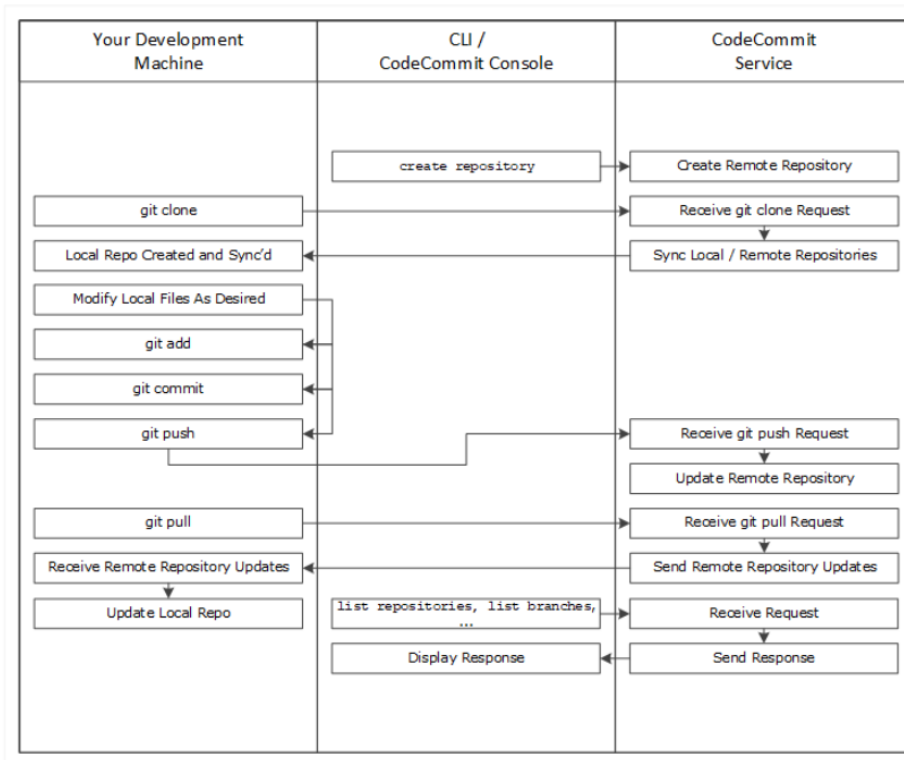
- Provides AWS-native version control services (like GitHub but hosted in AWS)
- Supports secure management of code artifacts including tracking history of changes
- Integrates with and uses Git as a base for its operation

AWS CodeCommit



AWS CodeCommit

AWS CodeCommit is a fully-managed source control service that makes it easy for companies to host secure and highly available private Git repositories.



Source: <https://docs.aws.amazon.com/codecommit/latest/userguide/welcome.html>

AWS CodeBuild

AWS CodeBuild

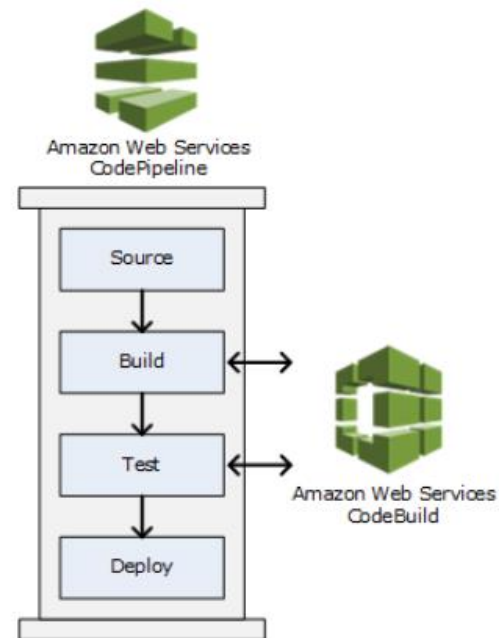
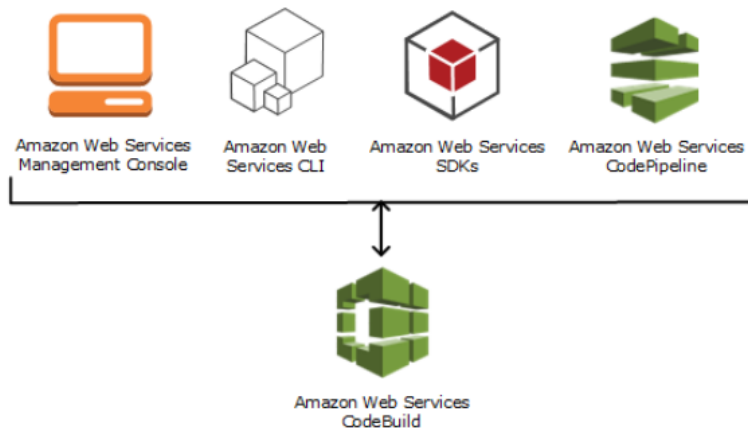


- Provides AWS-native build pipeline services
- Can be used to build code, run unit tests, and produce artifacts ready for deployment
- Handles creation and configuration of build servers/services with “hooks” that support integration with BYOT (“bring your own tools”)

AWS CodeBuild



AWS CodeBuild



Source: <https://docs.aws.amazon.com/codebuild/latest/userguide/welcome.html>

AWS CodeDeploy

AWS CodeDeploy

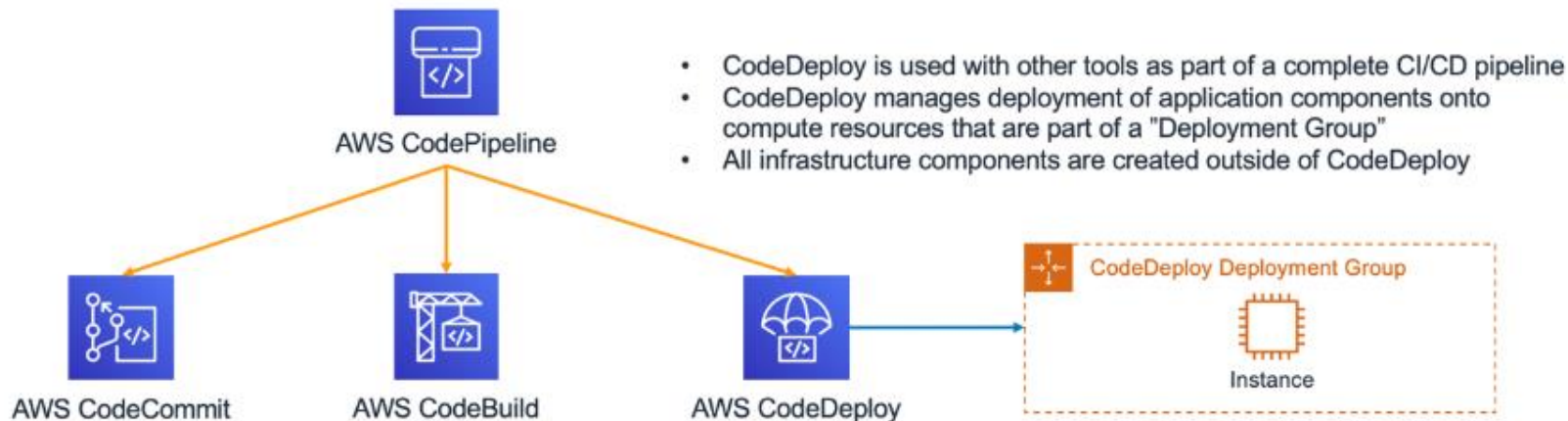


- Provides AWS-native software deployment services
- Automates application deployments to several types of AWS infrastructure (including EC2 instances, Lambda functions, Amazon ECS) and even to on-premise infrastructure (a la Hybrid)
- Supports multiple artifact sources for deployment (including CodeBuild)
- Natively supports Blue/Green testing and canary deployments

AWS CodePipeline



AWS CodeDeploy



AWS CodePipeline

AWS CodePipeline



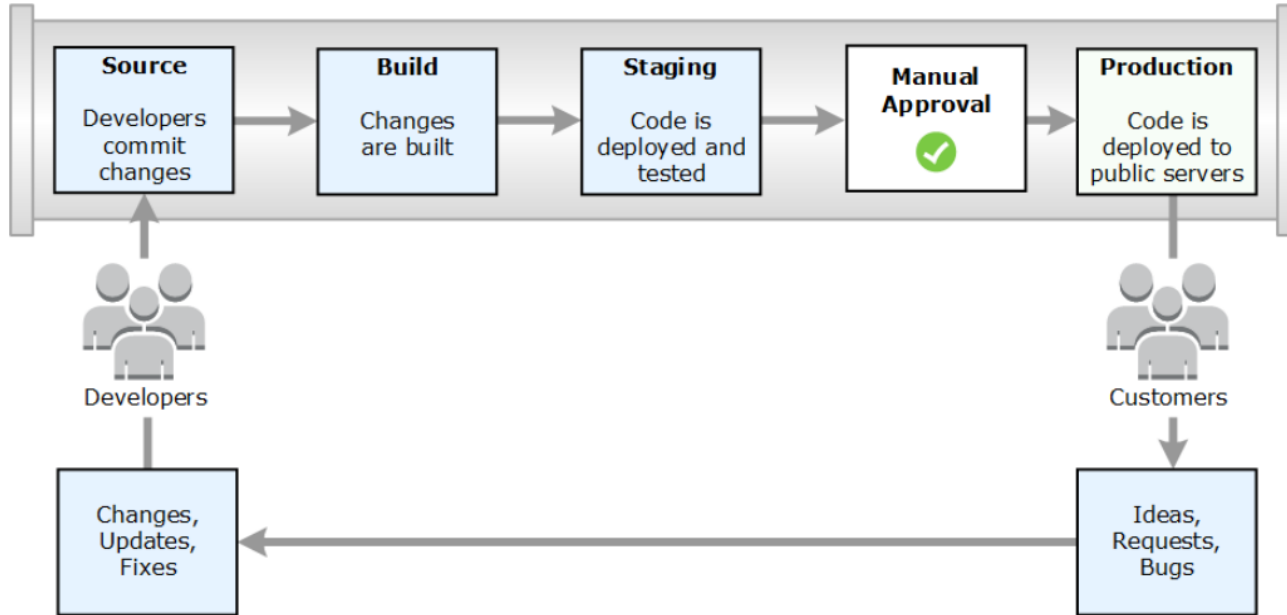
AWS CodePipeline

- Provides AWS-native continuous delivery services for your applications
- Supports automation of entire process (including integration with other native services) from “soup to nuts”

AWS CodePipeline



AWS CodePipeline



Source: <https://docs.aws.amazon.com/codepipeline/latest/userguide/welcome-introducing.html>

AWS CodeStar

AWS CodeStar



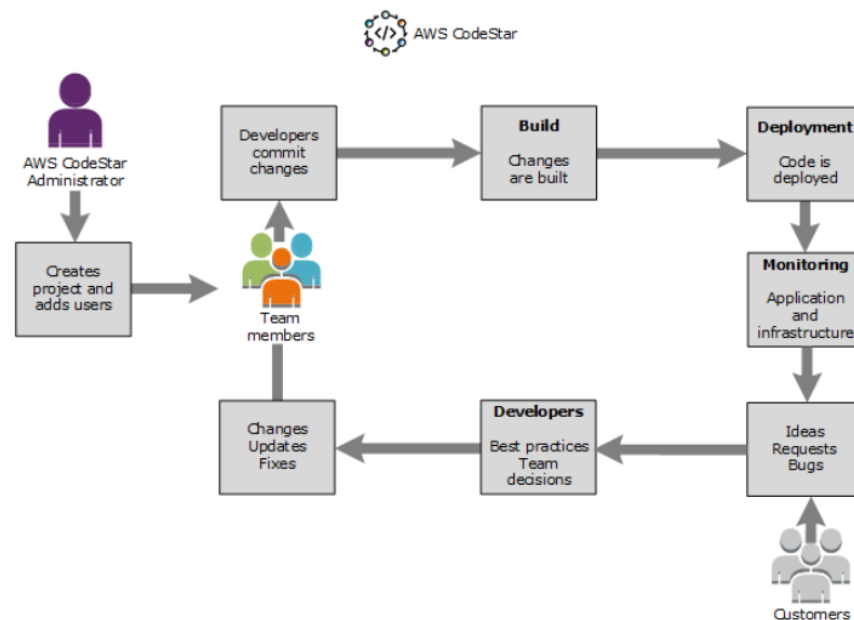
AWS CodeStar

- Provides AWS-native service to facilitate setup and configuration of the other pieces of CI/CD workflow in the Cloud
- Offers multiple template types for common workloads
- Makes available a project dashboard that can be used to track end-to-end CI/CD for your automated builds & deployments

AWS CodeStar



AWS CodeStar



LAB:

AWS CodePipeline

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GitLab CI/CD

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LAB:

GitLab CI/CD

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Thank you!

If you have additional questions,
please reach out to me at:
asanders@gamuttechnologysvcs.com