AWS re:Invent

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SVS305-R2

CI & CD workflows for serverless applications

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AWS

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About me

What I do

- Principal Developer Advocate
- Developer
- Solutions Architect

Why I do it

- Husband
- Father of five amazing kids
- Drummer
- Pizza lover



@edjgeek

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Agenda

- Defining CI/CD
- The right tools
- To the chalkboard

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Defining CI/CD

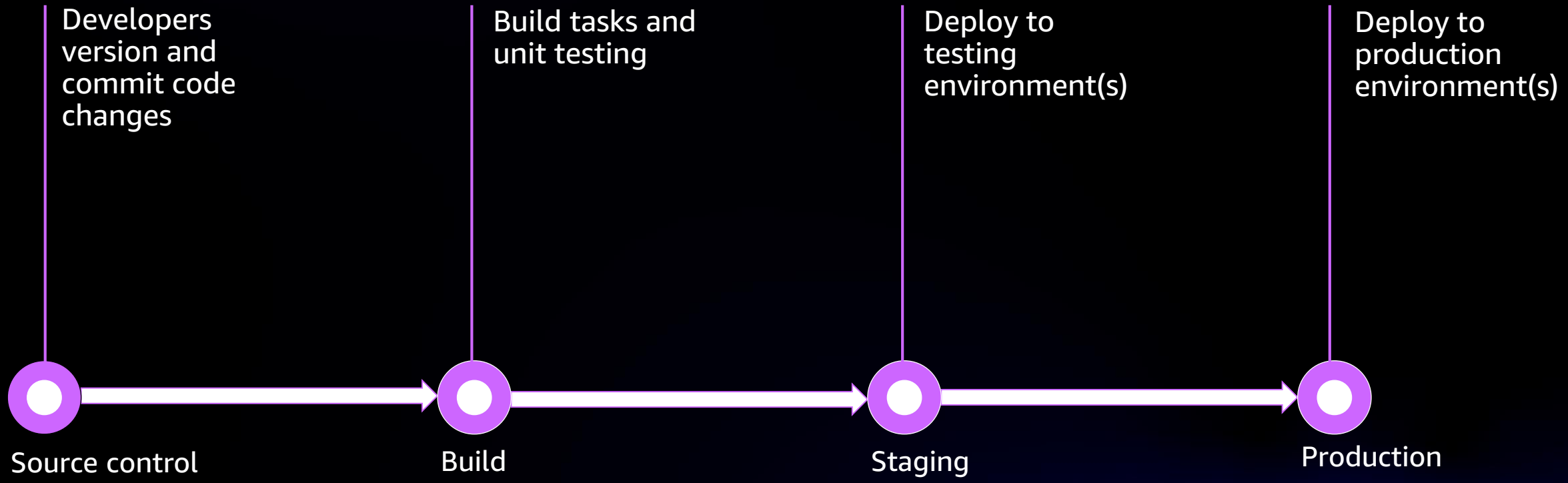
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What is CI/CD?

CI: Continuous integration
CD: Continuous delivery or
CD: Continuous deployment

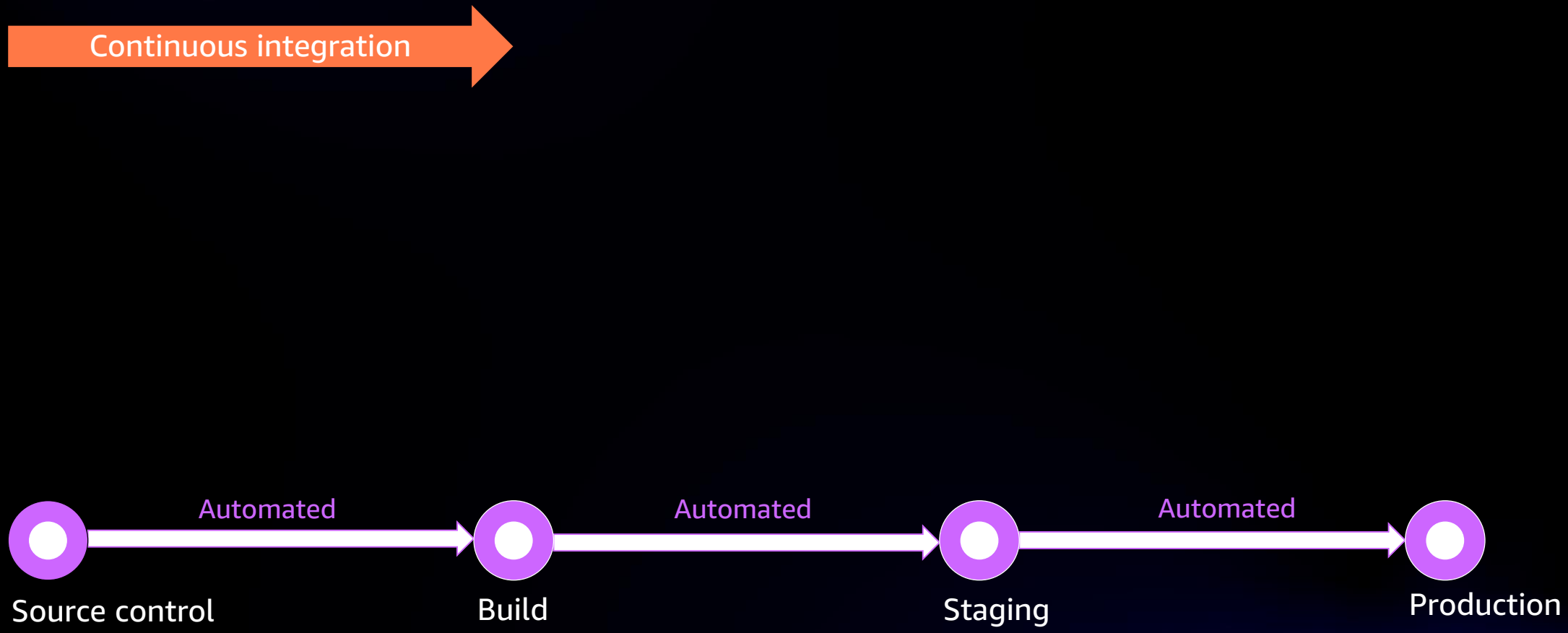
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The pipeline: Continuous integration



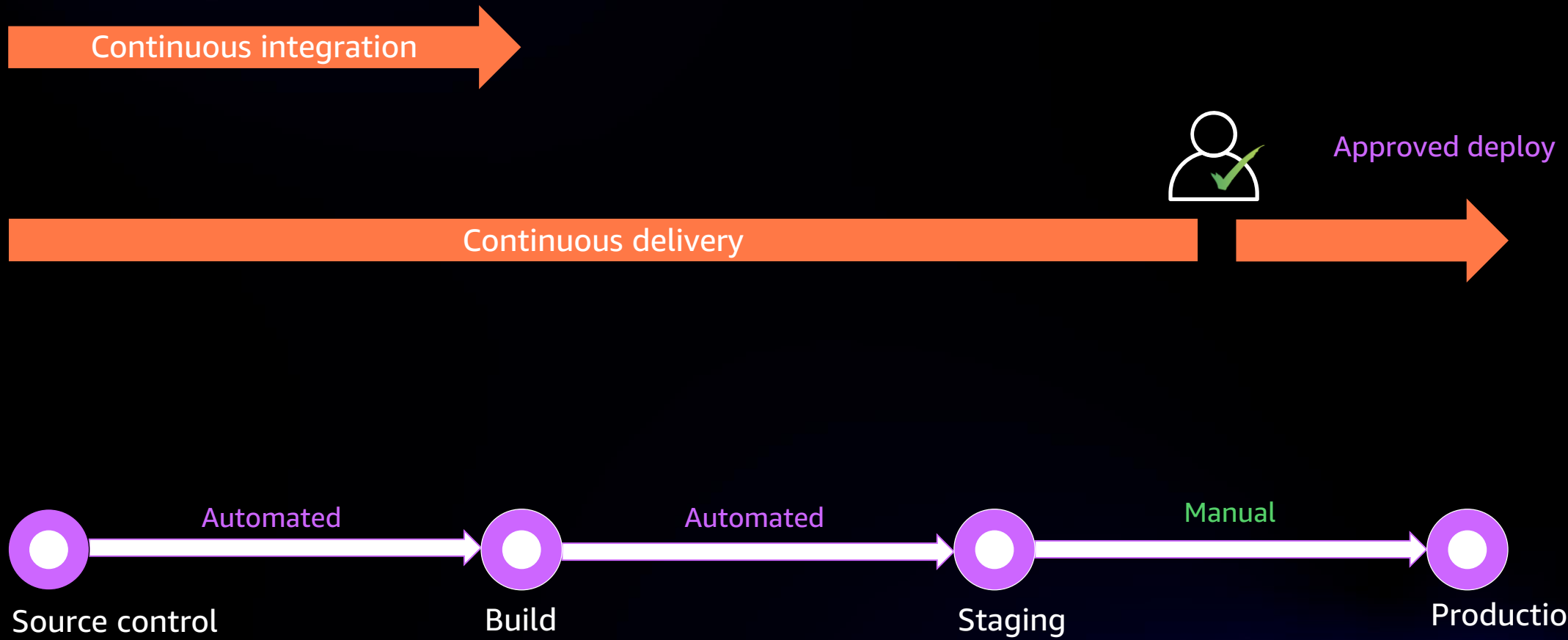
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The pipeline: Continuous deployment



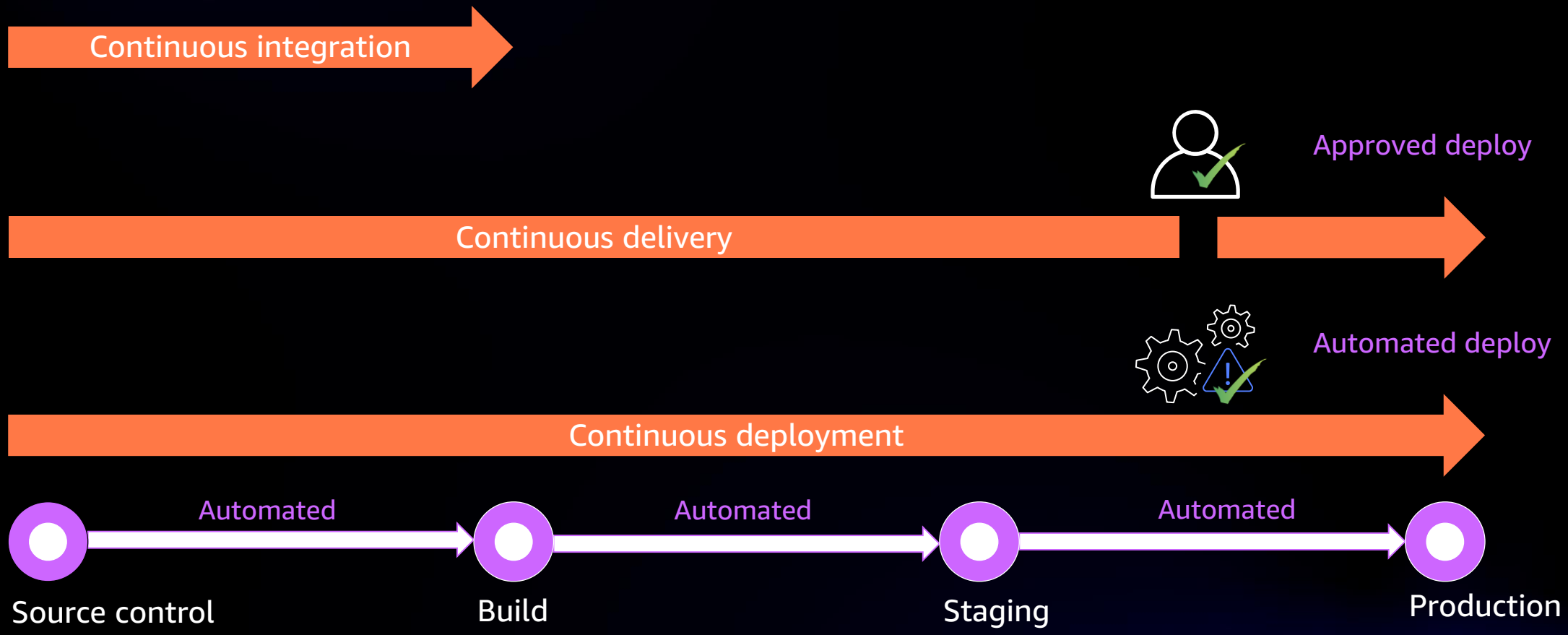
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The pipeline: Continuous deployment



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The pipeline: Continuous deployment



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The right tools

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Infrastructure as Code (IaC)

- Automate the provisioning process
- Instantiate infrastructure using configuration files
- Treat configuration files as software code
- Reduce configuration drift through automation

AWS IaC solutions

- AWS CloudFormation
- AWS Serverless Application Model (AWS SAM)
- AWS Cloud Development Kit (AWS CDK)

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AWS SAM templates

```
AWSTemplateFormatVersion: '2010-09-09'
Transform: AWS::Serverless-2016-10-31
Resources:
  GetProductsFunction:
    Type: AWS::Serverless::Function
    Properties:
      CodeUri: src/
      Handler: app.handler
      Runtime: python3.9
      Policies:
        - DynamoDBReadPolicy:
            TableName: !Ref ProductTable
      Events:
        GetProductsEvent:
          Type: Api
          Properties:
            Path: /products
            Method: get
    ProductTable:
      Type: AWS::Serverless::SimpleTable
```

Only 20 lines to create

AWS Lambda function

AWS Identity and Access Management role

Amazon API Gateway

Amazon DynamoDB table

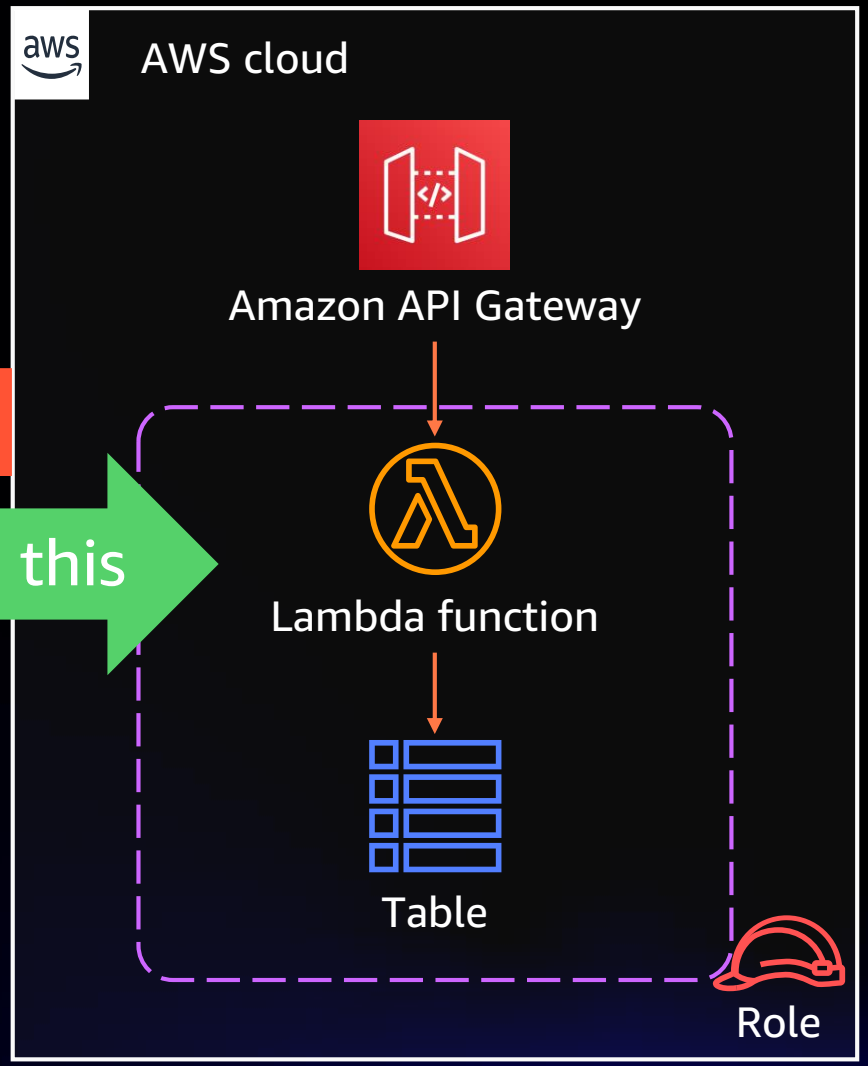
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        - DynamoDBReadPolicy:
            TableName: !Ref ProductTable
      Events:
        GetProductsEvent:
          Type: Api
          Properties:
            Path: /products
            Method: get
    ProductTable:
      Type: AWS::Serverless::SimpleTable
```

Allowing this

To become this



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AWS CodeCommit

- Fully managed source control service that hosts secure Git-based repositories
- Allows teams to collaborate on code in a secure and highly scalable ecosystem
- Automatically encrypts your files in transit and at rest
- Integrated with AWS Identity and Access Management (IAM)



https://aws.amazon.com/codecommit/

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AWS CodePipeline

- Continuous delivery service for fast and reliable application updates
- Model and visualize your software release process
- Builds, tests, and deploys your code every time there is a code change
- Integrates with third-party tools and AWS



https://aws.amazon.com/codepipeline/

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AWS CodeBuild

- Fully managed build service that can compile source code, run tests, and produce software packages
- Scales continuously and processes multiple builds concurrently
- Can consume environment variables from AWS SSM Parameter Store
- Can run in your VPC and locally
- Supports dependency caching



https://aws.amazon.com/codebuild/

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AWS CloudFormation

- Infrastructure as code (IaC)
- Provides a common language for you to describe and provision all the infrastructure resources in your cloud environment
- Build and rebuild your infrastructure and applications, without having to perform manual actions or write custom scripts
- https://aws.amazon.com/cloudformation/



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AWS Partners for CI/CD

GitHub

Atlassian Bitbucket

GitLab



Jenkins

serverless

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AWS SAM pipelines

- AWS SAM pipeline init --bootstrap:
- Creates the AWS resources and permissions required to deploy application artifacts from your code repository into your AWS environments
- Walks you through setting up a CI/CD pipeline with AWS CodeSuite*, Jenkins, GitLab, or GitHub Actions

https://s12d.com/sam-pipelines

```
$ sam pipeline init --bootstrap

sam pipeline init generates a pipeline configuration file that you can use to
connect your
AWS account(s) to your CI/CD system. We will guide you through the process to
bootstrap resources for each stage, then walk through the details necessary for
creating the pipeline config file.

Please ensure you are in the root folder of your SAM application before you begin.

Select a pipeline structure template to get started:
Select template
        1 - AWS Quick Start Pipeline Templates
        2 - Custom Pipeline Template Location
Choice: 1

Cloning from https://github.com/aws/aws-sam-cli-pipeline-init-templates.git
CI/CD system
        1 - Jenkins
        2 - GitLab CI/CD
        3 - GitHub Actions
Choice: 2
You are using the 2-stage pipeline template.
 _________    _________
|         |  |         |
| Stage 1 |->| Stage 2 |
|_________|  |_________|

Checking for bootstrapped resources...

No bootstrapped resources were detected.

Do you want to go through stage setup process now? If you choose no, you can still
reference other bootstrapped resources. [y/N]: y

For each stage, we will ask for [1] stage definition, [2] account details, and [3]
reference application build resources in order to bootstrap these pipeline
resources.

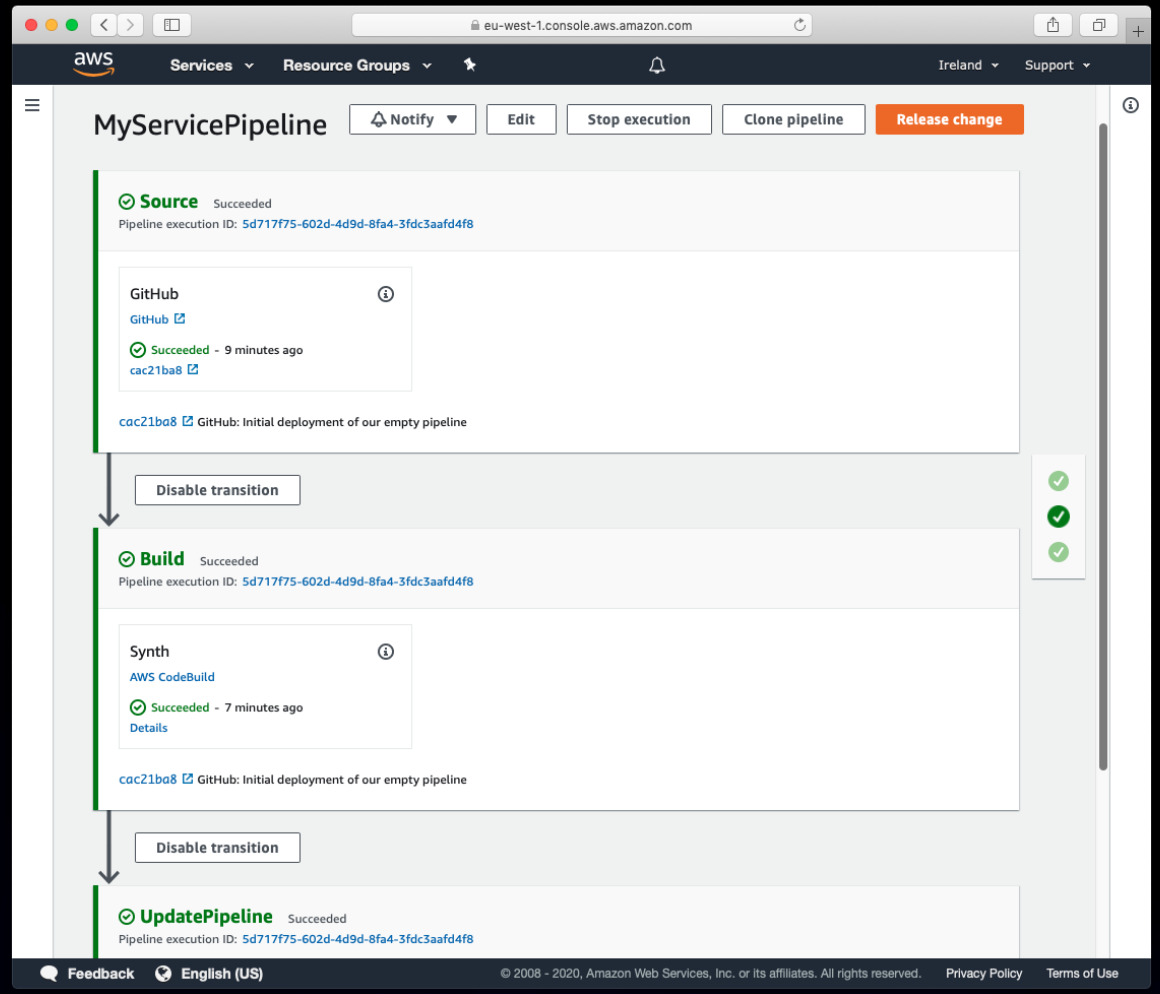
We recommend using an individual AWS account profiles for each stage in your
pipeline. You can set these profiles up using [little bit of info on how to do
this/docs].
```

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AWS CDK pipelines

- CDK pipelines is a high-level construct library that makes it easy to set up a continuous deployment pipeline for your CDK applications, powered by AWS CodePipeline

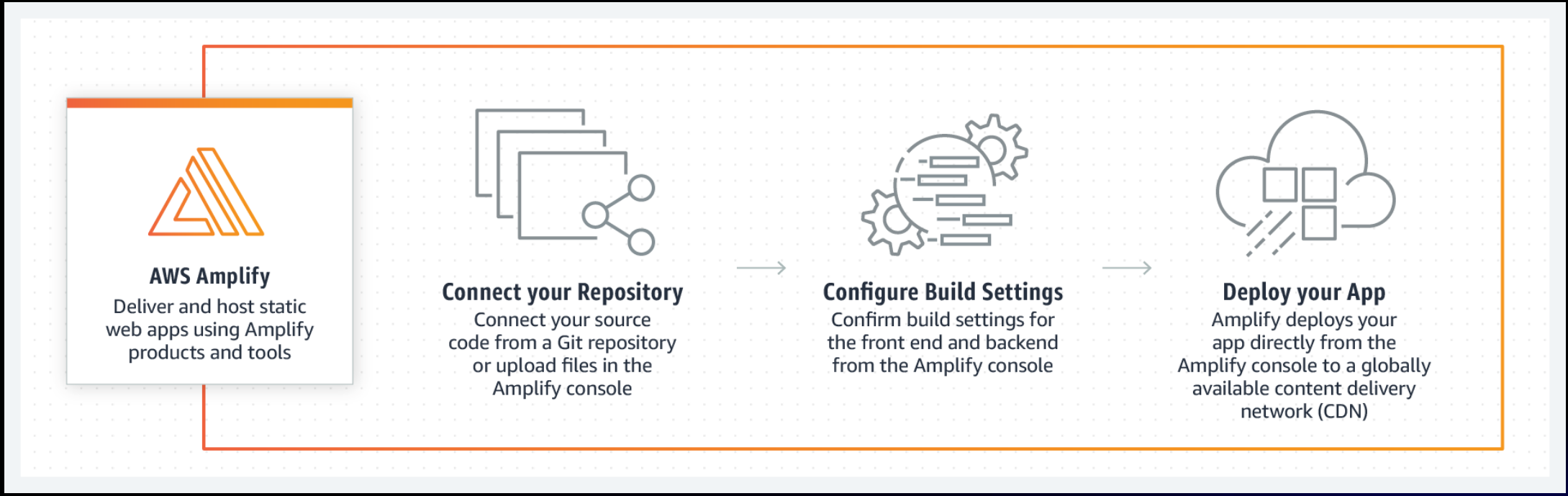
https://s12d.com/cdk-pipelines



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AWS Amplify

- Continuous workflow
- Pull request reviews
- One-click custom domain setup
- Monitoring
- Instant and atomic deployments
- Password protection
- Powered by Amazon S3 and Amazon CloudFront

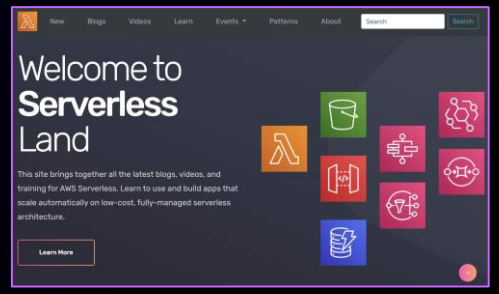


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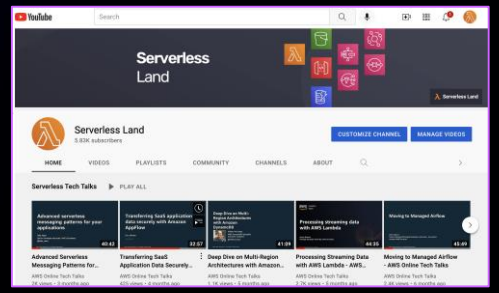
To the chalkboard

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Helpful resources



https://serverlessland.com



https://youtube.com/serverlessland



Serverless office hours

Every Tuesday 10 am PT

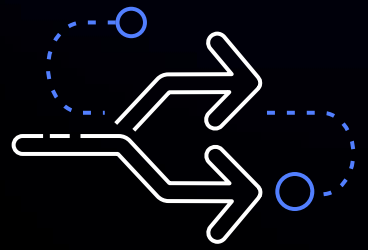
twitch.tv/aws and youtube.com/serverlessland

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AWS SAM Accelerate

ITERATE AGAINST THE CLOUD WITH THE SPEED OF LOCAL DEVELOPMENT





Incremental builds

Build only the parts of your code that have changed



AWS SAM sync

Quickly sync code changes with the cloud



Aggregated feedback

Tail application logs that include output from all resources in a single command

https://s12d.com/accelerate

aws

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Thank you!

Eric Johnson

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