



INNOVATE2018

ONLINE CONFERENCE



Deliver Software Quickly and Safely with Serverless Applications (Level 300)

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Speed + Safety





AWS CloudFormation



Declarative **templates** of your resources

Manages AWS resources based on **dependencies**

Manage with **Source control**



Meet SAM!

AWS Serverless Application Model (SAM)



CloudFormation extension optimized for serverless

Serverless resource types: **functions, APIs, and tables** and **any resource** CloudFormation supports

Supports Parameters, Mappings, Outputs, Global Variables, Intrinsic Functions, and some ImportValues

<https://github.com/awslabs/serverless-application-model>

SAM Template

AWSTemplateFormatVersion: '2010-09-09'

Transform: AWS::Serverless-2016-10-31

Resources:

CalculatorAdd:

Type: AWS::Serverless::Function

Properties:

Handler: calculator

Runtime: go1.x

Events:

Add:

Type: Api

Properties:

Path: /

Method: get

SAM Template

```
AWSTemplateFormatVersion: '2010-09-09'
```

```
Transform: AWS::Serverless-2016-10-31
```

```
Resources:
```

```
  CalculatorAdd:
```

```
    Type: AWS::Serverless::Function
```

```
    Properties:
```

```
      Handler: calculator
```

```
      Runtime: go1.x
```

```
      Events:
```

```
        Add:
```

```
          Type: Api
```

```
          Properties:
```

```
            Path: /
```

```
            Method: get
```


Transformed Template

```
{
  "AWSTemplateFormatVersion": "2010-09-09",
  "Resources": {
    "AwesomeCalculatorRole": {
      "Type": "AWS::IAM::Role",
      "Properties": {
        "ManagedPolicyArns": [
          "arn:aws:iam::aws:policy/service-role/AWSLambdaBasicExecutionRole"
        ],
        "AssumeRolePolicyDocument": {
          "Version": "2012-10-17",
          "Statement": [
            {
              "Action": [
                "sts:AssumeRole"
              ],
              "Effect": "Allow",
              "Principal": {
                "Service": [
                  "lambda.amazonaws.com"
                ]
              }
            }
          ]
        }
      }
    },
    "AwesomeCalculatorAddPermissionTest": {
      "Type": "AWS::Lambda::Permission",
      "Properties": {
        "Action": "lambda:invokeFunction",
        "Principal": "apigateway.amazonaws.com",
        "FunctionName": {
          "Ref": "AwesomeCalculator"
        },
        "SourceArn": {
          "Fn::Sub": [
            "arn:aws:execute-api:${AWS::Region}:${AWS::AccountId}:${AWS::StackName}/${Stage}/${ApiId}"
          ]
        }
      }
    },
    "ServerlessRestApiProdStage": {
      "Type": "AWS::ApiGateway::Stage",
      "Properties": {
        "DeploymentId": {
          "Ref": "ServerlessRestApiDeployment9bcc4decb0"
        },
        "RestApiId": {
          "Ref": "ServerlessRestApi"
        },
        "StageName": "Prod"
      }
    },
    "AwesomeCalculator": {
      "Type": "AWS::Lambda::Function",
      "Properties": {
        "Code": {
          "S3Bucket": "sydney-summit-sam",
          "S3Key": "001fd29dc238636e2b94fe7a71aa00c"
        },
        "Handler": "index.handler",
        "Role": {
          "Fn::GetAtt": [
            "AwesomeCalculatorRole",
            "Arn"
          ]
        },
        "Runtime": "nodejs6.10",
        "Tags": [
          {
            "Value": "SAM",
            "Key": "lambda:createdBy"
          }
        ]
      }
    },
    "ServerlessRestApi": {
      "Type": "AWS::ApiGateway::RestApi",
      "Properties": {
        "Body": {
          "info": {
            "version": "1.0",
            "title": {
              "Ref": "AWS::StackName"
            }
          },
          "paths": {
            "/": {
              "get": {
                "x-amazon-apigateway-integration": {
                  "httpMethod": "POST",
                  "type": "aws_proxy",
                  "uri": {
                    "Fn::Sub": "arn:aws:apigateway:${AWS::Region}:lambda::/prod/functions/awesome-calculator"
                  },
                  "responses": {}
                }
              }
            }
          },
          "swagger": "2.0"
        },
        "AwesomeCalculatorAddPermissionProd": {
          "Type": "AWS::Lambda::Permission",
          "Properties": {
            "Action": "lambda:invokeFunction",
            "Principal": "apigateway.amazonaws.com",
            "FunctionName": {
              "Ref": "AwesomeCalculator"
            },
            "SourceArn": {
              "Fn::Sub": [
                "arn:aws:execute-api:${AWS::Region}:${AWS::AccountId}:${AWS::StackName}/${Stage}/${ApiId}"
              ]
            }
          }
        },
        "ServerlessRestApiDeployment9bcc4decb0": {
          "Type": "AWS::ApiGateway::Deployment",
          "Properties": {
            "RestApiId": {
              "Ref": "ServerlessRestApi"
            },
            "Description": "RestApi deployment id: 9bcc4decb055b4dac489",
            "StageName": "Stage"
          }
        }
      }
    }
  }
}
```

SAM Template

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Lambda function

SAM Template

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Type: Api

Properties:

Path: /

Method: get



API Gateway API

SAM Commands: Easier Deployment

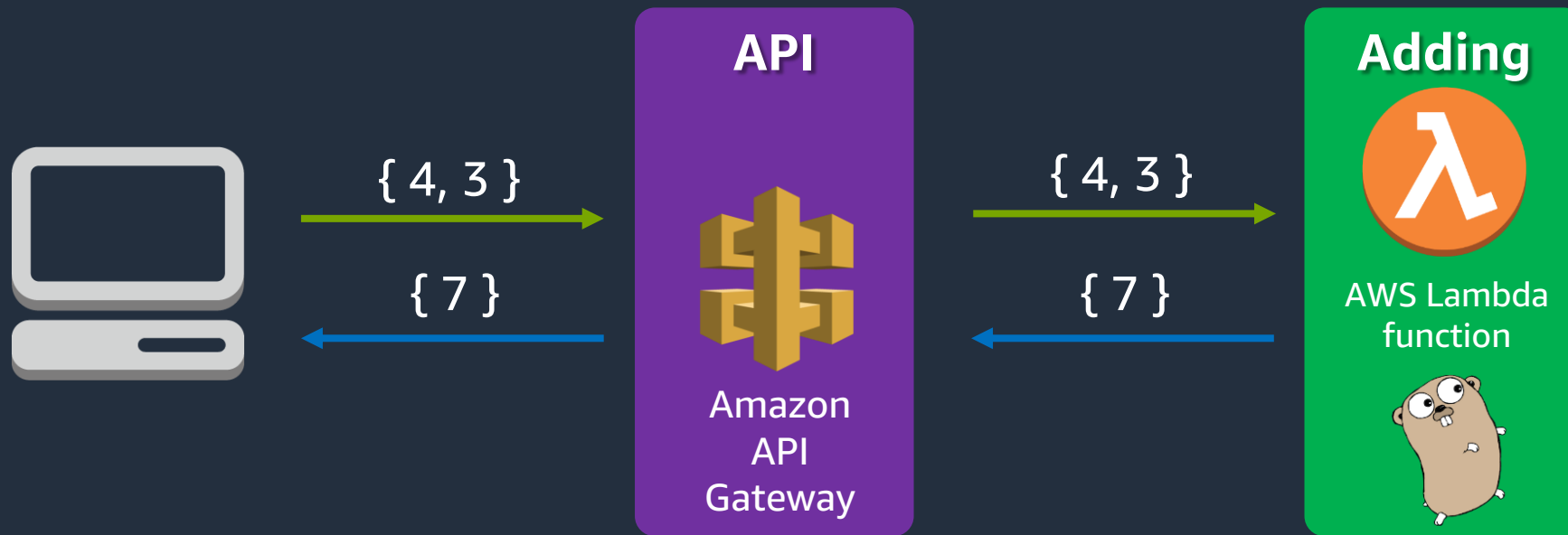
Package

- Creates a deployment **package** (.zip file)
- Uploads** deployment package to an Amazon S3 Bucket
- Adds a **CodeUri** property with S3 URI

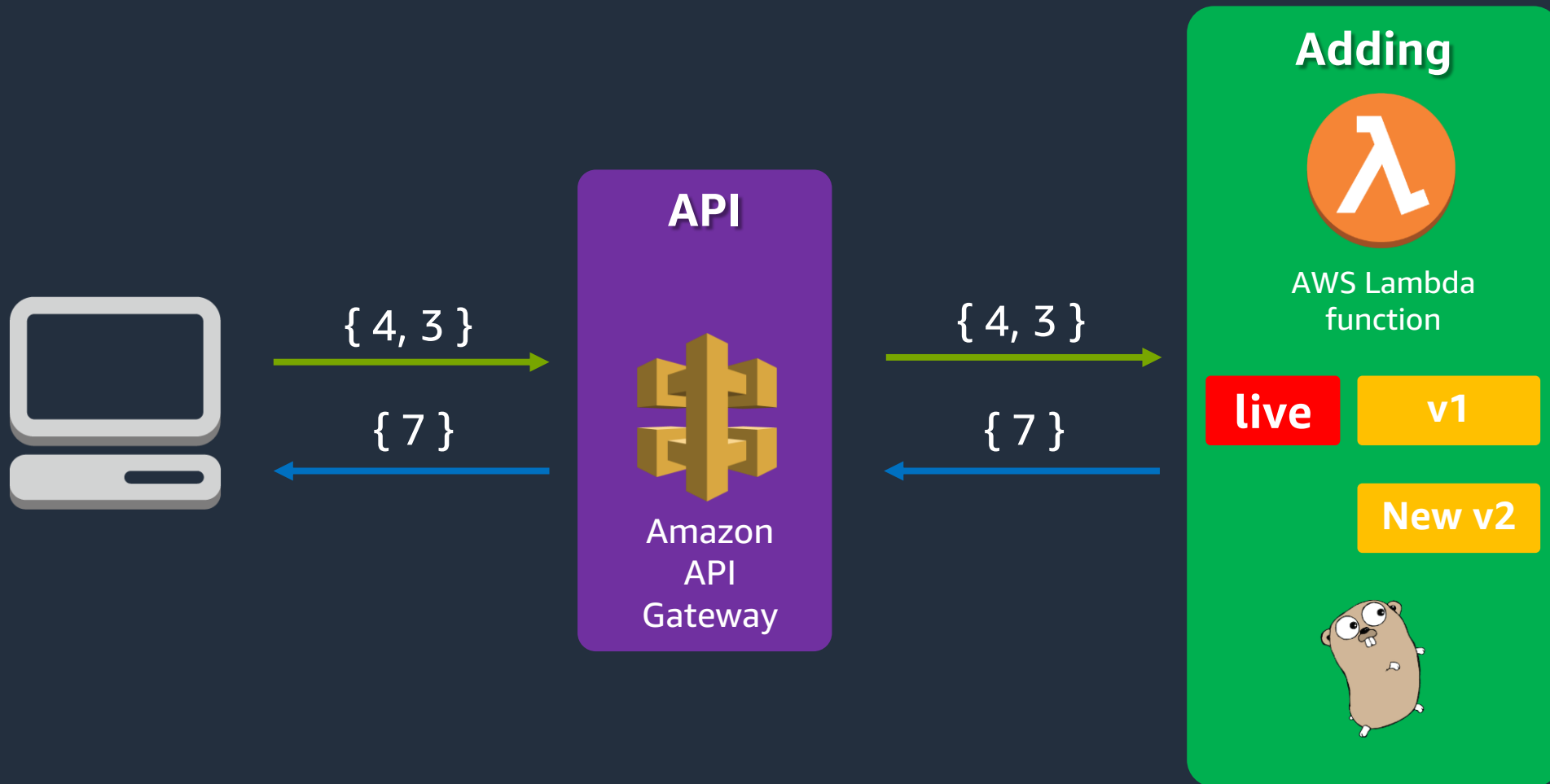
Deploy

- Calls CloudFormation '**CreateChangeSet**' API
- Calls CloudFormation '**ExecuteChangeSet**' API

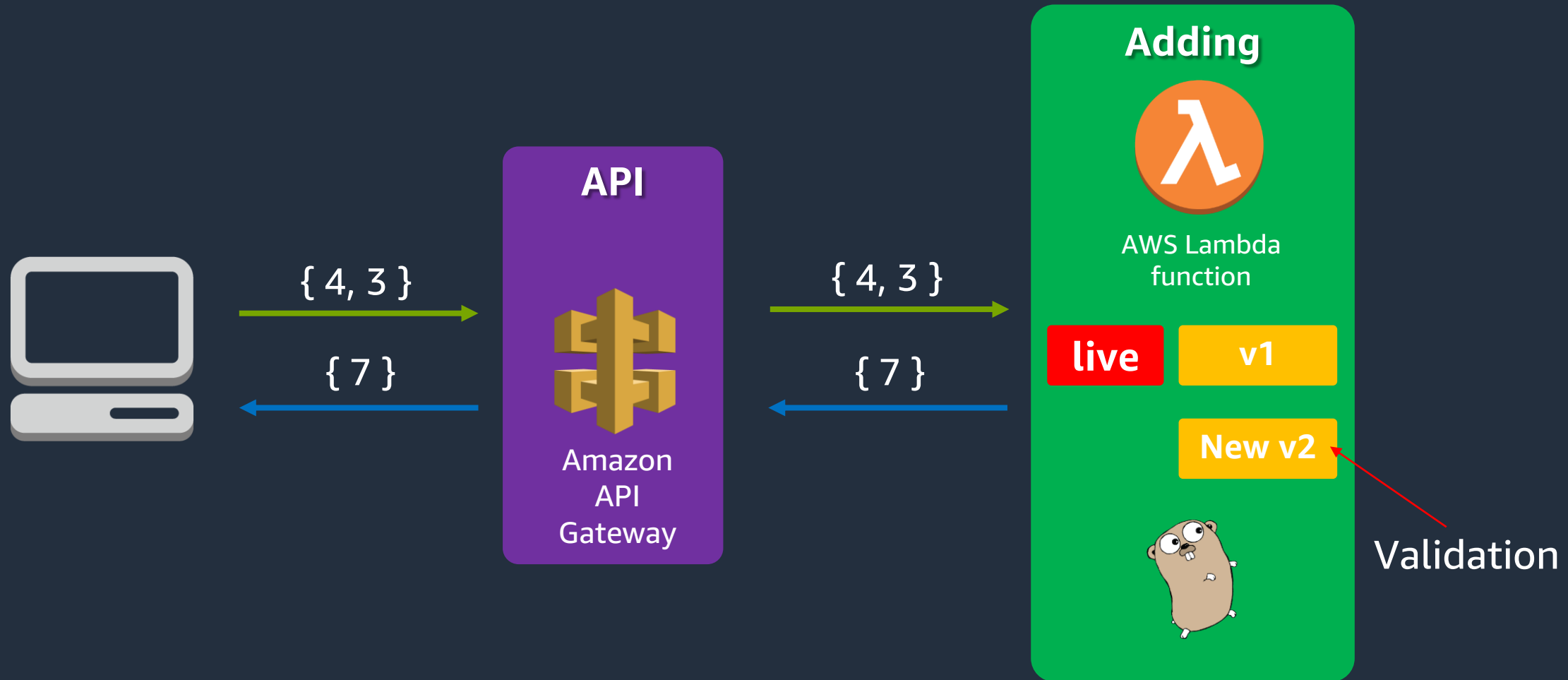
1st Demo – Simple Calculator



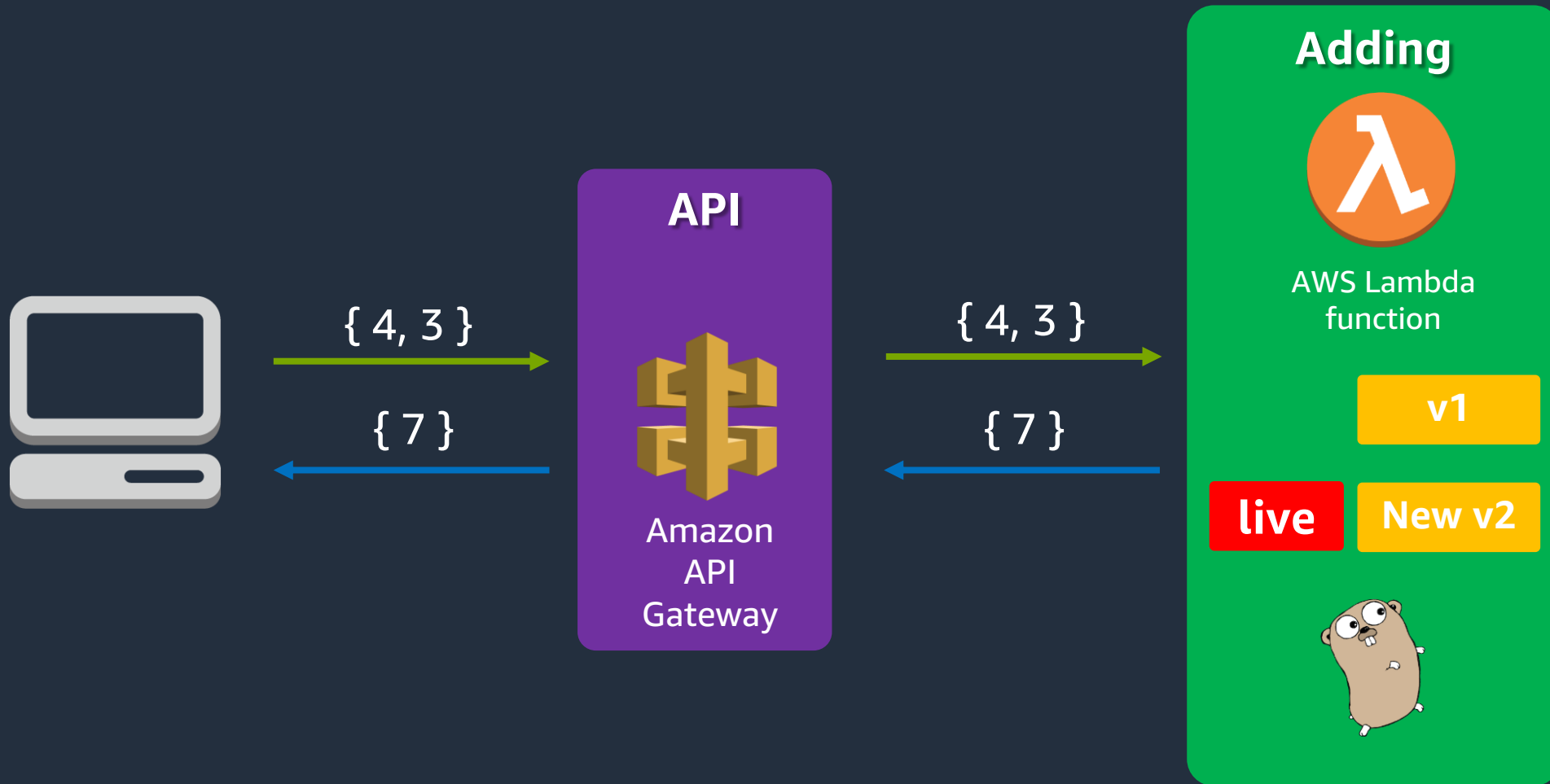
1st Demo – Lambda Deployment Safety



1st Demo – Lambda Deployment Safety



1st Demo – Lambda Deployment Safety



SAM Summary



Less Code

Less Process (with SAM Commands)

Easy **Safe Deployments** for Lambda
via **Canaries** and **blue|green**

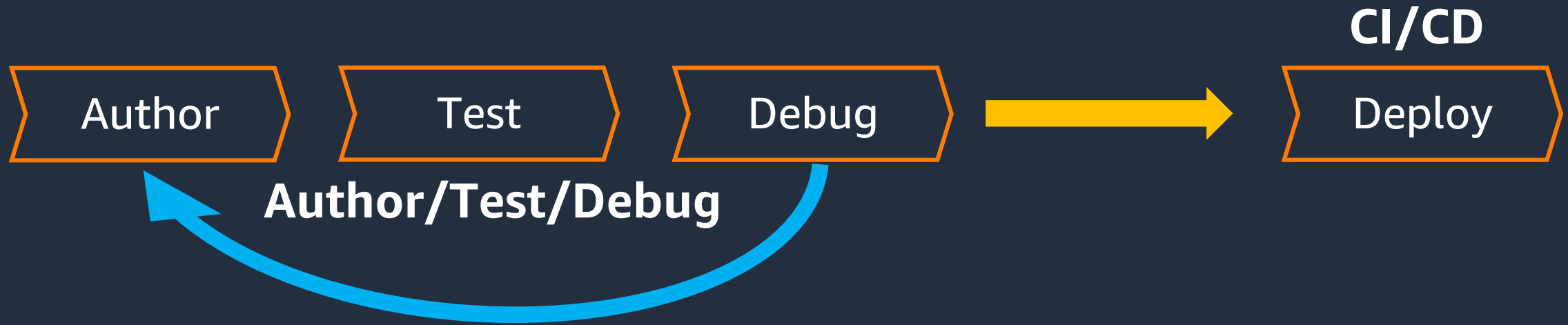


AWS CodeDeploy

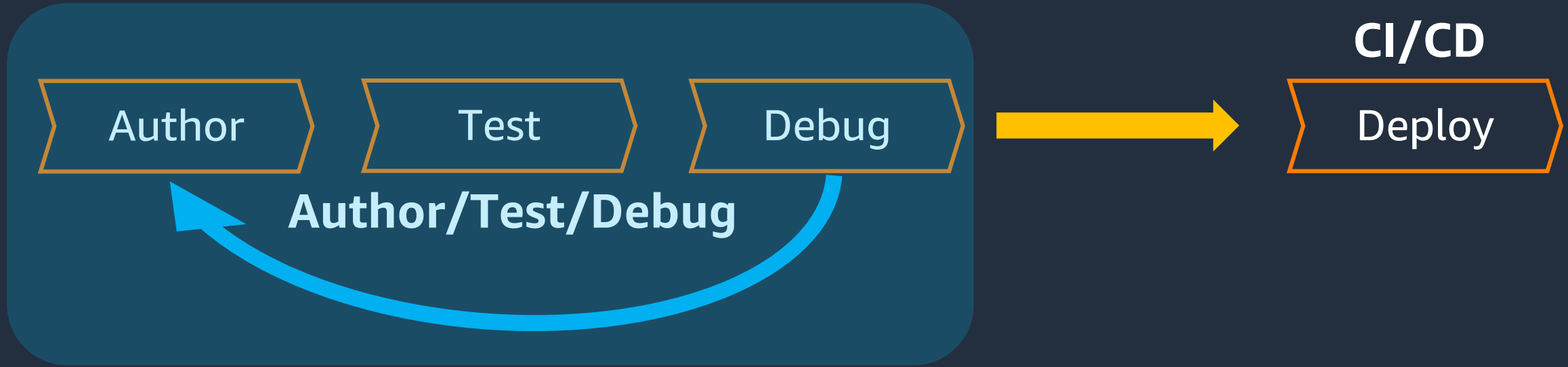
What we did...



Better



SAM CLI



- ✓ No Waiting
- ✓ No Interruptions
- ✓ No Internet

CLI tool for local test, debug and deploy serverless apps

SAM CLI



Invoke **Lambda** functions locally

Start **API** Gateway locally

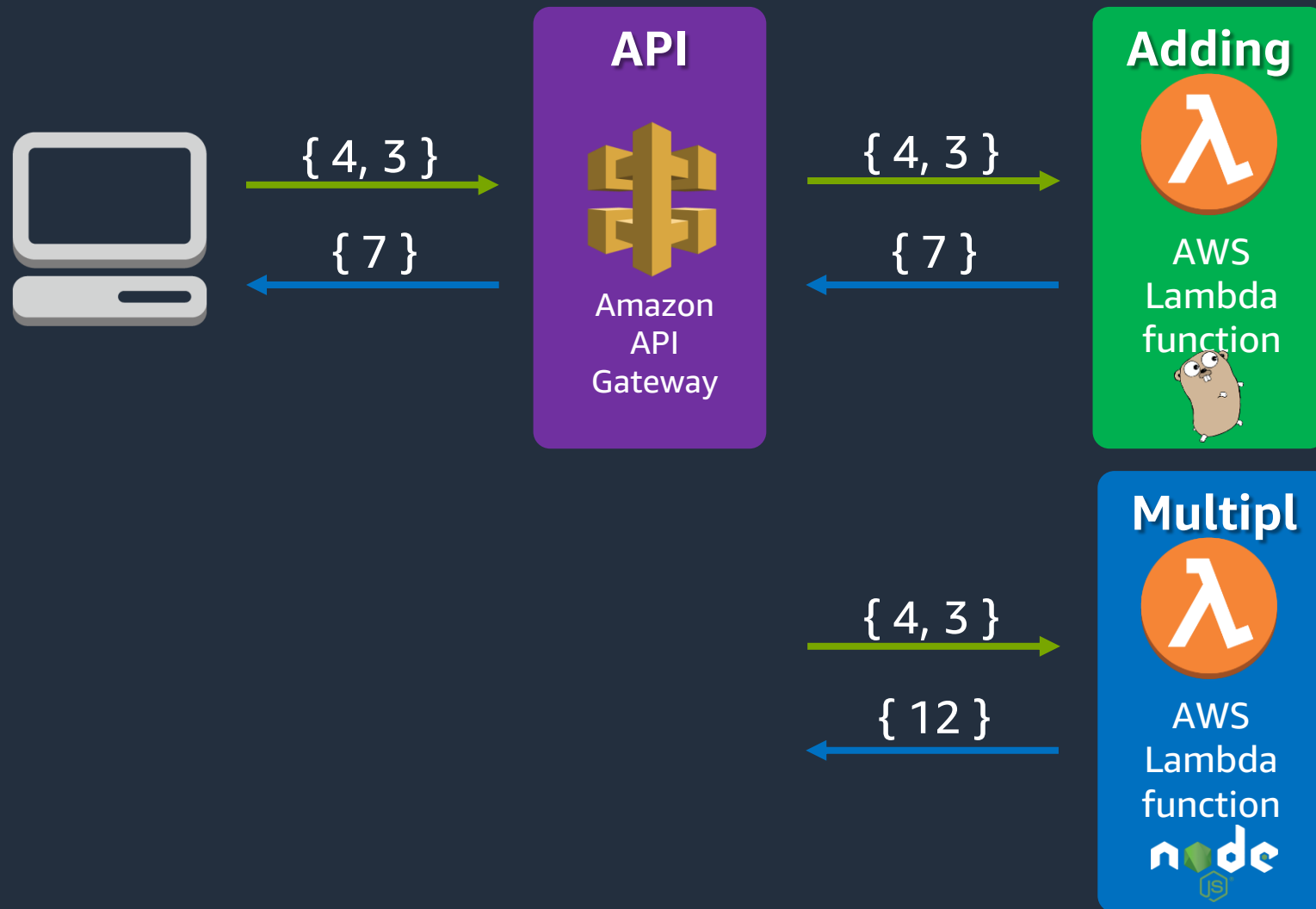
Mock event sources like S3, DDB, Kinesis, etc

Live debugging for Java, Node.js, and Python

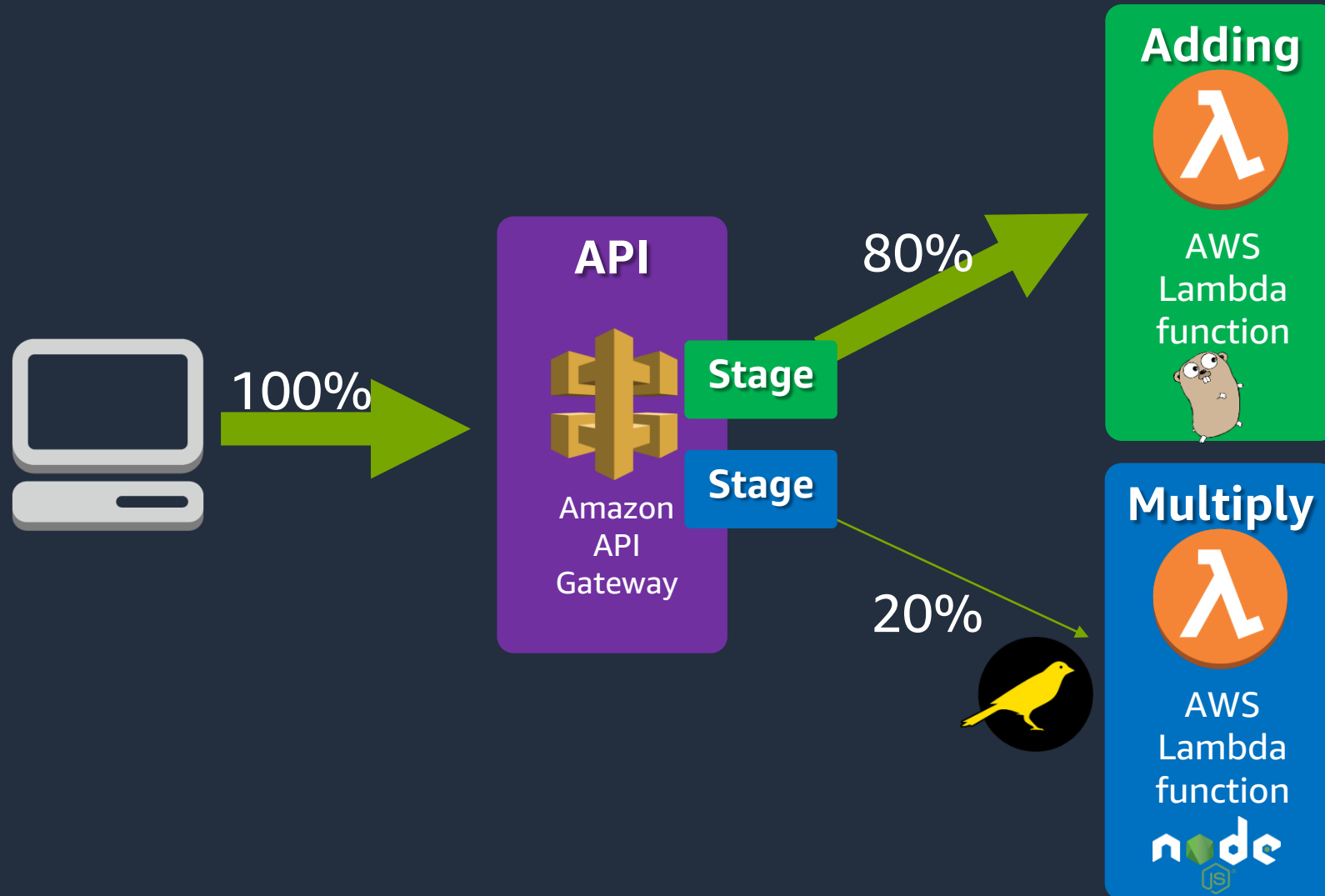
<https://github.com/awslabs/aws-sam-cli>

```
pip install aws-sam-cli
```

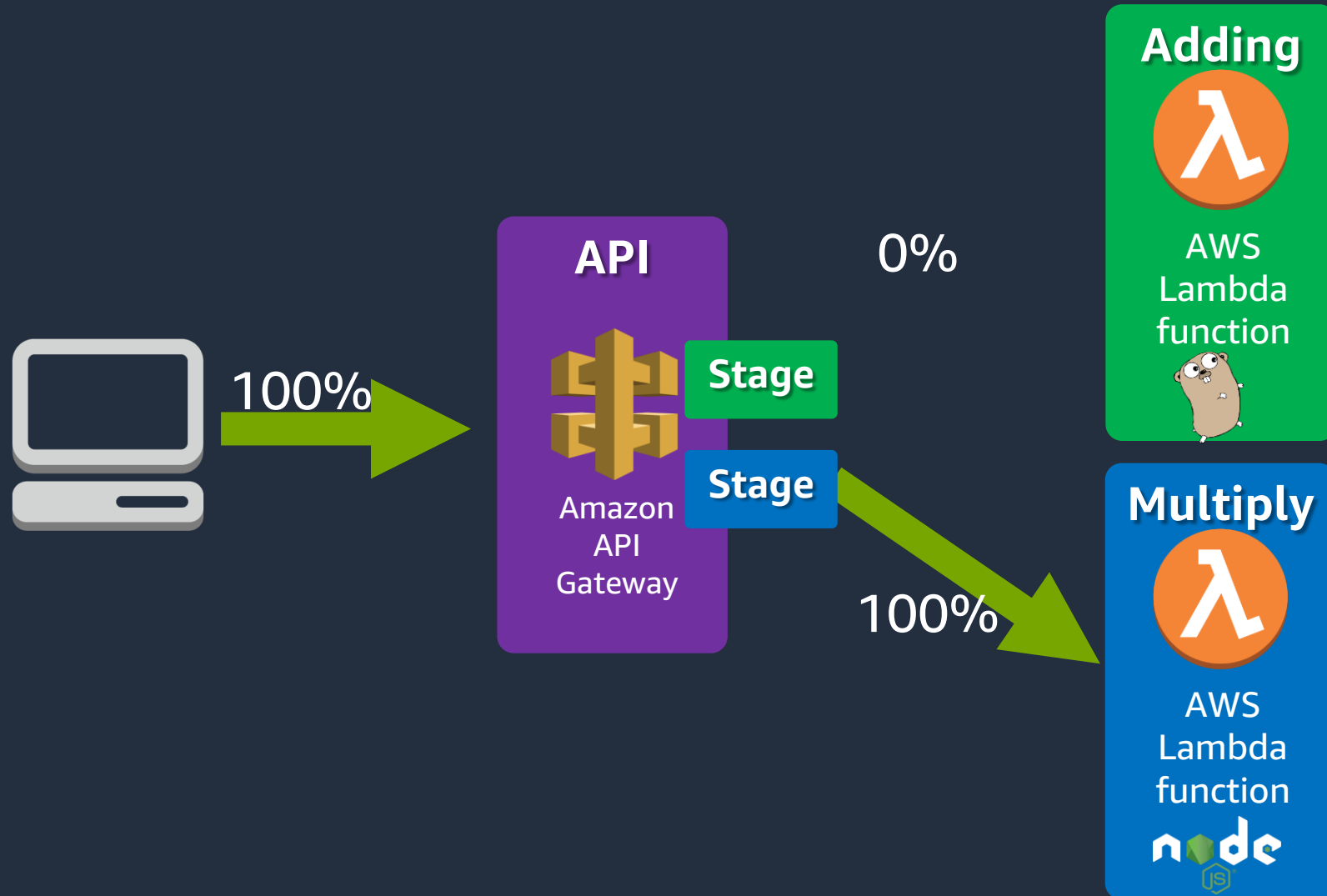
2nd Demo – Multiply



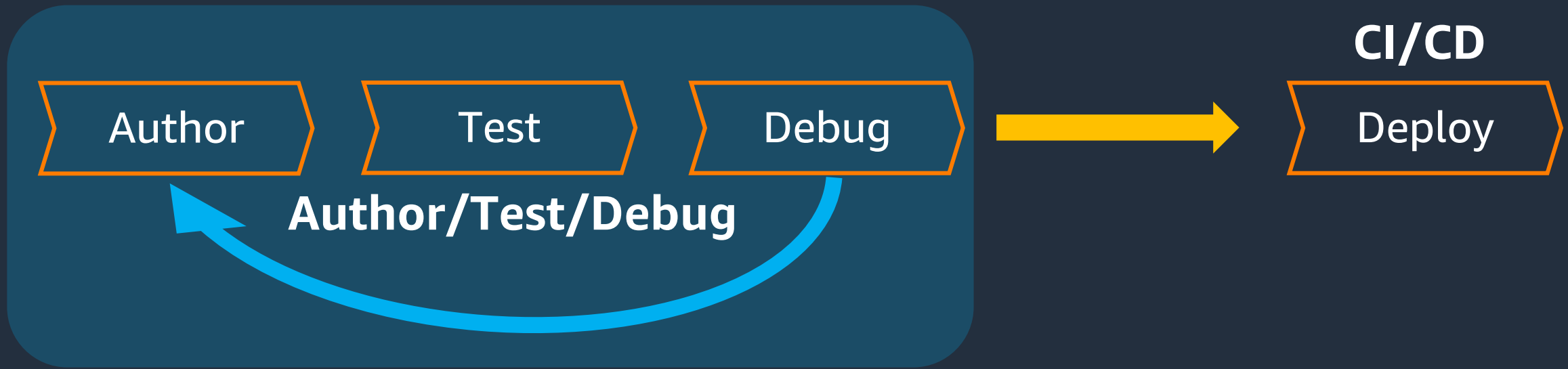
2nd Demo – Canary Release for APIGW



2nd Demo – Canary Release for APIGW

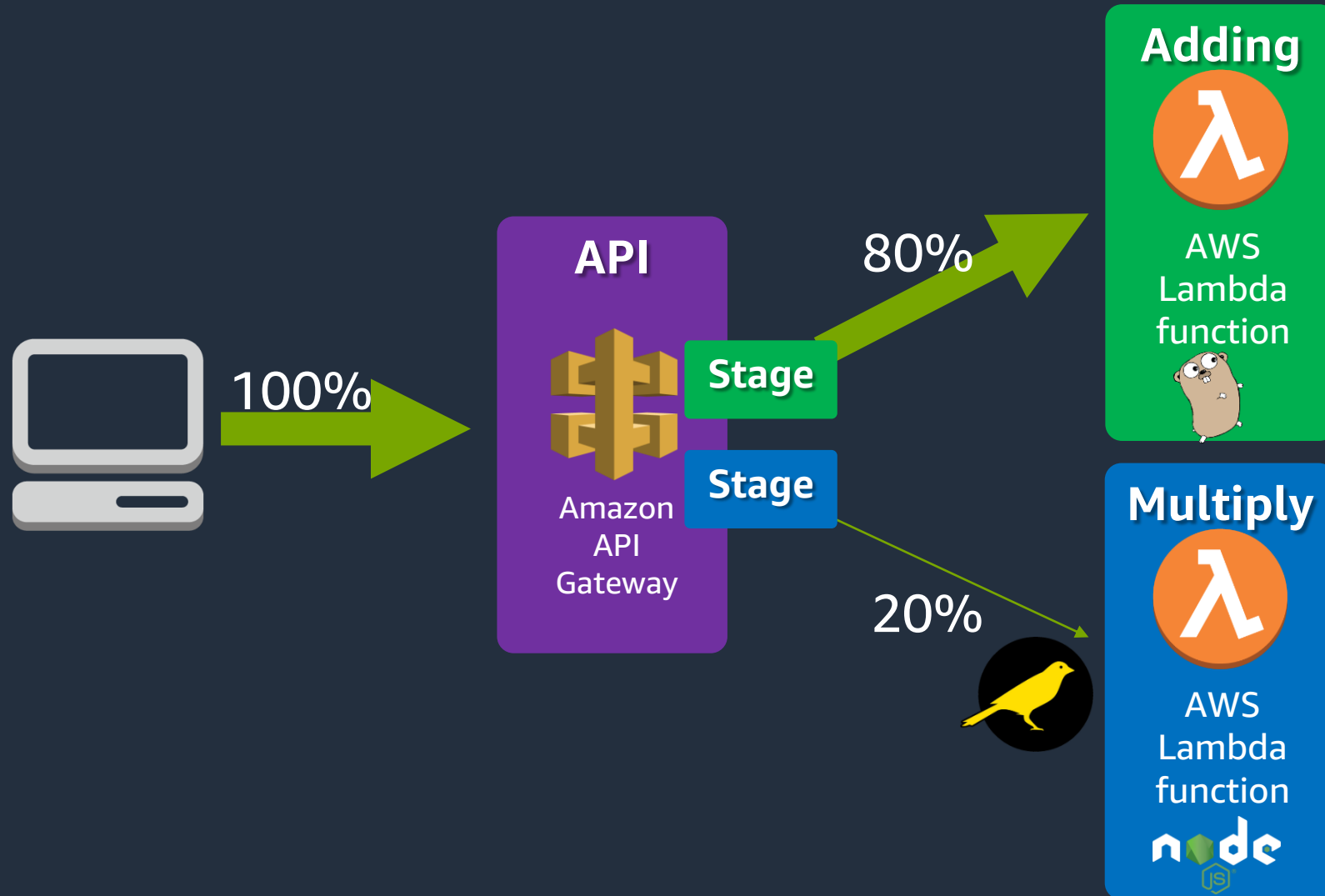


SAM CLI Summary: Faster Software Creation



- ✓ No Waiting
- ✓ No Interruptions
- ✓ No Internet

Safe Deployments (APIGW) Summary

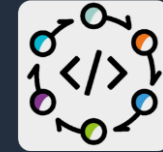


Resources

<https://aws.training>

<https://youtube.com/AmazonWebServices>

<https://docs.aws.amazon.com>



AWS
CodeStar



AWS
Cloud9

SAM and SAM CLI:

<https://github.com/awslabs/serverless-application-model>

<https://github.com/awslabs/aws-sam-cli>



Get Started:

<https://aws.amazon.com/serverless/build-a-web-app/>

[Lambda console blueprints](#)

[AWS Serverless Application Repository](#)



Speed + Safety



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