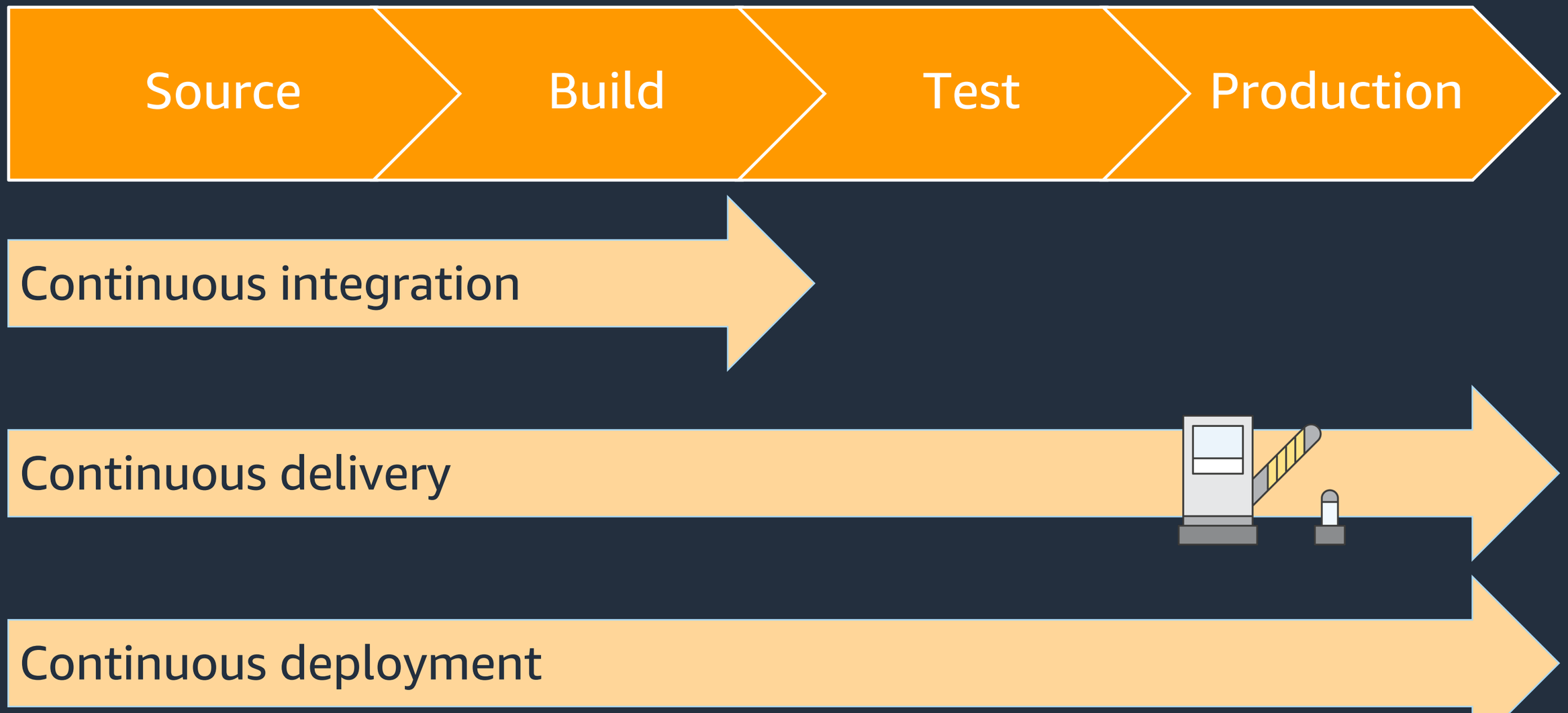
Reach AWS from your Azure DevOps pipeline

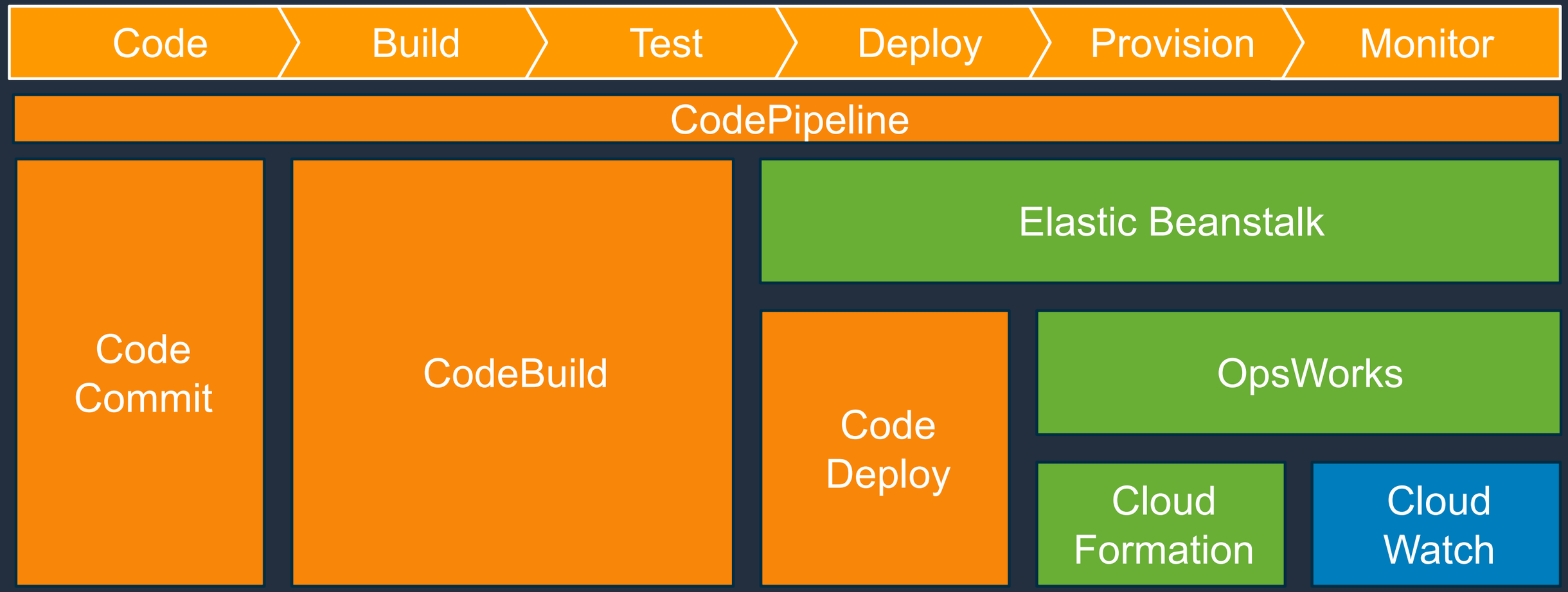
Using the AWS Toolkit for Azure DevOps

Roman Martynenko
Sr. Solutions Architect, AWS

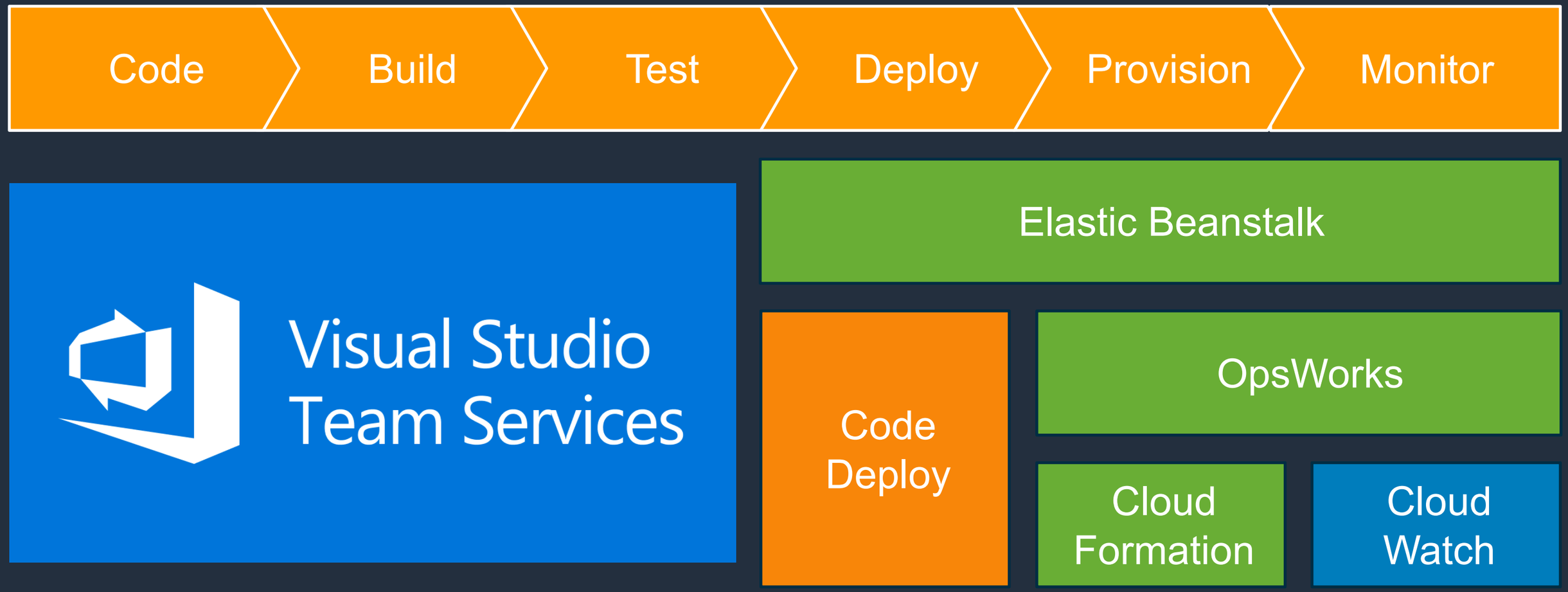
Release processes levels



AWS DevOps Services



AWS DevOps Services



What is the Toolkit for Azure DevOps?

Extension for hosted and on-premises Azure DevOps (aka: TFS, VSTS)

Continue to use your existing tools!

Adds AWS-specific tasks that can be added to your build and release pipelines

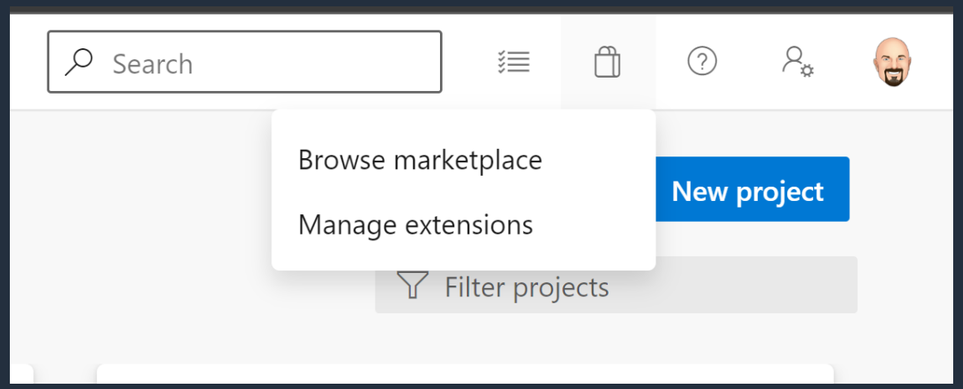
Interacts with AWS Services

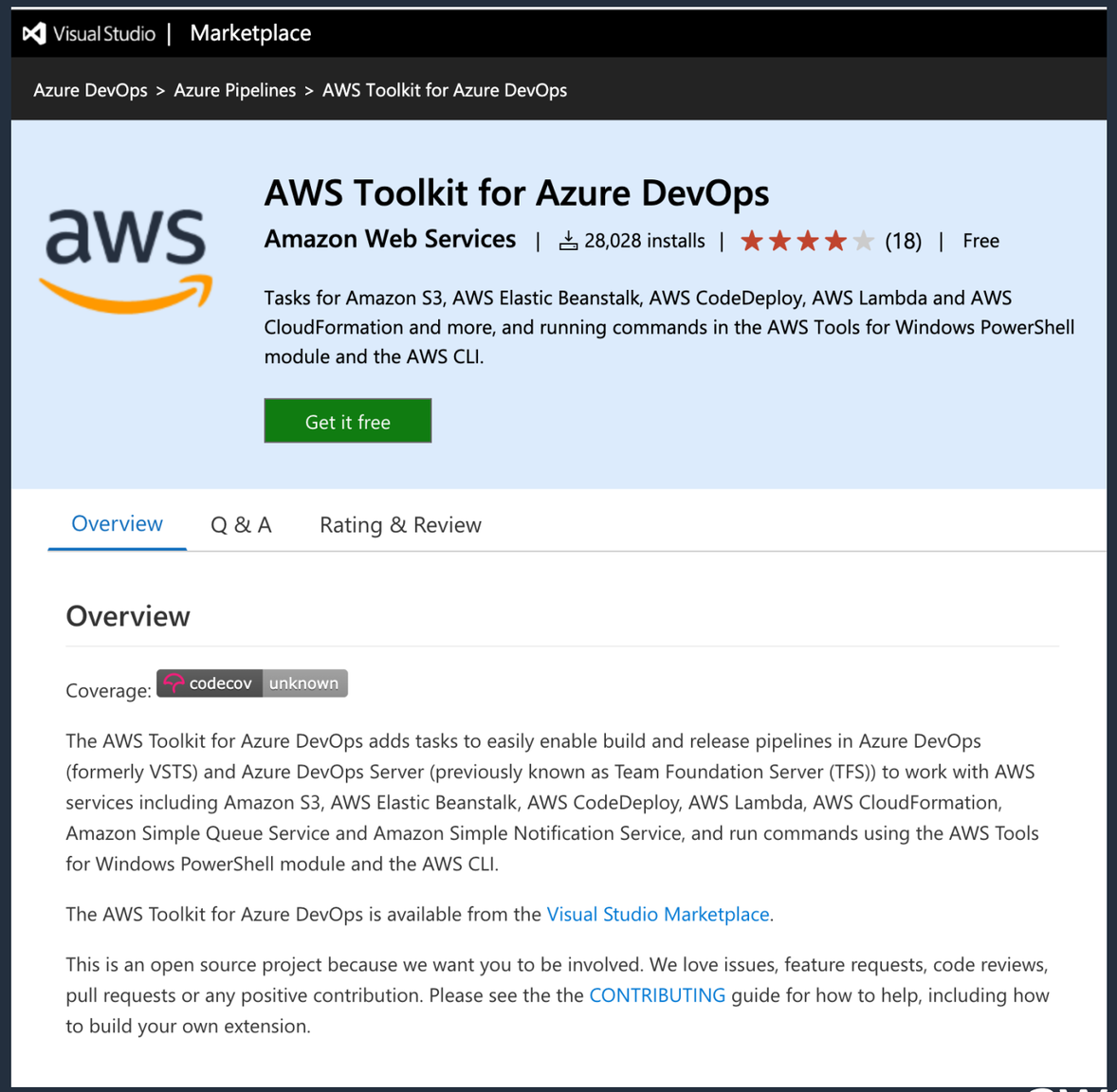
- ECR/ECS
- Elastic Beanstalk
- CodeDeploy
- Lambda
- (and many others!)

Installing the Toolkit

Available in the Extensions Marketplace

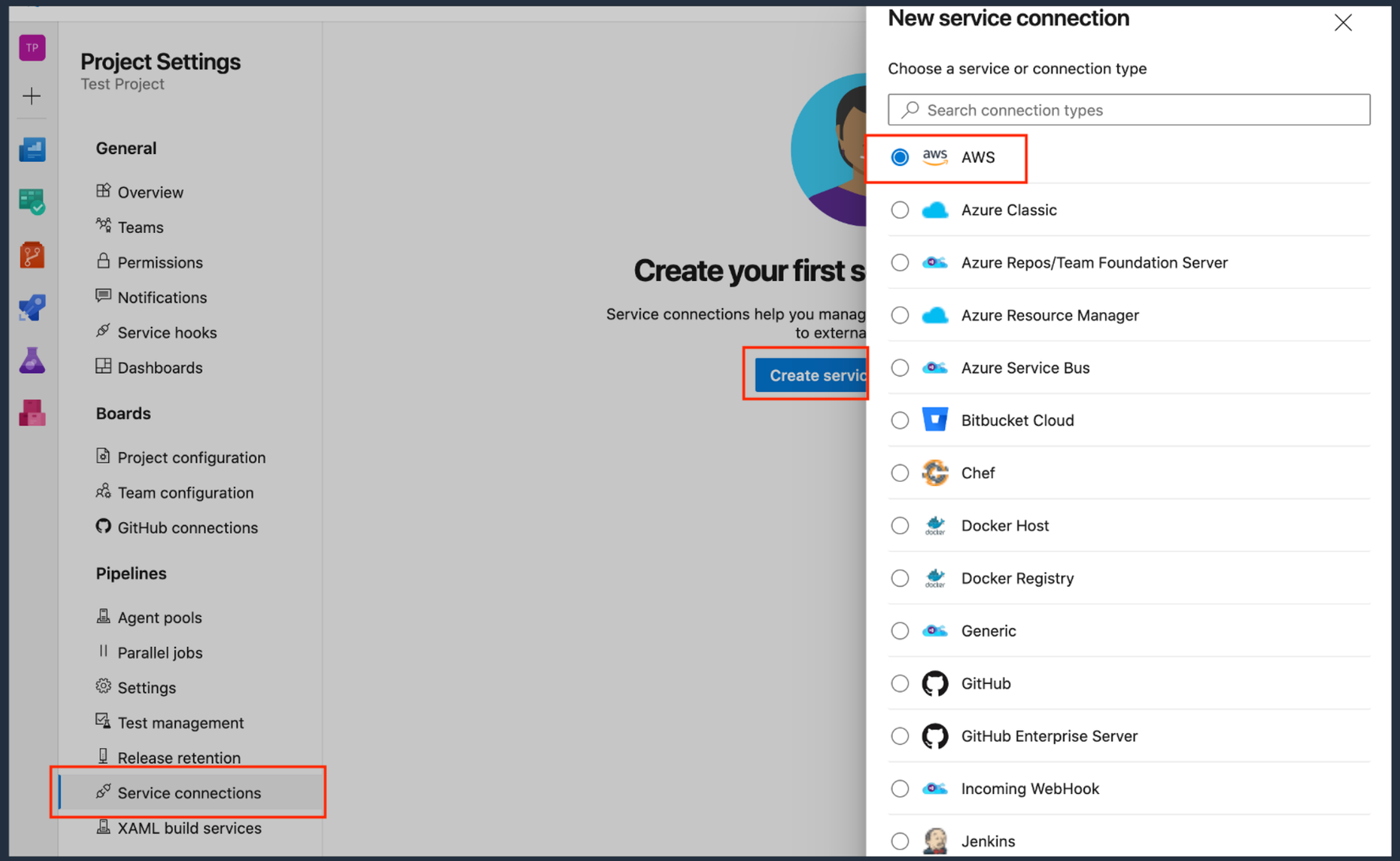
Search the Azure DevOps Marketplace for “AWS Toolkit”





Providing AWS Credentials

Adding an AWS Service Connection



Setting AWS Credentials in Service Endpoint

One-time setup for all users of the pipeline
Obtain credentials from IAM

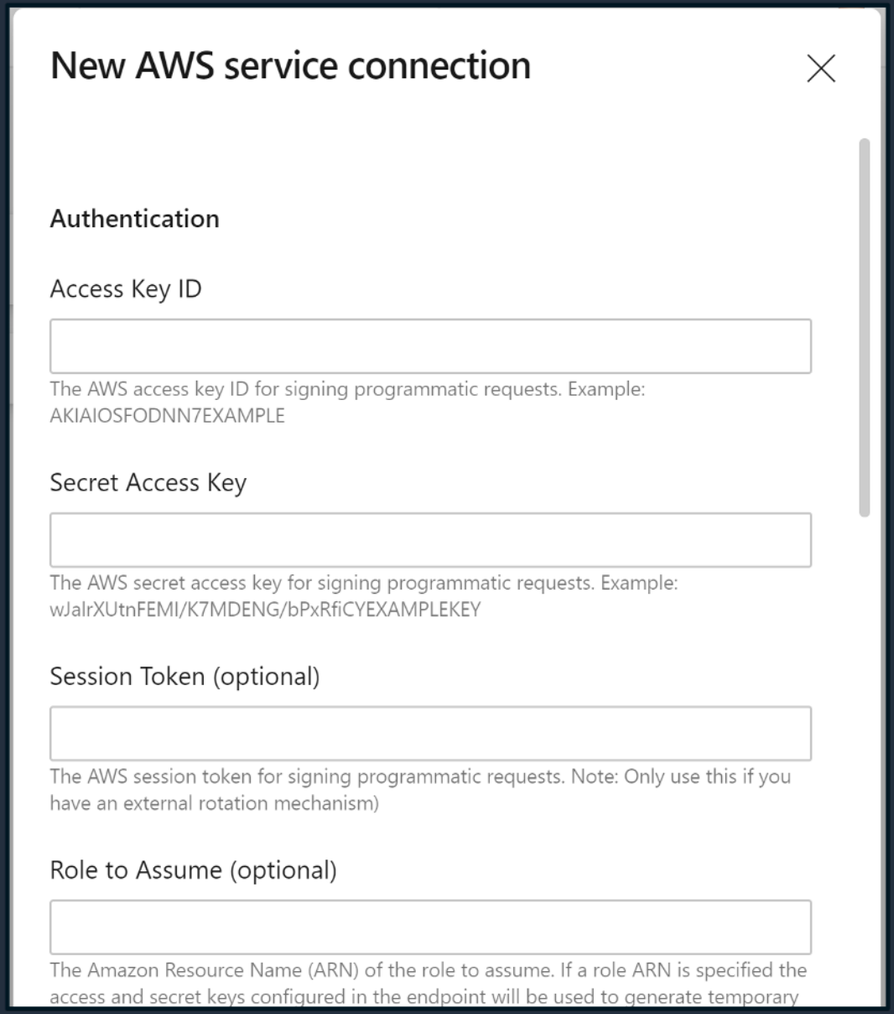
- Access Key ID
- Secret Access Key

Can also use STS assume-role for temporary credentials generated at build time

- Role to assume
- External ID (optional)

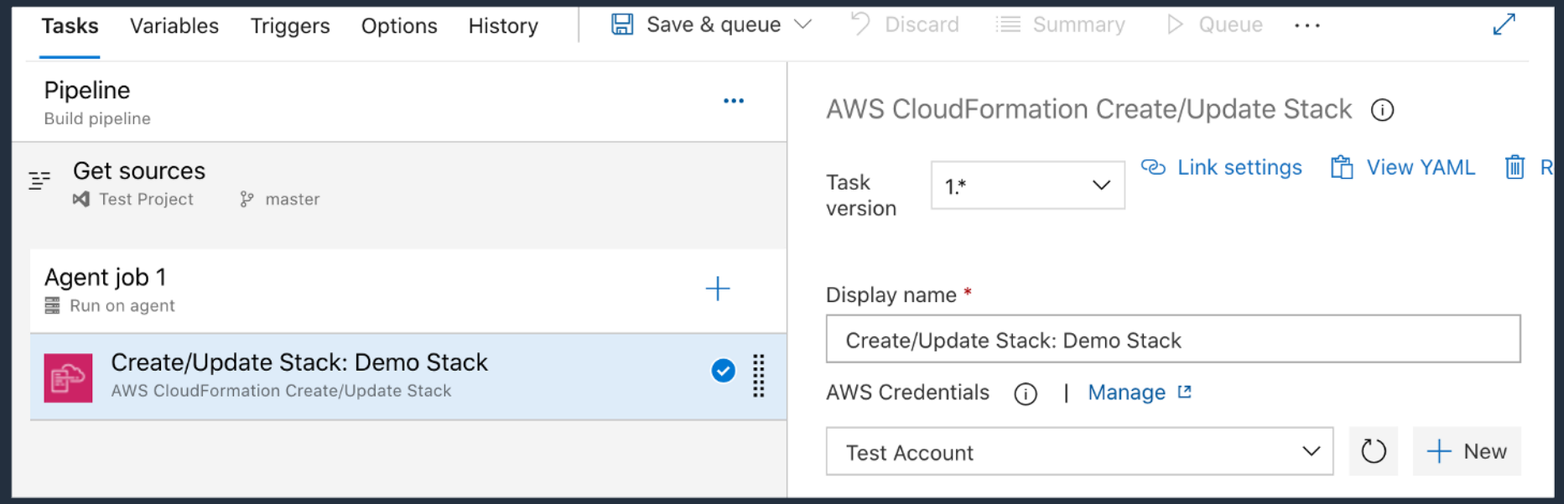
Can use STS-assigned credentials

- Session Token
- NOTE: STS credentials expire and will need to be refreshed with an external process



Supplying AWS Credentials to Tasks

- Configure a service endpoint of type AWS for use in tasks
- Create specific named variables in your build
- Use standard AWS environment variables in the build agent process
- Create specific named variables in your build
- Use EC2 Instance Profiles



Setting AWS Credentials as Pipeline Variables

Set well-known variables in your pipeline:

- AWS.AccessKeyID – IAM Access Key
- AWS.SecretAccessKey – IAM Secret Key

If using STS-issued credentials, also supply the token using

- AWS.SessionToken

Optionally, can also specify the region using

- AWS.Region

Setting AWS Credentials as Environment Variables

Set well-known environment variables on your build server/user profile:

- AWS_ACCESS_KEY_ID – IAM Access Key
- AWS_SECRET_ACCESS_KEY – IAM Secret Key

If using STS-issued credentials, also supply the token using

- AWS_SESSION_TOKEN

Optionally, can also specify the region using

- AWS_REGION

Setting AWS Credentials as EC2 Instance Profiles

When running a build agent on EC2:

- Associate EC2 instance profile with permissions to call AWS services
- Tasks will automatically obtain credentials from EC2 metadata
- Credentials will be automatically refreshed by EC2

NOTE: These credentials will be for all users' pipelines executed on the server

Pipeline tasks

Amazon S3

Upload/download file and folder content to/from an S3 Bucket file or folder

Supports Globbing (/**/*) to select files

Useful to do things like:

- Upload published assets for Web front-ends
- Download latest branding images
- etc.

Task names:

- S3Upload
- S3Download

AWS Elastic Beanstalk

Creates an application version or deploys an application to Amazon EC2 instance(s) using A WS Elastic Beanstalk

Can package/deploy ASP.NET/ASP.NET Core directly from the workspace, or can copy to/deploy from S3 URL.

Task names:

- BeanstalkCreateApplicationVersion
- BeanstalkDeployApplication

AWS Lambda

Deployment of AWS Lambda functions for all supported language runtimes.

Builds, packages and deploys a .NET Core AWS Lambda function or serverless application.

Can also create a deployment package for later deployment in another build or release pipeline.

Can also invoke an existing AWS Lambda function, supplying a payload as a JSON string.

Task names:

- LambdaDeployFunction
- LambdaInvokeFunction
- LambdaNETCoreDeploy

Amazon ECR

Pull/push Docker images from/to ECR

Supports tagging (for both pulling and pushing)

Task names:

- ECRPullImage
- ECRPushImage

AWS CodeDeploy Application Deployment

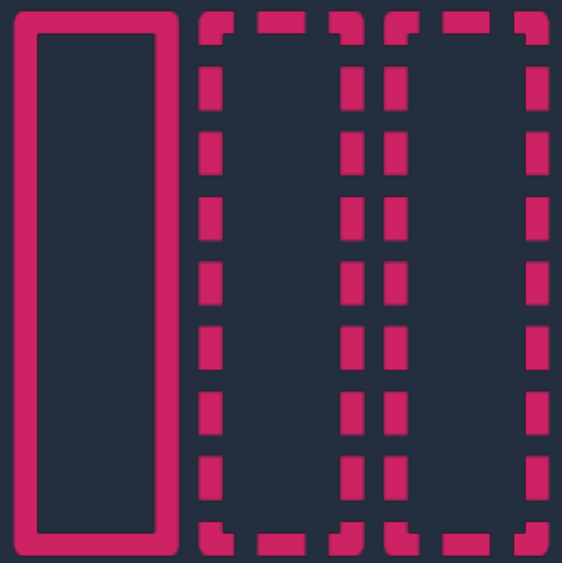
Deploys an application to Amazon EC2 instances using AWS CodeDeploy

Can supply either a folder, a pre-generated zip file, or an S3 URL for the application revision

Task name:

- CodeDeployDeployApplication

Amazon SNS & SQS



Sends a message to an Amazon Simple Notification Service (SNS) topic or Amazon Simple Queue Service (SQS) queue

Can also specify delay prior to sending

Task name:

- SendMessage

AWS CloudFormation

Deploys/updates/deletes stacks

Creates/executes changesets

Task names:

- CloudFormationCreateOrUpdateStack
- CloudFormationExecuteChangeSet
- CloudFormationDeleteStack

AWS Systems Manager

Creates, updates, or reads a parameter in Systems Manager (SSM) Parameter Store

Runs a SSM command remotely on a fleet of Amazon EC2 instances and/or on-premise machines.

Task names:

- SystemsManagerSetParameter
- SystemsManagerGetParameter
- SystemsManagerRunCommand

AWS Secrets Manager

Updates a secret, optionally creating a secret if it does not exist, or reads a secret
Supports pipeline variable for output

Can supply secret value inline or from a file (must be a file for binary secrets)

Can optionally specify KMS key (will use default CMK if none is specified)

Task names:

- SecretsManagerCreateOrUpdateSecret
- SecretsManagerGetSecret

AWS CLI/PowerShell

Run a single CLI Command, an AWS CLI script, or an AWS Tools for Windows PowerShell script

Supports the ability to capture output in pipeline variables using ***task.setvariable***

CLI environment is either CMD or Bash depending upon selected agent platform

Task names:

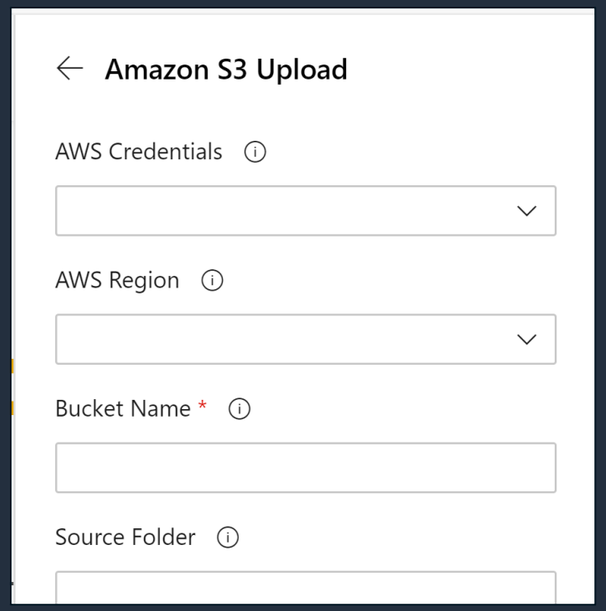
- AWSCLI
- AWSShellScript
- AWSPowerShellModuleScript

Using AWS Tasks in Your Pipeline

YAML Pipeline Syntax

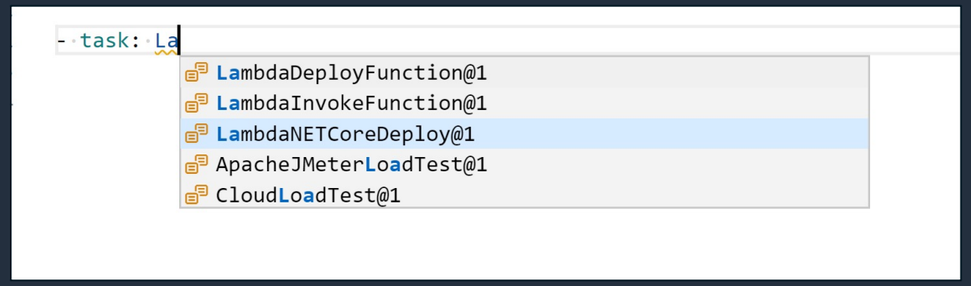
Adding task via tasks sidebar

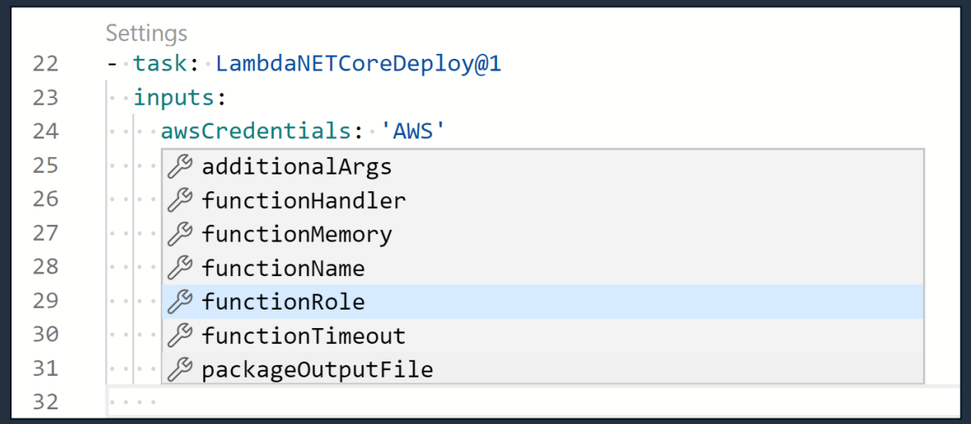
- Provides a property editor
- Generates YAML after clicking “Add”



Also supports Intellisense in Pipeline Editor

- CTRL/Option-Space for type-ahead
- Supports tasks and parameters





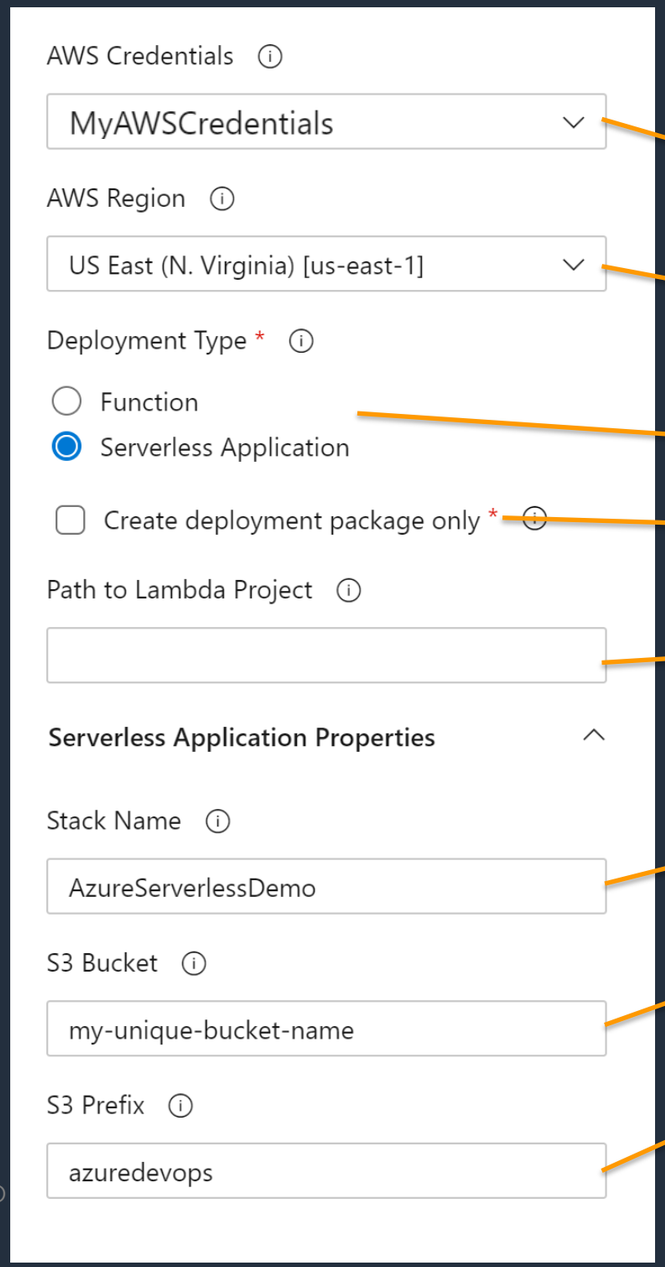
Example Pipeline: Serverless Application Deployment

```yaml
trigger:
- master

pool:
  vmImage: 'ubuntu-latest'

steps:
- task: LambdaNETCoreDeploy@1
  inputs:
    awsCredentials: 'MyAWSCredentials'
    regionName: 'us-east-1'
    command: 'deployServerless'
    packageOnly: false
    lambdaProjectPath: './'
    stackName: 'AzureServerlessDemo'
    s3Bucket: 'my-unique-bucket-name'
    s3Prefix: 'azuredevops'
```

Service Connection Name

If no value is specified for `lambdaProjectPath`, builds & deploys the project at the root of the source tree.

Setting Task Parameters: GUI vs. YAML




```yaml
- task: LambdaNETCoreDeploy@1
  inputs:
    awsCredentials: 'MyAWSCredentials'
    regionName: 'us-east-1'
    command: 'deployServerless'
    packageOnly: false
    lambdaProjectPath: './'
    stackName: 'AzureServerlessDemo'
    s3Bucket: 'my-unique-bucket-name'
    s3Prefix: 'azuredevops'
```

Debugging your Pipeline

Can obtain diagnostic logging information using the ***System.Debug*** variable

- Enabled by setting to `true`
- Logs written to pipeline output with `##[debug]` prefix

```
11
12  variables:
13  - name: System.Debug
14    value: true
15
```

LambdaNETCoreDeploy

```
1  ##[debug]Evaluating condition for step: 'LambdaNETCoreDeploy'
2  ##[debug]Evaluating: SucceededNode()
3  ##[debug]Evaluating SucceededNode:
4  ##[debug]=> True
5  ##[debug]Result: True
6  Starting: LambdaNETCoreDeploy
7  ==============================================================================
8  Task         : AWS Lambda .NET Core
9  Description  : Builds, packages and deploys a .NET Core AWS Lambda function or serv
10 Version      : 1.7.0
11 Author       : Amazon Web Services
12 Help         : Please refer to [AWS Lambda Developer Guide](https://docs.aws.amazon
13
14 More information on this task can be found in the [task reference](https://docs.aws
15
16 ####Task Permissions
17 This task requires permissions to call the following AWS service APIs (depending on
18 * lambda:CreateFunction
19 * lambda:UpdateFunctionCode
```

DEMO

Resources

- AWS Toolkit for Azure DevOps Home Page: https://aws.amazon.com/vsts/
- User Guide (includes task reference): https://docs.aws.amazon.com/vsts/latest/userguide
- GitHub Repo: https://github.com/aws/aws-toolkit-azure-devops

Thank you!