AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

XNT301

What's new with .NET development and deployment on AWS

Norm Johanson
Senior Software Developer Engineer
AWS

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Goals for today

- Introduce our new .NET deployment tooling
- Scalable from simple to complex automated deployments
- Bonus: Updates for .NET and AWS Lambda

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

New deployment tooling

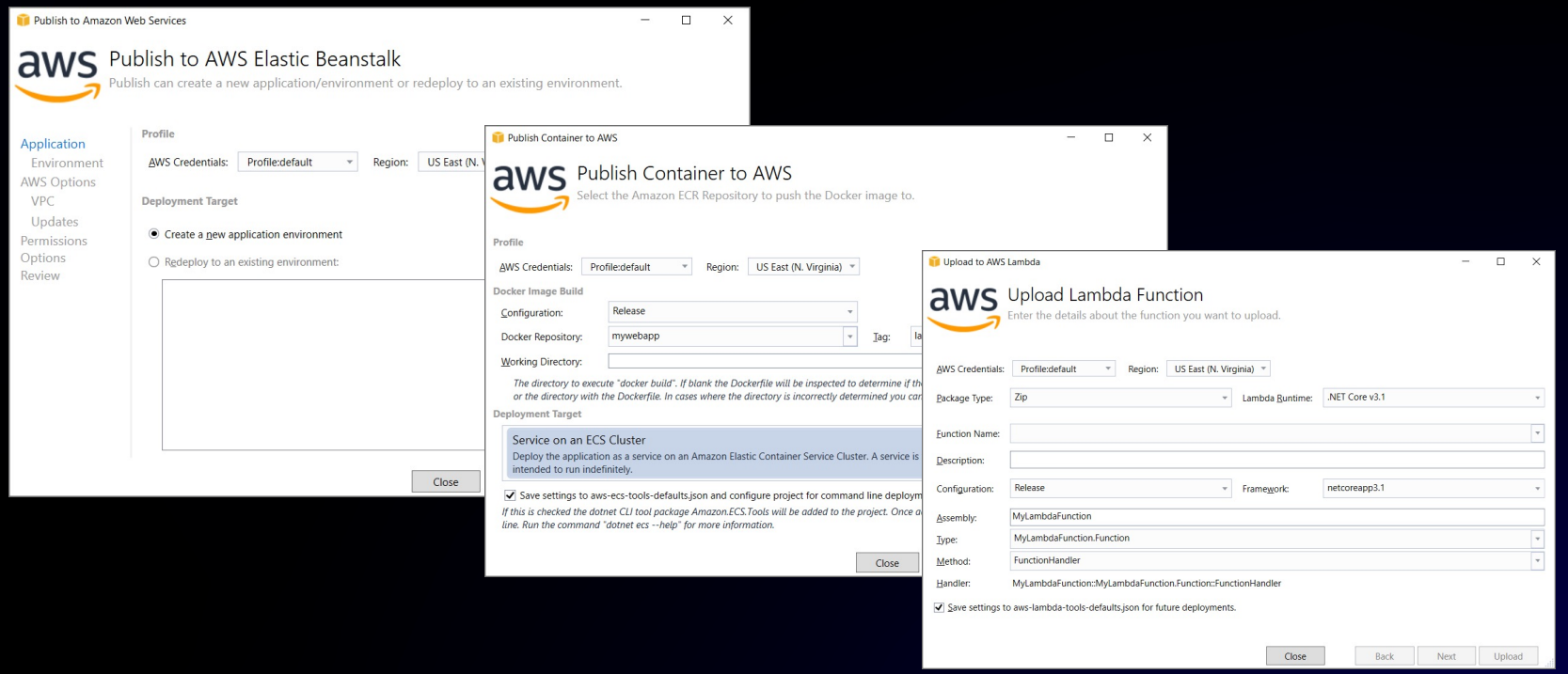
- Available today in preview
- AWS CLI experience available on NuGet
  - Install command: dotnet tool install -g aws.deploy.cli
  - New releases happen every 1 to 2 weeks
- Open source on GitHub: github.com/aws/aws-dotnet-deploy
- Visual Studio integration is currently an opt-in preview

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Why build new .NET deployment tooling?

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Existing Visual Studio wizards



AWS Toolkit for Visual Studio available at Visual Studio Marketplace

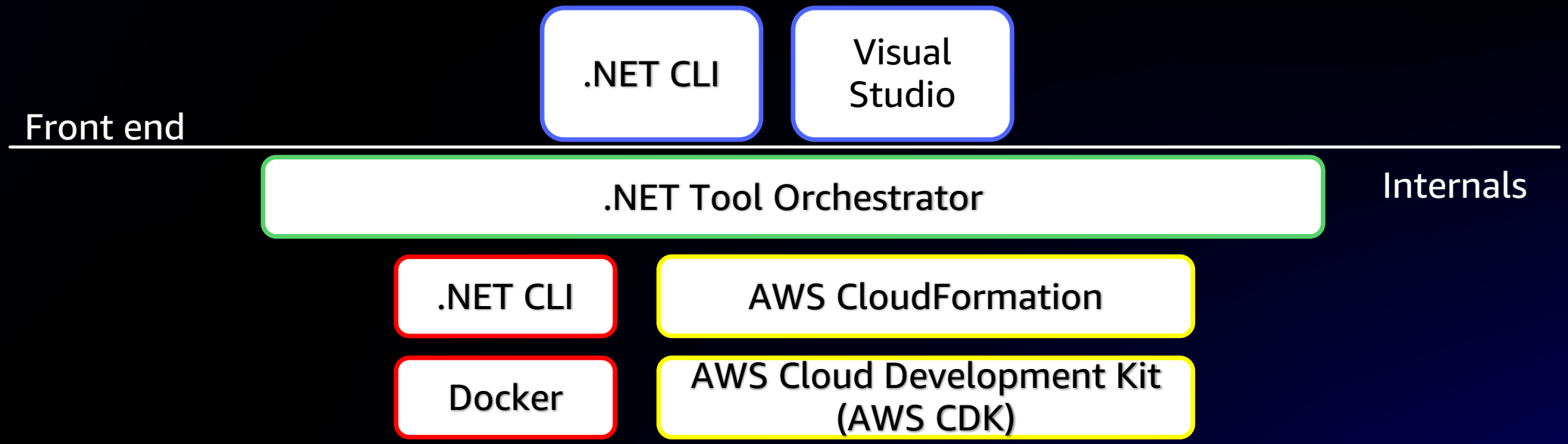
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Goals for the new experience

- Unified deployment experience
- Requires little knowledge about AWS to get started
  - Still provides access to more advanced features when needed
- Ability to deploy in minimal steps
- Reuse what you learn to automate deployment
- Extensible

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

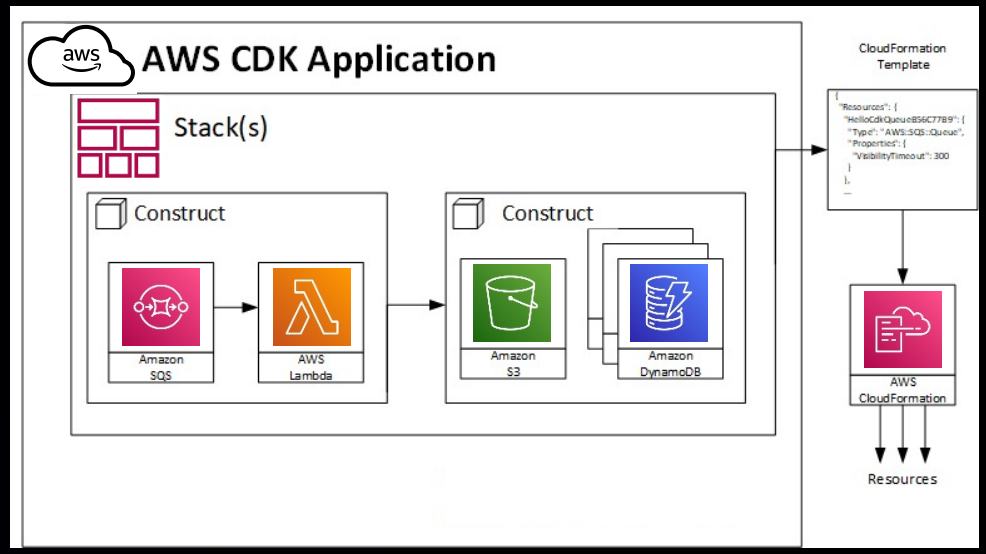
Architecture of the new tooling



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS Cloud Development Kit (AWS CDK)

- Define your application infrastructures and resources in code (IaC)
- “Compile” into AWS CloudFormation template and create stacks
- Provides many high-level constructs to reduce required code




```
public class MyEcsConstructStack : Stack
{
    public MyEcsConstructStack(Construct scope, string id, IStackProps props=null) : base(scope, id, props)
    {
        var vpc = new Vpc(this, "MyVpc", new VpcProps
        {
            MaxAzs = 3
        });

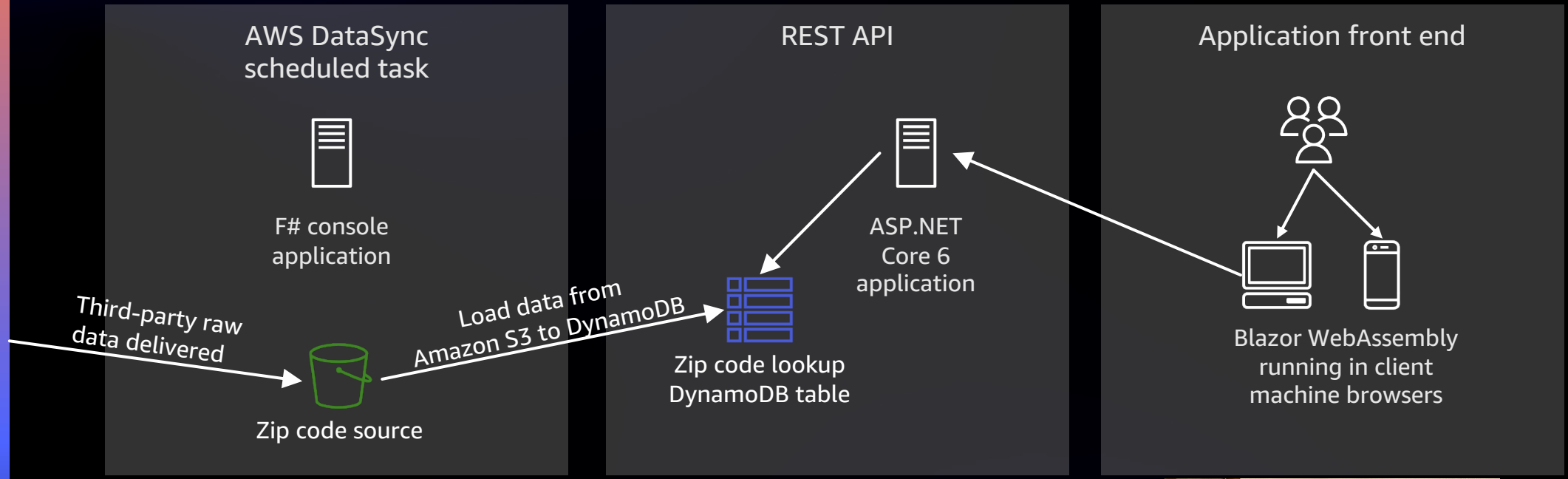
        var cluster = new Cluster(this, "MyCluster", new ClusterProps
        {
            Vpc = vpc
        });

        new ApplicationLoadBalancedFargateService(this, "MyFargateService",
            new ApplicationLoadBalancedFargateServiceProps
        {
            Cluster = cluster,
            Cpu = 512,
            DesiredCount = 6,
            TaskImageOptions = new ApplicationLoadBalancedTaskImageOptions
            {
                Image = ContainerImage.FromRegistry("amazon/amazon-ecs-sample")
            },
            MemoryLimitMiB = 2048,
            PublicLoadBalancer = true,
        });
    }
}
```

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Demo application architecture

US ZIP CODE LOOKUP WEB APPLICATION





Team Dad Rock



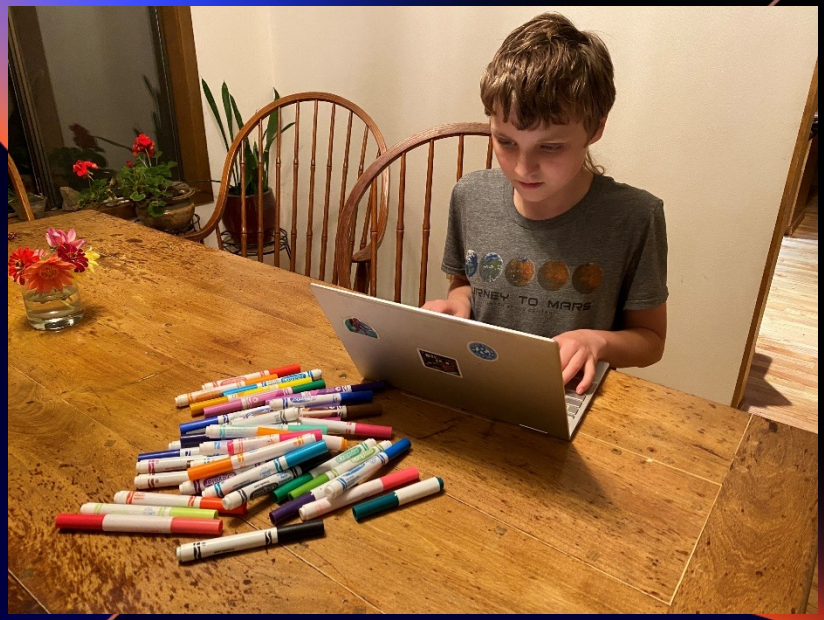
Team Stuffies



Team Markers

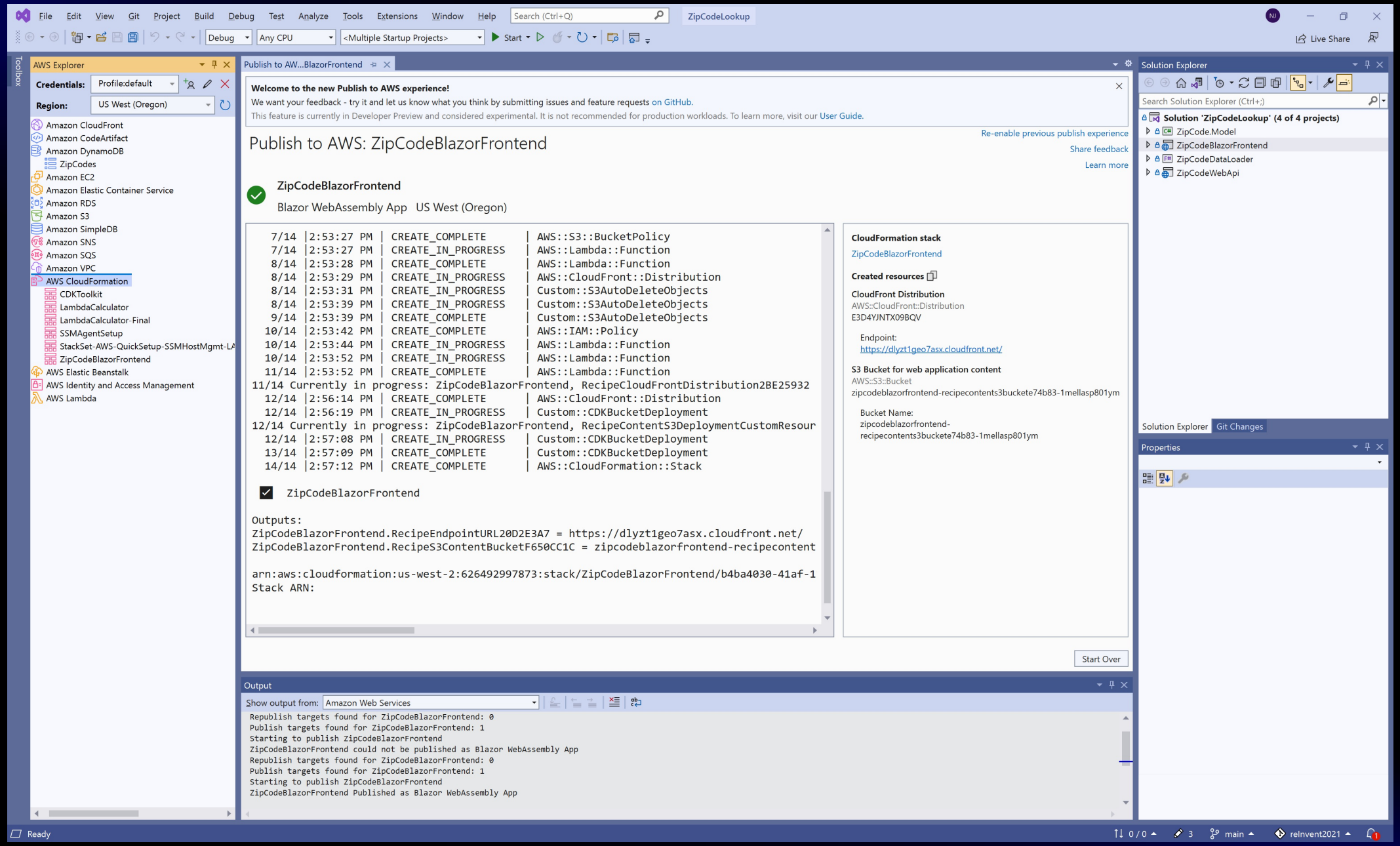
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Demo: Blazor front end



Team Markers

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What did we see?

- Easy deployment
- Didn’t require knowing anything about AWS
- Deployed from Visual Studio
- Blazor WebAssembly application hosted in Amazon S3 and Amazon CloudFront

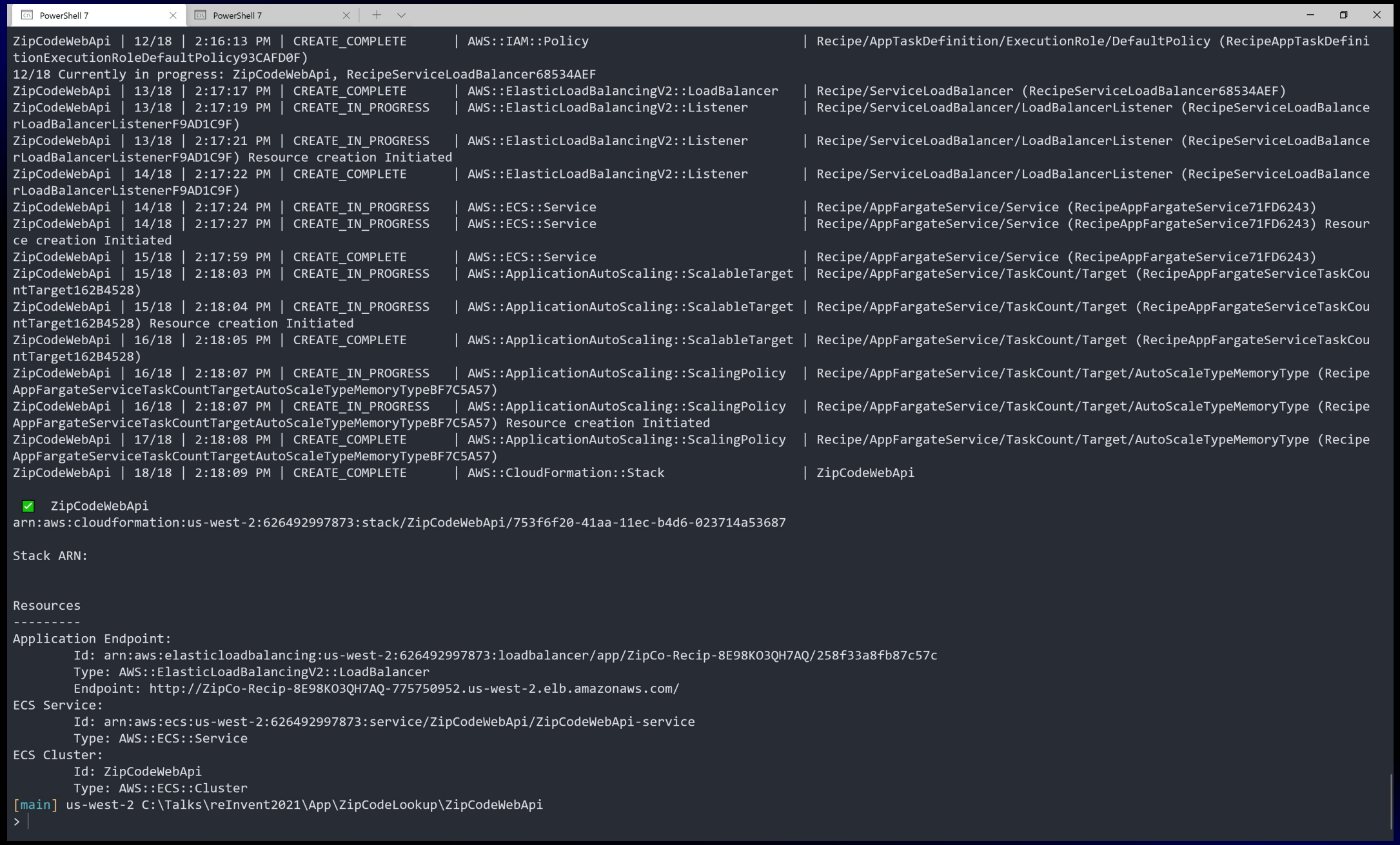
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Demo: REST API



Team Stuffies

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What did we see?

- Deployed from AWS CLI
  - Install command: dotnet tool install -g AWS.Deploy.CLI
- Automatically containerized, deployed to Amazon ECS
- Created a deployment project
  - Redeployments use deployment project
- Customized project to add application resources

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Demo: Data loader



Team Dad Rock

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What did we see?

- Used to deploy non-web projects
  - Services for long-lived process
  - Schedule tasks
- Learned about the recipe file
- Added custom setting for the interactive experience
- Connected Blazor front end to REST API

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Automating deployments

- Disable interactivity with --silent parameter
- Settings can be specified in a JSON file
  - The file can then be version controlled
- Settings files are used with the --apply parameter

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Updates for .NET and AWS Lambda

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

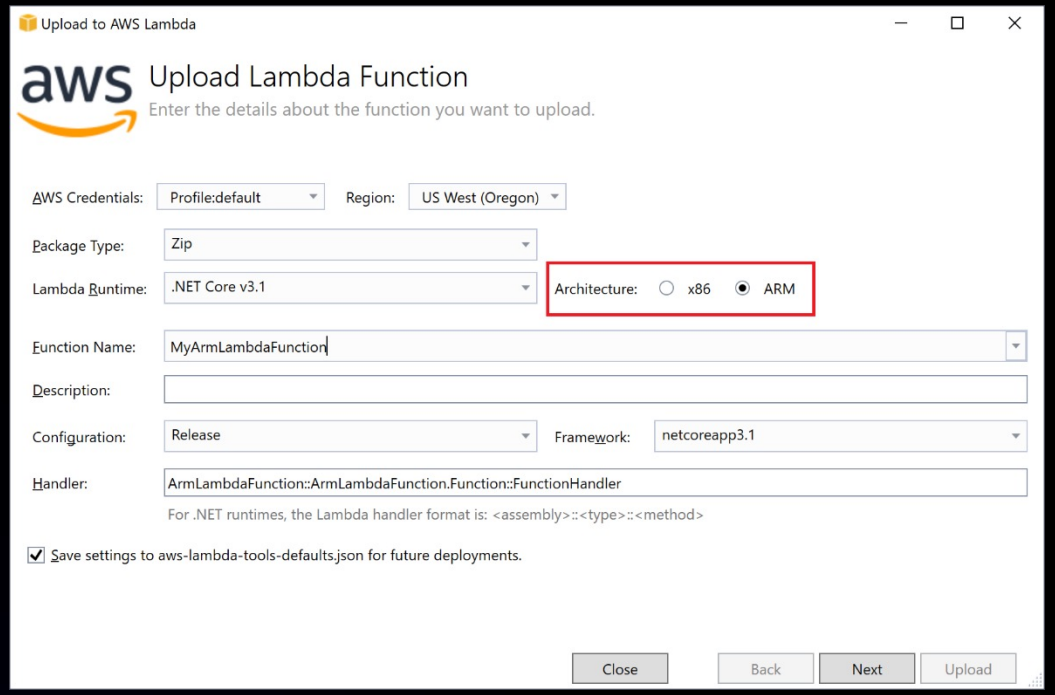
.NET 6 is coming

- .NET 6 is a long-term support (LTS) version
  - Three years of support
- Key .NET 6 features for Lambda packaging
  - Trimming
  - Ready to run improvements

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

.NET and Lambda ARM support

- Using AWS Graviton2 processors
- 20% duration cost reduction
- Supported in .NET Core 3.1 today
  - .NET 6 support coming
- Same programming model
  - Requires recompilation



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

A new .NET Lambda framework

- Lightweight and removes the common boilerplate code
- Framework uses new .NET feature – source generator
- Targets .NET 6
- Open source at aws/aws-lambda-dotnet GitHub repository
  - Design doc: github.com/aws/aws-lambda-dotnet/pull/961

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

New Lambda Framework Demo

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Recap

- New AWS .NET deployment tool
  - Created simple deployments
  - Customized deployment to include new resources and UI settings
  - Automated deployments for continuous integrations

- .NET and Lambda
  - .NET 6 is coming
  - AWS Lambda ARM support to reduce cost
  - Check out upcoming .NET Lambda framework and provide feedback at https://github.com/aws/aws-lambda-dotnet

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Thank you!

Norm Johanson

@socketnorm



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.