

Azure DevOps CI/CD Crash Course

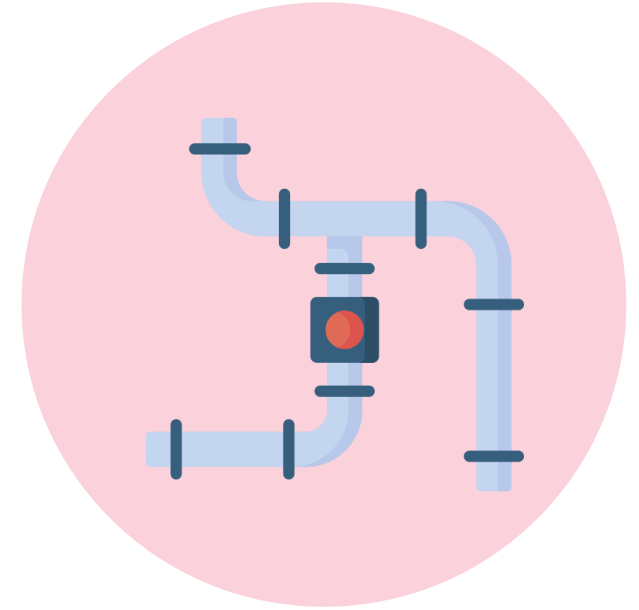
ADS Go Fast Training Sessions



Session 1
Git Crash Course



Session 2
Azure DevOps CI/CD
Crash Course



Session 3
ADS Go Fast CI/CD



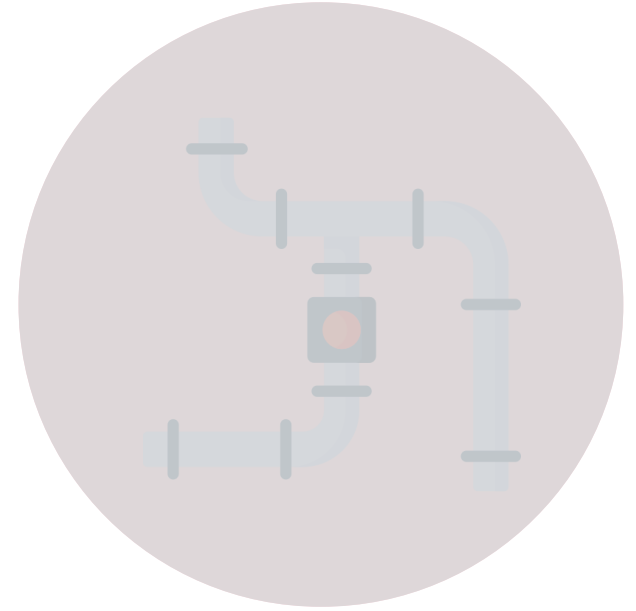
ADS Go Fast Training Sessions



Session 1
Git Crash Course



Session 2
Azure DevOps CI/CD
Crash Course



Session 3
ADS Go Fast CI/CD

Agenda / navigation

Pre-requisites

DevOps

CI/CD

Azure DevOps

Azure DevOps – Repos

Azure DevOps – Build

Azure – Create Web Application

Azure DevOps – Release

Azure DevOps – DevOps Workflow

Azure DevOps – Workflow Exercise

Resources

Experience Sharing, Q&A



Pre-requisites

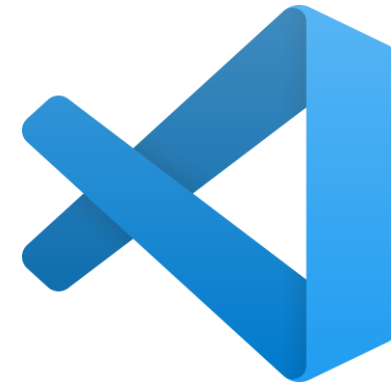


It is recommended that you have the following software installed on your computer so that you can follow along the exercises.



Git

<https://git-scm.com/downloads>



Visual Studio Code

<https://code.visualstudio.com/download>



Pre-requisites



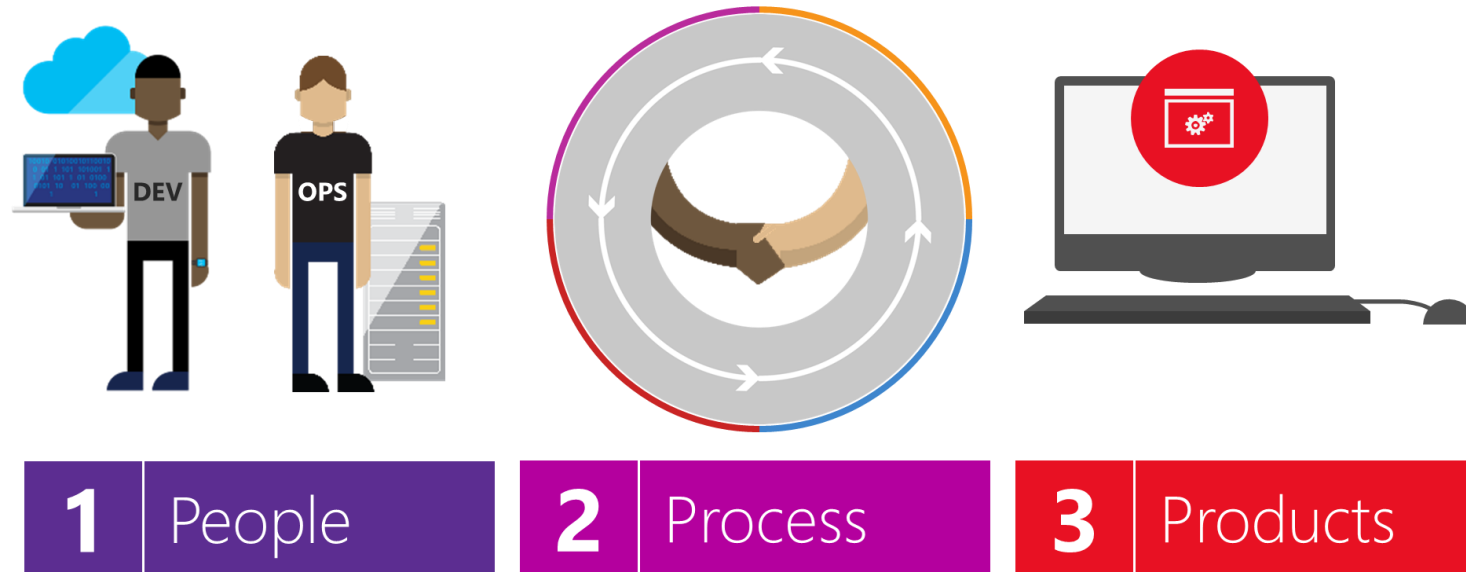
Please verify that you have **Contributor** permissions to the training Azure Resource Group.



DevOps – What is it?



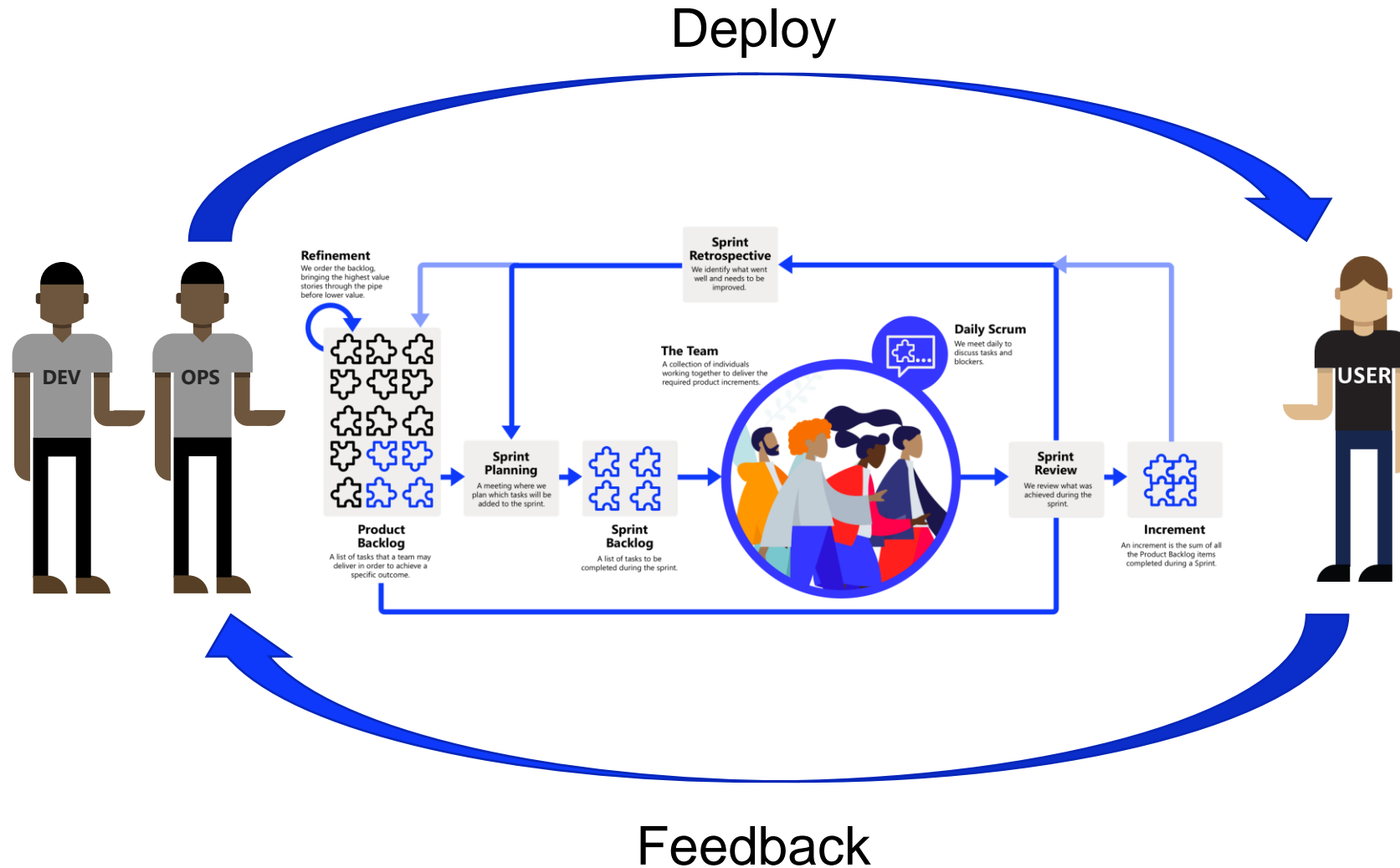
The combination of



To deliver value to end users



DevOps – What is it?

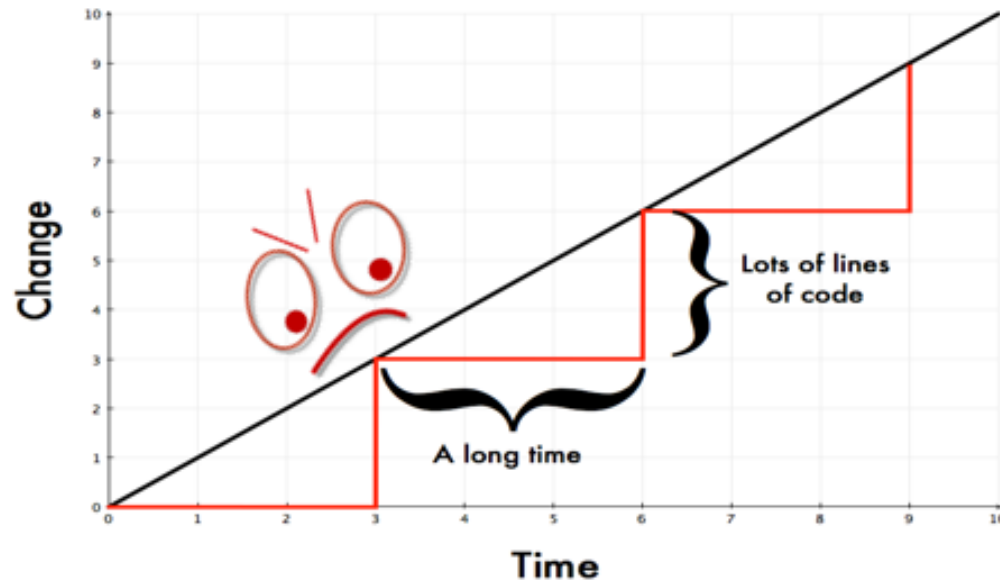


DevOps – Why do we need it?

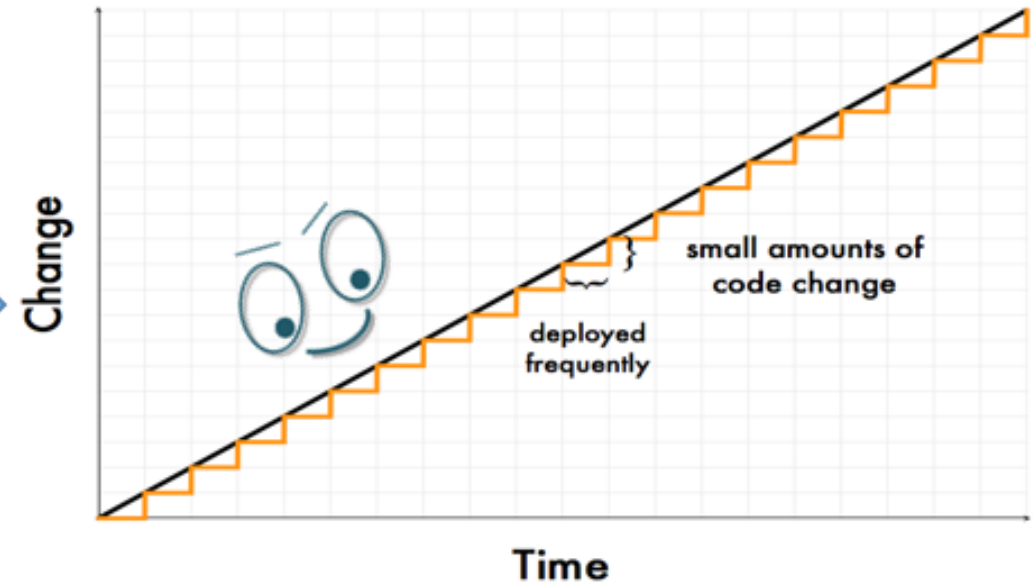


Do you have war stories where you've tried to do things using the traditional approach and things ended up less than perfect?

John Allspaw's visual – From slow delivery cycles to fast delivery cycles



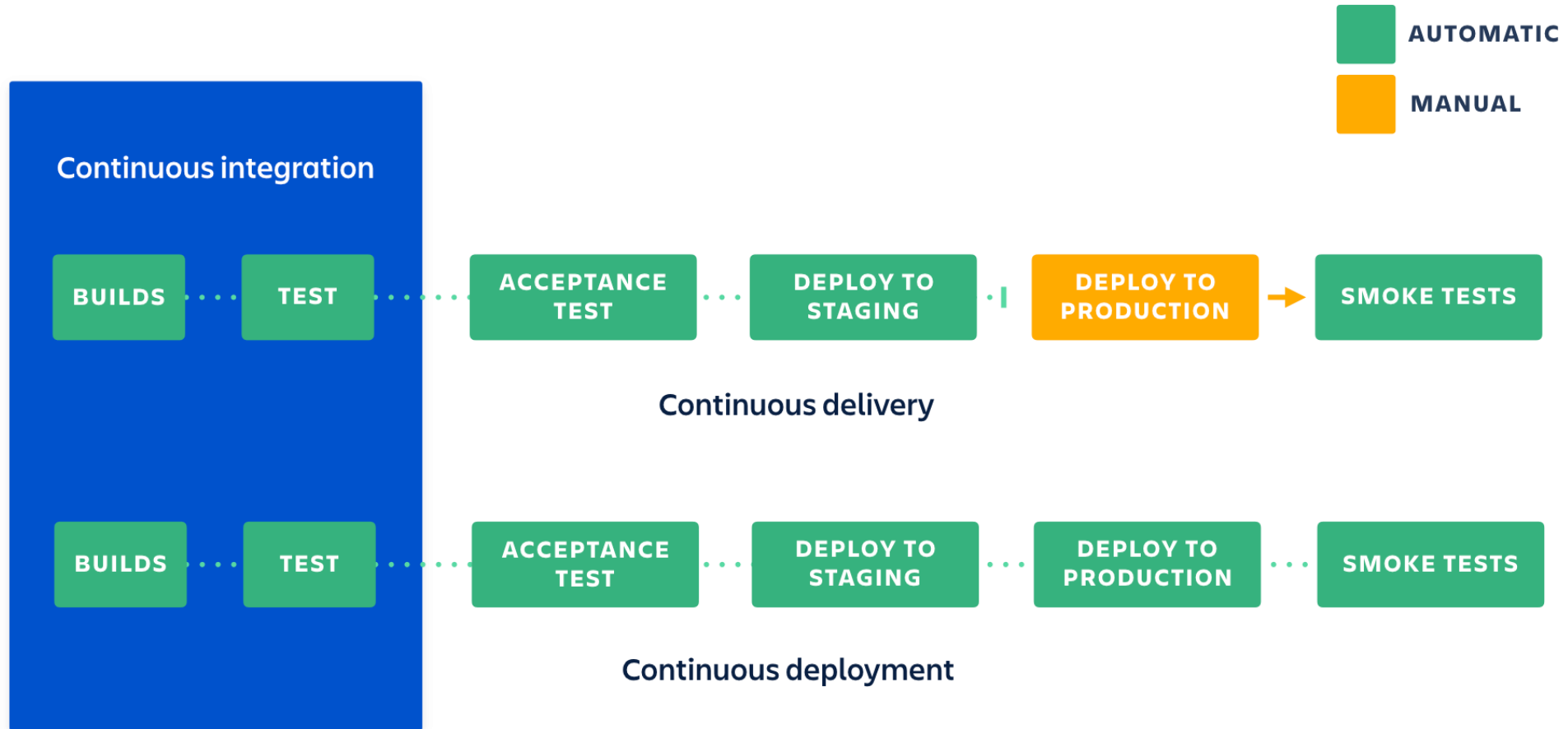
Traditional Software Development



DevOps-led Software Development



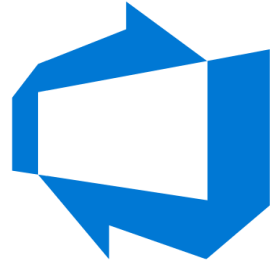
CI/CD



Source: <https://www.atlassian.com/continuous-delivery/principles/continuous-integration-vs-delivery-vs-deployment>



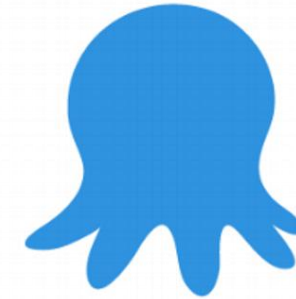
CI/CD Tools



Azure DevOps



GitHub Actions



Octopus Deploy



Bitbucket CI/CD



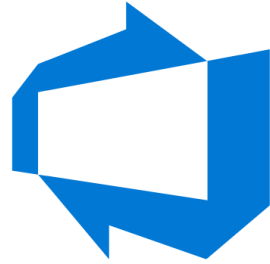
TeamCity



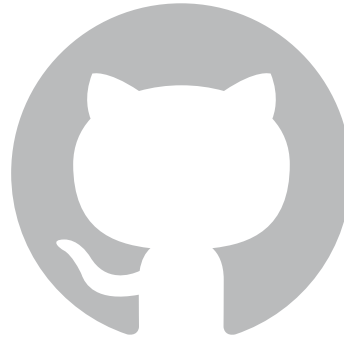
Jenkins



CI/CD Tools



Azure DevOps



GitHub Actions



Octopus Deploy



Bitbucket CI/CD



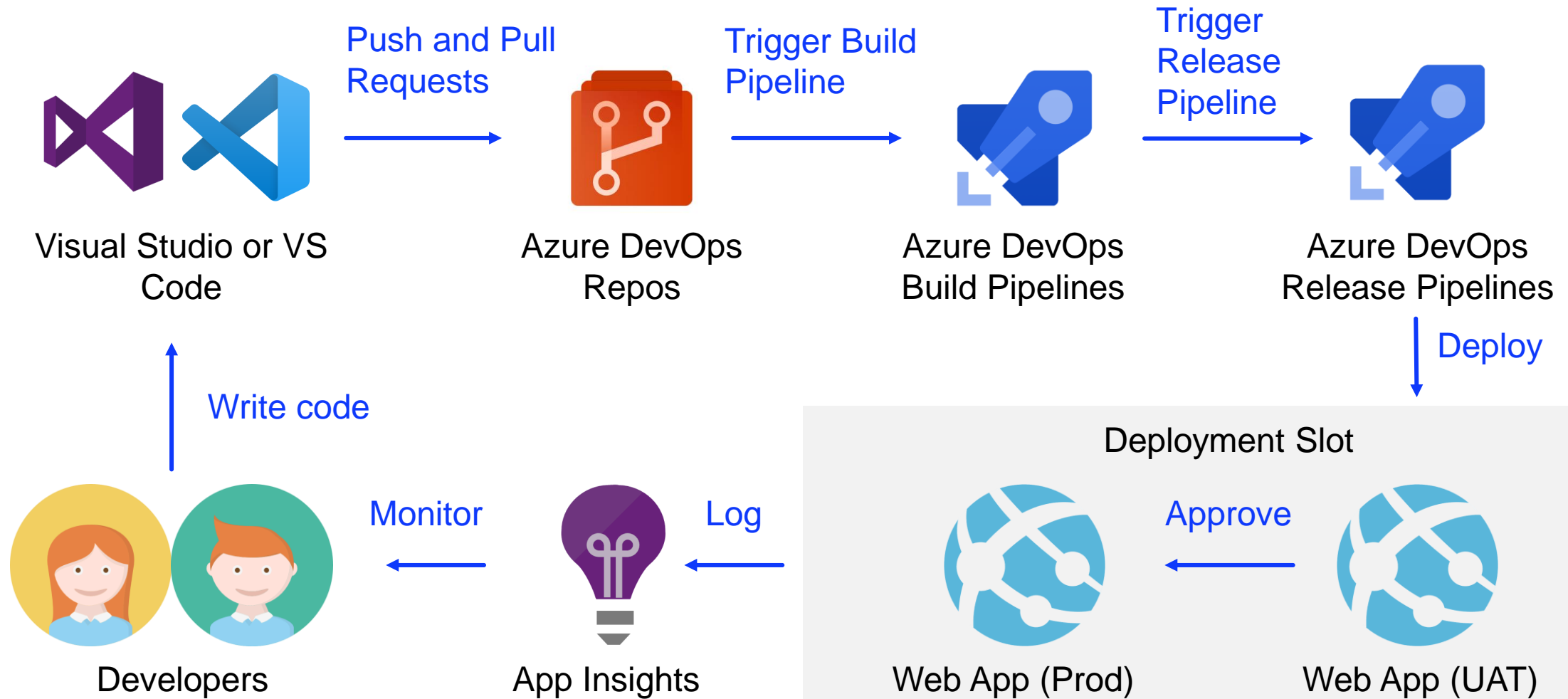
TeamCity



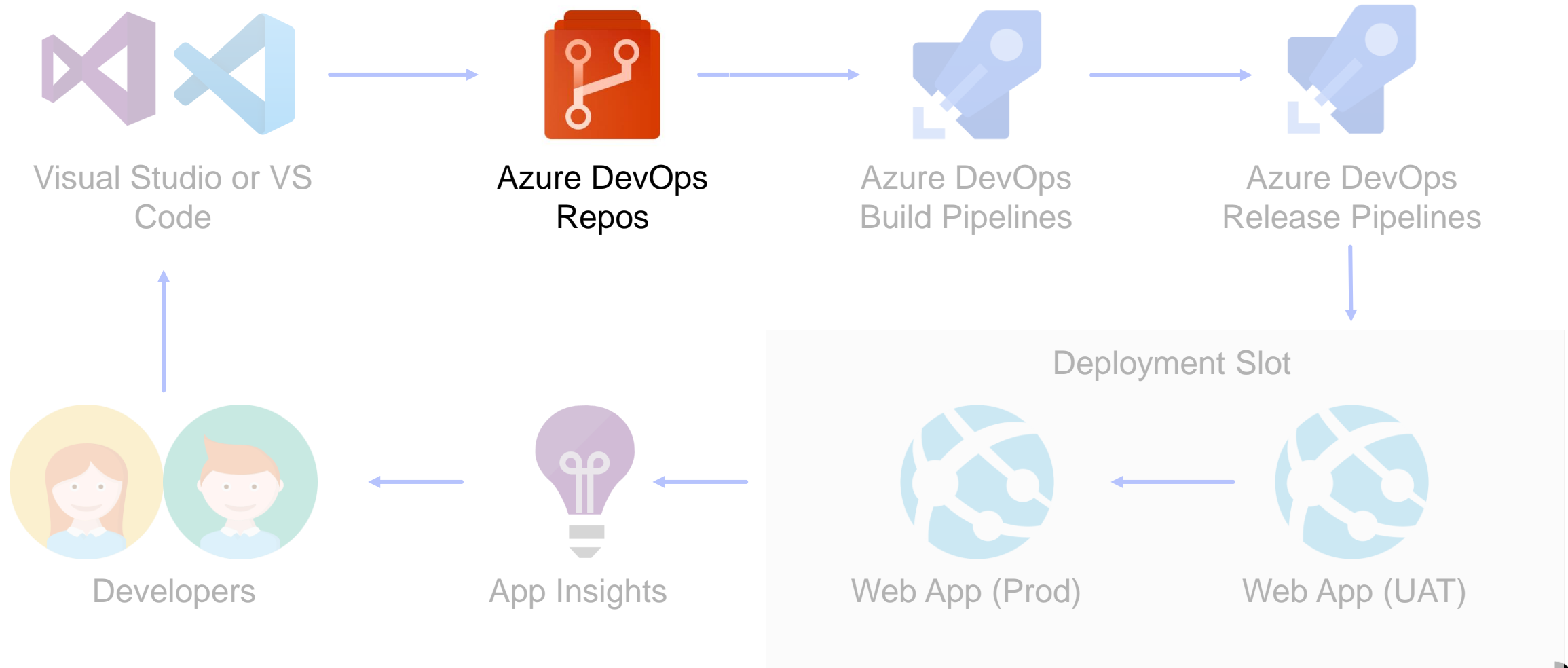
Jenkins



Azure DevOps – DevOps Workflow



Azure DevOps – Repos



Azure DevOps – Repos



eShopOnWeb

Contents History

eShopOnWeb Build and Test passing

Microsoft eShopOnWeb ASP.NET Core Reference Application

Sample ASP.NET Core reference application, powered by Microsoft, demonstrating a single-process (monolithic) application architecture and deployment model. If you're new to .NET development, read the [Getting Started for Beginners](#) guide.

A list of Frequently Asked Questions about this repository can be found [here](#).

This reference application is meant to support the free .PDF download ebook: [Architecting Modern Web Applications with ASP.NET Core and Azure](#), updated to ASP.NET Core 3.1. Also available in [ePub/mobi formats](#).

You can also read the book in online pages at the .NET docs here: <https://docs.microsoft.com/en-us/dotnet/standard/modern-web-apps-azure-architecture/>

The **eShopOnWeb** sample is related to the [eShopOnContainers](#) sample application which, in that case, focuses on a microservices/containers-based application architecture. However, **eShopOnWeb** is much simpler in regards to its current functionality and focuses on traditional Web Application Development with a single deployment.

The goal for this sample is to demonstrate some of the principles and patterns described in the [eBook](#). It is not meant to be an eCommerce reference application, and as such it does not implement many features that would be obvious and/or essential to a real eCommerce application.

VERSIONS

The `master` branch is currently running ASP.NET Core 3.1.

Older versions are tagged.



We will be using a sample ASP.NET Core web application for this exercise. The repo has already been cloned to the exercise Azure DevOps repo.



Source: <https://github.com/dotnet-architecture/eShopOnWeb>



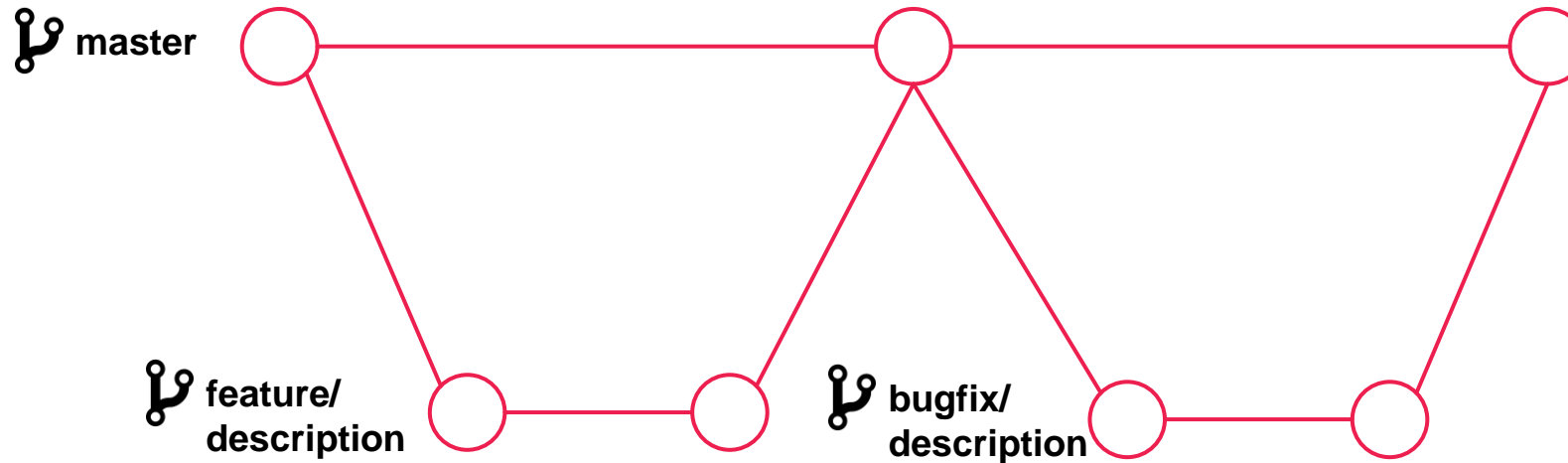
Azure DevOps – Branching Strategy



Feature branching



Has anyone tried any other branching strategies?



After you've selected what branching strategy your team should use, you'll need to implement branch policies to ensure that the team sticks to that strategy.



Read more on different types of branching strategies [here](#).



Azure DevOps – Branching Strategy



Let's now create our own master branches for the exercises later by using the branch name: “master-<your initials>”.

1

2

3

4



We are only creating multiple master branches for this exercise to avoid merge conflicts as we will be changing same lines of code and merging it to master. In practice, this should not be done!



Azure DevOps – Repos – Branch Policies



The screenshot shows the Azure DevOps interface with the 'Repos' section selected in the left sidebar. The 'Branches' tab is active, displaying a table of branches. The 'master-jn' branch is highlighted, and its context menu is open, showing options like 'New branch', 'New pull request', 'Delete branch', 'View files', 'View history', 'Compare branches', 'Set as compare branch', 'Set as default branch', 'Lock', 'Branch policies', and 'Branch security'. A red callout box points to the 'Branch policies' option.

Branch	Commit	Author	Authored Date	Behind Ahead	Status	Pull Request
change-page-titles	c2b4afce	Jonathan	6h ago	1 0		
master	5ca12fa8	Jonathan N...	6h ago		failed	
master-jn	5ca12fa8	Jonathan N...	6h ago	0 0		

Find the branch you have just created and select the ellipse "...". and select "Branch policies"



Azure DevOps – Repos – Branch Policies



Branch policies for master-jn

Save changes Discard changes

Protect this branch

- Setting a Required policy will enforce the use of pull requests when updating the branch
- Setting a Required policy will prevent branch deletion
- Manage permissions for this branch on the [Security page](#)

☒ Require a minimum number of reviewers

Require approval from a specified number of reviewers on pull requests.

Minimum number of reviewers

1

- ☐ Allow requestors to approve their own changes
- ☐ Prohibit the most recent pusher from approving their own changes
- ☐ Allow completion even if some reviewers vote to wait or reject
- ☐ Reset code reviewer votes when there are new changes

☐ Check for linked work items

Encourage traceability by checking for linked work items on pull requests.

☐ Check for comment resolution

Check to see that all comments have been resolved on pull requests.

☐ Limit merge types

Control branch history by limiting the available types of merge when pull requests are completed.

Build validation

Validate code by pre-merging and building pull request changes

Add build policy

When your changes are done, remember to save it

Set the number of reviewers to “1”. This will also enforce the use of pull requests when updating the branch

We’ll update Build validation later. For now just take note of it.



Azure DevOps – Repos



Can everyone please pull their master-<your initial> branch to your local repository now?

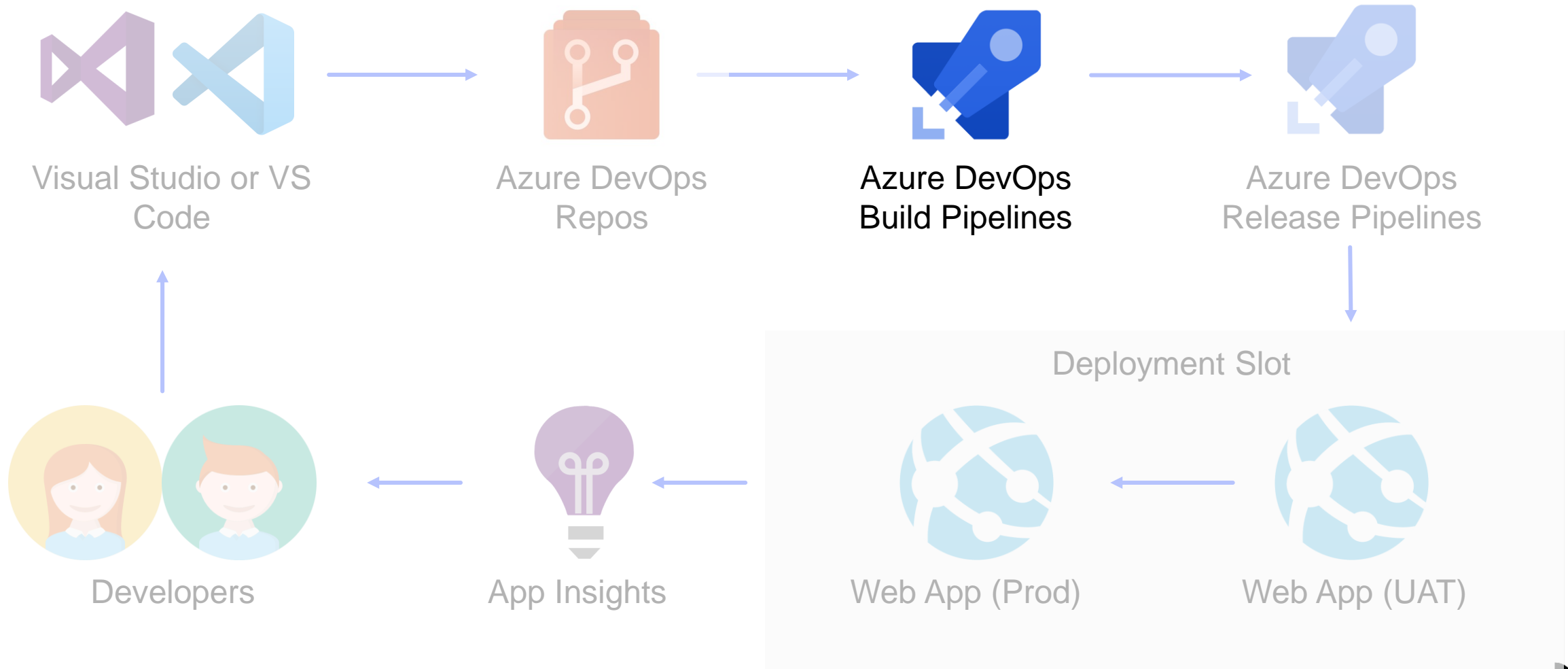


terminal

```
> git clone <url>
```



Azure DevOps – Build Pipelines

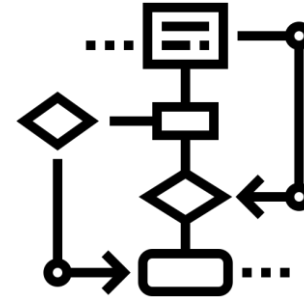


Azure DevOps – Build Pipelines



Yet Another **M**arkdown **L**anguage

- Code
- Checked into source control and go through review process (PR)



Classic Pipelines

- Created via a GUI
- Easier to use (we'll be using this for our exercises so that we can learn the concepts)

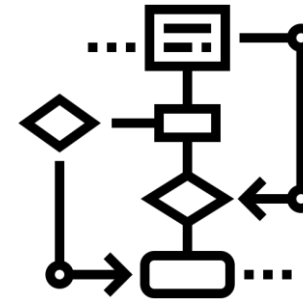


Azure DevOps – Build Pipelines



Yet Another Markdown Language

- Code
- Checked into source control and go through review process (PR)

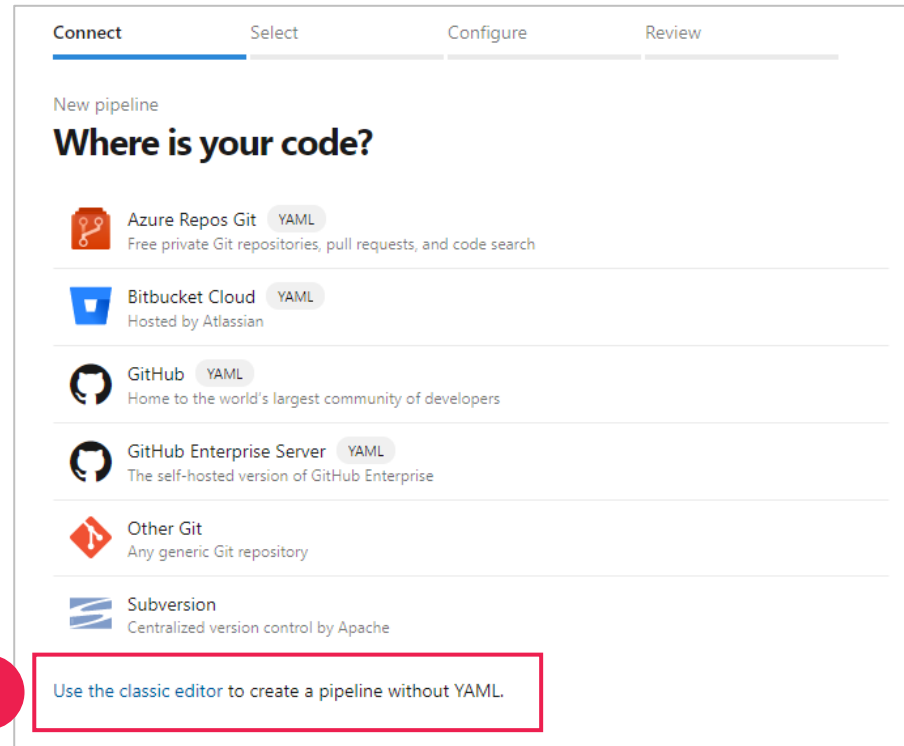
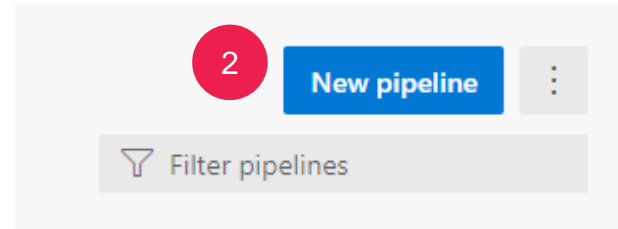
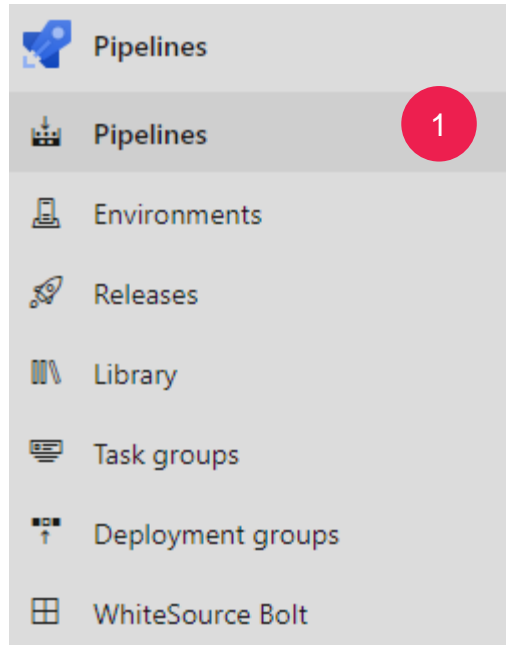


Classic Pipelines

- Created via a GUI
- Easier to use (we'll be using this for our exercises so that we can learn the concepts)



Azure DevOps – Build Pipelines



Azure DevOps – Build Pipelines



Select a source



Team project



Repository



Default branch for manual and scheduled builds



Select the master-<your initials> branch



Azure DevOps – Build Pipelines



Others



ASP.NET Core

Build and test an ASP.NET Core web application.

Apply

5

Replace [initials] with
your initials

6

... > eShopOnWeb.CI.[initials]

Tasks Variables Triggers Options Retention History | Save & queue Discard Summary Queue ...

Pipeline

Build pipeline

Get sources

eShopOnWeb master

Agent job 1

Run on agent

Restore

.NET Core

Build

.NET Core

Test

.NET Core

Publish

.NET Core

Publish Artifact

Publish build artifacts

Name *

eShopOnWeb.CI.[initials]

Agent pool * | Pool information | Manage

Azure Pipelines

Agent Specification *

ubuntu-16.04

Parameters | Unlink all

Project(s) to restore and build

**/*.csproj

Project(s) to test

**/*[Tt]ests/*.csproj



Azure DevOps – Build Pipelines



🏠 ... > eShopOnWeb.CI.[initials]

Tasks Variables **Triggers** Options Retention History | Save & queue Discard Summary Queue

Continuous integration

eShopOnWeb
Enabled

Scheduled + Add
No builds scheduled

Build completion + Add
Build when another build completes

eShopOnWeb

☒ Enable continuous integration

☐ Batch changes while a build is in progress

Branch filters

Type Branch specification

Include Include master

+ Add

Path filters

+ Add

Select "Enable continuous integration"

7



Azure DevOps – Build Pipelines



🏠 ... > eShopOnWeb.CI.[initials]

Tasks Variables **Triggers** Options Retention History

Continuous integration

eShopOnWeb
Enabled

Scheduled

+ Add

Save & queue

Save & queue

Save

Save as draft

8

Run pipeline ✕

Select parameters below and manually run the pipeline

Save comment

Agent pool

Azure Pipelines

Agent Specification *

ubuntu-16.04

Branch/tag

master

Select the branch, commit, or tag

Advanced options

Variables

3 variables defined

Demands

This pipeline has no defined demands

☐ Enable system diagnostics

Cancel

Save and run

9



Azure DevOps – Build Pipelines



After run is complete:

Select the pipeline



Pipelines

Recent All Runs

New pipeline

Filter pipelines

Recently run pipelines




Pipeline	Last run
 eShopOnWeb.CI.JN	#20200527.1 • initial commit Manually triggered for  master

7m ago
3m 9s

Select the most recent run

Runs Branches Analytics

Description

Description	Stages
#20200527.1 initial commit Manually triggered for  master  05950e2	

6m ago
3m 9s



Azure DevOps – Build Pipelines



View the completed run

✓

#20200527.2 initial commit

on eShopOnWeb.CI ✎ Retained by release

Run new

⋮

Summary

Tests

Releases

Code Coverage

WhiteSource Bolt Build Report

Manually run by Jonathan Neo

View change

Repository and version

eShopOnWeb

master 05950e2

Time started and elapsed

Today at 14:18

3m 1s

Related

0 work items

1 published

Tests and coverage

100% passed

[Setup code coverage](#)

Jobs

Name	Status	Duration
✓ Agent job 1	Success	2m 57s



Azure DevOps – Build Pipelines



Select the job

#20200527.2 initial commit
on eShopOnWeb.CI Retained by release

Run new

Summary

Tests

Releases

Code Coverage

WhiteSource Bolt Build Report

Manually run by Jonathan Neo

View change

Repository and version

Time started and elapsed

Related

Tests and coverage

eShopOnWeb

Today at 14:18

0 work items

100% passed

master 05950e2

3m 1s

1 published

[Setup code coverage](#)

Jobs

Name	Status	Duration
Agent job 1	Success	2m 57s



Azure DevOps – Build Pipelines



View the job logs

← Jobs in run #20200527.2

eShopOnWeb.CI

Jobs

✓	Agent job 1	2m 57s
✓	Initialize job	2s
✓	Checkout eShopOnWeb@master ...	2s
✓	Restore	1m 10s
✓	Build	45s
✓	Test	44s
✓	Publish	8s
✓	Publish Artifact	3s
✓	Post-job: Checkout eShopOnWe...	<1s
✓	Finalize Job	<1s
✓	Report build status	<1s

✓ Build

View raw log

1 Starting: Build

2 =====

3 Task : .NET Core

4 Description : Build, test, package, or publish a dotnet application, or run a custom dotnet command

5 Version : 2.169.1

6 Author : Microsoft Corporation

7 Help : <https://docs.microsoft.com/azure/devops/pipelines/tasks/build/dotnet-core-cli>

8 =====

9 /usr/bin/dotnet build /home/vsts/work/1/s/src/ApplicationCore/ApplicationCore.csproj -dl:CentralLogger,"/home/vsts/work/_tasks/DotNetCoreCLI_5541a522-603c-47ad-91fc-a4b1d163081b/2.1

10 Microsoft (R) Build Engine version 16.5.0+d4cbfca49 for .NET Core

11 Copyright (C) Microsoft Corporation. All rights reserved.

12

13 Restore completed in 351.44 ms for /home/vsts/work/1/s/src/ApplicationCore/ApplicationCore.csproj.

14 ApplicationCore -> /home/vsts/work/1/s/src/ApplicationCore/bin/Release/netstandard2.1/ApplicationCore.dll

15

16 Build succeeded.

17 0 Warning(s)

18 0 Error(s)

19

20 Time Elapsed 00:00:07.51

21 /usr/bin/dotnet build /home/vsts/work/1/s/src/Infrastructure/Infrastructure.csproj -dl:CentralLogger,"/home/vsts/work/_tasks/DotNetCoreCLI_5541a522-603c-47ad-91fc-a4b1d163081b/2.169

22 Microsoft (R) Build Engine version 16.5.0+d4cbfca49 for .NET Core

23 Copyright (C) Microsoft Corporation. All rights reserved.

24

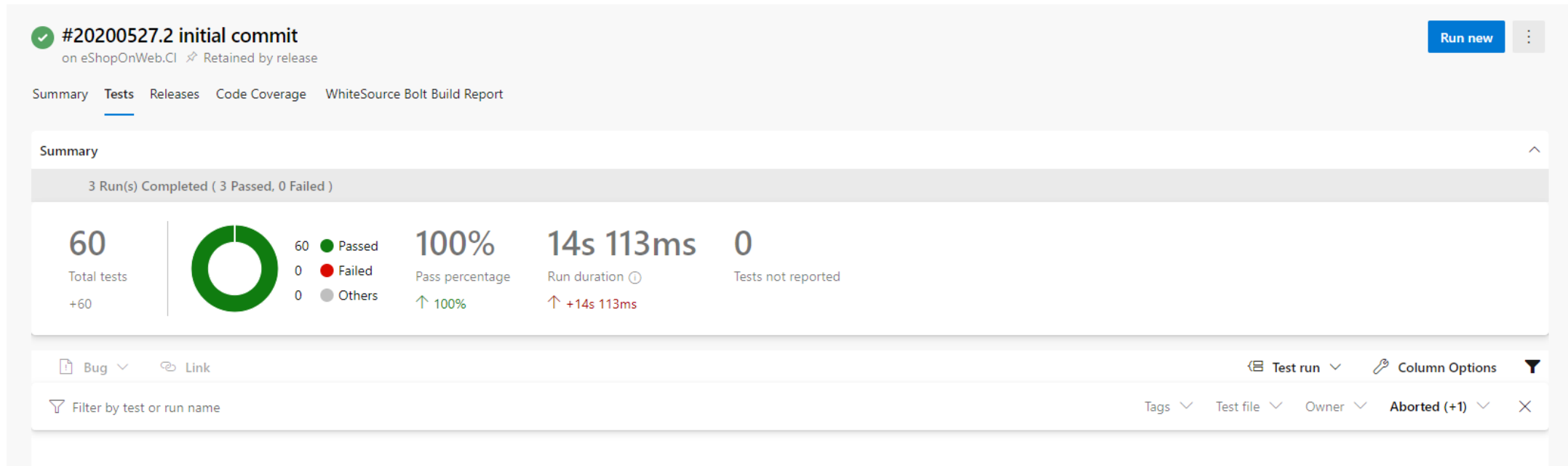
25 Restore completed in 38.6 ms for /home/vsts/work/1/s/src/ApplicationCore/ApplicationCore.csproj.



Azure DevOps – Build Pipelines



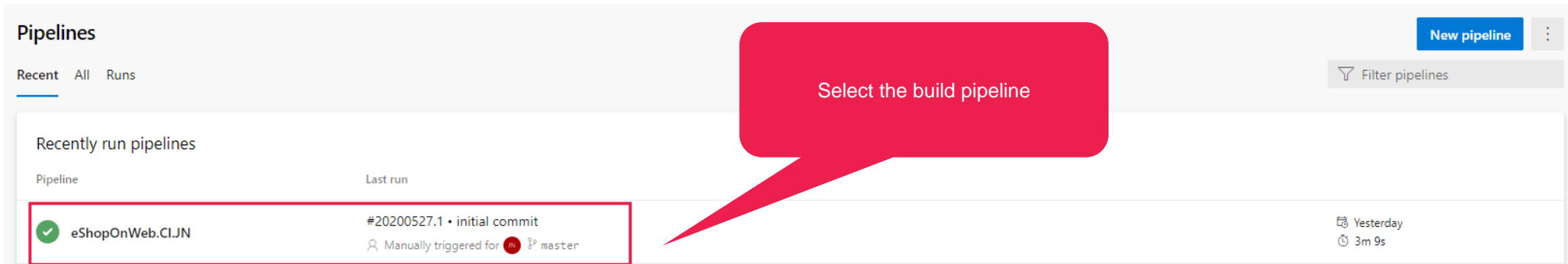
View the test summary





Azure DevOps – Build Pipelines



Let's now clone our build pipeline so that it can be used for the build validation policy.



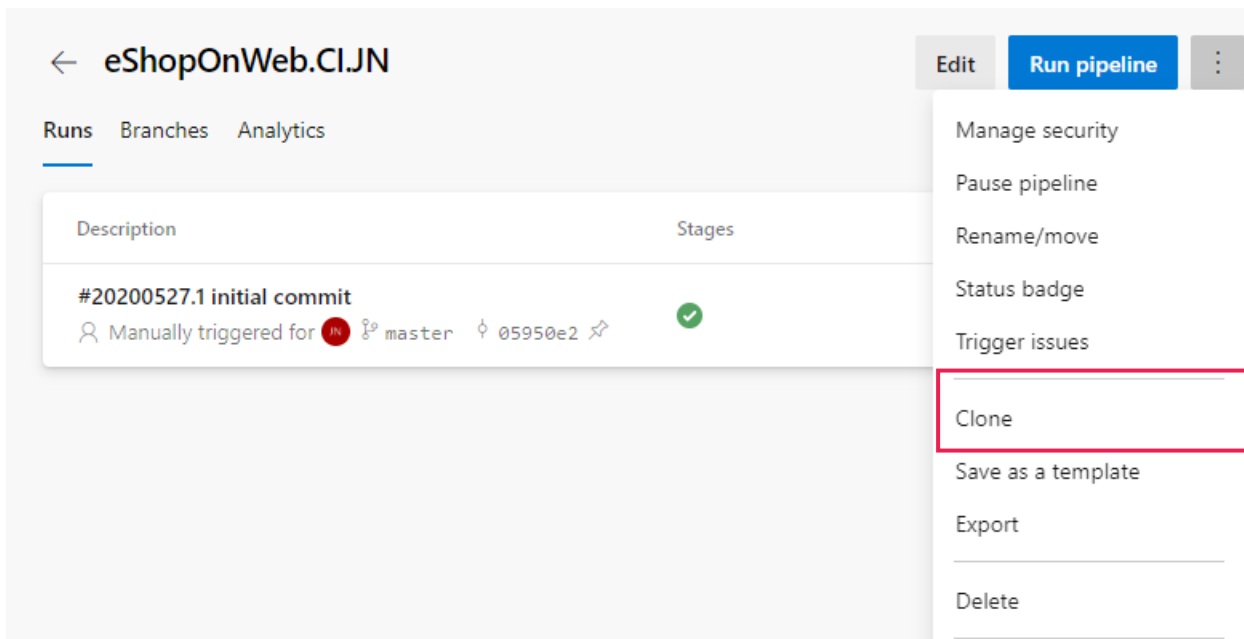
The screenshot shows the 'Pipelines' section in Azure DevOps. The 'Recent' tab is selected. A table titled 'Recently run pipelines' displays the following information:

Pipeline	Last run
 eShopOnWeb.CI.JN	#20200527.1 • initial commit Manually triggered for  master




On the right side of the table, the last run details are shown: Yesterday, 3m 9s. A red speech bubble with the text 'Select the build pipeline' points to the first row of the table.



Azure DevOps – Build Pipelines



The screenshot shows the Azure DevOps interface for a build pipeline named 'eShopOnWeb.CI.JN'. The 'Runs' tab is selected, showing a table of pipeline runs. The first run, '#20200527.1 initial commit', is highlighted. To the right of the table, a dropdown menu is open, showing various actions that can be performed on the selected run. The 'Clone' option is highlighted with a red rectangle.

Description	Stages
#20200527.1 initial commit Manually triggered for  master  05950e2 	

- Edit
- Run pipeline
- Manage security
- Pause pipeline
- Rename/move
- Status badge
- Trigger issues
- Clone**
- Save as a template
- Export
- Delete




Azure DevOps – Build Pipelines



🏠 ... > eShopOnWeb.CI.JN-PR

Tasks Variables **Triggers** Options Retention History | Save & queue Discard Summary

Continuous integration


 eShopOnWeb
Disabled

Scheduled + Add

No builds scheduled

Build completion + Add

Build when another build completes

 eShopOnWeb

☐ Enable continuous integration

Disable "Continuous integration"



Azure DevOps – Build Pipelines



Append a “-PR” for Pull Request
to the end of the build pipeline
name

🏠 ... > eShopOnWeb.CI.JN-PR

Tasks Variables Triggers Options Retention History **Save & queue** Discard Summary Queue ...

Pipeline
Build pipeline

Get sources
eShopOnWeb master

Agent job 1
Run on agent

Restore
.NET Core

Build
.NET Core

Test
.NET Core

Publish
.NET Core

Publish Artifact
Publish build artifacts

Name *

eShopOnWeb.CI.JN-PR

Agent pool * ⓘ | Pool information | Manage

Azure Pipelines

Agent Specification *

ubuntu-16.04

Parameters ⓘ | Unlink all

Project(s) to restore and build

**/*.csproj

Project(s) to test

**/[Tt]ests/*.csproj



Azure DevOps – Build Pipelines



Azure Data Services +

- Overview
- Boards
- Repos
- Files
- Commits
- Pushes
- Branches**
- Tags
- Pull requests
- Pipelines
- Test Plans
- Artifacts

Branches

Mine All Stale

Search branch name

Branch	Commit	Author	Autho...	Behind Ahead	Status	Pull R...
change-...	05950e28	J...	Yeste...	0 0	✓ succe	
master	05950e28	J...	Yeste...		✓ succe	

Select the ellipse "...\" next to the master branch

- + New branch
- New pull request
- Delete branch
- View files
- View history
- Compare branches
- Set as compare branch
- Set as default branch
- Lock
- Branch policies**

Select branch policies



Azure DevOps – Build Pipelines



Branch policies for master

Save changes Discard changes

- ☐ Require a minimum number of reviewers
Require approval from a specified number of reviewers
- ☐ Check for linked work items
Encourage traceability by checking for linked work items
- ☐ Check for comment resolution
Check to see that all comments have been resolved
- ☐ Limit merge types
Control branch history by limiting the available types

Build validation
Validate code by pre-merging and building pull requests

+ Add build policy

Require approval from additional services
Require other services to post successful status to complete the build

+ Add status policy

Automatically include code reviewers
Include specific users or groups in the code review based on the build

+ Add automatic reviewers

Add build policy

Build pipeline *
eShopOnWeb.CI.JN-PR

Path filter (optional) ⓘ
No filter set

Trigger
☒ Automatic (whenever the source branch is updated)
☐ Manual

Policy requirement
☒ Required
Build must succeed in order to complete pull requests.
☐ Optional
Build failure will not block completion of pull requests.

Build expiration
☐ Immediately when master is updated
☒ After 12 hours if master has been updated
☐ Never

Display name

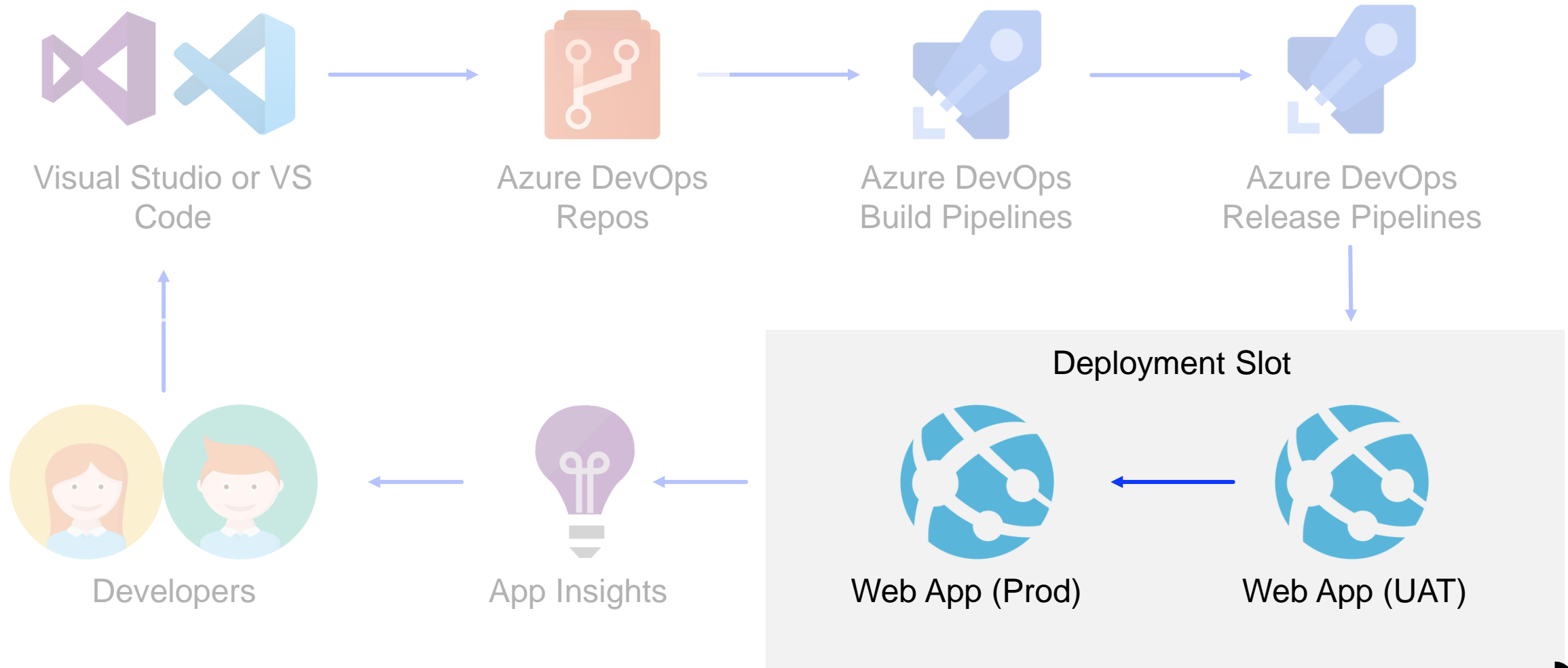
Save Cancel

Select Add build policy

Select the "-PR" build pipeline we just created



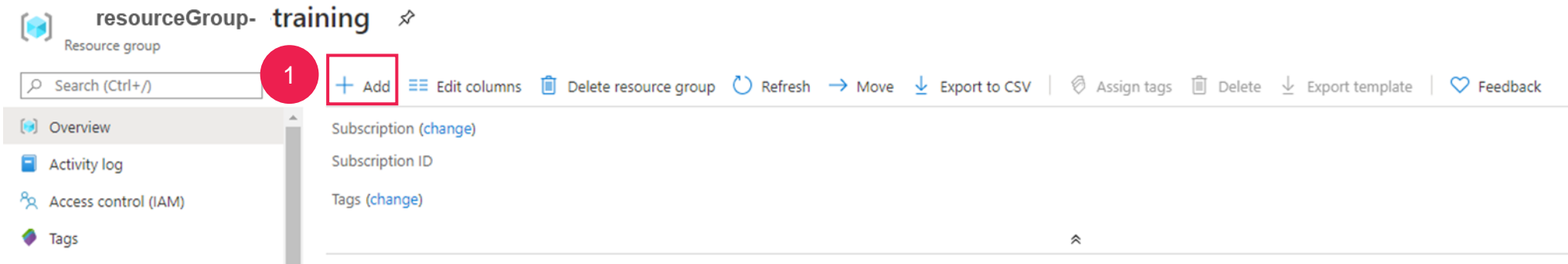
Azure DevOps – Create web app resource



Azure DevOps – Create web app resource



Navigate to the training resource group



Azure DevOps – Create web app resource



Search for “web app”

2

web app

Azure Marketplace [See all](#)

Popular

Get started


Recently created

AI + Machine Learning


Analytics

Blockchain


Compute



Windows Server 2016 Datacenter
[Quickstarts + tutorials](#)



Ubuntu Server 18.04 LTS
[Learn more](#)



Web App
[Quickstarts + tutorials](#)



Azure DevOps – Create web app resource



Select “Web App”

web app

Pricing : All

Operating System : All

Publisher : All

Showing All Results

3



Web App

Microsoft

Enjoy secure and flexible development, deployment, and scaling options for your web app



Web App Bot

Microsoft

An Azure Bot Service Bot deployed to an Azure App Service Web App.



ArcGIS Business Analyst Web App

Esri

See people and opportunities clearly using ArcGIS Business Analyst. Business Analyst helps you



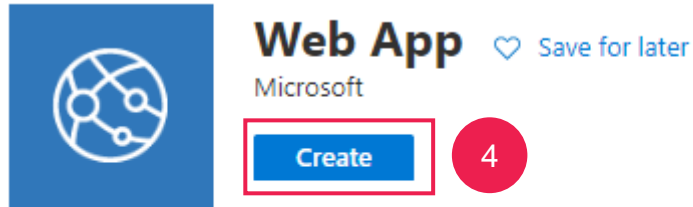
Static Web App (Preview)

Microsoft

Enjoy secure and flexible development, deployment, and scaling options for your web app



Azure DevOps – Create web app resource



Overview Plans

Web App

Basics Monitoring Tags Review + create

App Service Web Apps lets you quickly build, deploy, and scale enterprise-grade web, mobile, and API apps running on any platform. Meet rigorous performance, scalability, security and compliance requirements while using the platform to perform infrastructure maintenance. [Learn more](#)

Project Details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize all your resources.

Subscription *

Resource Group *

Instance Details

Name *

Publish *

Runtime stack *

Operating System *

Region *

App Service Plan

App Service plan pricing tier determines the location, features, cost and compute resources associated with your app. [Learn more](#)

Windows Plan (Australia East) *

Sku and size *

Review + create

< Previous

Next : Monitoring >

Verify subscription and resource group

Replace "initials" with your initials. May need to enter random text to generate a unique name

Select Runtime stack: ".NET Core 3.1 (LTS)"

Select "S1" tier

5



Azure DevOps – Create web app resource



eShopOnWeb-jn | Configuration
App Service

Search (Ctrl+/) Refresh Save Discard

Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Security
Events

Deployment
Quickstart
Deployment slots
Deployment Center

Settings
Configuration
Authentication / Authorization
Application Insights

Application settings
General settings Default documents Path mappings

Application settings are encrypted at rest and transmitted over an encrypted channel. You can choose to display them application at runtime. [Learn more](#)

+ New application setting Show values **Advanced edit** Filter

Name	Value
ANCM_ADDITIONAL_ERROR_PAGE_LINK	Hidden value. Click to show value
APPINSIGHTS_INSTRUMENTATIONKEY	Hidden value. Click to show value
APPLICATIONINSIGHTS_CONNECTION_STRING	Hidden value. Click to show value
ApplicationInsightsAgent_EXTENSION_VERSION	Hidden value. Click to show value
XDT_MicrosoftApplicationInsights_Mode	Hidden value. Click to show value

Connection strings



Azure DevOps – Create web app resource



```
1 {
2   {
3   }
4   {
5   }
6   {
7   }
8   {
9   }
10  {
11  }
12  {
13  }
14  {
15  }
16  {
17  {
18    "name": "ApplicationInsightsAgent_EXTENSION_VERSION",
19    "value": "~2",
20    "slotSetting": false
21  },
22  {
23    "name": "ASPNETCORE_ENVIRONMENT",
24    "value": "Development",
25    "slotSetting": false
26  },
27  {
28    "name": "WEBSITE_RUN_FROM_PACKAGE",
29    "value": "1",
30    "slotSetting": false
31  },
32  {
33    "name": "XDT_MicrosoftApplicationInsights_Mode",
34    "value": "default",
35    "slotSetting": false
36  }
37 }
```

Add in the following code:

```
{
  "name": "ASPNETCORE_ENVIRONMENT",
  "value": "Development",
  "slotSetting": false
}
```

OK Cancel



Azure DevOps – Create web app resource



8

Refresh

Save

Discard

Application settings *

General settings

Default documents

Path mappings

Application settings

Application settings are encrypted at rest and transmitted over an encrypted channel. You can choose to display application at runtime. [Learn more](#)

+ New application setting

👁 Show values

✎ Advanced edit

🔍 Filter

Name	Value
ANCM_ADDITIONAL_ERROR_PAGE_LINK	👁 Hidden value. Click to show value
APPINSIGHTS_INSTRUMENTATIONKEY	👁 Hidden value. Click to show value
APPLICATIONINSIGHTS_CONNECTION_STRING	👁 Hidden value. Click to show value
ApplicationInsightsAgent_EXTENSION_VERSION	👁 Hidden value. Click to show value
ASPNETCORE_ENVIRONMENT	👁 Hidden value. Click to show value
WEBSITE_RUN_FROM_PACKAGE	👁 Hidden value. Click to show value
XDT_MicrosoftApplicationInsights_Mode	👁 Hidden value. Click to show value



Azure DevOps – Create web app resource



eShopOnWeb-jn App Service

Search (Ctrl+/) <<

[Browse](#) [Stop](#) [Swap](#) [Restart](#) [Delete](#) [Get publish profile](#) [Reset publish profile](#)

Click here to access our Quickstart guide for deploying code to your app →

Resource group ([change](#)) :

Status :

Location :

Subscription ([change](#)) :

Subscription ID :

Tags ([change](#)) :

Deployment

[Quickstart](#)

9 [Deployment slots](#)

[Deployment Center](#)

Settings

Diagnose and solve problems
Our self-service diagnostic and troubleshooting experience helps you identify and resolve issues with your web app.

Application Insights
Application Insights helps you detect and diagnose quality issues in your apps, and helps you understand what your users actually do with it.



Azure DevOps – Create web app resource



10

Save Discard **+ Add Slot** Swap Logs Refresh

You haven't added any deployment slots. Click here to get started. →

Deployment Slots

Deployment slots are live apps with their own hostnames. App content and configurations element

NAME	STATUS
eshoponweb-jn PRODUCTION	Running

11

Give slot the name "UAT" and clone settings from production

Add a slot

Name
UAT

Clone settings from:
eshoponweb-jn

Add Close



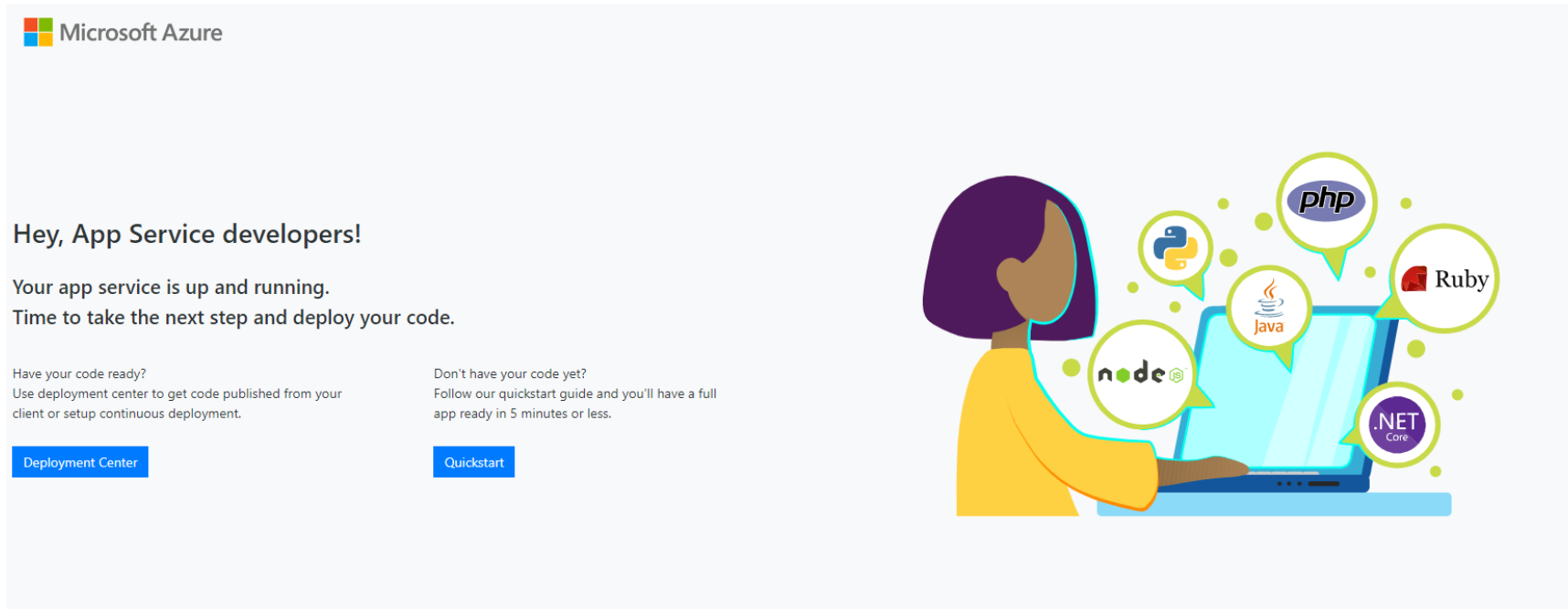
More info on deployment slots [here](#). S1 pricing plan has up to 5 deployment slots.



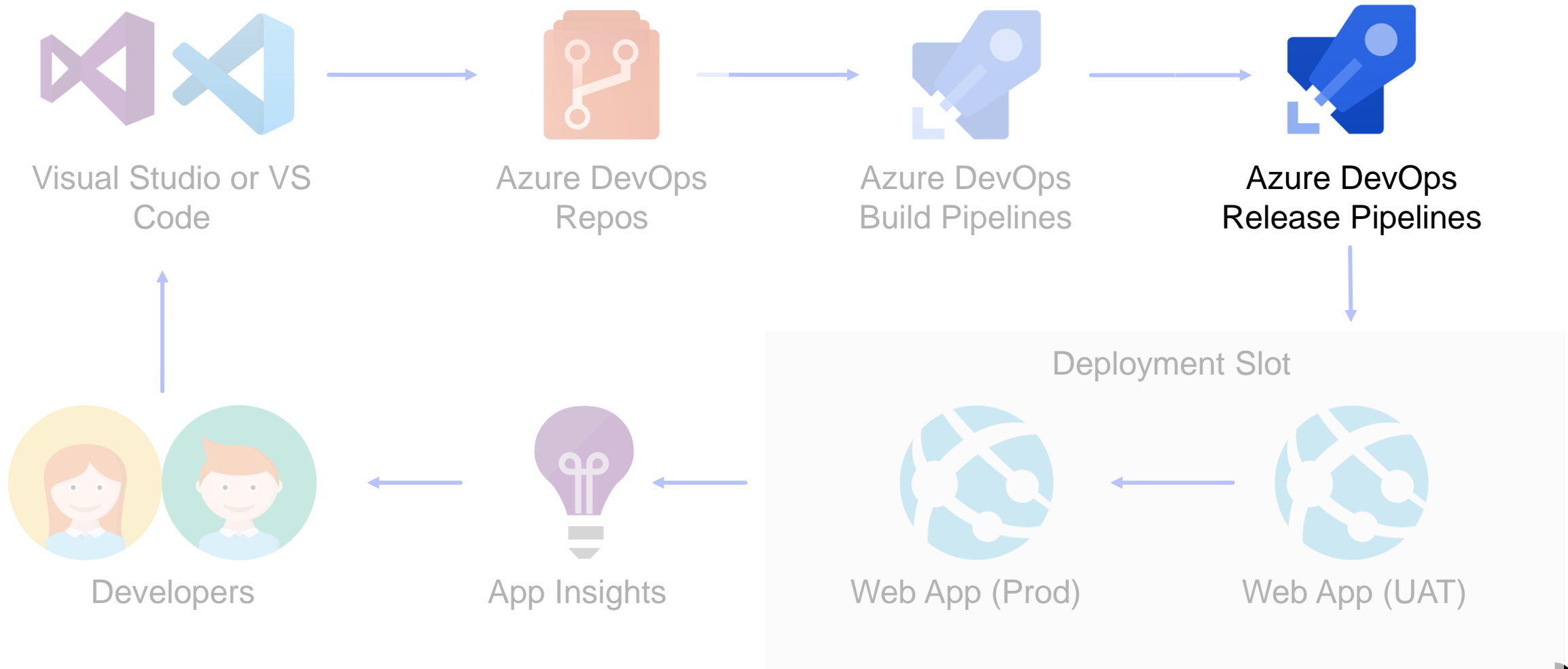
Azure DevOps – Create web app resource



Try accessing your web app now by using the URL provided in the Overview panel. You should see the following page below as you haven't deployed any code to the web app resource.



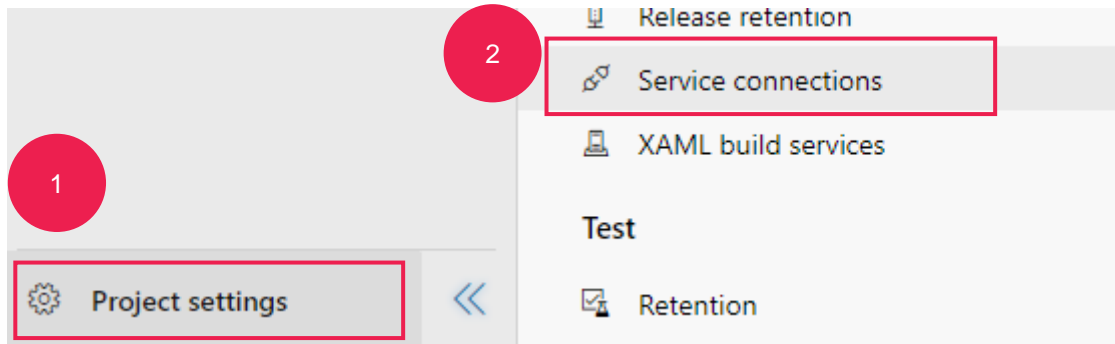
Azure DevOps – Release Pipelines



Azure DevOps – Release Pipelines



First, we need to create a service connection. A service connection is used to connect to an Azure Subscription and Resource Group so that you can deploy resources to it.



More info on service connections [here](#).



Azure DevOps – Release Pipelines



Service connections

3 **New service connection**

Filter by keywords Created by ▾ ×

eShopOnWeb-training

New service connection

Choose a service or connection type

Search connection types

- ☐ Apple App Store
- ☐ Azure Classic
- ☐ Azure Repos/Team Foundation Server
- 4 ☒ Azure Resource Manager**

New Azure service connection

Azure Resource Manager

Authentication method

- 5 ☒ Service principal (automatic)** Recommended
- ☐ Service principal (manual)
- ☐ Managed identity
- ☐ Publish Profile



Azure DevOps – Release Pipelines



New Azure service connection ✕
Azure Resource Manager using service principal (automatic)

Scope level

☒ Subscription
☐ Management Group
☐ Machine Learning Workspace

Subscription

Resource group

Details

Service connection name

Description (optional)

Security

☒ Grant access permission to all pipelines

[Learn more](#)
[Troubleshoot](#)

Choose appropriate subscription
and resource group

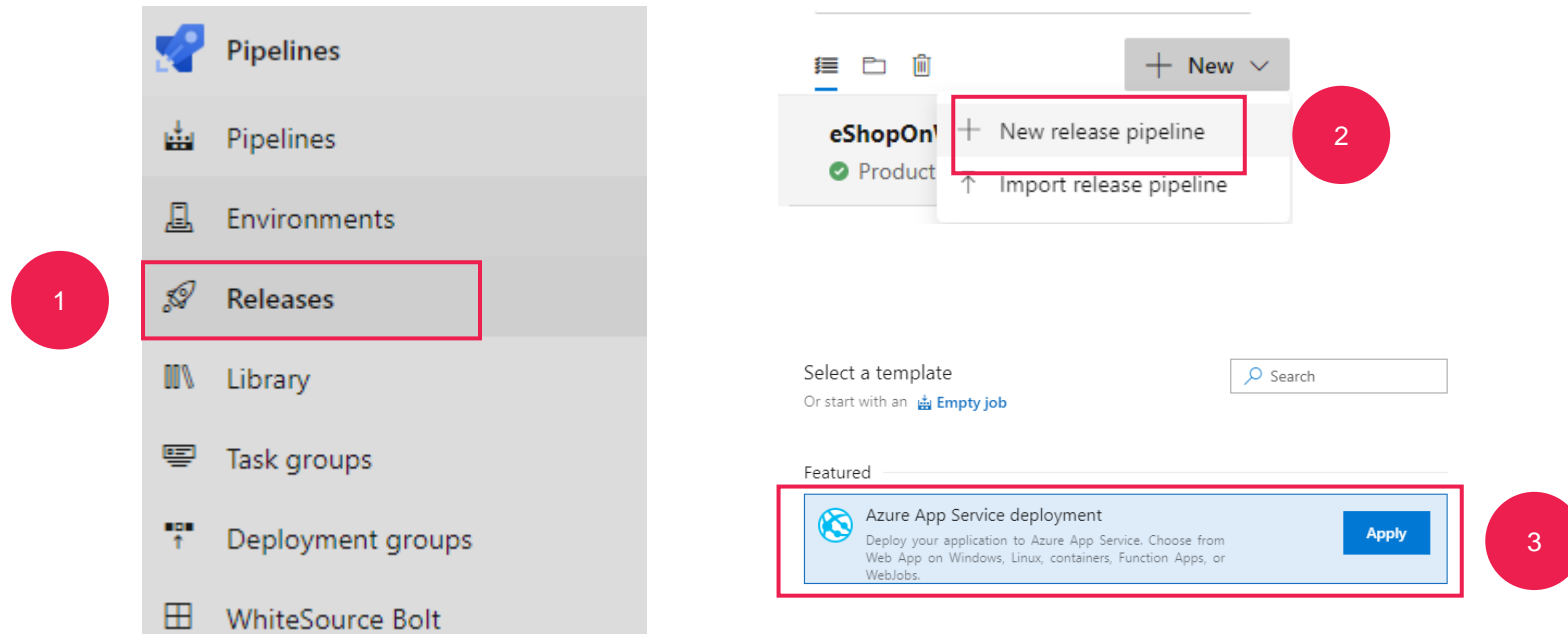
Provide a service connection name



Azure DevOps – Release Pipelines



Now that we have created a service connection, let's create a release pipeline and use the service connection to deploy our code to the web app resource.



The screenshot illustrates the process of creating a release pipeline in Azure DevOps, with three numbered steps:

- Step 1:** In the left-hand navigation pane, the **Releases** option is highlighted with a red box and a red circle containing the number 1.
- Step 2:** In the main content area, the **+ New** dropdown menu is open, and the **New release pipeline** option is highlighted with a red box and a red circle containing the number 2.
- Step 3:** Under the **Featured** section, the **Azure App Service deployment** template is highlighted with a red box and a red circle containing the number 3. The template description reads: "Deploy your application to Azure App Service. Choose from Web App on Windows, Linux, containers, Function Apps, or WebJobs." An **Apply** button is visible next to the template.



Azure DevOps – Release Pipelines



×

4

Stage

Stage 1

Properties ^

Name and owners of the stage

Stage name

Stage 1

Stage owner

JN

Jonathan Neo

Delete

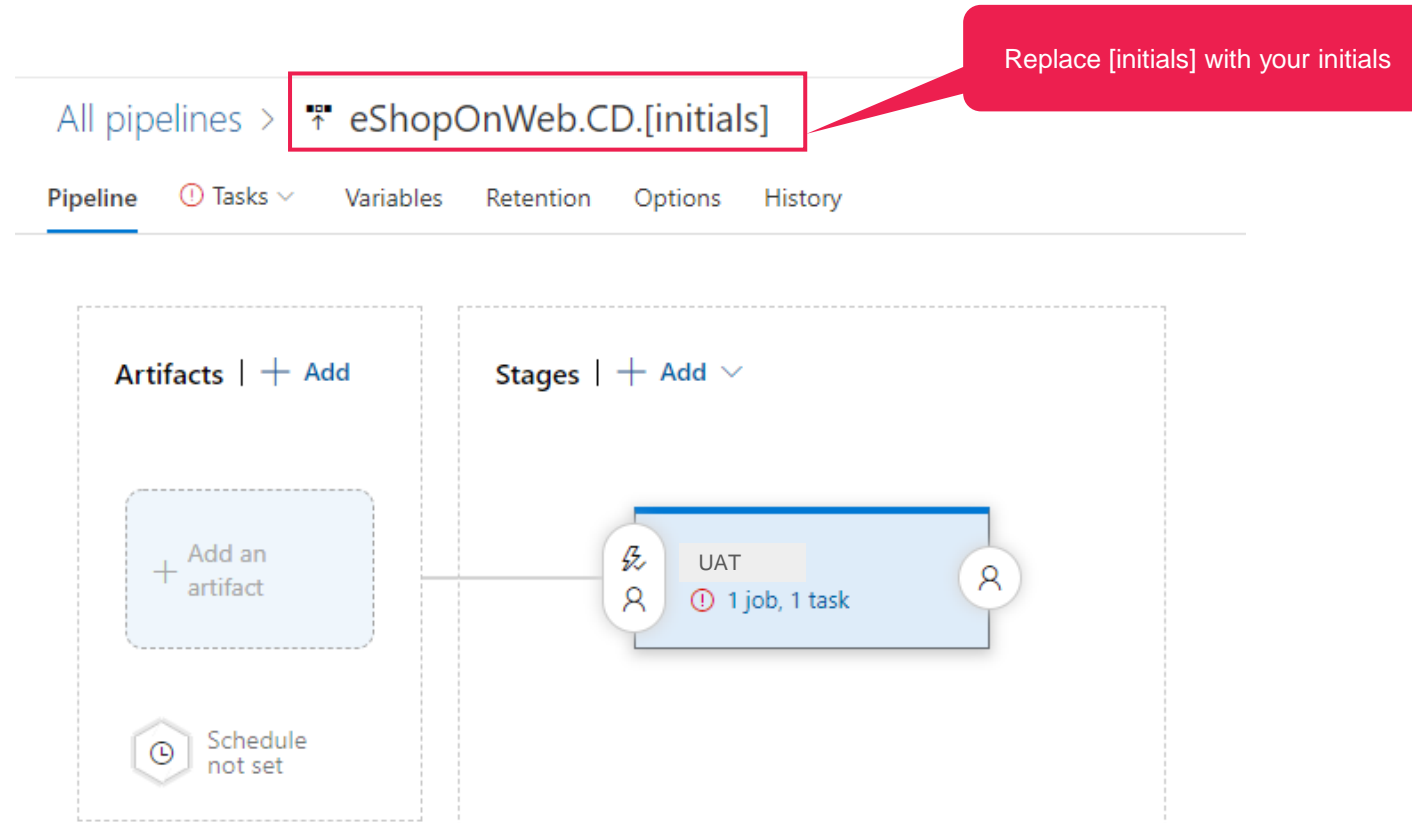
Move

...

Rename the stage to "UAT"




Azure DevOps – Release Pipelines

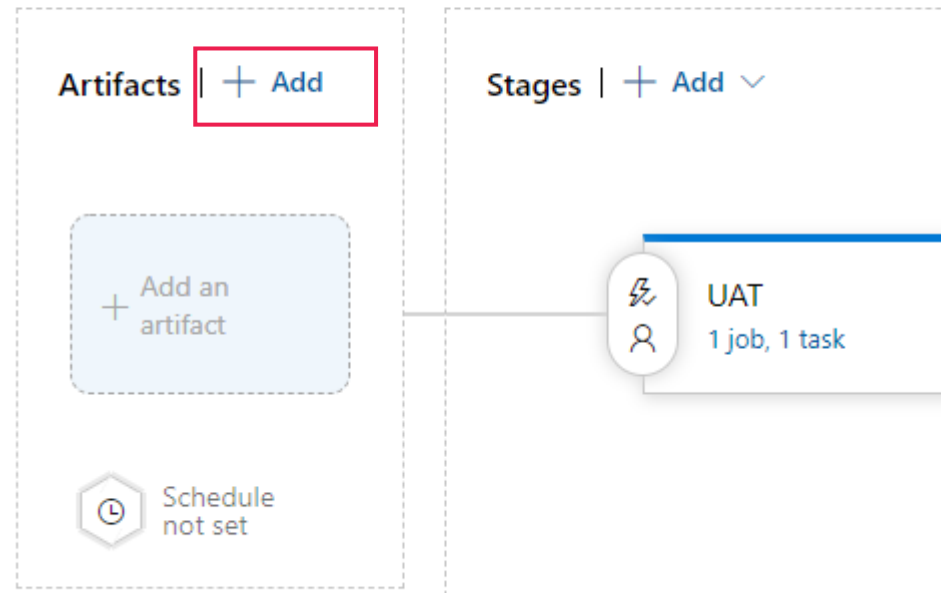


Azure DevOps – Release Pipelines



[All pipelines](#) >  eShopOnWeb.CD.JN

Pipeline Tasks ▾ Variables Retention Options History

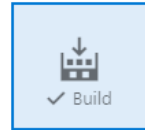


Azure DevOps – Release Pipelines



Add an artifact

Source type



5 more artifact types ▾

Project * ⓘ

Azure Data Services ▾

Source (build pipeline) * ⓘ

eShopOnWeb.CI.JN ▾

Default version * ⓘ

Latest ▾

Source alias * ⓘ

_eShopOnWeb.CI.JN

ⓘ The artifacts published by each version will be available for deployment in release pipelines. The latest successful build of **eShopOnWeb.CI.JN** published the following artifacts: **drop**.

Add

Select the build pipeline you created previously



Azure DevOps – Release Pipelines



Artifacts | + Add

Select the Continuous Deployment Trigger

Continuous deployment trigger

Build: _eShopOnWeb.CI.JN

☒ Enabled
Creates a release every time a new build is available.

Build branch filters ⓘ

No filters added.

+ Add | v

Pull request trigger

Build: _eShopOnWeb.CI.JN

☐ Disabled

ⓘ Enabling this will create a release every time a selected artifact is available as part of a pull request workflow

Enable continuous deployment every time a new build is available



Azure DevOps – Release Pipelines



5

pipelines > eShopOnWeb.CD.[initials]

Tasks Variables Retention Options History

Stage 1
Some settings need attention

Run on agent
Run on agent

Deploy Azure App Service
Some settings need attention

You are currently configuring the Stage settings

Stage name
UAT

Parameters | Unlink all

Azure subscription * | Manage

Select the service connection that was created for this exercise

This setting is required.

App type
Web App on Windows

App service name * | Manage

Select the app service name that you created

This setting is required.



Azure DevOps – Release Pipelines



All pipelines > eShopOnWeb.CD.[initials]

Pipeline Tasks Variables Retention Options History

Artifacts | + Add

Stages | + Add

+ Add an artifact

Schedule not set

UAT
1 job, 1 task

+ Add

Add a stage

6

Select a template

Or start with an [Empty job](#)

Search

7

Stage

Production

Delete Move ...

Properties

Name and owners of the stage

Stage name

Production

Stage owner

John Neo

Rename stage to "Production"



Azure DevOps – Release Pipelines



All pipelines > eShopOnWeb.CD.[initials]

Pipeline Tasks Variables Retention Options History

Production Deployment pipeline ...

Agent job Run on agent

UAT

Production

+

Add tasks | Refresh

Search and add "Azure App Service manage"

azure app service ...

Azure App Service manage

Start, stop, restart, slot swap, slot delete, install site extensions or enable continuous monitoring for an Azure App Service

by Microsoft Corporation

Add

Learn more



Azure DevOps – Release Pipelines



Azure App Service manage ⓘ

View YAML Remove

Task version 0.* ▼

Display name *

Swap Slots: eShopOnWeb-jn

Azure subscription * ⓘ | [Manage](#)

eShopOnWeb-training

ⓘ Scoped to resource group

Action ⓘ

Swap Slots ▼

App Service name * ⓘ

eShopOnWeb-jn ▼ ↺

Resource group * ⓘ

▼ ↺

Source Slot * ⓘ

UAT ▼ ↺

☒ Swap with Production ⓘ

☐ Preserve Vnet ⓘ

Control Options ▼

Output Variables ▼

Populate the missing fields

Swap UAT with Production

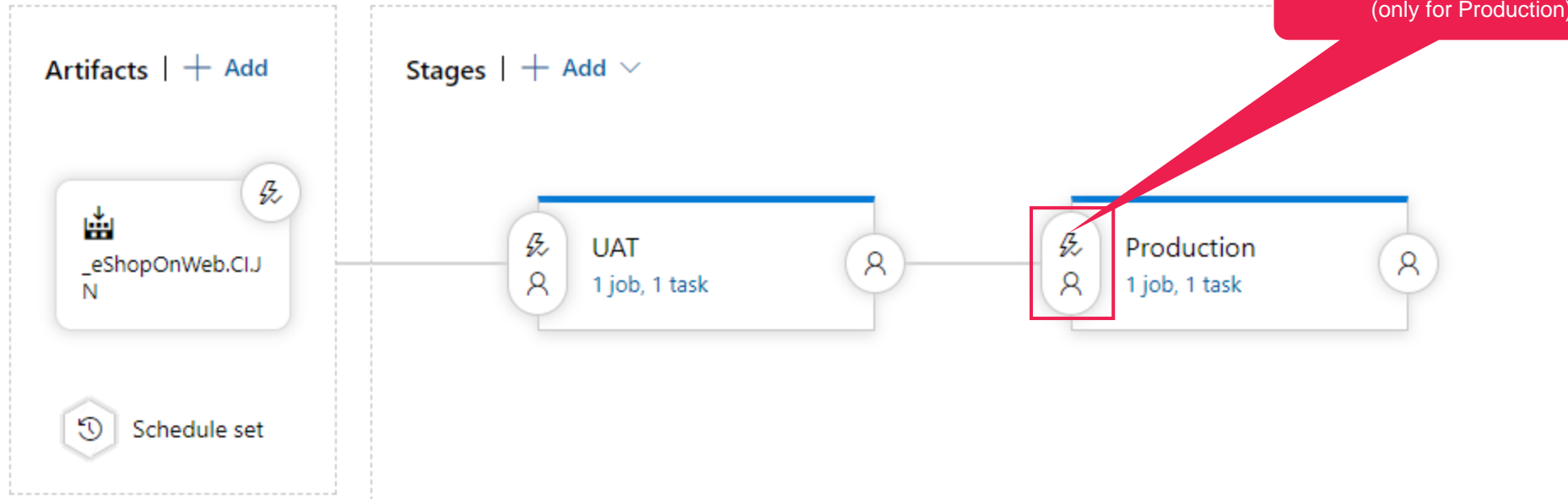


Azure DevOps – Release Pipelines



All pipelines > Training > eShopOnWeb.CD.JN

Pipeline Tasks Variables Retention Options History



Azure DevOps – Release Pipelines



Pre-deployment conditions

Production

Triggers

Define the trigger that will start deployment to this stage

Pre-deployment approvals

Select the users who can approve or reject deployments to this stage

Enabled

Approvers

Search users and groups for approvers

Enter at least one approver.

Timeout

30

Days

Approval policies

- ☐ The user requesting a release or deployment should not approve it
- ☐ Revalidate identity of approver before completing the approval.
- ☐ Skip approval if the same approver approved the previous stage

Gates

Define gates to evaluate before the deployment.

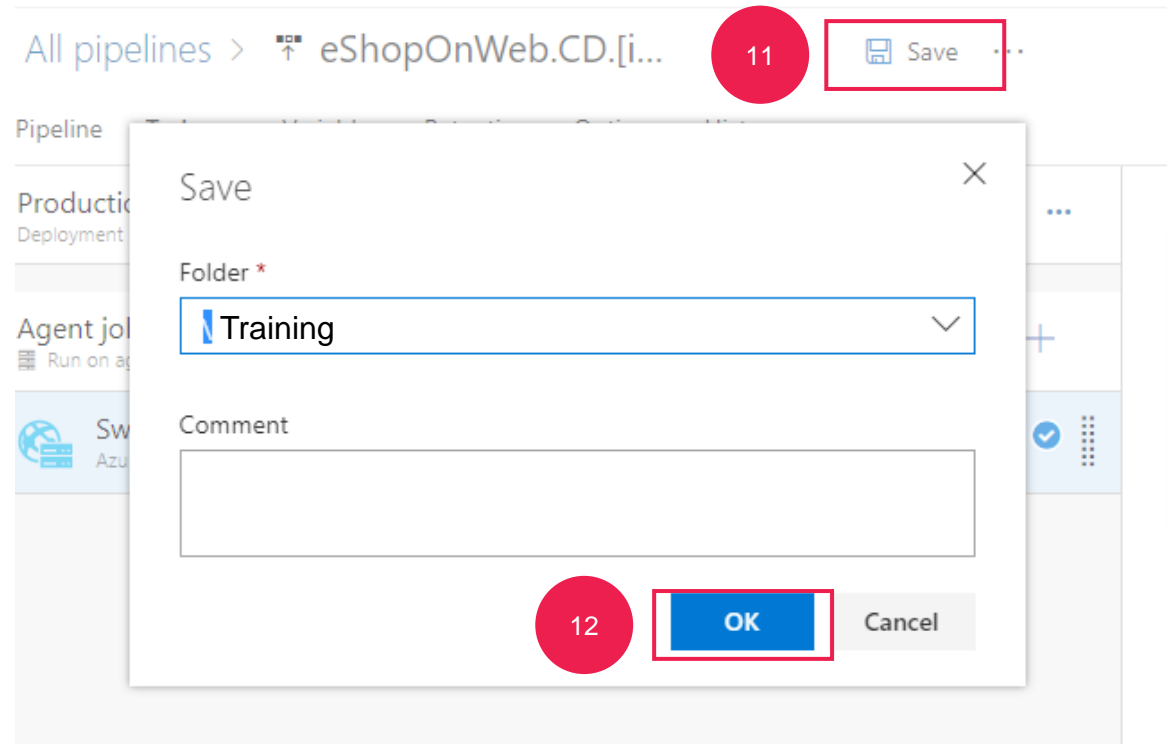
[Learn more](#)

Disabled

Enable Pre-deployment approval and select a person or group of your choice



Azure DevOps – Release Pipelines



Azure DevOps – Release Pipelines



eShopOnWeb.CD.JN

Edit

Create release

Releases

Deployments

Analytics

All releases



Create a new release

eShopOnWeb.CD.JN

Pipeline

Click on a stage to change its trigger from automated to manual.

UAT

Production

Stages for a trigger change from automated to manual.

Artifacts

Select the version for the artifact sources for this release

Source alias

Version

_eShopOnWeb.CI.JN

20200527.1

Release description

Review the release information

Provide an optional release description

14

Create

Cancel



Azure DevOps – Release Pipelines



eShopOnWeb.CD.JN

Releases Deployments Analytics

Releases

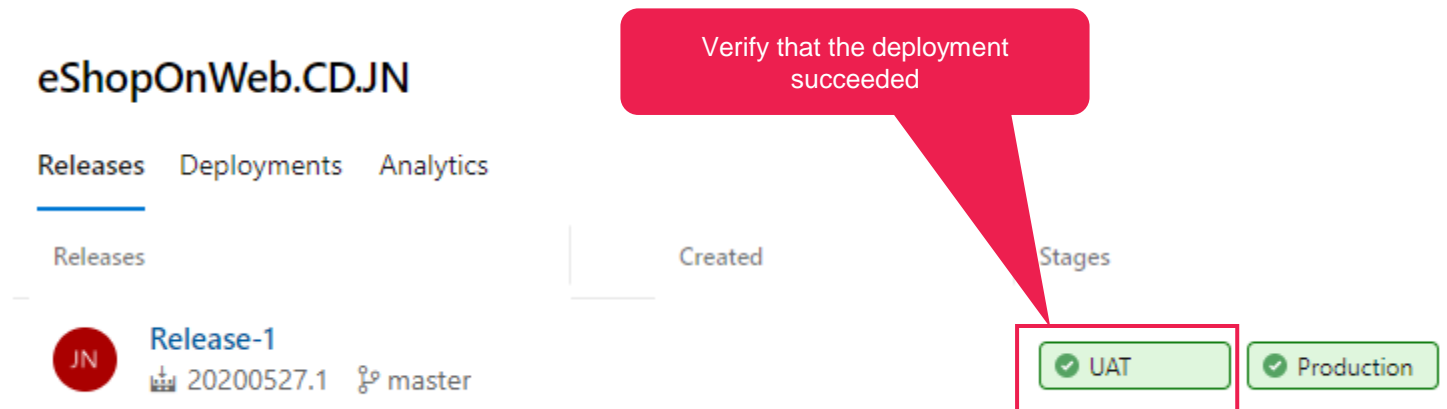
Created Stages

Release-1

20200527.1 master

UAT Production

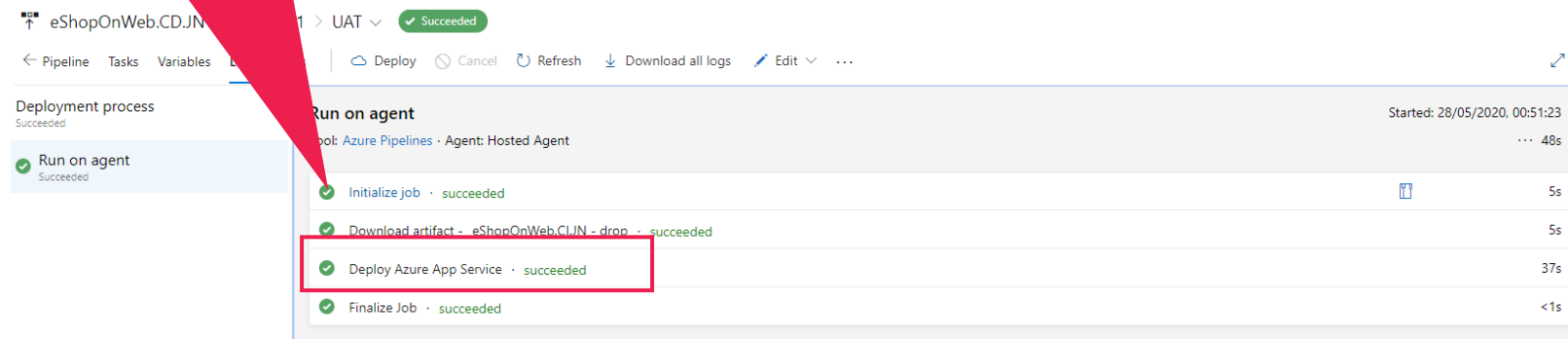
Verify that the deployment succeeded



Azure DevOps – Release Pipelines



View logs of the run by clicking on the detailed logs



The screenshot shows the 'Run on agent' step of a release pipeline. The pipeline is named 'eShopOnWeb.CD.JN' and is in the 'UAT' environment. The run status is 'Succeeded'. The 'Run on agent' step is highlighted in the left sidebar. The main area shows the deployment process with a table of tasks:

Task	Status	Duration
Initialize job	succeeded	5s
Download artifact - eShopOnWeb.CI.JN - drop	succeeded	5s
Deploy Azure App Service	succeeded	37s
Finalize Job	succeeded	<1s

The 'Deploy Azure App Service' task is highlighted with a red box. A red arrow points from the text 'View logs of the run by clicking on the detailed logs' to the 'Deploy Azure App Service' task.



Azure DevOps – Release Pipelines



LOGIN



Verify that you can access the web application

ALL T-SHIRTS
ON SALE
THIS WEEKEND

BRAND

All

TYPE

All



Previous

Showing 10 of 12 products - Page 1 - 2

Next



[ADD TO BASKET]



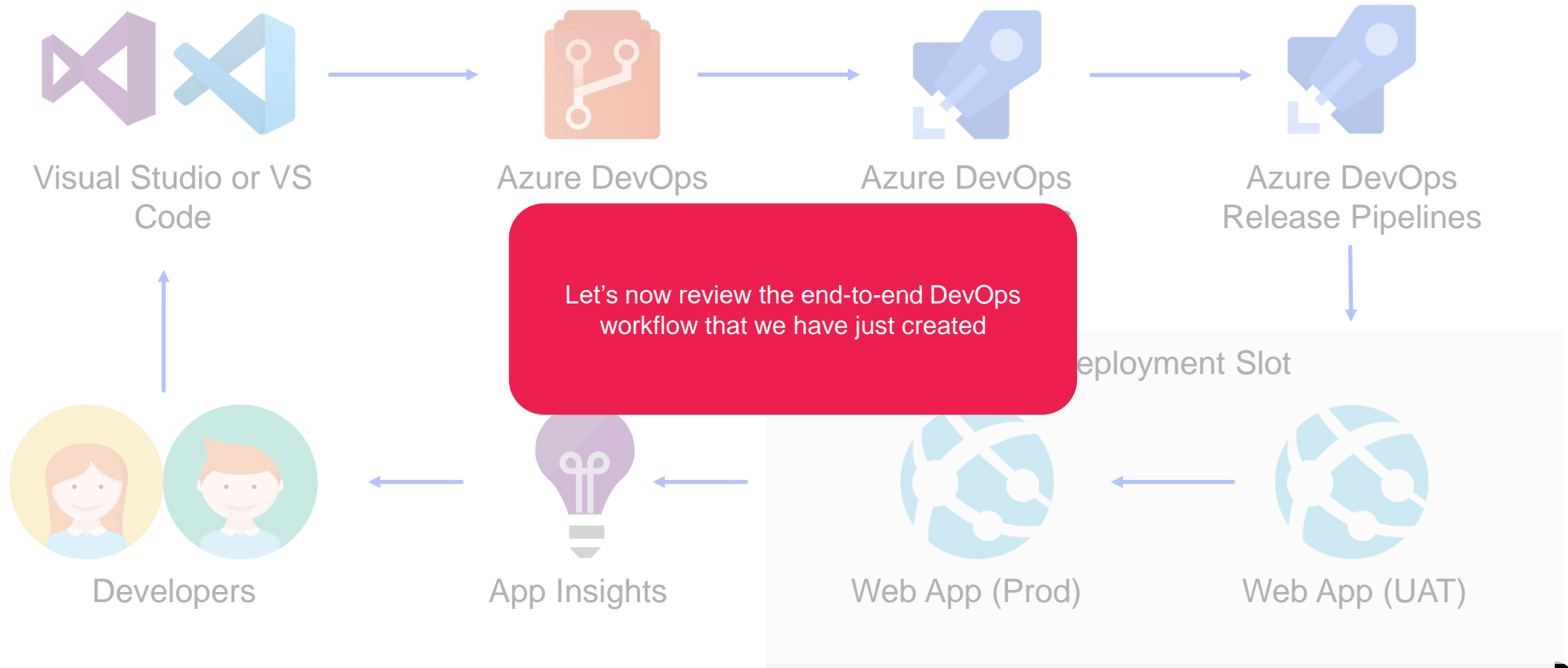
[ADD TO BASKET]



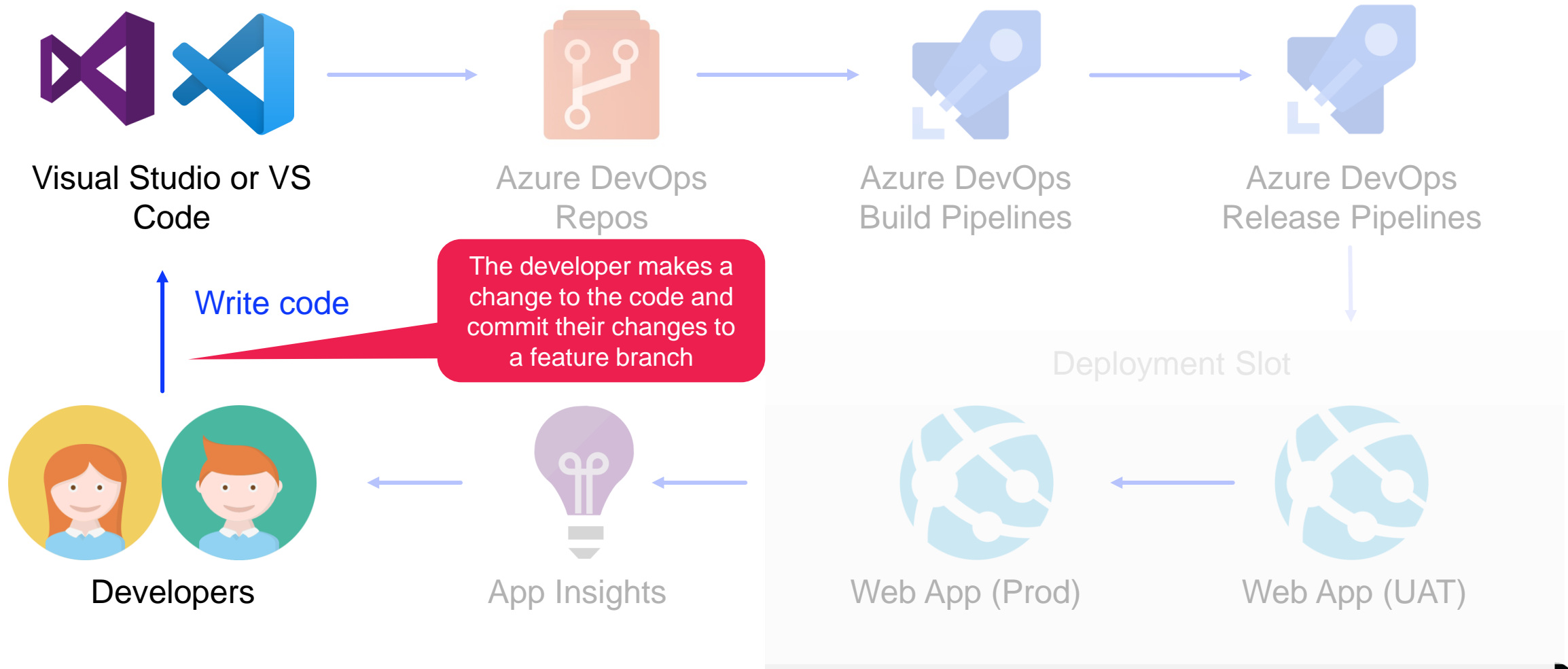
[ADD TO BASKET]



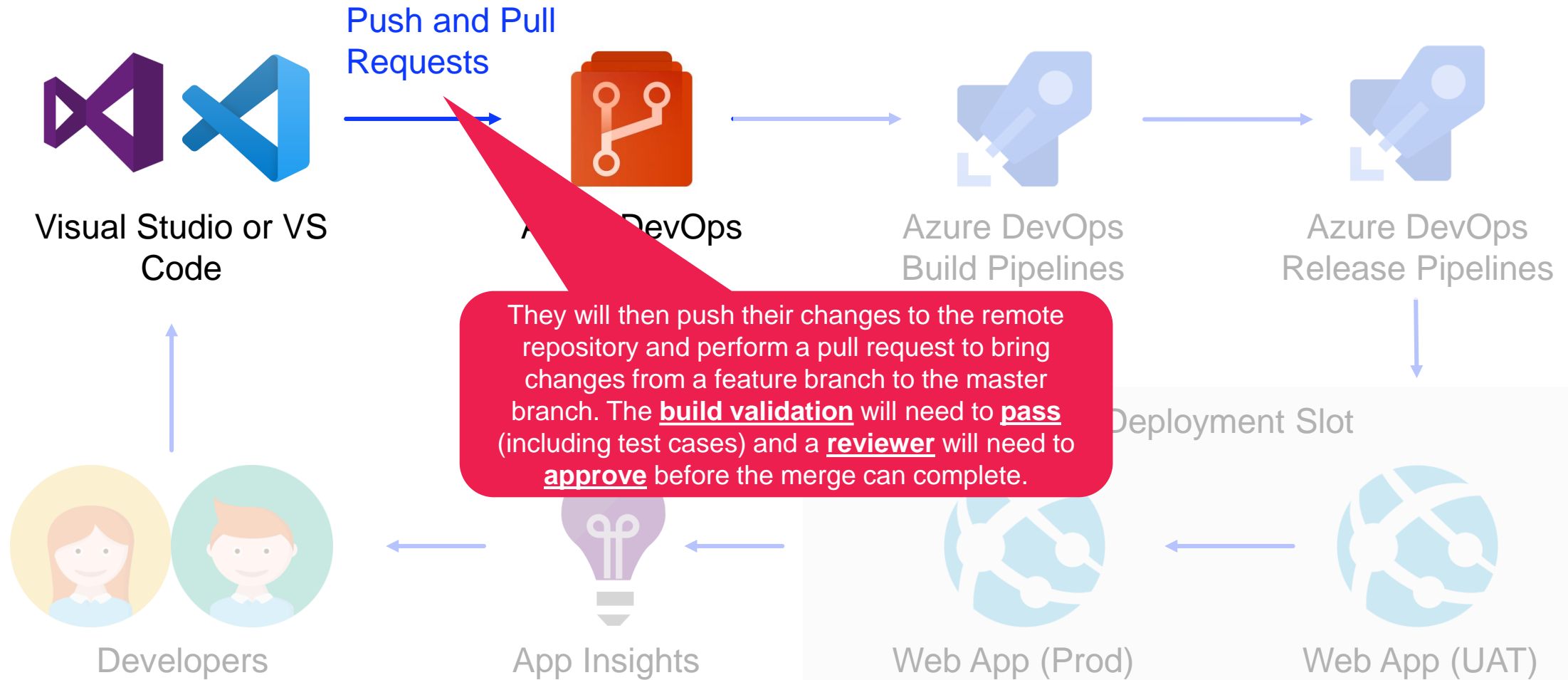
Azure DevOps – DevOps Workflow



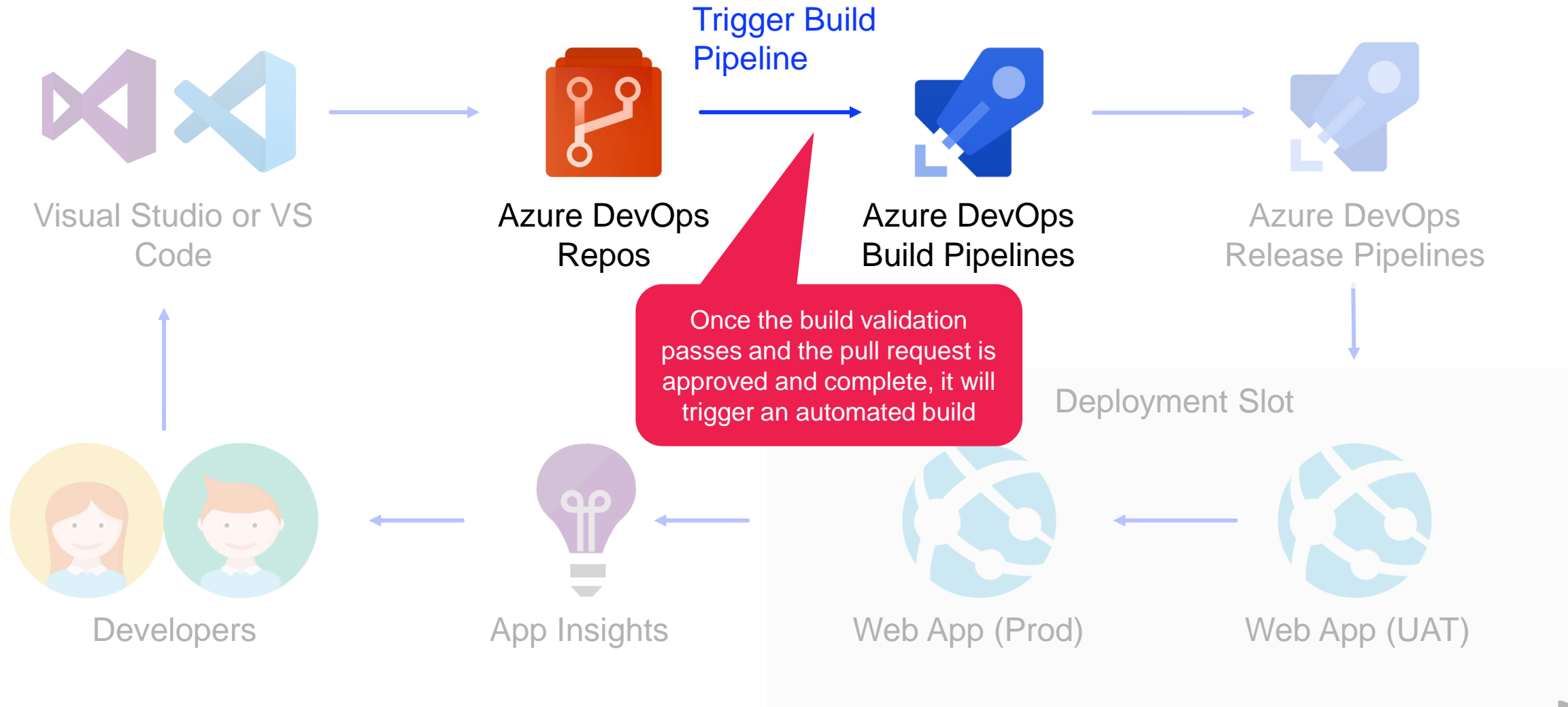
Azure DevOps – DevOps Workflow



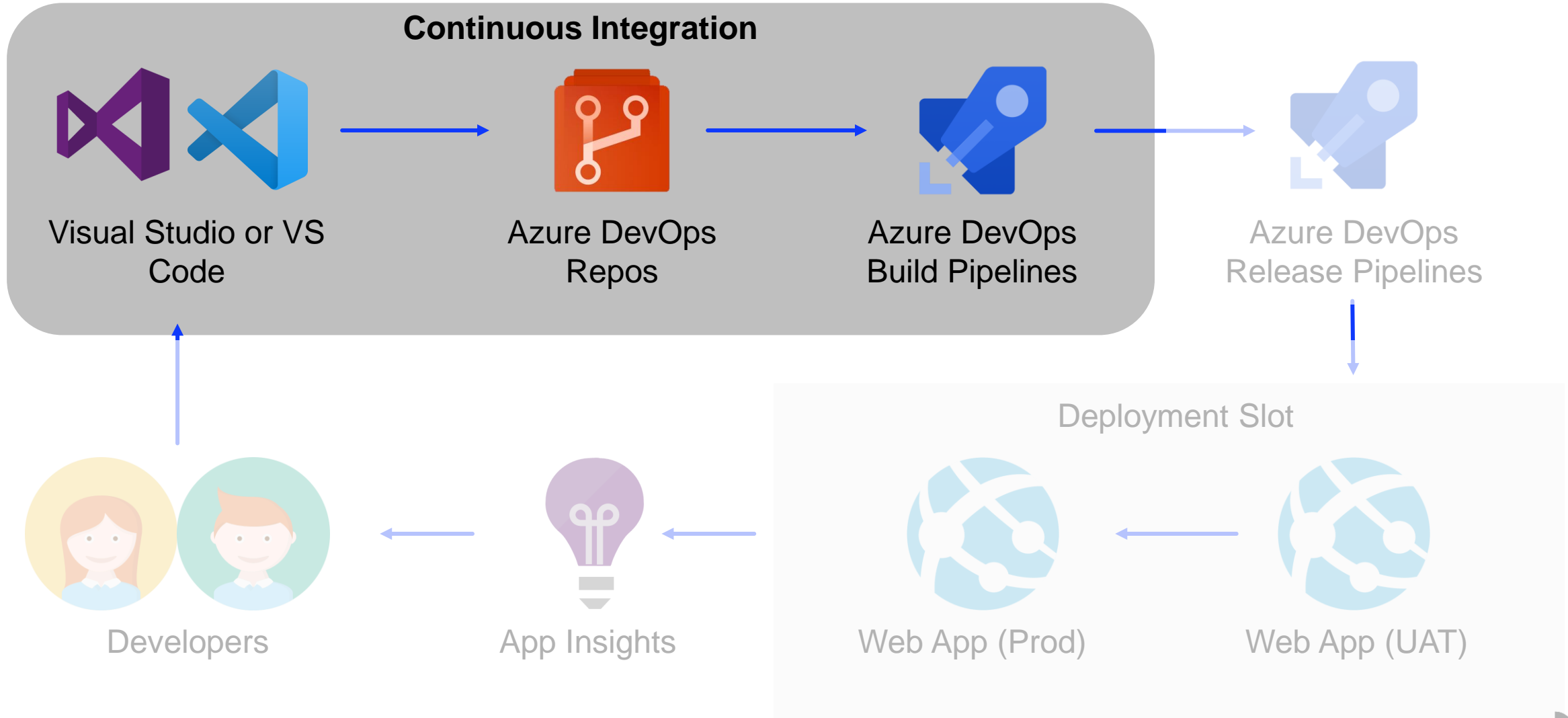
Azure DevOps – DevOps Workflow



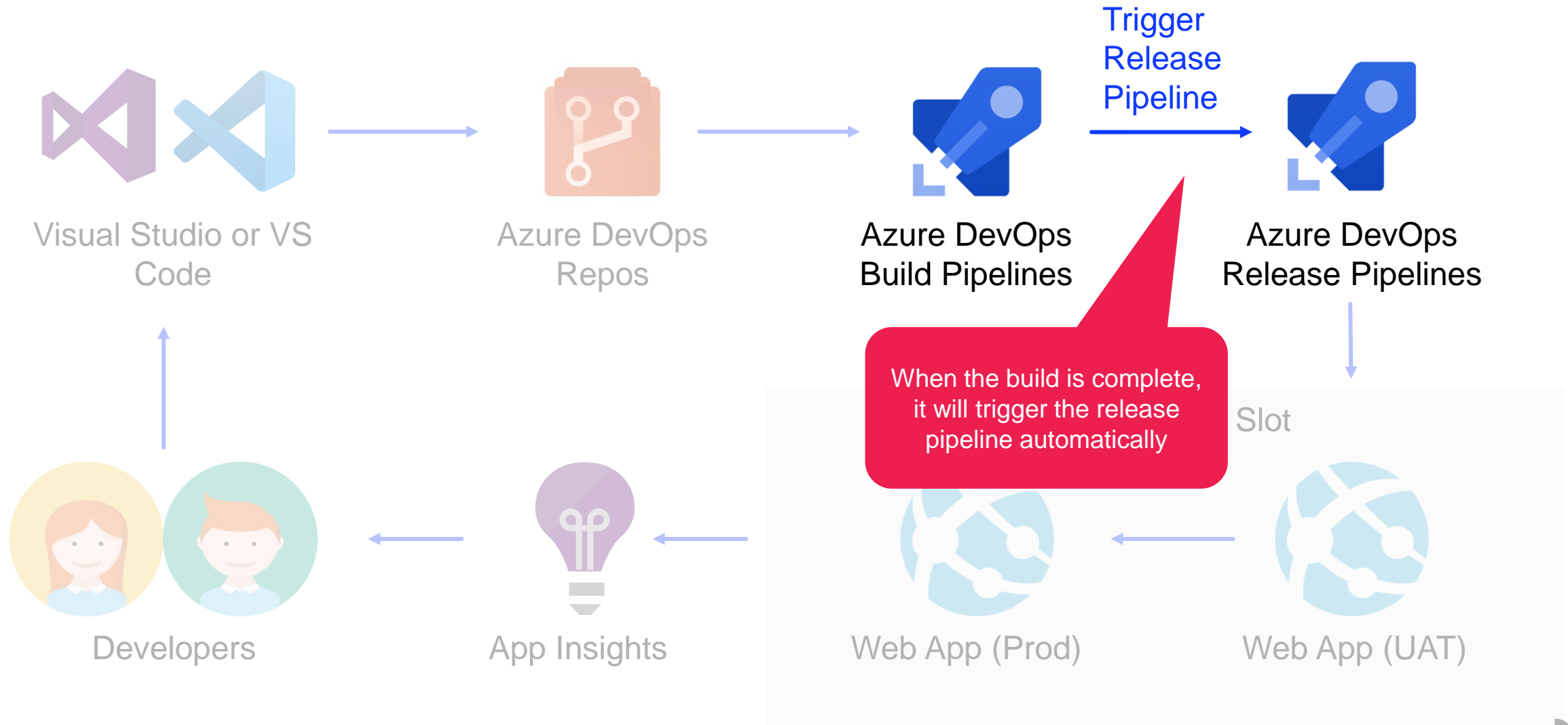
Azure DevOps – DevOps Workflow



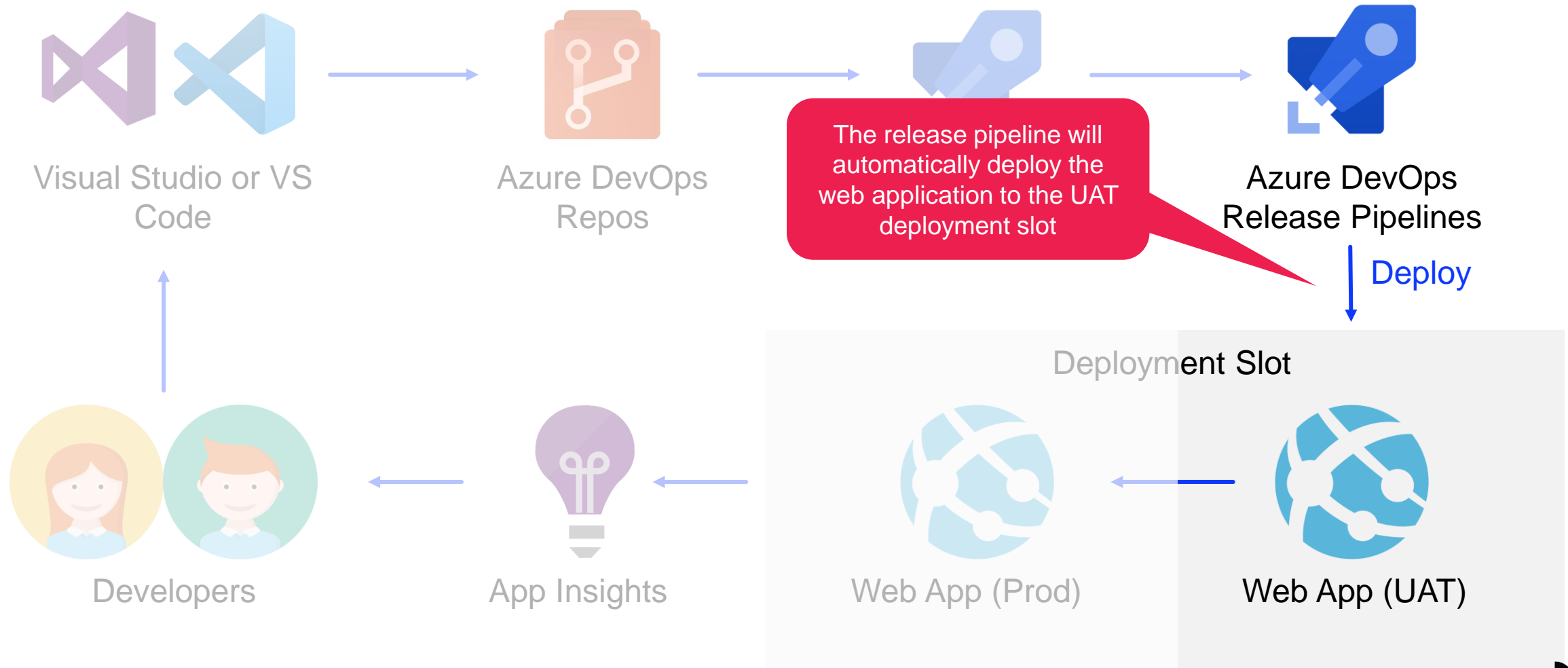
Azure DevOps – DevOps Workflow



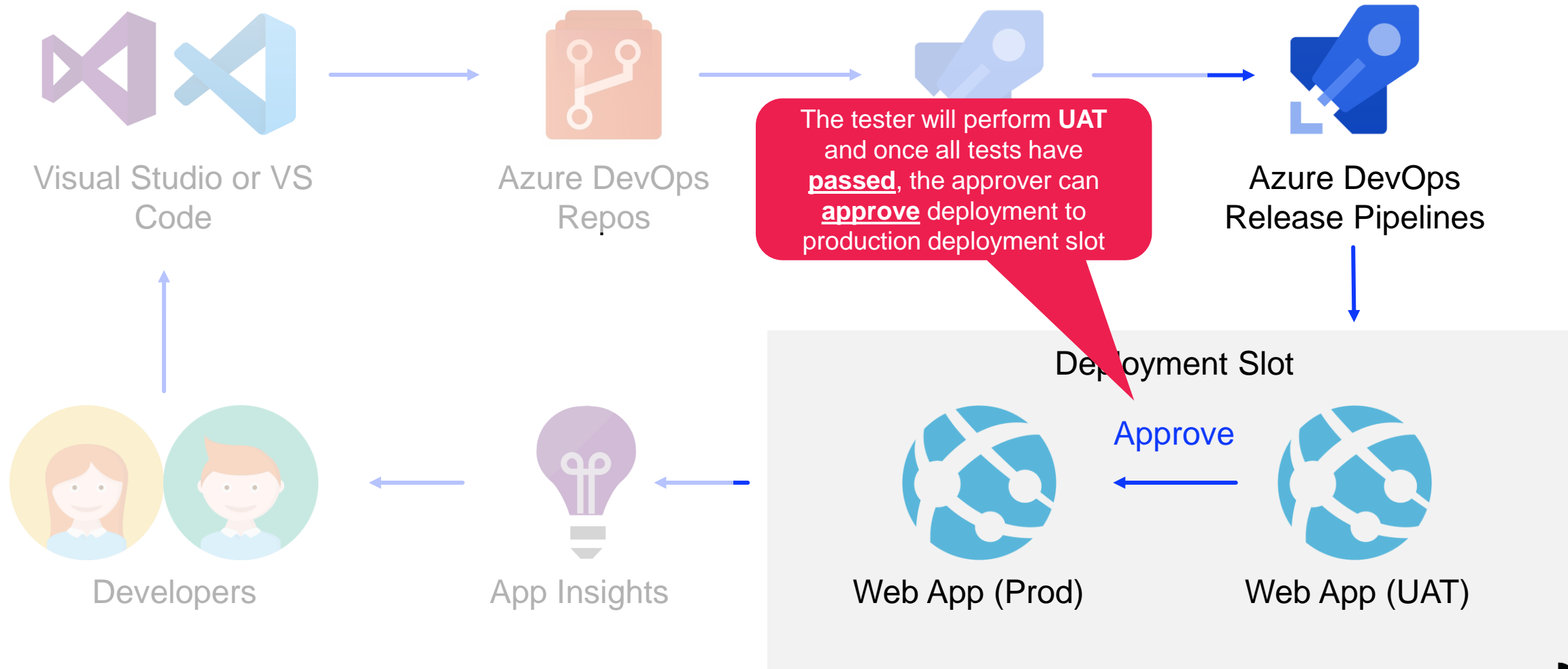
Azure DevOps – DevOps Workflow



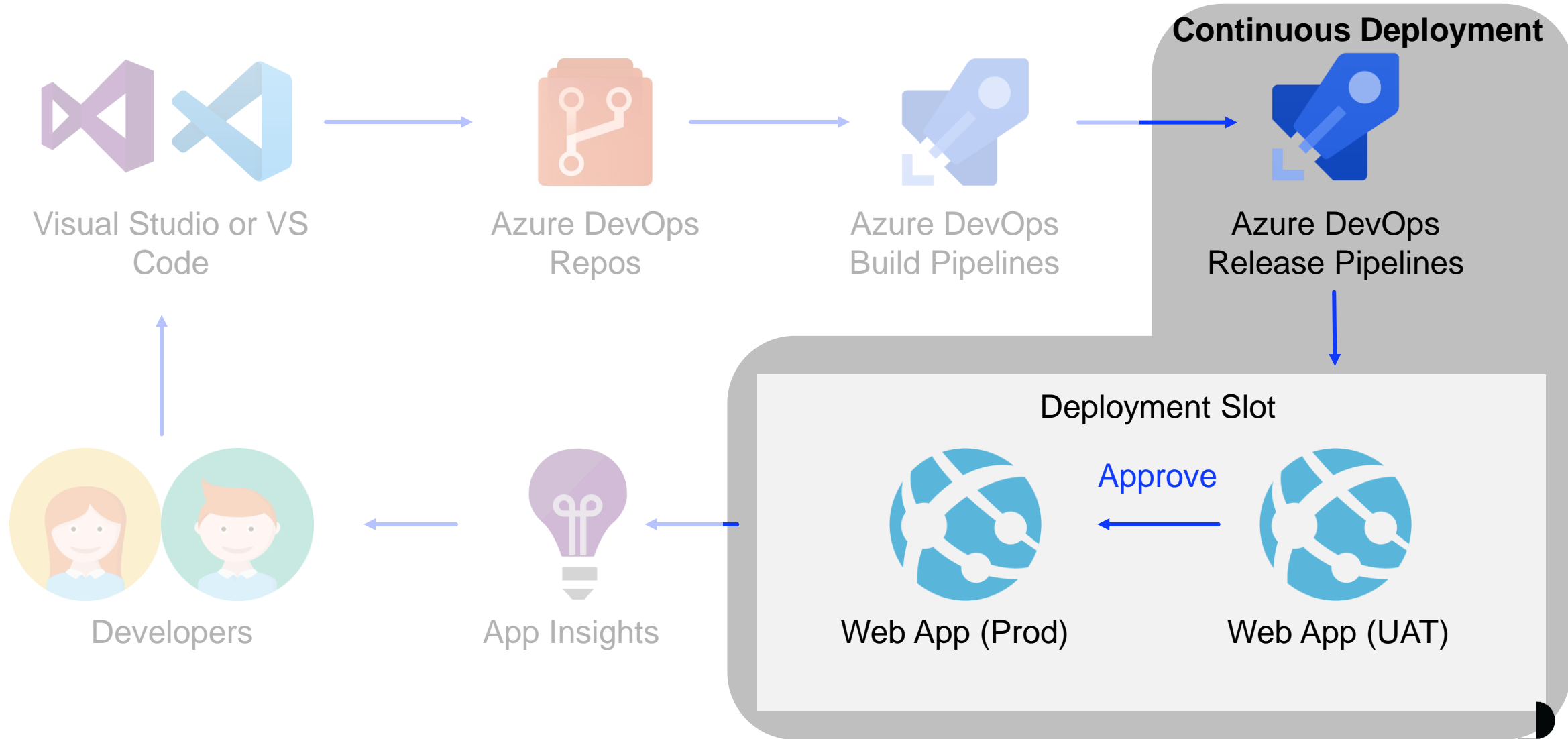
Azure DevOps – DevOps Workflow



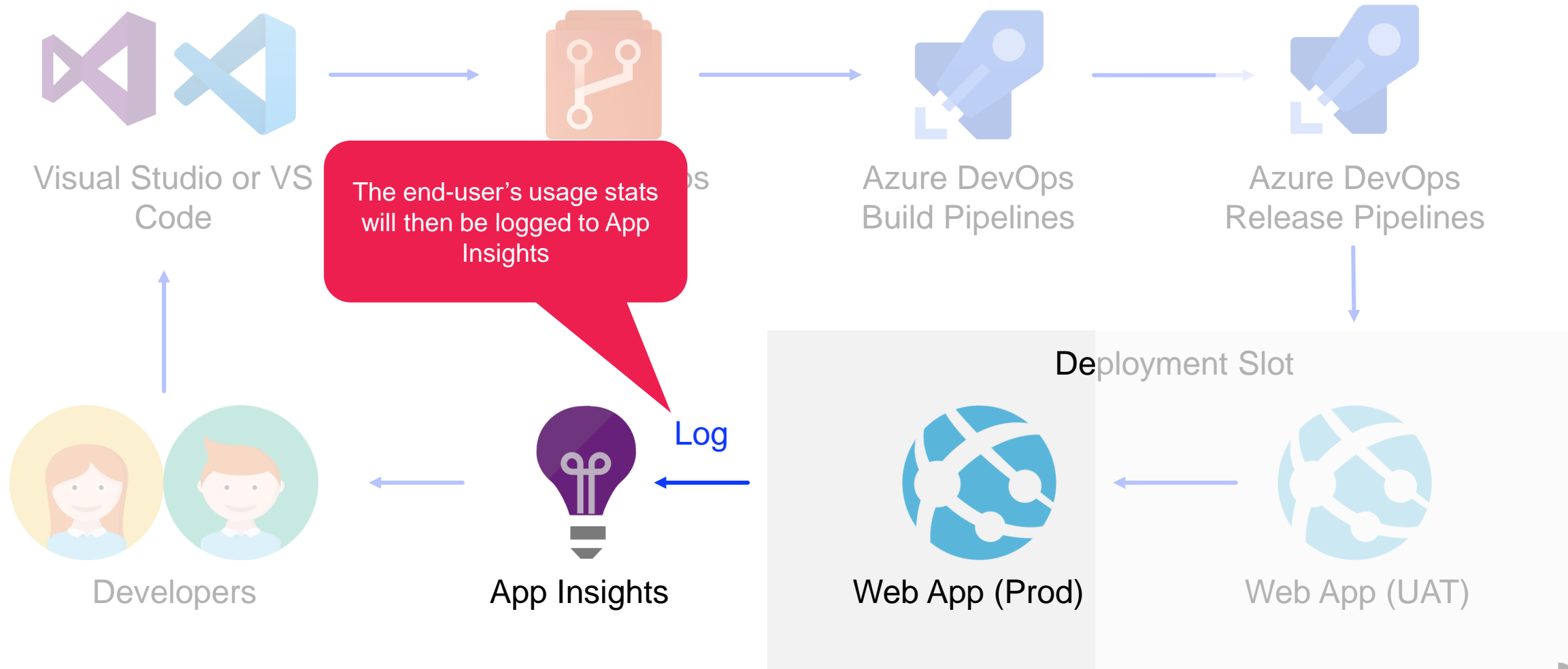
Azure DevOps – DevOps Workflow



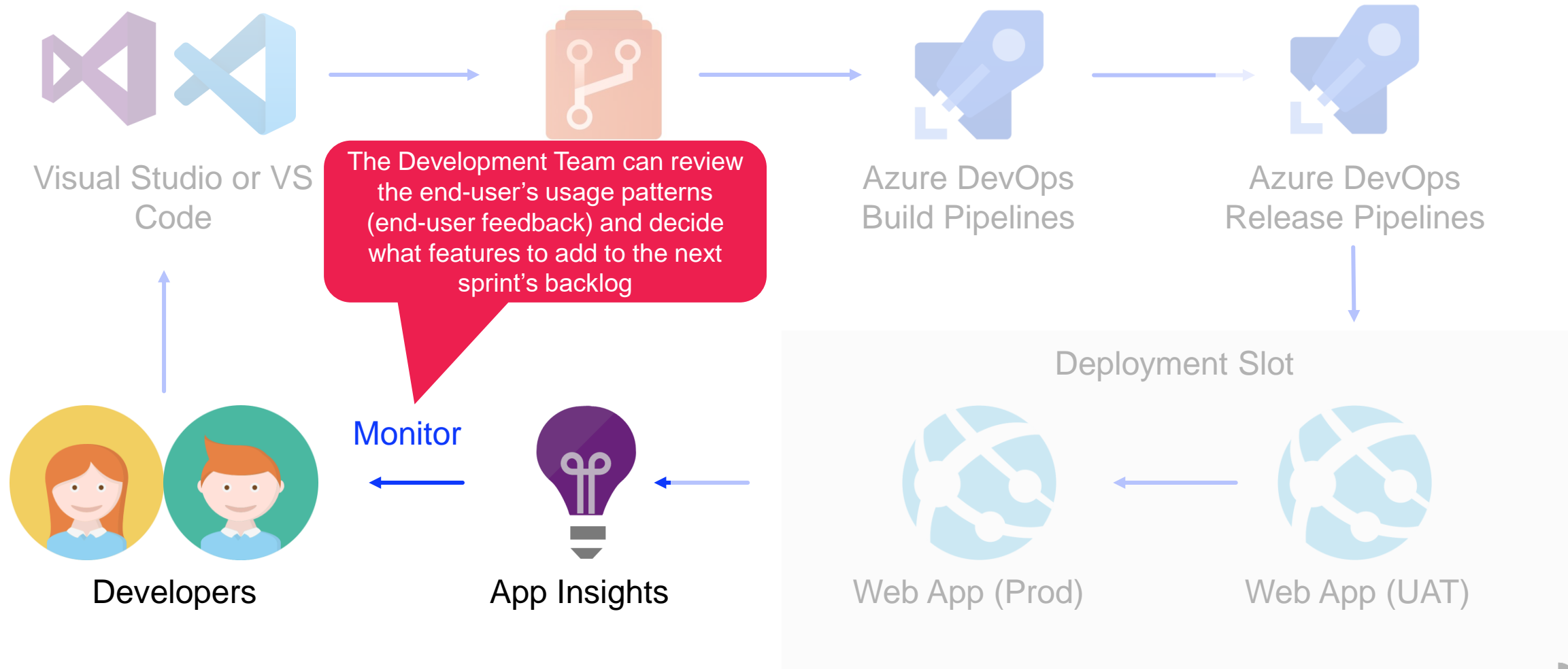
Azure DevOps – DevOps Workflow



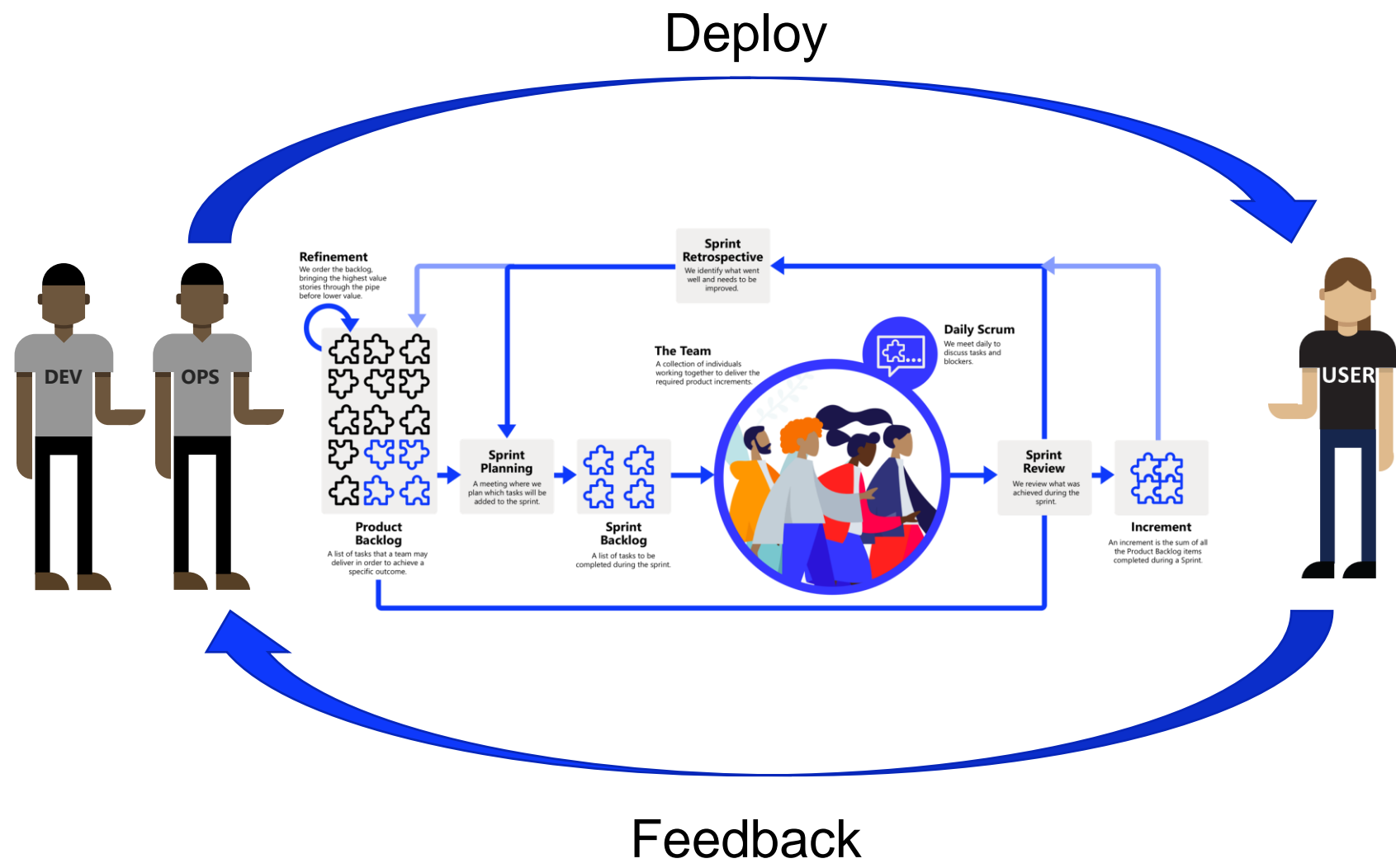
Azure DevOps – DevOps Workflow



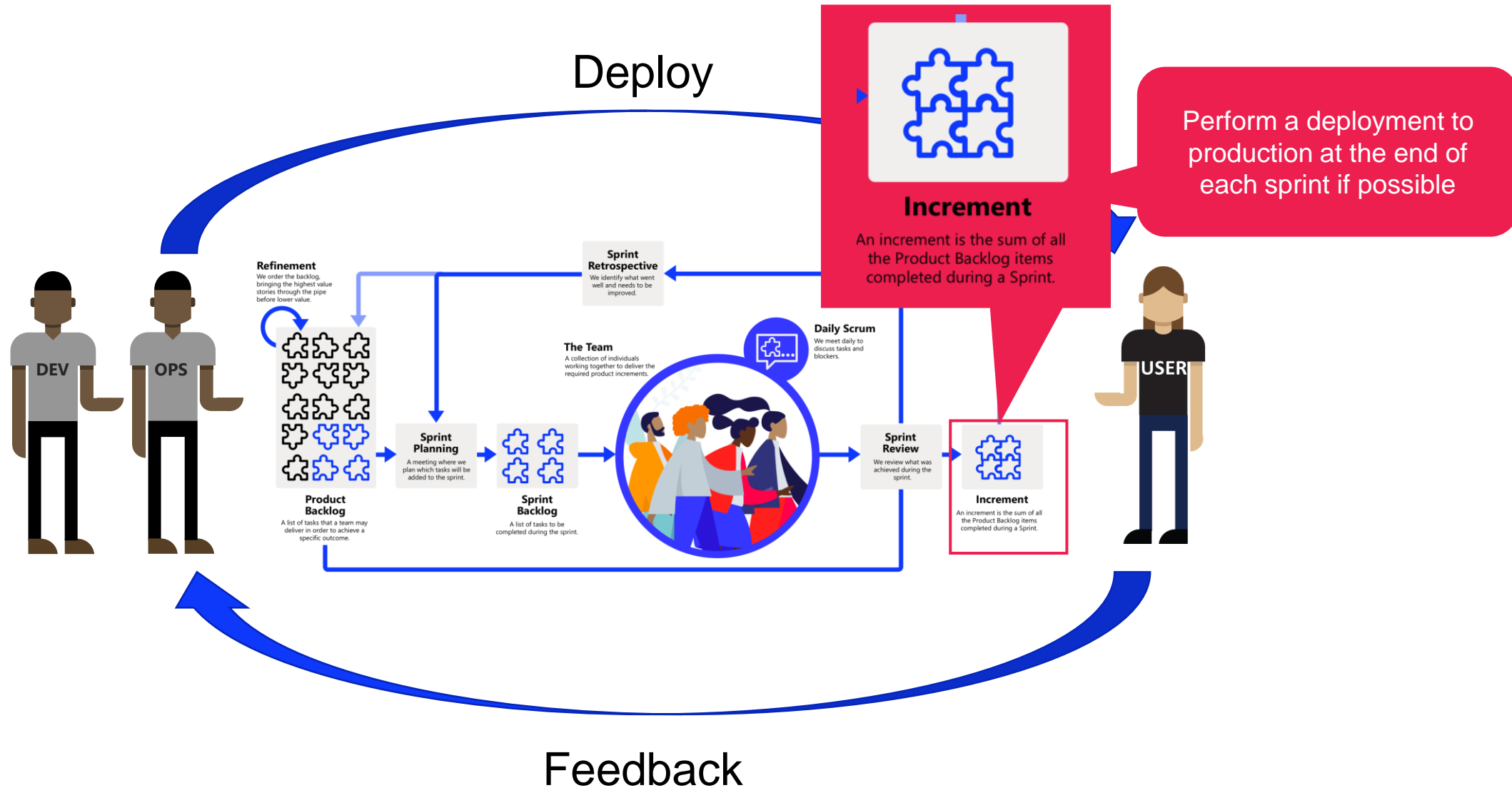
Azure DevOps – DevOps Workflow



Azure DevOps – DevOps Workflow



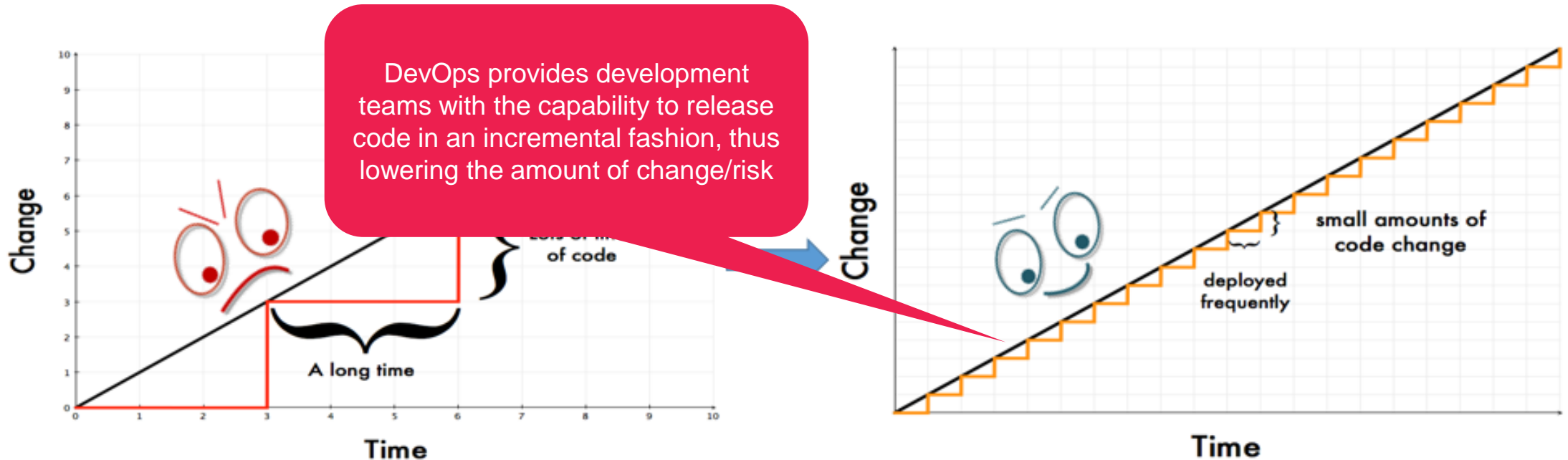
Azure DevOps – DevOps Workflow



Azure DevOps – Incremental Changes



John Allspaw's visual – From slow delivery cycles to fast delivery cycles

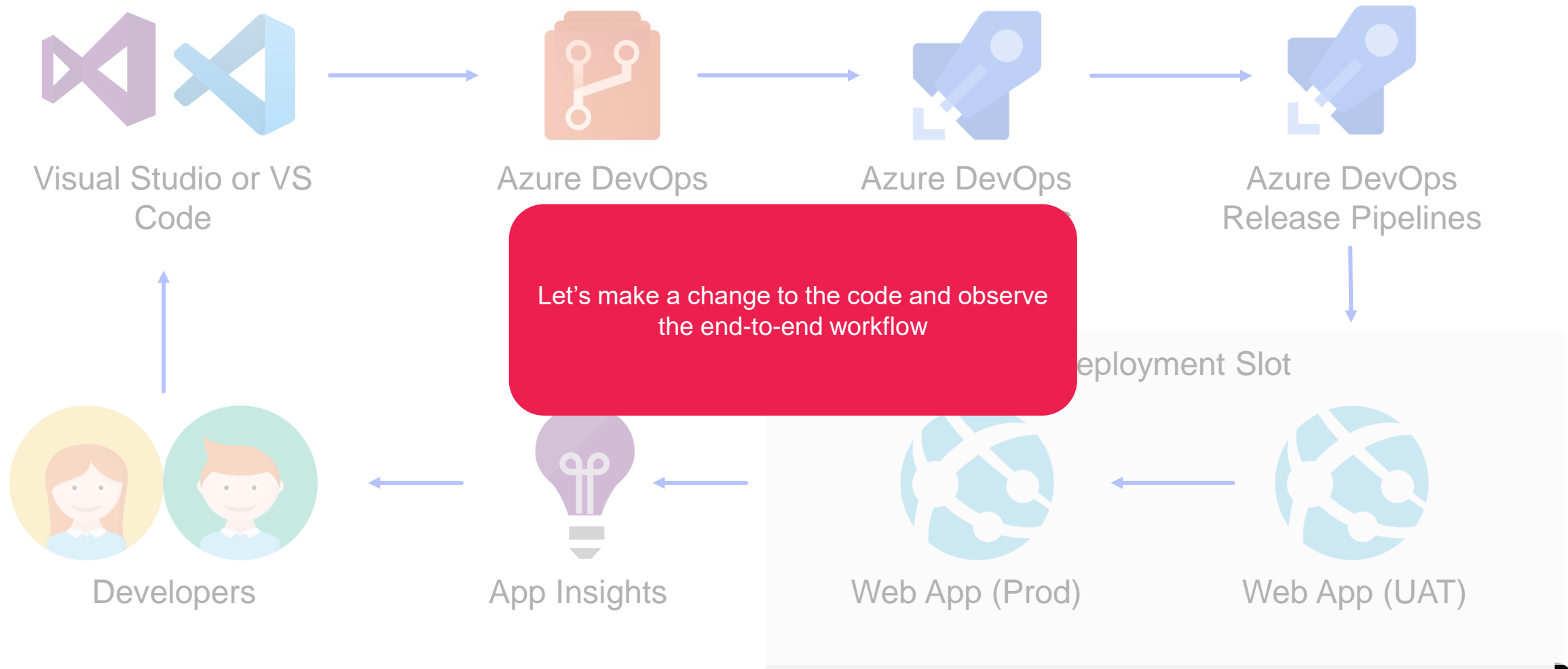


Traditional Software Development

DevOps-led Software Development



Azure DevOps – DevOps Workflow Exercise



Azure DevOps – DevOps Workflow Exercise



Navigate to:

```
eShopOnWeb
├── src
│   ├── Web
│   │   ├── Views
│   │   │   └── Shared
│   │   │       └── _Layout.cshtml
```

_Layout.cshtml

```
<title>@ViewData["Title"] - Microsoft.eShopOnWeb</title>
```



Azure DevOps – DevOps Workflow Exercise



Navigate to:

```
eShopOnWeb
├── src
│   ├── Web
│   │   └── Views
│   │       └── Shared
│   │           └── _Layout.cshtml
```

_Layout.cshtml

```
<title>@ViewData["Title"] - <Your_Name> eShop </title>
```



Azure DevOps – DevOps Workflow Exercise



1. Commit change to a local feature branch called change-title-<your initials>
2. Push local branch to remote
3. Create a pull request to remote master-<your initials> and add a reviewer
4. Wait for reviewer to approve and for build validation to succeed
5. Complete the pull request
6. Observe an automated build is triggered and wait for it to complete
7. Observe an automated release is created and wait for it to complete deployment to UAT slot
8. Wait for approver to approve deployment to production slot
9. Deployment to production slot complete



Course Complete!



Resources



Resource	URL
Introduction to DevOps	https://channel9.msdn.com/Series/DevOps-Fundamentals/Introduction-to-DevOps?term=devops&lang-en=true
Automated Testing	https://channel9.msdn.com/Series/DevOps-Fundamentals/Automated-Testing
Unit testing for databases	https://channel9.msdn.com/Shows/DevOps-Lab/Unit-Testing-your-Database-Changes?term=database%20testing&lang-en=true
Continuous Integration	https://channel9.msdn.com/Series/DevOps-Fundamentals/Continuous-Integration
Continuous Deployment	https://channel9.msdn.com/Series/DevOps-Fundamentals/Continuous-Deployment-and-Release-Management



References



Resource	URL
Icons from Pixel Perfect	https://www.flaticon.com/authors/pixel-perfect
Icons from Freepik	https://www.flaticon.com/authors/freepik





Thank you

