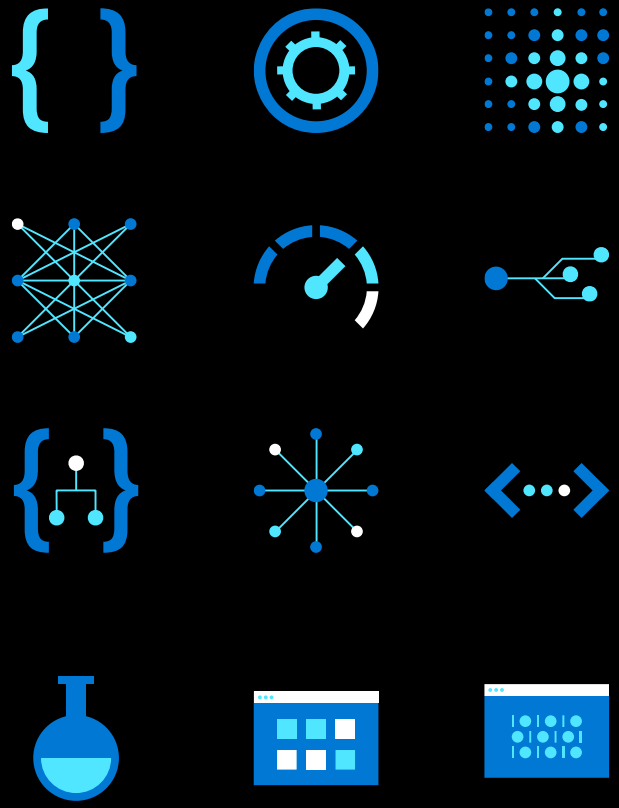
Microsoft Azure

Azure Training Day

Run cloud-native apps with Azure Kubernetes Service



Microsoft

Azure

Deploy an app using DevOps and Kubernetes

Part 4 of 4 in the Run cloud-native apps with Azure Kubernetes Service series

MSUSDev@Microsoft.com

Oct, 2019

About us...

Dave Burnison

- Sr. Specialist

For questions or help with this series
MSUSDev@Microsoft.com

For the lab guides and sample code
https://github.com/MSUSDEV/Run-Cloud-Native-Apps-With-AKS

Setting the scene

Overview of the workshop

About the workshop content…

About:
This series is the second half of a longer workshop that teaches how to build a proof of concept (POC) that will transform an existing ASP.NET-based Web application (SimplCommerce) to a container-based application. You can register to view the modules from the first half at https://aka.ms/web-app-series You can find all the presentations form the first half at https://github.com/MSUSDEV/Migrating-web-apps-to-Azure

At the end of this workshop, you will have a good understanding of container concepts, Docker architecture and operations, Azure Container Services, Azure Kubernetes Services and Azure DevOps tools.

Target Audience:
The workshop is targeted to Cloud Architects, Cloud Solution designers, developers and IT sysadmins, CIO's, CTO's and anybody else who is interested in learning about Azure, containers, application cloud migration and digital transformation.
Focus of the workshop (40%) is getting hands-on experience, complemented with presentations and whiteboard sessions (if in-person delivery).

Time Estimate:
11 hours (+/- 5 hours presentations, 6 hours of optional hands-on labs for attendees)

Workshop Agenda - Presentations

What we will talk about…

Series 1: https://aka.ms/web-app-series

- Module 1: Digital App Transformation with Azure
- Module 2: Running Azure Infrastructure and execute Lift & Shift Migrations
- Module 3: Performing proper assessments to smooth Azure Migrations
- Module 4: Why and how migrating databases to Azure PaaS
- Module 5: Migrating to Azure App Services – Azure Web Apps (.NET)

Series 2: https://aka.ms/cloud-native-series

- Module 1: Deploying Containers on Azure
- Module 2: Deploying Azure Kubernetes Services
- Module 3: Optimizing Azure Operations and Monitoring
- Module 4: Introduction to Azure DevOps YOU ARE HERE

Workshop Agenda – Hands On Labs

From series 1

- **Module 2: Running Azure Infrastructure and execute Lift & Shift Migrations**
- *Lab 1: Deploy an Azure VM Infrastructure using ARM-Templates*

- **Module 3: Performing proper assessments to smooth Azure Migrations**
- *Lab 2: Using Azure assessment tools*

- **Module 4: Why and how migrating databases to Azure PaaS**
- *Lab 3: Migrating SQL Databases to Azure using Database Migration Assistant*

- **Module 5: Migrating to Azure App Services – Azure Web Apps (.NET)**
- *Lab 4: Publishing application source code to Azure Web Apps using Visual Studio 2019*

Workshop Agenda – Hands On Labs

For this series 2

- **Module 1: Deploying Containers on Azure**
- *Lab 5: Containerizing applications using Docker and running it in Azure Container Instance and Azure WebApp for Containers*

- **Module 2: Deploying Azure Kubernetes Services**
- *Lab 6: Deploying Azure Kubernetes Services and running containerized apps from Azure Container Registry*

- **Module 3: Optimizing Azure Operations and Monitoring**
- *Lab 7: Monitoring and Managing your Azure deployed workloads*

- **Module 4: Introduction to Azure DevOps YOU ARE HERE**
- *Lab 8: Deploying Azure DevOps with CI/CD Pipelines and deploy your applications to Azure WebApps, WebApp for Containers, Azure Container Instance and Azure Kubernetes Services*

Technical Requirements

What you need…

- See appendix slides for lab dependencies and / or alternate path for workshop
- Client workstation running recent Windows, Linux or Mac OS and latest internet browser
- Access to ports 80 (HTTP), 443 (HTTPS) and 3389 (Remote Desktop)
- Full Azure subscription (MSDN, AzurePass, Paid subscription, AE, CSP,…), where you have Owner permissions on subscription level
- Lab consumption estimate: $15-35

Questions and HOL support

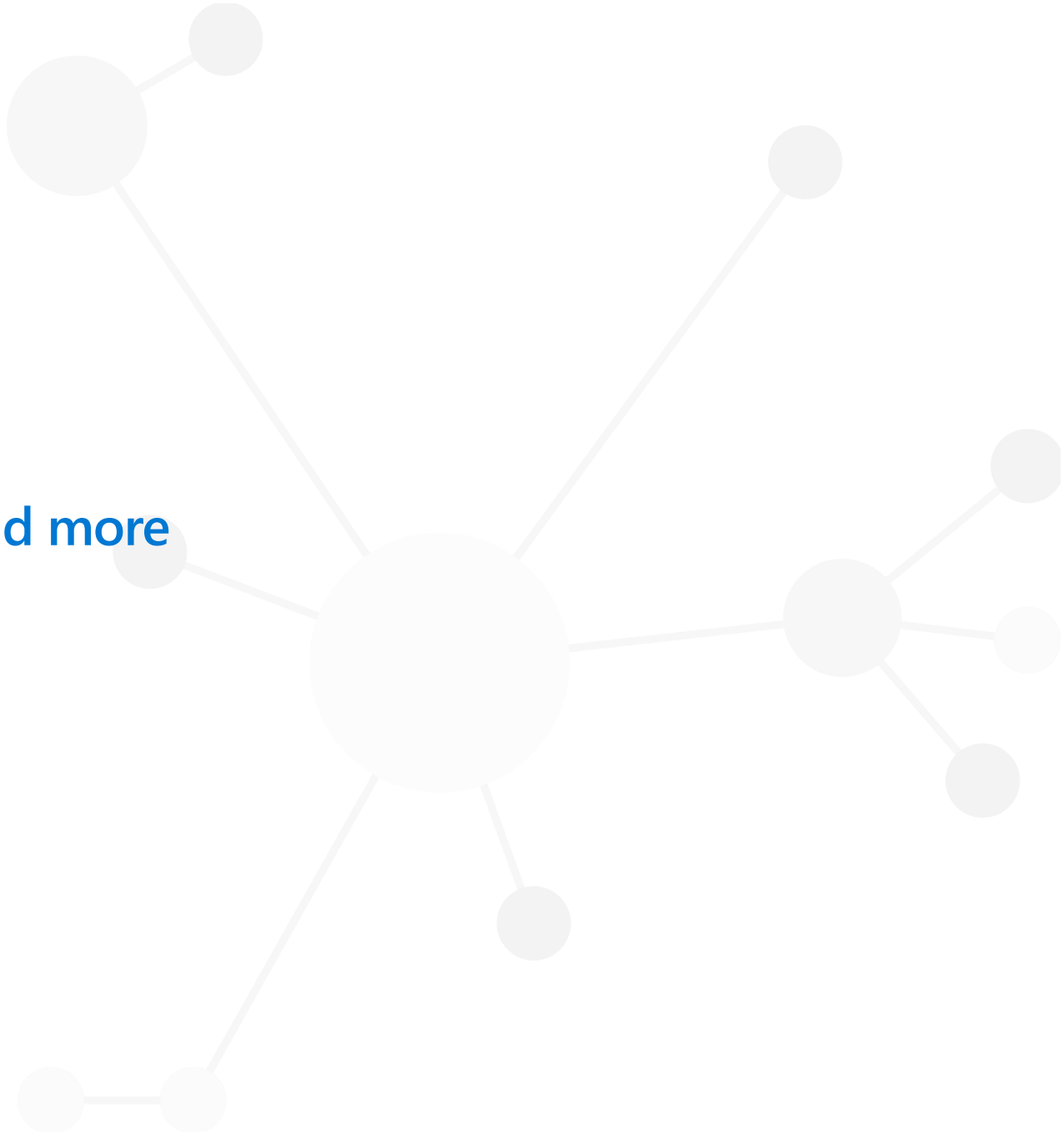
For questions or help with this series
MSUSDev@Microsoft.com

For the lab guides and sample code
https://github.com/MSUSDEV/Run-Cloud-Native-Apps-With-AKS

For information about lab dependencies and alternate approach please see the appendix slides at the end of this presentation.

Deploying applications using CI/CD... and more

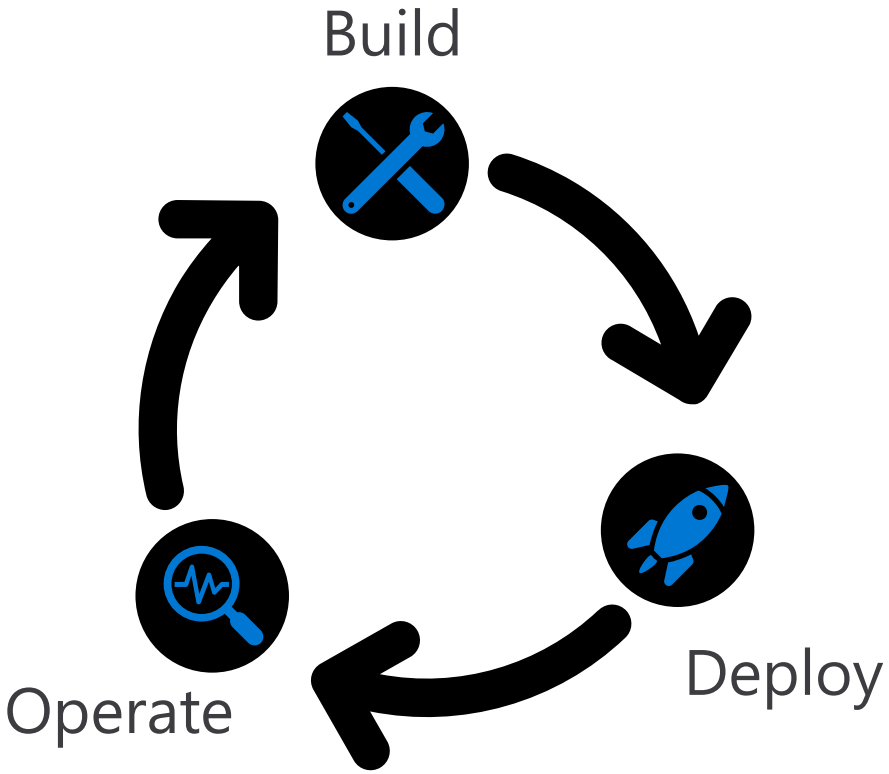
Azure DevOps



The DevOps methodology

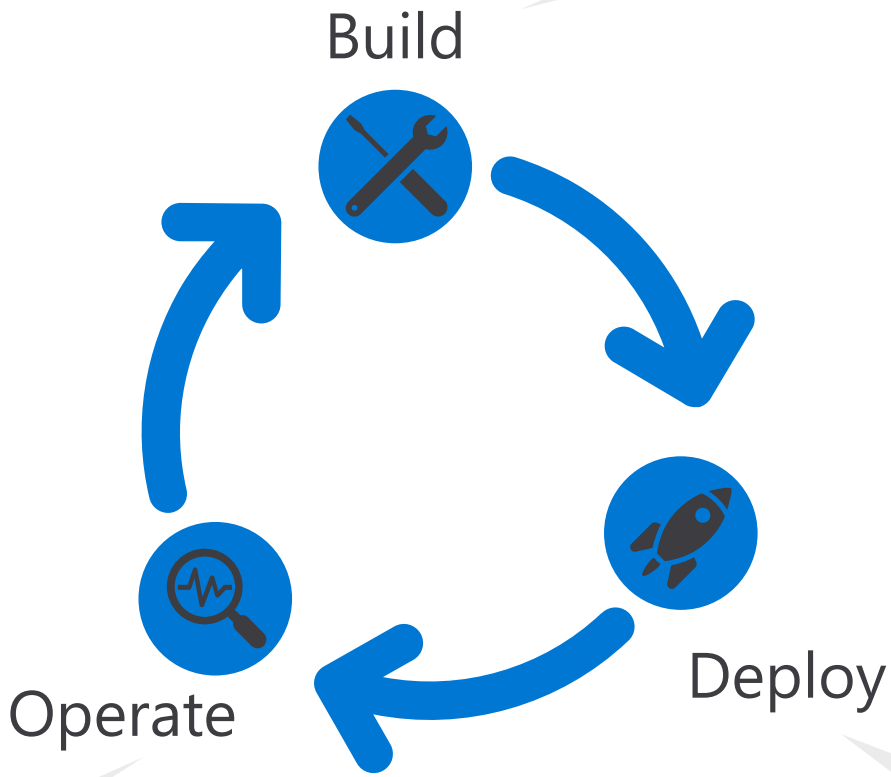
*"...DevOps is the union of **people**, **process** and **products** to enable continuous delivery of **value** to your business and its end-users..."*

Donovan Brown, Microsoft



The DevOps Toolkit (Microsoft)

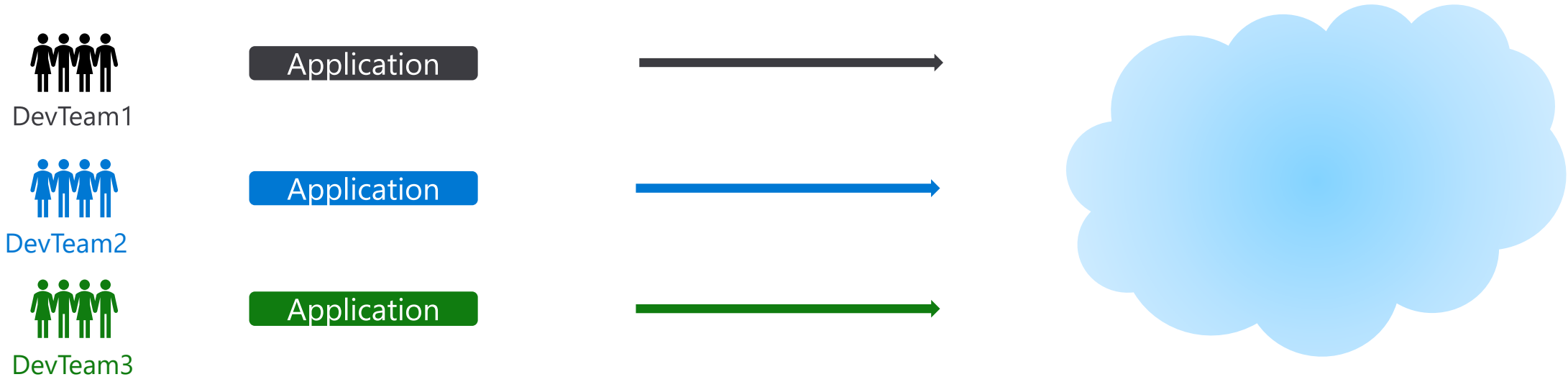
- GitHub
- Visual Studio
- Visual Studio Code



- Azure Monitor
- Azure App Insights
- Azure Security Center

- Azure Boards
- Azure Repos
- Azure Pipelines
- Azure Tests
- Azure Artifacts

Challenge of DevOps: Different approaches, same cloud endpoint



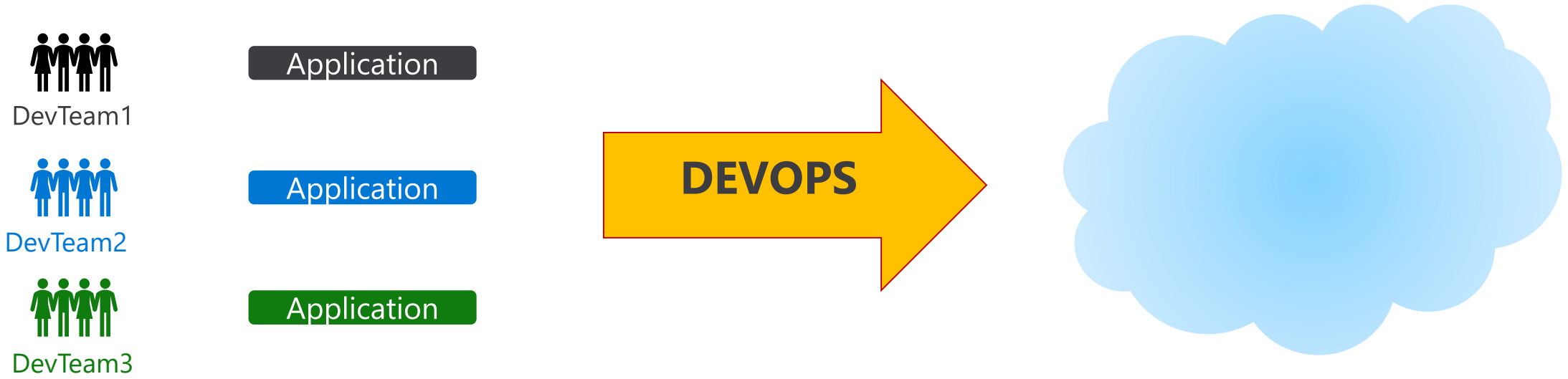
PRO's:

- DevTeams can run independently
- DevTeams are in control
- DevTeams enjoy their work

CON's:

- Different teams = different approaches
- Different teams = different results
- Operational challenges
- Security challenges

Solution of DevOps: Same approach, same toolkit, same cloud endpoint



PRO's:

- DevTeams can run independently
- DevTeams are in control
- DevTeams enjoy their work

More PRO's:

- Different teams = same approach
- Different teams = same results
- Operational benefits
- Governed and Controlled

Introducing Azure DevOps

"... Azure DevOps is a suite of products that allows any organization to do better DevOps..."

Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.

Azure Pipelines

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.

Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.

Azure Test Plans

Test and ship with confidence using manual and exploratory testing tools.

Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.

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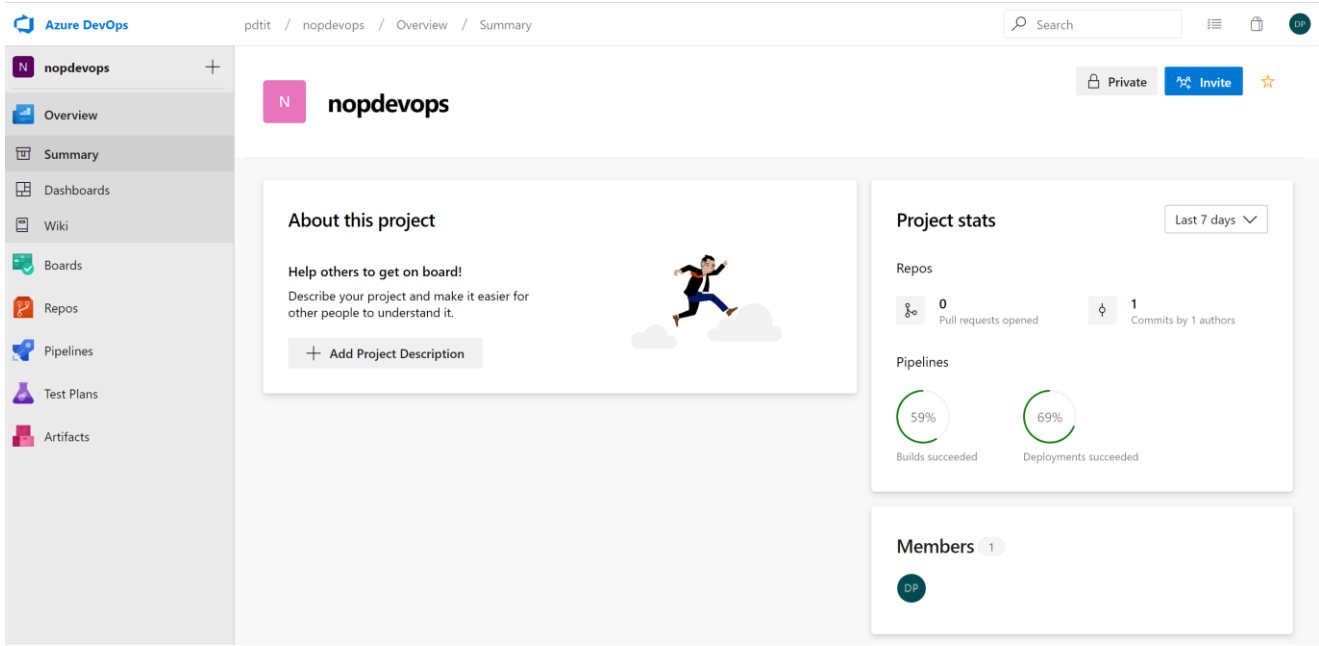
Benefits of Azure DevOps Services

- Quick Set-up
- Maintenance-free operations
- Easy collaboration across domains
- Elastic Scale
- Rock-solid security
- Access to cloud-running build and deployment servers



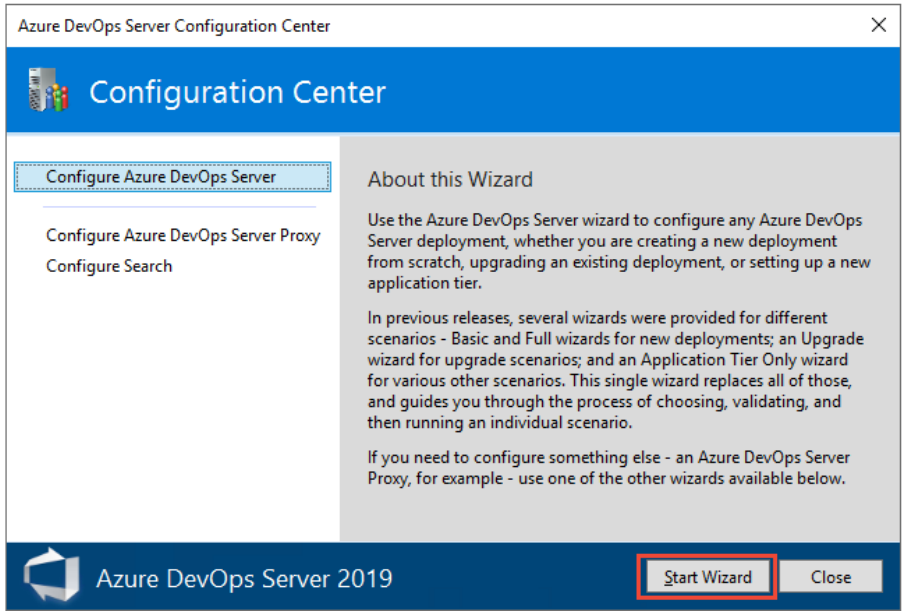
Azure DevOps Server

- Simplicity of Azure DevOps from the cloud, in your on-prem datacenter
- Data always stays in your own datacenters
- Work process and tracking requirements are handled using XML processes model, instead of using the inheritance process model

- Azure DevOps Build Server supports both on-premises and cloud-hosted builds
- SQL Server and SQL Analysis Server can be added

- Single Server
- Dual Servers
- Multiple Servers

- Express Install Mode
- Custom Install Mode



Demo

Creating your first Azure DevOps Project

Introducing Azure DevOps

"... Azure DevOps is a suite of products that allows any organization to do better DevOps, where you can choose which products you use..."

JIRA

If you do development tracking with Jira instead of Azure Boards, fine, **Azure Devops totally integrates with it**

Azure Pipelines

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.

Git / GitHub

If you don't want to use Azure Repos, fine, use Git / GitHub instead; **Azure DevOps totally integrates with it**

Azure Test Plans

Test and ship with confidence using manual and exploratory testing tools.

Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.

Main benefit is the openness

Azure Boards

Track work with Kanban boards, backlogs, team dashboards and custom reporting

Drag & Drop Sprint Planning

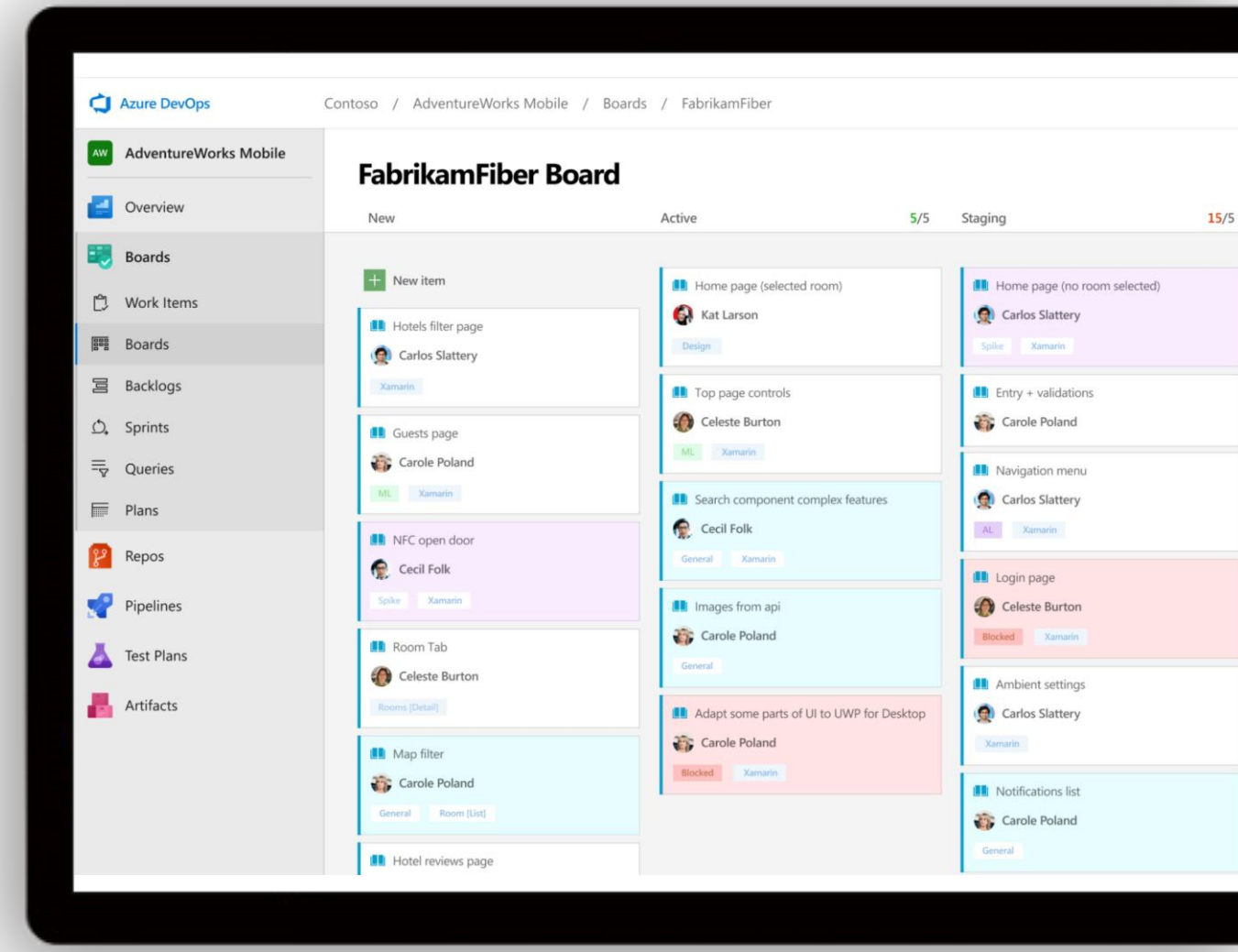
Flexible work item tracking, using comprehensive traceability to have the perfect environment to manage your development projects and processes

Scrum-ready

Use built-in Scrum boards and planning tools to help your teams run sprints, stand-ups, and planning meetings

Integration with GitHub

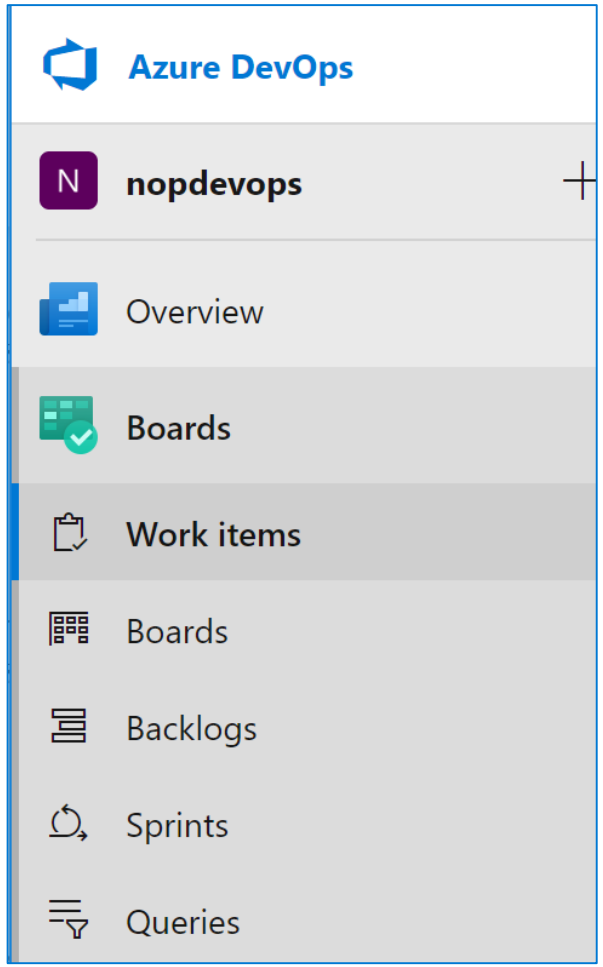
Boost your teams productivity with Boards, Backlogs and Sprints for easy or most complex projects. Connect your GitHub Repo to Azure Boards and start linking commits and PRs to work items

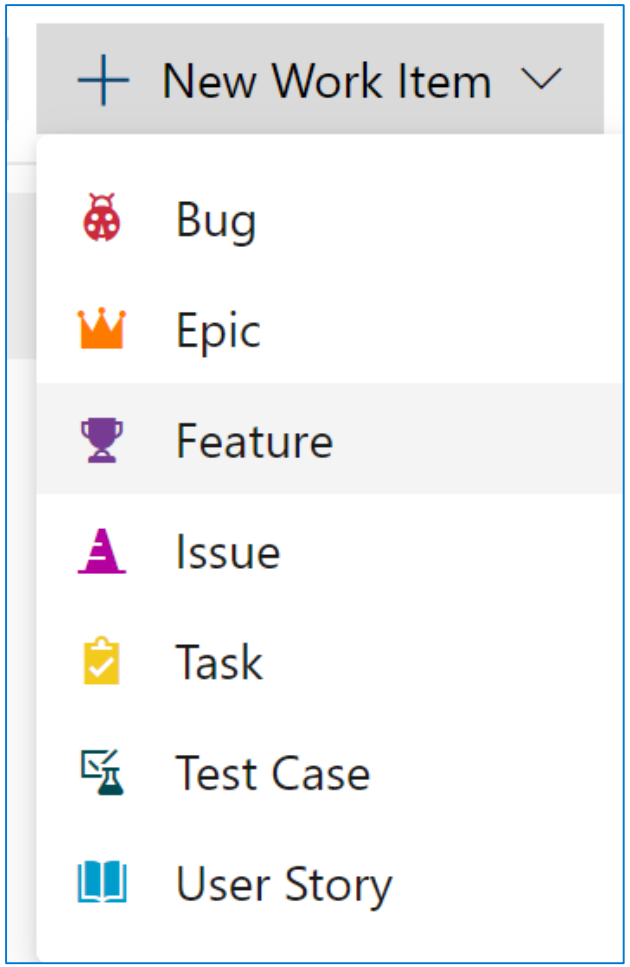


https://azure.com/boards

Azure Boards

- Work Items
- Boards
- Backlogs
- Sprints
- Queries





Demo

Azure Boards

Azure Repos

Cloud-hosted, unlimited private Git Repositories for your projects

Support for any Git Client

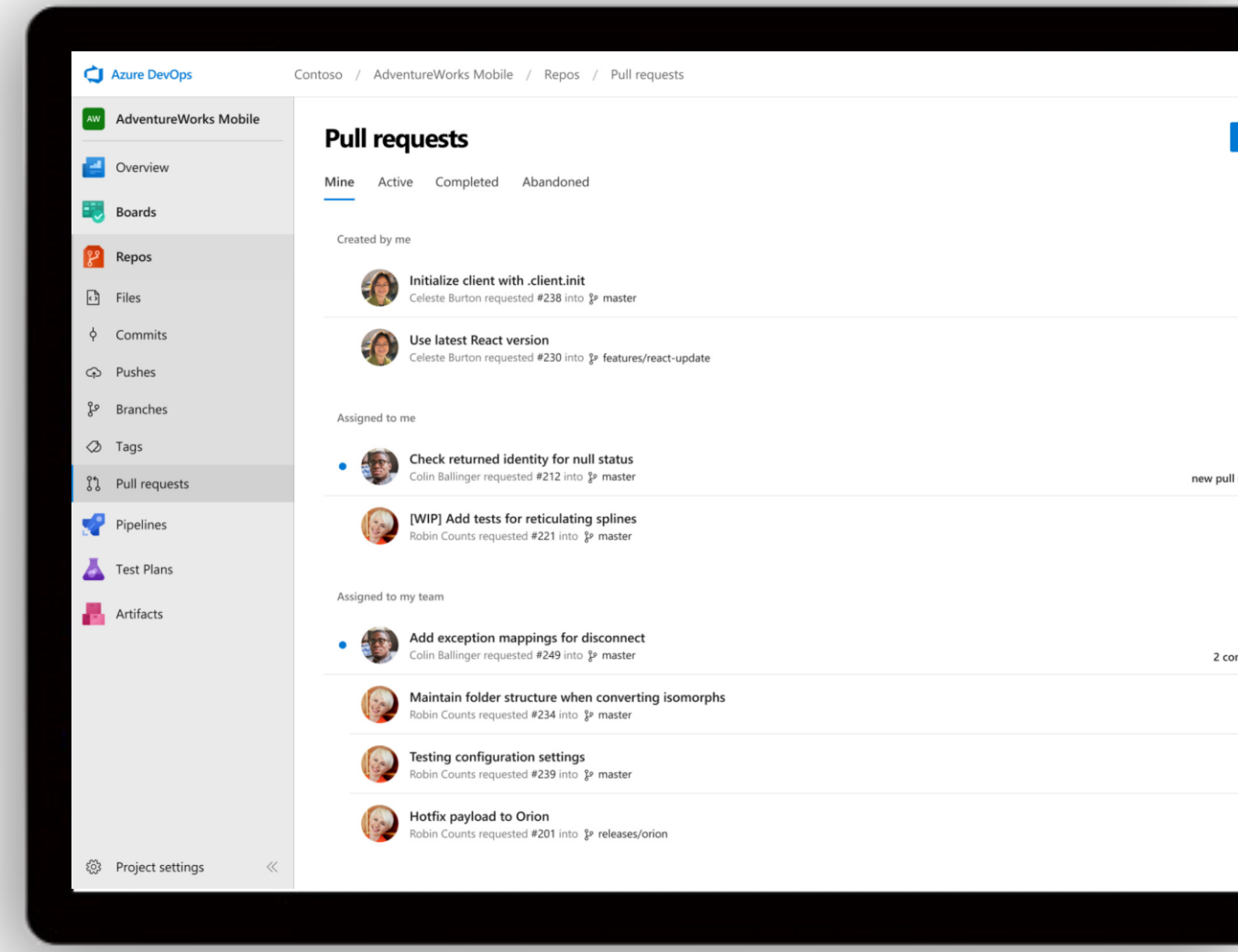
Securely connect with and push code into your Git Repos from any IDE, editor or Git Client

Collaborate to build better code

Perform more effective Git code reviews with threaded discussion and continuous integration for each change. Use forks to promote collaboration with inner source workflows

Protect your code with branches

Keep code quality high by requiring signoff, successful builds, and passing tests before pull requests can be merged. Customize your branch policies to maintain your team's standards



https://azure.microsoft.com/en-us/services/devops/repos/

Demo

Azure Repos

Azure Pipelines

Cloud-hosted pipelines for Linux, Windows and macOS.

Any language, any platform, any cloud

Build, test, and deploy Node.js, Python, Java, PHP, Ruby, C/C++, .NET, Android, and iOS apps. Run in parallel on Linux, macOS, and Windows. Deploy to Azure, AWS, GCP or on-premises

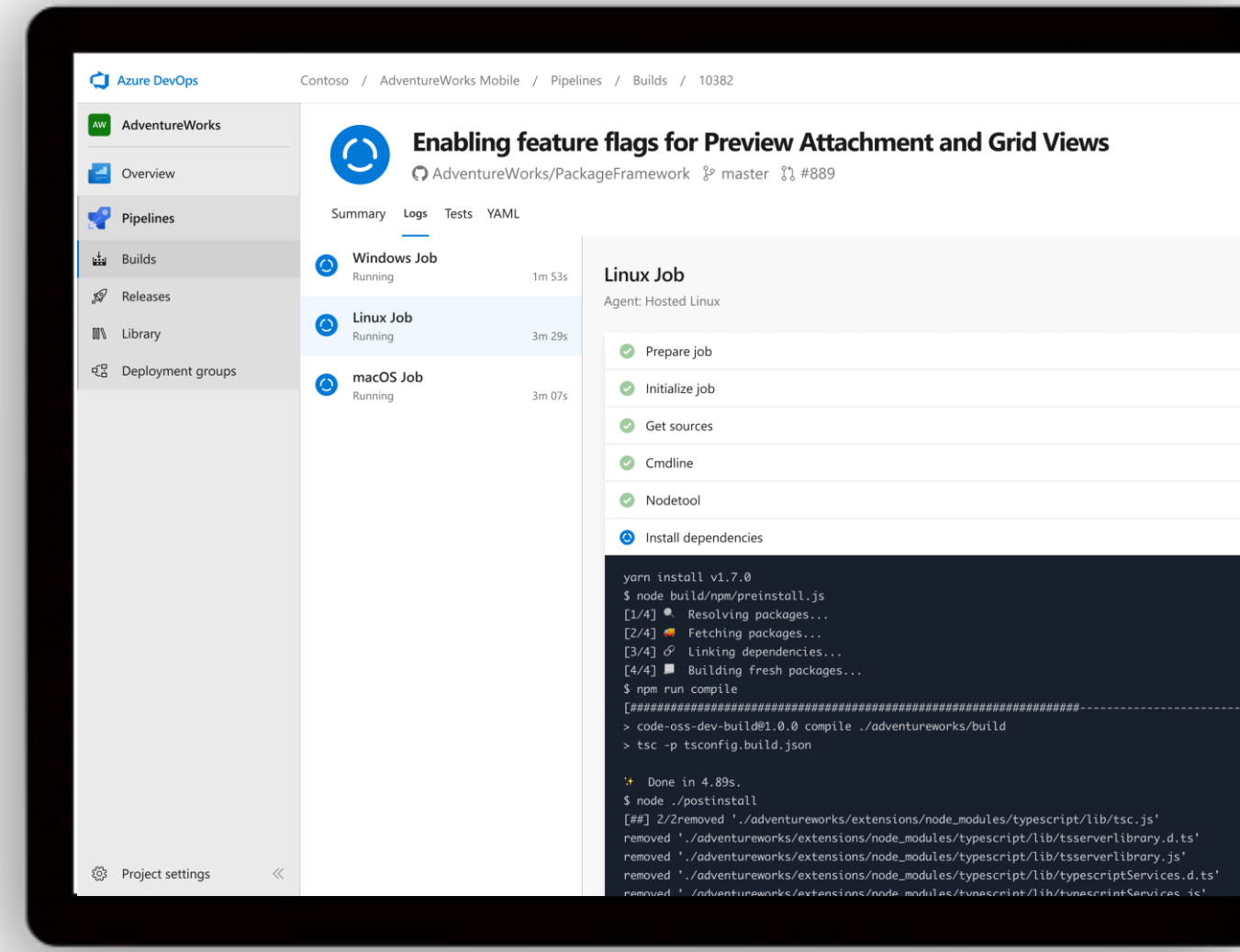
Extensible

Explore and implement a wide range of community-built build, test, and deployment tasks, along with hundreds of extensions from Slack to SonarCloud. Support for YAML, reporting and more

Containers and Kubernetes

Easily build and push images to container registries like Docker Hub and Azure Container Registry. Deploy containers to individual hosts or Kubernetes.

https://azure.com/pipelines

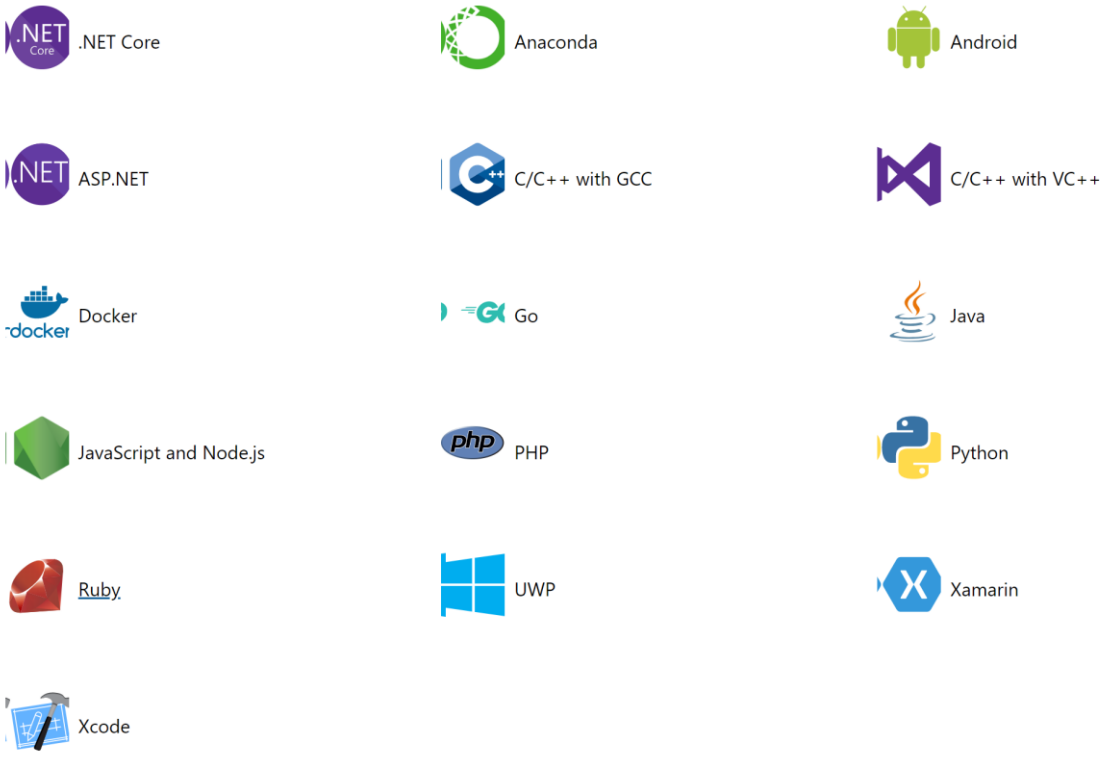


Running a Build with Azure DevOps Pipelines

- **Supporting multiple languages**
- **Prerequisites:**
- A GitHub Account
- An Azure DevOps Organization
- Application Source Code

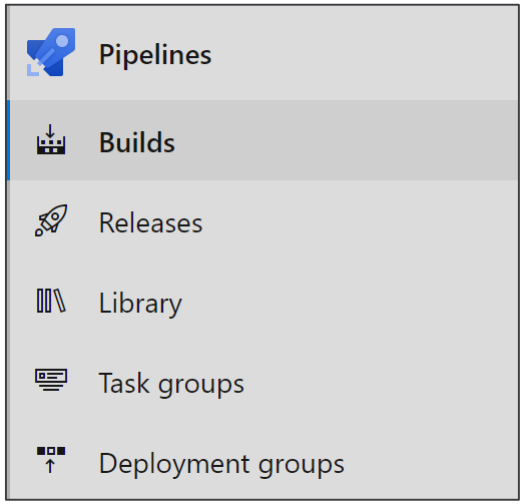
- **Based on your source code, Azure DevOps Pipelines "recognizes" the capabilities**

- **The output of the Pipelines process is a "Azure-Pipelines.yml" file**



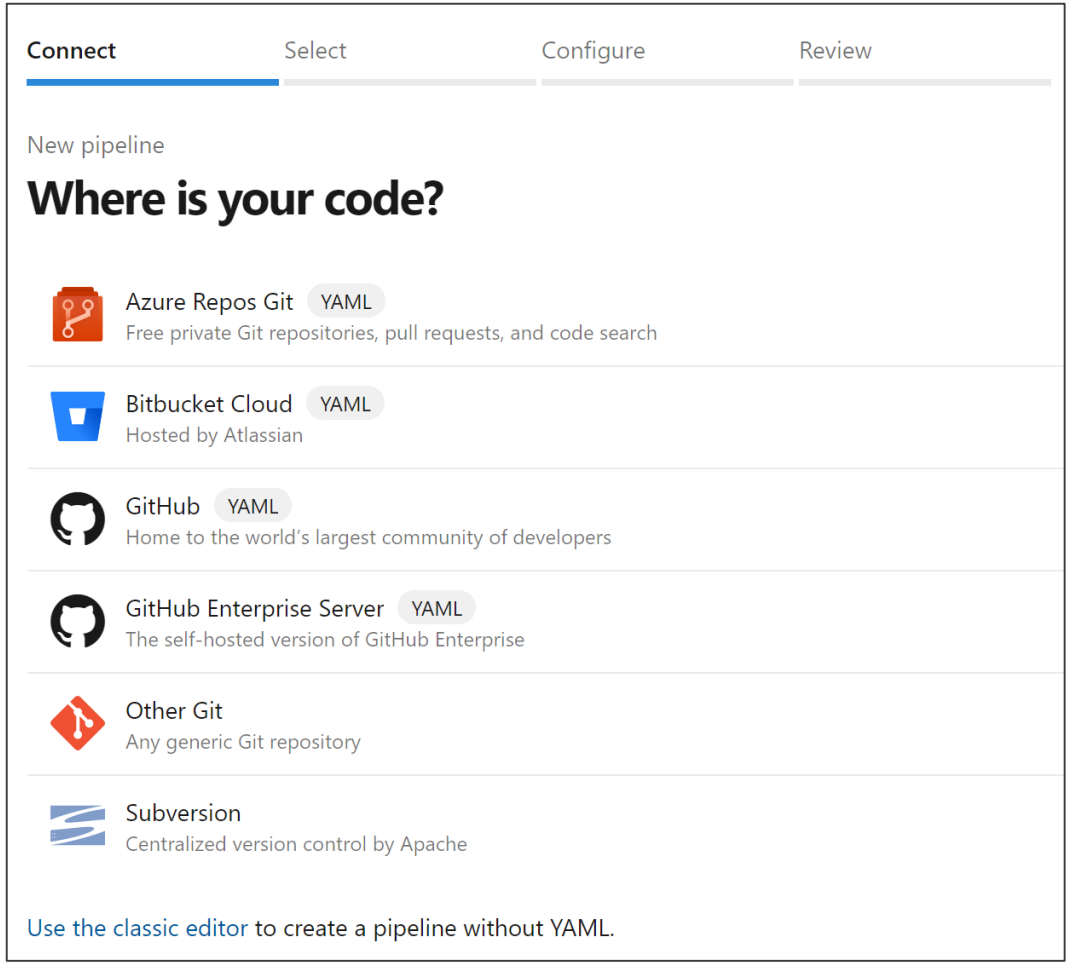
Building a Pipeline for .NET Core applications

1. New Build Pipeline



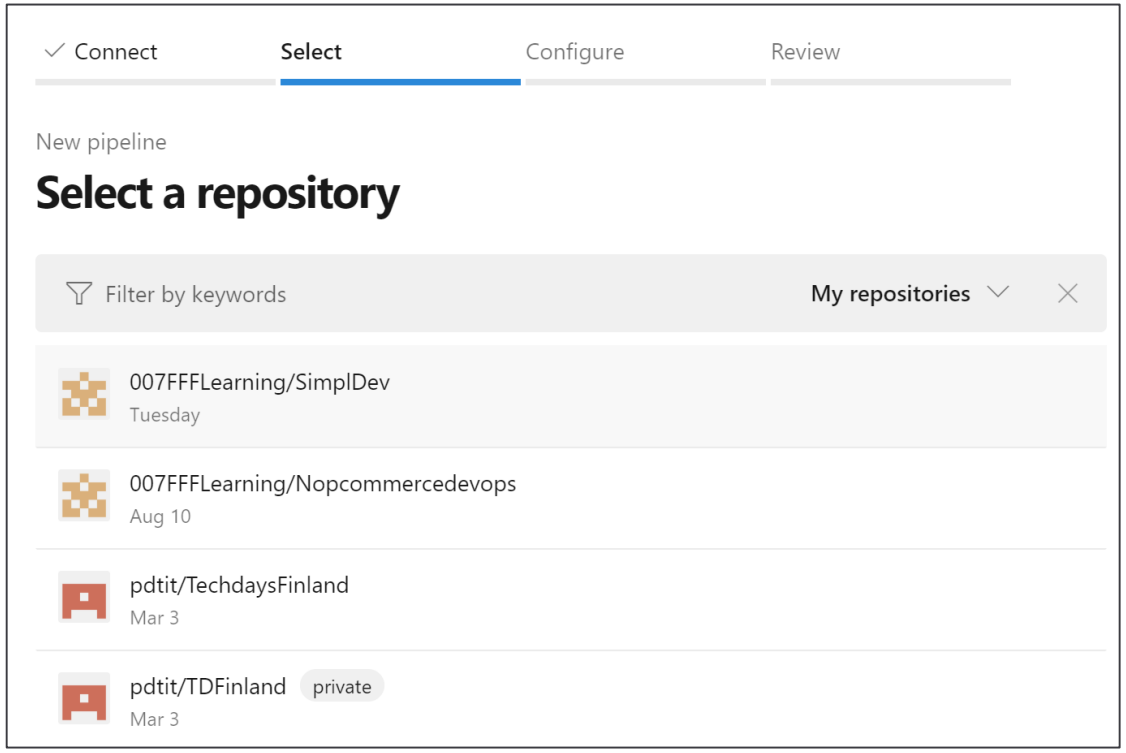
Building a Pipeline for .NET Core applications

1. New Build Pipeline
2. Select Source Control environment



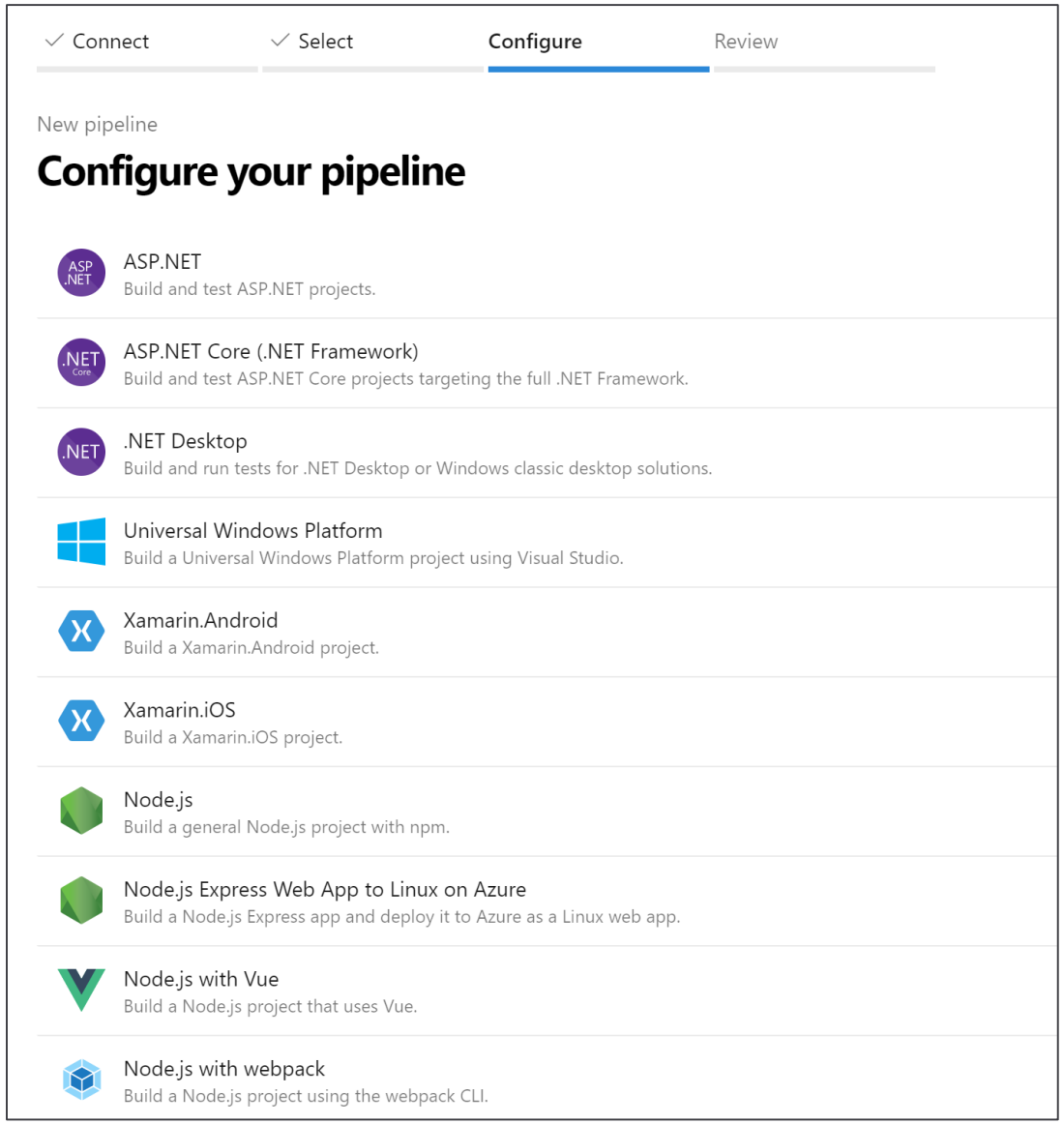
Building a Pipeline for .NET Core applications

1. New Build Pipeline
2. Select Source Control environment
3. Select Repo
4.



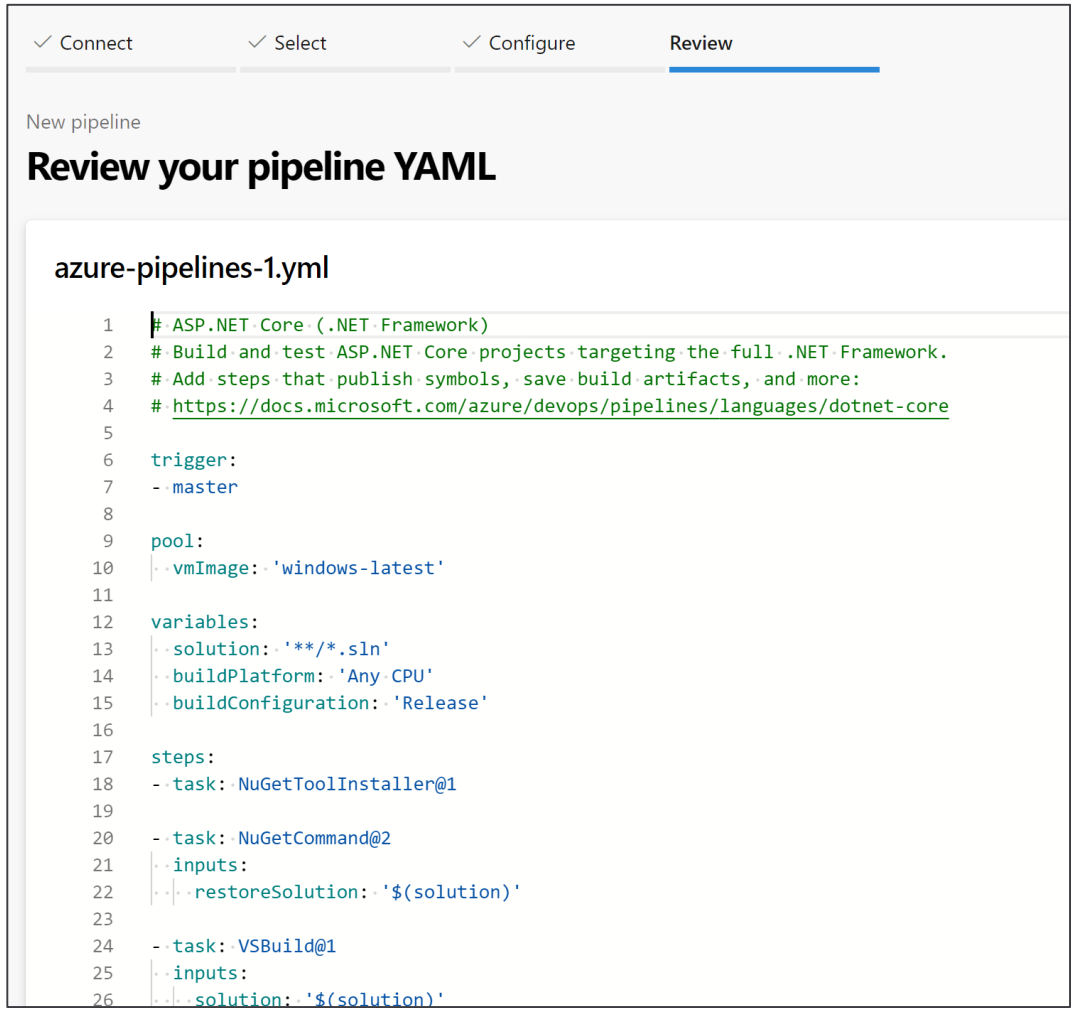
Building a Pipeline for .NET Core applications

1. New Build Pipeline
2. Select Source Control environment
3. Select Repo
4. Azure Pipelines analyzes the source code, and provides “options” for Build



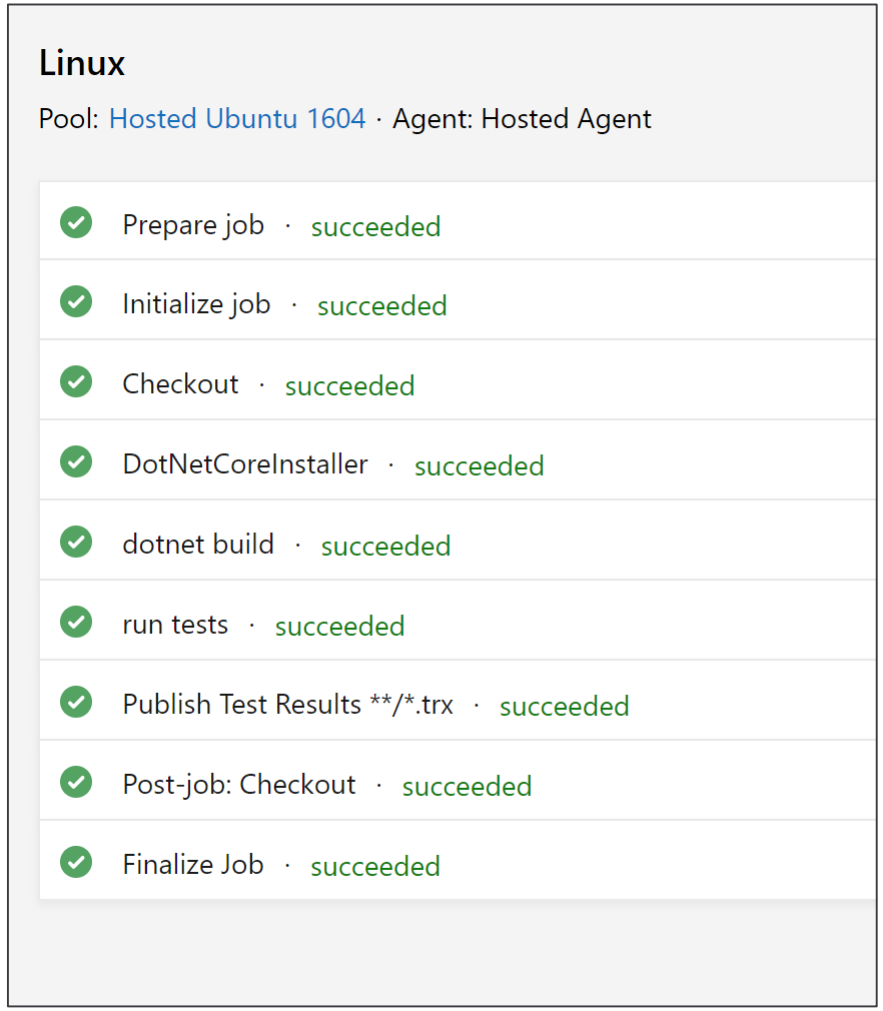
Building a Pipeline for .NET Core applications

1. New Build Pipeline
2. Select Source Control environment
3. Select Repo
4. Azure Pipelines analyzes the source code, and provides “options” for Build
5. This results in a “Azure-pipelines.yml” file



Building a Pipeline for .NET Core applications

1. New Build Pipeline
2. Select Source Control environment
3. Select Repo
4. Azure Pipelines analyzes the source code, and provides “options” for Build
5. This results in a “Azure-pipelines.yml” file
6. Create and Run your Build



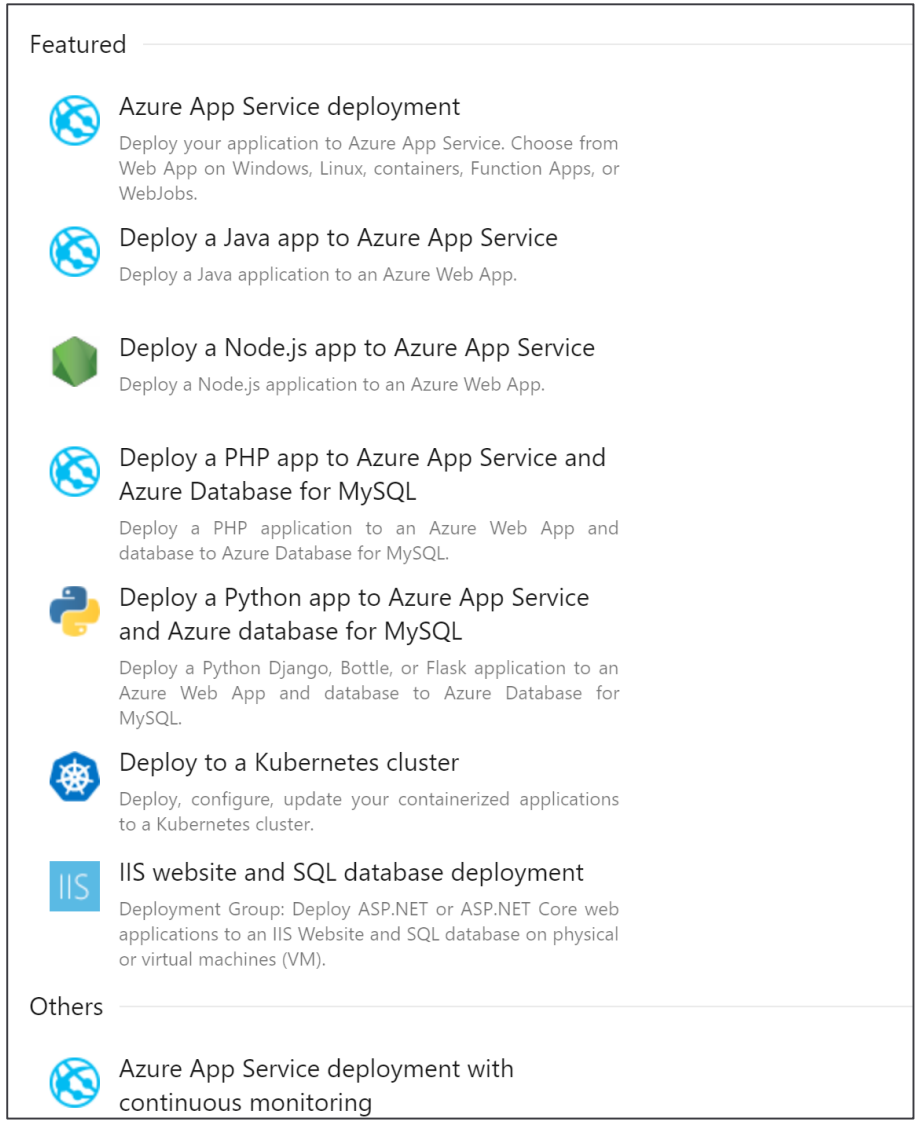
Demo

Using Azure Pipelines to create your Build

- Source Code to Web Apps
- Source Code to Docker Container

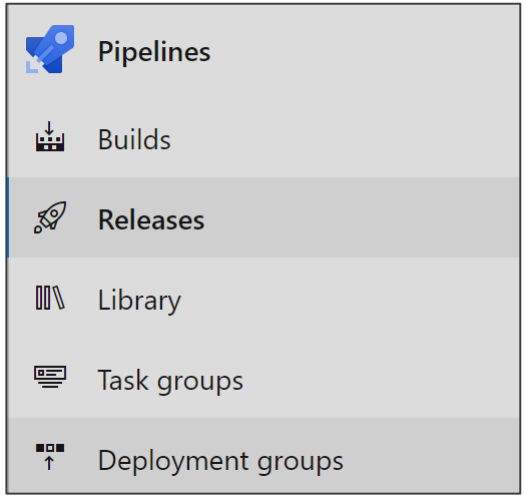
Running a Release with Azure DevOps Pipelines

- Supporting multiple languages
- Start from a template, or blank
- Based on a Pipeline build artifact, or other sources
- Single or multi-staged release scenarios



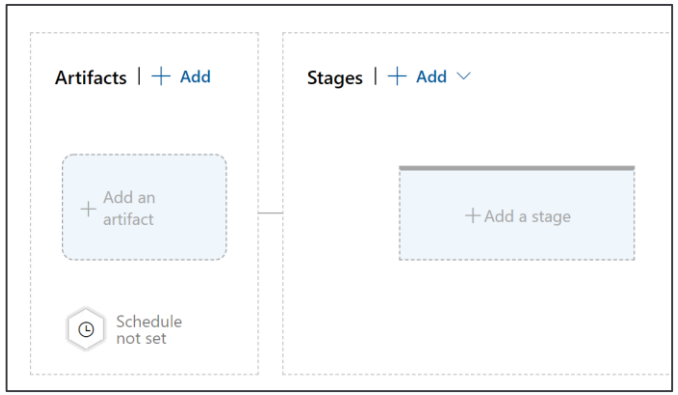
Configuring a Release Pipeline for .NET Core applications

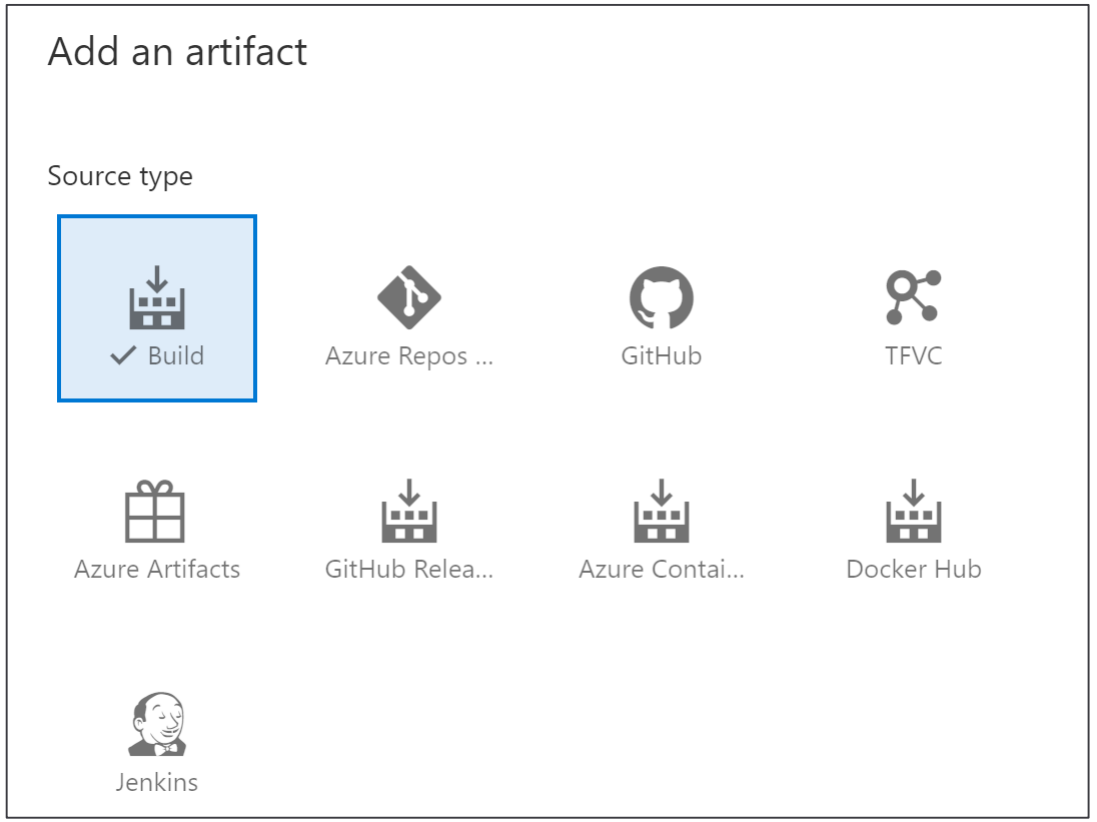
1. New Release Pipeline



Configuring a Release Pipeline for .NET Core applications

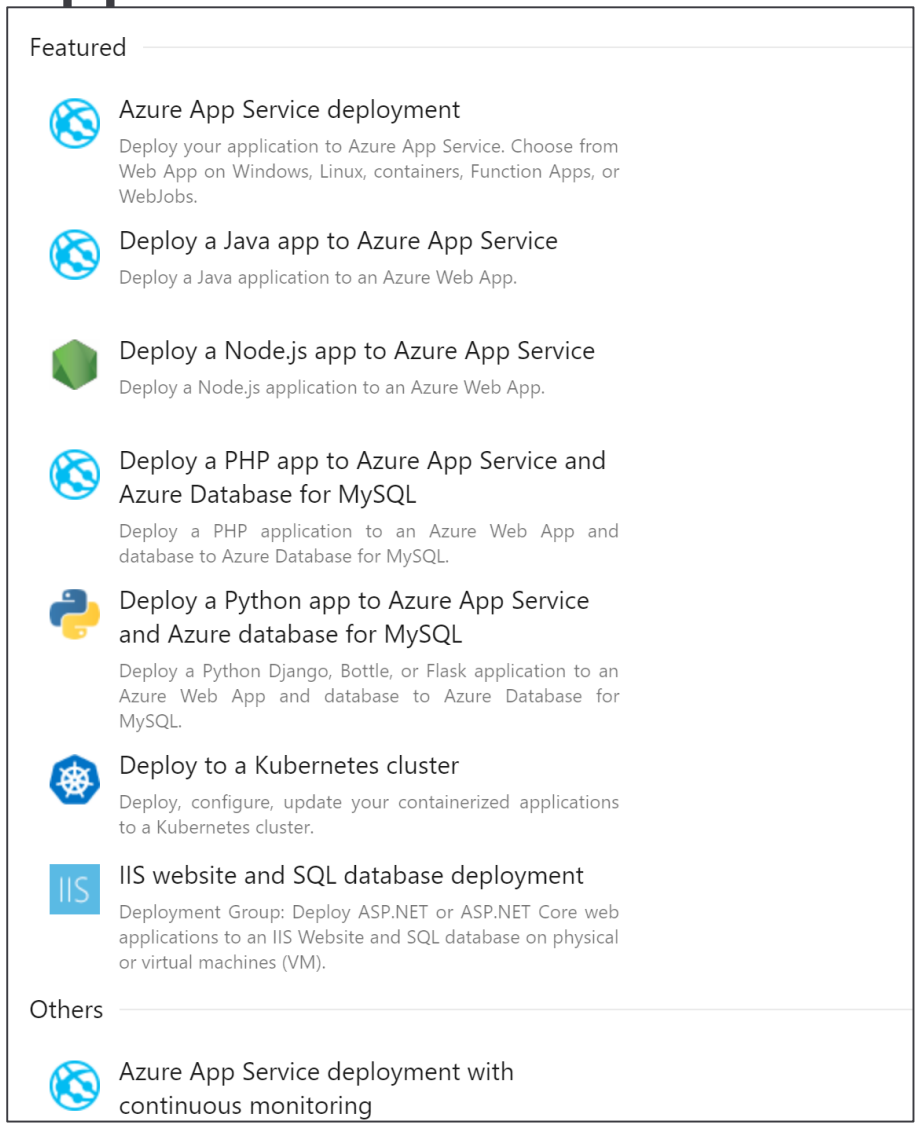
1. New Release Pipeline
2. Select Artifacts





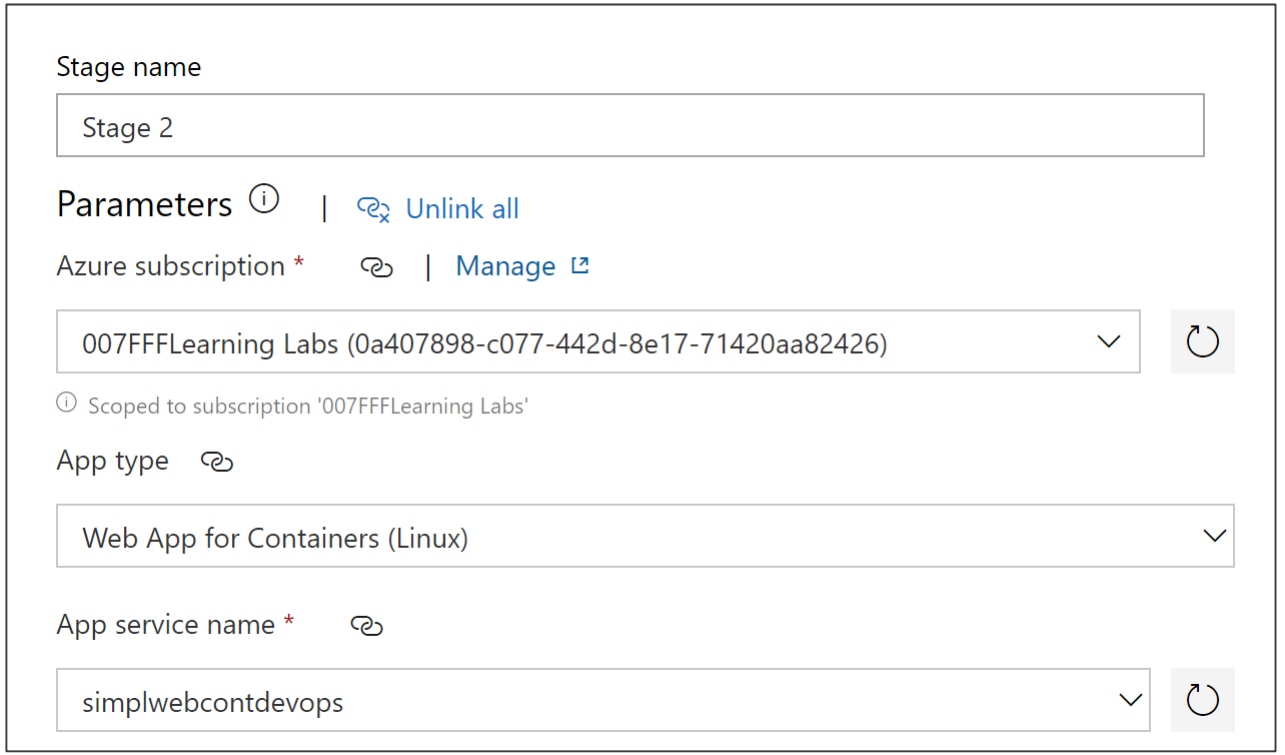
Configuring a Release Pipeline for .NET Core applications

1. New Release Pipeline
2. Select Artifacts
3. Define a Stage Template



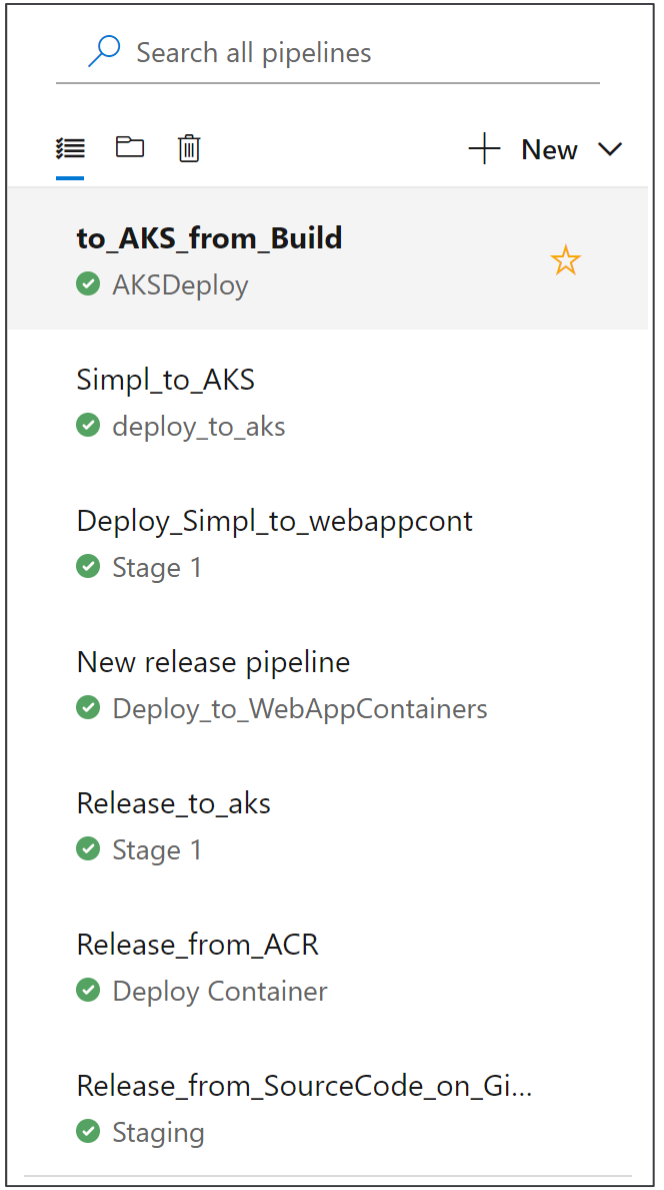
Configuring a Release Pipeline for .NET Core applications

1. New Release Pipeline
2. Select Artifacts
3. Define a Stage Template
4. Complete Stage Template parameters



Configuring a Release Pipeline for .NET Core applications

1. New Release Pipeline
2. Select Artifacts
3. Define a Stage Template
4. Complete Stage Template parameters
5. Save & Run



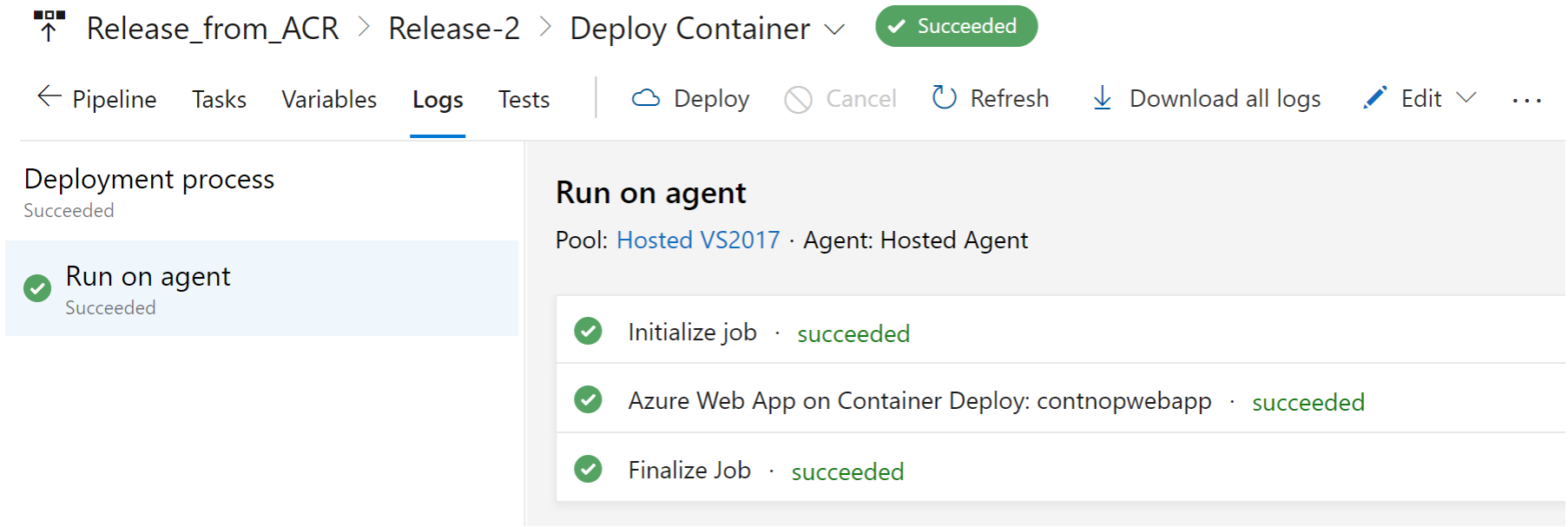
Demo

Using Azure Pipelines to create your Release

- From source code Build to Azure WebApps
- From source container to Azure WebApps for Containers
- From source container to AKS

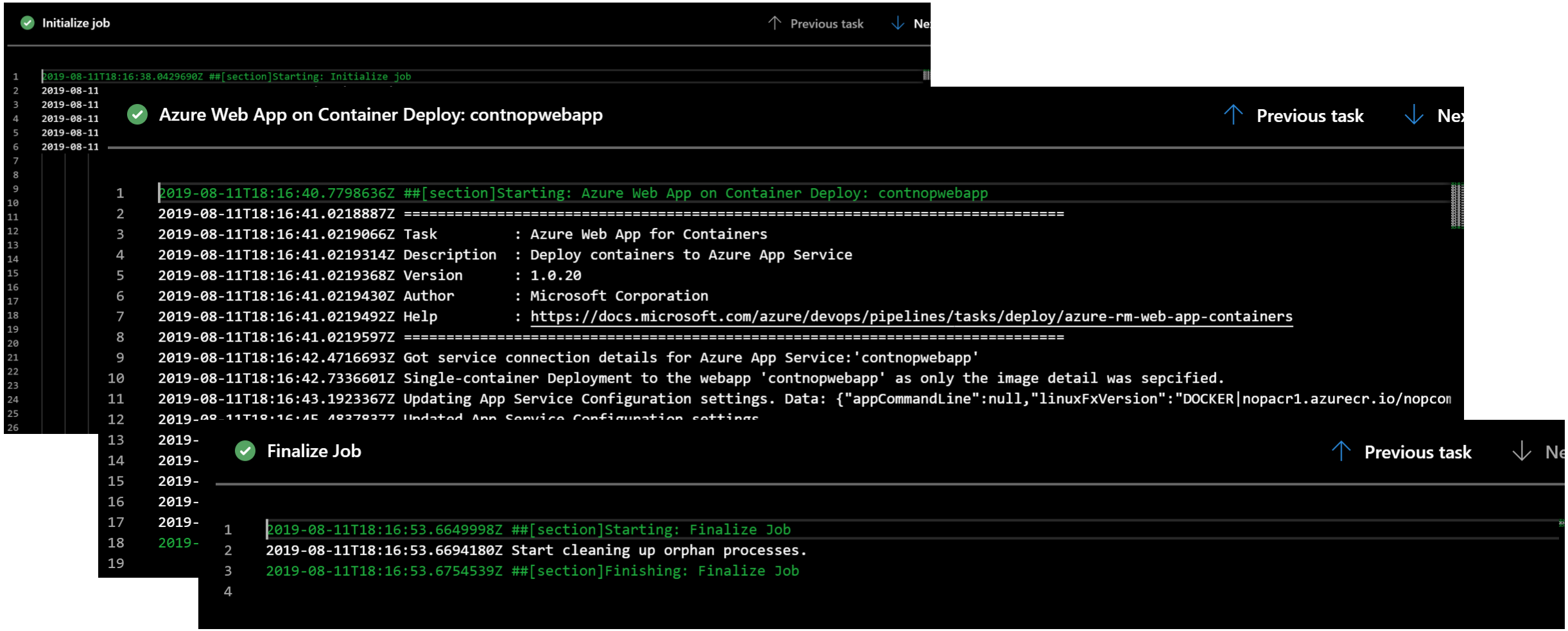
Monitoring a Release Pipeline for .NET Core applications

- Full details of each step in the Release process
- Succeeded / Failed
- Duration of the Pipeline



Monitoring a Release Pipeline for .NET Core applications

- Full details of each step in the Release process



Demo

Monitoring Azure Pipelines

Azure Test Plans

Test and Ship with confidence using manual and exploratory testing tools

Test across web and desktop

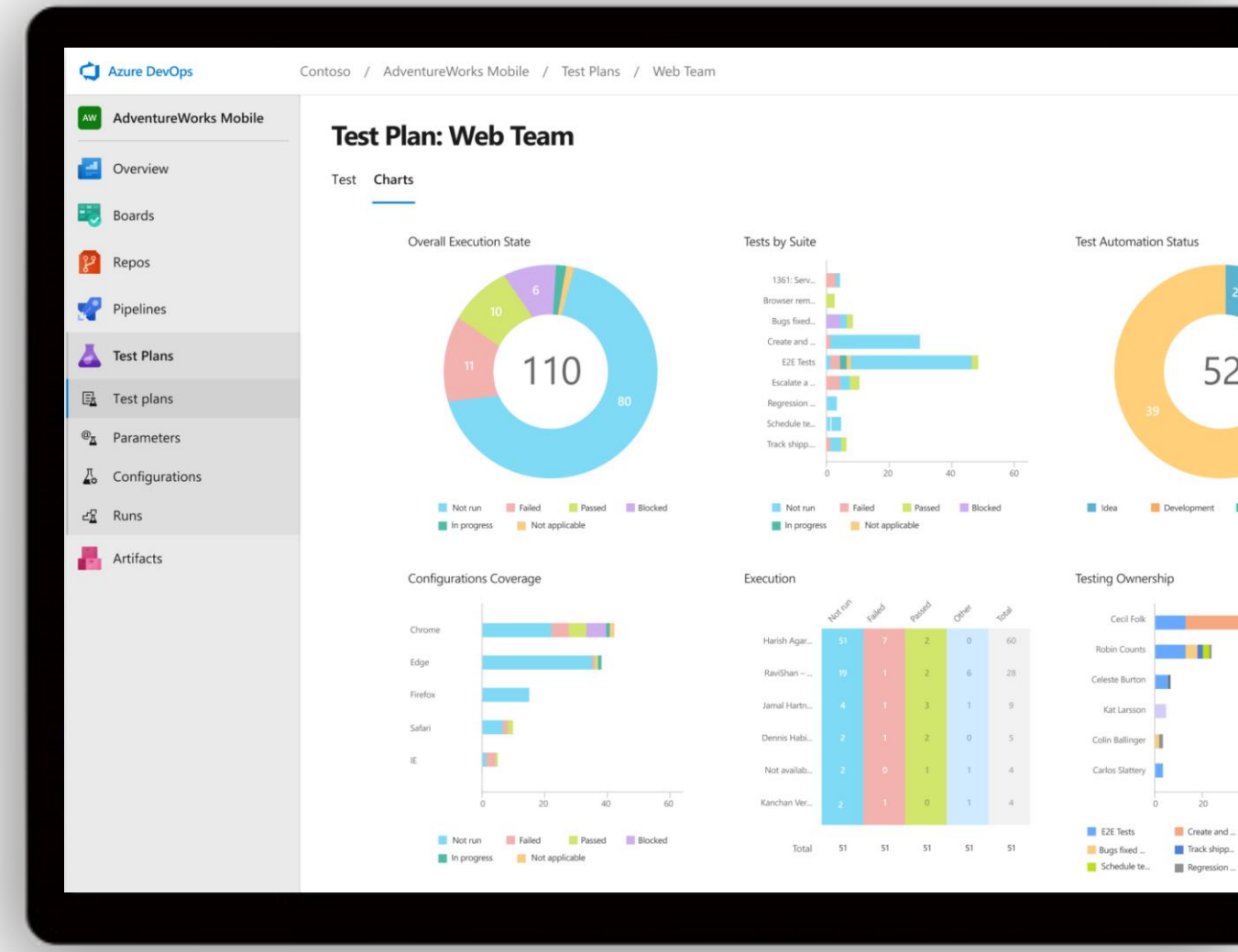
Test your application by executing tests across different environments, from web apps to different desktop applications

Planned manual and automated tests

Plan, execute and track scripted tests with actionable defects and end-to-end traceability. Assess quality throughout the development lifecycle by testing your desktop and web applications

Unit & Functional Testing (VS2019)

Create a Unit Test project; Run Unit Tests with Test Explorer; Start using IntelliTest; Use code coverage to determine how much code is being tested



https://azure.microsoft.com/en-us/services/devops/repos/

Azure Artifacts

Create, host and share packages with your team

Support for multiple package languages

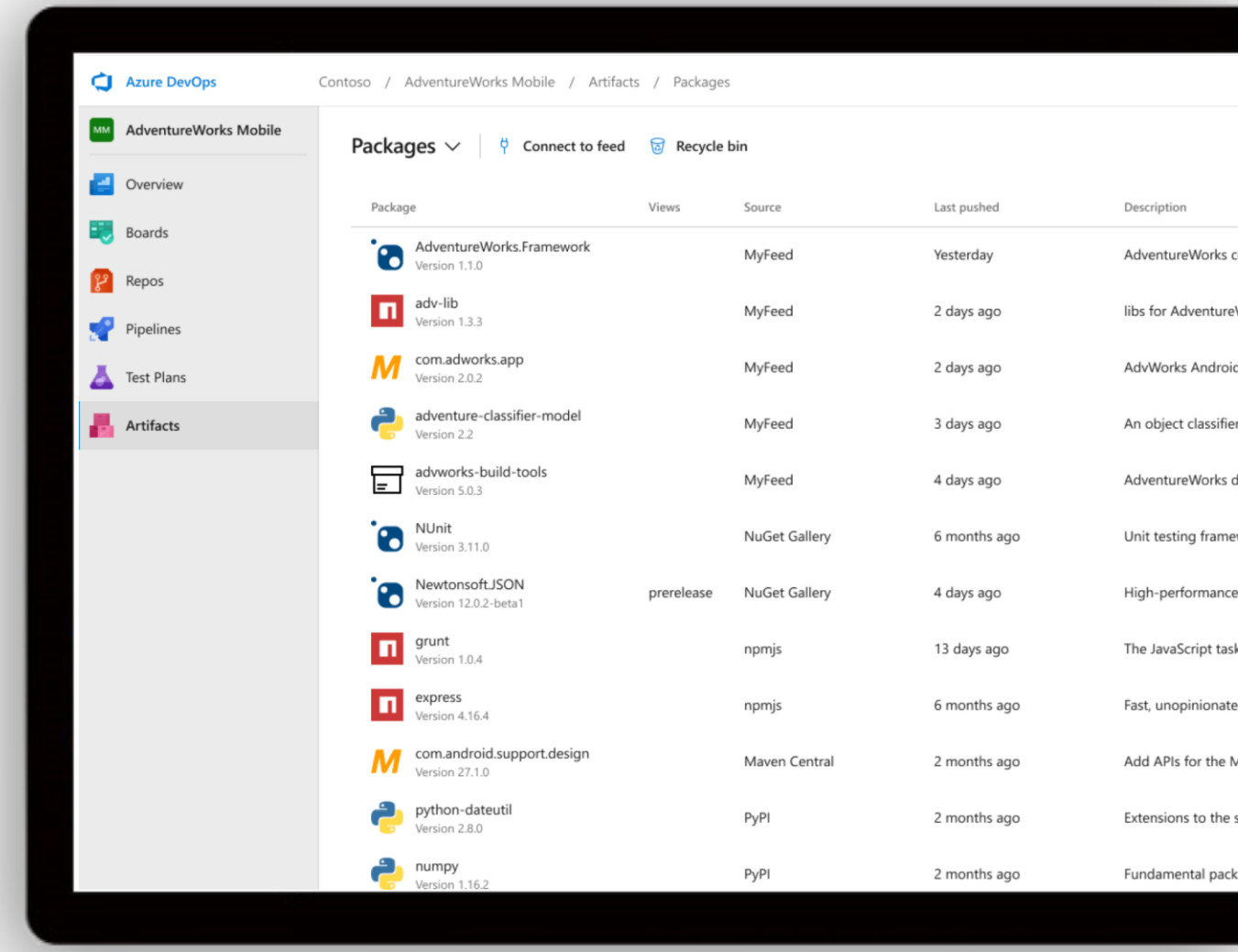
Create and share Maven, NPM, NuGet, and Python package feeds from public and private sources

Keep your artifacts organized

Share code effortlessly by storing Maven, NPM, NuGet, Python packages together. And there is no need to store these in Git. Simply store them using Universal Packages in Azure Artifacts

Seamless Package handling

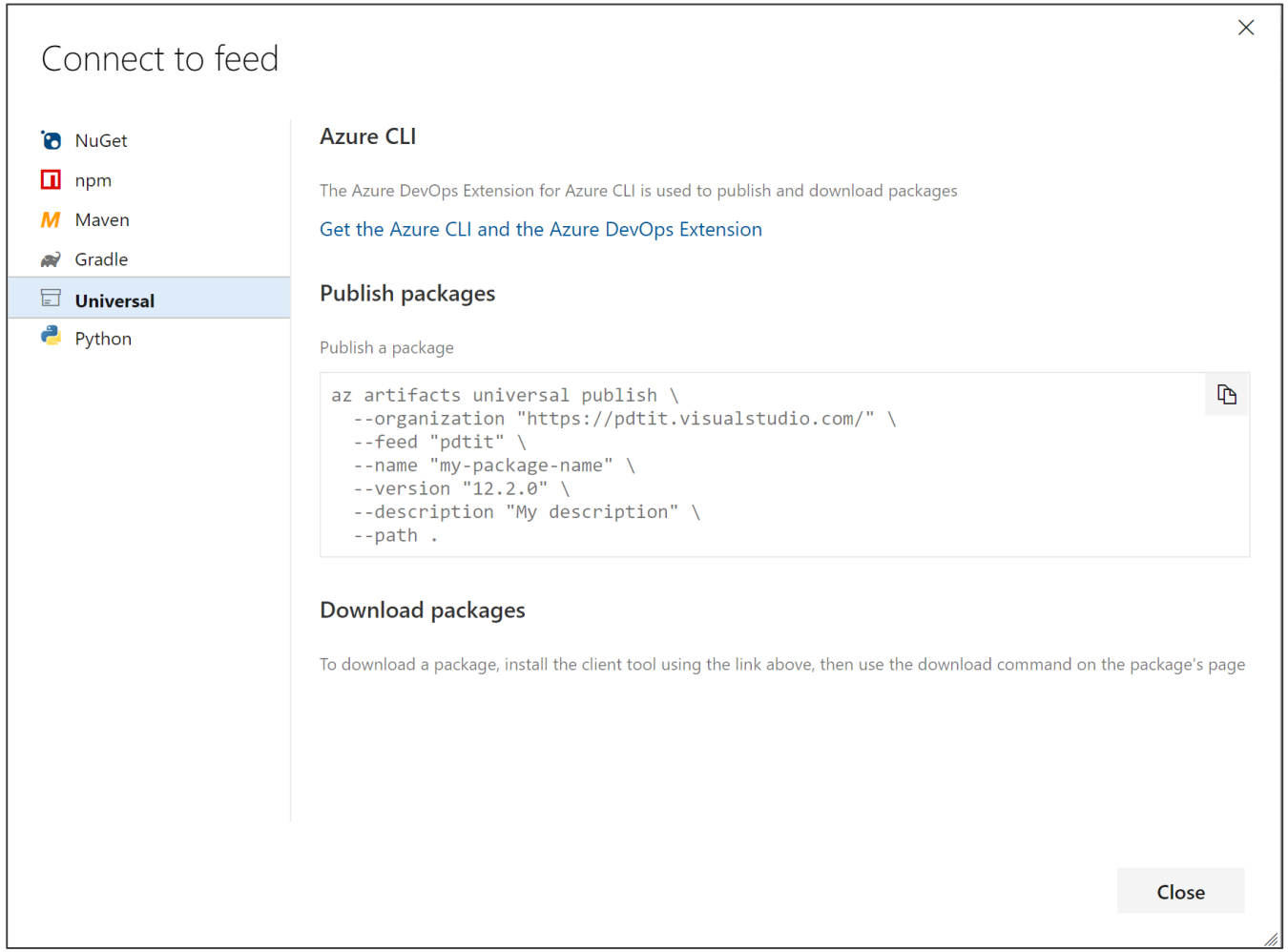
Integrate seamless package handling into your CI/CD Pipeline. Easily access all your artifacts in builds and releases.



https://azure.microsoft.com/en-us/services/devops/repos/

Azure Artifacts

- Based on “feeds”
- Private & Public
- Multiple packages:
  - Maven, NPM, Nuget, Universal



Azure Pipelines

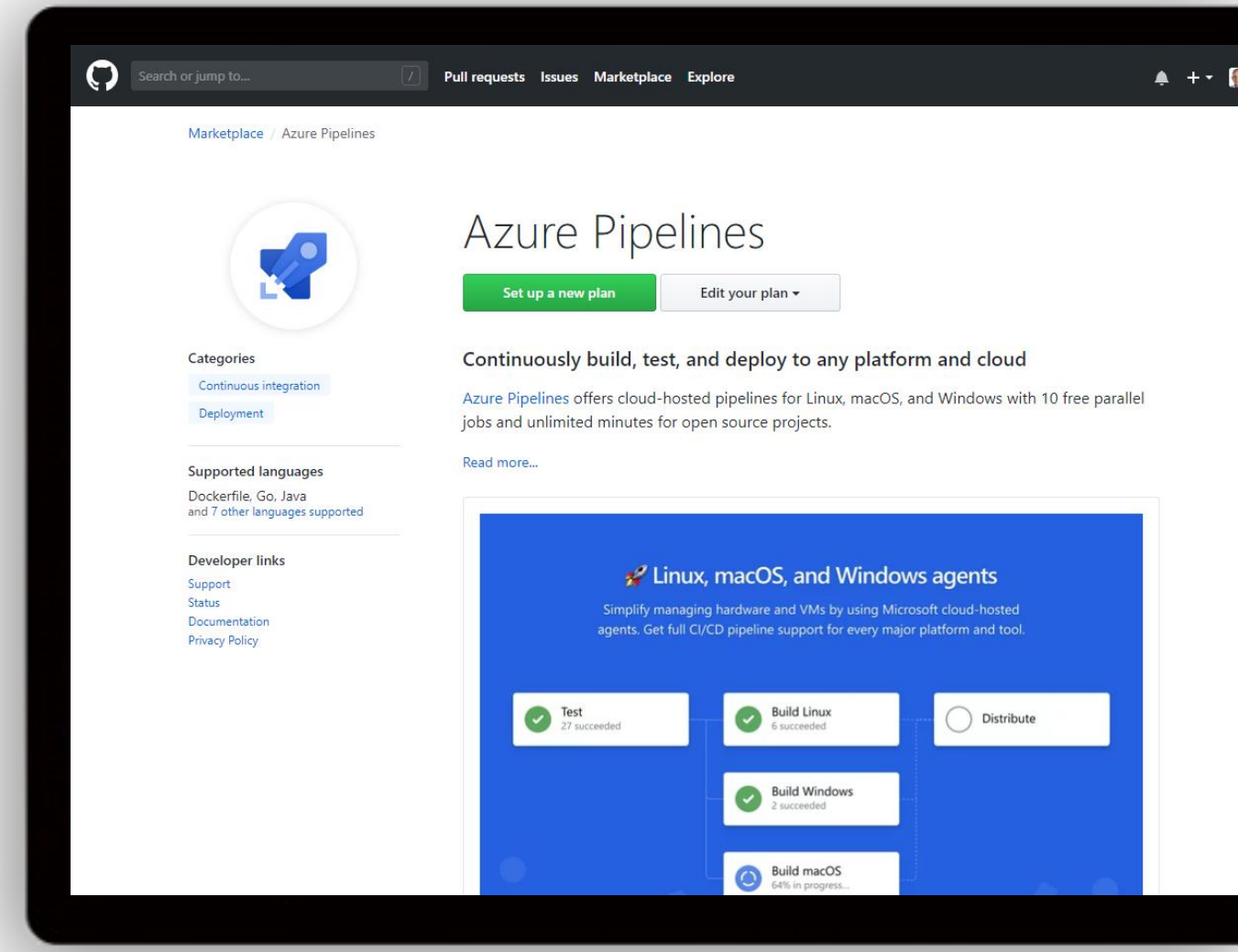
- Free **unlimited** build minutes for public projects
- Up to 10 free parallel jobs across Windows, Linux and macOS

https://azure.com/pipelines

Microsoft ❤ Open Source

Integrated with GitHub

Azure Pipelines available now to any developer from the GitHub Marketplace



Azure DevOps Summary

Better together

Azure Boards

Azure Repos

Azure Pipelines

Azure Test Plans

Azure Artifacts

An end-to-end solution for organizations looking for an enterprise-grade toolchain

Fully Integrated with end to end traceability

Scalable to any team and project size

Highly available, multi region, hybrid cloud & on-prem

Customer Support

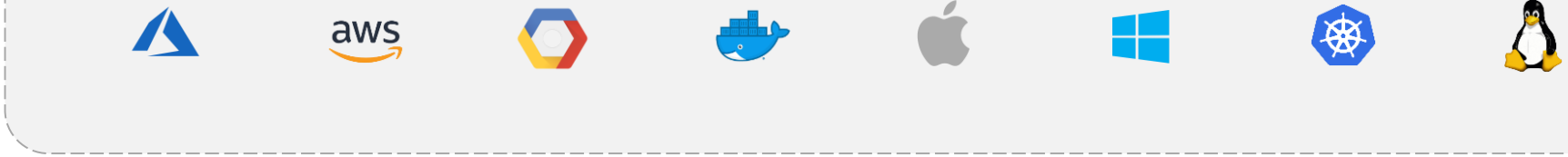
Consistent admin and access control

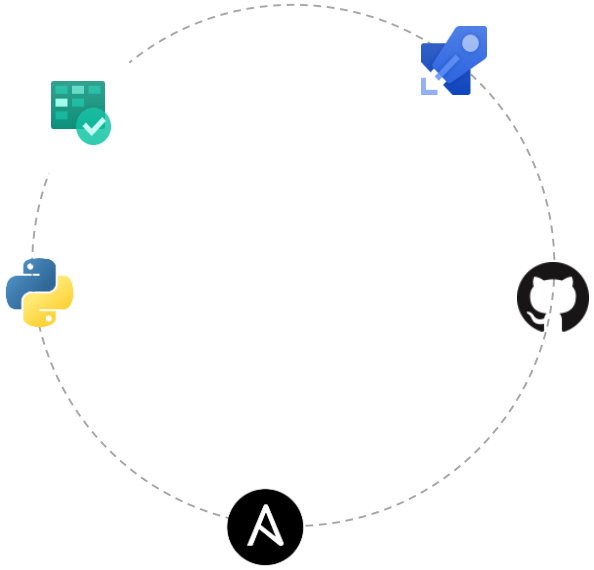
https://azure.com/devops

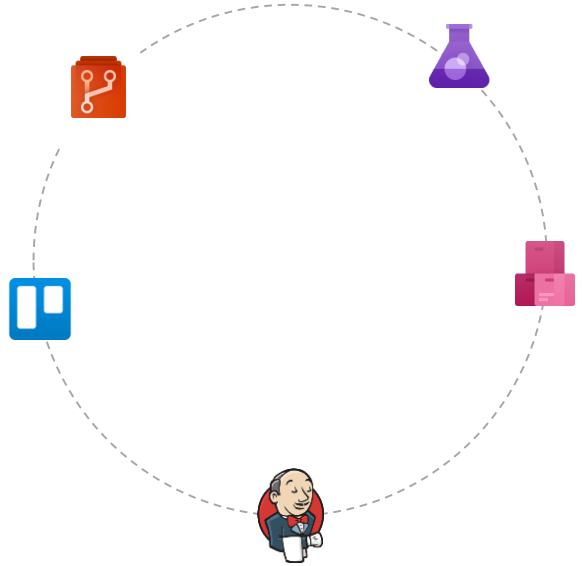
Azure DevOps: Choose what you love

Your tools, languages, and clouds

Any cloud, any platform, whether public, hybrid, on-premises







Developers are still in control of the language and process they want to keep using…

Azure DevOps integrates with existing dev tools, or can replace most of them… you choose!!

Section Take-Aways

1. Azure DevOps helps organizations in adopting and using DevOps… easier and better

2. Azure DevOps covers all aspects of the DevOps cycle: Repos, Build, Release, Artifacts,… end-to-end CI/CD Pipeline

3. Azure DevOps provides massive flexibility, by integrating with your existing Open Source tools you already use today

Questions Landing Spot

"…If you want good answers,

ask better questions…"

Microsoft

Thank You