



Module 5 – DevOps with Containers

Microsoft Services



Agenda

- Container Devops Value Proposition
- What is DevOps?
- Azure DevOps overview
- Containerized Workflow Pipeline
- Azure DevOps: Continuous Integration - Windows/Linux
- Azure DevOps : Continuous Deployment - SF/AKS

Software Innovation Collision

Containers

Standardization of the application packaging



DevOps

Optimizing how applications
are built, delivered and
managed



**Better
Software**



Microservices

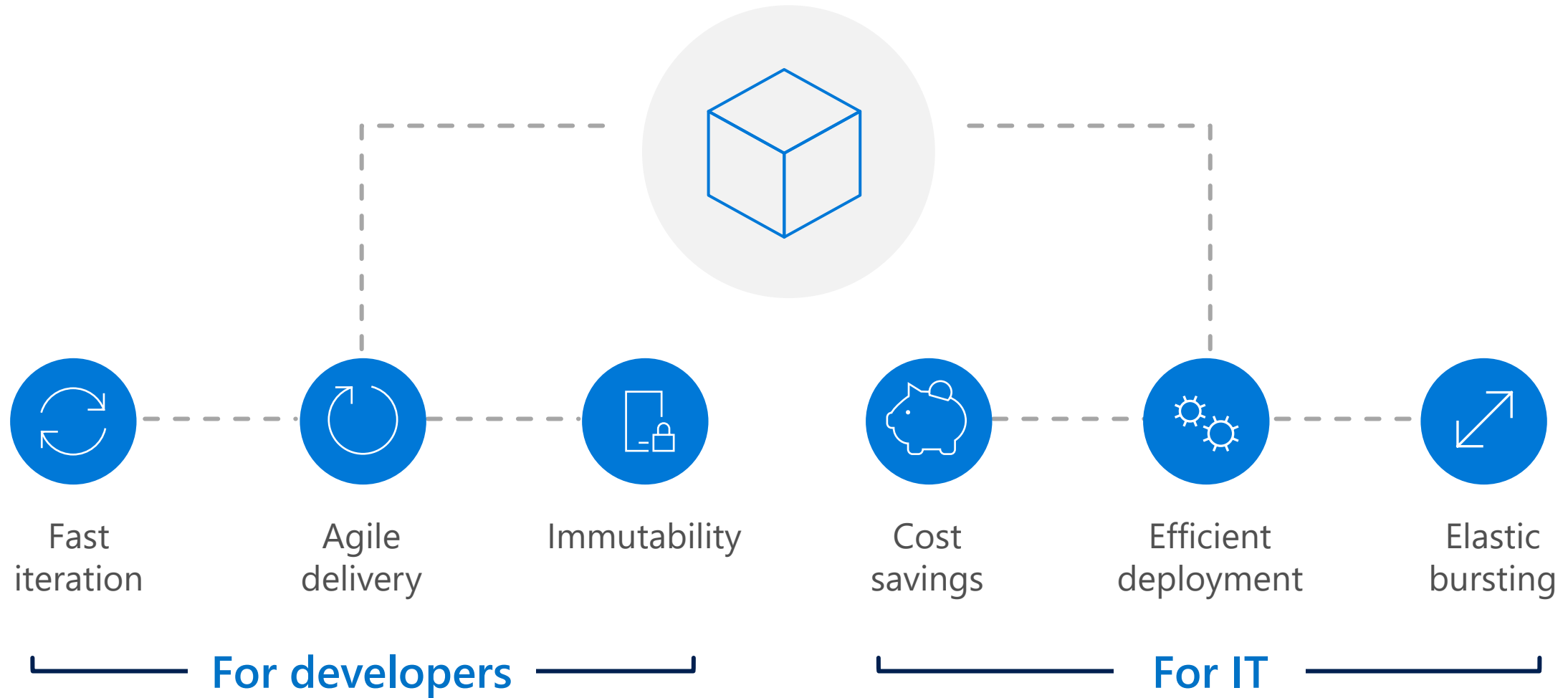
Optimizing how applications
are composed



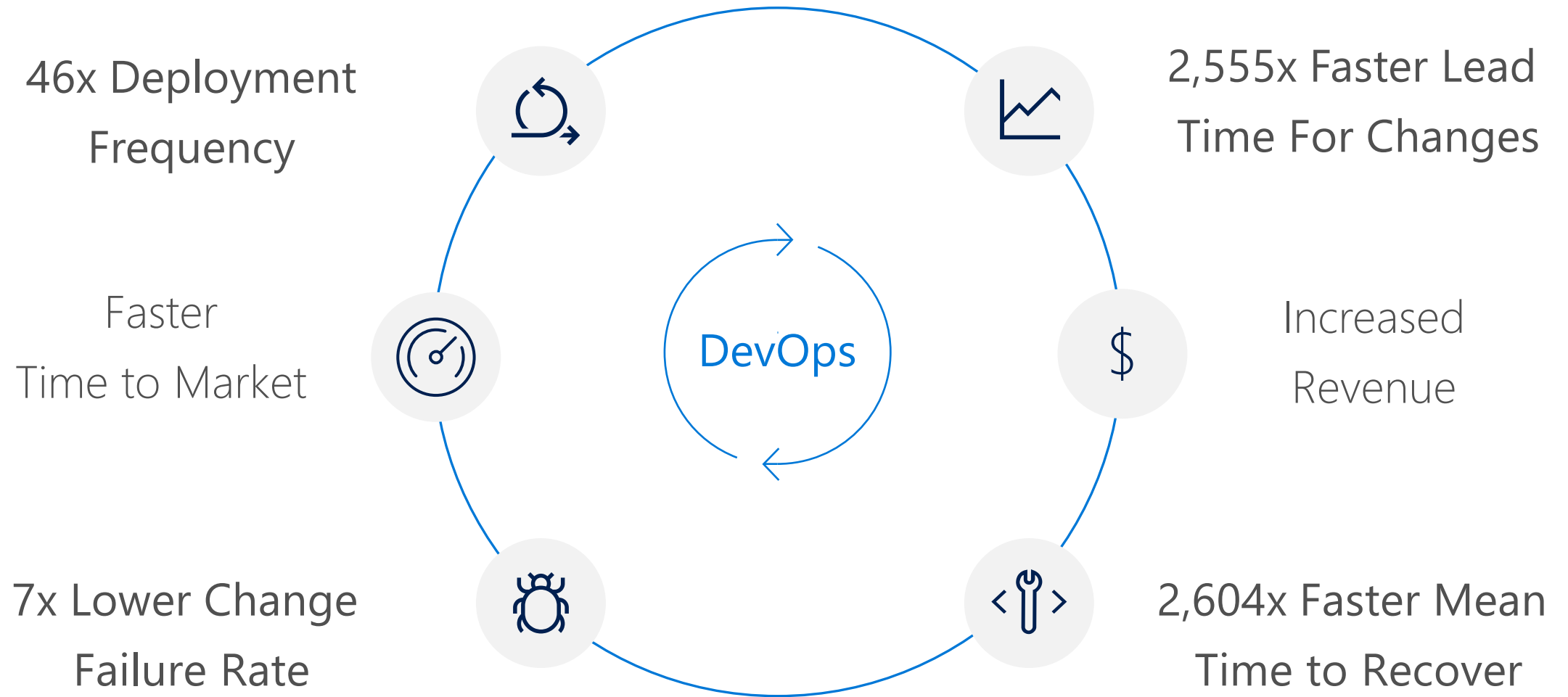
Cloud Orchestrators

Efficient ways to deliver Infrastructure for
Applications

Devops View Of The Container Advantage



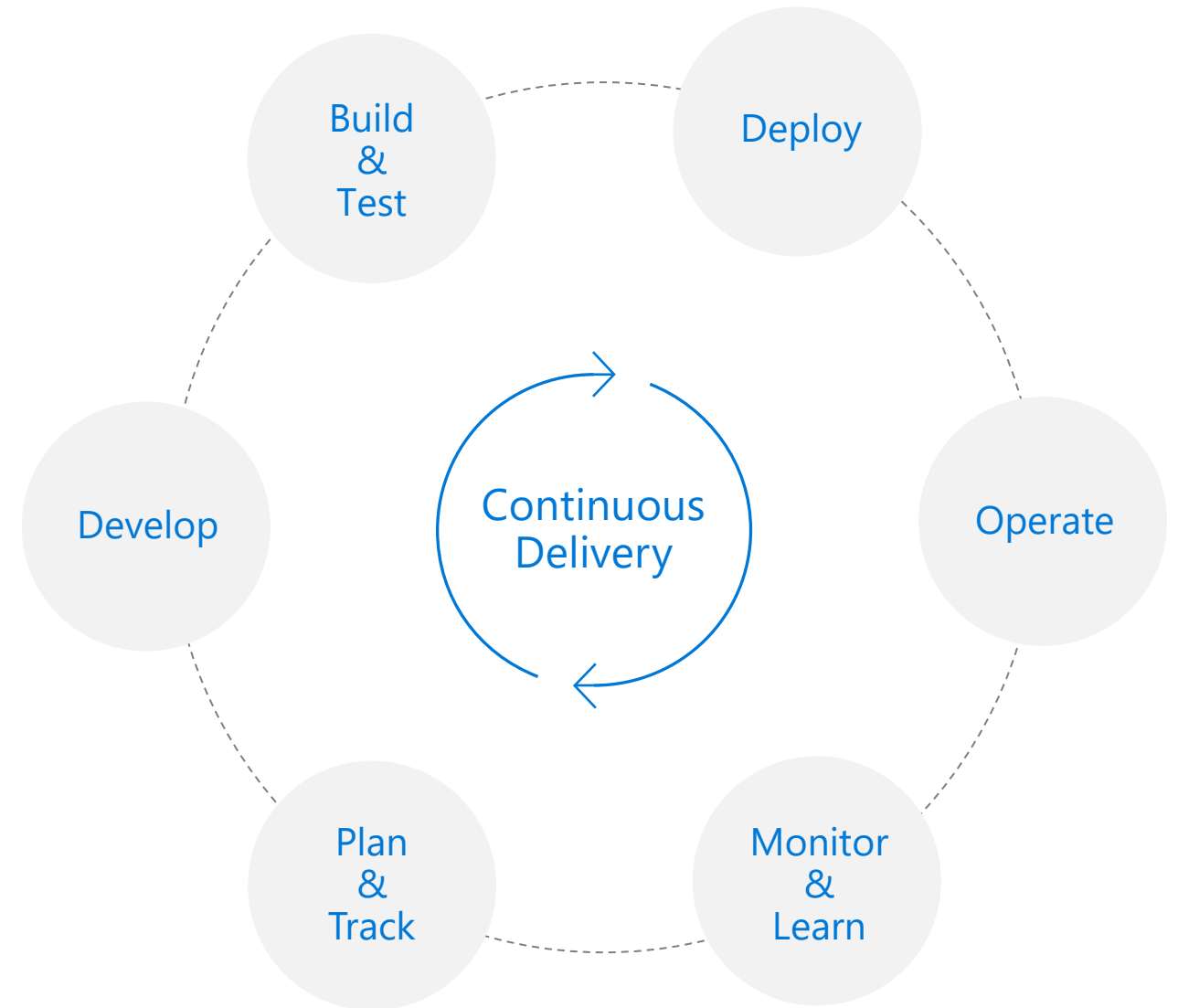
High Performance Devops Companies Achieve...



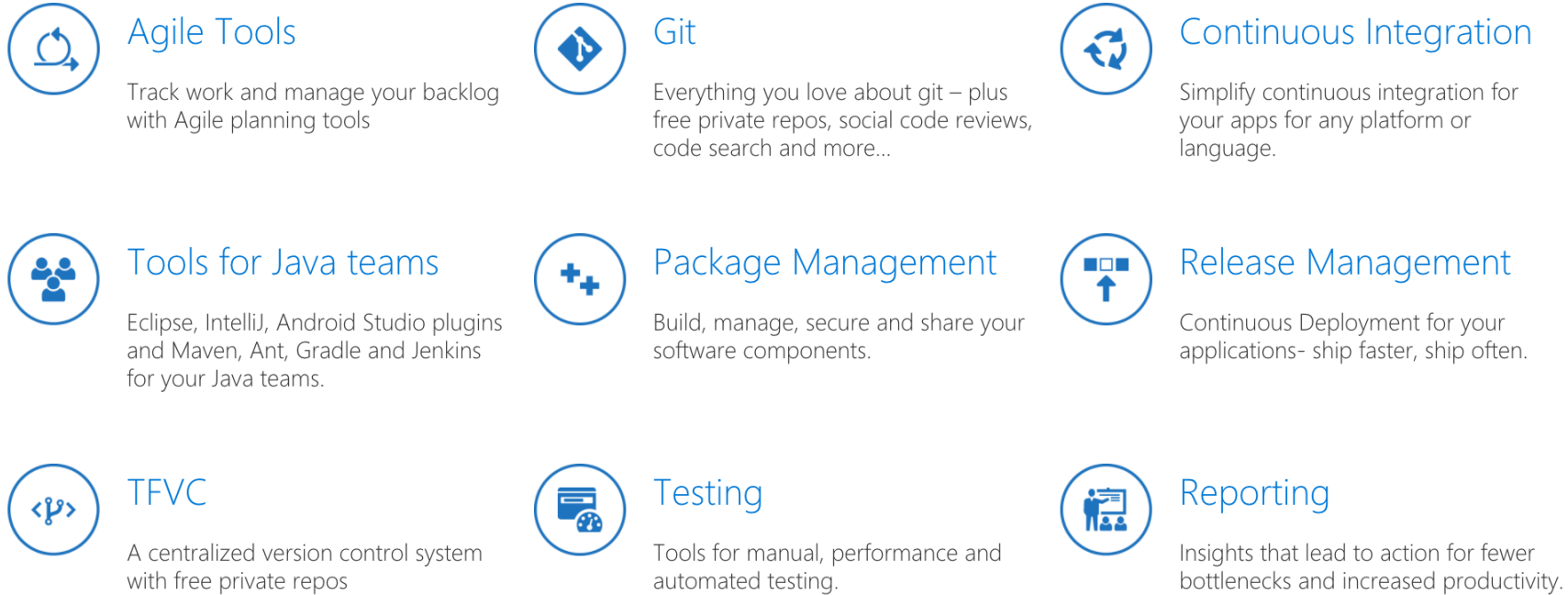
What is DevOps?



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



Azure DevOps



Increase productivity with powerful features



Code in any IDE/language and build applications for any target platform.

Azure DevOps



Azure Boards

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



Azure Test Plans

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



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 Artifacts

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



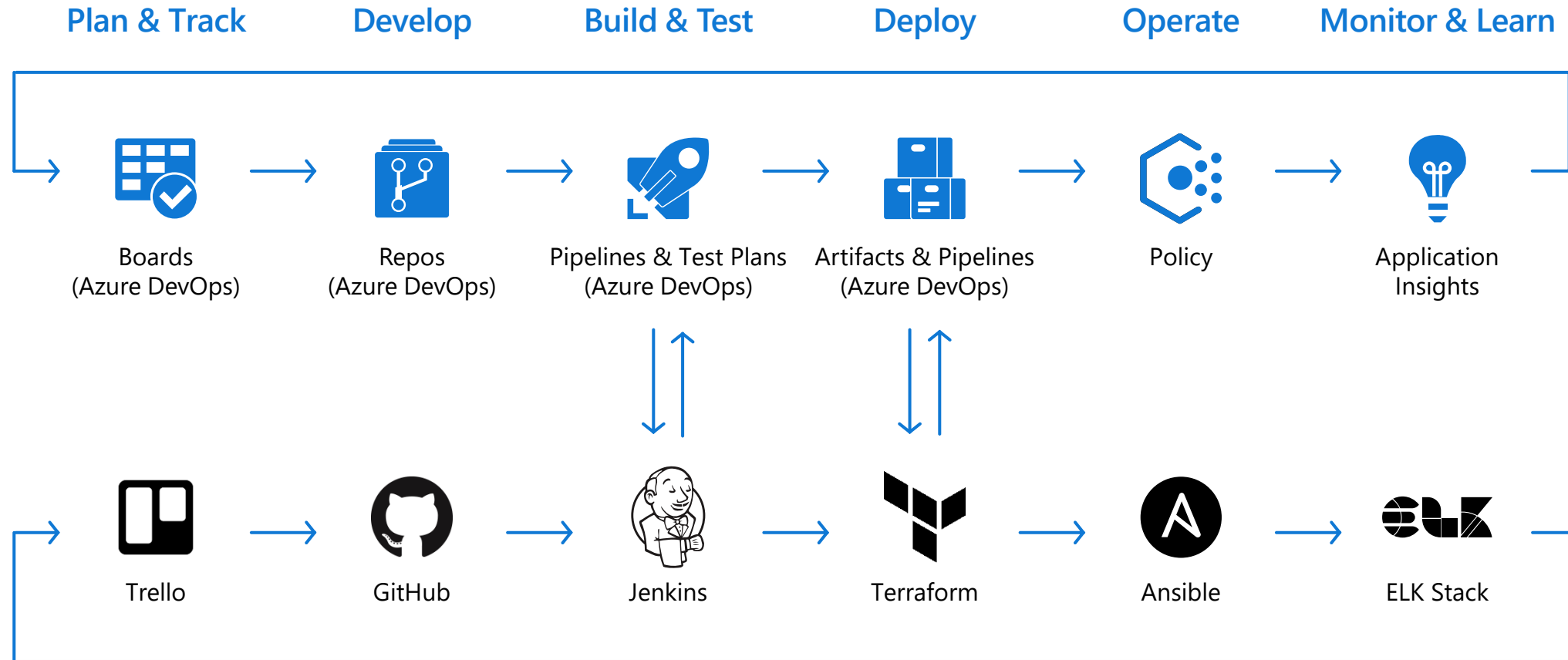
Azure Repos

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

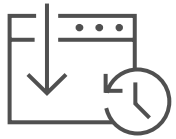


<https://azure.com/devops>

DevOps on Azure framework



What Technologies Do I Need To Support Devops?



Continuous Integration (CI)

- Improve software development quality and speed.
- When you use Azure Pipelines or Jenkins to build apps in the cloud and deploy to Azure, each time you commit code, it's automatically built and tested and bugs are detected faster.



Continuous Deployment (CD)

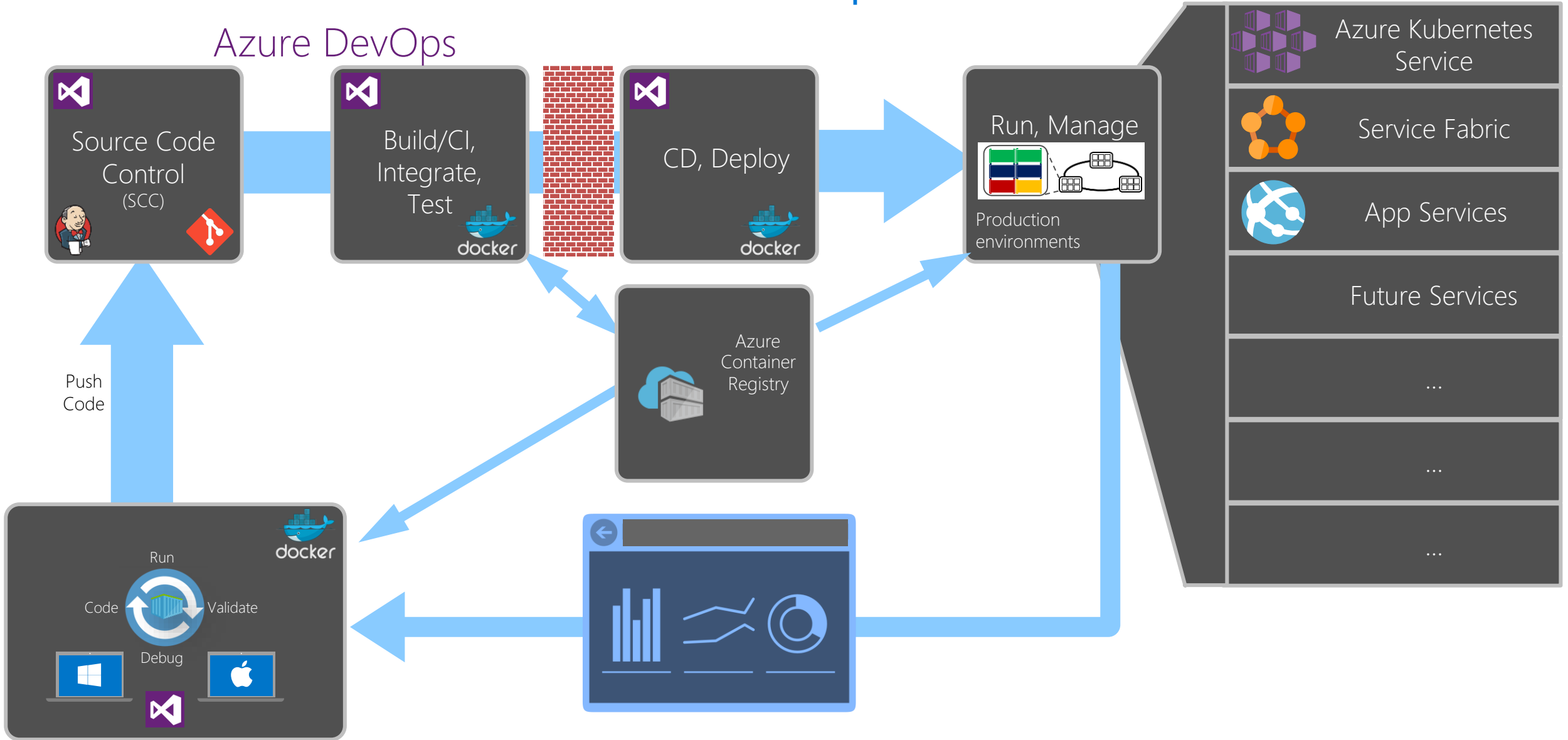
- By combining continuous integration and infrastructure as code (IaC), you'll achieve identical deployments and the confidence to deploy to production at any time.
- With continuous deployment, you can automate the entire process from code commit to production if your CI/CD tests are successful.



Continuous Learning & Monitoring

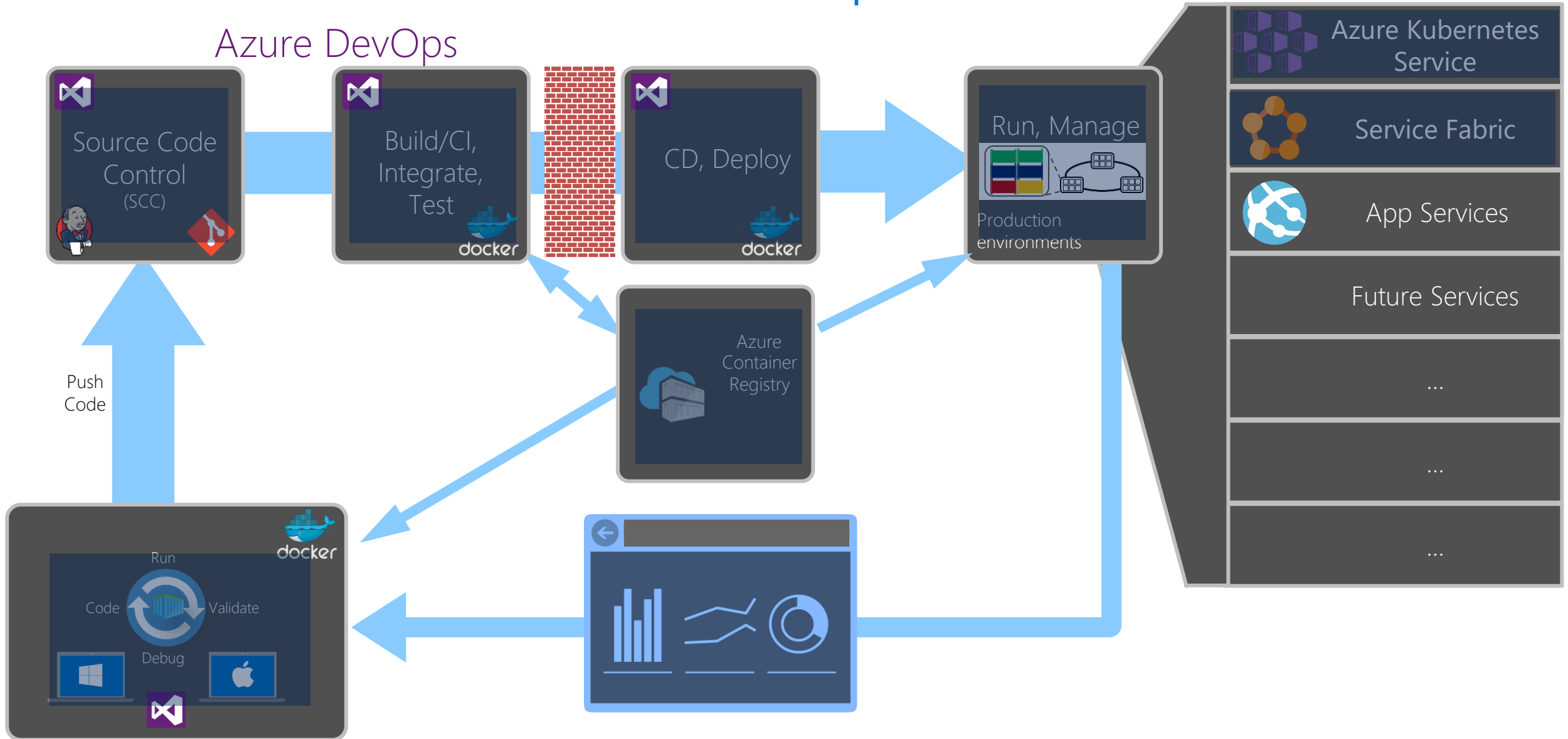
- With Azure Application Insights you can identify how your applications are performing and test if the recent deployment made things better or worse.
- Using CI/CD practices, paired with monitoring tools, you'll be able to safely deliver features to your customers as soon as they're ready.

Containerized Workflow Pipeline

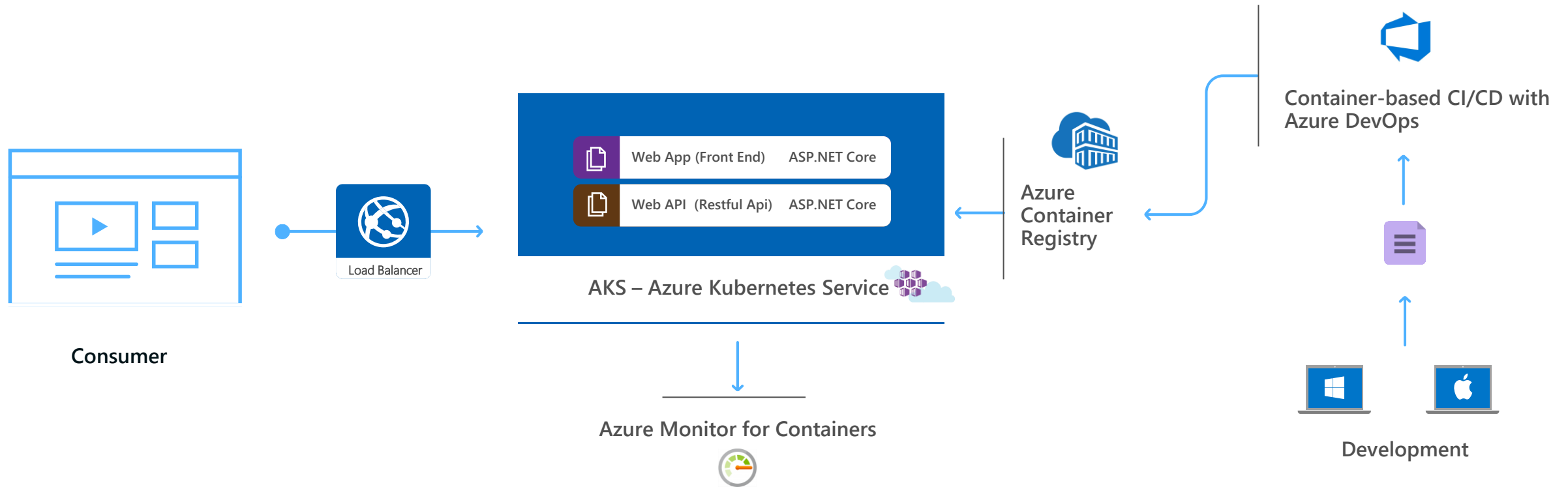


Containerized Workflow Pipeline With AKS/SF

Azure DevOps



CI/CD Pipeline | Azure DevOps and AKS



Azure DevOps Agents

- **Agents:** To build your code or deploy your software you need at least one agent.
 - **Private Agents :** More control to install dependent software needed for builds and deployments
 - **Hosted Agents:** Microsoft provides the agent and takes care of the maintenance and upgrades
- **Linux Agents (Azure Pipeline / TFS 2017):** <https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/v2-linux?view=vsts>
- **Windows Agents (Azure Pipeline / TFS 2017):** <https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/v2-windows>

Agents for pool Hosted Ubuntu 1604 [Download agent](#)


Enabled	Name	State	Current status
<input checked="" type="checkbox"/>	Hosted Agent	Online	Idle


Agents for pool Hosted VS2017 [Download agent](#)


Enabled	Name	State	Current status
<input checked="" type="checkbox"/>	Hosted Agent	Online	Idle


Build Pipeline


Build for Multi-Container ASP.NET Core Application using Linux Containers


Agent job 1 


 Run on agent


 **Build and Push WebAPI Image**
Docker

 **Build and Push WebApp Image**
Docker


 **Replace build number in backend-webapi.yaml file co...**
Command Line


 **Replace build number in frontend-webapp.yaml file**
Command Line


 **Publish Artifact: frontend-webapp.yaml**
Publish Build Artifacts


 **Publish Artifact: backend-webapi.yaml**
Publish Build Artifacts


Build for Multi-Container ASP.NET Core Application using Windows Containers


Agent job 1 


 Run on agent

 **Build and Push WebAPI Image**
Docker

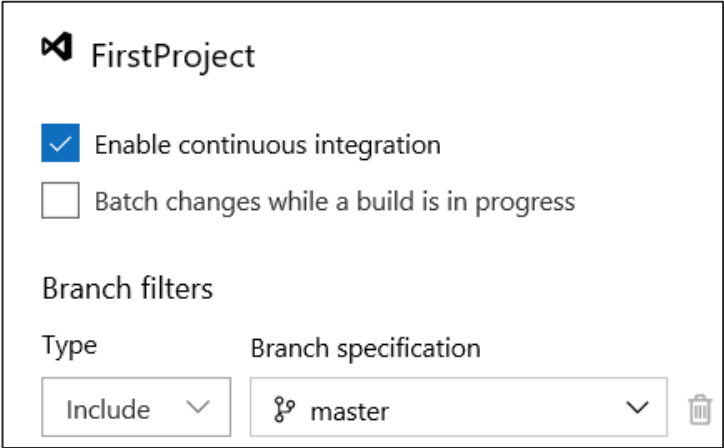
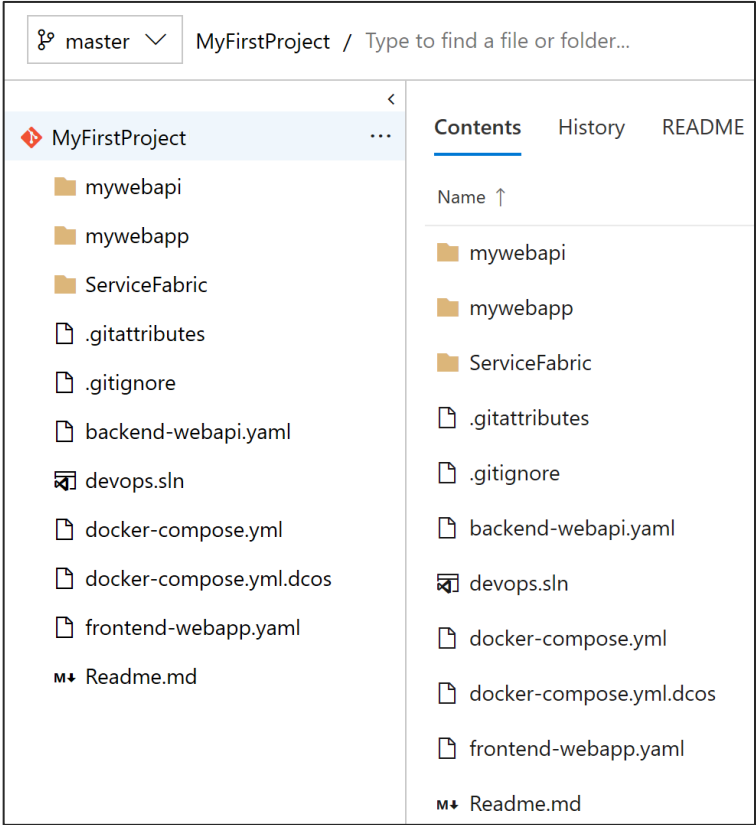
 **Build and Push WebApp Image**
Docker

 **Replace build number in WebApi Service...**
PowerShell

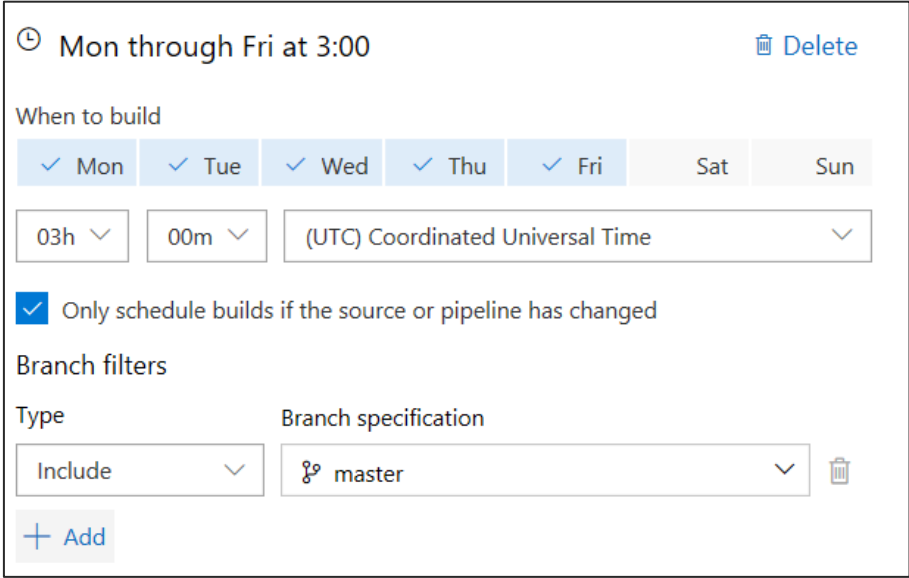
 **Replace build number in WebApp Servic...**
PowerShell

 **Publish Artifact: drop**
Publish Build Artifacts

Continuous Integration Setting



Build → Triggers → CI Enabled



Schedule Build
Example: Nightly/Daily

Changes to a branch can trigger the build automatically

Demonstration: *Build Pipeline*


Build Pipeline for Multi-Container Application





Release Pipeline

Release pipeline for AKS | Kubernetes

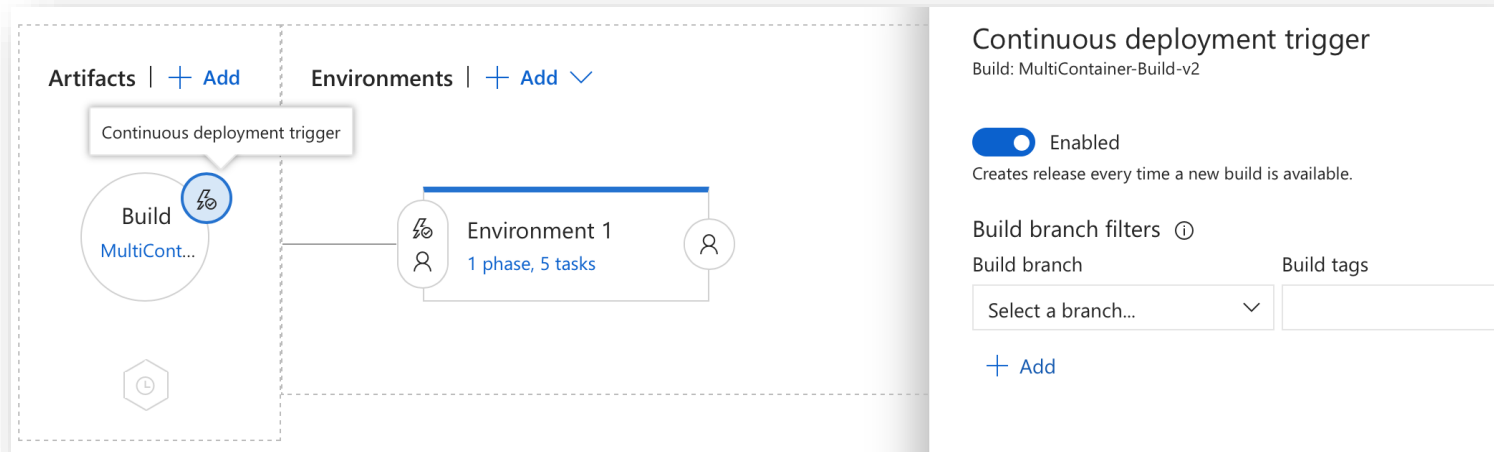
Agent job

 Run on agent

 **kubectl apply webapp**
Deploy to Kubernetes

 **kubectl apply webapi**
Deploy to Kubernetes

Azure Pipeline Continuous Deployment Setting



The screenshot shows the Azure Pipelines interface. On the left, under 'Artifacts', there is a '+ Add' button. Below it, a 'Build' icon is selected, and a 'Continuous deployment trigger' is assigned to it. The build is named 'MultiCont...'. On the right, under 'Environments', there is a '+ Add' button. Below it, 'Environment 1' is selected, showing '1 phase, 5 tasks'. A line connects the build to the environment. On the right side of the interface, the 'Continuous deployment trigger' settings are shown for the build 'MultiContainer-Build-v2'. The trigger is 'Enabled' (toggle switch). Below this, the 'Build branch filters' section shows 'Build branch' set to 'Select a branch...' and 'Build tags' set to an empty field. There is a '+ Add' button at the bottom of the filters section.

Assign Build and select continuous deployment trigger

Continuous Deployment on every successful Build



The screenshot shows the 'Create new release for K8s - Release' form. It has a 'Release Description' field. Below it, under 'Artifacts', there is a 'Source Alias' field with the value 'K8s - CI (Build)' and a 'Version' field with the value '115'. There is a dropdown arrow next to the version field.

On-Demand Release Kickoff

Demonstration: *Release Pipeline*

Release Pipeline for AKS

Continuous Deployment
Setting



