Microsoft Azure

Continuous Delivery in Azure DevOps & GitHub Action

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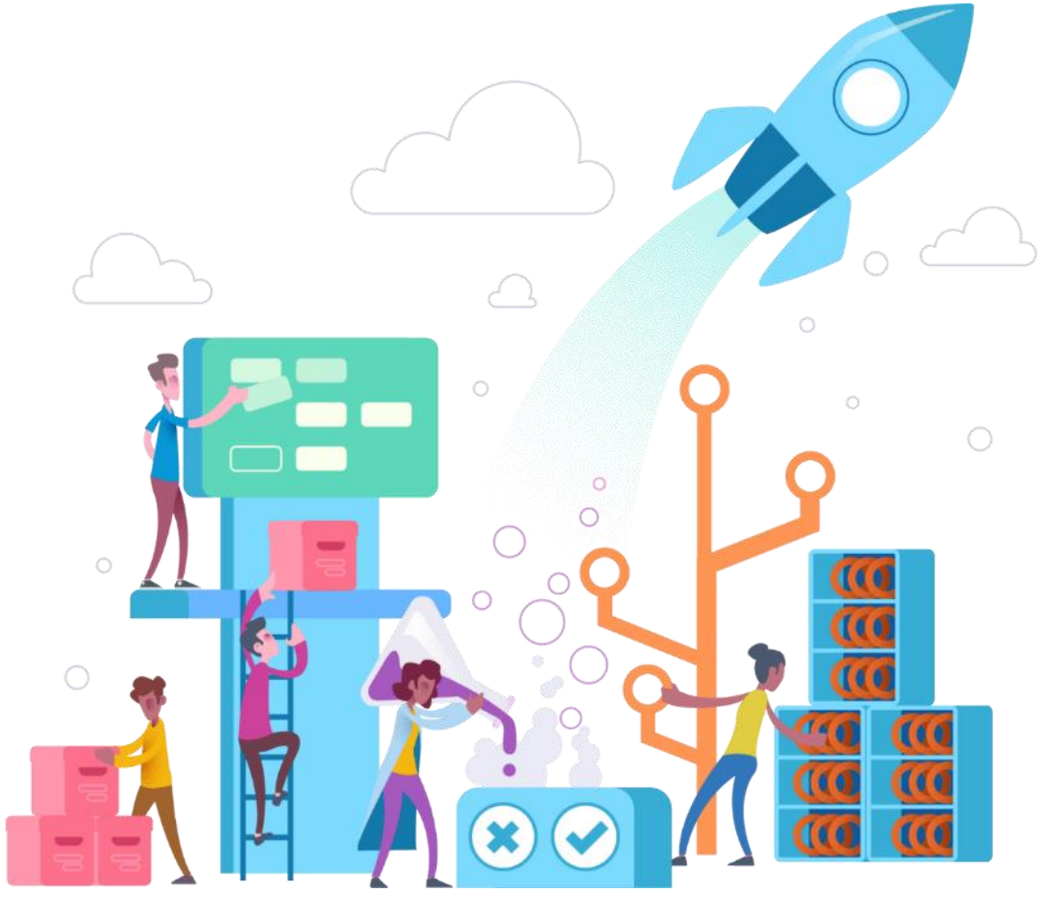


Differentiating Agility and Scrum

Agility

"The ability to create **value** and to **continuously delight the customer,** while promoting and responding to changes in its environment."

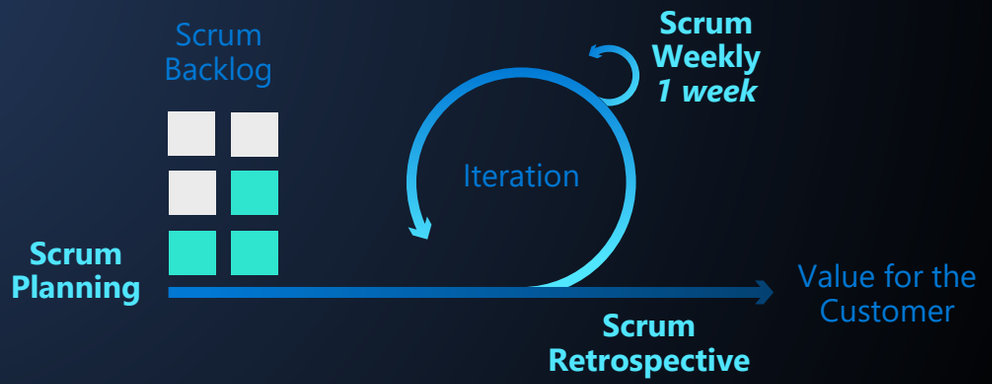
A living approach that must be tailored to Microsoft's culture.

These 4 pillars are the ground base of the Agile culture @Microsoft.

- Customer Centricity
- Empowered and Cross-Functional Teams
- Common Focus
- Action-Oriented

Scrum

"A **framework** for **project management**. It emphasizes teamwork, accountability and iterative progress towards a well-defined goal.



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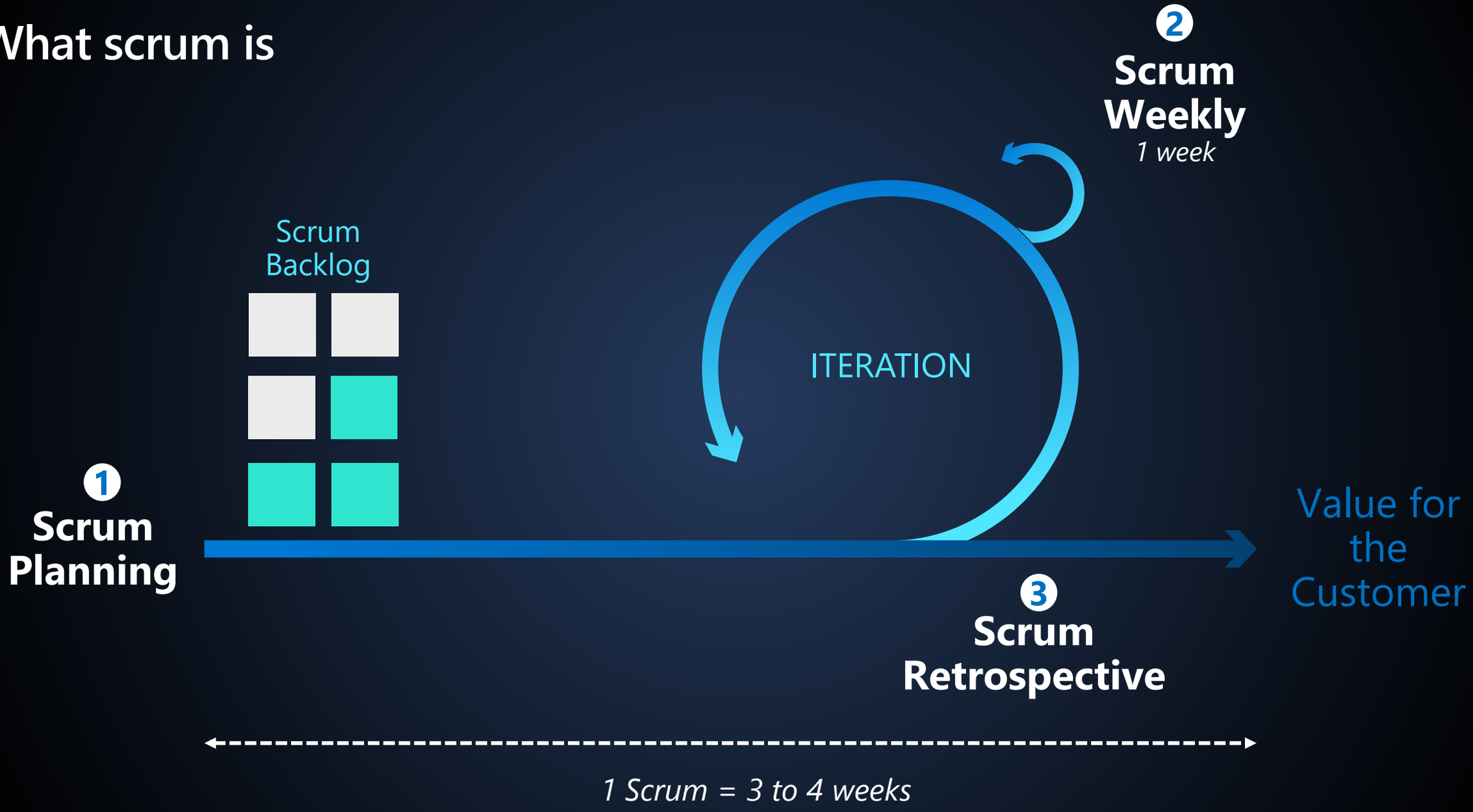
Azure

What scrum is



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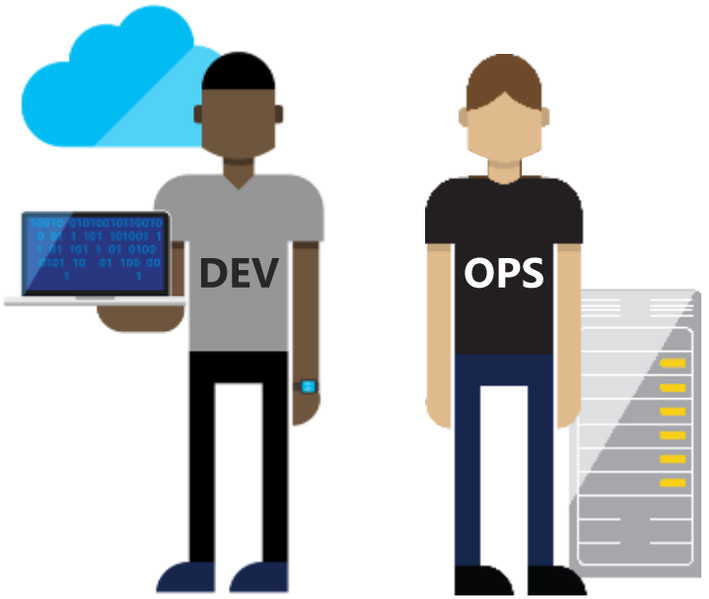
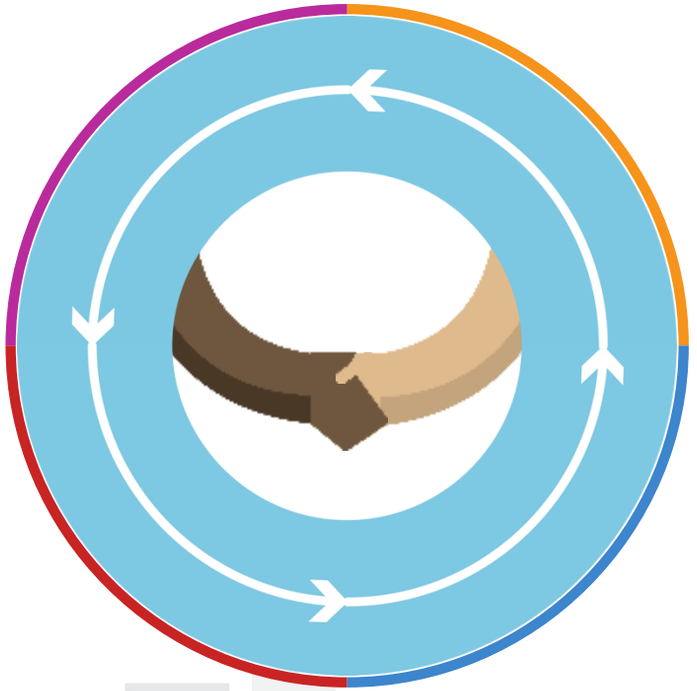
Azure

DevOps in Microsoft

Our own journey

DevOps: the three stage conversation



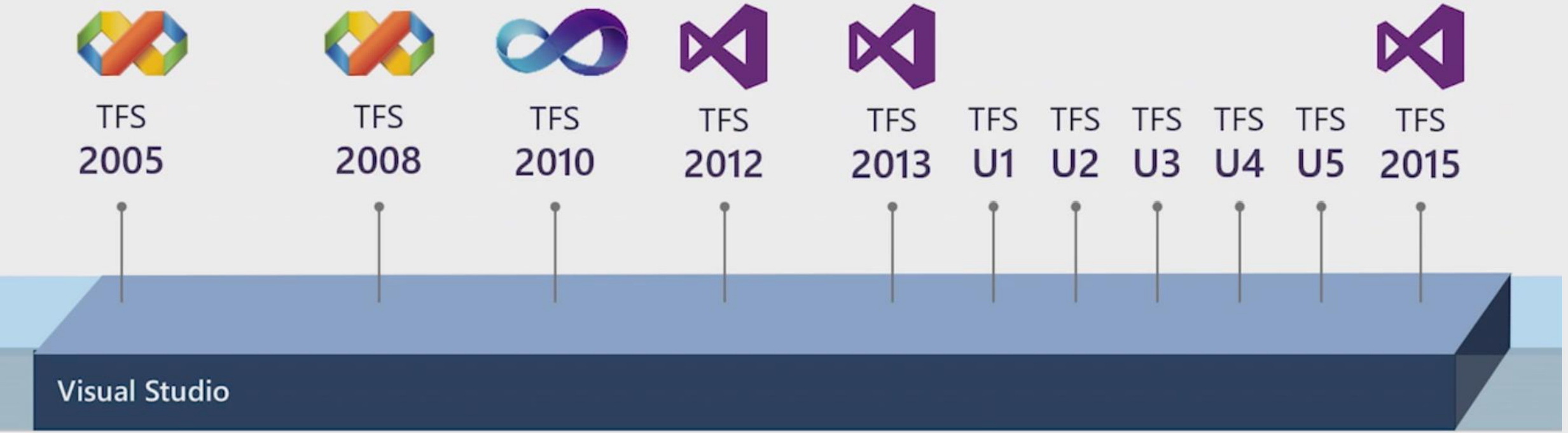


1 People

2 Process

3 Products

The Journey


TFS 2005
TFS 2008
TFS 2010
TFS 2012
TFS 2013
TFS U1
TFS U2
TFS U3
TFS U4
TFS U5
TFS 2015
Visual Studio

One Engineering System for DevOps

There cannot be a more important thing for an engineer, for a product team, than to work on the systems that drive our productivity.

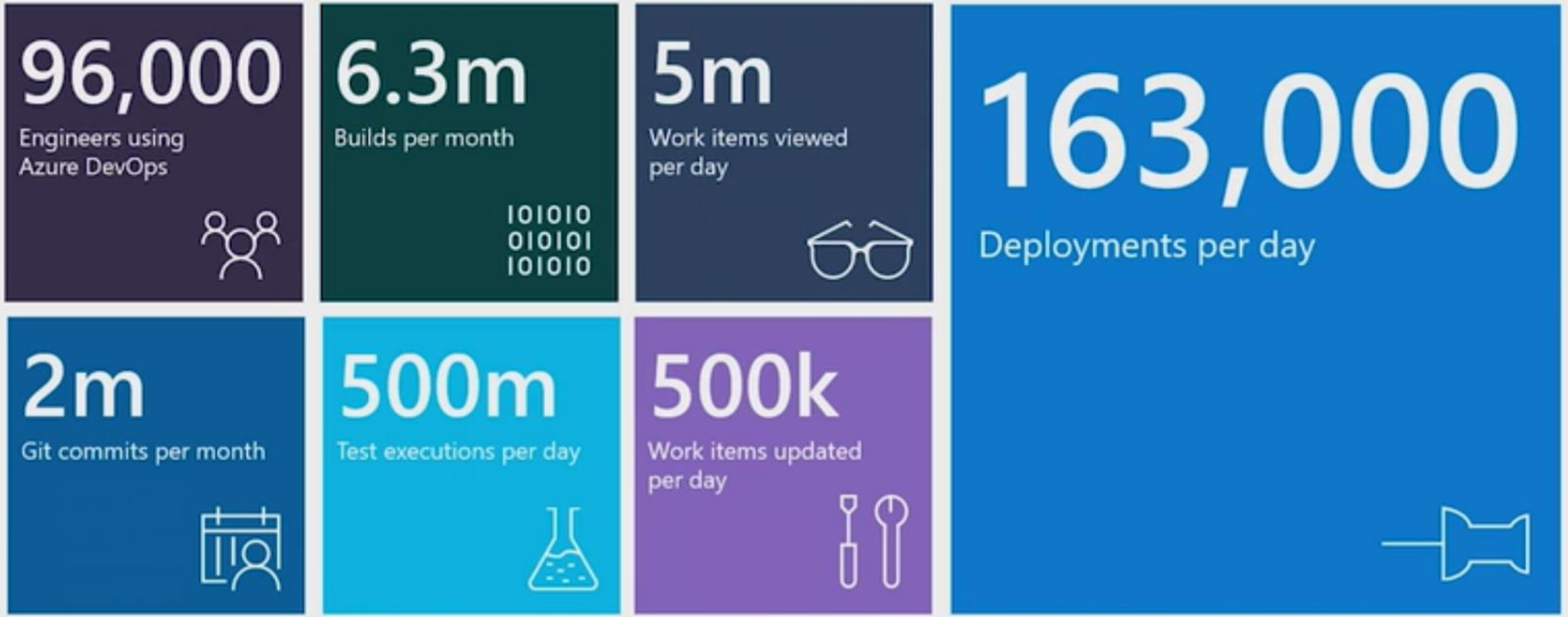
So I would, any day of the week, trade off features for our own productivity.

I want our best engineers to work on our engineering systems, so that we can later on come back and build all of the new concepts we want.

- Satya Nadela

DevOps in Microsoft

Azure DevOps is the toolchain of choice for Microsoft engineering with over 96,000 internal users



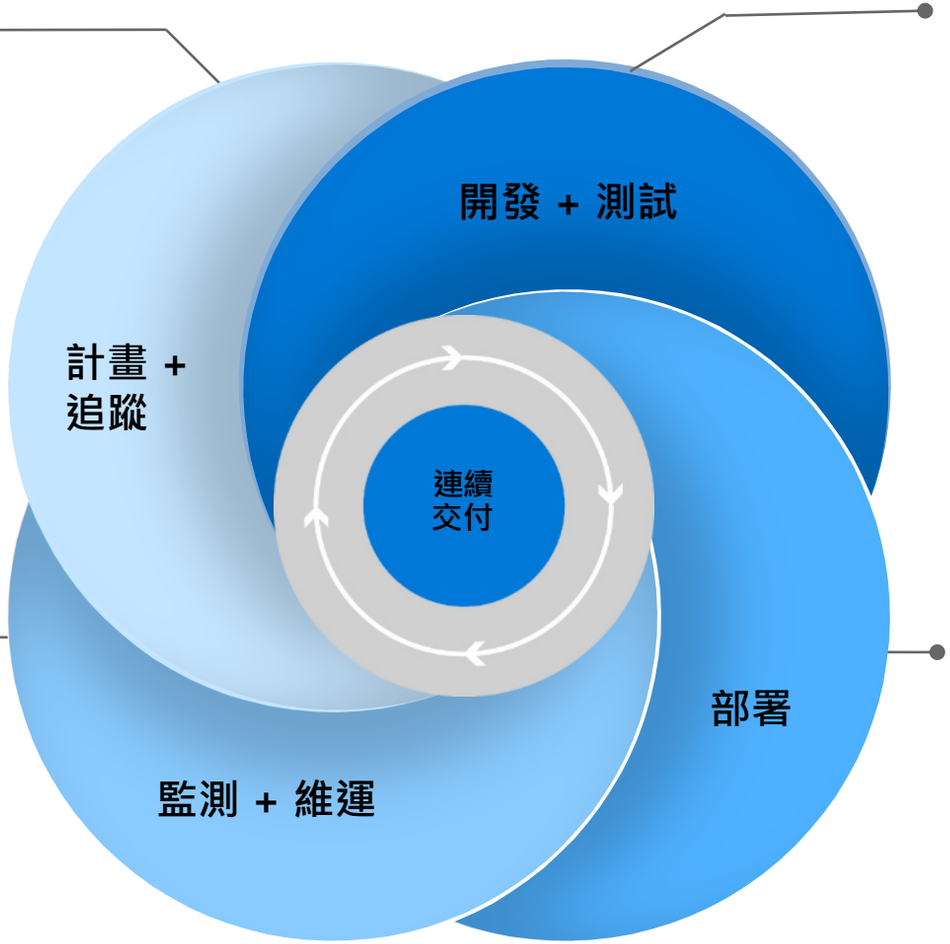
DevOps 是人、流程和技術的結合，用來對**最終用戶持續得交付價值**

計畫和追蹤

敏捷規劃
儀錶板
看板
Taskboards

開發和測試

Git 原始程式碼管理
現代代碼工作流
連續集成
連續測試
套件管理
開源法規遵從性



監測和維運

遙測
診斷
分析
合規

部署

應用程式和基礎架構的部署
PaaS、IaaS 和容器

Microsoft DevOps Solution

Azure DevOps Services & Azure DevOps Server

Azure DevOps

Azure Boards

使用經實證的敏捷式工具與所有小組一起規劃、追蹤及討論工作，更快傳遞價值給您的使用者。

Azure Pipelines

以適用於任何語言、平台和雲端的 CI/CD 建置、測試及部署。連線到 GitHub 或任何其他 Git 提供者並持續部署。

Azure Repos

取得無限的雲端託管私人 Git 存放庫，並透過提取要求和進階檔案管理來共同作業以建置更佳的程式碼。

Azure Test Plans

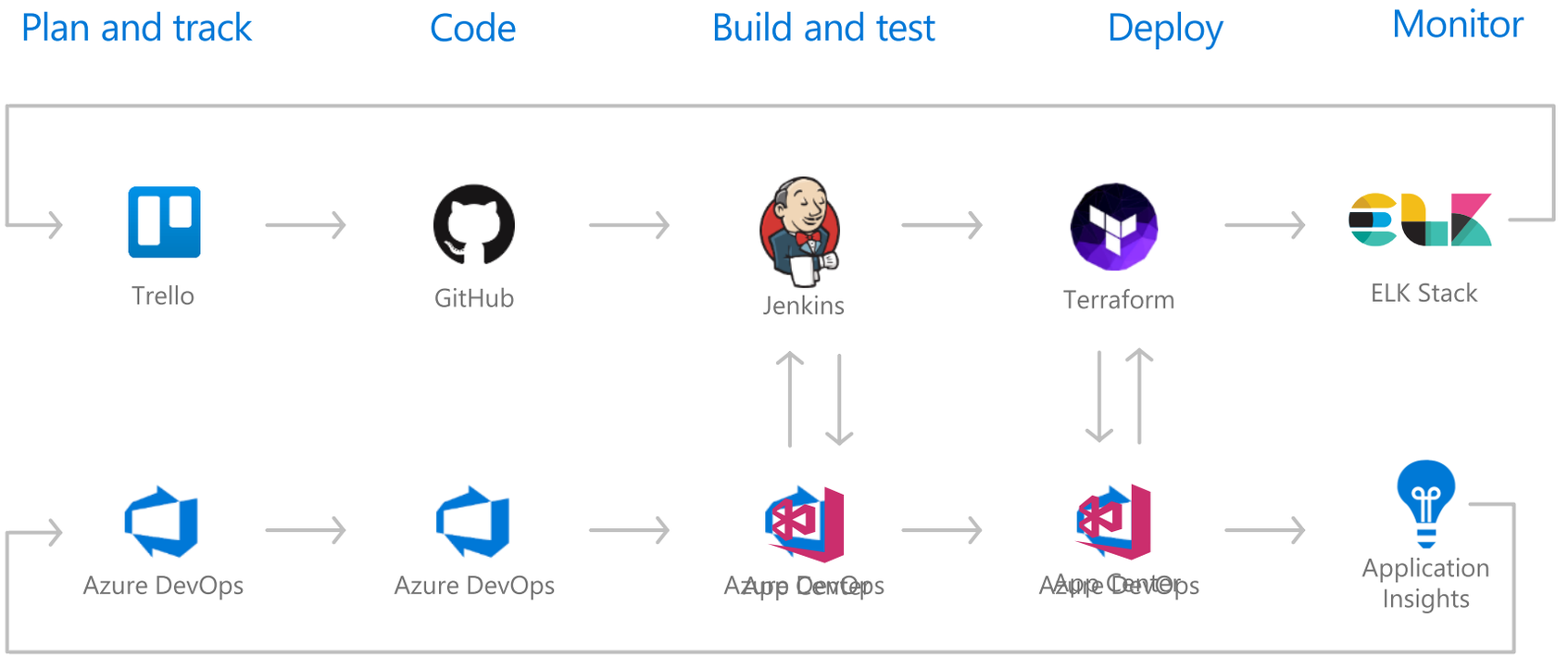
使用手動與探勘測試工具放心測試及交付。

Azure Artifacts

建立、裝載套件並與您的小組共用，只要按一下即可將成品新增至您的 CI/CD 管線。

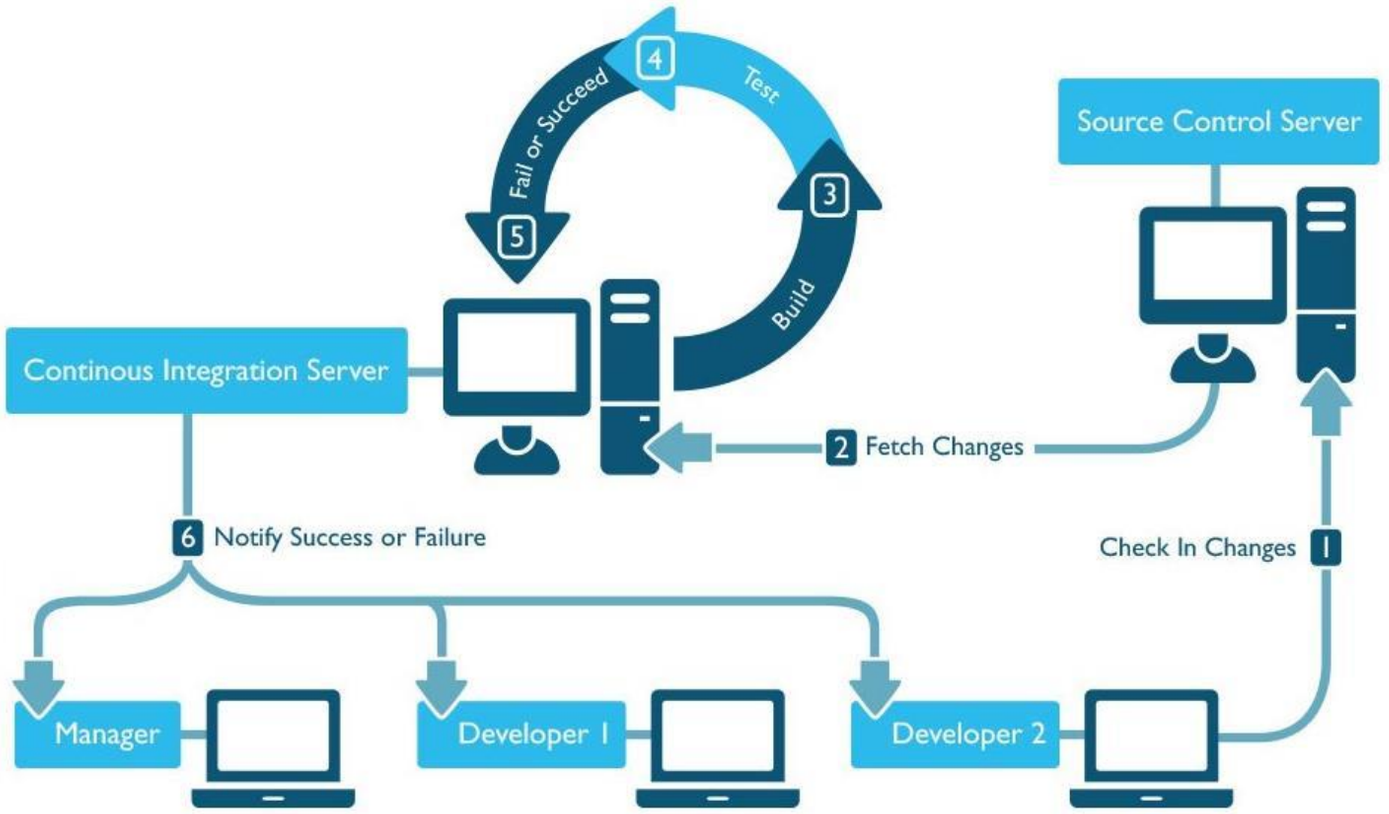
https://azure.com/devops

DevOps Flow


Plan and track
Code
Build and test
Deploy
Monitor
Trello
GitHub
Jenkins
Terraform
ELK Stack
Azure DevOps
Azure DevOps
Azure DevOps
Azure DevOps
Application Insights

Build – Continuous Integration

Continuous integration / CI



Decline the error rate on compiling after source code check in

Fully automatic Integration and Unit test task

Connection with code analysis

常用 Build Task

Microsoft

.NET Core
Build, test, package, or publish a dotnet application, or run a custom dotnet command. For package commands, supports NuGet.org and authenticated feeds like Package Management and MyGet.

Gradle
Build using a Gradle wrapper script

Maven
Build with Apache Maven

Ant
Build with Apache Ant

Python Script
Run a Python script.

React Native Prepare
Prep a React Native project to avoid build hangs for i
to use the right version of Node.js when generating ar
bundle.

React Native Bundle
Generate an offline bundle for a React Native project.

Go
Get, build, or test a Go application, or run a custo
command.

Android Signing
Sign and align Android APK files

Xcode
Build, test, or archive an Xcode workspace on macOS. Optionally package an ap

Visual Studio Test
Run unit and functional tests (Selenium, Appium, Coded UI test, etc.) using the Visual Studio Test (VsTest) runner. Test frameworks that have a Visual Studio test adapter such as MsTest, xUnit, NUnit, Chutzpah (for JavaScript tests using QUnit, Mocha and Jasmine), etc. can be run. Tests can be distributed on multiple agents using this task (version 2).

MSBuild
Build with MSBuild

Visual Studio Build
Build with MSBuild and set the Visual Studio version property.

npm
Install and publish npm packages, or run an npm command. Supports npmjs.com and authenticated registries like Package Management.

NuGet
Restore, pack, or push NuGet packages, or run a NuGet command. Supports NuGet.org and authenticated feeds like Package Management and MyGet. Uses NuGet.exe and works with .NET Framework apps. For .NET Core and .NET Standard apps, use the .NET Core task.

CocoaPods
CocoaPods is a dependency manager for Swift and Objective-C Cocoa projects. This task runs 'pod install'.

Python Pip Authenticate
Authentication task for pip client used for installing python distributions.

PowerShell
Run a PowerShell script on Windows, macOS, or Linux.

Command Line
Run a command line script using cmd.exe on Windo
bash on macOS and Linux.

Azure PowerShell
Run a PowerShell script within an Azure environment

Archive Files
Archive files using compression formats such as .7z, .rar, .tar.gz, and .zip.

Publish Build Artifacts
Publish build artifacts to Azure Pipelines/TFS or a file share

自動化加速程式碼品質

Microsoft

CODE REVIEW

BY OURSELF

CODE REVIEW

BY COMPUTER

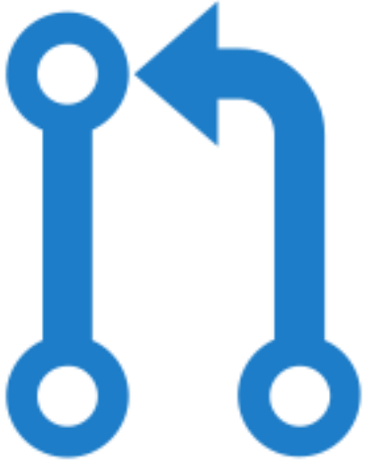
sonarqube

FORTIFY®

WhiteSource

BLACKDUCK

Build 啟動時機



Commit

- 新的程式碼 Commit 上來後
- Branch合併到Master

Schedule

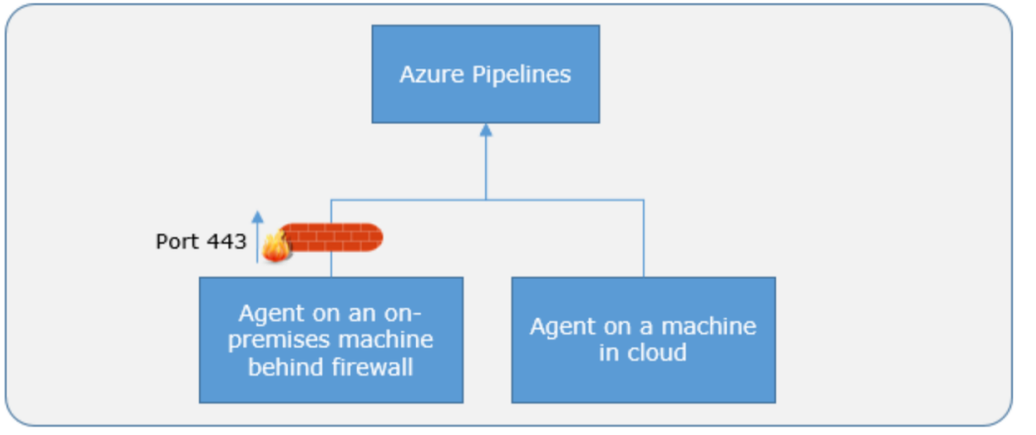
- 訂立特定時程

Azure DevOps API

- 訂立特定時程

Frequently Ask

- 編譯過程很複雜而且很多非基本流程，Azure DevOps 可以做到嗎？
  - 原則上，如果編譯的流程都可以透過 command 的方式完成，都能在Azure DevOps上執行
- Security Issue？
  - 處理編譯(Build)和部屬(Release)的機器，在Azure DevOps上有兩種選擇：
    - MS Host Agent：Windows/Ubuntu/MacOS
      https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/hosted?view=azure-devops&tabs=yaml
    - Self Host Agent



Release – Continuous Delivery

應用程式部屬上會遇到 ...

複雜且多樣的部署環境

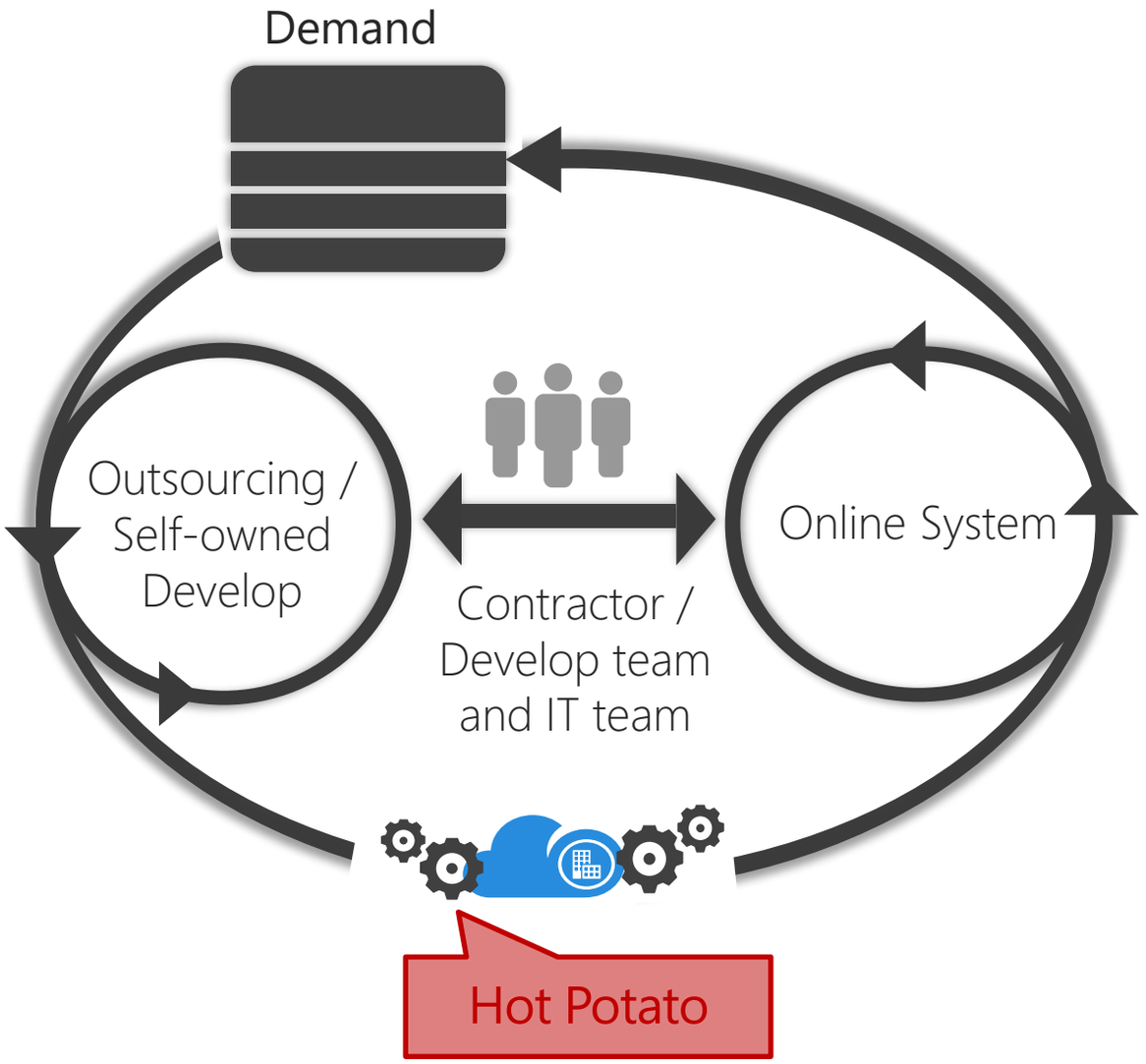
- .NET, Java ...
- Web, DB, Production, Staging
- Windows, Linux, On-premises server, Cloud

系統部屬環境準備費時

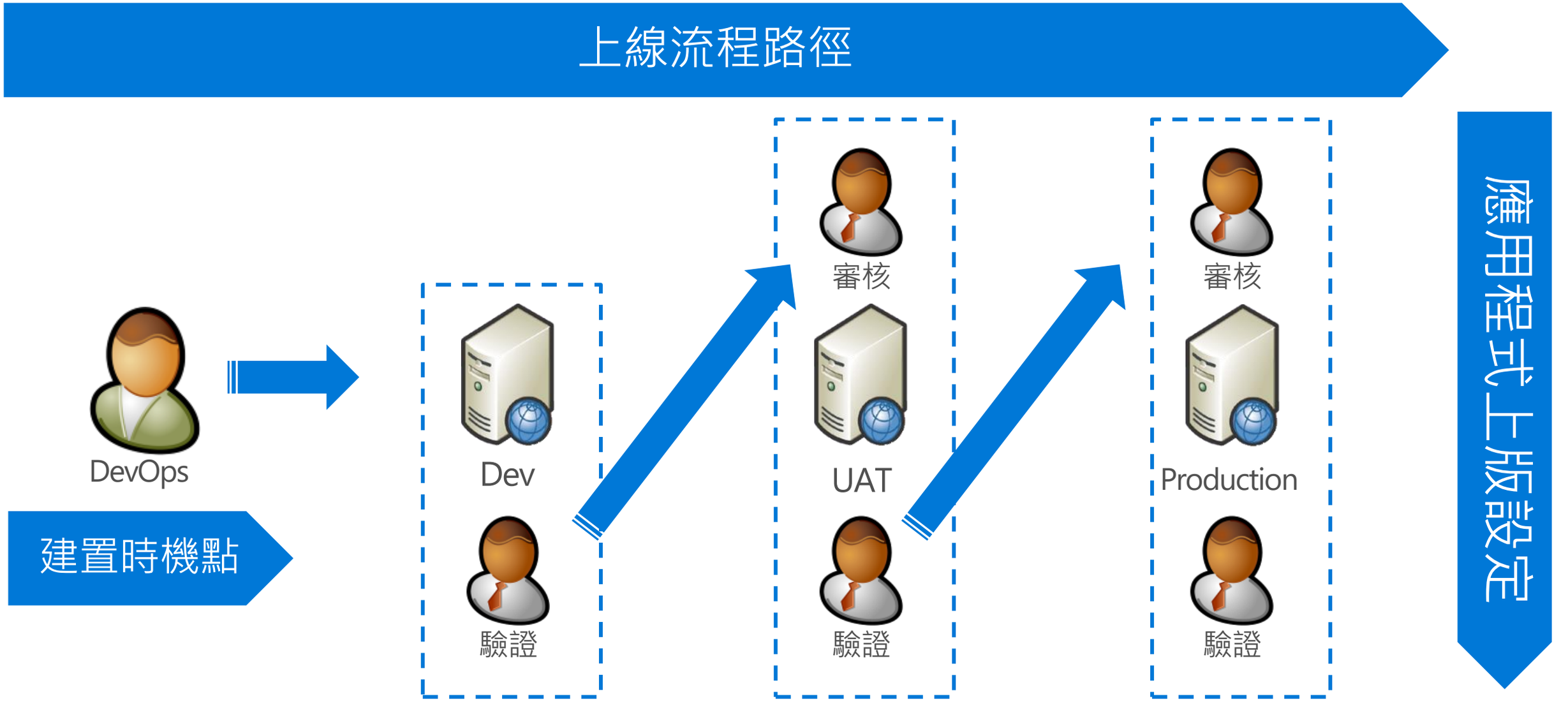
- 公司可能會有上百上千個系統，每天都會有新的版本需要做部屬
- 手動部屬、跨組織跨 team 溝通、工作交接而產生的 issue

稽核、公司內部政策考量

- 如何做 Security 的控管
- 災難備援機制

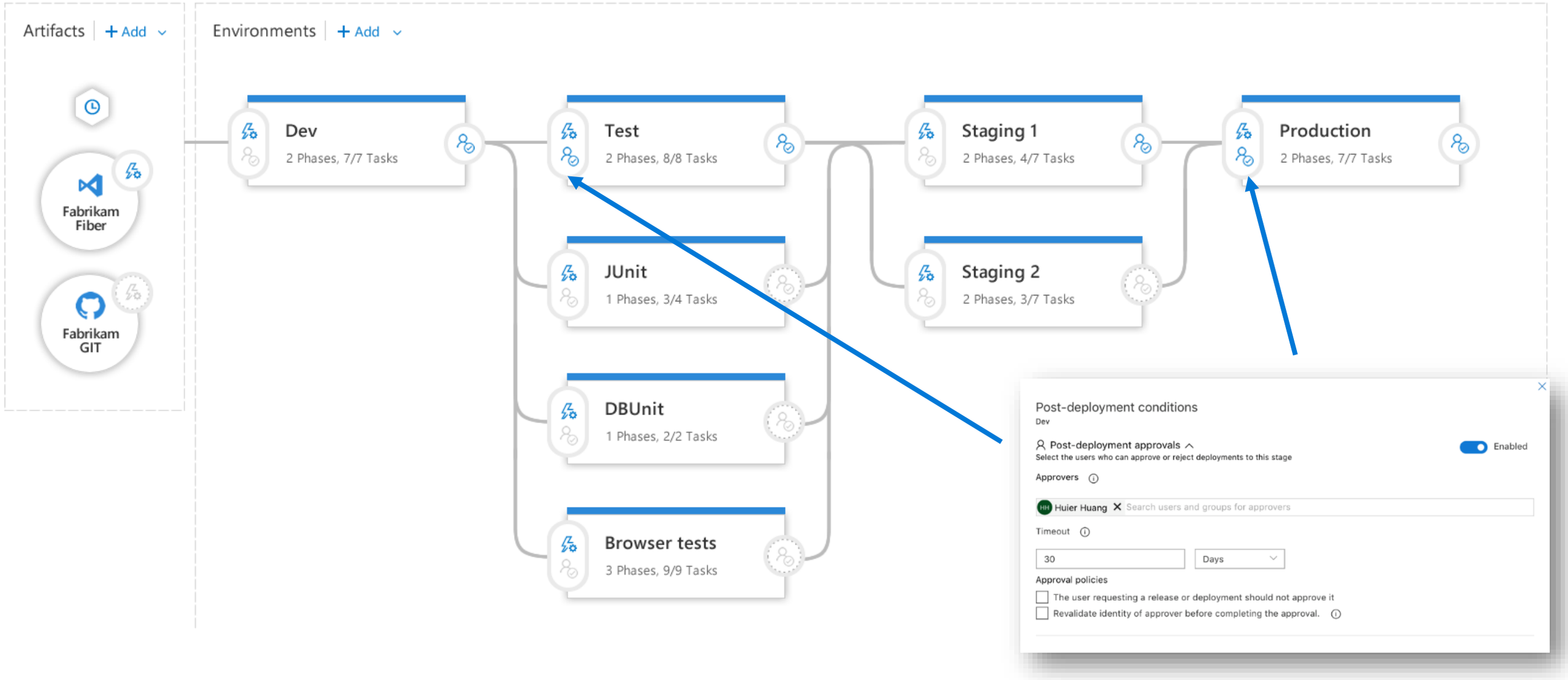


自動化過版三步驟

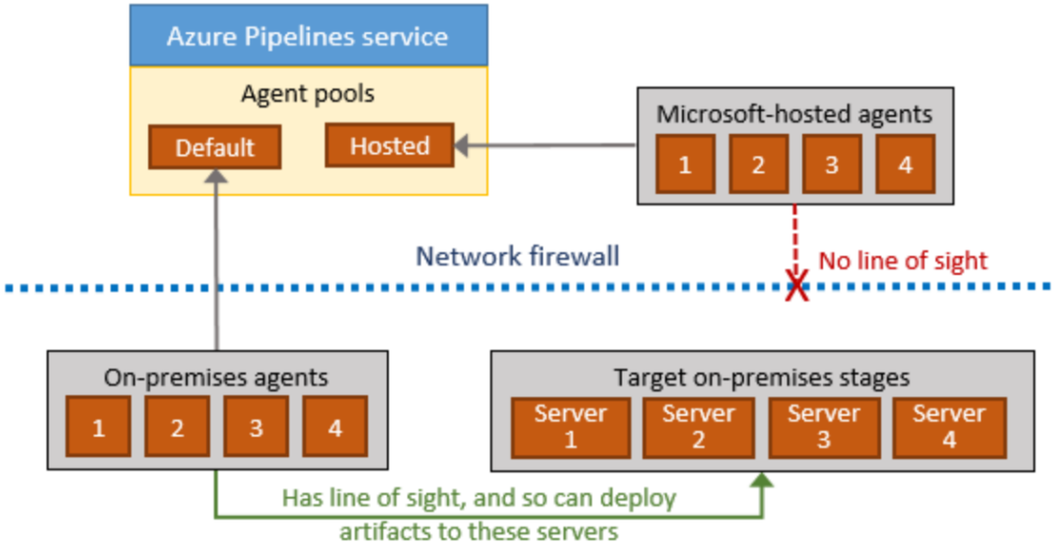

上線流程路徑
DevOps
建置時機點
Dev
驗證
審核
UAT
驗證
審核
Production
驗證
應用程式上版設定

Release Pipeline

自動化程式碼發佈流程



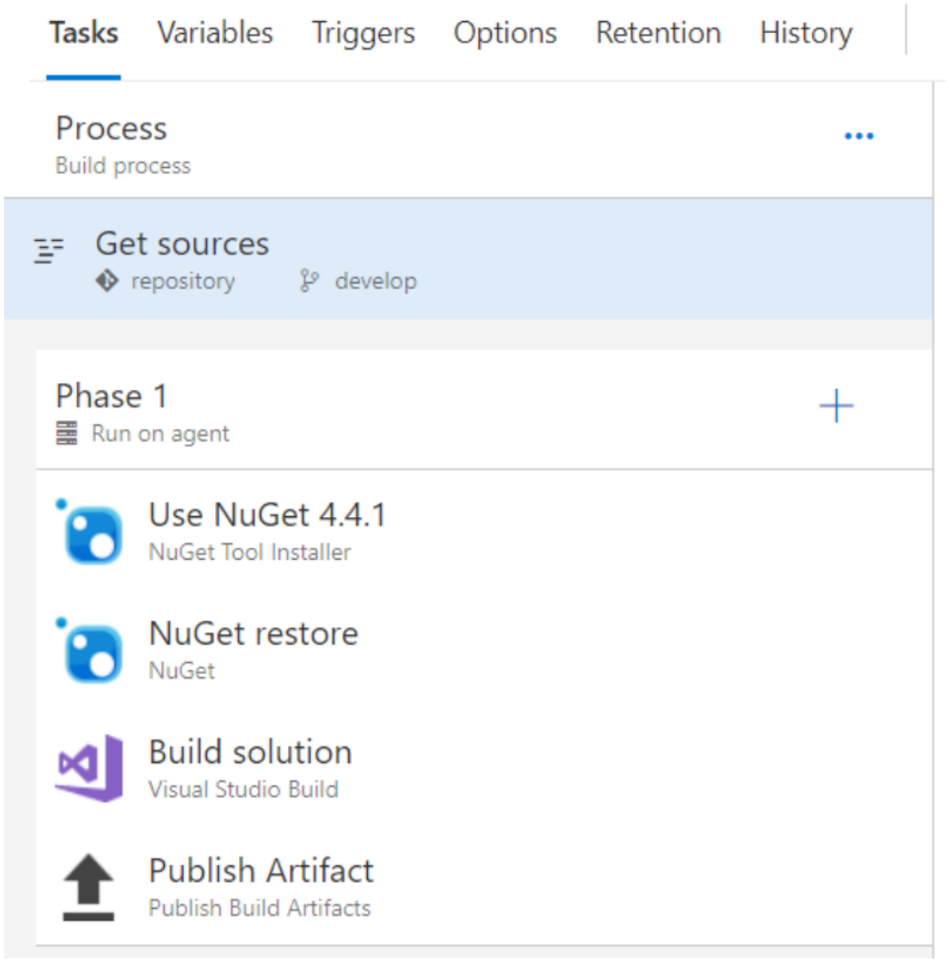
Frequently Ask



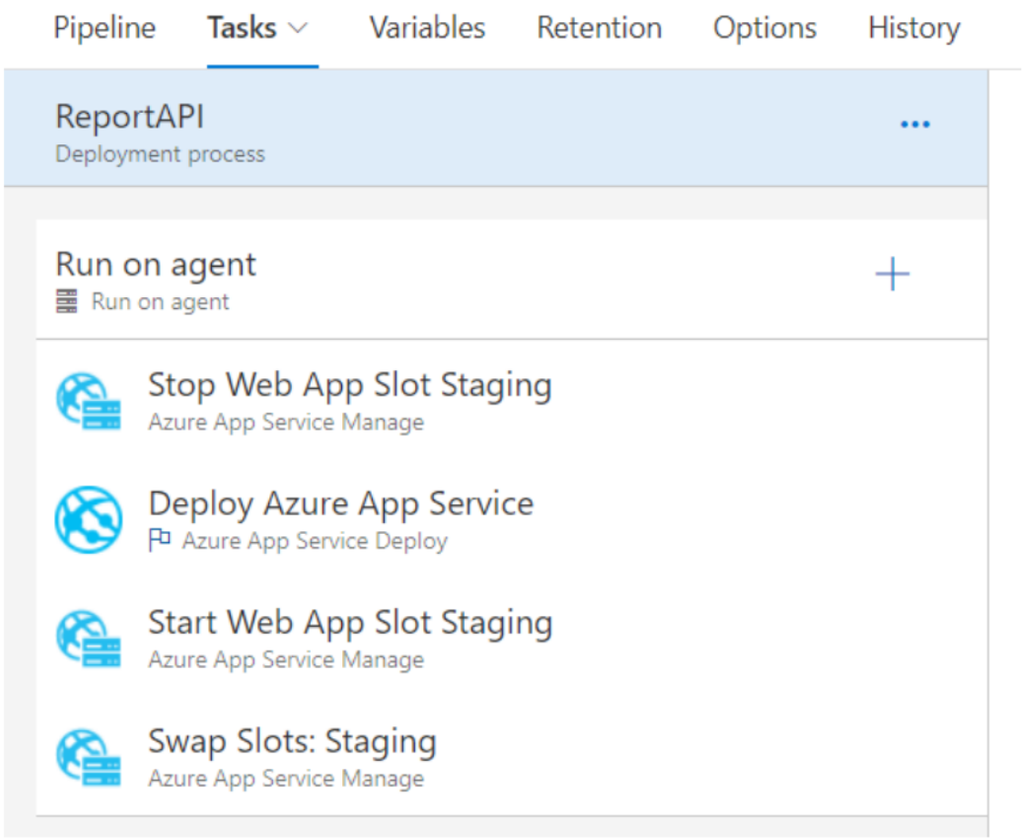
- 可以部屬到地端嗎？
  - 可以
  - 分兩種做法：
    - 使用 Self host agent 為 release machine 當作跳板機
    - 於 target server 安裝 Azure DevOps agent
- 資料庫可以部屬嗎？
  - 可以

Use Case

.NET Core Web

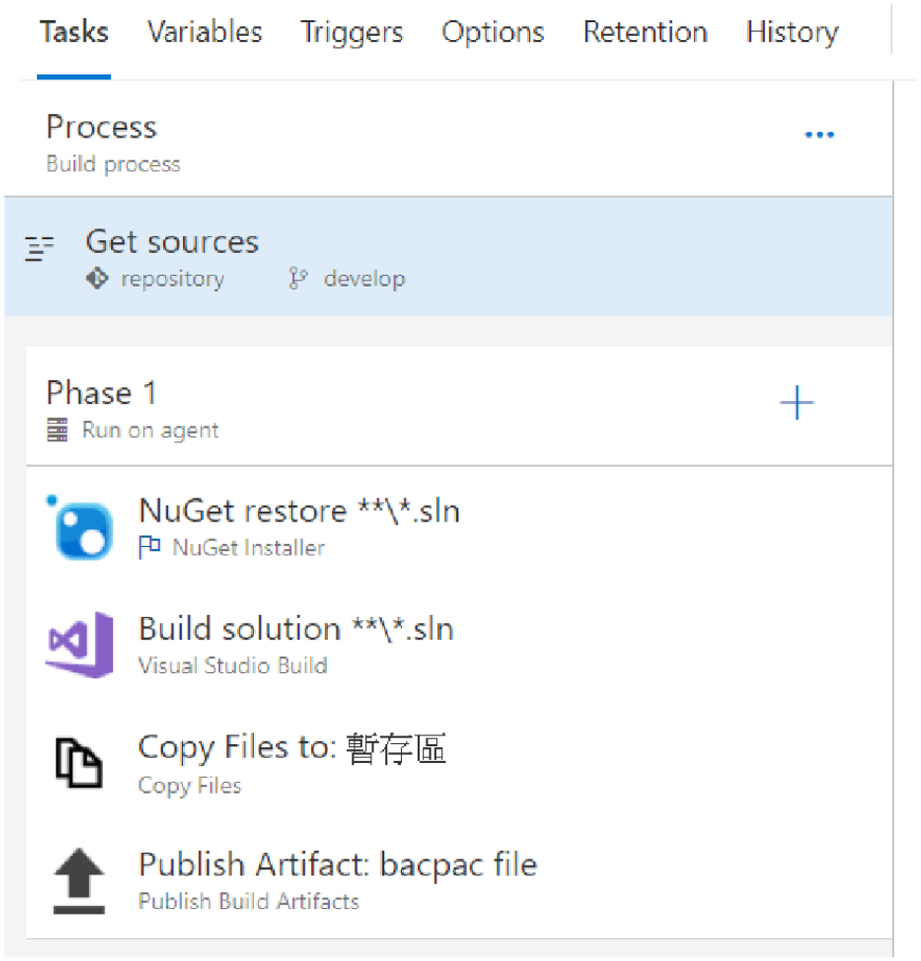


Build

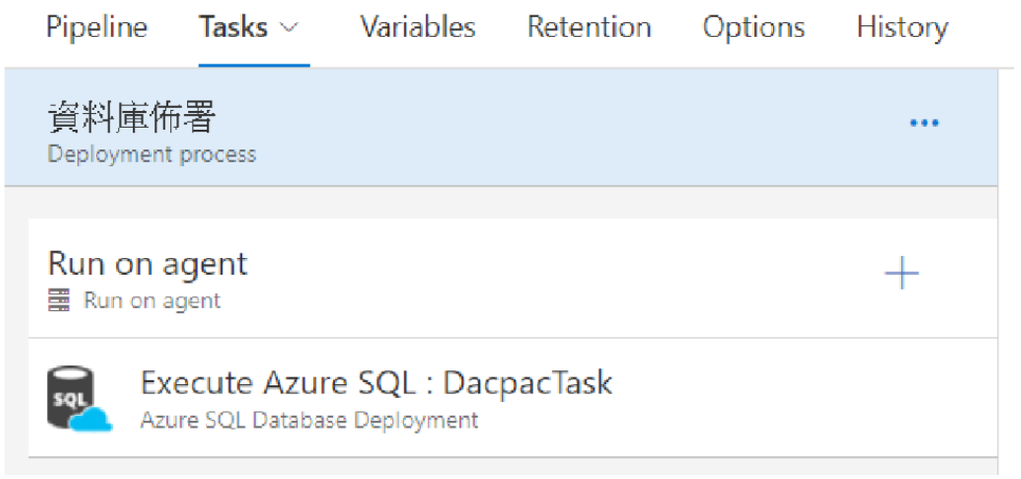


Release

Azure SQL Database

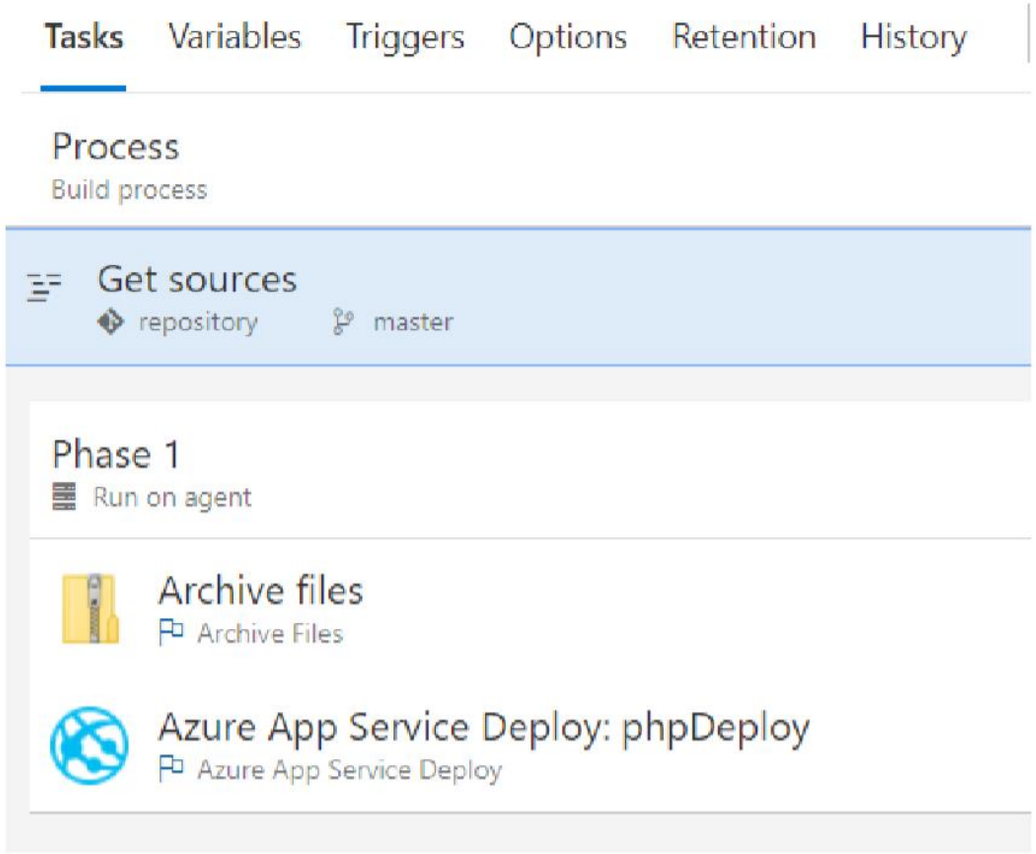


Build



Release

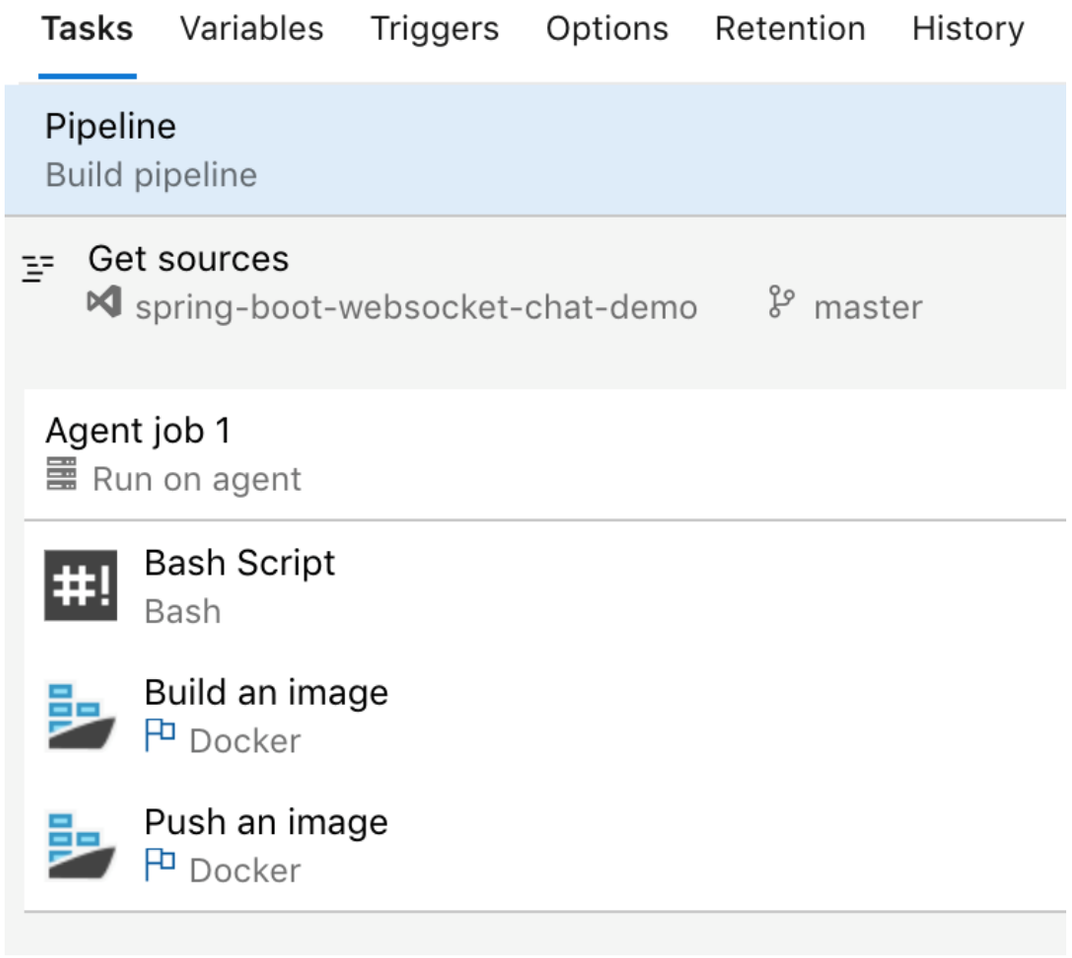
PHP Web



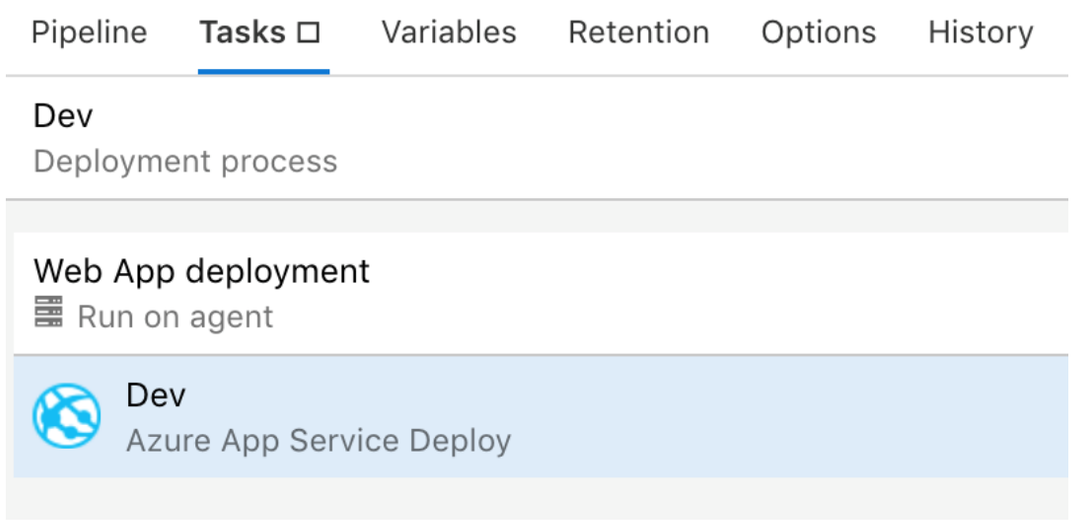
Build

Release

Container Web



Build



Release

AKS

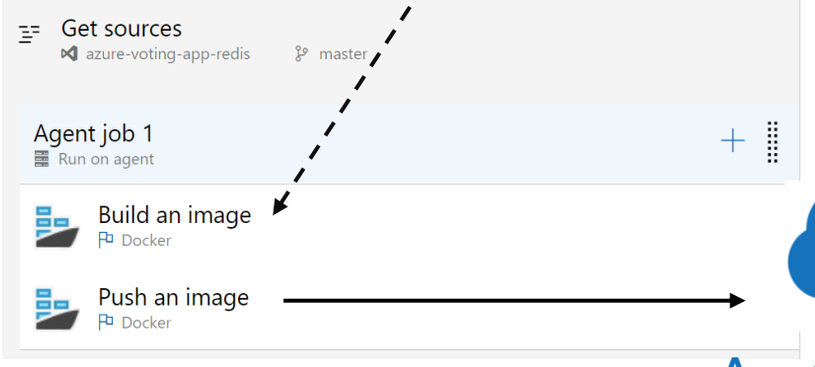
- Build Image

Azure Repos

Dockerfile

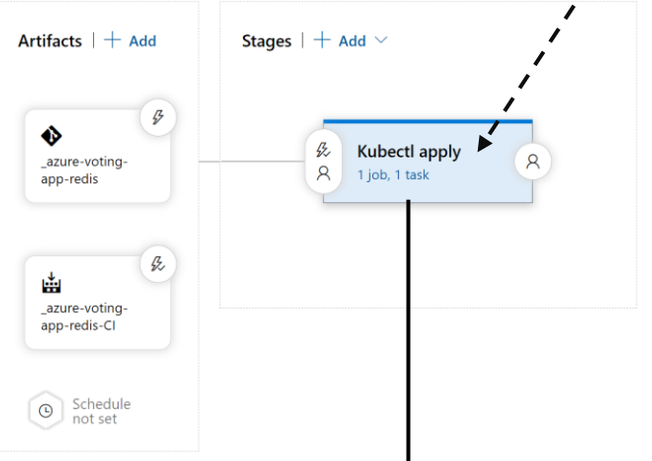
Contents | History | Compare | Blame

```
1 FROM tiangolo/uwsgi-nginx-flask:python3.6
2 RUN pip install redis
3 ADD /azure-vote /app
4
```



Azure Container Registry

- Deploy to AKS



Azure Kubernetes Service

azure-vote-all-in-one-redis.yaml

Contents | History | Compare | Blame

```
1  apiVersion: apps/v1beta1
2  kind: Deployment
3  metadata:
4    name: azure-vote-back
5  spec:
6    replicas: 1
7    template:
8      metadata:
9        labels:
10         app: azure-vote-back
11     spec:
12       nodeSelector:
13         "beta.kubernetes.io/os": linux
14       containers:
15       - name: azure-vote-back
16         image: redis
17         ports:
18         - containerPort: 6379
19           name: redis
20 ---
21 apiVersion: v1
22 kind: Service
23 metadata:
24   name: azure-vote-back
25 spec:
26   ports:
27   - port: 6379
28   selector:
29     app: azure-vote-back
30 ---
31 apiVersion: apps/v1beta1
32 kind: Deployment
33 metadata:
34   name: azure-vote-front
35 spec:
36   replicas: 1
37   strategy:
38     rollingUpdate:
39       maxSurge: 1
40       maxUnavailable: 1
41   minReadySeconds: 5
42   template:
43     metadata:
44       labels:
45         app: azure-vote-front
46     spec:
47       nodeSelector:
48         "beta.kubernetes.io/os": linux
49       containers:
```

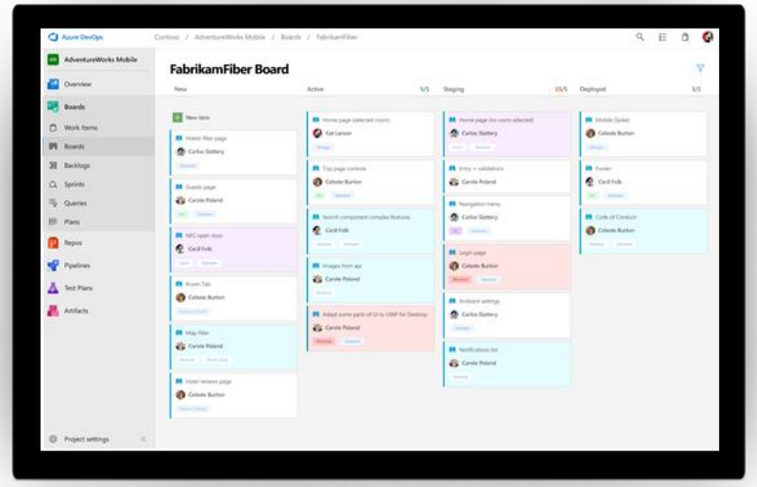
Let’s Hands-on !

https://hackmd.io/@mtcazuredev/r1APoaXnP

Microsoft Technology Centers

Microsoft, trusted by enterprise development teams for decades

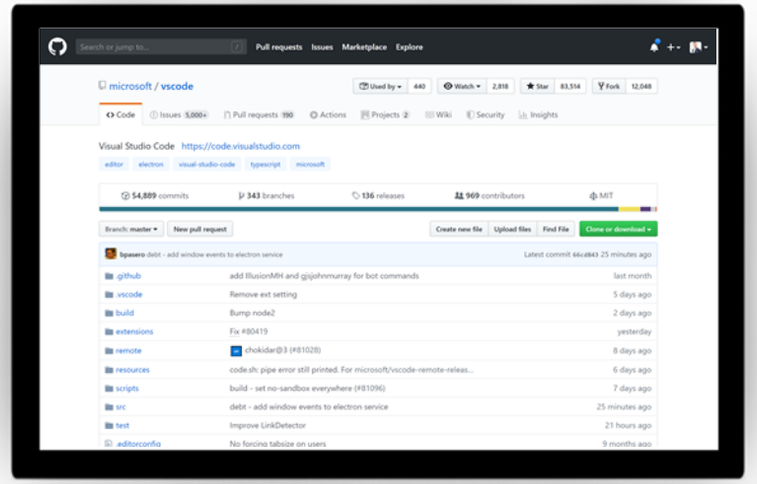
Now committed to the world's largest developer community



Azure DevOps

Empowering 1000s of enterprises

15+ years of developer innovation



GitHub

The home of open source software

50 million+ users

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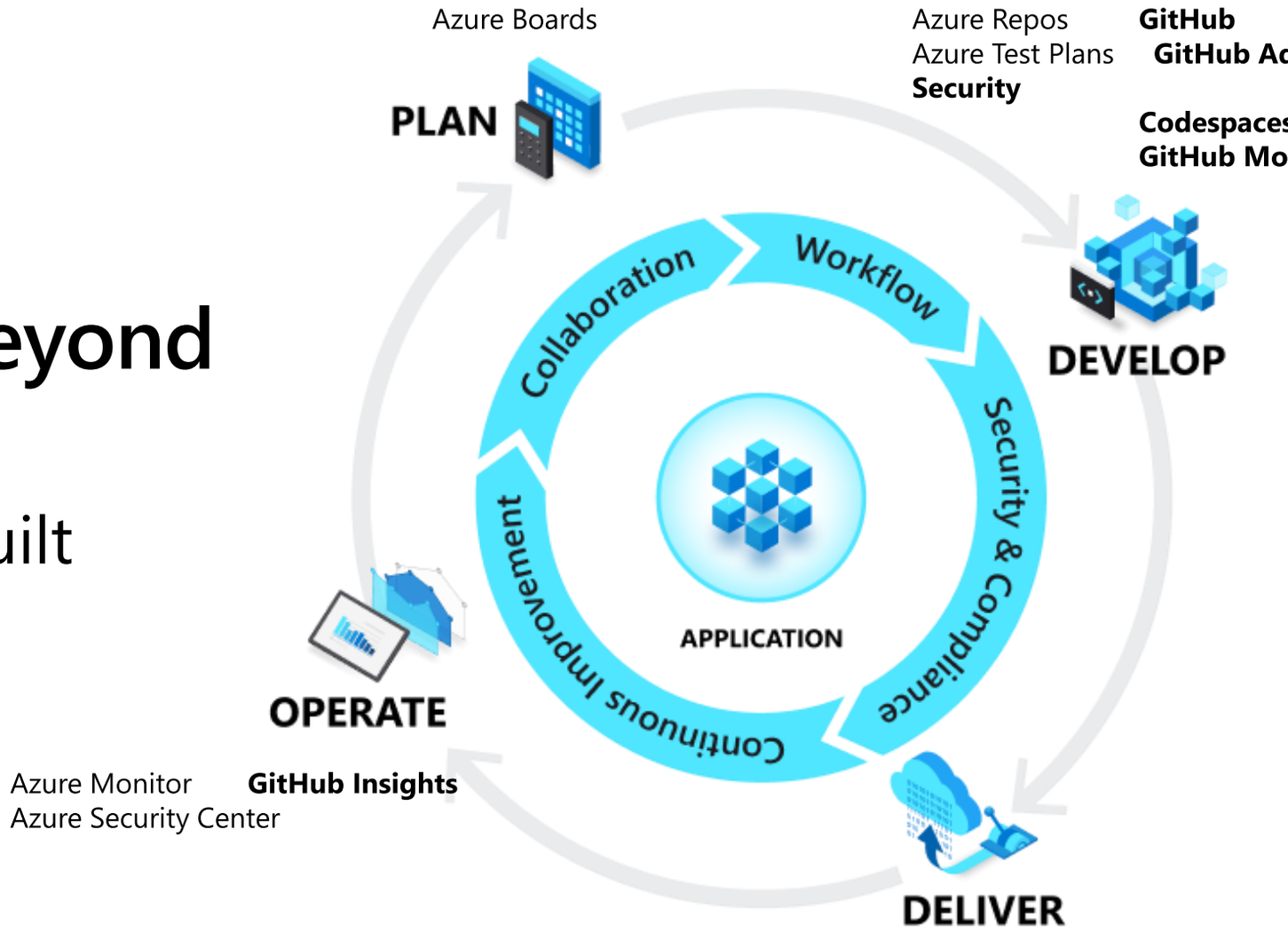
Expanding GitHub beyond the community

Native DevOps platform built on the planet's code-base



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Leveraging an enterprise proven foundation

Source control

Based on Git

Azure Repos

GitHub

CI/CD

Based on the Azure Pipelines technology

Azure Pipelines

GitHub Actions

Code packages

Based on standard, open package formats

Azure Artifacts

GitHub Packages

Microsoft DevOps Engineering Team

GitHub 和開發人員計劃工程團隊位於同一組織中，具有相同的領導能力。

專注於使用 GitHub 構建同類雲的最佳集成。

在 Azure 方案中對 DevOps 進行最佳知識共用。

Automated Delivery – GitHub Action

Automating workflows from code to cloud

Accelerate delivery through automation

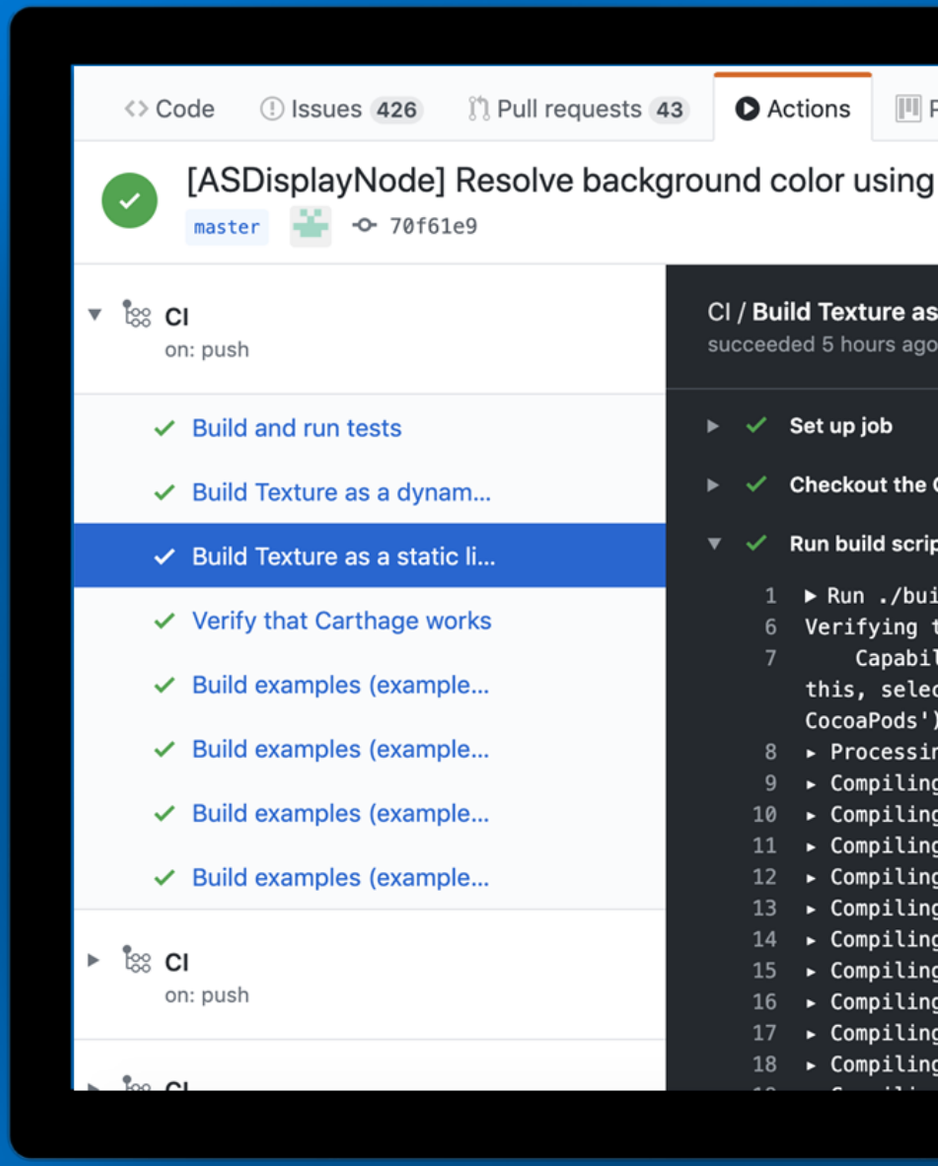
Automation triggers for 20+ project events allows for automation beyond just CI/CD to any available API

Simple and easy to use

Configuration based on YAML with a host of sample workflows to learn from and get started

Global community for actions

Thousands of open source Actions, maintained by the community and by companies offering integrations, including Microsoft Azure



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https://aka.ms/GitHubActionsforAzureDocs

Let’s Hands-on !

Deploy a cloud-native ASP.NET Core microservice with GitHub Actions - Learn | Microsoft Docs

Microsoft