

Azure DevOps Pipelines

박용준 (RedPlus)
Microsoft MVP 2019-2020
www.devlec.com



CI/CD 용어 정리

Continuous Integration

- 자동화 된 빌드 및 테스트 프로세스를 사용하여 코드 변경 사항을 마스터 또는 기본 브랜치로 병합
- 소스 통합/빌드

Continuous Delivery

- 코드가 변경되고 빌드/테스트가 완료되면, 자동으로 미리 지정한 테스트/스테이징/프로덕션 환경으로 게시
- 게시/배포
- Continuous Deployment

마이크로소프트의 DevOps 도구들



Azure Boards



Azure Repos



Azure Pipelines



Azure Kubernetes Service



Azure Test Plans



Azure DevTest Labs



Azure Security Center



Azure Artifacts



Visual Studio App Center



Azure Policy



Azure Monitor



Azure Key Vault

GitHub



Security



Package Registry



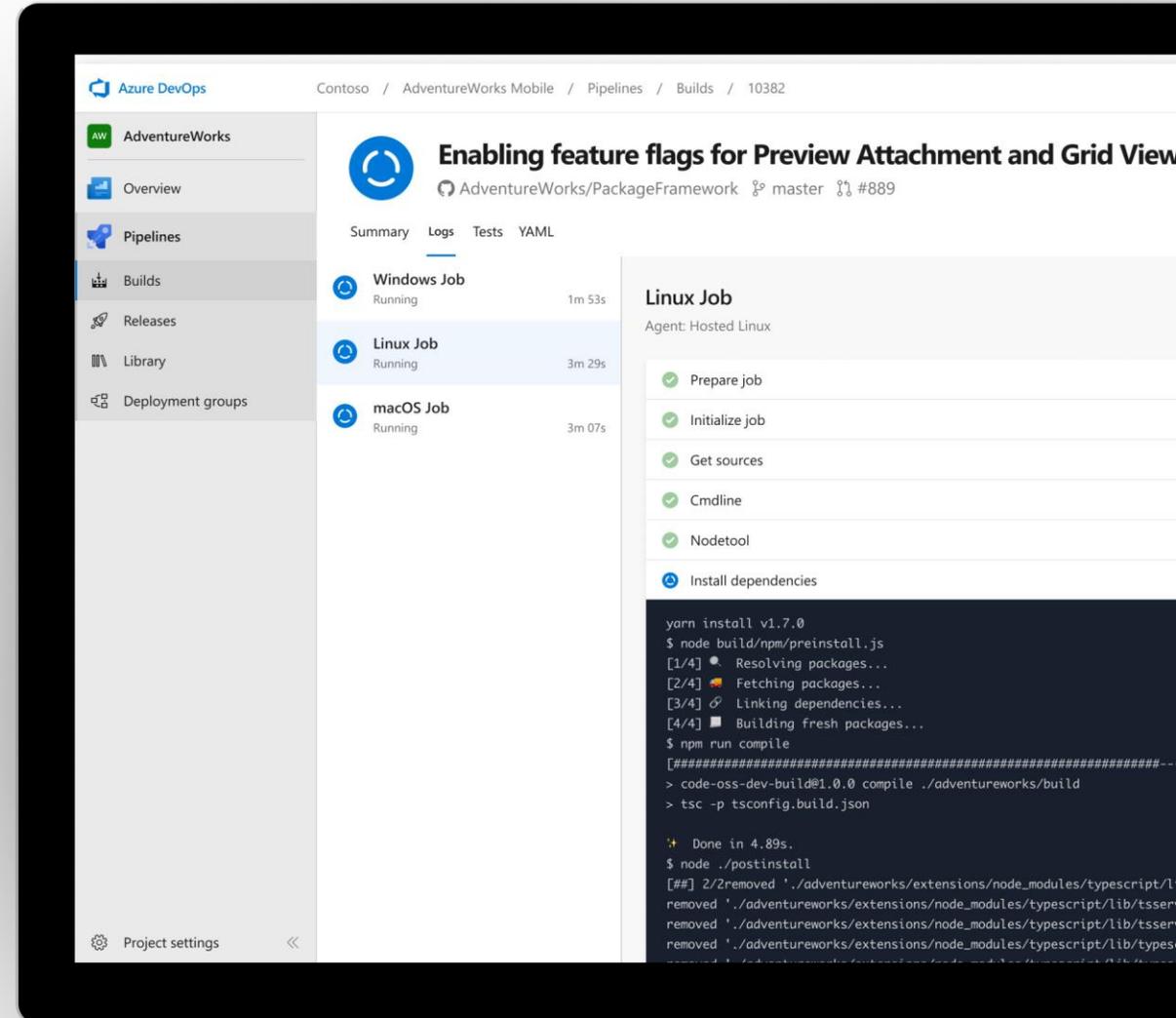
Actions



Azure Pipelines

즉시 배포

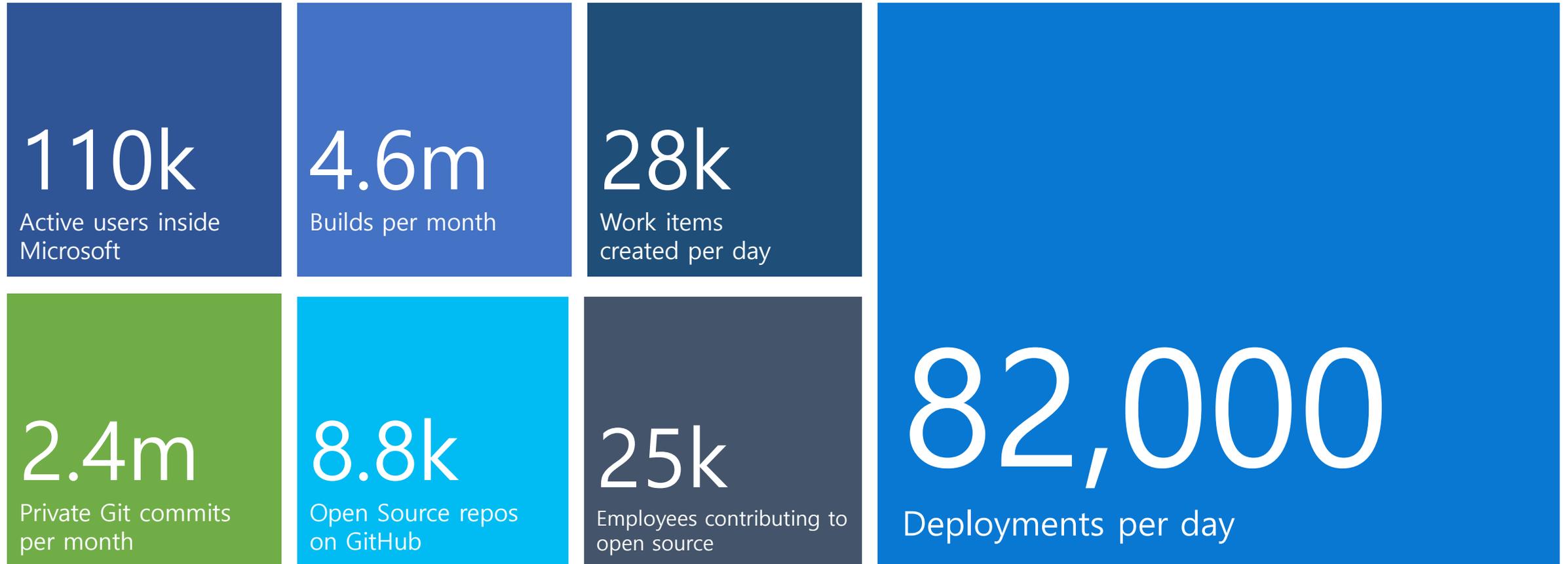
- 커밋마다 코드를 자동으로 빌드하고 테스트
- 클라우드 호스트된 파이프라인
 - Linux, macOS, Windows
- 모든 언어, 모든 플랫폼, 모든 클라우드
- 컨테이너 및 Kubernetes에 대한 기본 지원



<https://azure.com/pipelines>

마이크로소프트의 DevOps 엿보기

→ <https://aka.ms/DevOpsAtMicrosoft>



TODO: Azure DevOps CI/CD

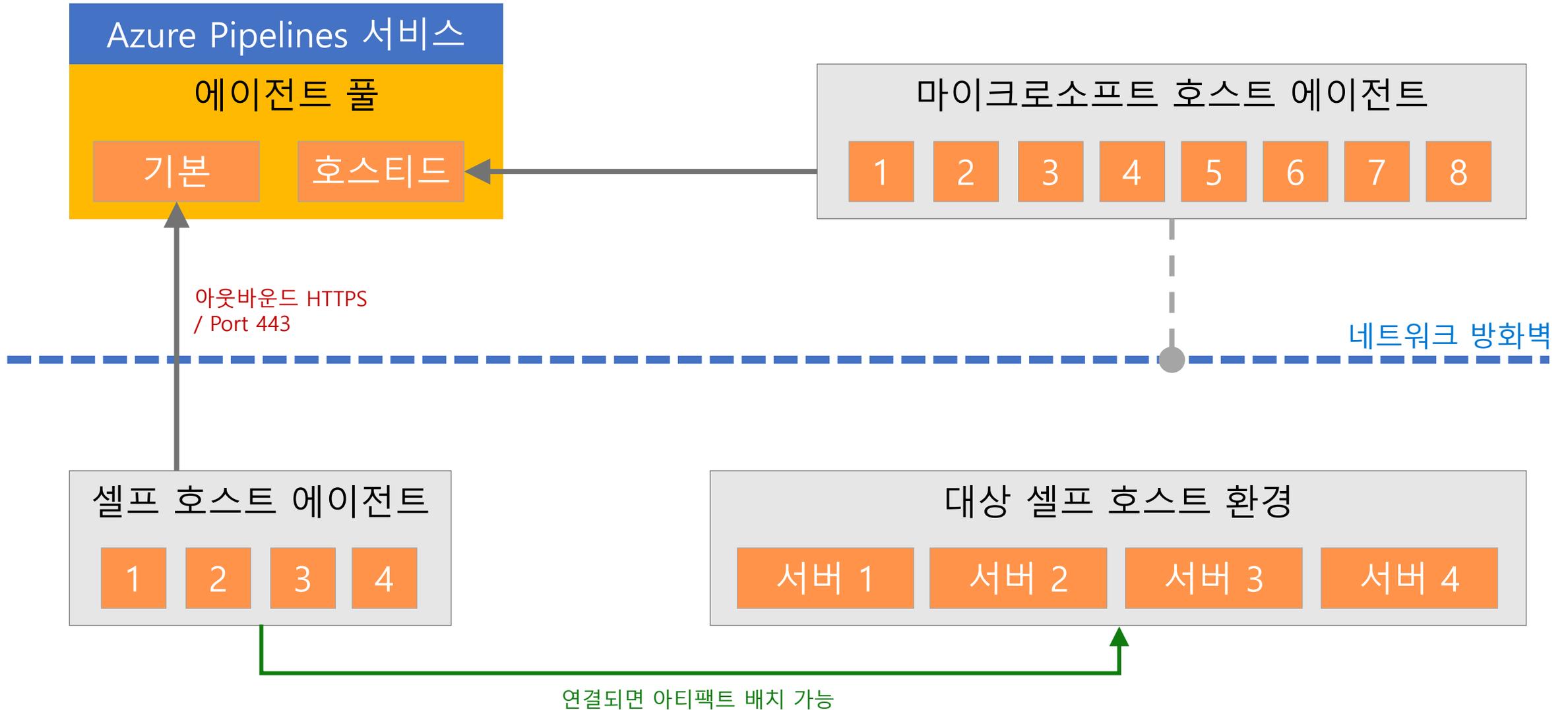
- 자동 빌드
 - Azure DevOps를 사용하여 프로젝트를 **자동 빌드** 후 Azure 웹 앱에 게시하기
- 자동 릴리스
 - Azure DevOps를 사용하여 프로젝트를 자동 빌드 및 **자동 릴리스** 후 Azure 웹 앱에 게시하기
- 승인
 - Azure DevOps를 사용하여 프로젝트를 자동 빌드 및 자동 릴리스 후 Azure 웹 앱에 **스태이징**에 게시 후 **승인** 후 Azure 웹 앱의 **프로덕션**에 게시하기

Demo:

SpringBootHelloWorld
빌드/릴리스 파이프라인
살펴보기



Azure Pipelines 작동 방식: 강의 -> MS





Azure Pipelines - 빌드

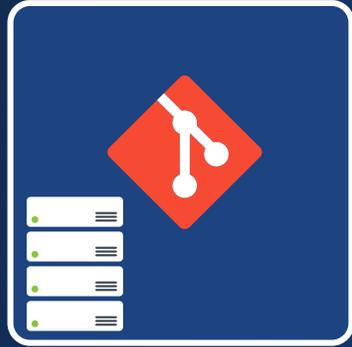
Windows, Linux, macOS 지원 포함



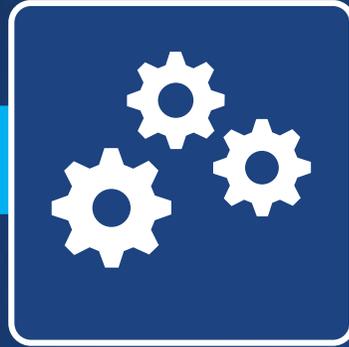
 <https://azure.com/pipelines>

DevOps

2) 코드 리포지토리



3) 빌드



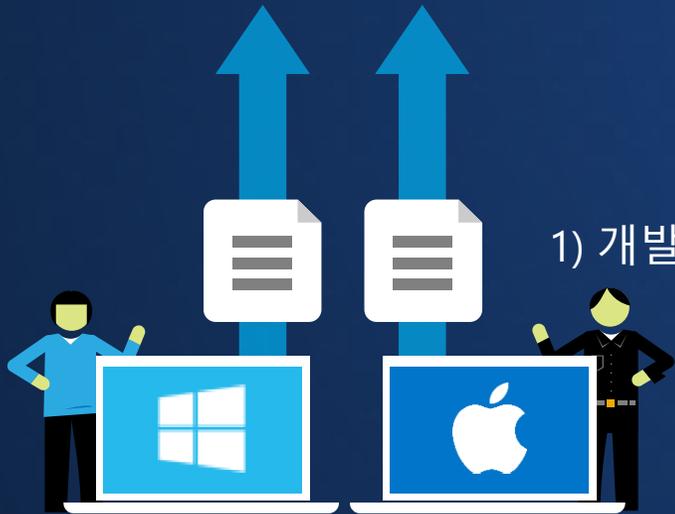
4) 테스트



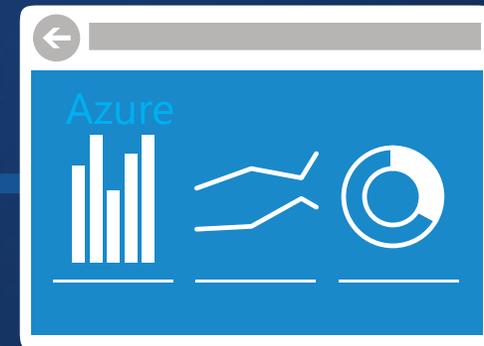
5) 클라우드로 게시



1) 개발자



6) 모니터링 및 개선



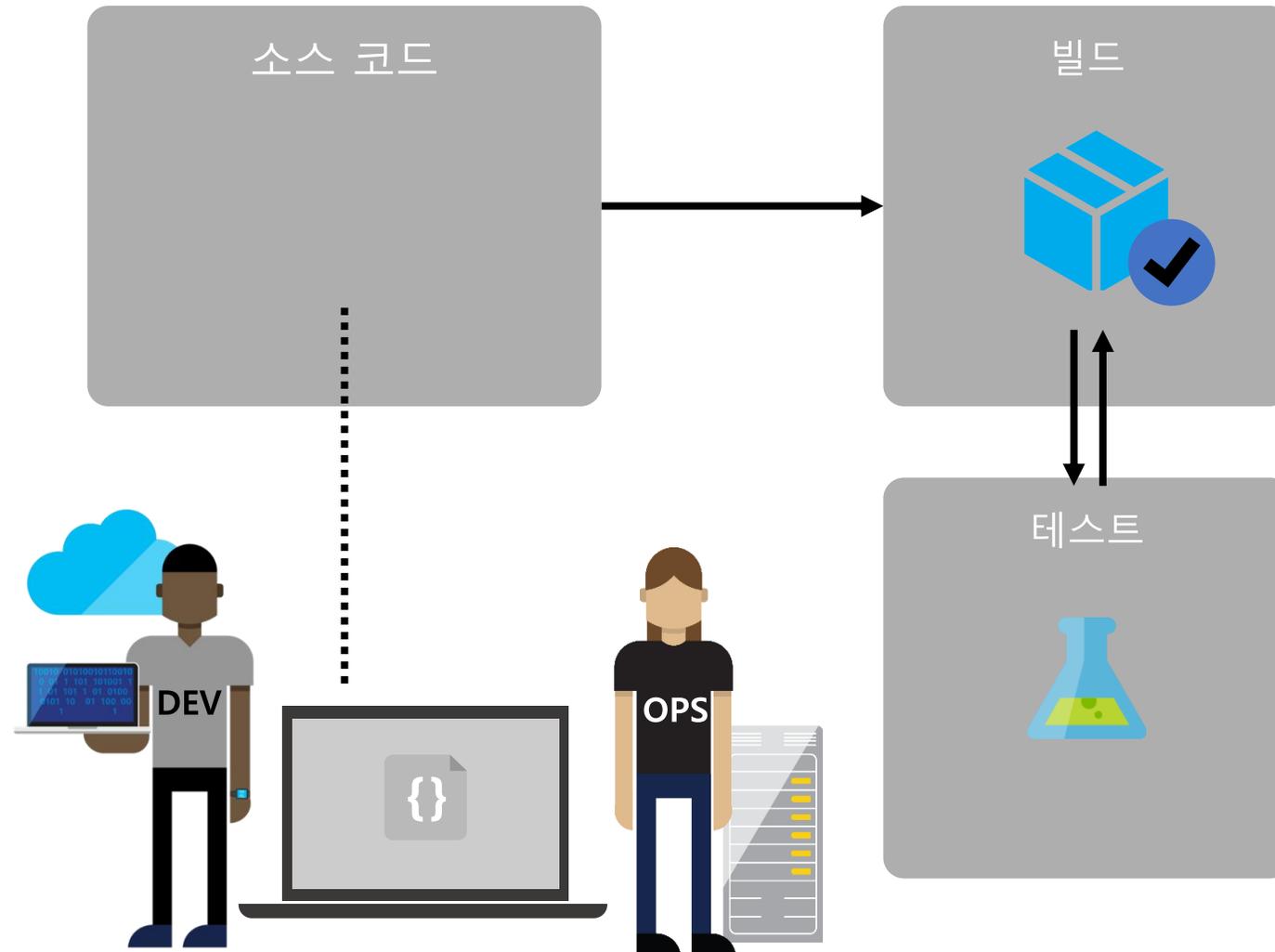


개발 + 테스트

개발이 시작되면,
개발자는 아이디어(요구사항)을
실제 기능으로 구현



지속적인 통합(Continuous Integration)



실습:
지속적인 통합(Continuous Integration)
연속적인 통합(?)



My organizations

- w webcamp

Related pages

- What's new in DevOps
- Documentation
- Get help

+ New organization

⚙ Organization settings

Create a project to get started

Project name *

 ✓

Description

Visibility

<p> Public ⓘ</p> <p>Anyone on the internet can view the project. Certain features like TFVC are not supported.</p>	<p> Private <input checked="" type="radio"/></p> <p>Only people you give access to will be able to view this project.</p>
---	--

Public projects are disabled for your organization. You can turn on public visibility with [organization policies](#).

∨ Advanced

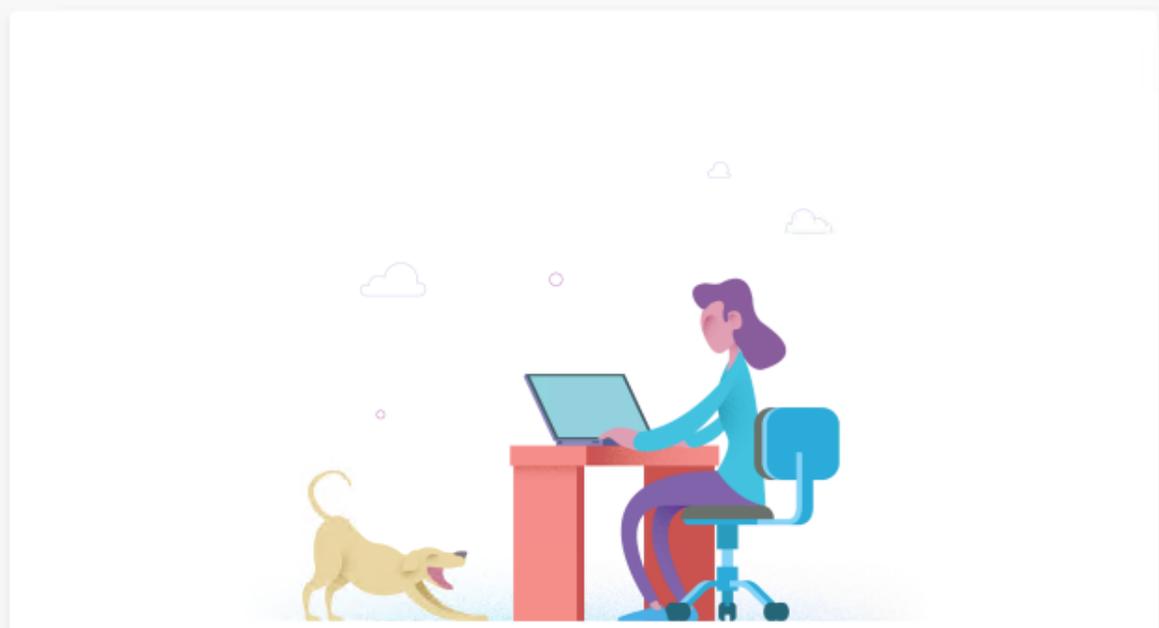
+ Create project

- DotNetNoteChats +
- Overview
- Summary
- Dashboards
- Wiki
- Boards
- Repos
- Pipelines
- Test Plans
- Artifacts
- Project settings <<

Full access to Azure Pipelines for Stakeholders: Give Stakeholders full access to Azure Pipelines for private projects. [Learn more](#) **Try it!** Not now

DotNetNoteChats

Private Invite



Welcome to the project!

What service would you like to start with?

Project stats



No stats are available at this moment
Setup a service to see project activity.

- DotNetNoteChats +
- Overview
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- Pipelines**
- Builds
- Releases
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- Test Plans
- Project settings <<



Select your repository

Tell us where your sources are.
You can customize how to get these sources from the repository later.

Select a source

- Azure Repos Git
- GitHub
- GitHub Enterprise
- Subversion
- Bitbucket Cloud
- External Git

Team project

DotNetNoteChats

Repository

DotNetNoteChats

Default branch for manual and scheduled builds

master

DotNetNoteChats +

- Overview
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Choose a template

Choose a template that builds your kind of app.
Don't worry if it's not an exact match;
you can add and customize the tasks later.

Select a template

Or start with an [Empty job](#)

Search [input]

Featured

-  **.NET Desktop**
Build and test a .NET or Windows classic desktop solution.
-  **Android**
Build, test, sign, and align an Android APK.
-  **ASP.NET**
Build and test an ASP.NET web application.
-  **Azure Web App for ASP.NET**
Build, package, test, and deploy an ASP.NET Azure Web App.
-  **Docker container**
Build a Docker image and push it to a container registry.
-  **Maven**
Build and test a Java project with Apache Maven.
-  **Python package**
Create and test a Python package on multiple Python

DotNetNoteChats +

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DotNetNoteChats-Azure Web...

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

Pipeline Some settings need attention

Get sources
DotNetNoteChats master

Agent job 1
Run on agent

- Use NuGet 4.4.1
NuGet Tool Installer
- NuGet restore
NuGet
- Build solution **W*.sln
Visual Studio Build
- VsTest - testAssemblies
Visual Studio Test
- Azure App Service Deploy:
Some settings need attention
- Publish symbols path

View YAML

Name *
DotNetNoteChats-Azure Web App for ASP.NET-CI

Agent pool * | Pool information | Manage
Hosted VS2017

Parameters | Unlink all

Solution *
**W*.sln

Azure subscription * | Manage
This setting is required.

App service name *
This setting is required.

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DotNetNoteChats-Azure Web...

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

Pipeline Build pipeline

Get sources DotNetNoteChats master

Agent job 1 Run on agent

- Use NuGet 4.4.1 NuGet Tool Installer
- NuGet restore NuGet
- Build solution **W*.sln Visual Studio Build
- VsTest - testAssemblies Visual Studio Test
- Azure App Service Deploy: dotnetnotechats Azure App Service Deploy
- Publish symbols path

View YAML

Name * DotNetNoteChats-Azure Web App for ASP.NET-CI

Agent pool * Hosted VS2017

Parameters Unlink all

Solution * **W*.sln

Azure subscription * Visual Studio Enterprise

App service name * dotnetnotechats

Azure DevOps navigation sidebar:

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Queue build for DotNetNoteChats-Azure Web App for ASP...

Agent pool: **Hosted VS2017**

Branch: **master**

Commit:

Variables Demands

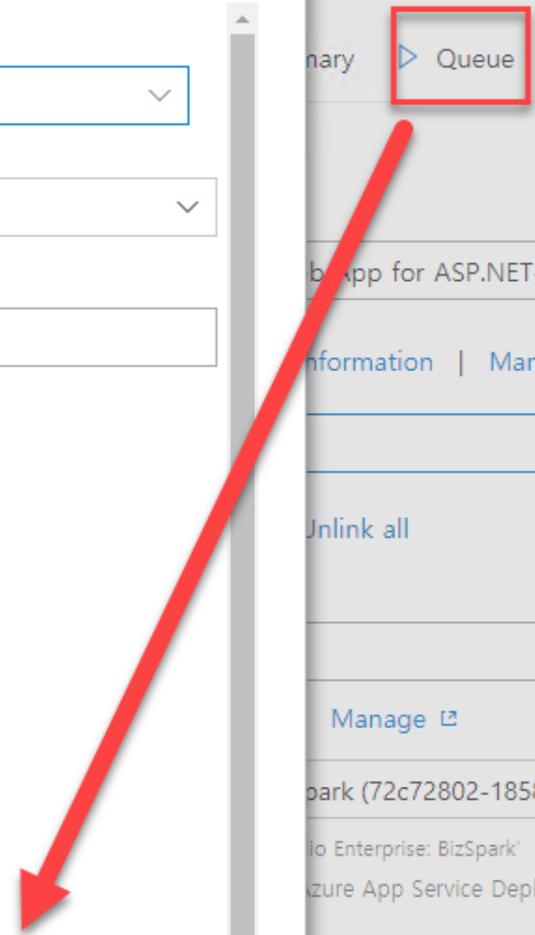
BuildConfiguration	release
BuildPlatform	any cpu
system.debug	false

+ Add

Queue Cancel

Build definition details:

- Queue
- View YAML
- App for ASP.NET-CI
- Information | Manage
- Unlink all
- Manage
- park (72c72802-1858-4eb2-8t
- to Enterprise: BizSpark
- azure App Service Deploy:



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DotNetNoteChats-Azure Web...

Build #20181207.1 has been queued.

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

Pipeline Build pipeline

Get sources DotNetNoteChats master

Agent job 1 Run on agent

- Use NuGet 4.4.1 NuGet Tool Installer
- NuGet restore NuGet
- Build solution **W*.sln Visual Studio Build
- VsTest - testAssemblies Visual Studio Test
- Azure App Service Deploy: dotnetnotechats

Name * DotNetNoteChats-Azure Web App for ASP.NET-CI

Agent pool * Hosted VS2017

Parameters * Unlink all

Solution * **W*.sln

Azure subscription * Visual Studio Enterprise: BizSpark (72c72802-1858-4eb2-8bc9)

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#20181207.1: ASP.NET Core 프로젝트 생성

Cancel build ...

Manually run just now by WebCamp DotNetNoteChats master f3d4d25

Logs Summary Tests

Agent job 1 Job

Started: 2018. 12. 8. 오전 7:09:26

Pool: Hosted VS2017 · Agent: Hosted Agent

20s

Initialize Agent · succeeded	1s
Initialize job · succeeded	8s
Checkout · succeeded	9s
Use NuGet 4.4.1 · succeeded	<1s

NuGet restore 2s

```

*****
Starting: NuGet restore
*****
=====
Task       : NuGet
Description : 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.
Version    : 2.144.0
  
```

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Logs Summary Tests

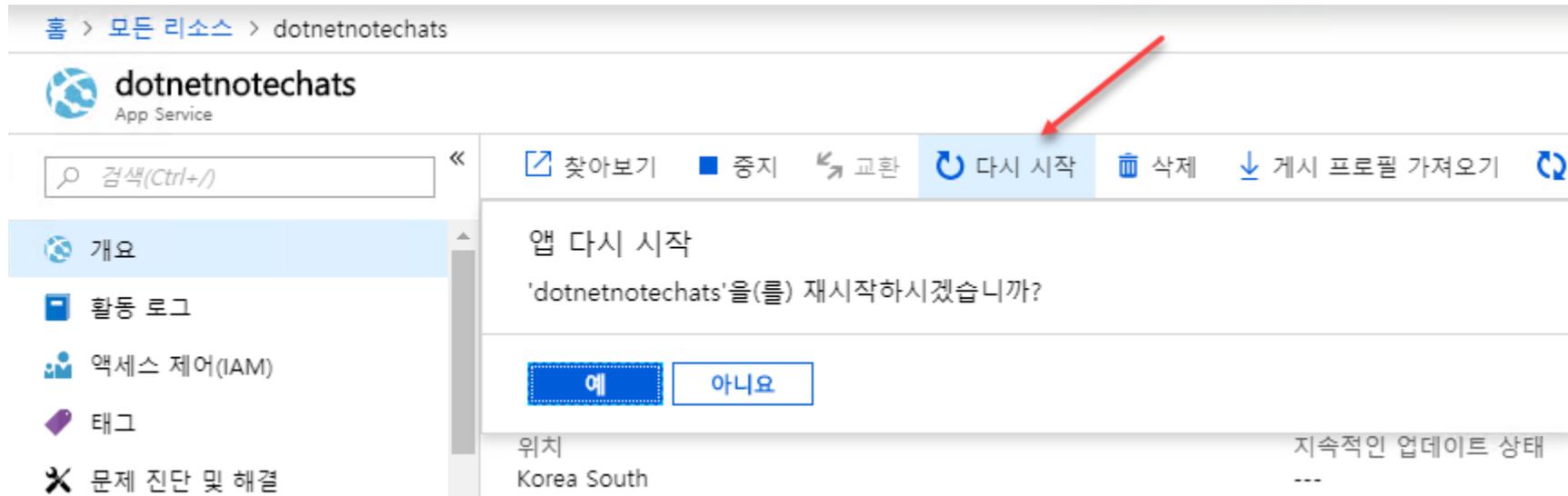
Use NuGet 4.4.1	· succeeded	<1s
NuGet restore	· succeeded	26s
Build solution ***.sln	· succeeded	23s
VsTest - testAssemblies	· succeeded 1 warning	2s
Azure App Service Deploy: dotnetnotechats	· 3 errors 1 warning	47s

Failed to deploy web package to App Service.
Error Code: ERROR_FILE_IN_USE
More Information: Web Deploy cannot modify the file 'DotNetNoteChats.dll' on the destination because it is locked by an external process. In order to allow the publish operation to succeed, you may need to either restart your application to release the lock, or use the AppOffline rule handler for .Net applications on your next publish attempt. Learn more at: http://go.microsoft.com/fwlink/?LinkId=221672#ERROR_FILE_IN_USE.
Error count: 1.
Error: C:\Program Files\IIS\Microsoft Web Deploy V3\msdeploy.exe failed with return code: 4294967295

Publish symbols path	· skipped	
Publish Artifact: drop	· skipped	
Post-job: Checkout	· succeeded	<1s
Report build status	· succeeded	<1s

초간단 해결: 다시 시작

- 더 좋은 방법: 스테이징 사용



DotNetNoteChats

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Search all pipelines

+ New

- DotNetNoteChats-Azure Web A...**
master

DotNetNoteChats-Azure Web App f...

Edit Queue

History Analytics*

Commit	Build #
 제목 변경 CI build for WebCamp	 20181207.2
 ASP.NET Core 프로젝트 생성 Manual build for WebCamp	 20181207.1



There are powerful new features in Visual Studio for building modern web apps. [Learn More](#)



Application uses

- Sample pages using ASP.NET Core MVC
- Theming using [Bootstrap](#)

How to

- [Add a Controller and View](#)
- [Manage User Secrets using Secret Manager.](#)
- [Use logging to log a message.](#)
- [Add packages using NuGet.](#)
- [Target development, staging or production environment.](#)

Overview

- [Conceptual overview of what is ASP.NET Core](#)
- [Fundamentals of ASP.NET Core such as Startup and middleware.](#)
- [Working with Data](#)
- [Security](#)
- [Client side development](#)
- [Develop on different platforms](#)
- [Read more on the documentation](#)

Run & Deploy

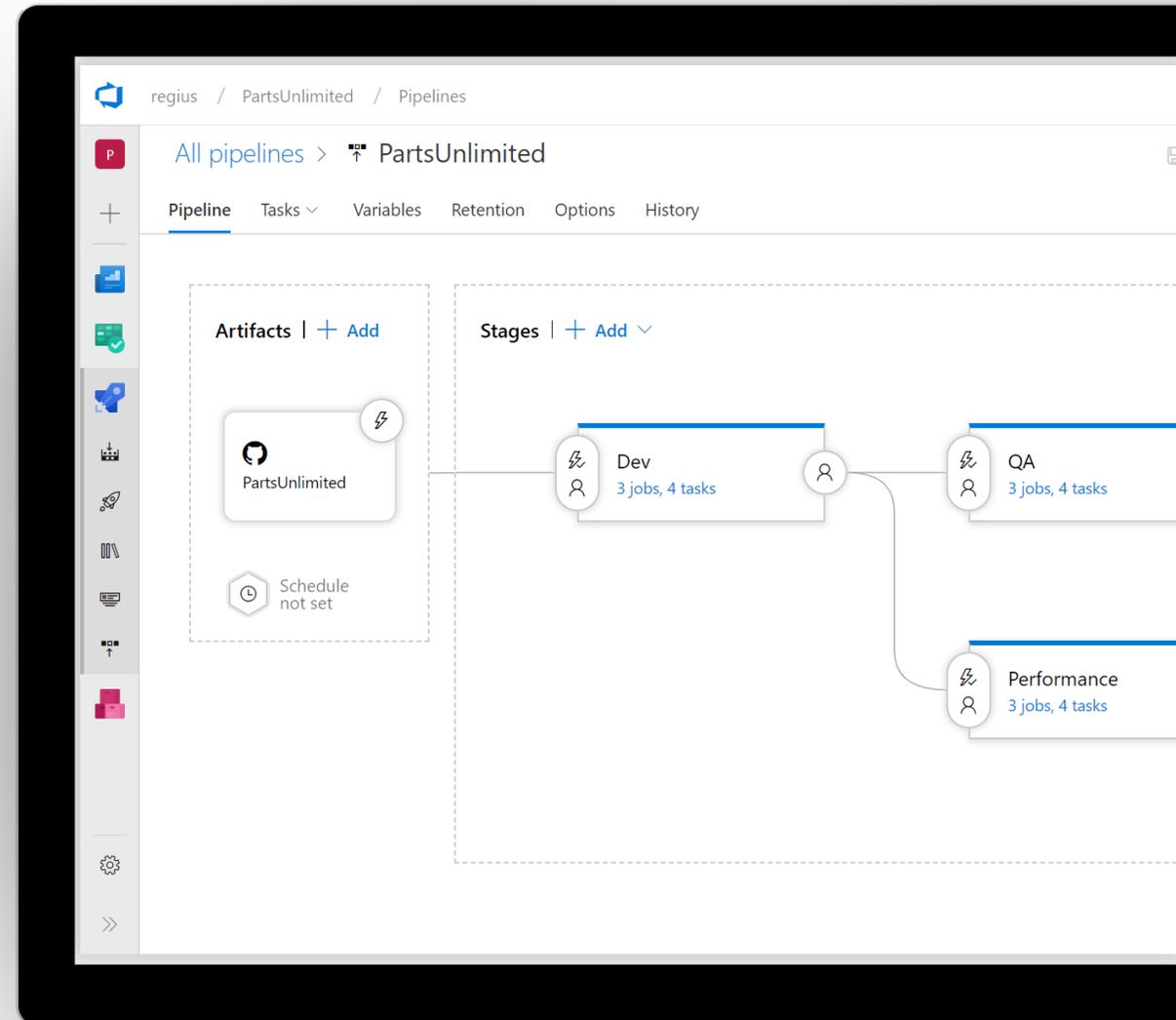
- [Run your app](#)
- [Run tools such as EF migrations and more](#)
- [Publish to Microsoft Azure Web Apps](#)



Azure Pipelines - 릴리스

더 많은 지원으로 더 빠르게 배포

- 모든 클라우드 또는 온-프레미스로 배포
- 승인 및 추적 가능
- Kubernetes, Serverless, ML 또는 VM에 대한 기본 지원
- Classic UI -또는- YAML 기반 워크플로
- GitHub 통합

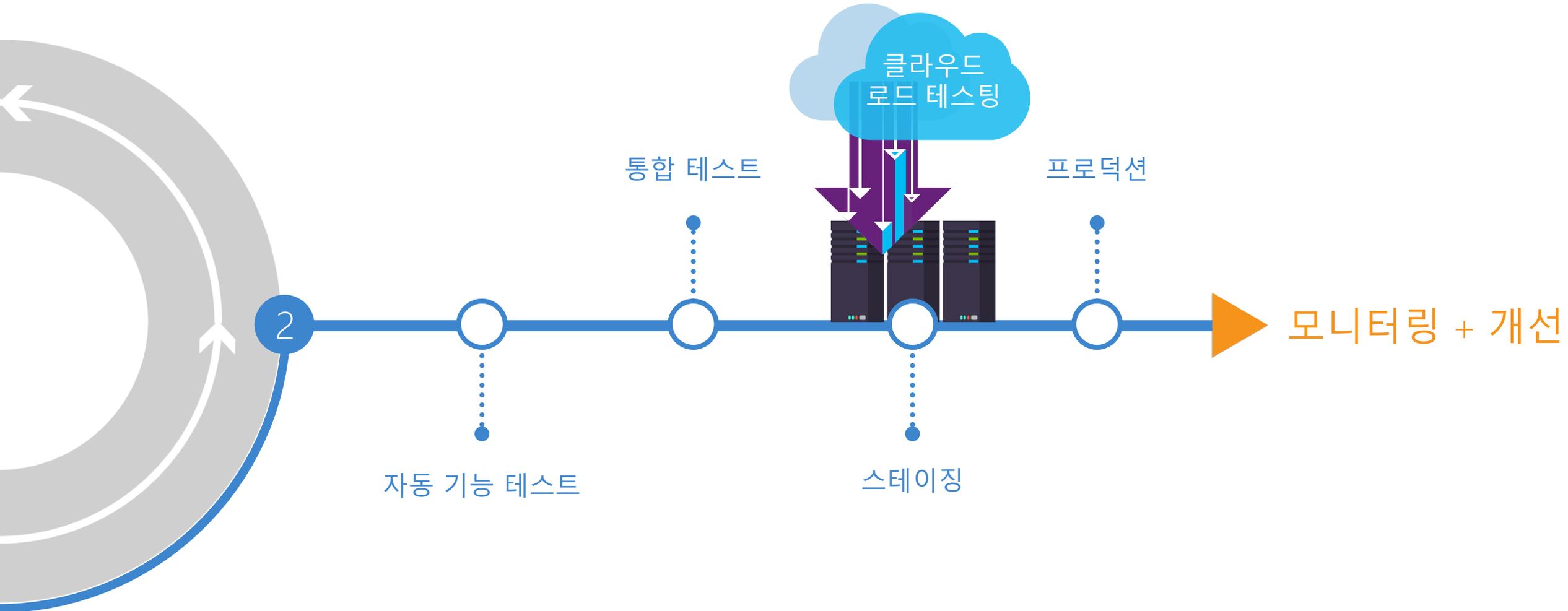


<https://azure.com/pipelines>

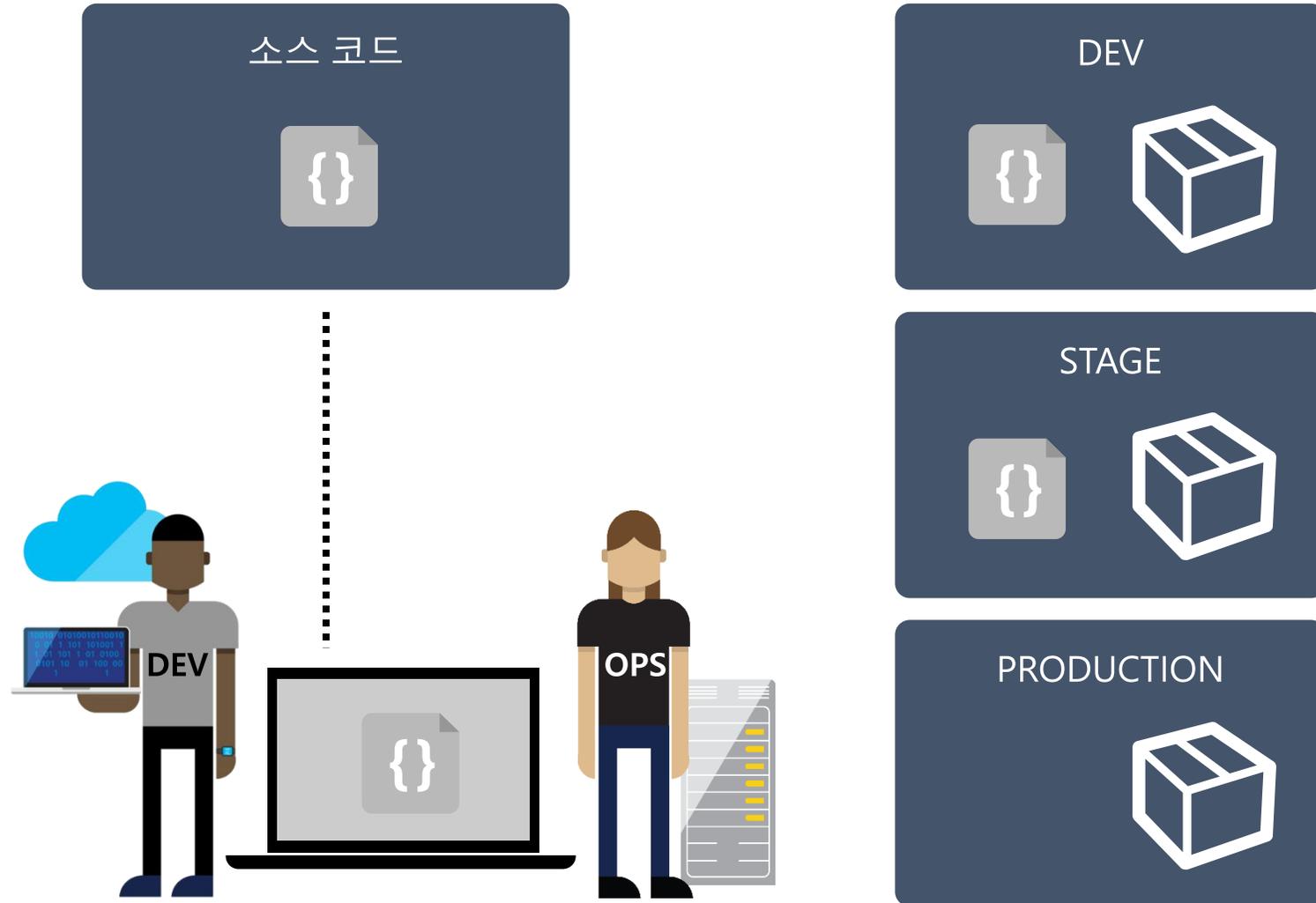


릴리스

모든 테스트가 통과되면 빌드는 릴리스 프로세스의 각 단계에 대한 테스트 환경에 배포됩니다.



릴리스



Demo:
지속적인 배포
(Continuous Deployment, Continuous Delivery)





DotNetNoteChat +

Overview

Boards

Repos

Pipelines

Builds

Releases

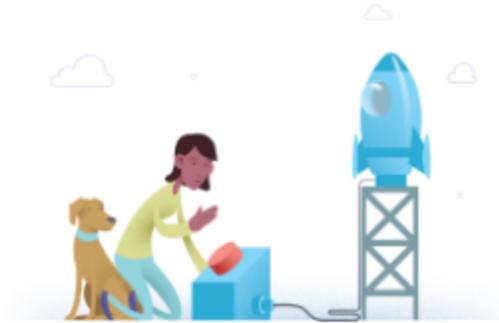
Library

Task groups

Deployment groups

Test Plans

Artifacts



No release pipelines found

Automate your release process in a few easy steps with a new pipeline

New pipeline



Azure DevOps

redplus / DotNetNoteC

DotNetNoteChat

Overview

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All pipelines >

Pipeline Tasks

+ Add

Stage 1
Select a template

Select a template

Or start with an [Empty job](#)

Featured



Azure App Service deployment

Deploy your application to Azure App Service. Choose from Web App on Windows, Linux, containers, Function Apps, or WebJobs.

Apply



Deploy a Java app to Azure App Service

Deploy a Java application to an Azure Web App.



Deploy a Node.js app to Azure App Service

Deploy a Node.js application to an Azure Web App.



Deploy a PHP app to Azure App Service and Azure Database for MySQL

Deploy a PHP application to an Azure Web App and



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All pipelines > New release pipeline

Save + Release ...

Pipeline Tasks Variables Retention Options History

+ Add

Stage 1
1 job, 1 task

Stage

Stage 1

Delete Move ...

Properties

Name and owners of the stage

Stage name

Stage 1

Stage owner

RedPlus

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All pipelines > New release pipeline

Save + Release ...

Pipeline **Tasks** Variables Retention Options History

Stage 1

Deployment process

Run on agent

Run on agent

Deploy Azure App Service

Azure App Service Deploy

Stage name

Stage 1

Parameters



Unlink all

Azure subscription *

Manage

Azure Sponsorship



Managed Service Identity service connection scope is limited to access granted to the Azure virtual machine running the agent. Ensure that the VM has access to specified resources.

App type

Web App

App service name *

dotnetnotechat



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All pipelines > New release pipeline

Save + Release ...

Pipeline **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

Stage name

Stage 1

Parameters

Unlink all

Azure subscription *

Manage

Microsoft Azure Sponsors

Authorize

Click Authorize to configure an Azure service connection

App type

Web App

App service name *

This setting is required.

Save



Folder *

Comment

OK

Cancel



DotNetNoteChat



All pipelines > **New release pipeline**

Save

+ Release



Overview

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Pipeline **Tasks** Variables Retention Options History

Stage 1

Deployment process

Run on agent

Run on agent



Deploy Azure App Service

Azure App Service Deploy

Azure App Service Deploy

Version

3.*

Display name *

Deploy Azure App Service

Azure subscription *

[Manage](#)

Azure Sponsorship

Managed Service Identity service connection scope is limited to access granted to the Azure virtual machine running the agent. Ensure that the VM has access to specified resources.

App type *



Create a new release

New release pipeline

 Pipeline ^

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

 Stage 1

Stages for a trigger change from automated to manual. 

- Stage 1 
- Stage 1

Release description



All pipelines > **New release pipeline**

Save + Release ▾ ...

✔ Release [Release-1](#) has been created



Pipeline **Tasks** ▾ Variables Retention Options History

Stage 1

Deployment process



Run on agent

Run on agent



Deploy Azure App Service

Azure App Service Deploy



Azure App Service Deploy ⓘ

Version 3.* ▾

Display name *

Deploy Azure App Service

Azure subscription *

| [Manage](#)

↑ New release pipeline > Release-1 ↓

Pipeline Variables History | + Deploy ↓ ⓧ Cancel ↻ Refresh ✎ Edit release ...

Release

Manually triggered

by  RedPlus

2018. 12. 7. 오전 5:29

Artifacts

① No artifacts

Stages

Stage 1

Not deployed



DotNetNoteChat



New release pipeline > Release-1

Help

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Pipeline

Variables

History

+ Deploy

Cancel

Refresh

Edit release

...



Release

Manually triggered

by RedPlus

2018. 12. 7. 오전 5:29

Artifacts

No artifacts

Stages

Stage 1

Not deployed

Deploy

Logs

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↑ New release pipeline > Release-1

📄 Help

Pipeline Variables History | + Deploy ▾ ⏹ Cancel ↻ Refresh ✎ Edit release ... ↗



Stage 1

Deploy release

Overview

To be deployed (Deploying for the first time)
Release-1

Artifacts

📄 No artifact is associated with this release.

Comment

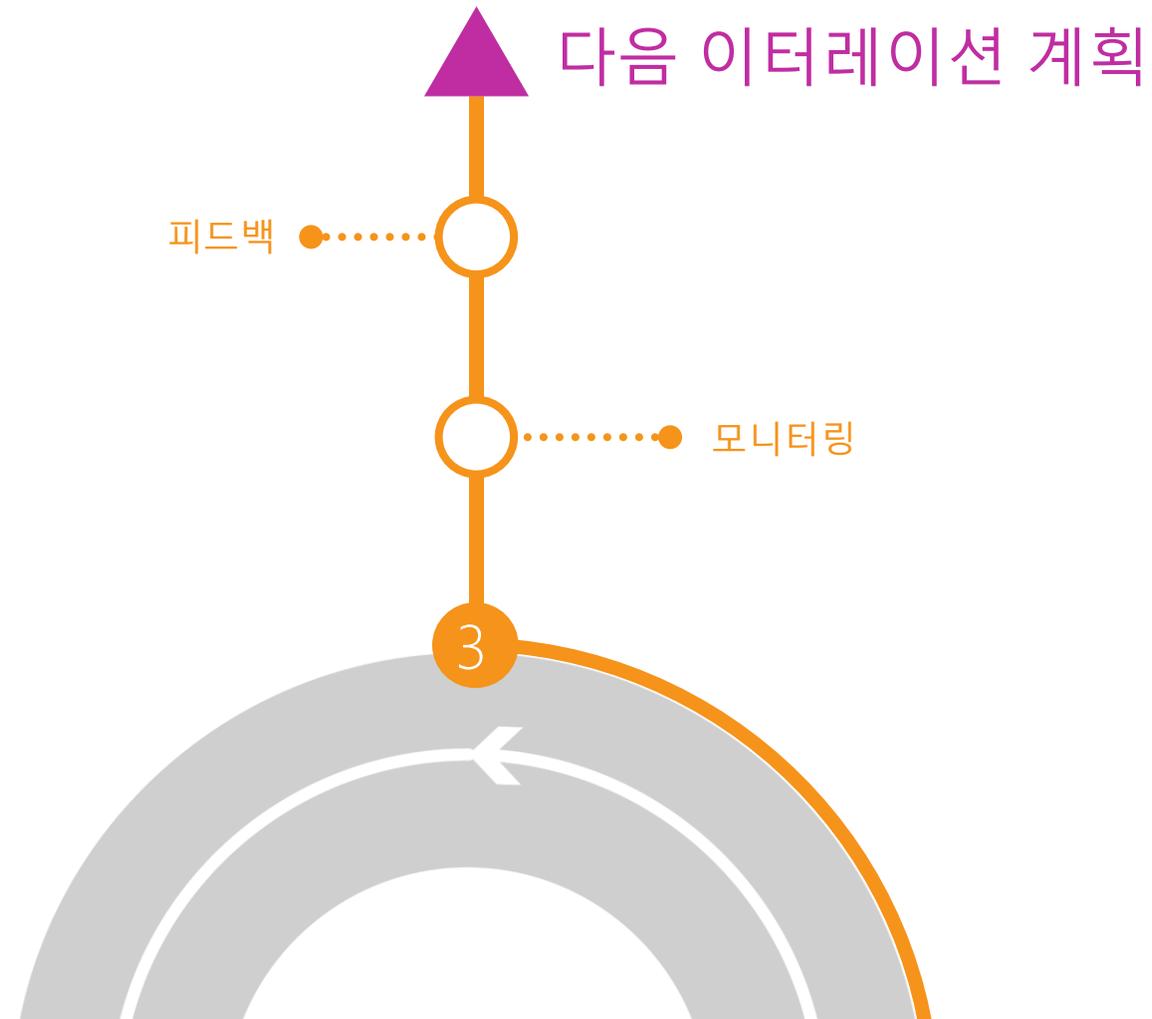
Deploy Cancel



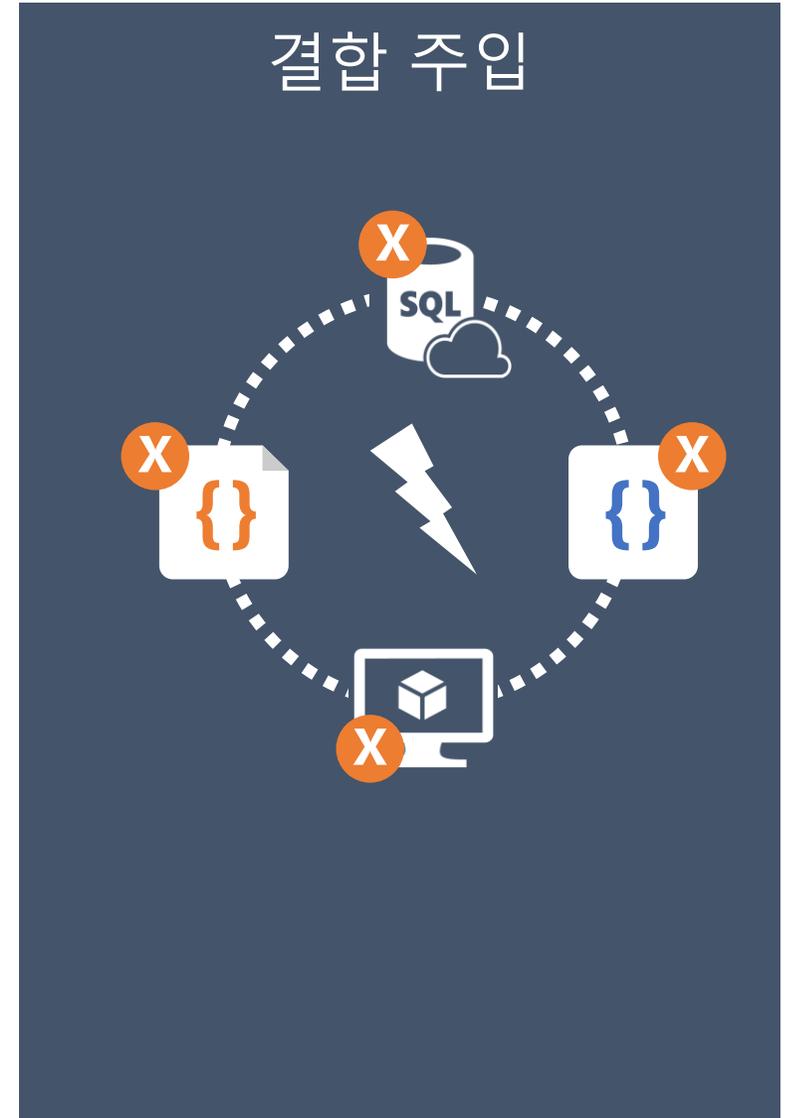
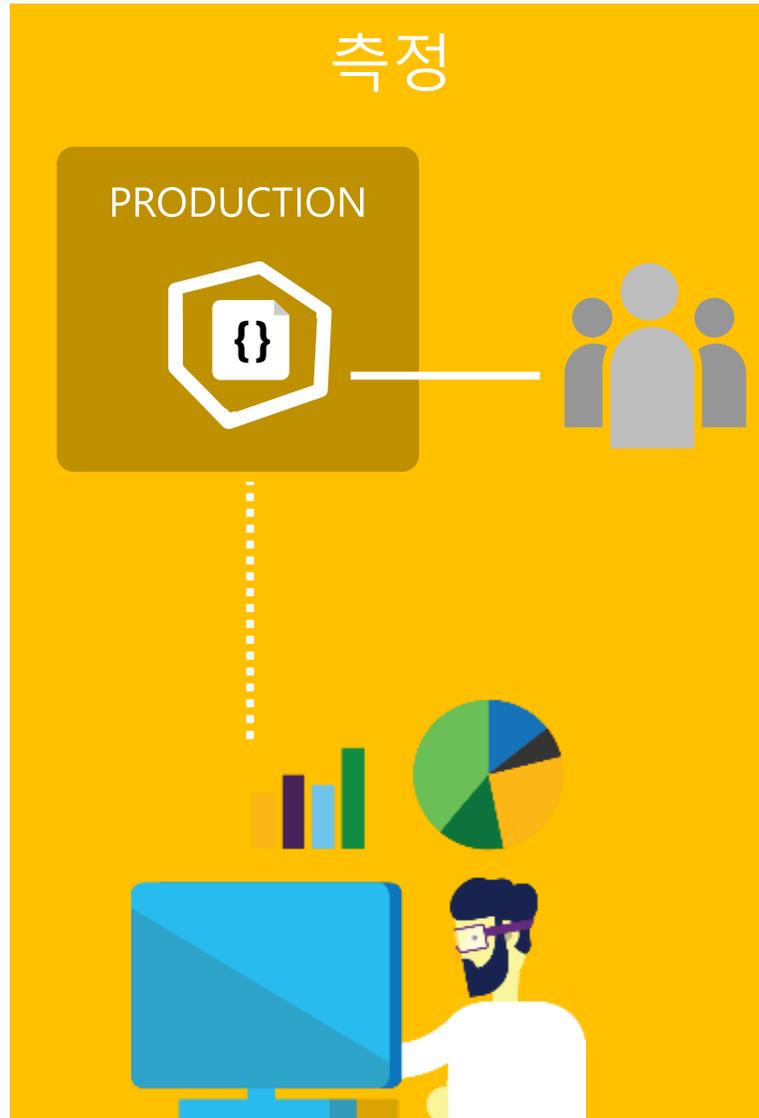
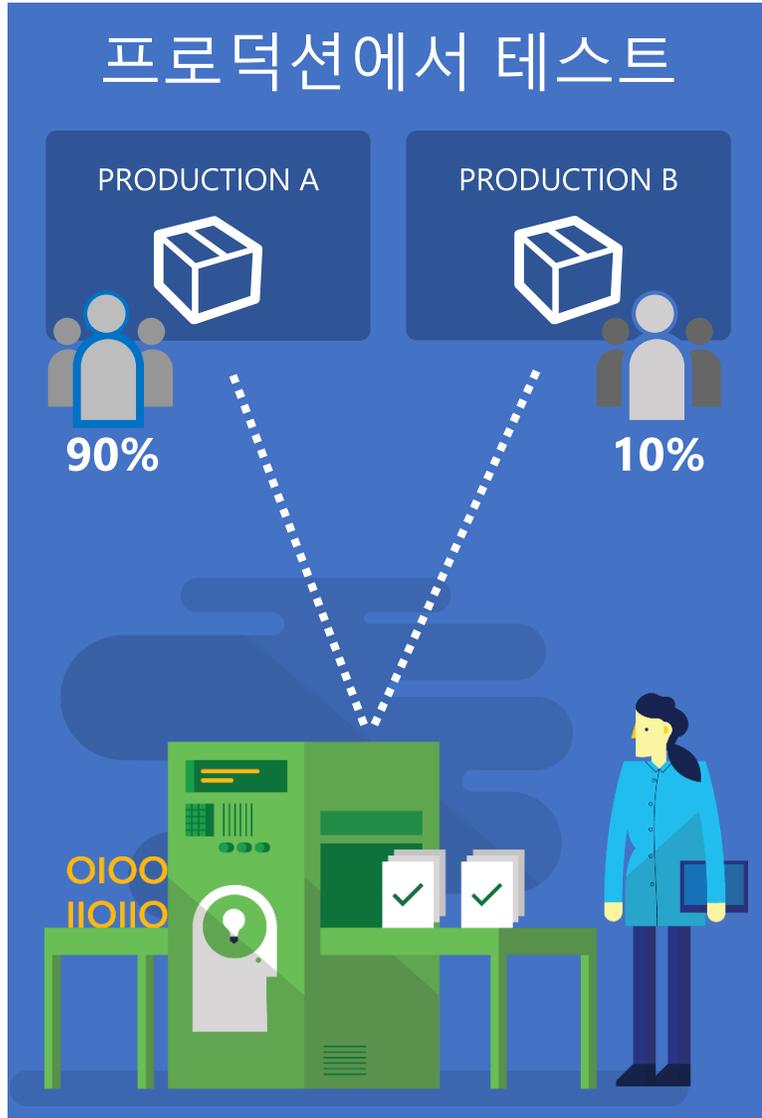


모니터링 + 피드백

사용자가 앱을 사용하는 방법 및
앱에 대한 문제 및 버그에 대한 피드백 제공



모니터링 + 피드백



집에서 더 학습하기

- Azure Pipelines – Build
 - <https://channel9.msdn.com/Shows/Visual-Studio-Toolbox/Azure-Pipelines-Build>
- Azure Pipelines – Release
 - <https://channel9.msdn.com/Shows/Visual-Studio-Toolbox/Azure-Pipelines-Release>