A person is working at a desk. A laptop is open, displaying a document with text. A notebook with a pen is in the foreground. A pair of glasses is on the desk to the right. A blue semi-transparent box is overlaid on the center of the image, containing the title text.

TP 04: Azure DevOps Build Pipelines

Azure DevOps Pipelines



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MS Certified Azure Developer Associate
MS Certified Azure AI Engineer Associate



Azure Pipelines

Canalizaciones alojadas en la nube para Linux, Windows y macOS, con minutos ilimitados para código abierto



Cualquier idioma, cualquier plataforma, cualquier nube

Cree, pruebe e implemente aplicaciones Node.js, Python, Java, PHP, Ruby, C/C++, .NET, Android e iOS. Se ejecuta en paralelo en Linux, macOS y Windows. Implemente en Azure, AWS, GCP o en las instalaciones



Extensible

Explora e implementa una amplia gama de tareas de creación, prueba e implementación creadas por la comunidad, junto con cientos de extensiones, desde Slack hasta SonarCloud. Compatibilidad con YAML, informes y mucho más



Containers and Kubernetes

Cree e inserte imágenes fácilmente en registros de contenedores como Docker Hub y Azure Container Registry. Implemente contenedores en hosts individuales o en Kubernetes. Deploy containers to individual hosts or Kubernetes.

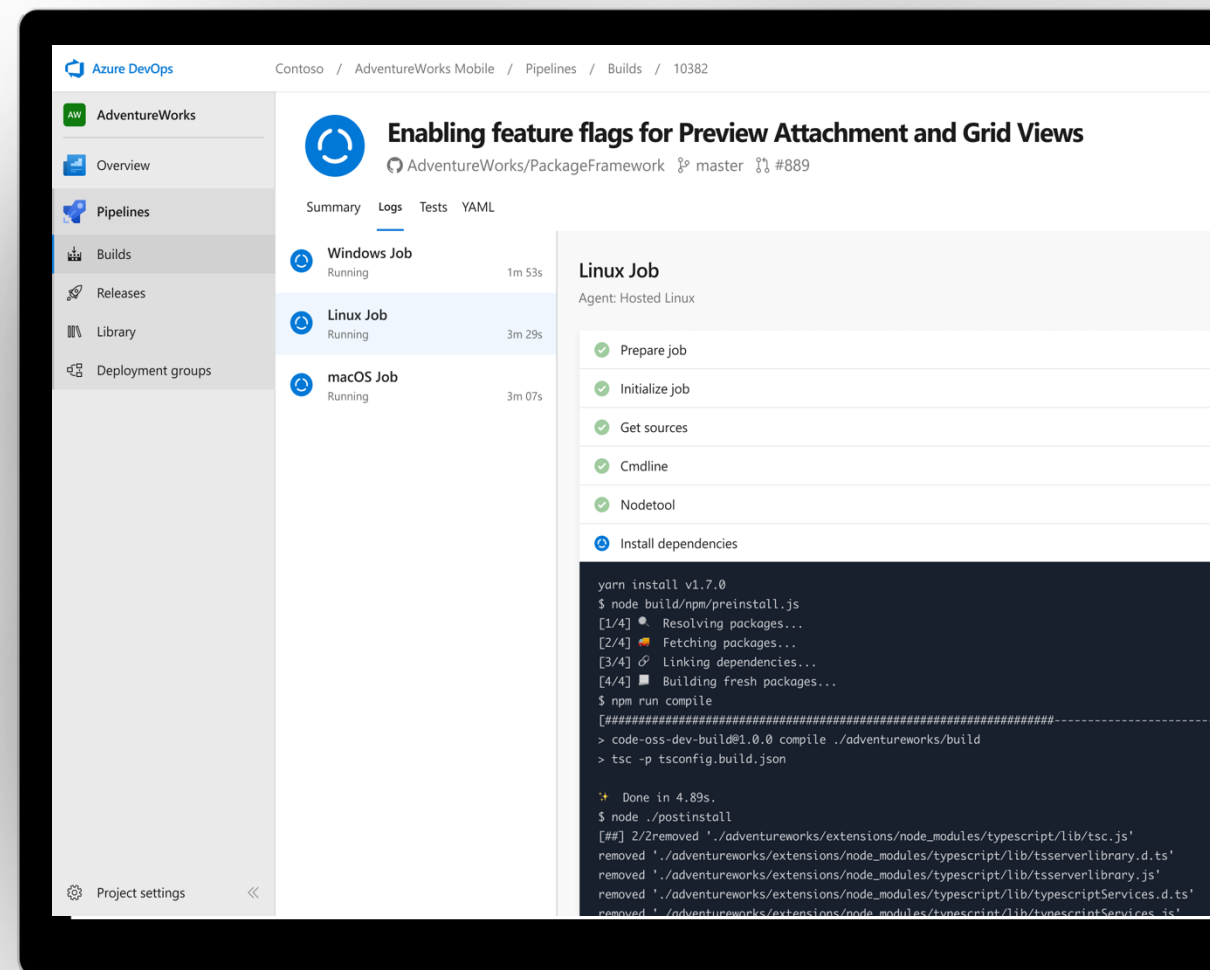


El mejor de su clase para código abierto

Garantice canalizaciones rápidas de integración continua/entrega continua (CI/CD) para cada proyecto de código abierto. Obtén minutos de compilación ilimitados para todos los proyectos de código abierto con hasta 10 trabajos paralelos gratuitos en Linux, macOS y Windows



<https://azure.com/pipelines>



Solicitar Acceso a MS para la ejecución de pipelines

#20240820.1 • Set up CI with Azure Pipelines

Rerun failed jobsRun new

This run will be cleaned up after 1 month based on your project settings.

SummaryCode Coverage

Triggered byTestUCC IngSoftView 33 changes

Repository and version
Sample02
main 52bce8b1

Time started and elapsed
Today at 9:25 a.m.
<1s

Related
0 work items
0 artifacts

Tests and coverage
[Get started](#)

Errors 1

No hosted parallelism has been purchased or granted. To request a free parallelism grant, please fill out the following form <https://aka.ms/azpipelines-parallelism-request>

[View documentation for troubleshooting failed runs](#)

Jobs

Name	Status	Duration
Job	Failed	

Una vez recibido el acceso, reintentamos correr el pipeline

Free tier request was completed

Recibidos x

Aria Tao (Centific Technologies Inc)

Hi Ariel Schwindt, We've received your request to increase free parallelism in Azure DevOps. Please note that your request was Completed Request Details: Name A

Aria Tao (Centific Technologies Inc) <v-xitao@microsoft.com>

mié, 21 ago, 5:04 a.m. | para mí ▾

Hi Ariel,

We've received your request to increase free parallelism in Azure DevOps.

Please note that your request was Completed

Request Details:

Name	Ariel
Email	ingsoft3ucc@gmail.com
Organization Name	ingsoft3ucc
Parallelism Type	Private

...

← Sample02

Edit Run pipeline ⋮

Runs

Branches

Analytics

Description	Stages	
<div>✓ #20240825.1 • Set up CI with Azure Pipelines</div> <div>⌕ Manually triggered for main 52bce8b1 ⌕</div>	<div>✓</div>	<div>🕒 17m ago</div> <div>🕒 1m 24s</div>
<div>✗ #20240820.1 • Set up CI with Azure Pipelines</div> <div>⌕ Individual CI for main 52bce8b1 ⌕</div>	<div>✗</div>	<div>🕒 martes</div> <div>🕒 <1s</div>

Agregamos task de publish

Agregamos tasks de publish para poder acceder al paquete de recursos de software ejecutables producidos por el pipeline y guardamos. Al commit se disparara automáticamente el pipeline y genera una carpeta **drop**

Pipelines		
Recent All Runs		
All pipeline runs		
Description		Stages
<div><div></div><div>Update azure-pipelines.yml for Azure Pipelines</div><div>#20240825.2 on Sample02 main </div></div>		<div><div></div></div>
<div><div></div><div>Set up CI with Azure Pipelines</div><div>#20240825.1 on Sample02 main </div></div>		<div><div></div></div>
<div><div></div><div>Set up CI with Azure Pipelines</div><div>#20240820.1 on Sample02 main </div></div>		<div><div></div></div>

← Sample02

main

Sample02 / azure-pipelines.yml

Settings

31

- task: VSTest@2

32

inputs:

33

platform: '\$(buildPlatform)'

34

configuration: '\$(buildConfiguration)'

35

Settings

36

- task: DotNetCoreCLI@2

37

inputs:

38

command: publish

39

publishWebProjects: True

40

arguments: '--configuration \$(BuildConfiguration) --output \$(Build.ArtifactStagingDirectory)'

41

zipAfterPublish: true

Settings

42

- task: PublishBuildArtifacts@1

43

inputs:

44

PathToPublish: '\$(Build.ArtifactStagingDirectory)'

45

ArtifactName: 'drop'

46

publishLocation: 'Container'

#20240825.3 - Update azure-pipelines.yml for Azure Pipelines

Sample02

This run is being retained as one of 3 recent runs by main (Branch).

Summary

Code Coverage

Triggered by

TestUCC IngSoft

Repository and version

Sample02

1 main

Time started and elapsed

Today at 9:36 a.m.

2m 1s

Related

0 work items

1 published

Tests and c

Get star

Warnings 1

No test sources found matching the given filter '**\bin**\test.dll,**\bin**\tests.dll'

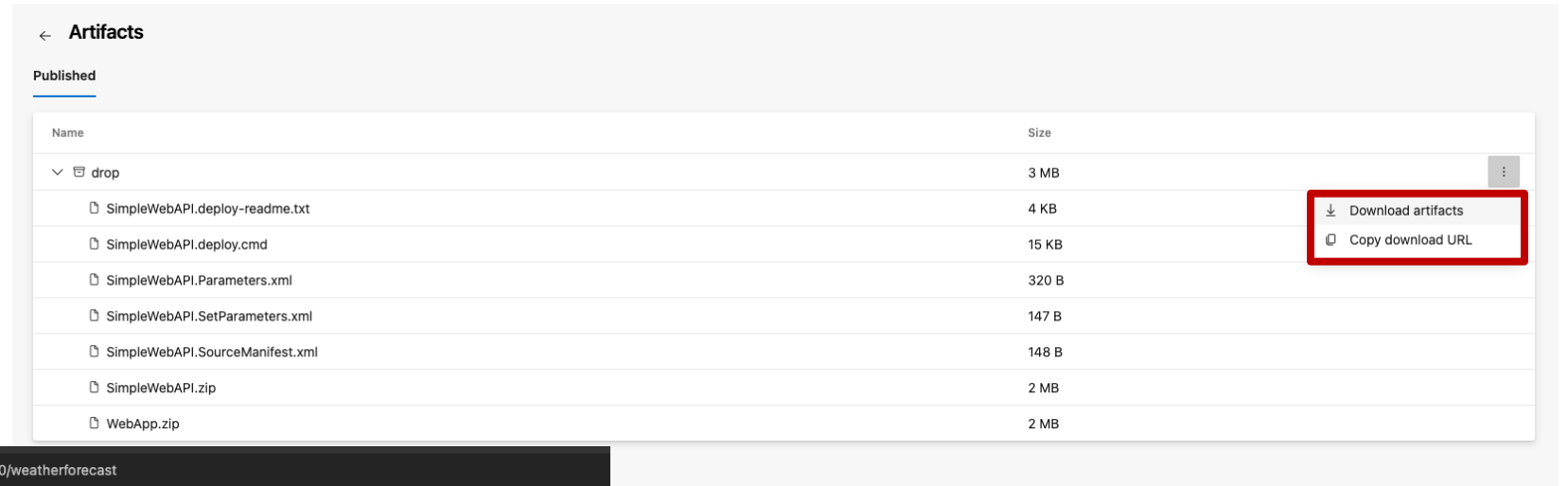
VSTest

Jobs

Name	Status	Duration
Job	Success	1m 53s

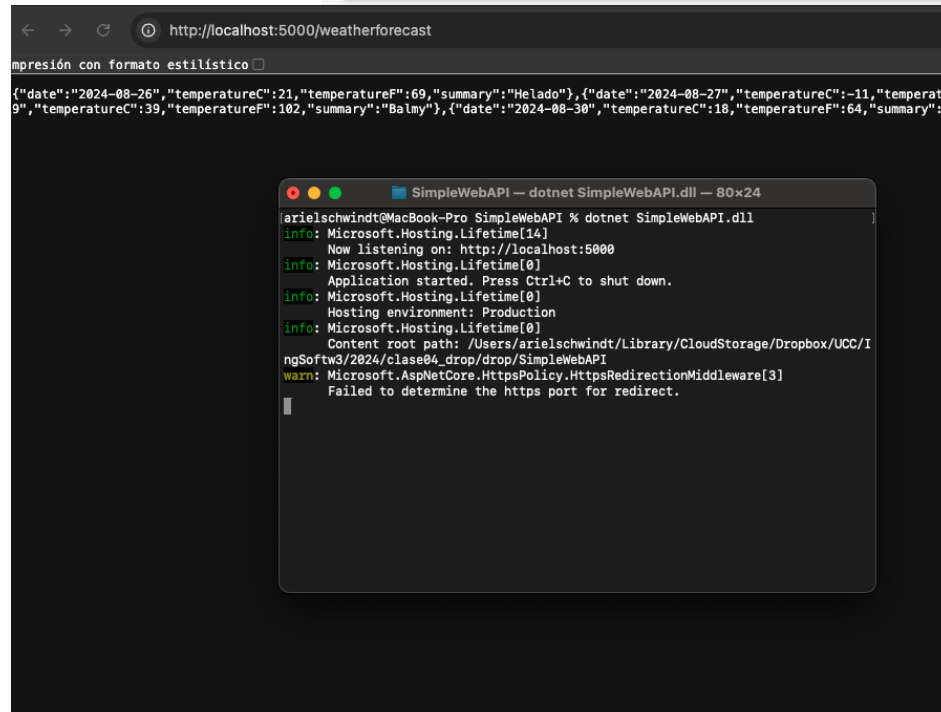
Descargamos el resultado de drop

- Descargamos el resultado de drop.
- Descomprimos drop.zip y luego SimpleWebAPI.zip
- Ejecutamos nuestra app localmente



← Artifacts	
Published	
Name	Size
▼ drop	3 MB
SimpleWebAPI.deploy-readme.txt	4 KB
SimpleWebAPI.deploy.cmd	15 KB
SimpleWebAPI.Parameters.xml	320 B
SimpleWebAPI.SetParameters.xml	147 B
SimpleWebAPI.SourceManifest.xml	148 B
SimpleWebAPI.zip	2 MB
WebApp.zip	2 MB

[Download artifacts](#)
[Copy download URL](#)



http://localhost:5000/weatherforecast

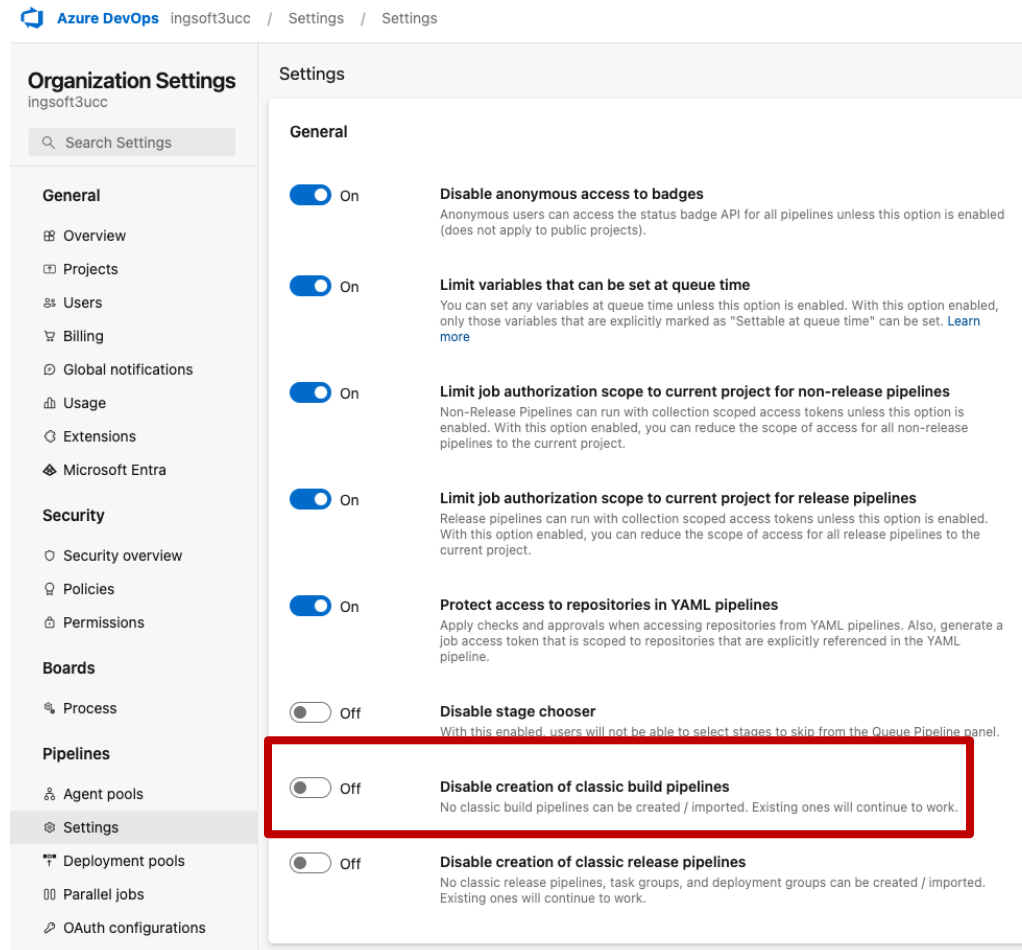
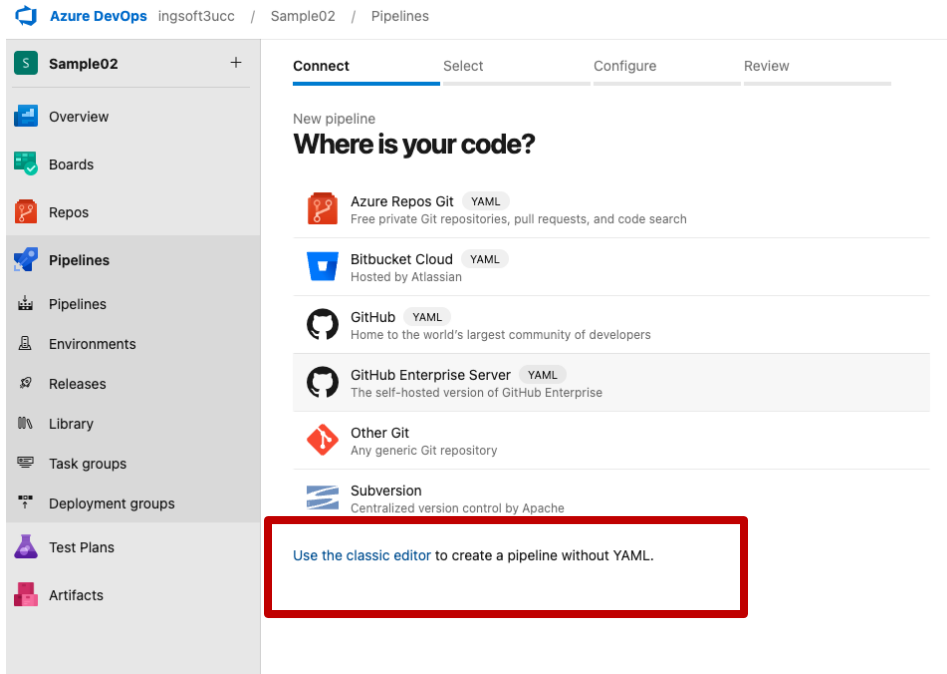
Impresión con formato estético

```
{ "date": "2024-08-26", "temperatureC": 21, "temperatureF": 69, "summary": "Helado", "date": "2024-08-27", "temperatureC": -11, "temperatureF": 9, "temperatureC": 39, "temperatureF": 102, "summary": "Balm\u00ed", "date": "2024-08-30", "temperatureC": 18, "temperatureF": 64, "summary": "Balm\u00ed" }
```

```
arielschwindt@MacBook-Pro SimpleWebAPI % dotnet SimpleWebAPI.dll
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: http://localhost:5000
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Production
info: Microsoft.Hosting.Lifetime[0]
      Content root path: /Users/arielschwindt/Library/CloudStorage/Dropbox/UCC/I
ngSoftw3/2024/clase04_drop/drop/SimpleWebAPI
warn: Microsoft.AspNetCore.HttpsPolicy.HttpsRedirectionMiddleware[3]
      Failed to determine the https port for redirect.
```

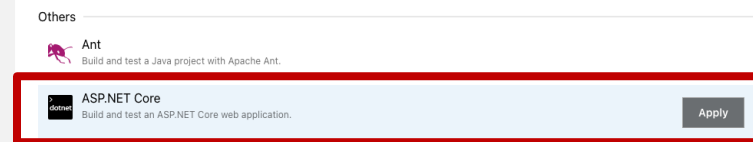
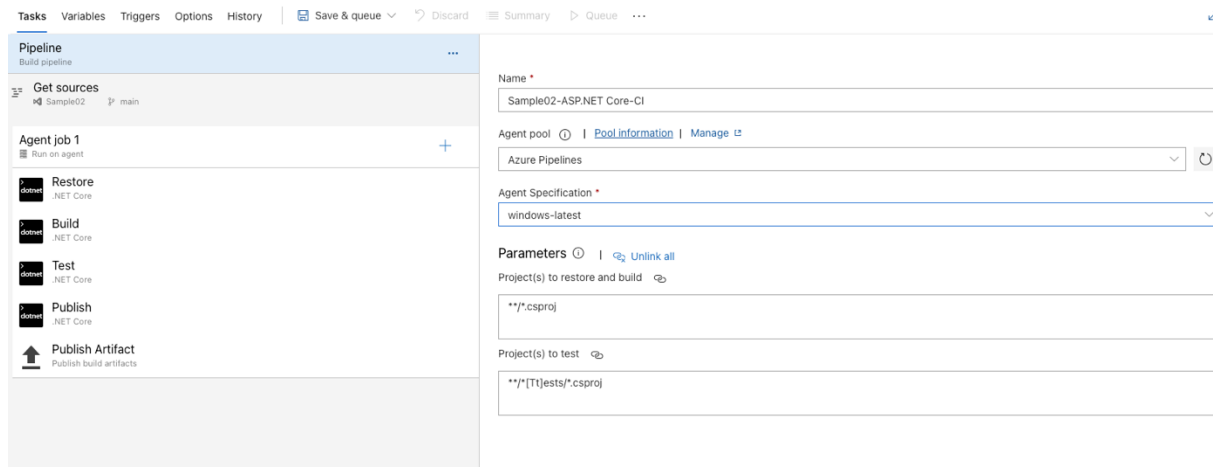
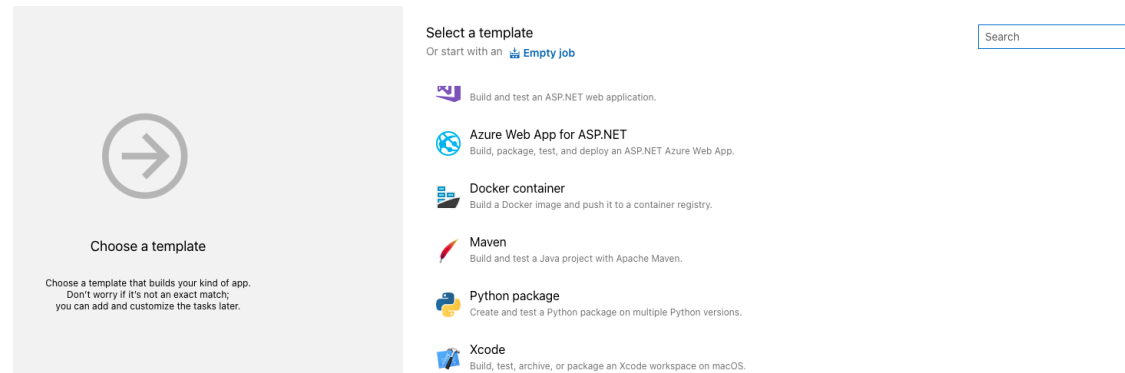
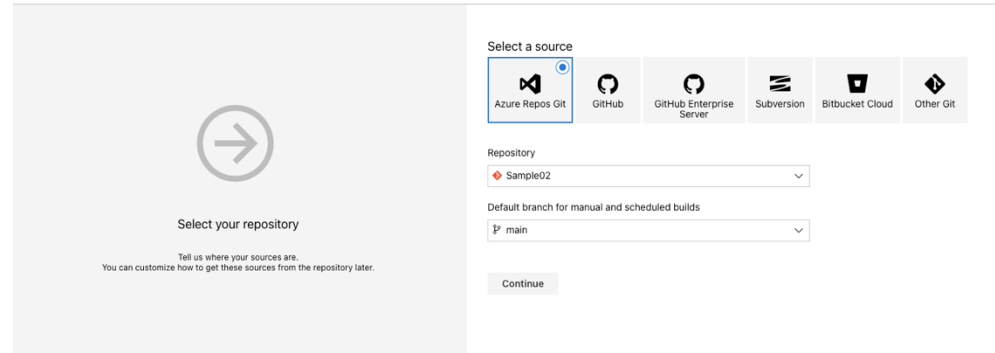

Habilitar Pipeline Classic Editor

- Desde Organization Settings
- Pipelines -> Settings
- Dejamos en Off la deshabilitación de creación de classic build pipelines
- Volvemos a los pipelines de nuestro proyecto y creamos un nuevo pipeline usando el editor clásico



Crear y Correr Pipeline con Classic Editor

- Seleccionamos Tipo de Repo
- Seleccionamos Repo y Branch
- Seleccionamos el Template correspondiente a nuestro proyecto
- Seleccionamos el tipo de agente
- Analizamos el editor clásico
- Le damos Save & Queue



Descargamos el resultado de drop

- Descargamos el resultado de drop.
- Descomprimos drop.zip y luego SimpleWebAPI.zip
- Ejecutamos nuestra app localmente

The screenshot displays the Azure Pipelines interface for a build named '#20240825.1 • Update azure-pipelines.yml for Azure Pipelines' in the 'Sample02-ASP.NET Core-CI' repository. The build status is 'Succeeded'.

Summary:

- Manually run by: TestUCC IngSoft
- Repository and version: Sample02, main, 6a3a79fa
- Time started and elapsed: Just now, 1m 0s
- Related: 0 work items, 1 published, 1 consumed
- Tests and coverage: 35 changes, Get started

Warnings: 1 warning: Project file(s) matching the specified pattern were not found. Test

Jobs:

Name	Status	Duration
Agent job 1	Success	52s

Artifacts:

Name	Size
drop	2 MB
SimpleWebAPI.zip	2 MB

Buttons: Download artifacts, Copy download URL

Terminal Output:

```
arielschwindt@MacBook-Pro drop % ls
SimpleWebAPI      SimpleWebAPI.zip
arielschwindt@MacBook-Pro drop % cd simplewebapi
arielschwindt@MacBook-Pro simplewebapi % ls
Microsoft.AspNetCore.OpenApi.dll  Swashbuckle.AspNetCore.Swagger.dll
Microsoft.OpenApi.dll             Swashbuckle.AspNetCore.SwaggerGen.dll
SimpleWebAPI.deps.json            Swashbuckle.AspNetCore.SwaggerUI.dll
SimpleWebAPI.dll                 appsettings.Development.json
SimpleWebAPI.exe                 appsettings.json
SimpleWebAPI.pdb                 web.config
SimpleWebAPI.runtimeconfig.json

arielschwindt@MacBook-Pro simplewebapi % dotnet SimpleWebAPI.dll
Info: Microsoft.Hosting.Lifetime[14]
      Now listening on: http://localhost:5000
Info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
Info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Production
Info: Microsoft.Hosting.Lifetime[0]
      Content root path: /Users/arielschwindt/Library/CloudStorage/Dropbox/UCC/I
ngSoftw/2024/Class04_drop/Class04_drop/SimpleWebAPI
warn: Microsoft.AspNetCore.HttpsPolicy.HttpsRedirectionMiddleware[3]
      Failed to determine the https port for redirect.
```

Descargamos el resultado de drop

- Descargamos el resultado de drop.
- Descomprimos drop.zip y luego SimpleWebAPI.zip
- Ejecutamos nuestra app localmente

The screenshot displays the Azure Pipelines interface for a build named "#20240825.1 • Update azure-pipelines.yml for Azure Pipelines". The build status is "Succeeded" and it was manually run by "TestUCC IngSoft". The summary shows the repository "Sample02" and the build configuration "main". The build logs indicate that the project file(s) matching the specified pattern were not found. The artifacts section shows two published artifacts: "drop" (2 MB) and "SimpleWebAPI.zip" (2 MB). A dropdown menu is visible next to the "SimpleWebAPI.zip" artifact, showing options to "Download artifacts" and "Copy download URL".

Summary

Manually run by TestUCC IngSoft

Repository and version: Sample02, main, 6a3a79fa

Time started and elapsed: Just now, 1m 0s

Related: 0 work items, 1 published, 1 consumed

Tests and coverage: Get started

Warnings 1

Project file(s) matching the specified pattern were not found.

Jobs

Name	Status	Duration
Agent job 1	Success	52s

Artifacts

Published Consumed

Name	Size
drop	2 MB
SimpleWebAPI.zip	2 MB

Download artifacts

Copy download URL

```
http://localhost:5000/weatherforecast
[{"date": "2024-08-26", "temperatureC": -11, "temperatureF": 13, "summary": "Sweltering"}, {"date": "2024-08-27", "temperatureC": 42, "temperatureF": 107, "summary": "Hot"}, {"date": "2024-08-28", "temperatureC": 107, "temperatureF": 142, "summary": "Mild"}, {"date": "2024-08-29", "temperatureC": 147, "temperatureF": 116, "summary": "Melado"}]

SimpleWebAPI - dotnet SimpleWebApi.dll - 80x24
arielschwindt@MacBook-Pro drop % ls
SimpleWebAPI               SimpleWebAPI.zip
arielschwindt@MacBook-Pro drop % cd simplewebapi
arielschwindt@MacBook-Pro simplewebapi % ls
Microsoft.AspNetCore.OpenApi.dll  Swashbuckle.AspNetCore.Swagger.dll
Microsoft.OpenApi.dll             Swashbuckle.AspNetCore.SwaggerGen.dll
SimpleWebAPI.deps.json            Swashbuckle.AspNetCore.SwaggerUI.dll
SimpleWebAPI.dll                 appsettings.Development.json
SimpleWebAPI.exe                 appsettings.json
SimpleWebAPI.pdb                 web.config
SimpleWebAPI.runtimeconfig.json
arielschwindt@MacBook-Pro simplewebapi % dotnet SimpleWebApi.dll
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: http://localhost:5000
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Production
info: Microsoft.Hosting.Lifetime[0]
      Content root path: /Users/arielschwindt/Library/CloudStorage/Dropbox/UCC/I
ngSoftw/2024/Class04_drop/Class04_drop/SimpleWebAPI
warn: Microsoft.AspNetCore.HttpsPolicy.HttpsRedirectionMiddleware[3]
      Failed to determine the https port for redirect.
```

slido

Please download and install the
Slido app on all computers you use



Audience Q&A

① Start presenting to display the audience questions on this slide.



Cuándo es más conveniente usar el Classic Editor?

① Start presenting to display the poll results on this slide.



Cuál es la principal diferencia entre un Pipeline de Build en YAML vs. Classic Editor?

① Start presenting to display the poll results on this slide.

Configurar CI: Integración Continua

- En Classic Pipelines:

Sample02-ASP.NET Core-CI

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

Continuous integration

Sample02
Enabled

Scheduled + Add
No builds scheduled

Build completion + Add
Build when another build completes

Sample02

☒ Enable continuous integration
☐ Batch changes while a build is in progress

Branch filters

Type Branch specification

Include main

+ Add

Path filters

+ Add

- En YAML Pipelines, por default habilitada

- A) Deshabilitar desde Pipeline Settings B) modificar YAML con trigger: none

trigger:
- none

Sample02 / Pipelines

Sample02

Sample02 / azure-pipelines.yml

```
1 # ASP.NET Core (.NET Framework)
2 # Build and test ASP.NET Core projects targeting the full .NET Framework.
3 # Add steps that publish symbols, save build artifacts, and more:
4 # https://docs.microsoft.com/azure/devops/pipelines/languages/dotnet-core
5
6 trigger:
7   - main
8
9 pool:
10  vmImage: 'windows-latest'
11
12 variables:
13   solution: '**/*.sln'
14   buildPlatform: 'Any CPU'
15   buildConfiguration: 'Release'
16
17 steps:
18   - task: NuGetToolInstaller@1
19
20   - task: NuGetCommand@2
21     inputs:
22       restoreSolution: '$(solution)'
23
24   - task: VSBuild@1
25     inputs:
26       solution: '$(solution)'
27       msbuildArgs: '/p:DeployOnBuild=true /p:WebPublishMethod=Package /p:PackageAsSingleFile=true /p:SkipInvalidConfigurations=true'
28       platform: '$(buildPlatform)'
29       configuration: '$(buildConfiguration)'
30
31   - task: VSTest@2
32     inputs:
```

Pipeline settings

Processing of new run requests

☐ Enabled
☐ Paused
☒ Disabled

YAML file path

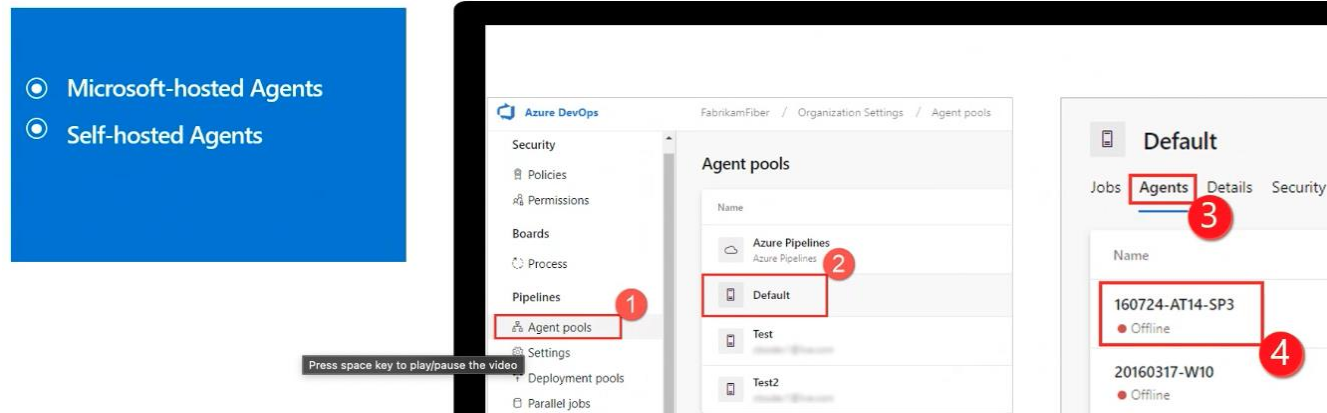
azure-pipelines.yml

☐ Automatically link work items included in this run

Cancel Save

Instalar un agente en nuestro entorno

- Microsoft Hosted
 - Proveen 10GB de Storage
 - Proyectos públicos hasta 10 MS-hosted gratis que pueden correr por 6 hs cada vez. Sin límites por mes.
 - Proyectos privados: 1 job gratis que puede correr por 1 hr cada vez con un límite de 30 hs al mes.
 - Corren sobre Microsoft Azure general purpose virtual machines Standard_DS2_v2
 - Corren como administrador en Windows y passwordless sudo user en Linux
- Self Hosted Agents:
 - Puedo instalar agentes en mis entornos



Seguridad de los Agentes

- Reader: Los miembros de este rol pueden ver el grupo de agentes, así como los agentes. Normalmente, se utiliza para agregar operadores que son responsables de supervisar los agentes y su estado.
- Service Account: los miembros de este rol pueden usar el grupo de agentes de la organización para crear un grupo de agentes de proyecto en un proyecto. Si sigue las directrices anteriores para crear nuevos grupos de agentes de proyecto, normalmente no tiene que agregar ningún miembro aquí.
- Administrator: además de todos los permisos anteriores, los miembros de este rol pueden registrar o anular el registro de agentes del grupo de agentes de la organización. También pueden hacer referencia al grupo de agentes de la organización al crear un grupo de agentes de proyecto en un proyecto. Por último, también pueden administrar la pertenencia a todos los roles del grupo de agentes de la organización. El usuario que creó el grupo de agentes de la organización se agrega automáticamente al rol de administrador de ese grupo.

Instalar un agente en nuestro entorno

- Crear un Personal Access Token
- Guardarlo en algún lugar

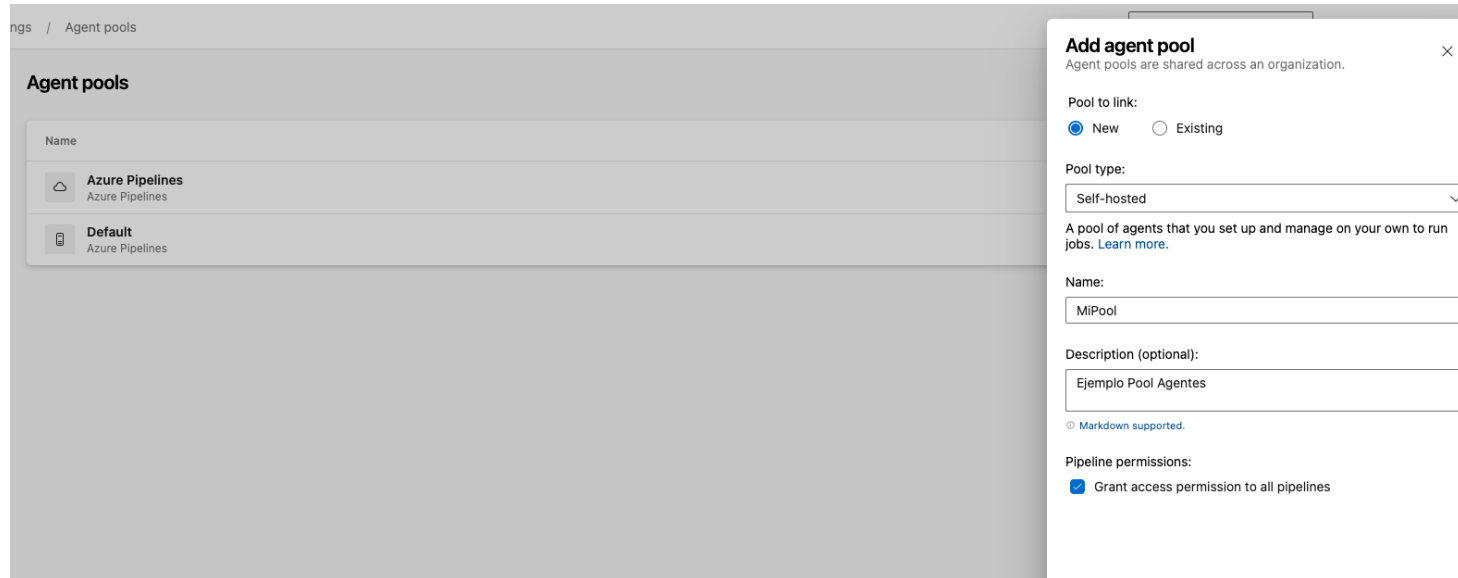
The screenshot displays the GitHub web interface. On the left, a sidebar menu is open, showing options like 'Preview features', 'Profile', 'Time and Locale', 'Permissions', 'Notifications', 'Theme', 'Usage', 'Personal access tokens', and 'SSH public keys'. The 'Personal access tokens' option is selected. The main content area shows a message: 'You do not have any personal access tokens yet.' with a '+ New Token' button. A modal window titled 'Create a new personal access token' is open, showing the following details:

- Name:** miPAT
- Organization:** ingsoft3ucc
- Expiration (UTC):** 30 days (dropdown), 24/9/2024 (calendar icon)
- Scopes:** Full access (selected), Custom defined

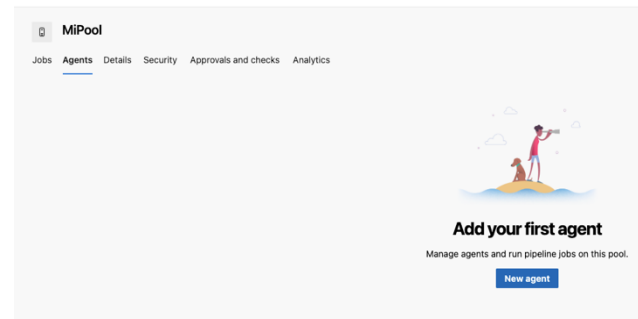
Below the modal, a 'Success!' notification box appears, stating: 'You have successfully added a new personal access token. Copy the token now!'. The token is displayed as 'miPAT token' followed by a text box containing '745cf4dfqd6rvx4znrnia:' and a copy icon. A warning message at the bottom of the notification box reads: 'Warning - Make sure you copy the above token now. We don't store it and you will not be able to see it again.'

Instalar un agente en nuestro entorno

- En Project Settings->Pipelines-> Agent Pools, creamos un nuevo Pool de Agentes de tipo "Self-hosted"
- Dar permisos a todos los pipelines



- Seleccionar el Pool creado y agregar un nuevo agente



Instalar un agente en nuestro entorno

- Seguir las instrucciones según el Sistema Operativo y Procesador

Get the agent

×

Windows

macOS

Linux

x64

arm64

System prerequisites

Configure your account

Configure your account by following the steps outlined [here](#).

Download the agent

Download

Create the agent

```
~/ $ mkdir myagent && cd myagent
~/myagent$ tar zxvf ~/Downloads/vsts-agent-osx-arm64-3.243.0.tar.gz
```

Configure the agent [Detailed instructions](#)

```
~/myagent$ ./config.sh
```

Optionally run the agent interactively

If you didn't run as a service above:

```
~/myagent$ ./run.sh
```

That's it!

[More Information](#)

Instalar un agente en nuestro entorno

- En Server Url ponemos la url de ADO de nuestra organización, por ejemplo <https://dev.azure.com/ingsoft3ucc>
- En PAT pegamos el generado
- En Agent Pool ponemos el nombre del Pool que creamos, en mi caso MiPool
- En Agent Name ponemos el nombre que queremos que tenga el agente, por ejemplo MiAgente01
- Revisamos que fue instalado correctamente.
- Correr el agente con run.sh por ej.

```
arielschwindt@MacBook-Pro myagent % ./config.sh

agent v3.243.0 (commit d429c24)

>> End User License Agreements:

Building sources from a TFVC repository requires accepting the Team Explorer Everywhere End User License Agreement. This step is not required for building sources from Git repositories.

A copy of the Team Explorer Everywhere license agreement can be found at:
/Users/arielschwindt/TEMPORAL/myagent/license.html

[Enter (Y/N) Accept the Team Explorer Everywhere license agreement now? (press enter for N) > Y

>> Connect:

[Enter server URL > https://dev.azure.com/ingsoft3ucc
[Enter authentication type (press enter for PAT) >
[Enter personal access token > *****
Connecting to server ...

>> Register Agent:

[Enter agent pool (press enter for default) > MiPool
[Enter agent name (press enter for MacBook-Pro) > MiAgente01
Scanning for tool capabilities.
Connecting to the server.
Successfully added the agent
Testing agent connection.
[Enter work folder (press enter for _work) >
2024-08-25 23:27:02: Settings Saved.
arielschwindt@MacBook-Pro myagent %
```

MiPool					Update all agents	New agent
Jobs Agents Details Security Approvals and checks Analytics						
Name	Last run	Current status	Agent version	Enabled		
MiAgente01 Offline		Idle	3.243.0	<input checked="" type="checkbox"/> On		

Creamos un pipeline que use nuestro Self-hosted Agent

- Cambiamos Agent Pool del pipeline para que use el nuestro
- Guardamos y ejecutamos

🏠 ... > Sample02-ASP.NET Core-CI (1)

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

Pipeline
Build pipeline

Get sources
Sample02 main

Agent job 1
Run on agent

- Restore .NET Core
- Build .NET Core
- Test .NET Core
- Publish .NET Core
- Publish Artifact Publish build artifacts

Name *
Sample02-ASP.NET Core-CI (1)

Agent pool ⓘ | [Pool information](#) | [Manage](#)

MIPool

Parameters ⓘ | [Unlink all](#)

Project(s) to restore and build

**/*.csproj

Project(s) to test

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

🏠 ... > Sample02-ASP.NET Core-CI (1)

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

Agent job 1

Display name *
Agent job 1

Agent selection

Execution plan

Parallelism ⓘ
☒ None ☐ Multi-configuration ☐ Multi-agent

Timeout * ⓘ
0

Job cancel timeout * ⓘ
0

Dependencies

Select dependencies

Additional options

☐ Allow scripts to access the OAuth token ⓘ
Run this job ⓘ
Only when all previous jobs have succeeded

Save comment
Test self

Agent pool
MIPool

Branch/tag
main

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

Verificamos ejecución y Paquete

- Una vez que haya terminado de ejecutarse el pipeline vamos a nuestro directorio myagent/_work/1/a y encontraremos el SimpleWebAPI.zip

```
arielschwindt@MacBook-Pro myagent % ./run.sh
Scanning for tool capabilities.
Connecting to the server.
2024-08-25 23:39:15Z: Listening for Jobs
2024-08-25 23:39:29Z: Running job: Agent job 1
2024-08-25 23:39:37Z: Job Agent job 1 completed with result: Failed
2024-08-25 23:44:57Z: Running job: Agent job 1
2024-08-25 23:46:08Z: Job Agent job 1 completed with result: Canceled
2024-08-25 23:46:17Z: Running job: Agent job 1
2024-08-25 23:47:18Z: Job Agent job 1 completed with result: Succeeded
```

```
a — -zsh — 80x24
arielschwindt@MacBook-Pro ~ % cd temporal/myagent/_work/1/a
arielschwindt@MacBook-Pro a % ls
SimpleWebAPI.zip
arielschwindt@MacBook-Pro a %
```



**¿Cuál es la principal ventaja de
usar agentes autoalojados?**

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**¿En qué se diferencian los
agentes alojados de los agentes
alojados?**

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**¿Por qué se prefieren los agentes
autohospedados para ciertos
escenarios?**

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¿Cuándo se recomienda usar agentes autoalospedados?

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