

Do-it-yourself CI/CD made easy with AL-Go for GitHub



Dynamics 365 Business Central Launch Event

**Do-it-yourself CI/CD made easy with AL-Go
for GitHub**

Freddy Kristiansen
Technical Evangelist
April 2022



AL-Go for GitHub

"For simple PTEs and AppSource apps, DevOps should be a tool - not an investment area!"

"You should never ever build production bits on your laptop!"

"Nobody should install apps manually on a customer environment anymore!"

Agenda

- What is AL-Go for GitHub
- Scenario walkthrough
 - Demos, demos and demos...
- Versioning

What is AL-Go for GitHub

What is AL-Go for GitHub?



- Plug-and-play DevOps on GitHub
 - Continuous Integration/Continuous Deployment
 - Source control, pull requests, issue tracking, code reviews, collaboration
 - Automated functional and upgrade tests
 - Build and test your app against future versions (Next Minor / Next Major)
 - Release management
 - Automatic release to QA environment
 - Gated deployment to Production
- No need for a DevOps engineer
 - Easy to get started - use a template to get CI/CD for your app in 5 minutes
 - Easy to maintain - apply updates to the template using a GitHub workflow
- GitHub only

Why GitHub

- Insufficient resources to support multiple DevOps backends
- Azure DevOps is more complex / enterprise style
- GitHub was born for cloud, open source and agile
- Other alternatives exists for Azure DevOps (ALOps, Cosmo, ...)
- We want to support codespaces
- Very good for open-source projects



Template repositories and actions repository



- Template repository with workflows and various files for
 - PTEs – <https://aka.ms/al-go-pte>
 - AppSource Apps – <https://aka.ms/al-go-appsource>
- Workflows utilize actions in <https://github.com/microsoft/AL-Go-Actions>
 - Add existing app or test app
 - CI/CD
 - Create Online Dev. Environment
 - Create new app
 - Create a new test app
 - Create Release
 - Increment Version Number
 - Publish To Environment
 - Test Current
 - Test NextMajor
 - Test NextMinor
 - Update AL-Go system files



Scenario walkthrough

With a ton of demos...

Get Started


- Create your first repository
 - <https://aka.ms/al-go-pte> (for PTEs)
 - <https://aka.ms/al-go-appsource> for (AppSource apps)
- Specify
 - Owner
 - Name
 - Description
 - Access control

Create an app

- Run the "Create a new app" workflow
 - Like AL:Go in VS Code
 - Creates a Hello World app
- Specify
 - Name
 - Publisher
 - Object ID range
 - Direct COMMIT

Add existing app

- Run the "Add existing app" workflow
 - Like Copy/Paste the source from an existing app to your repo
 - Extracts the .app or .zip files and adds the source(s) to your repo
- Specify
 - Direct download URL to an .app or a .zip file
 - Direct COMMIT

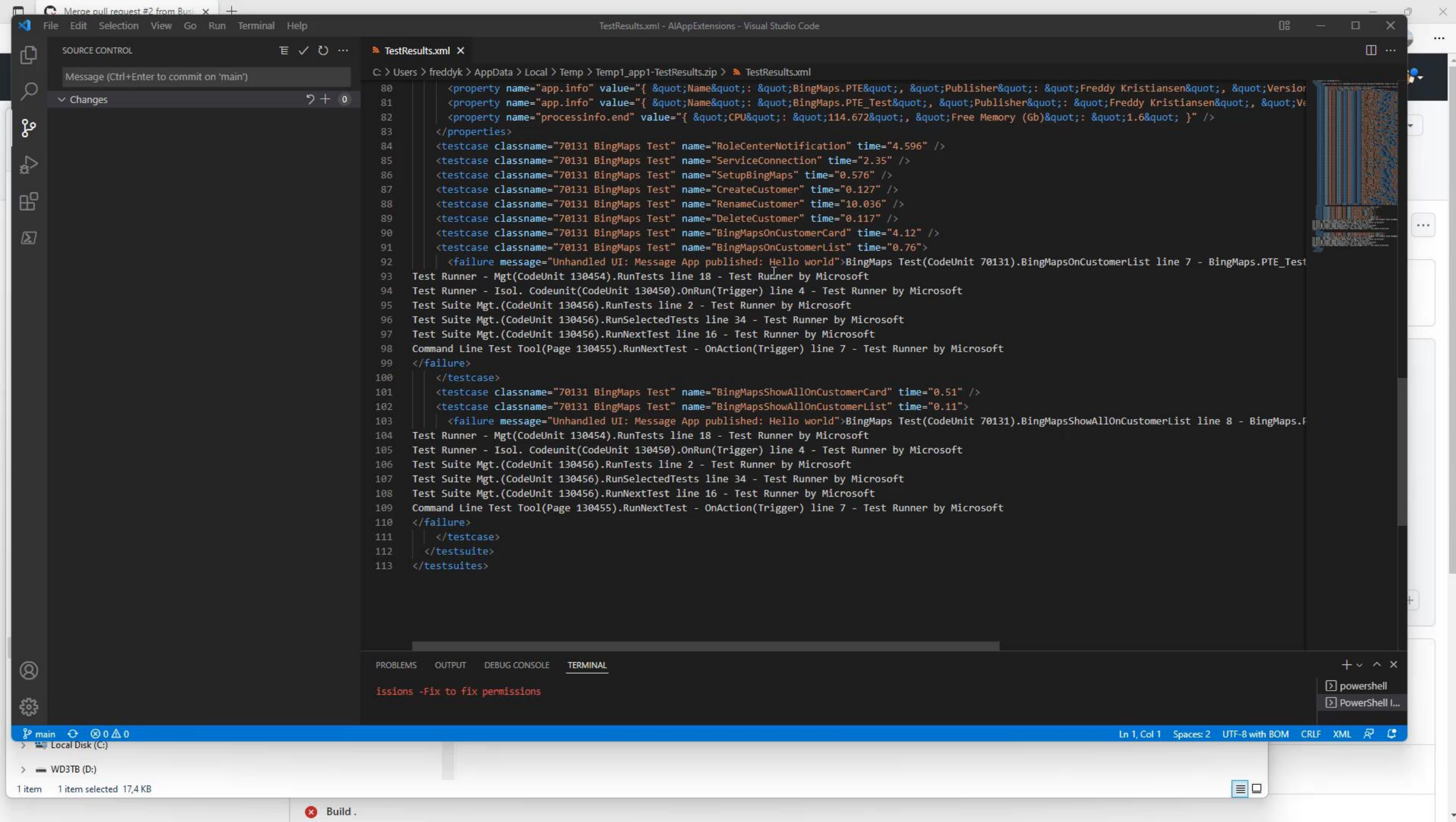
⋮ README.md 

Per Tenant Extension Project

Process:

Test Results

- JUnit format
 - Including extra information about memory, apps installed & cpu usage
- V0.2 doesn't have a UI for viewing test results 😞
- Download and view!



Create an online development environment

- Create Online Business Central Sandbox Environment
- Build and publish all apps to dev. scope in dependency order
- Modify launch.json to include new sandbox environment
- Ready for RAD!

Develop against online dev. environment

- Clone the repository to your laptop
- Download symbols (authenticate if necessary)
- Modify a file and press F5 to launch the Sandbox environment

Actions · BusinessCentralDemos

https://github.com/BusinessCentralDemos/app1/actions

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⚙️ Settings

Workflows

New workflow

All workflows

🔗 Add existing app or test app

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All workflows

Showing runs from all workflows

🔍 Filter workflow runs

7 workflow runs

Event

Status

Branch

Actor

✅ Create Online Dev. Environment

Create Online Dev. Environment #2: Manually run by freddydk

📅 1 hour ago

🕒 20m 44s

...

✅ Delete HelloWorld.al

CI/CD #3: Commit f7b641d pushed by freddydk

main

📅 2 hours ago

🕒 17m 25s

...

❌ Merge pull request #2 from BusinessCentralDemos/nirfg...

CI/CD #2: Commit 6e5e459 pushed by freddydk

main

📅 12 hours ago

🕒 19m 29s

...

✅ Add existing app or test app

Add existing app or test app #2: Manually run by freddydk

📅 12 hours ago

🕒 2m 6s

...

✅ Merge pull request #1 from BusinessCentralDemos/c35rx...

CI/CD #1: Commit 9c7d06e pushed by freddydk

main

📅 13 hours ago

🕒 15m 33s

...

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📅 13 hours ago

🕒 1m 45s

...

✅ Create a new app

Create a new app #1: Manually run by freddydk

📅 yesterday

🕒 2m 2s

...

Develop against local docker environment

- Clone the repository to your laptop
- Setup local development environment
 - Run localDevEnv.ps1
 - Specify
 - Container Name
 - Password
 - Optional license file (mandatory for AppSource Apps)
- Modify a file and press F5 to launch the Sandbox environment

Actions · BusinessCentralDemos

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https://github.com/BusinessCentralDemos/app1/actions

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Setup Continuous Deployment to QA

- Create GitHub environment named QA
- Add AUTHCONTEXT secret
 - Using OAuth - S2S or user impersonation
- Modify your app and submit your changes to deploy

BusinessCentralDemos/app1: App1

https://github.com/BusinessCentralDemos/app1

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main3 branches0 tags

Go to fileAdd fileCode

freddydk 'Create a development environment Sandbox'0e581f311 hours ago9 commits

.AL-Go	'Add existing apps (BingMaps.PTE_Test)'	22 hours ago
.github	Initial commit	2 days ago
BingMaps.PTE	'Create a development environment Sandbox'	11 hours ago
BingMaps.PTE_Test	'Create a development environment Sandbox'	11 hours ago
Loyalty	'Create a development environment Sandbox'	11 hours ago
.gitignore	Initial commit	2 days ago
README.md	Initial commit	2 days ago
al.code-workspace	'Add existing apps (BingMaps.PTE_Test)'	22 hours ago

README.md

AL-Go Template

Per Tenant Extension Project

This template repository can be used for managing Per Tenant Extensions for Business Central.

Process:

1. Click **Use this template** to create a new repository based on this template
2. Under Actions, use the **Add existing** or **add new** workflows to add your apps and test apps
3. Continuous Integration (CI) pipeline is automatically started
4. **Register a customer environment** using an AAD app for authentication. (Remember to register the AAD app in

About

App1

Readme

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1 watching

0 forks

Releases

No releases published

Create a new release

Packages

No packages published

Publish your first package

Languages

AL81.7%PowerShell18.3%

Environments

- Register environments for deployment in GitHub
 - AuthContext secret can be specified on the environment or in a KeyVault
- Sandbox environments
 - are automatically picked up for continuous deployment in CI/CD
- Production environments
 - PTEs can be deployed by running a workflow
 - Currently not supported for AppSource Apps
 - For AppSource Apps we should auto-submit for validation when creating a release

Test your app against upcoming releases

- Test your app against Current, Next Minor or Next Major release
 - On demand or on a schedule
- Add additional countries to the tests

Actions · BusinessCentralDemos / x

← → ↺

https://github.com/BusinessCentralDemos/app1/actions

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📊 Insights

⚙️ Settings

Workflows

New workflow

All workflows

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🔗 Update AL-Go System Files

All workflows

Showing runs from all workflows

🔍 Filter workflow runs

8 workflow runs

Event ▾Status ▾Branch ▾Actor ▾

✓ Add Loyalty program

CI/CD #6: Commit a88a497 pushed by freddydk

main

📅 2 hours ago

🕒 17m 0s

⋮

✓ Create Online Dev. Environment

Create Online Dev. Environment #2: Manually run by freddydk

📅 14 hours ago

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🕒 1m 45s

⋮

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📅 2 days ago

🕒 2m 2s

⋮

Versioning of your app

- Schema: Major.Minor.Build.Revision
- Major and Minor are taken from app.json
- Build and Revision are calculated
- 3 Versioning strategies supported currently
 0. Major.Minor.GITHUB_RUN_NUMBER.Attempt (with configurable offset)
 1. Major.Minor.GITHUB_RUN_ID.Attempt
 2. Major.Minor.yyyyMMdd.hhmmss
- IncrementVersionNumber can help bump version number in apps
- NextMajor and NextMinor builds are using maxint

Actions · BusinessCentralDemos

https://github.com/BusinessCentralDemos/app1/actions

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Filter workflow runs

11 workflow runs

EventStatusBranchActor

Test Next Major

Test Next Major #2: Scheduled

5 hours ago

32m 54s

Update AL-Go System Files

Update AL-Go System Files #2: Manually run by freddydk

yesterday

3m 13s

Test Next Major

Test Next Major #1: Manually run by freddydk

yesterday

19m 29s

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Scenario walkthrough

With a ton of demos...

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 - Description
 - Access control













Create an app

- Run the "Create a new app" workflow
 - Like AL:Go in VS Code
 - Creates a Hello World app
- Specify
 - Name
 - Publisher
 - Object ID range
 - Direct COMMIT

Workflows

New workflow

All workflows

-  Add existing app or test app
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All workflows

Showing runs from all workflows

🔍 Filter workflow runs

0 workflow runs

Event ▼ Status ▼ Branch ▼ Actor ▼



There are no workflow runs yet.

Add existing app

- Run the "Add existing app" workflow
 - Like Copy/Paste the source from an existing app to your repo
 - Extracts the .app or .zip files and adds the source(s) to your repo
- Specify
 - Direct download URL to an .app or a .zip file
 - Direct COMMIT

BusinessCentralDemos/app1: Ap

https://github.com/BusinessCentralDemos/app1

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Actions

Projects

Wiki

Security

Insights

Settings

main

1 branch

0 tags

Go to file

Add file

Code

freddydk

'New PTE (Loyalty)'

e7d038c 14 hours ago

2 commits

.AL-Go	'New PTE (Loyalty)'	14 hours ago
.github	Initial commit	14 hours ago
Loyalty	'New PTE (Loyalty)'	14 hours ago
.gitignore	Initial commit	14 hours ago
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README.md

AL-Go Template

Per Tenant Extension Project

This template repository can be used for managing Per Tenant Extensions for Business Central.

Process:

1. Click **Use this template** to create a new repository based on this template
2. Under Actions, use the **Add existing** or **add new** workflows to add your apps and test apps
3. Continuous Integration (CI) pipeline is automatically started
4. **Register a customer environment** using an AAD app for authentication. (Remember to register the AAD app in the Business Central environment as well)
5. When CI pipeline finishes, Continuous Deployment pipeline is automatically started.
6. CD pipeline published latest CI build to sandbox environments setup for CD.

About

App1

Readme

0 stars

1 watching

0 forks

Releases

No releases published

Create a new release

Packages

No packages published

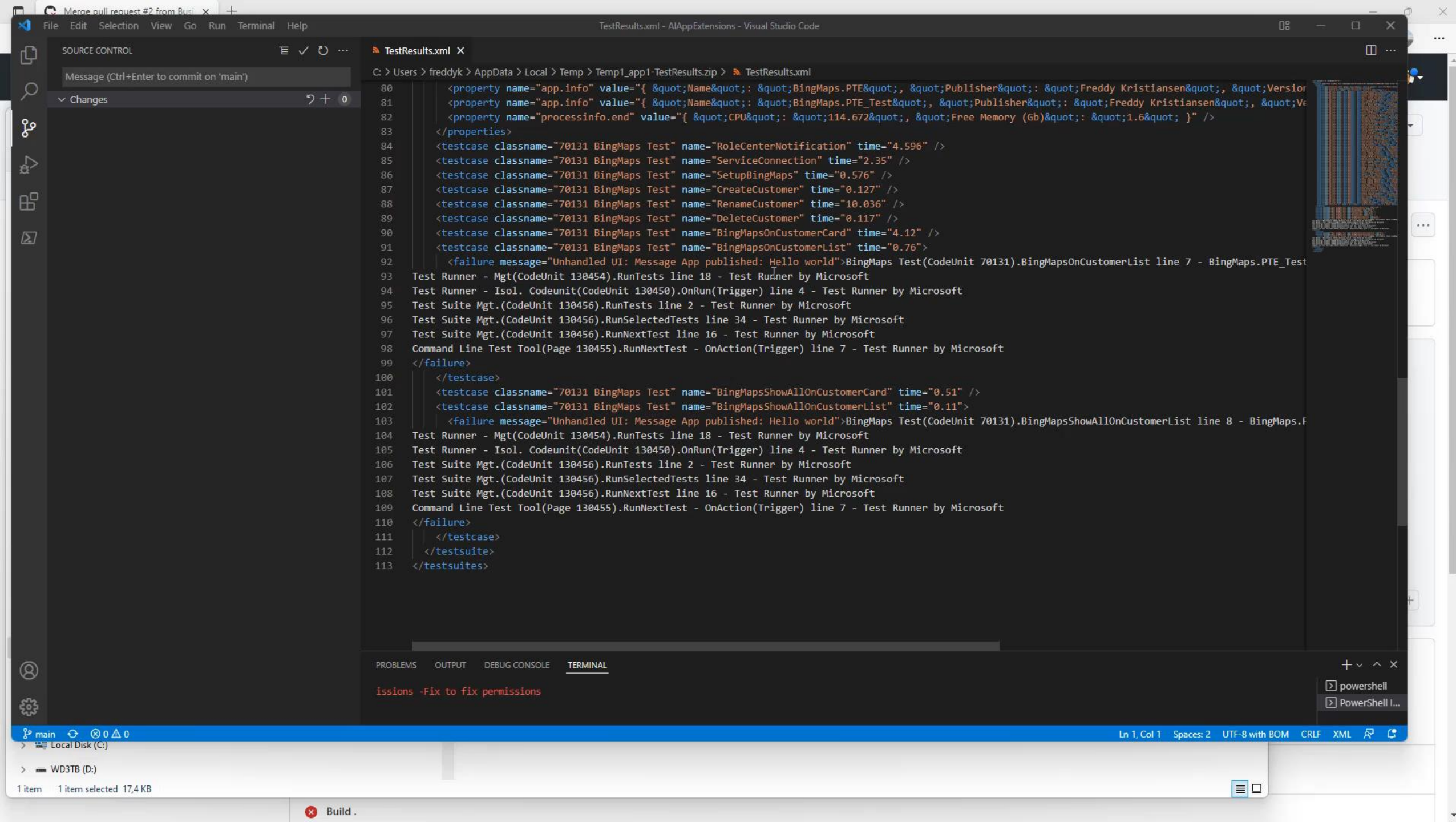
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Languages

PowerShell 100.0%

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 - Container Name
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 - Optional license file (mandatory for AppSource Apps)
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Setup Continuous Deployment to QA

- Create GitHub environment named QA
- Add AUTHCONTEXT secret
 - Using OAuth - S2S or user impersonation
- Modify your app and submit your changes to deploy

BusinessCentralDemos/app1: Ap

https://github.com/BusinessCentralDemos/app1

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main 3 branches 0 tags

Go to file

Add file

Code

freddydk 'Create a development environment Sandbox' 0e581f3 11 hours ago 9 commits

.AL-Go	'Add existing apps (BingMaps.PTE_Test)'	22 hours ago
.github	Initial commit	2 days ago
BingMaps.PTE	'Create a development environment Sandbox'	11 hours ago
BingMaps.PTE_Test	'Create a development environment Sandbox'	11 hours ago
Loyalty	'Create a development environment Sandbox'	11 hours ago
.gitignore	Initial commit	2 days ago
README.md	Initial commit	2 days ago
al.code-workspace	'Add existing apps (BingMaps.PTE_Test)'	22 hours ago

README.md

AL-Go Template

Per Tenant Extension Project

This template repository can be used for managing Per Tenant Extensions for Business Central.

Process:

1. Click **Use this template** to create a new repository based on this template
2. Under Actions, use the **Add existing** or **add new** workflows to add your apps and test apps
3. Continuous Integration (CI) pipeline is automatically started
4. **Register a customer environment** using an AAD app for authentication. (Remember to register the AAD app in

About

App1

Readme

0 stars

1 watching

0 forks

Releases

No releases published

Create a new release

Packages

No packages published

Publish your first package

Languages

AL 81.7% PowerShell 18.3%

Environments

- Register environments for deployment in GitHub
 - AuthContext secret can be specified on the environment or in a KeyVault
- Sandbox environments
 - are automatically picked up for continuous deployment in CI/CD
- Production environments
 - PTEs can be deployed by running a workflow
 - Currently not supported for AppSource Apps
 - For AppSource Apps we should auto-submit for validation when creating a release

Test your app against upcoming releases

- Test your app against Current, Next Minor or Next Major release
 - On demand or on a schedule
- Add additional countries to the tests

Actions · BusinessCentralDemos / x

← → ↺

https://github.com/BusinessCentralDemos/app1/actions

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🔔 + 👤

🐙

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🛡️ Security

📊 Insights

⚙️ Settings

Workflows

New workflow

All workflows

🔗 Add existing app or test app

🔗 CI/CD

🔗 Create Online Dev. Environme...

🔗 Create a new app

🔗 Create a new test app

🔗 Create release

🔗 Increment Version Number

🔗 Publish To Environment

🔗 Test Current

🔗 Test Next Major

🔗 Test Next Minor

🔗 Update AL-Go System Files

All workflows

Showing runs from all workflows

🔍 Filter workflow runs

8 workflow runs

Event ▾Status ▾Branch ▾Actor ▾

✓ Add Loyalty program

CI/CD #6: Commit a88a497 pushed by freddydk

main

📅 2 hours ago

🕒 17m 0s

⋮

✓ Create Online Dev. Environment

Create Online Dev. Environment #2: Manually run by freddydk

📅 14 hours ago

🕒 20m 44s

⋮

✓ Delete HelloWorld.al

CI/CD #3: Commit f7b641d pushed by freddydk

main

📅 14 hours ago

🕒 17m 25s

⋮

✗ Merge pull request #2 from BusinessCentralDemos/nirfg...

CI/CD #2: Commit 6e5e459 pushed by freddydk

main

📅 yesterday

🕒 19m 29s

⋮

✓ Add existing app or test app

Add existing app or test app #2: Manually run by freddydk

📅 yesterday

🕒 2m 6s

⋮

✓ Merge pull request #1 from BusinessCentralDemos/c35rx...

CI/CD #1: Commit 9c7d06e pushed by freddydk

main

📅 yesterday

🕒 15m 33s

⋮

✓ Add existing app or test app

Add existing app or test app #1: Manually run by freddydk

📅 yesterday

🕒 1m 45s

⋮

✓ Create a new app

Create a new app #1: Manually run by freddydk

📅 2 days ago

🕒 2m 2s

⋮

Versioning of your app

- Schema: Major.Minor.Build.Revision
- Major and Minor are taken from app.json
- Build and Revision are calculated
- 3 Versioning strategies supported currently
 0. Major.Minor.GITHUB_RUN_NUMBER.Attempt (with configurable offset)
 1. Major.Minor.GITHUB_RUN_ID.Attempt
 2. Major.Minor.yyyyMMdd.hhmmss
- IncrementVersionNumber can help bump version number in apps
- NextMajor and NextMinor builds are using maxint

Actions · BusinessCentralDemos

https://github.com/BusinessCentralDemos/app1/actions

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Test Next Major

Test Next Minor

Update AL-Go System Files

All workflows

Showing runs from all workflows

Filter workflow runs

11 workflow runs

EventStatusBranchActor

Test Next Major

Test Next Major #2: Scheduled

5 hours ago

32m 54s

Update AL-Go System Files

Update AL-Go System Files #2: Manually run by freddydk

yesterday

3m 13s

Test Next Major

Test Next Major #1: Manually run by freddydk

yesterday

19m 29s

Add Loyalty program

CI/CD #6: Commit a88a497 pushed by freddydk

main

yesterday

17m 0s

Create Online Dev. Environment

Create Online Dev. Environment #2: Manually run by freddydk

2 days ago

20m 44s

Delete HelloWorld.al

CI/CD #3: Commit f7b641d pushed by freddydk

main

2 days ago

17m 25s

Merge pull request #2 from BusinessCentralDemos/nirfg...

CI/CD #2: Commit 6e5e459 pushed by freddydk

main

2 days ago

19m 29s

Add existing app or test app

Add existing app or test app #2: Manually run by freddydk

2 days ago

2m 6s

Merge pull request #1 from BusinessCentralDemos/c35rx

2 days ago

Versioning

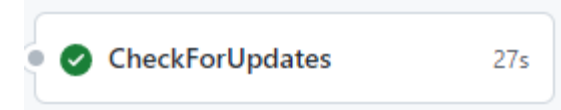



Versioning of AL-Go for GitHub

- Using a template simply copies the repository
 - With a reference to the template
- Workflows points to a specific version of actions
 - Main branch in AL-Go-Actions is not referenced
- With every build the template is checked for updates
 - Notification if changes to workflows or references
- Update AL-Go System Files
 - By running a workflow

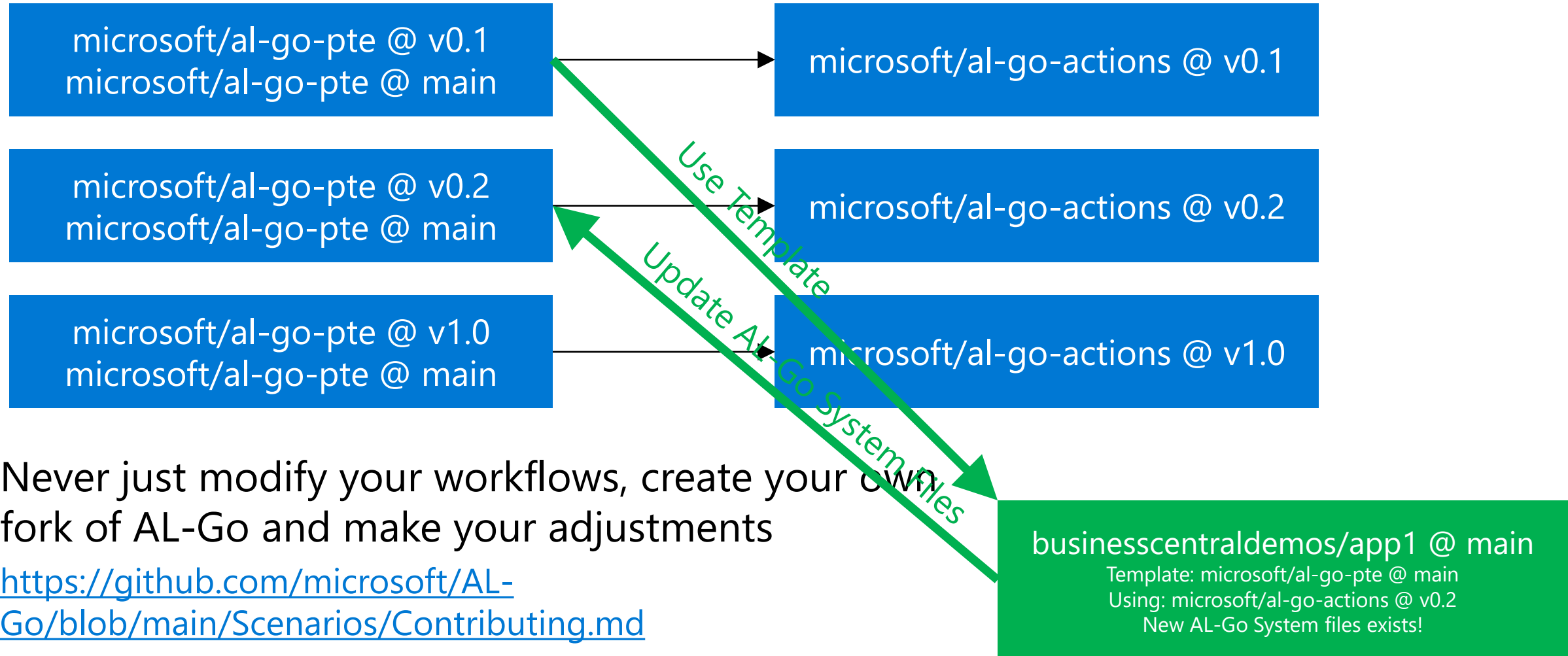
```
{  
  "type": "PTE",  
  "templateUrl": "https://github.com/microsoft/AL-Go-PTE@main"  
}
```

```
- name: Run pipeline  
  uses: microsoft/AL-Go-Actions/RunPipeline@v0.2
```



 Update AL-Go System Files

Versioning of AL-Go for GitHub

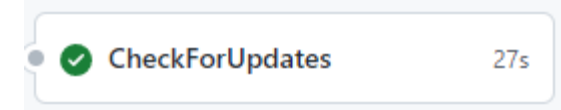



Versioning of AL-Go for GitHub

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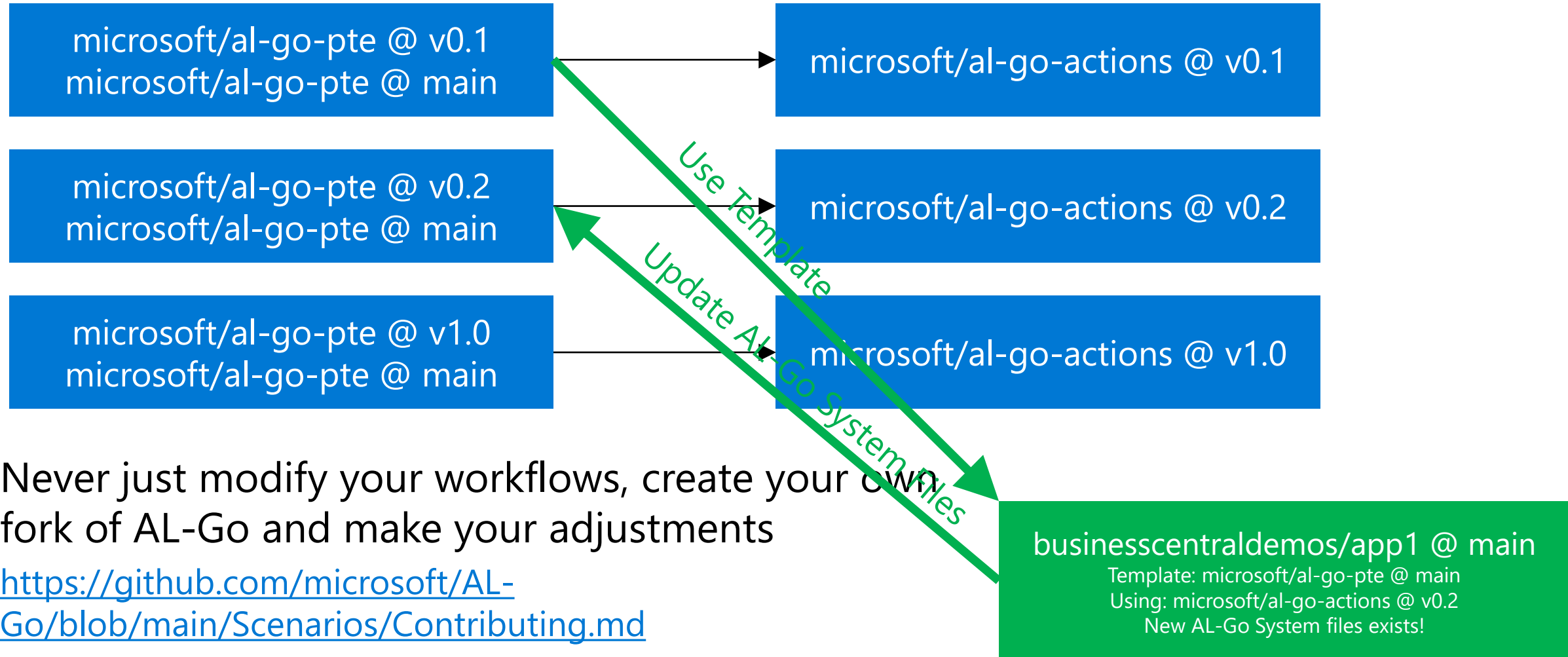
```
{  
  "type": "PTE",  
  "templateUrl": "https://github.com/microsoft/AL-Go-PTE@main"  
}
```

```
- name: Run pipeline  
  uses: microsoft/AL-Go-Actions/RunPipeline@v0.2
```



 Update AL-Go System Files

Versioning of AL-Go for GitHub



Thank you

