



Todor Todorov

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Unleash your build with NUKE



Следете актуалните обяви за **.NET**

DEV.BG

Todor Todorov

- ⌘ software developer;
- ⌘ clean code fanatic;
- ⌘ devops evangelist;
- ⌘ speaker;
- ⌘ father of 3 boys;
- ⌘ karaoke enthusiast;



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How do we do builds?

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GitLab interface showing a repository for 'totollygeek / awesome-app'. The main view displays the 'Tasks' configuration for 'azure-pipelines.yml' in the 'master' branch. The configuration includes a Docker task, a build task, and a test task.

```
1 # Docker
2 # Build and push an image to Azure
3 # https://docs.microsoft.com/azure/
4
5 trigger:
6 - master
7
8 pool:
9 - name: 'Tarox3 (2019-Itsc)'
10
11 variables:
12 - solution: '**/Scheduler.sln'
13 - buildPlatform: 'Any CPU'
14 - buildConfiguration: 'Release'
15
16 steps:
17 Settings
18 - task: NuGetToolInstaller@1
19
20 Settings
21 - task: NuGetCommand@2
22   inputs:
23     command: 'restore'
24     restoreSolution: '$(solution)'
25     feedsToUse: 'config'
26     nugetConfigPath: 'Scheduler/NuGet.Config'
27
28 Settings
29 - task: VSBuild@1
```

YAMA

- App Center distribute
Distribute app builds to testers and users via Visu...
- App Center test
Test app packages with Visual Studio App Center
- Archive files
Compress files into .7z, .tar.gz, or .zip
- ARM Outputs
This task reads the output values of an ARM depl...
- ARM template deployment
Deploy an Azure Resource Manager (ARM) templ...

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Problem?

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GitHub interface showing the file `continuous.yml` in the `main` branch of the repository `totollygeek / awesome-app`. The file content is as follows:

```
29 - uses: actions/checkout@v1
30 - name: Cache .nuke/temp, ~/.nuget/packages
31   uses: actions/cache@v2
32   with:
33     path: |
34       .nuke/temp
35       ~/.nuget/packages
36     key: ${{ runner.os }}-${{ hashFiles('global.json', 'source/**/*.csproj') }}
37 - name: Run './build.cmd Test PushPackages'
38   run: ./build.cmd Test PushPackages
39   env:
40     NuGetApiKey: ${{ secrets.NUGET_API_KEY }}
41 - uses: actions/upload-artifact@v1
42   with:
43     name: test-results
44     path: output/test-results
45 - uses: actions/upload-artifact@v1
46   with:
47     name: packages
48     path: output/packages
49 ubuntu-latest:
50   name: ubuntu-latest
```

The right sidebar shows the **Marketplace** section with a search bar and featured actions:

- Close Stale Issues** (389 stars): Close issues and pull requests with no recent activity.
- Setup Java JDK** (383 stars): Set up a specific version of the Java JDK and add the command-line tools to the PATH.
- Download a Build Artifact** (305 stars): Download a build artifact that was previously uploaded in the workflow by the upload-artifact action.

Use `Control` + `Space` to trigger autocomplete in most situations.

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```
<> Edit file  Preview changes  Spaces 2 No wrap
29   - uses: actions/checkout@v1
30   - name: Cache .nuke/temp, ~/.nuget/packages
31     uses: actions/cache@v2
32     with:
33       path: |
34         .nuke/temp
35         ~/.nuget/packages
36       key: ${{ runner.os }}-${{ hashFiles('global.json', 'source/**/*.csproj') }}
37   - name: Run './build.cmd Test PushPackages'
38     run: ./build.cmd Test PushPackages
39     env:
40       NuGetApiKey: ${{ secrets.NUGET_API_KEY }}
41   - uses: actions/upload-artifact@v1
42     with:
43       name: test-results
44       path: output/test-results
45   - uses: actions/upload-artifact@v1
46     with:
47       name: packages
48       path: output/packages
49   ubuntu-latest:
50     name: ubuntu-latest

Use Control + Space to trigger autocomplete in most situations.
```

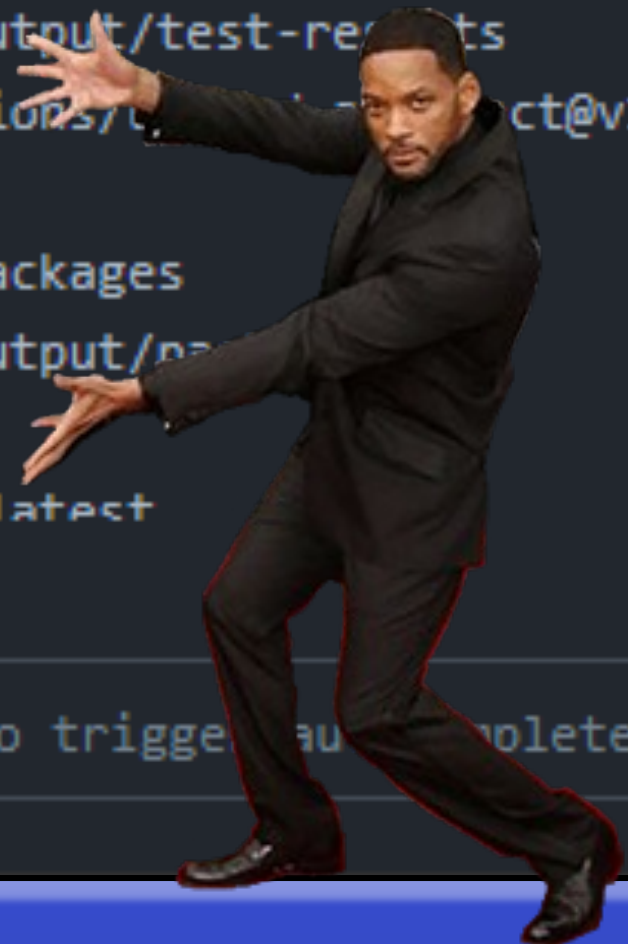
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```
40     NUGETApiKey: ${{ secrets.NUGET_API_KEY }}
41   - uses: actions/upload-artifact@v1
42     with:
43       name: test-results
44       path: output/test-results
45   - uses: actions/upload-artifact@v1
46     with:
47       name: packages
48       path: output/packages
49   ubuntu-latest:
50     name: ubuntu-latest
```



Use **Control** + **Space** to trigger autocomplete in most situations

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totollygeek / awesome-app

Unwatch 1 Star 0 Fork 0

Code Issues Pull requests **Actions** Projects Wiki Security Insights Settings

Try a broken yaml .github/workflows/continuous.yml #4

Summary

Jobs

Triggered via push 16 minutes ago	Status	Total duration	Artifacts
totollygeek pushed -o- 45cb452 main	Failure	-	-

This workflow graph cannot be shown
A graph will be generated the next time this workflow is run.

Annotations
1 error

- .github/workflows/continuous.yml#L46
You have an error in your yaml syntax on line 46

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This workflow graph cannot be shown

A graph will be generated the next time this workflow is run.

Annotations

1 error

- ✘ `.github/workflows/continuous.yml#L46`
You have an error in your yaml syntax on line 46

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```
<> Edit file  Preview changes  Spaces  2  No wrap

29   - uses: actions/checkout@v1
30   - name: Cache .nuke/temp, ~/.nuget/packages
31     uses: actions/cache@v2
32     with:
33       path: |
34         .nuke/temp
35         ~/.nuget/packages
36       key: ${{ runner.os }}-${{ hashFiles('global.json', 'source/**/*.csproj') }}
37   - name: Run './build.cmd Test PushPackages'
38     run: ./build.cmd Test PushPackages
39     env:
40       NuGetApiKey: ${{ secrets.NUGET_API_KEY }}
41   - uses: actions/upload-artifact@v1
42     with:
43       name: test-results
44       path: output/test-results
45   - uses: actions/upload-artifact@v1
46     with:
47       name: packages
48       path: output/packages
49   ubuntu-latest:
50     name: ubuntu-latest

Use Control + Space to trigger autocomplete in most situations.
```

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```
env:  
  NuGetApiKey: ${ secrets.NUGET_API_KEY }  
- uses: actions/upload-artifact@v1  
  with:  
    name: test-results  
    path: output/test-results  
- uses: actions/upload-artifact@v1  
  with:  
    name: packages  
    path: output/packages  
ubuntu-latest:
```

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Dear YAML,



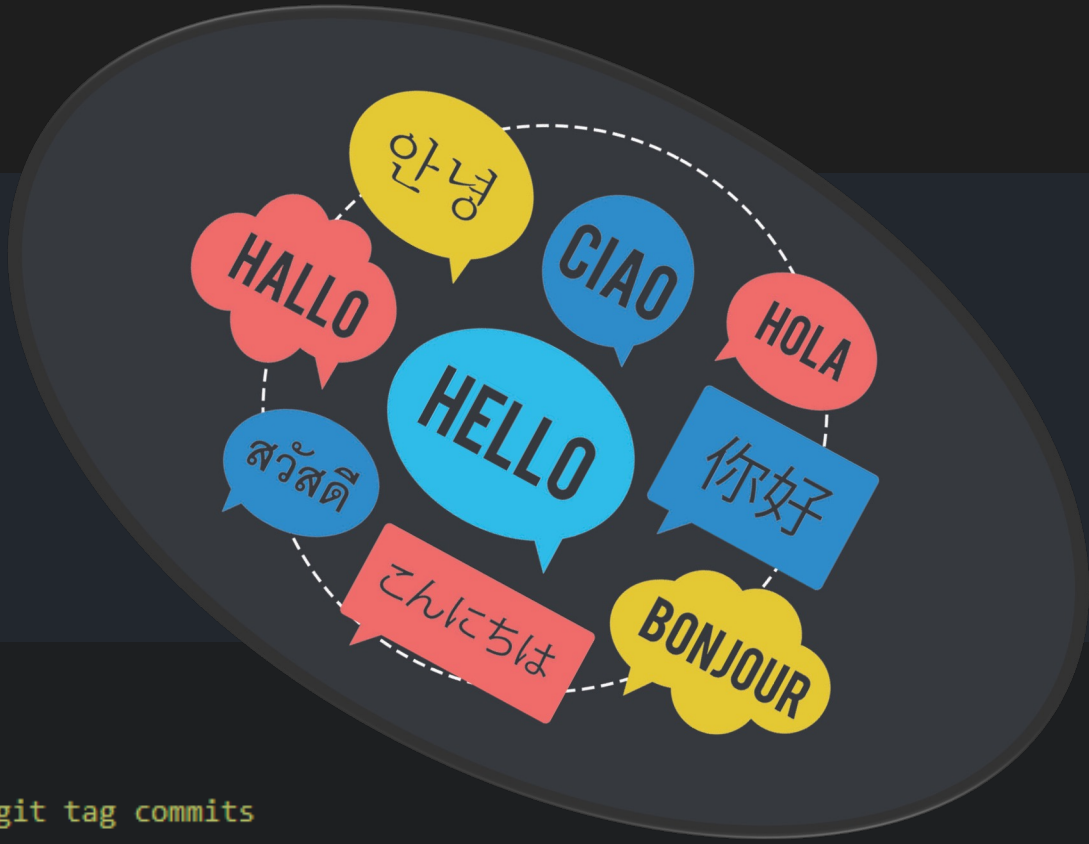
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```
9   - name: 'Tarox3 - (2019-ltsc)'  
10  
11  variables:  
12  - solution: '**/Scheduler.sln'  
13  - buildPlatform: 'Any-CPU'
```

```
19  on:  
20    push:  
21      branches:  
22        - main  
23  
24  jobs:  
25    windows-latest:
```

```
39  build_job:  
40    stage: build  
41    only:  
42      - tags # the build process will only be started by git tag commits  
43    script:  
44      - '& "$env:NUGET_PATH" restore' # restore Nuget dependencies  
45      - '& "$env:MSBUILD_PATH" /p:Configuration=Release' # build the project  
46    artifacts:  
47      expire_in: 1 week # save gitlab server space, we copy the files we need to deploy folder later on  
48      paths:  
49      - '$env:EXE_RELEASE_FOLDER\YourApp.exe' # saving exe to copy to deploy folder
```



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Dear YAML,



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Debugging

OnPrem

IDE Support

Portability

Customization

Highlighting

Reusability

The only problem?

Libraries

Extensibility

Learning curve

Build sharing

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A yellow silhouette of an excavator bucket, positioned as if it is about to dig into the first letter of the word 'ПОШУКЕ'.

ПОШУКЕ

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/njɜ:k/

1. The **cross-platform build automation** solution for **.NET** with **C# DSL**.
2. An approach to **embrace** existing **IDE tooling**.
3. A state where **everyone in a team** is able to **manage** and **change** the build.

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Matthias Koch

@matkoch87



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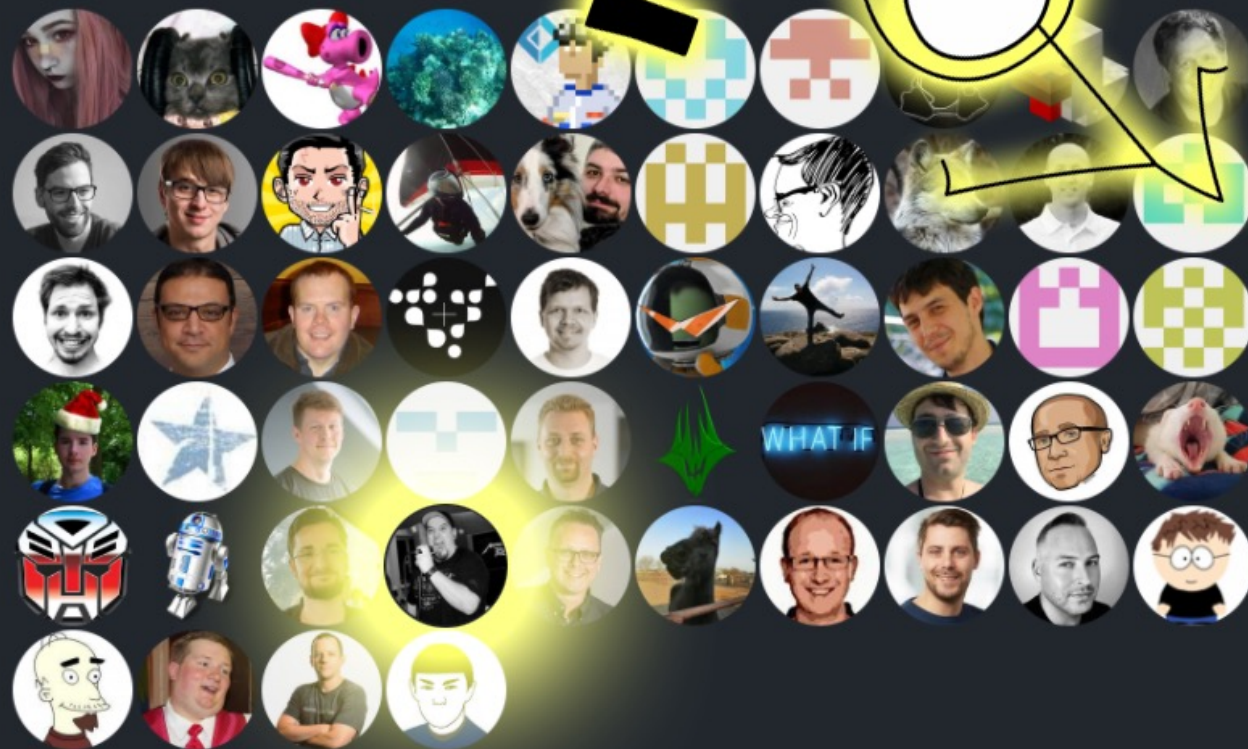


Contributing

NUKE is already a stable full-featured tool that allows implementing build automation on a professional level, and it continues to evolve! We add new features all the time, but we have many new cool ideas so that any help is highly appreciated. You can do many things: report bugs, improve the documentation, or do some other cool stuff.

If you want to contribute, check out the [contribution guidelines](#) and [report issues](#). If you have new ideas or want to complain about bugs, feel free to create [issues](#). Let's create the best tool for build automation together!

Thanks to all the great people who have already contributed to the project!

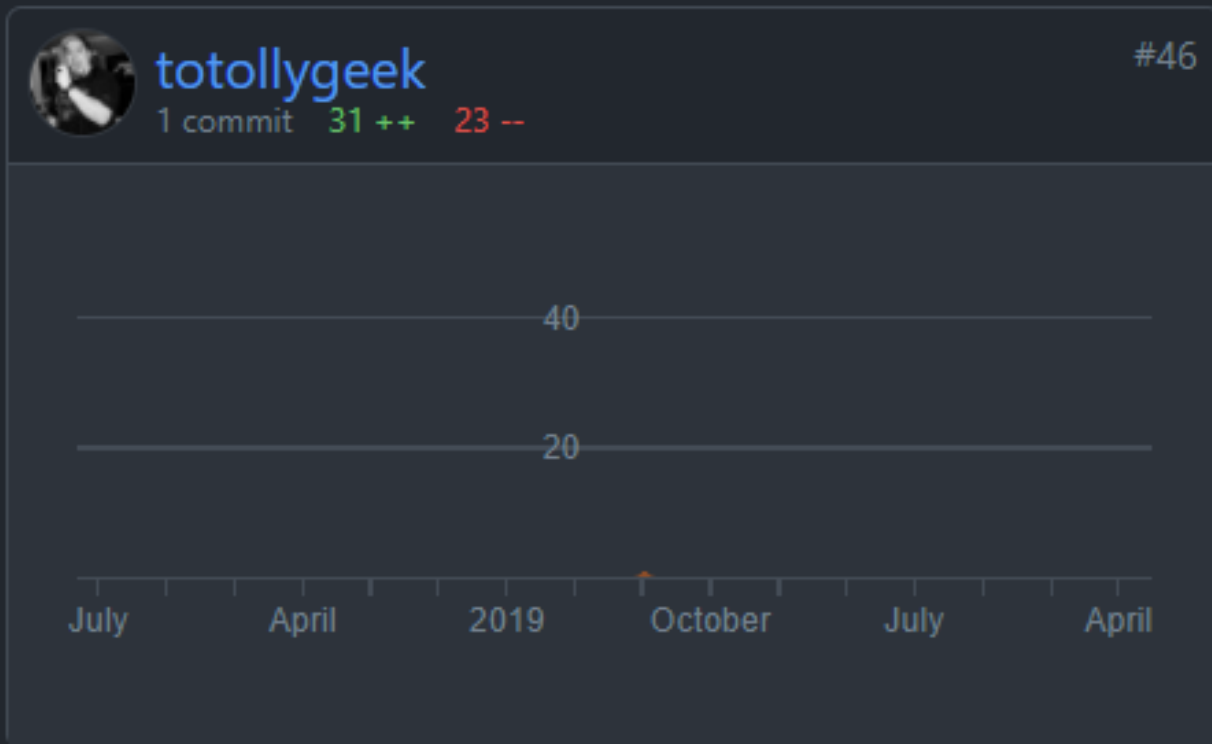


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What is it?

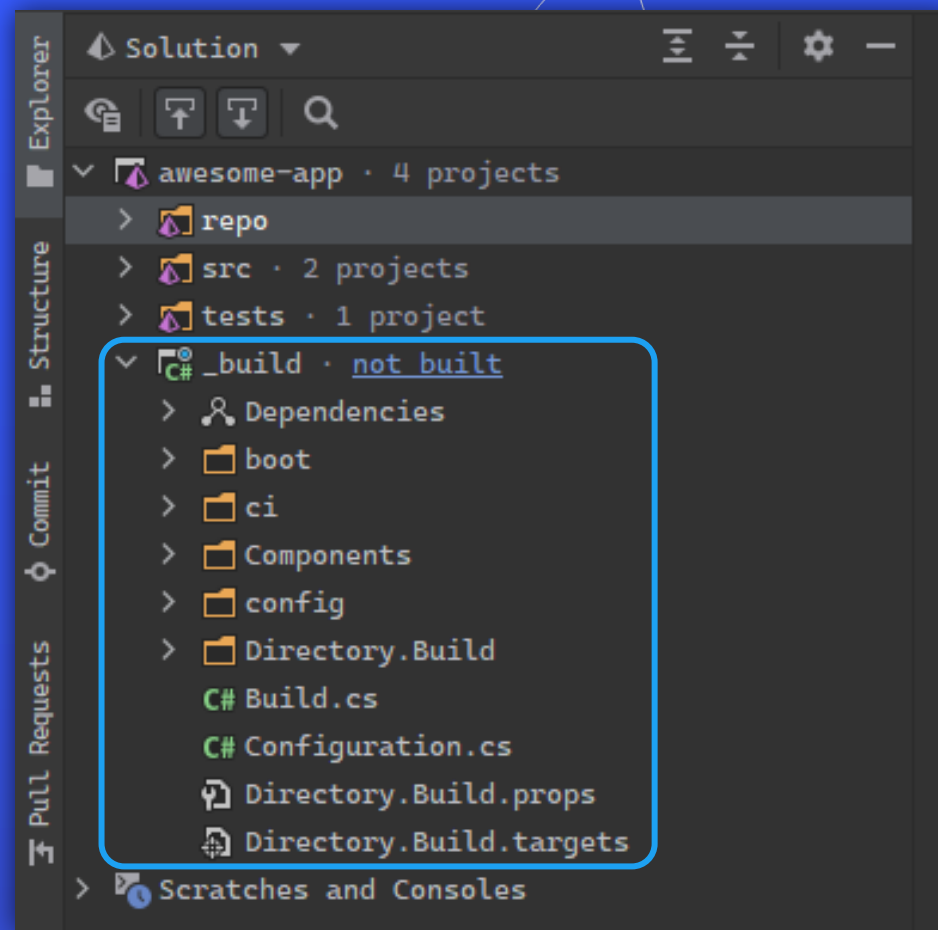
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What is it?



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But it is also so much more!

- » Global tool
- » Extensive libraries
- » CLI tool support
- » Fluent syntax
- » CI systems integration
- » Path handling
- » Solutions & projects models
- » Slack notifications
- » IDE extensions
- » Build sharing
- » ... and more



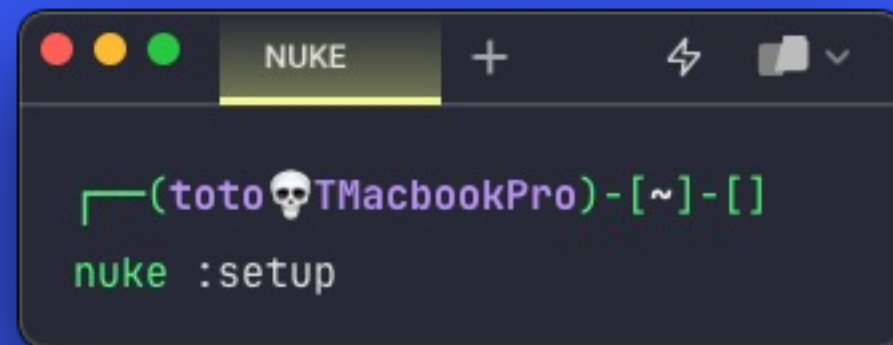
Photo by Xavi Cabrera on Unsplash



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Setup & Global Tool



```
(toto👁️TMacbookPro)-[~]-[ ]  
nuke :setup
```

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Installing a global tool is just one command away....

```
NUKE +
(toto@TMacbookPro)~/gh/awesome-app [⚡ main <✓>]
dotnet tool install Nuke.GlobalTool --global
You can invoke the tool using the following command: nuke
Tool 'nuke.globaltool' (version '6.3.0') was successfully installed.

(toto@TMacbookPro)~/gh/awesome-app [⚡ main <✓>]
nuke --help
GNU bash, version 3.2.57(1)-release (arm64-apple-darwin22)
Microsoft (R) .NET Core SDK version 7.0.202

NUKE
NUKE Execution Engine version 6.3.0 (OSX,.NETCoreApp,Version=v7.0)

Targets (with their direct dependencies):

Clean (default)
Restore
Compile -> Restore
Test -> Compile
Pack -> Test
PushPackages (default) -> Test, Pack
BuildDockerImage

(toto@TMacbookPro)~/gh/awesome-app [⚡ main <✓>]
```

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```
NUKE  
+  
⌘  
⌘  
⋮  
  
└─(toto👤MacbookPro)-[~/gh/awesome-app]-[~]  
nuke :setup  
NUKE Global Tool 🌐 version 6.3.0 (OSX,.NETCoreApp,Version=v6.0)  
  
Let's setup a new build!  
  
🌐 Root directory:           /Users/toto/gh/awesome-app  
👤 Build runtime:           .NET (net6.0)  
How should the project be named? (_build): █
```

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```
NUKE  
+  
⌘ ↵  
⌘ ⌘ ⋮  
  
└─(toto👤MacbookPro)-[~/gh/awesome-app]-[~]  
nuke :setup  
NUKE Global Tool 🌐 version 6.3.0 (OSX,.NETCoreApp,Version=v6.0)  
  
Let's setup a new build!  
🌐 Root directory:      /Users/toto/gh/awesome-app  
👤 Build runtime:      .NET (net6.0)  
    Build project name:  _build  
Where should the project be located? (./build): █
```

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```
NUKE  
+  
  
└─(toto👤MacbookPro)-[~/gh/awesome-app]-[ ]  
nuke :setup  
NUKE Global Tool 🌐 version 6.3.0 (OSX,.NETCoreApp,Version=v6.0)  
  
Let's setup a new build!  
  
🌐 Root directory:           /Users/toto/gh/awesome-app  
👤 Build runtime:           .NET (net6.0)  
📁 Build project name:      _build  
📍 Build project location:  ./build  
Which Nuke.Common version should be used?  
  
> 6.3.0 (latest release)
```

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```
NUKE +  
  
└─(toto👤MacbookPro)-[~/gh/awesome-app]-[]  
nuke :setup  
NUKE Global Tool 🌐 version 6.3.0 (OSX,.NETCoreApp,Version=v6.0)  
  
Let's setup a new build!  
  
🌳 Root directory:           /Users/toto/gh/awesome-app  
👤 Build runtime:           .NET (net6.0)  
📁 Build project name:      _build  
📍 Build project location:  ./build  
💎 Nuke.Common version:    6.3.0  
Which solution should be the default?  
  
> awesome-app.sln  
None
```

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```
NUKE  
+  
  
└─(toto👤TMacbookPro)-[~/gh/awesome-app]-[  
nuke :setup  
NUKE Global Tool 🌐 version 6.3.0 (OSX,.NETCoreApp,Version=v6.0)  
  
Let's setup a new build!  
  
🌳 Root directory:           /Users/toto/gh/awesome-app  
👤 Build runtime:           .NET (net6.0)  
📁 Build project name:      _build  
📍 Build project location:  ./build  
💎 Nuke.Common version:     6.3.0  
🇺🇸 Default solution:       awesome-app.sln  
  
Setup completed! 🎉  
  
└─(toto👤TMacbookPro)-[~/gh/awesome-app]-[
```

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How do builds look like?

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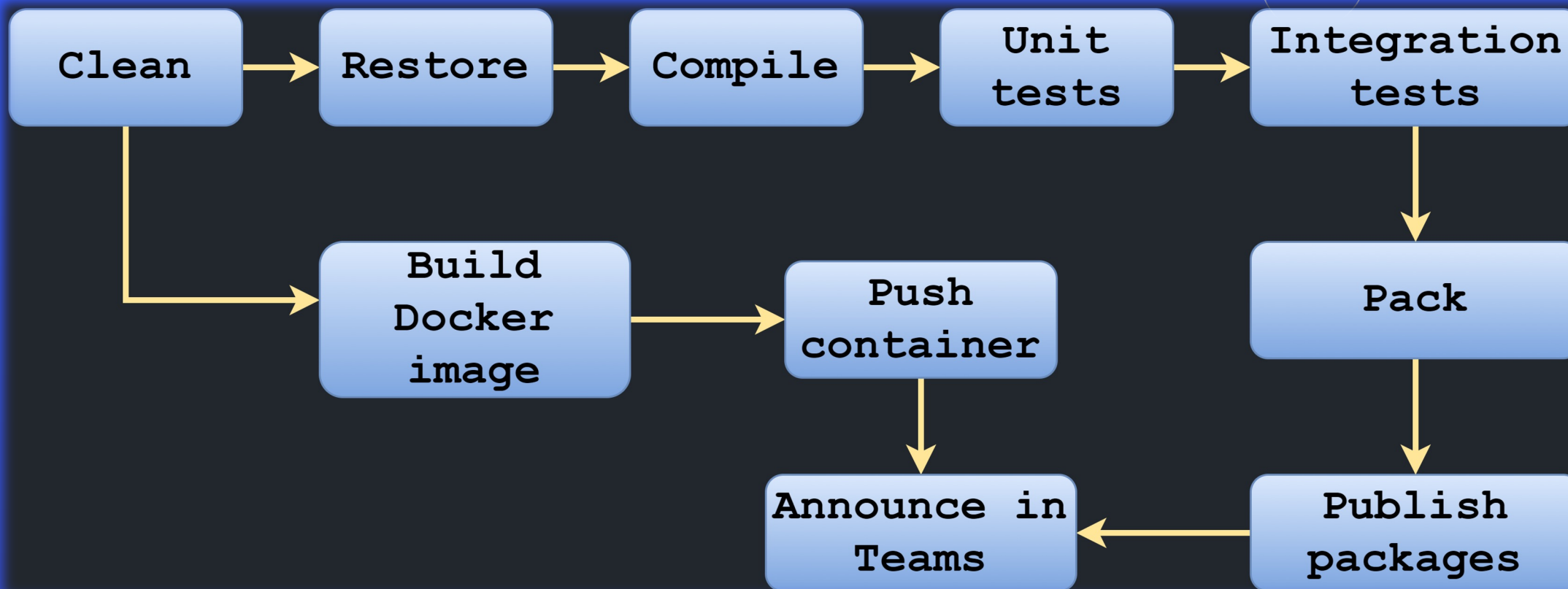


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Build model tree



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Targets

```
Target Restore => _ => _  
    .Executes(() =>  
    {  
        DotNetRestore(_ => _  
            .SetProjectFile(Solution));  
    });
```

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```
Target Clean => _ => _
  .Before(Restore)
  .Executes(() =>
  {
    SourceDirectory.GlobDirectories("**/bin", "**/obj").ForEach(DeleteDirectory);
    TestsDirectory.GlobDirectories("**/bin", "**/obj").ForEach(DeleteDirectory);
    EnsureCleanDirectory(OutputDirectory);
  });
```

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```
Target Clean => _ => _
  .Before(Restore)
  .Executes(() =>
  {
    SourceDirectory.GlobDirectories("**/bin", "**/obj").ForEach(DeleteDirectory);
    TestsDirectory.GlobDirectories("**/bin", "**/obj").ForEach(DeleteDirectory);
    EnsureCleanDirectory(OutputDirectory);
  });

Target Restore => _ => _
  .Executes(() =>
  {
    DotNetRestore(_ => _
      .SetProjectFile(Solution));
  });
```

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```
Target Clean => _ => _
  .Before(Restore)
  .Executes(() =>
  {
    SourceDirectory.GlobDirectories("**/bin", "**/obj").ForEach(DeleteDirectory);
    TestsDirectory.GlobDirectories("**/bin", "**/obj").ForEach(DeleteDirectory);
    EnsureCleanDirectory(OutputDirectory);
  });

Target Restore => _ => _
  .Executes(() =>
  {
    DotNetRestore(_ => _
      .SetProjectFile(Solution));
  });

Target Compile => _ => _
  .DependsOn(Restore)
  .Executes(() =>
  {
    DotNetBuild(_ => _
      .SetProjectFile(Solution)
      .SetConfiguration(Configuration)
      .SetAssemblyVersion(GitVersion.AssemblySemVer)
      .SetFileVersion(GitVersion.AssemblySemFileVer)
      .SetInformationalVersion(GitVersion.InformationalVersion)
      .EnableNoRestore());
  });
```

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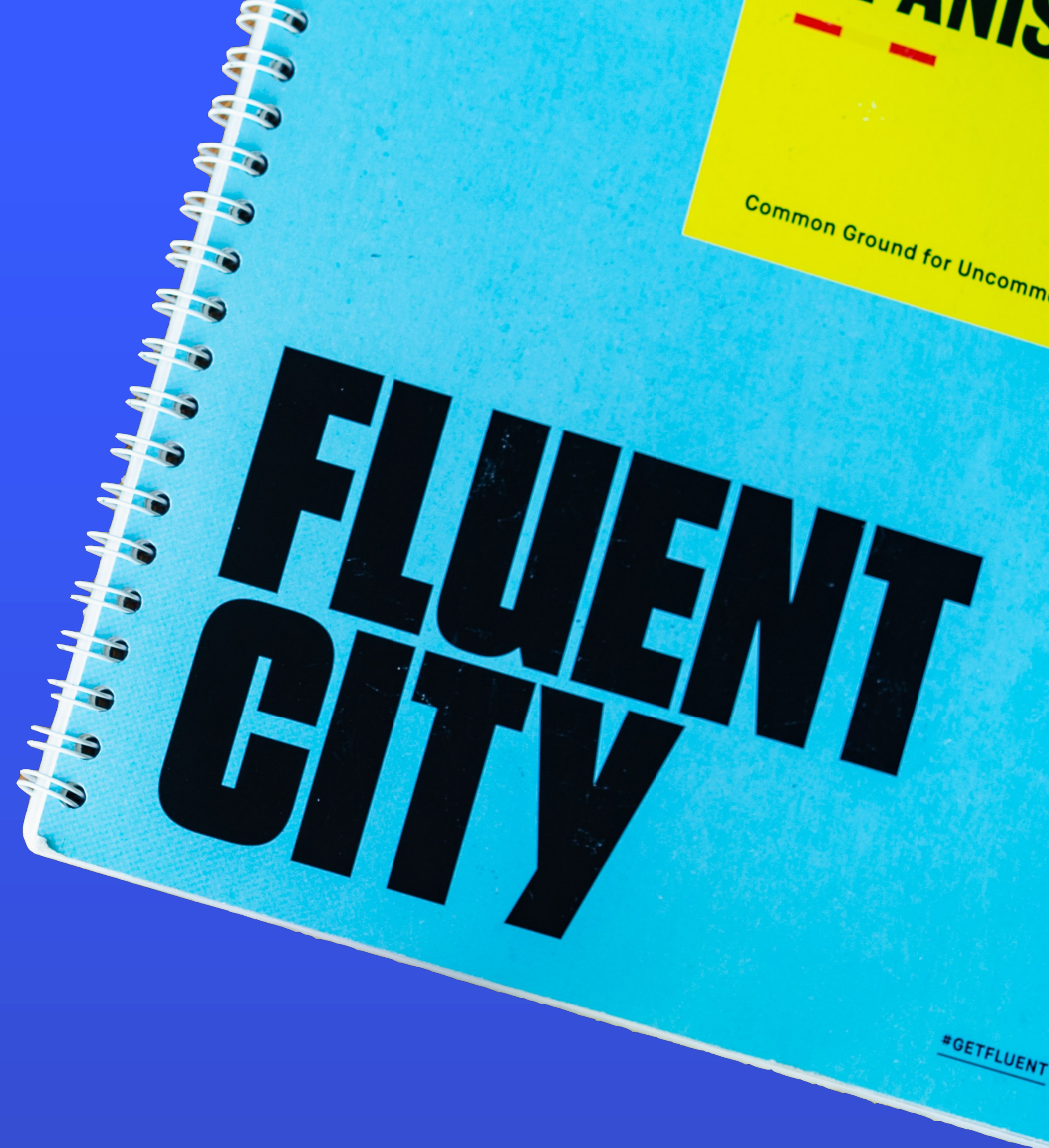


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Fluent API



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FluentInterface

20 December 2005



Martin Fowler

- API DESIGN
- DOMAIN SPECIFIC LANGUAGE

A few months ago I attended a workshop with Eric Evans, and he talked about a certain style of interface which we decided to name a fluent interface. It's not a common style, but one we think should be better known. Probably the best way to describe it is by example.

Source: <https://www.martinfowler.com/bliki/FluentInterface.html>

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```
DotNetTest(_ => _
    .SetConfiguration(Configuration)
    .SetNoBuild(SucceededTargets.Contains(Compile))
    .ResetVerbosity()
    .SetResultsDirectory(TestResultDirectory)
    .When(IsServerBuild, _ => _
        .EnableCollectCoverage()
        .SetCoverletOutputFormat(CoverletOutputFormat.cobertura)
        .SetExcludeByFile("*.Generated.cs")
        .SetCoverletOutputFormat(
            $"\\\\"{CoverletOutputFormat.cobertura},{CoverletOutputFormat.json}\\\\"")
        .EnableUseSourceLink())
    .CombineWith(TestProjects, (_, p) => _
        .SetProjectFile(p)
        .SetLogger($"{logger};LogFileName={p.Name}.{logger}")),
    completeOnFailure: true);
```




Fluent tasks convert to **CLI** call

```
DotNetRestore(_ => _  
    .SetProjectFile(Solution));
```



```
> "C:\Program Files\dotnet\dotnet.exe" restore C:\git\awesome-app\awesome-app.sln
```

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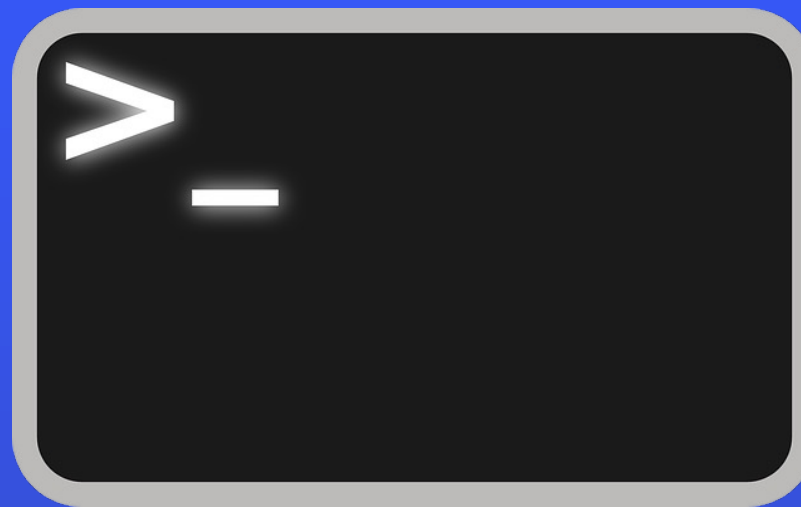


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CLI Tools



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DotCover GitVersion DotMemory SignTool SonarScanner
SpecFlow Npm
DotNet VSWhere Paket
MSBuild Helm DocFX GitHub
Docker Unity Squirrel OpenCover
Xunit NuGet Git
Kubernetes ReSharper Coverlet Octopus ReportGenerator VSTest

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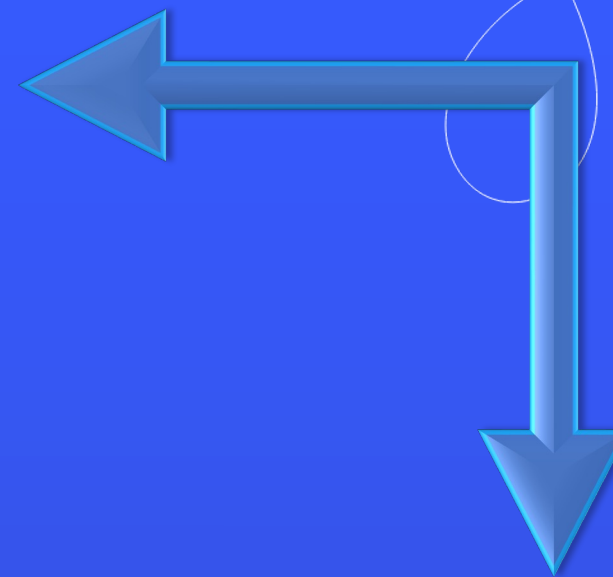
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```
Todor Todorov
Target BuildDockerImage => _ => _
  .Executes(() =>
  {
    DockerBuild(configurator: _ => _
      .SetFile("Dockerfile"));
  });
```

[Pure]
public static T SetFile<T>(this T toolSettings, string file)
in class DockerBuildSettingsExtensions

T is DockerBuildSettings

Sets File
Name of the Dockerfile (Default is 'PATH/Dockerfile').
`DockerBuildSettingsExtensions.SetFile` on google.com



Reference / Command-line reference / Docker CLI (docker) / docker build

docker attach	--cpuset-mems	MEMs in which to allow execution (0-3, 0,1)
docker build	--disable-content-trust	true Skip image verification
docker builder	--file, -f	Name of the Dockerfile (Default is 'PATH/Dockerfile')
docker buildx	--force-rm	Always remove intermediate containers
docker checkpoint	--iidfile	Write the image ID to the file

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Working with other executables

```
// This will locate it in PATH environment variable
[PathExecutable]
readonly Tool Docker;

// This will locate it via absolute/relative path
[LocalExecutable("./tools/confd.exe")]
readonly Tool Confd;

// This will get it from a NuGet package
[PackageExecutable("ReportGenerator", "ReportGenerator.exe")]
readonly Tool ReportGenerator;
```

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Working with other executables

```
var imageName = "alpine";  
var command = "sh";  
Docker($"run -it {imageName} {command}");  
// This will run: "docker run -it alpine sh"
```

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CI Systems Integration

GitHub
AzureDevOps
GitLab
Team City

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Prepare yourself...



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```
[GitHubActions(  
    "continuous",  
    GitHubActionsImage.WindowsLatest,  
    GitHubActionsImage.UbuntuLatest,  
    GitHubActionsImage.MacOsLatest,  
    OnPushBranches = new[] { MainBranch },  
    ImportSecrets = new[] { "NuGetApiKey" },  
    PublishArtifacts = true,  
    InvokedTargets = new[] { nameof(Test), nameof(PushPackages) },  
    CacheKeyFiles = new[] { "global.json", "source/**/*.csproj" })]  
[CheckBuildProjectConfigurations]  
[ShutdownDotNetAfterServerBuild]  
class Build : NukeBuild, IHaveGit  
{
```



```
awesome-app - gh-actions.yml
main
Search everywhere
Restore Run Debug
Solution gh-actions.yml x
Explorer
  awesome-app - 4 projects
    > repo
    > src - 2 projects
    > tests - 1 project
    > _build - not built
    > Dependencies
    > boot
    > ci
      azure-pipelines.yml
      gh-actions.yml
    > Components
    > config
    > Directory.Build
    > .editorconfig
    > Build.cs
    > Configuration.cs
    > Directory.Build.props
    > Directory.Build.targets
    > Scratches and Consoles
Pull Requests
Structure
Bookmarks
17 name: gh-actions
18
19 on:
20   push:
21     branches:
22       - main
23
24 jobs:
25   ubuntu-latest:
26     name: ubuntu-latest
27     runs-on: ubuntu-latest
28     steps:
29       - uses: actions/checkout@v3
30         with:
31           fetch-depth: 0
32       - name: Cache .nuke/temp, ~/.nuget/packages
33         uses: actions/cache@v3
34         with:
35           path: |
36             .nuke/temp
37             ~/.nuget/packages
38           key: ${{ runner.os }}-${{ hashFiles('global.json', 'source/**/*.csproj') }}
39       - name: Run './build.cmd Test PushPackages'
40         run: ./build.cmd Test PushPackages
41         env:
42           NuGetApiKey: ${{ secrets.NUGET_API_KEY }}
43           GITHUB_TOKEN: ${{ secrets.GITHUB_TOKEN }}
44       - uses: actions/upload-artifact@v3
45         with:
46           name: test-results
47           path: output/test-results
48       - uses: actions/upload-artifact@v3
49         with:
```

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View your build tree

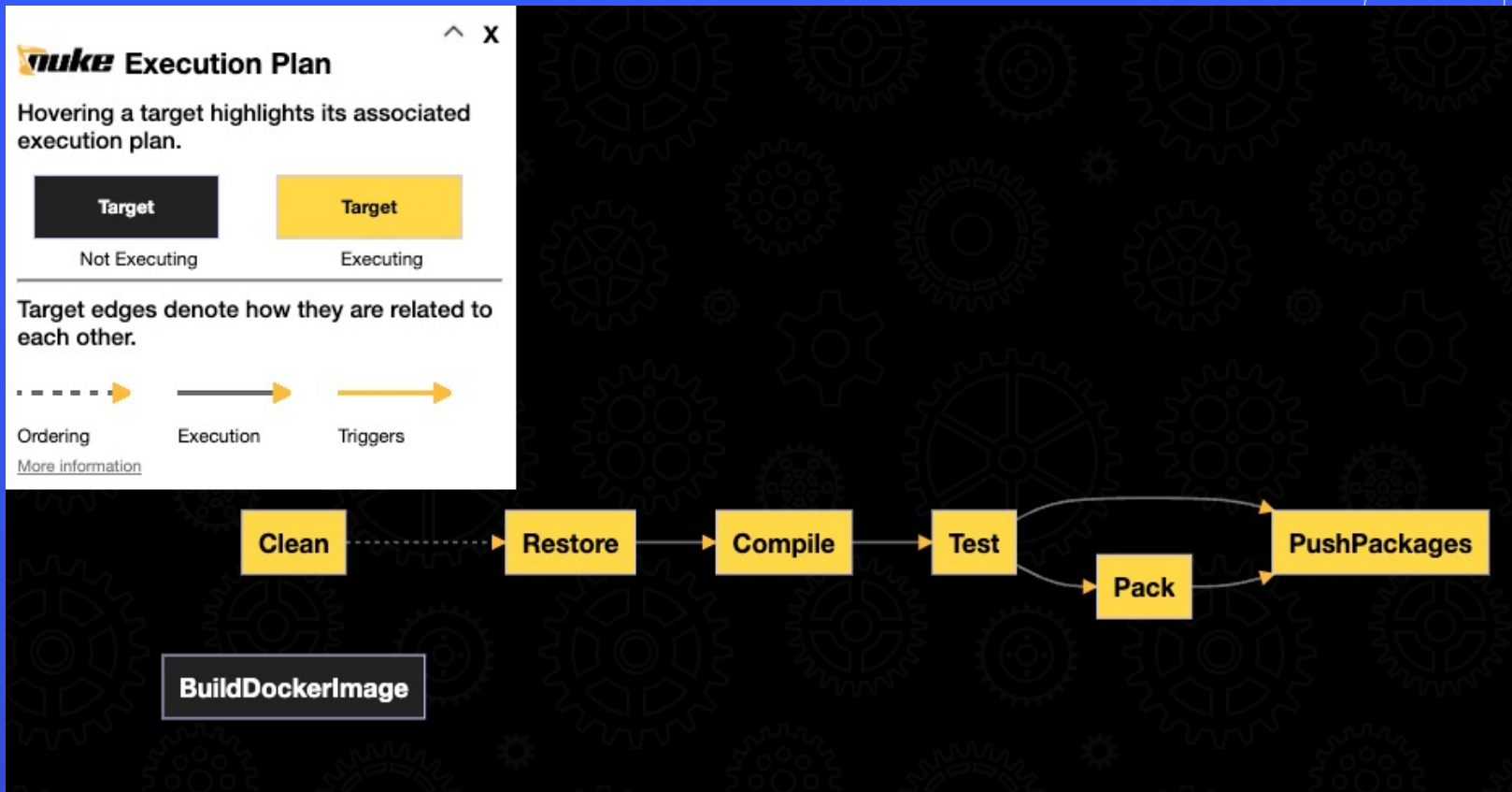
```
(toto👁️TMacbookPro)-[~]-[]  
nuke --plan|
```

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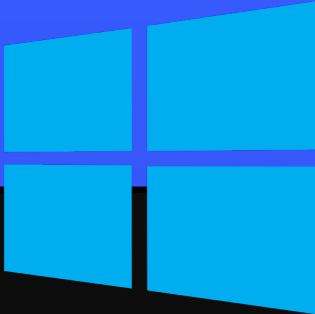
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Division operator magic



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```
AbsolutePath SourceDirectory => RootDirectory / "src";
AbsolutePath TestsDirectory => RootDirectory / "tests";
AbsolutePath OutputDirectory => RootDirectory / "output";
AbsolutePath TestResultDirectory => OutputDirectory / "test-results";
AbsolutePath PackagesDirectory => OutputDirectory / "packages";
AbsolutePath Dockerfile => SourceDirectory / "awesome.app" / "Dockerfile";
```



```
RootDirectory:    C:\git\awesome-app
TestsDirectory:   C:\git\awesome-app\tests
OutputDirectory: C:\git\awesome-app\output
Dockerfile:       C:\git\awesome-app\src\awesome.app\Dockerfile
```



```
RootDirectory:    /home/totollygeek/git/awesome-app
TestsDirectory:   /home/totollygeek/git/awesome-app/tests
OutputDirectory:  /home/totollygeek/git/awesome-app/output
Dockerfile:       /home/totollygeek/git/awesome-app/src/awesome.app/Dockerfile
```

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IDE Extensions



NUKE Support

Maintainers of NUKE 2021.1.0

Enabled for all projects

NUKE Support

This extension adds several features related to the NUKE build automation system:

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Together, We Create!



<https://github.com/nuke-build/nuke>



Thank you!

(•'◡'•)

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