

About Monoliths and Monorepos



Scalable Architecture for
Angular Apps with Nx



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oxaion

offen. flexibel. anders.

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Senior Software Architect



Please mind the gap 😊

 @c_janz

 <https://github.com/cjanz>



ng new



```
ng new ng-cli-app --routing
```

NG-CLI-APP

e2e

> src

protractor.conf.js

tsconfig.json

src

app

A app-routing.module.ts

S app.component.html

S app.component.scss

△ app.component.spec.ts

A app.component.ts

A app.module.ts

> assets

> environments

★ favicon.ico

S index.html

TS main.ts

TS polyfills.ts

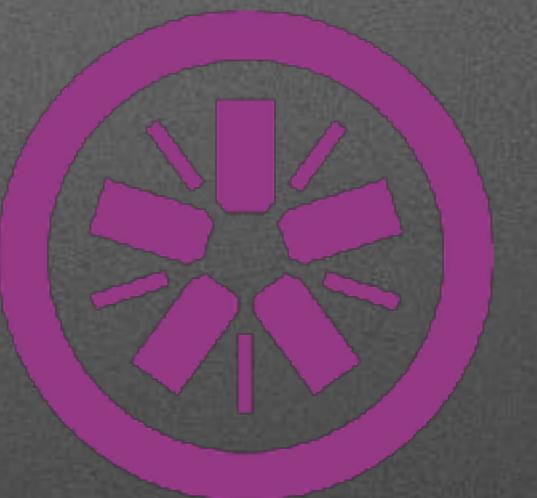
S styles.scss

TS test.ts

Angular CLI Tools

- ● ● Default Scripts

```
"scripts": {  
  "ng": "ng",  
  "start": "ng serve",  
  "build": "ng build",  
  "test": "ng test",  
  "lint": "ng lint",  
  "e2e": "ng e2e"  
}
```



Adding features

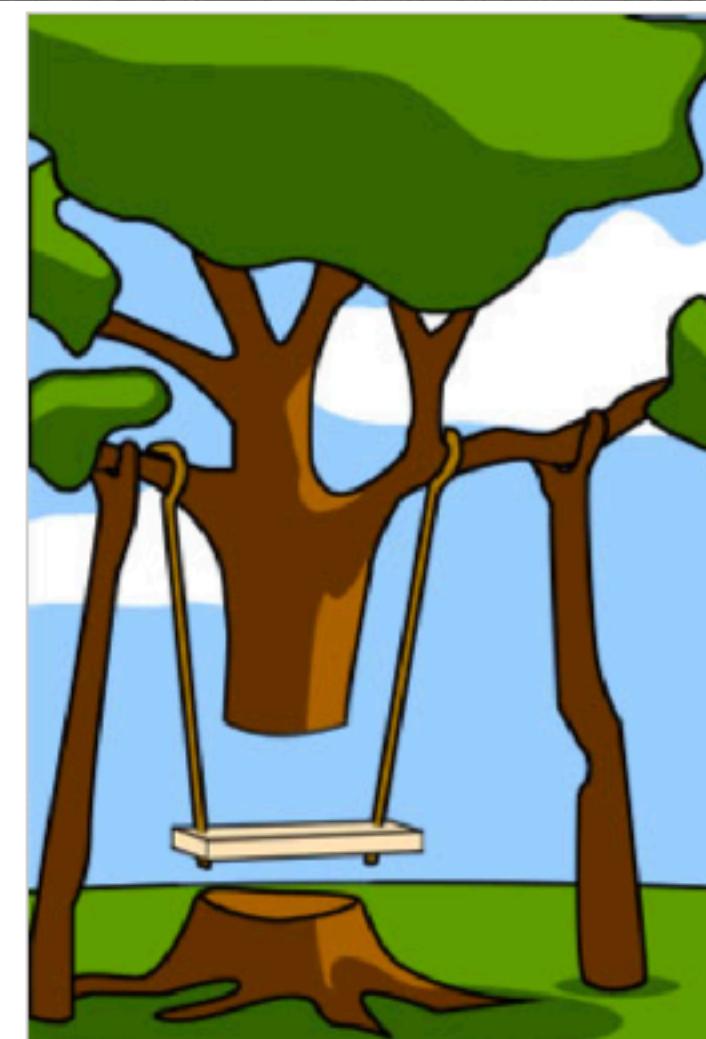




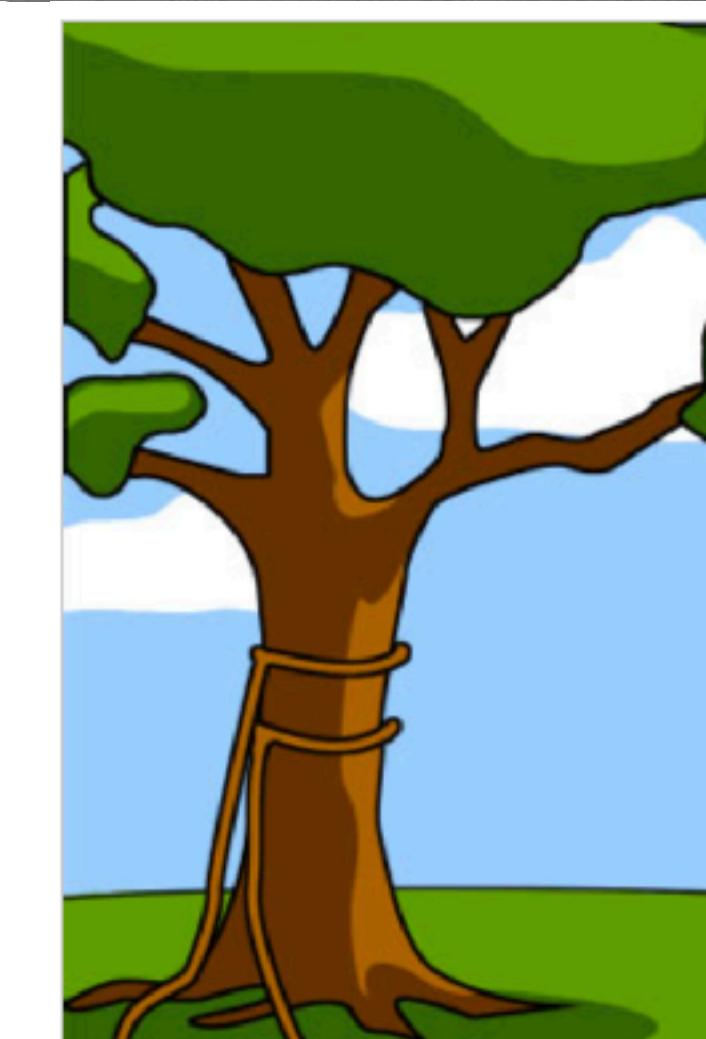
www.projectcartoon.com
How the customer explained it



www.projectcartoon.com
How Marketing proposed it



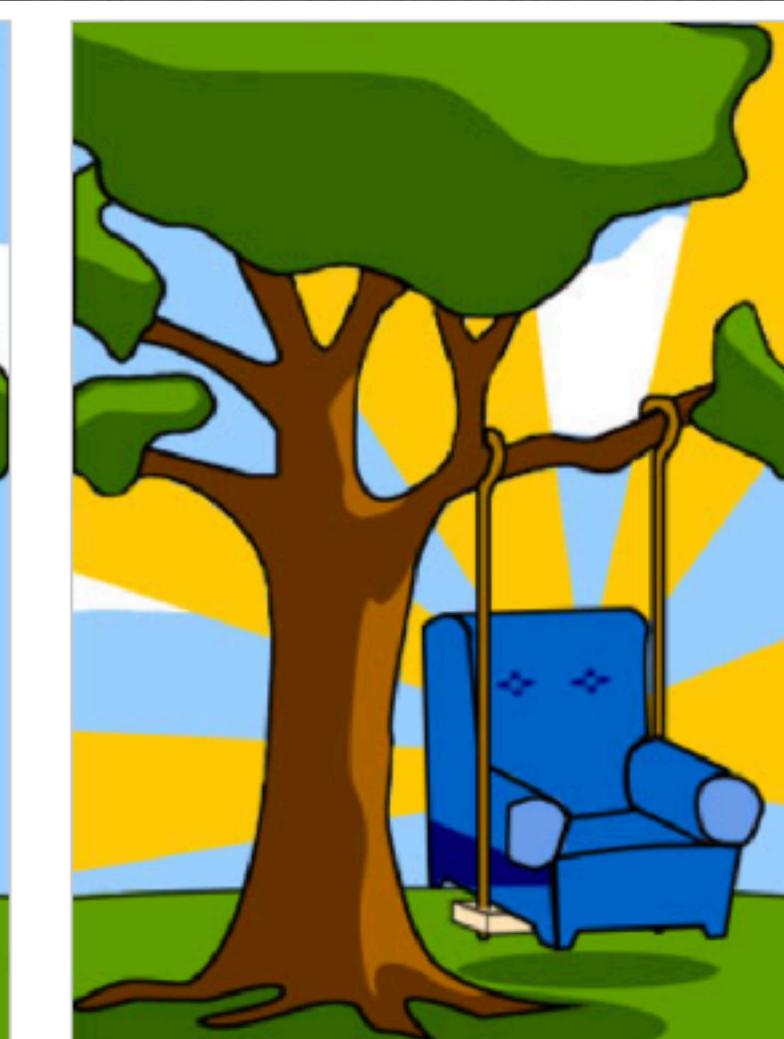
www.projectcartoon.com
How the analyst designed it



www.projectcartoon.com
How the programmer wrote it



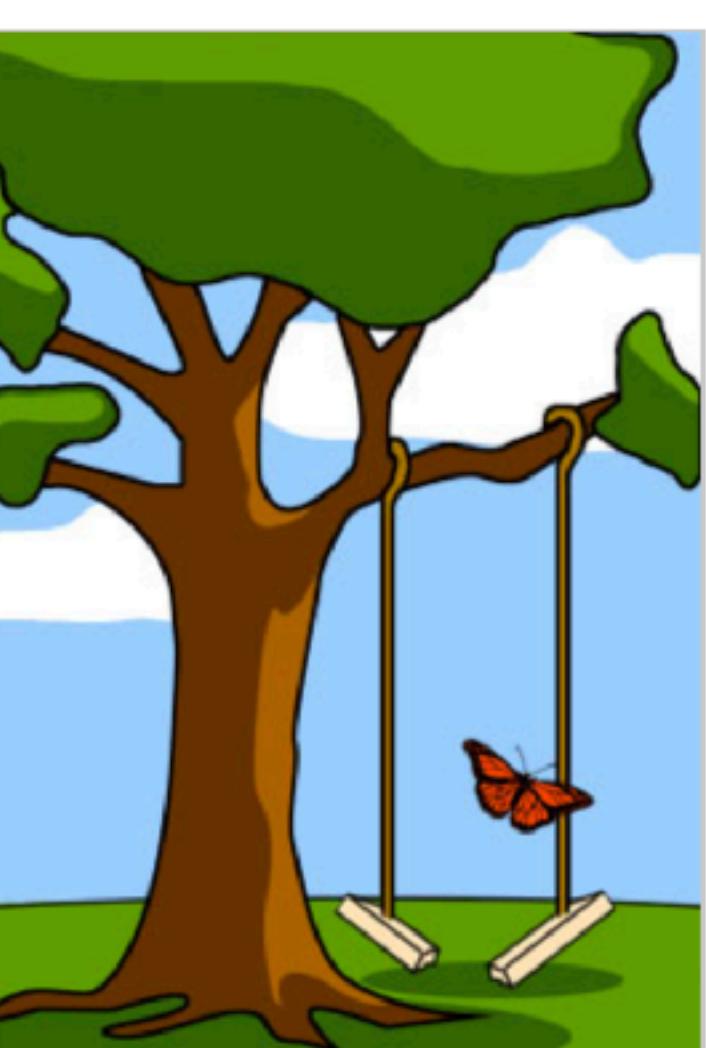
www.projectcartoon.com
What the beta testers received



www.projectcartoon.com
How the business consultant described it



www.projectcartoon.com
What operations installed



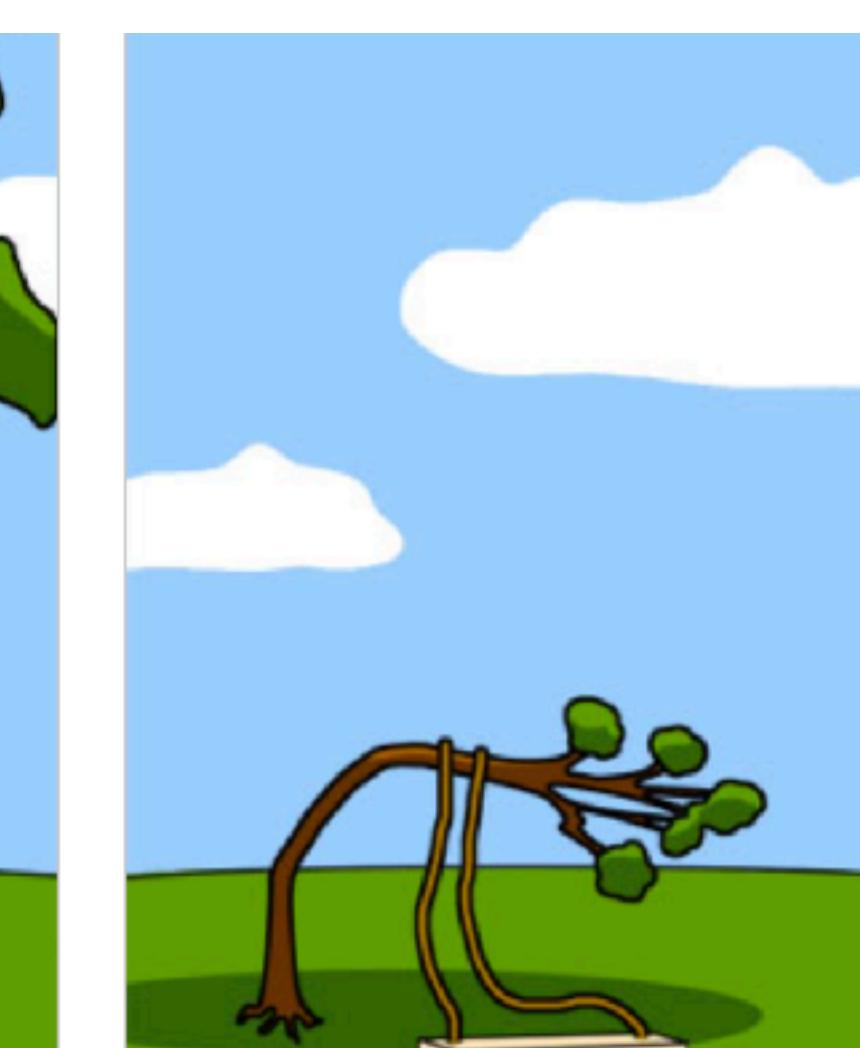
www.projectcartoon.com
How it performed under load



www.projectcartoon.com
When it was delivered



www.projectcartoon.com
What the customer really wanted



www.projectcartoon.com
The disaster recover plan

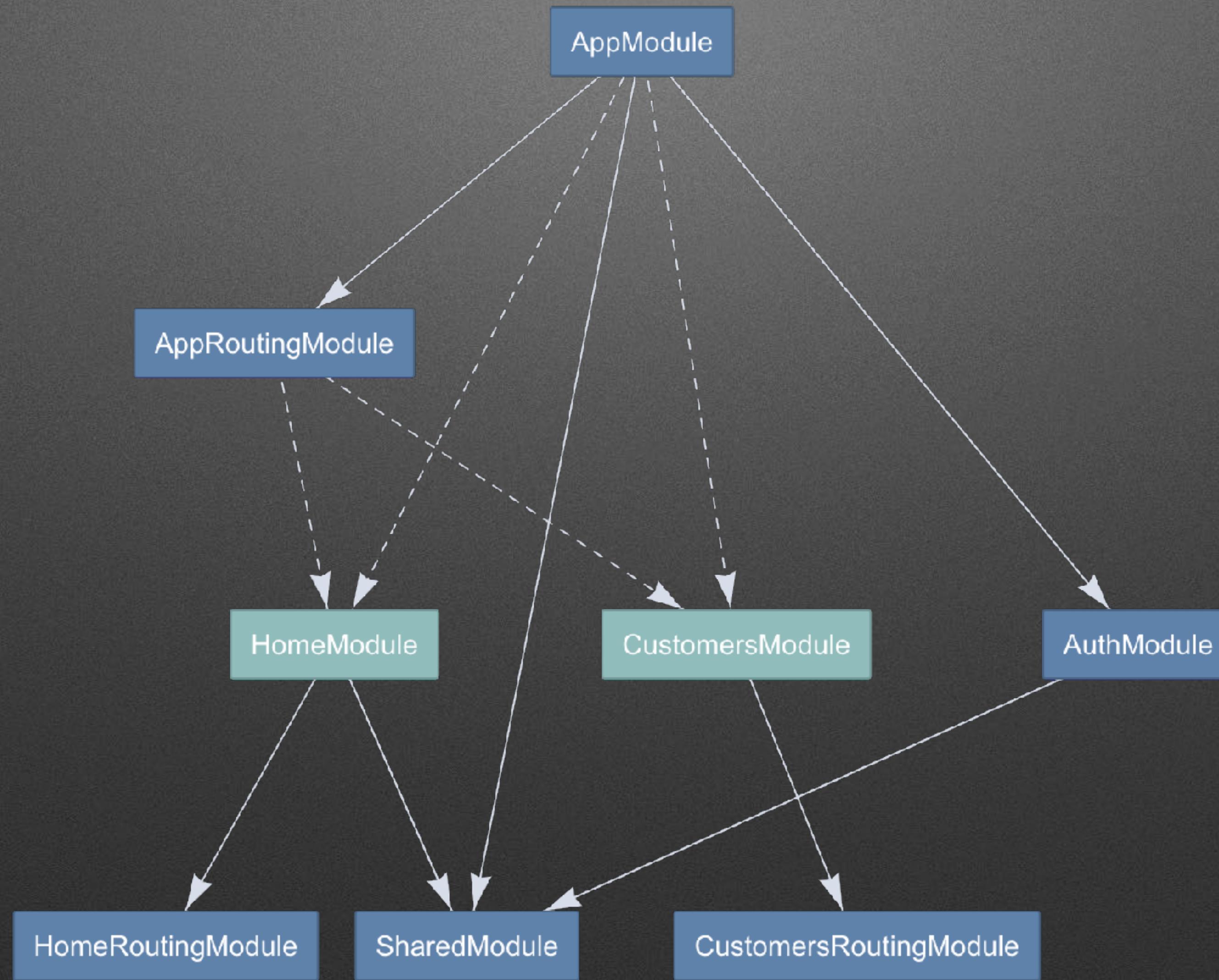


```
ng g module customers  
--project=ng-cli-app  
--module=app-routing.module.ts  
--routing --route=customers
```

NG-CLI-APP

- > dist
- > e2e
- > node_modules
- > src
 - > app
 - > auth
 - > customers
 - > home
 - > shared
 - > app-routing.module.ts
 - > app.component.html
 - > app.component.scss
 - > app.component.spec.ts
 - > app.component.ts
 - > app.module.ts
 - > assets
 - > environments
 - > favicon.ico
 - > index.html
 - > main.ts
 - > polyfills.ts
 - > styles.scss
 - > test.ts

Dependencies - NgModules



Dependencies - ES Modules



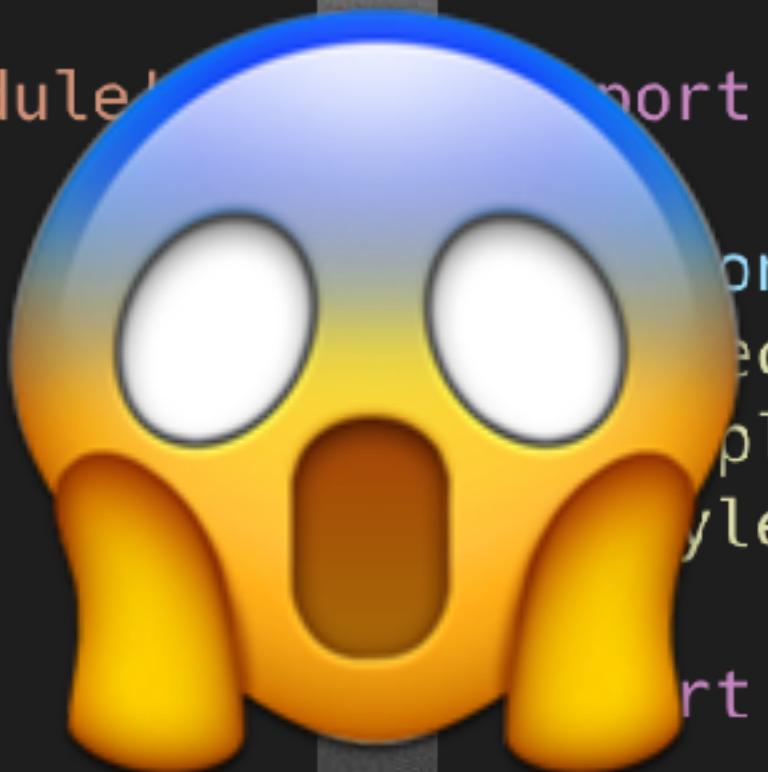
auth/auth.module.ts

```
import { NgModule } from '@angular/core';
import { SharedModule } from './shared/shared.module'
@NgModule({
  declarations: [LoginComponent],
  imports: [
    CommonModule,
    SharedModule,
    ...
  ]
})
export class AuthModule { }
```



shared/nav/navigation.component.ts

```
import { Component, OnInit } from '@angular/core';
import { User, AuthService } from './auth/auth.service';
@Component({
  selector: 'app-navigation',
  templateUrl: './navigation.component.html',
  styleUrls: ['./navigation.component.scss']
})
export class NavigationComponent implements OnInit {
  constructor(private authService: AuthService) { }
}
```



Monolith

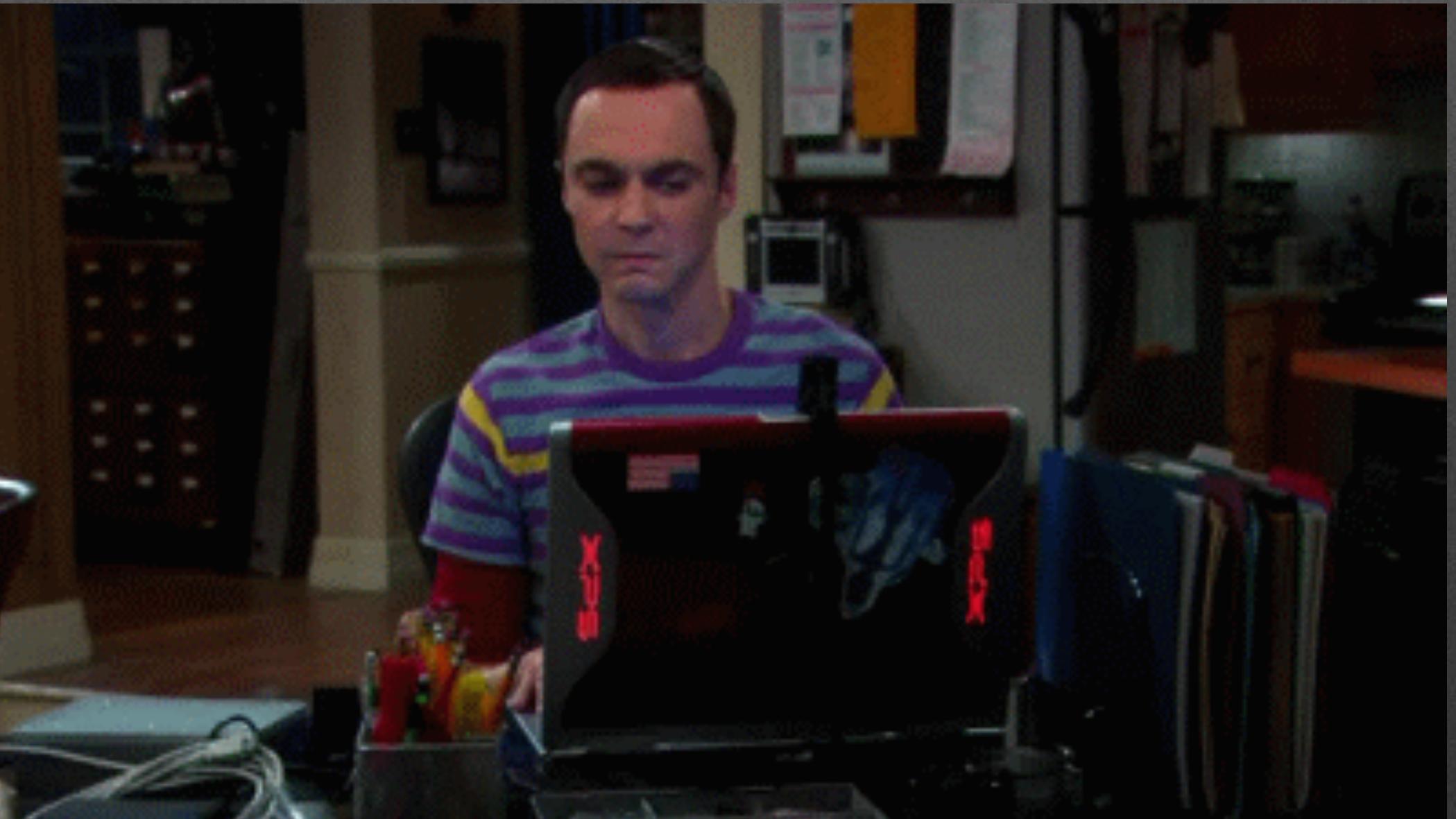
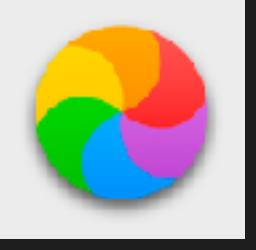
„In software engineering, a monolithic application describes a software application which is designed without modularity.

Modularity is desirable, in general, as it supports reuse of parts of the application logic and also facilitates maintenance by allowing repair or replacement of parts of the application without requiring wholesale replacement.“

```
29 10 2019 21:31:52.729:INFO [karma-server]: Karma v4.1.0 server started at http://0.0.0.0:9876/  
29 10 2019 21:31:52.729:INFO [launcher]: Launching browsers Chrome with concurrency unlimited  
30% building 18/18 modules 0 active29 10 2019 21:31:52.738:INFO [launcher]: Starting browser Chrome  
29 10 2019 21:31:55.682:WARN [karma]: No captured browser, open http://localhost:9876/  
29 10 2019 21:31:55.766:INFO [Chrome 78.0.3904 (Mac OS X 10.14.6)]: Connected on socket M2bMTUUmrvVTk  
Chrome 78.0.3904 (Mac OS X 10.14.6): Executed 560 of 1003 SUCCESS (0 secs / 1 min 1.701 secs)
```

```
> ng lint
```

```
Linting "ng-cli-app"...
All files pass linting.
```



Split Code into Libraries



TECHNIQUES

[Security](#)[Internationalization \(i18n\)](#)[Accessibility](#)[Service Workers & PWA](#)[Server-side Rendering](#)[Upgrading from AngularJS](#)[Angular Libraries](#)[Libraries Overview](#)[Using Published Libraries](#)[Creating Libraries](#)

Creating Libraries

You can create and publish new libraries to extend Angular functionality. If you find that you need to solve the same problem over and over again (for example, if you have multiple applications that need to do the same thing), or if you want to share your solution with other developers, you have a candidate for a library.

A simple example might be a button that sends users to your company website, that would be included in a library.

For more details on how a library project is structured you can refer the [Library Project Files](#)

Getting started

Use the Angular CLI to generate a new library skeleton with the following command:

<https://angular.io/guide/creating-libraries>

Development Workflow



Angular CLI Library Support



**Works well for
small number of libraries**



**Does not scale well for
large projects**

Introducing **Nx**



„Nx is a set of extensible dev tools for monorepos, which helps you develop like Google, Facebook, and Microsoft.“

<https://nx.dev/angular>

Monorepo

„In revision control systems, a monorepo (...) is a software development strategy where code for many projects are stored in the same repository. As of 2017 this software engineering practice was over a decade old, but had only recently been named.

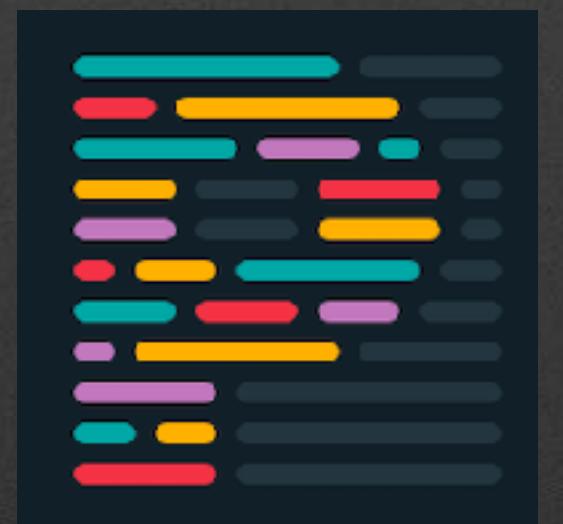
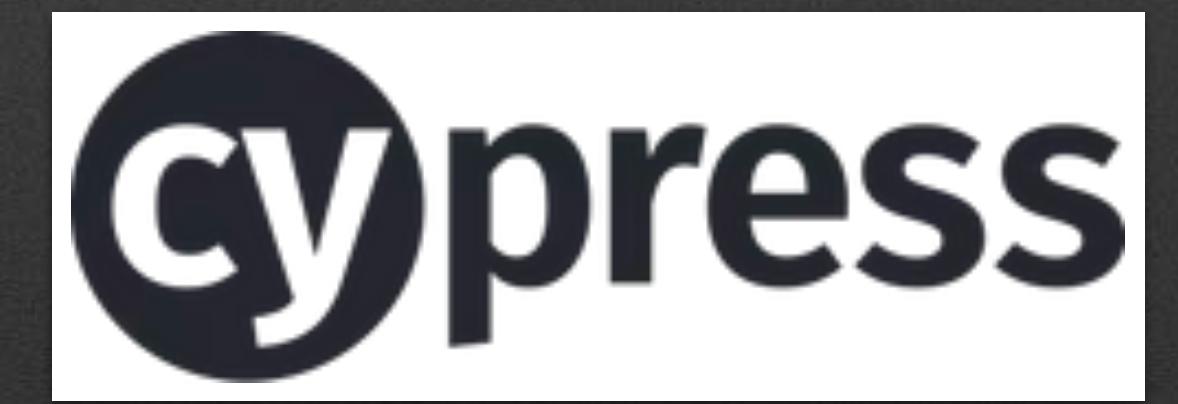
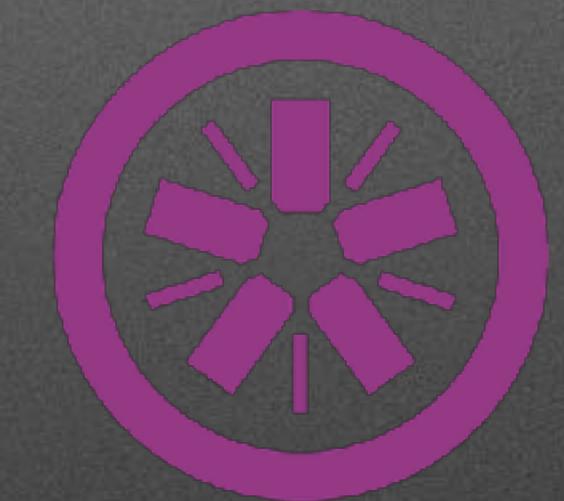
Google, Facebook, Microsoft, Uber, Airbnb and Twitter all employ very large monorepos with varying strategies to scale build systems and version control software with a large volume of code and daily changes.“

**„But we’re not Google or Facebook.
We don’t have many apps.“**

Nx: Use innovative tools

● ● ● Default Scripts

```
"scripts": {  
  "ng": "ng",  
  "start": "ng serve",  
  "build": "ng build",  
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  "lint": "ng lint",  
  "e2e": "ng e2e"  
}
```





or





and



Nx: Monorepo automation

- Support for multiple application and libraries
 - Define public API of libraries
 - Analysis and visualization of Dependencies
 - Test only projects affected by a code change
 - Support for parallel build targets

Nx: Factsheet

 @nrwl/*

 Nx is a set of Angular CLI power-ups for modern development.

 <https://nx.dev/angular>

 <https://github.com/nrwl/nx>

 MIT License

 Developed by Nrwl

Live Coding Time!



Summary

- 🔧 Nx is not a replacement for the CLI. It's a set of Angular CLI power-ups.
- 🤓 Do everything you can do using the CLI
- 💻 Build full-stack applications using Angular and Nest
- 🔄 Use scalable development practices such as monorepos
- 👮 Enforce coding guidelines with workspace schematics
- 🔬 Use innovative tools like Cypress and Jest

Thank you 🙏



Images used in this slides

- <https://www.pexels.com/photo/landscape-photo-of-stonehenge-2716774/>
- <https://www.pexels.com/photo/green-leaved-trees-under-blue-sky-1662145/>
- <https://www.pexels.com/photo/notebook-beside-the-iphone-on-table-196644/>
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- <https://www.pexels.com/photo/cargo-container-lot-906494/>
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- <https://media.giphy.com/media/N0PFV6nGA72XC/giphy.gif>