# Confartigianato
## FRAV
## Imprese Veneto

# AngularJS 2.0
# un framework per creare
# Single Page Application

**Daniele Morosinotto**
*Software Developer*

*JavaScript enthusiast*
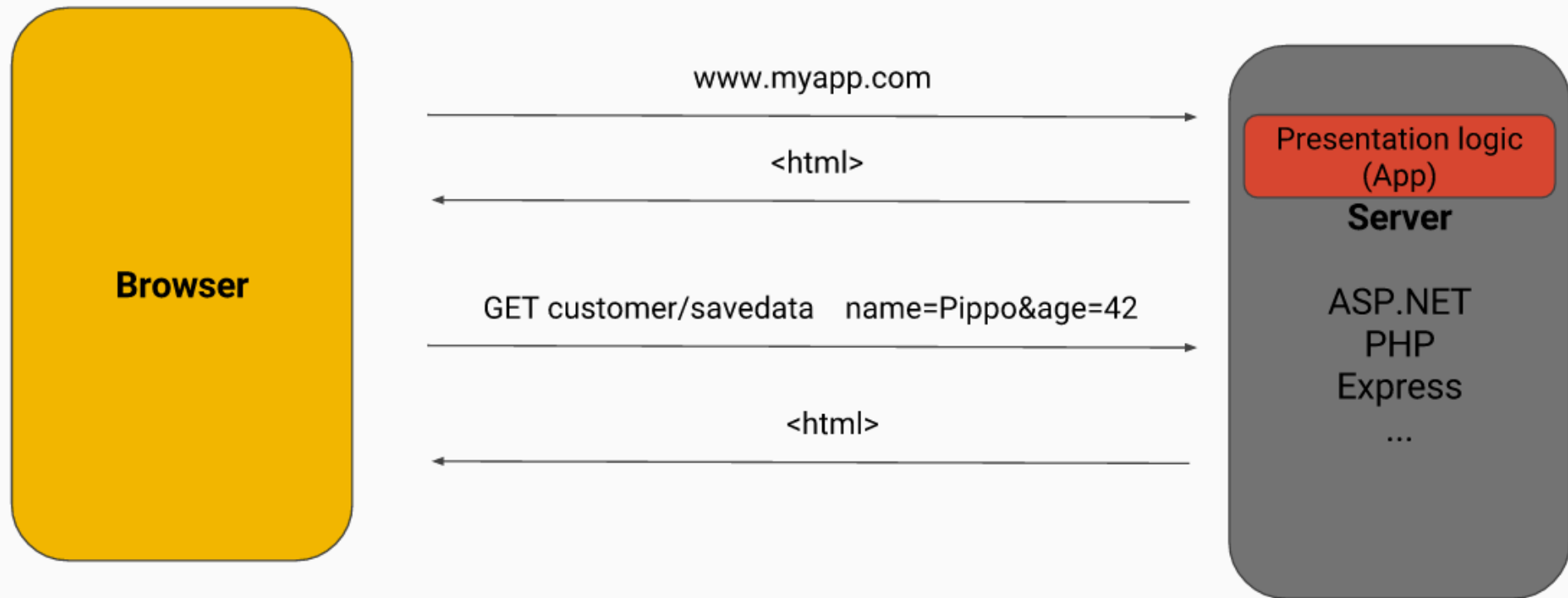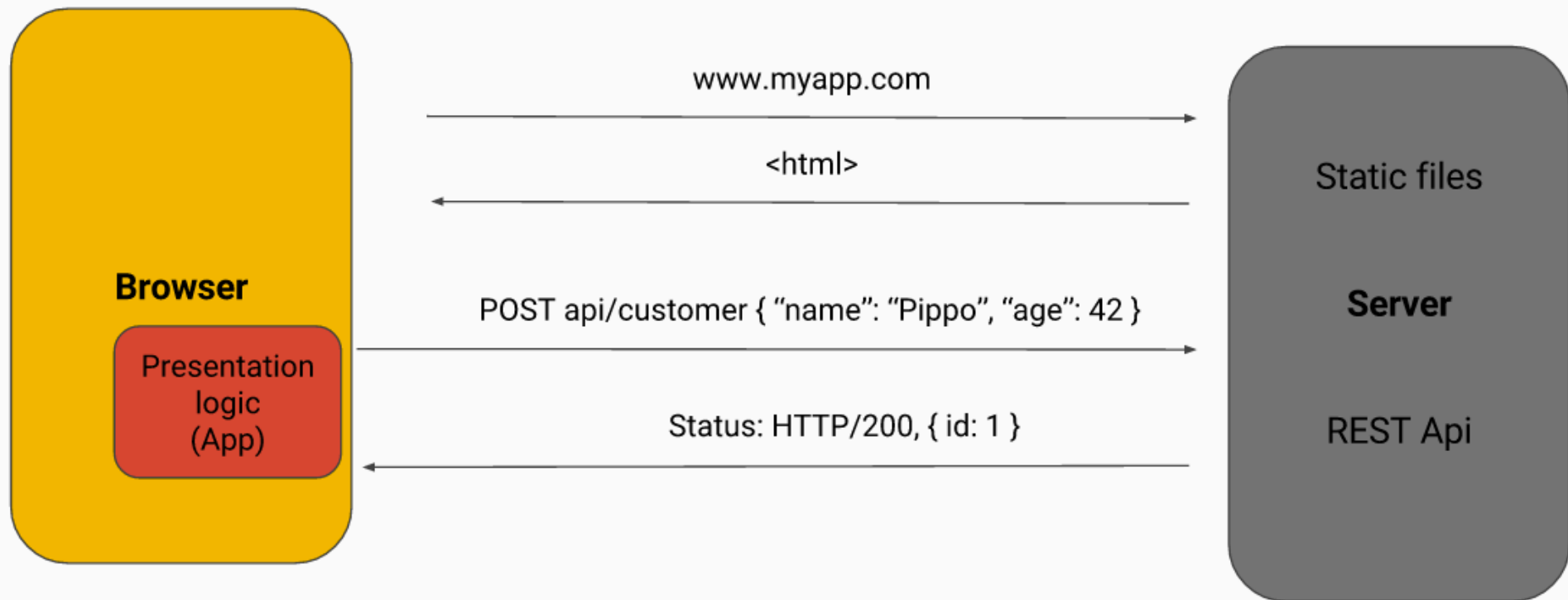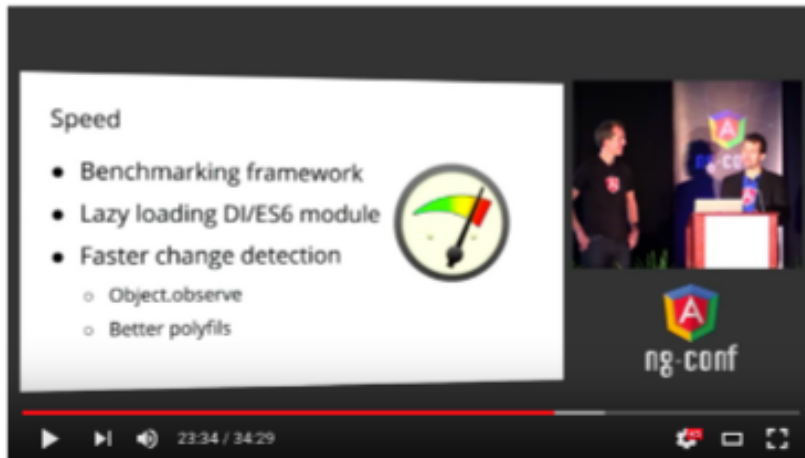
🐦 @dmorosinotto

XE

www.xedotnet.org

H-FARM

# SPA = Single Page Application

# SPA = Single Page Application



Browser
- Presentation logic (App)

www.myapp.com →

← <html>

POST api/customer { "name": "Pippo", "age": 42 } →

← Status: HTTP/200, { id: 1 }

Server
- Static files
- REST Api

# NG2  History / Big Picture



Speed
- Benchmarking framework
- Lazy loading DI/ES6 module
- Faster change detection
  - Object.observe
  - Better polyfils

**NGCONF January 2014** https://youtu.be/r1A1VR0ibIQ?t=1403

# NG2 History / Big Picture

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ng-conf

23:34 / 34:29

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JUN
22

## RC3 Now Available

Today we're happy to announce that we are shipping Angular 2.0.0-rc3.

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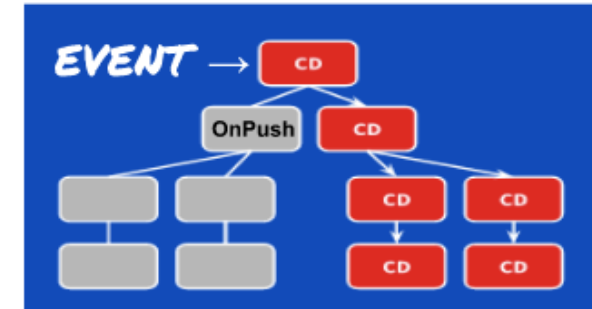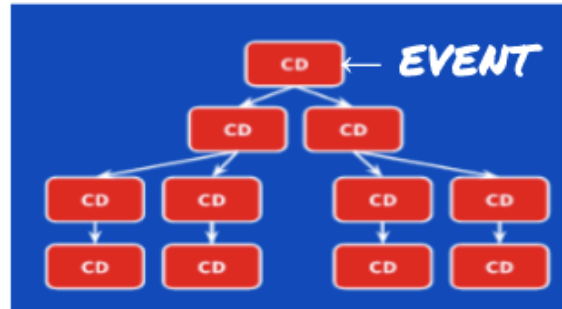
Performance

Productivity

# NG2 History / Big Picture

Speed
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JUN
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| Performance | Productivity | Versatility |
|---|---|---|

# Performance



Change Detection
+ OnPush
+ Rendering

| Render | Re-render | Always |
|:---:|:---:|:---:|
| 2.5x ~~faster~~ | 4.2x ~~faster~~ | ✔ **5x faster**<br>(10x OnPush) |

# Performance

Template Compiler Dynamic (at runtime)

# Performance

Template Compiler Offline (at build time)

link: https://youtu.be/bSssb9AmiJU?t=1967
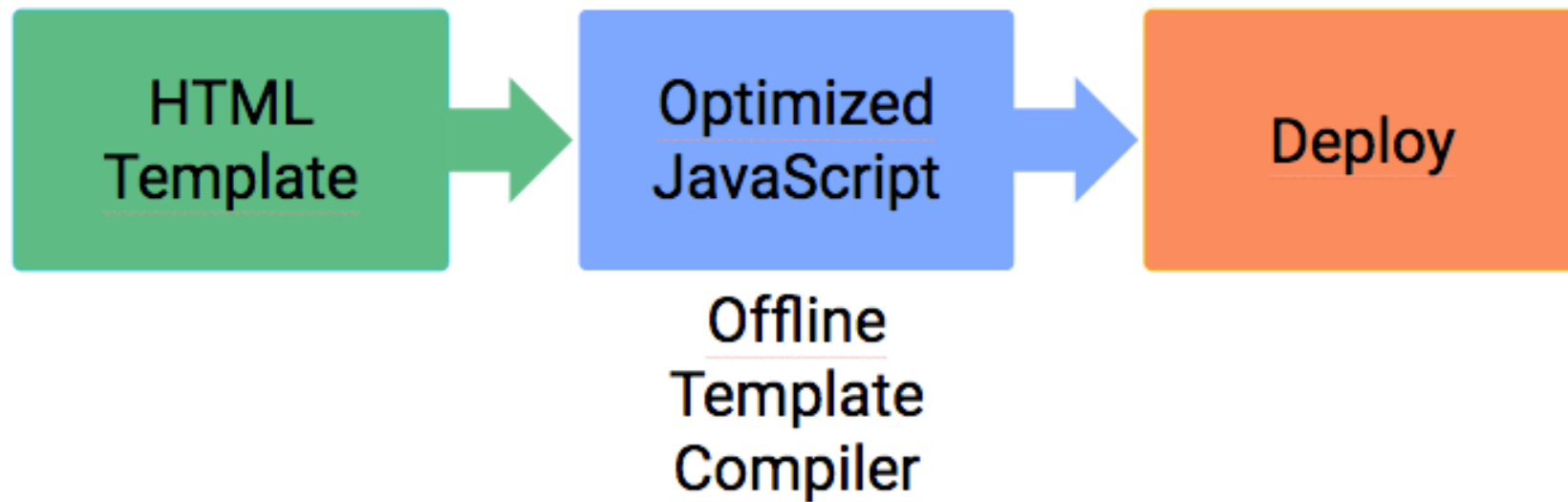
# Performance

## Template Compiler Offline (production build)

Offline compile → Inline modules → Tree-shake → Minify

**FUTURE Production Build CLI**
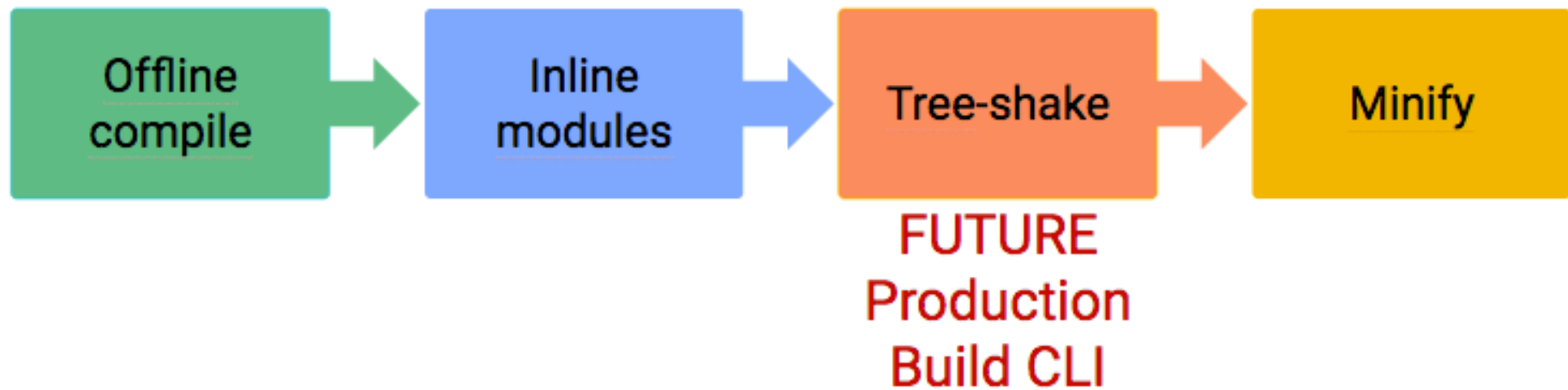
# Performance

## Smaller payload size (gzipped)



Bar chart comparing payload sizes:
- Angular 2: 170K
- Angular 1: 56K
- Angular 2 NOW: 49K
- Angular 2 FUTURE!?: 22K - 10K!?

link: https://youtu.be/bSssb9AmiJU?t=1967
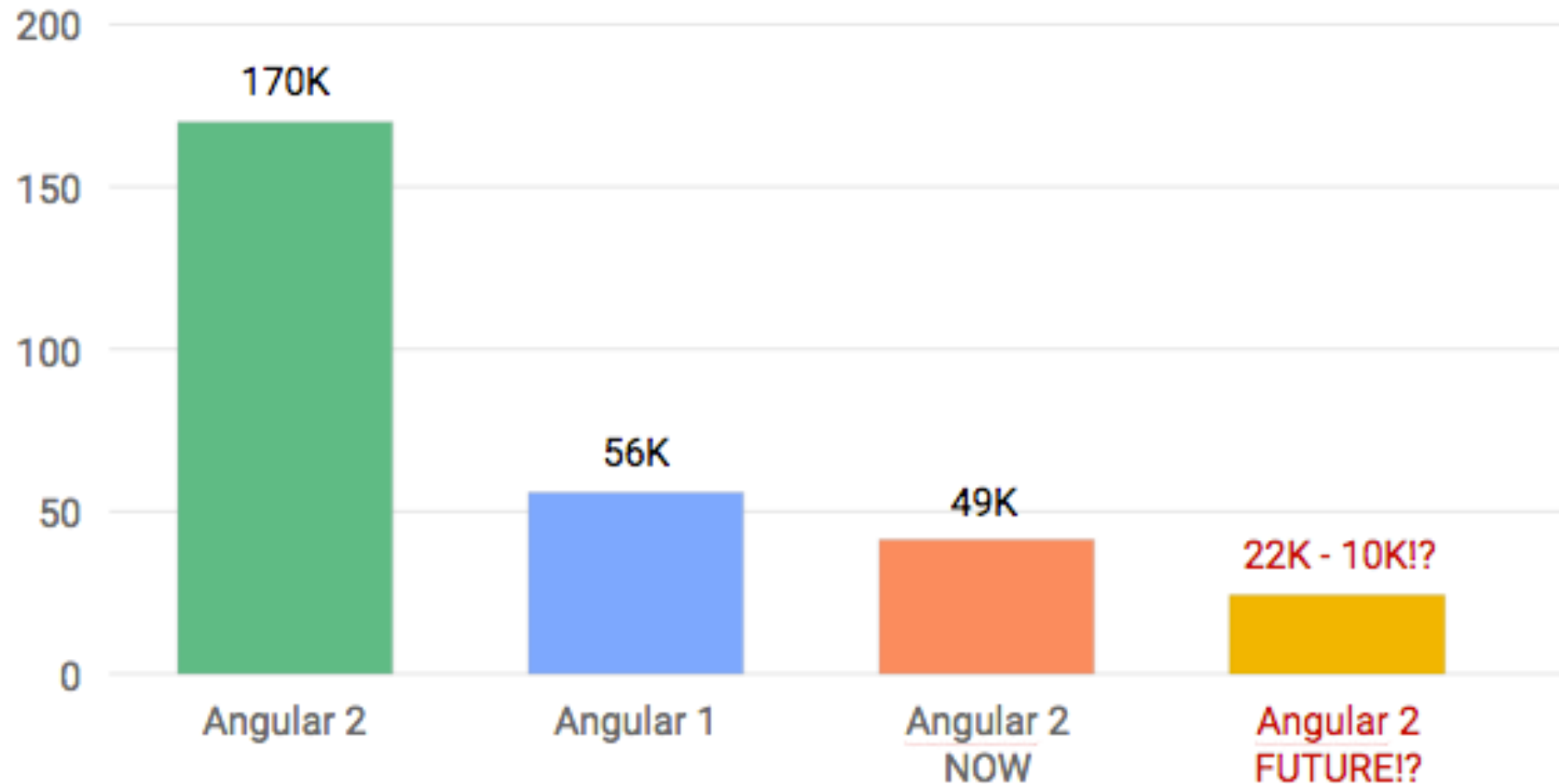
# Performance



Number of requests + Load time (ms)

- UMD: 12 (576ms)
- CommonJS bundled: 4 (335ms)
- Compile, Inline, tree-shake: 2 (130ms)
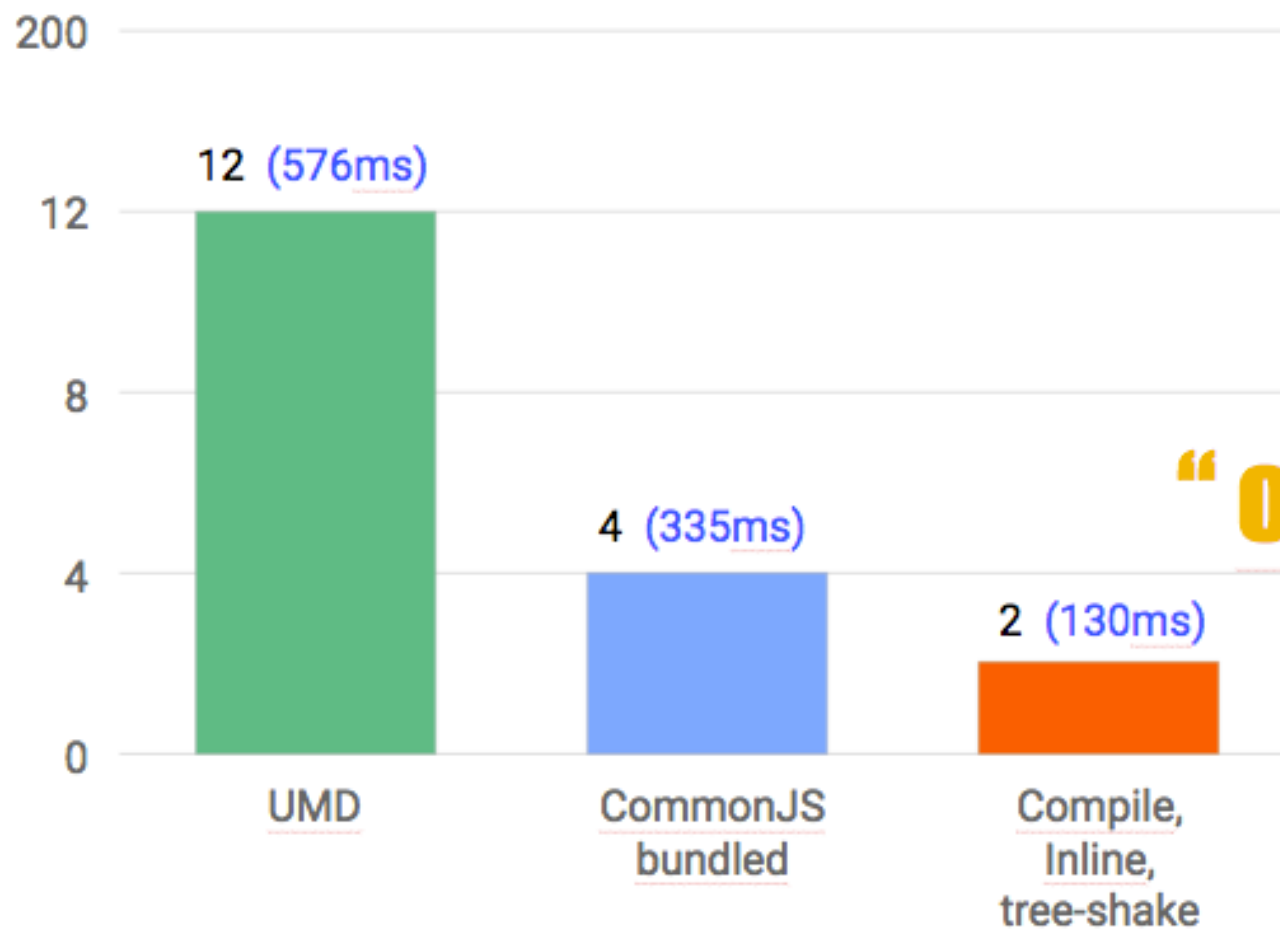
"obviously Fast" by Tobias Bosch

# Productivity

# Productivity

**ANGULAR** AUGURY                                        INSTALL

## Angular Augury

A Google Chrome Dev Tools extension
for debugging Angular 2 applications.

INSTALL
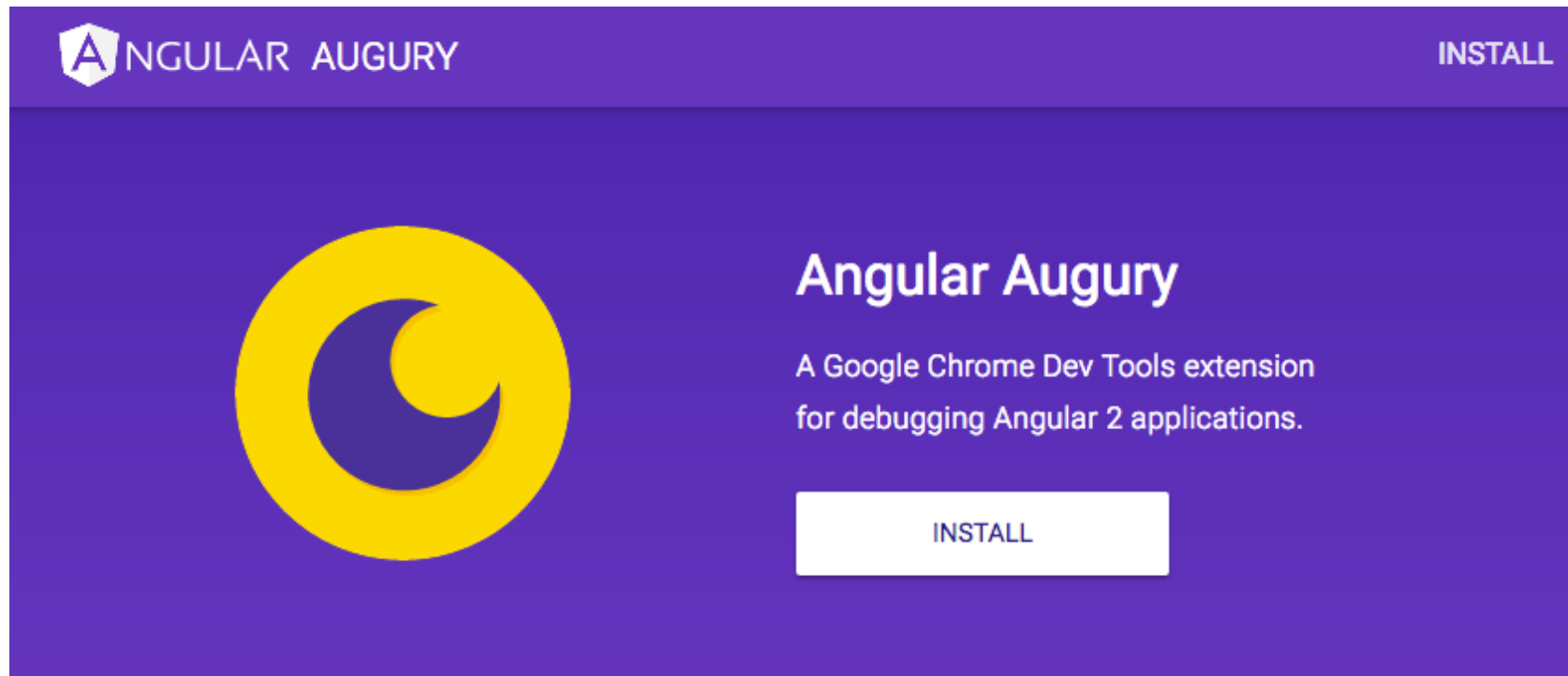
## Visual Interface

Helps Angular 2.0 developers visualize the application through component trees, and

visual debugging tools.

# Productivity

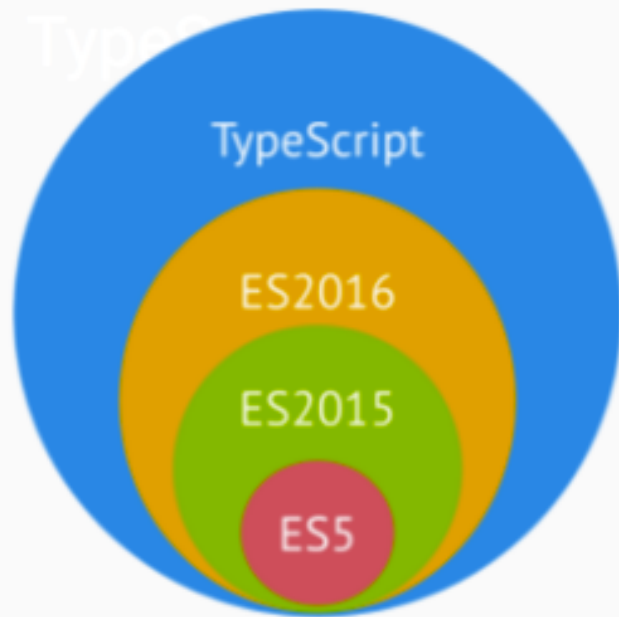**ANGULAR CLI**

CLI COMMANDS    GITHUB                    GET STARTED

```
> npm install -g angular-cli
> ng new my-dream-app
> cd my-dream-app
> ng serve
```

## Angular CLI

A command line interface for Angular

GET STARTED

## ng new

The Angular2 CLI makes it easy to create an application that already works, right out of
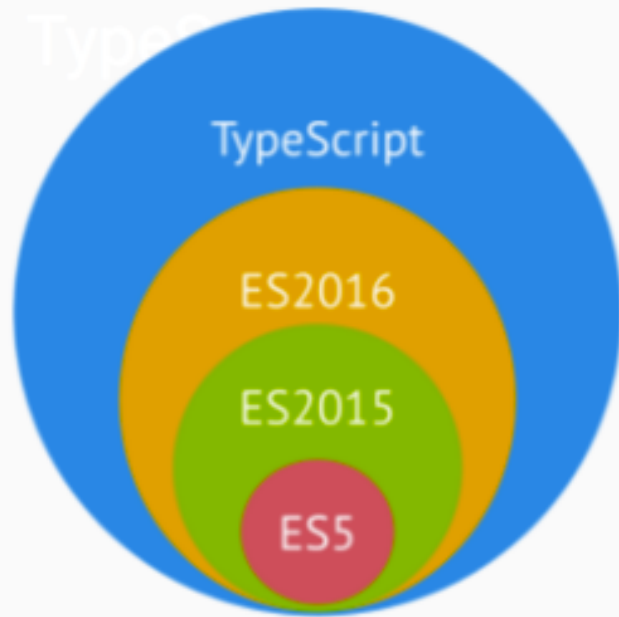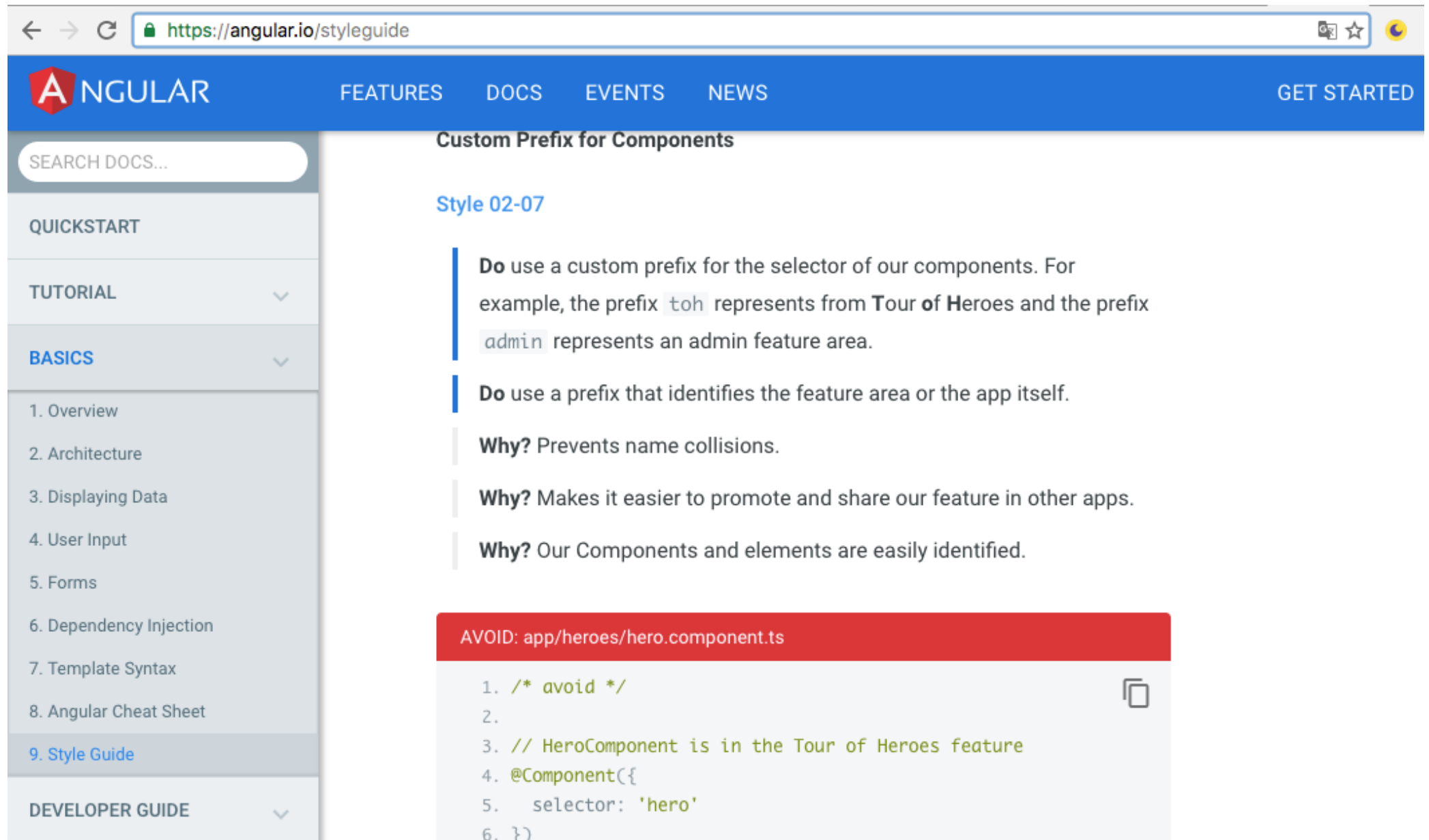
# Productivity



## Workflow Automation: Angular CLI

Create Project → Generate Components → Dev Server

Scaffold Tests ← Lint & Format ← Generate Routes

Run Tests → Preprocess CSS → Deployment Build → Deploy!
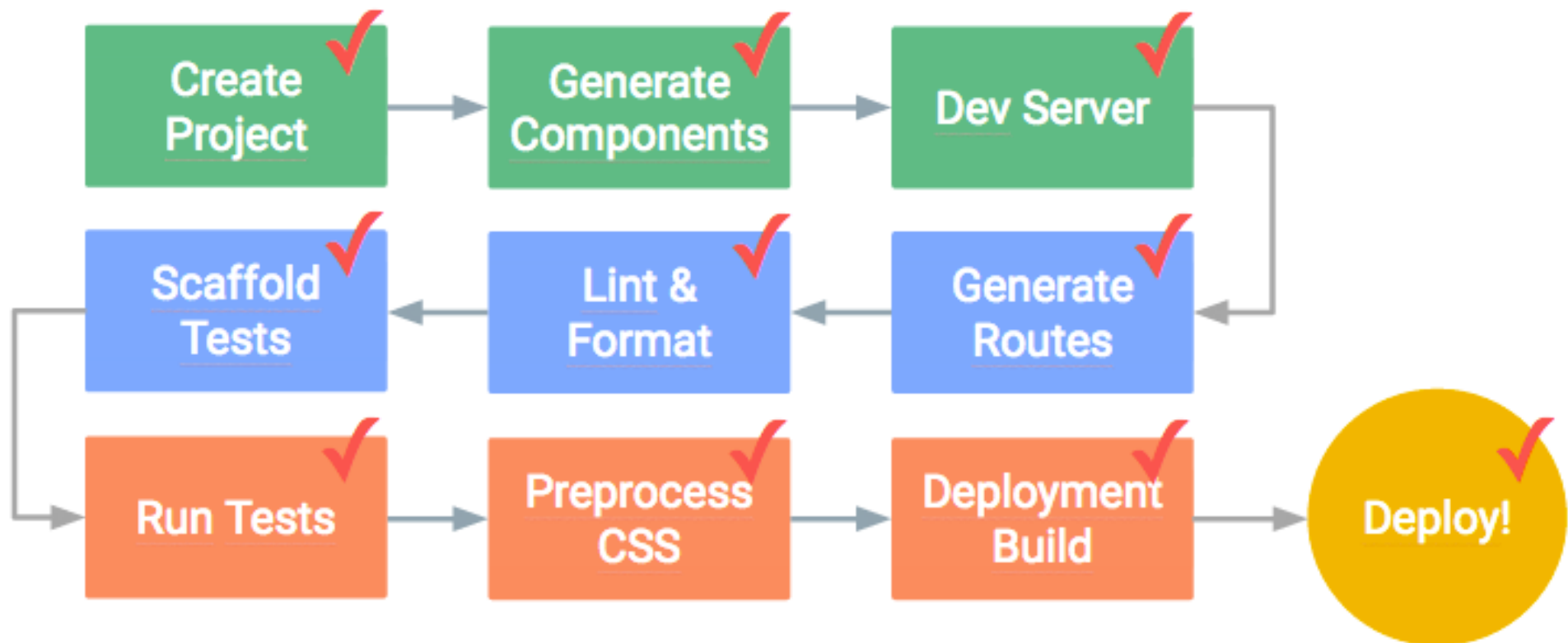
# Productivity

# Productivity



- Build by Microsoft in 2012 (1st public)
- Strong collaboration between Angular 2 and TypeScript team
- Angular 2 codebase written in TypeScript
- Why use it?
  - **ES2015+ features**
  - **Safety type-check**
  - **Intellisence and autocomplete**
  - **Better tooling support -> Refactoring**

# Productivity

FRAV

link: https://cli.angular.io/   https://augury.angular.io/
http://www.typescriptlang.org/docs/tutorial.html

# Versatility

Lazy Loading



Your Code

How to split?

# Versatility

Lazy Loading via Routes!

Via routes!

# Versatility

## Automatic Lazy Loading



Route 1

# Versatility
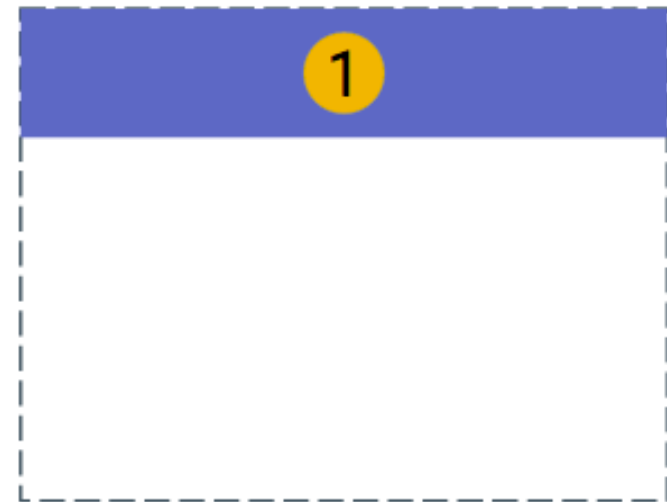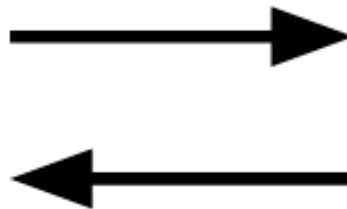


Automatic Lazy Loading

Route 2

# Versatility
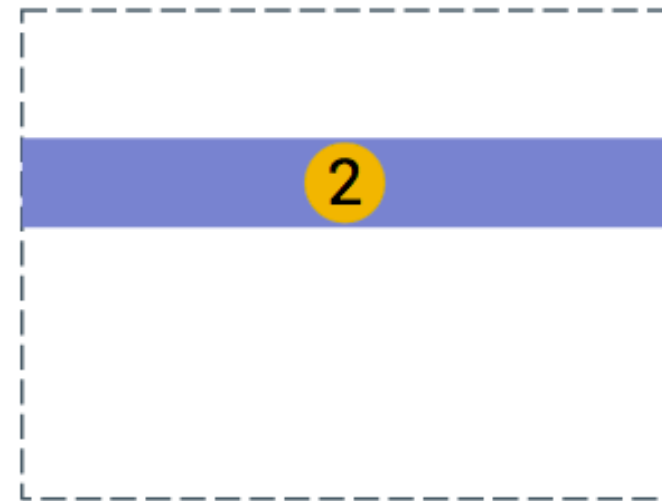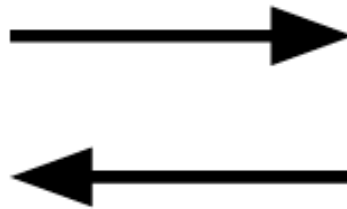
## Standard Angular 1.x render architecture

**Application**

Template:
```
<my-customer>
  {{name}}
</my-customer>
```

ANGULAR1.x

**DOM**

```
<!-- myCustomerComp -->
<div ng-isolete-scope>
  <span class="ng-binding">
    Pippo </span>
</div>
```

# Versatility

FRAV

## Renderer architecture

# Versatility
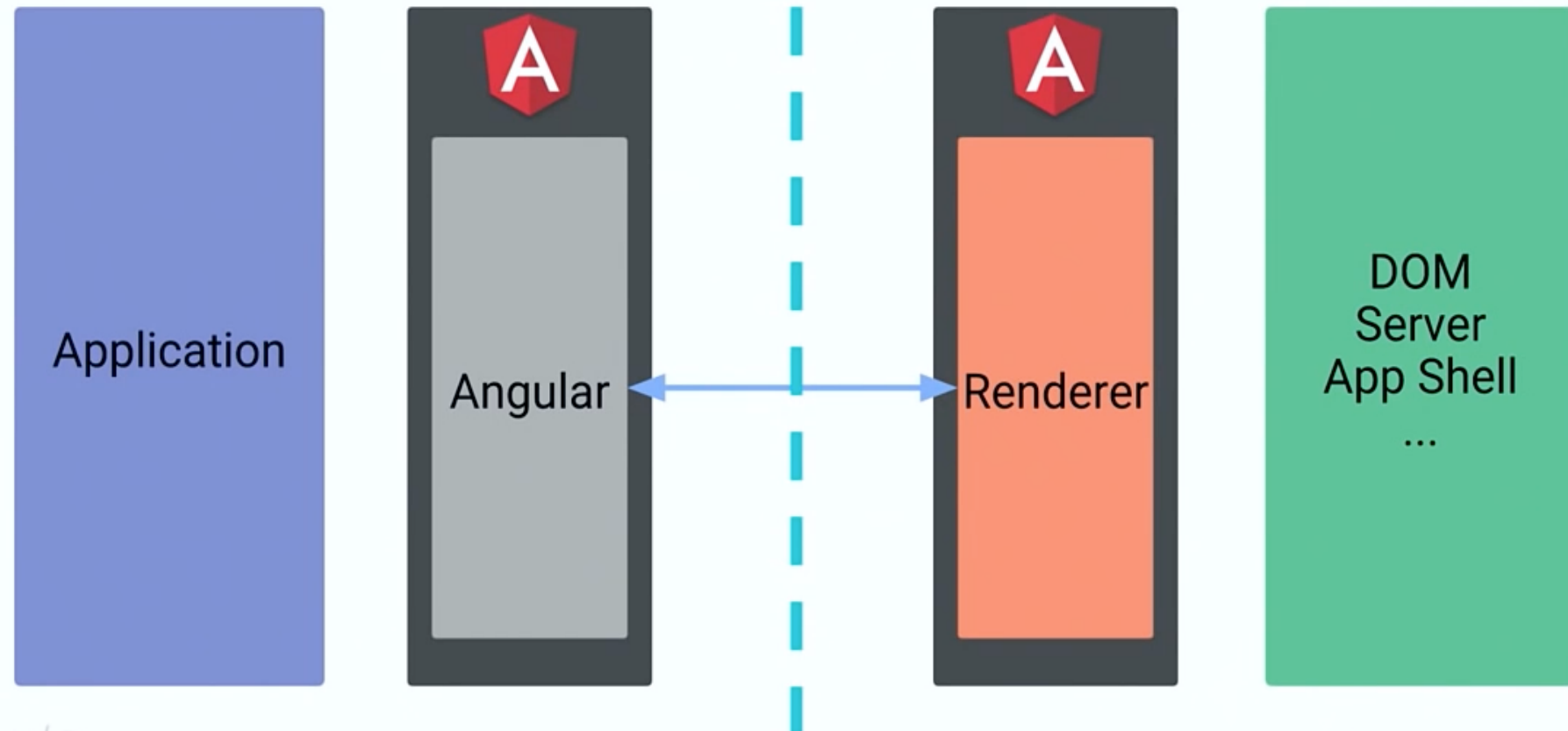


Unified development: Web - Desktop - Mobile

# Server-side Render = Universal
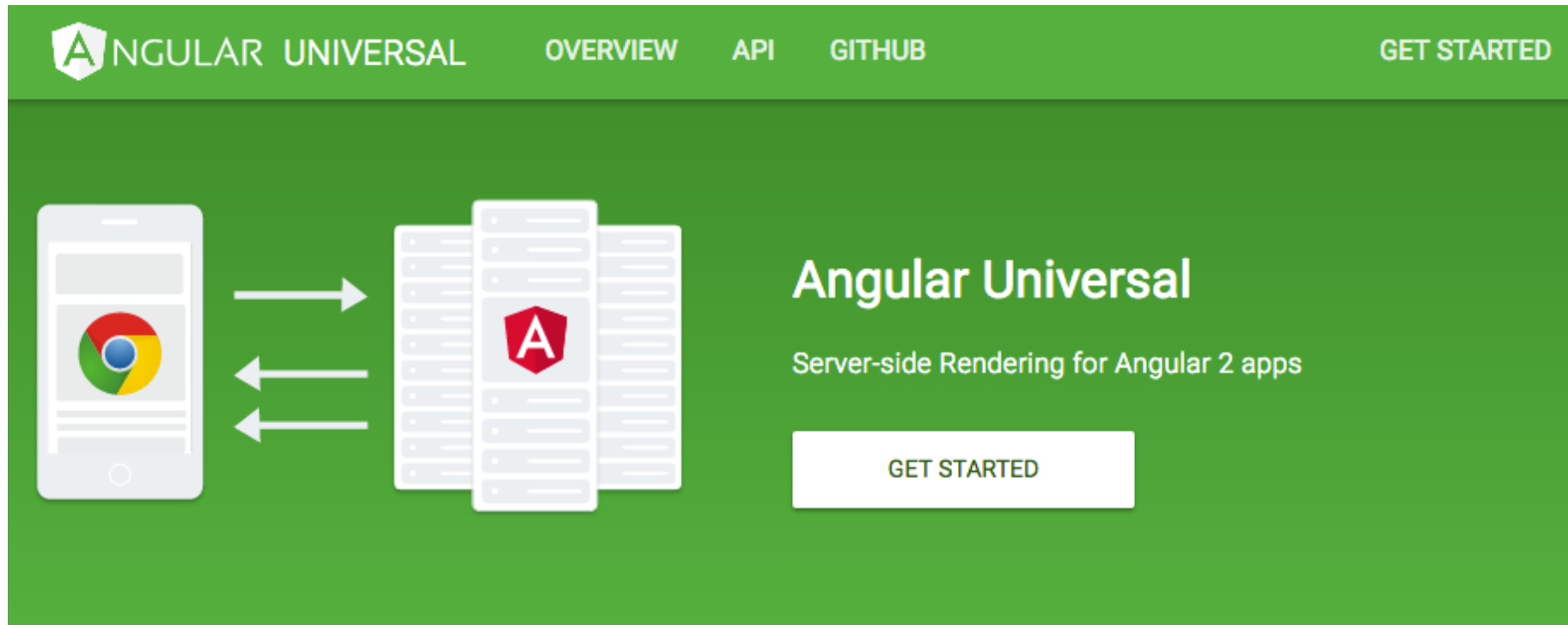
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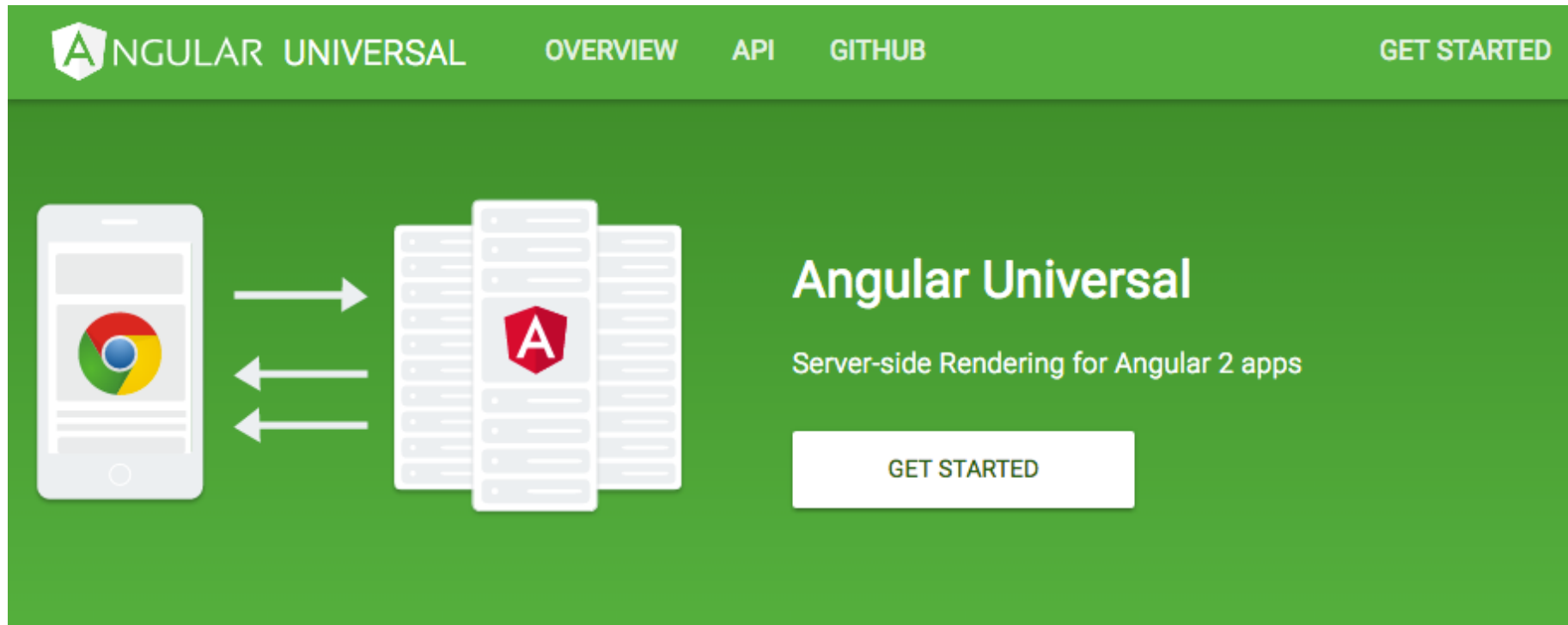


Startup Performance

# Server-side Render = Universal



Startup Performance

SEO
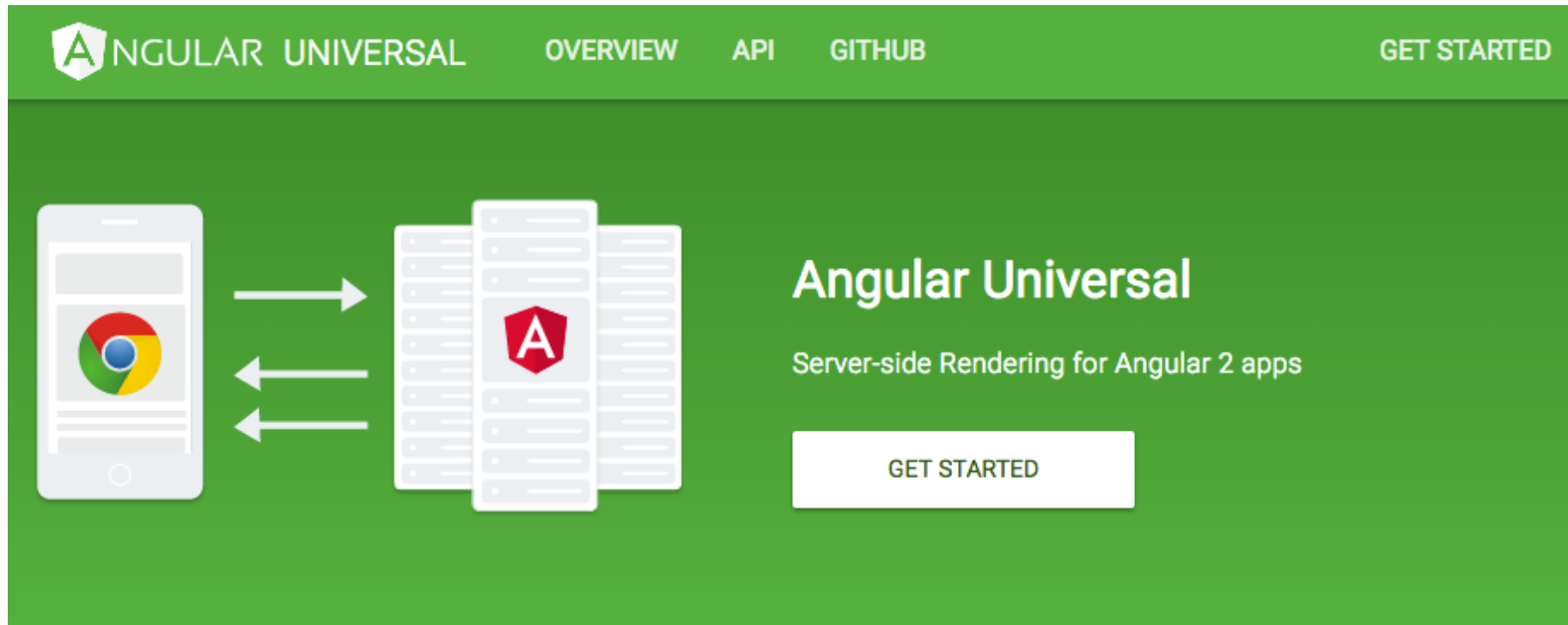
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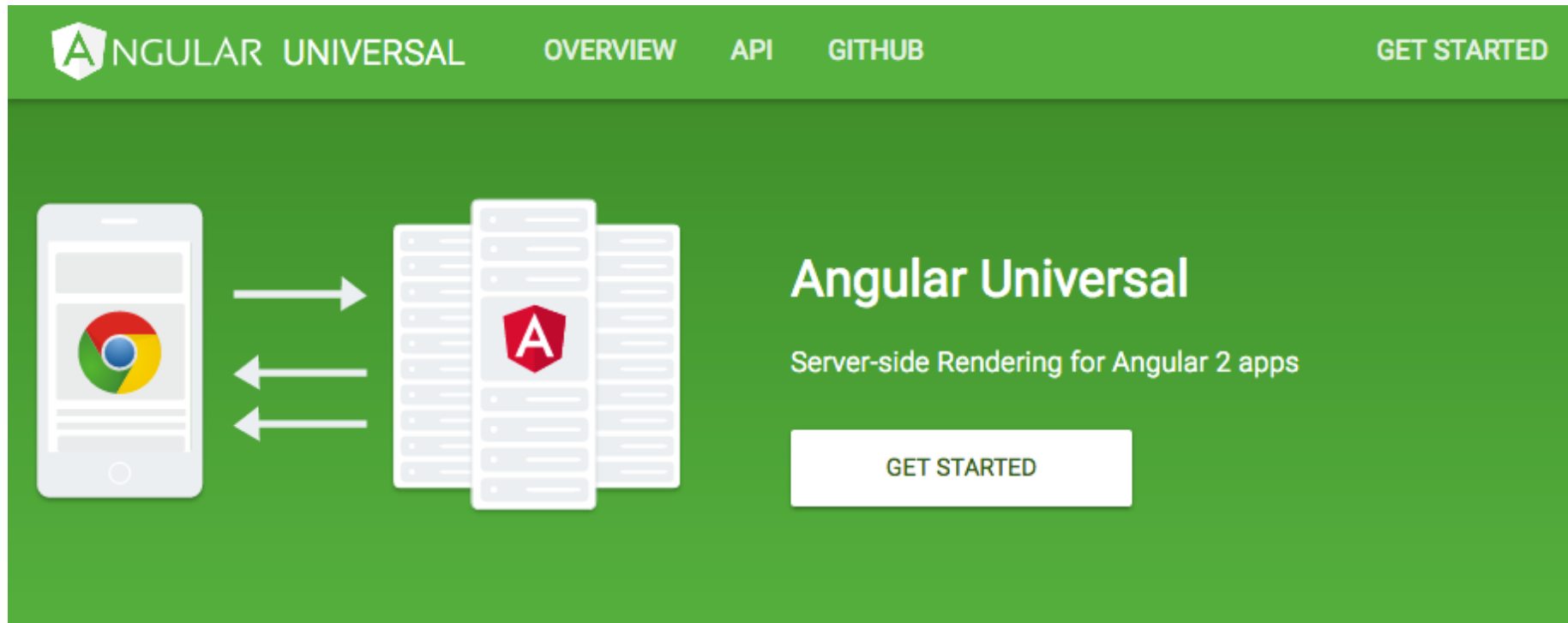


Startup Performance

SEO

Deep link Shareability

# Server-side Render = Universal



Initial Rendering: Universal

Request

# Server-side Render = Universal

Initial Rendering: Universal



**HTML + CSS**    rendered server-side
**+ prerender.js**    that register events

# Server-side Render = Universal
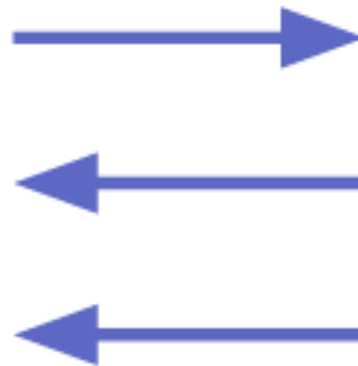


Initial Rendering: Universal

**async JS app** and then take over + replay events

dynamic startup

# Server-side Render = Universal

Initial Rendering: Universal

Node.js

ASP.NET

Others...

# Server-side Render = Universal



The Difference
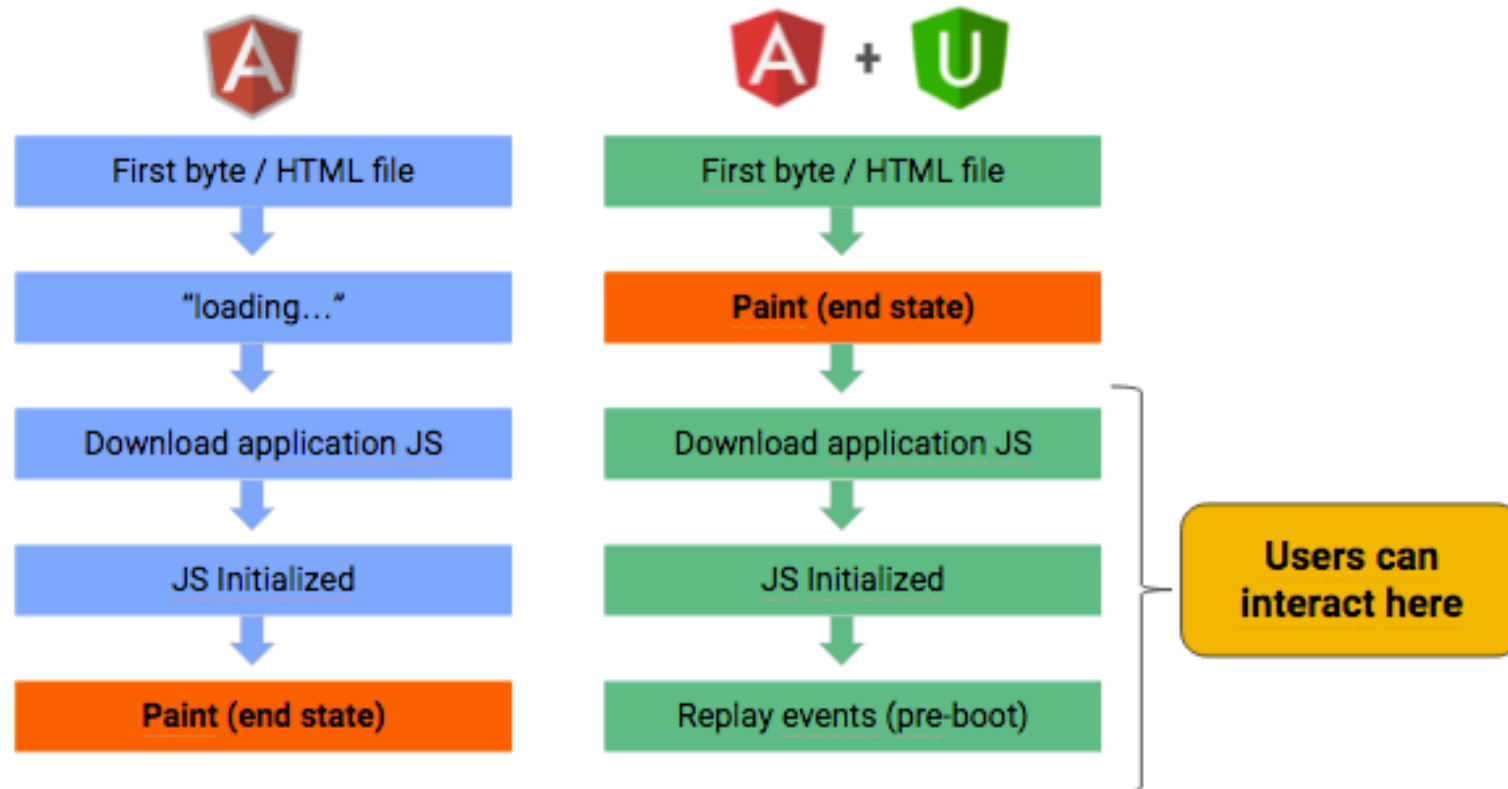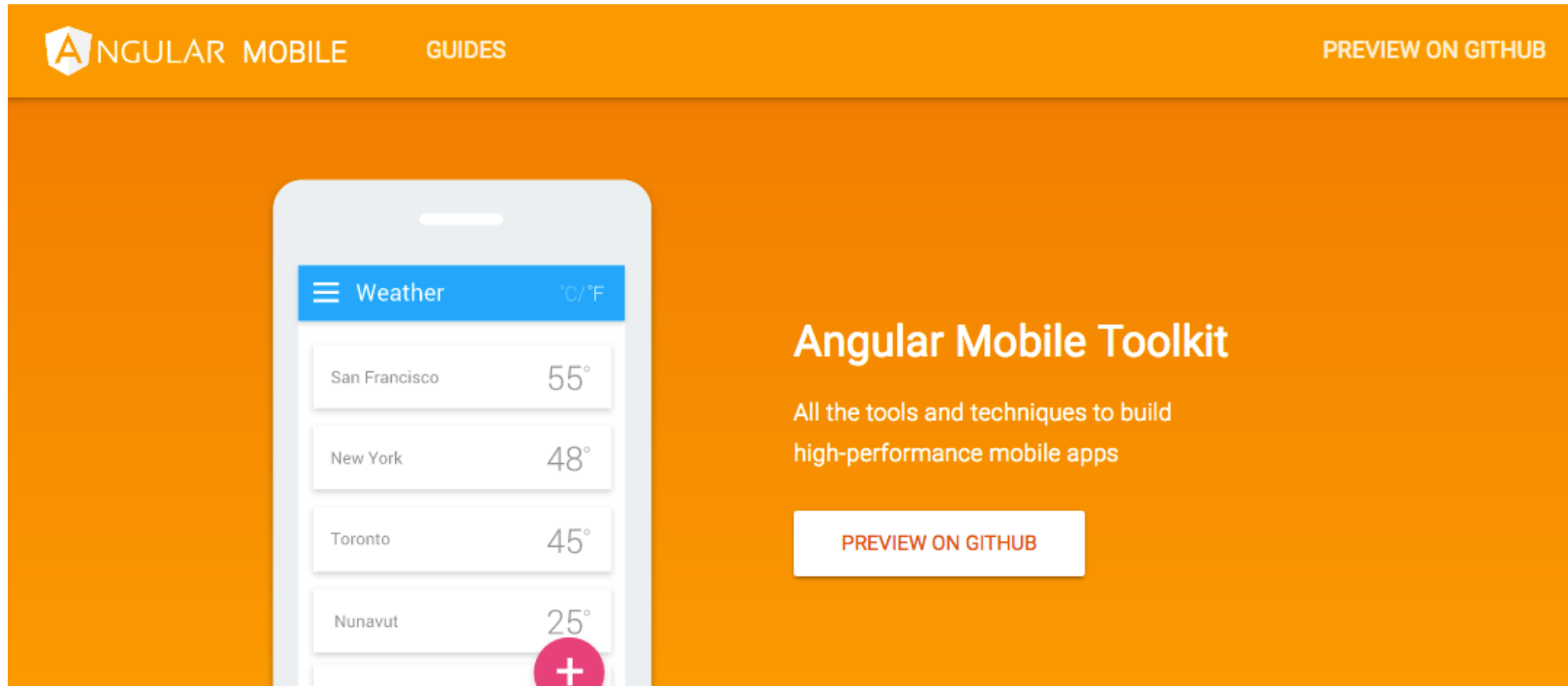
# Mobile

Performance of native, discoverability of the Web

# Mobile

Installed Mobile

| Hybrid App | Native App |
|---|---|

http://ionicframework.com/docs/v2/     https://www.nativescript.org/

# Exp.: Web Worker / Desktop

Without Web Workers

# Exp.: Web Worker / Desktop

Web Workers normal use with limitations!

| DOM | Process media or other CPU operations |
|-----|-----|
| | NO UI/DOM! |
| UI Thread | Worker Thread |
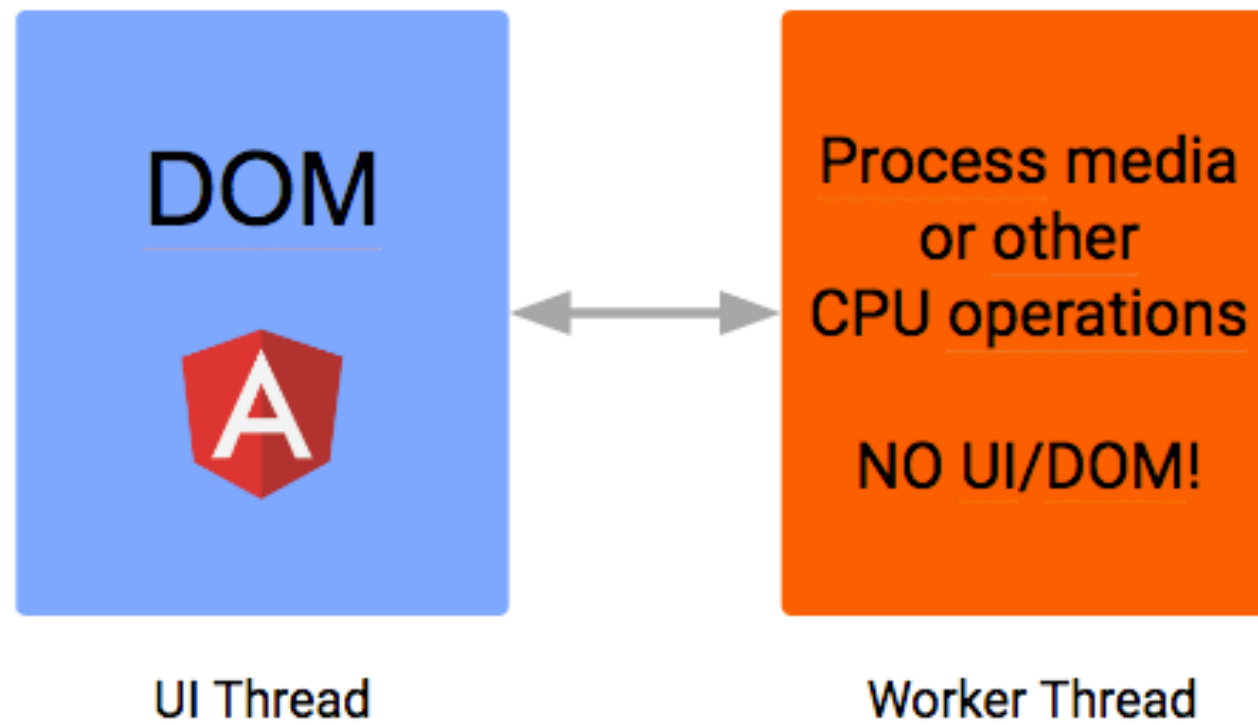
# Exp.: Web Worker / Desktop

Web Workers in Angular2



DOM

ng2 render

app logic

UI Thread

Worker Thread

# Exp.: Web Worker / Desktop



Installed Desktop

Chrome ⟷ Node

Electron http://electron.atom.io/
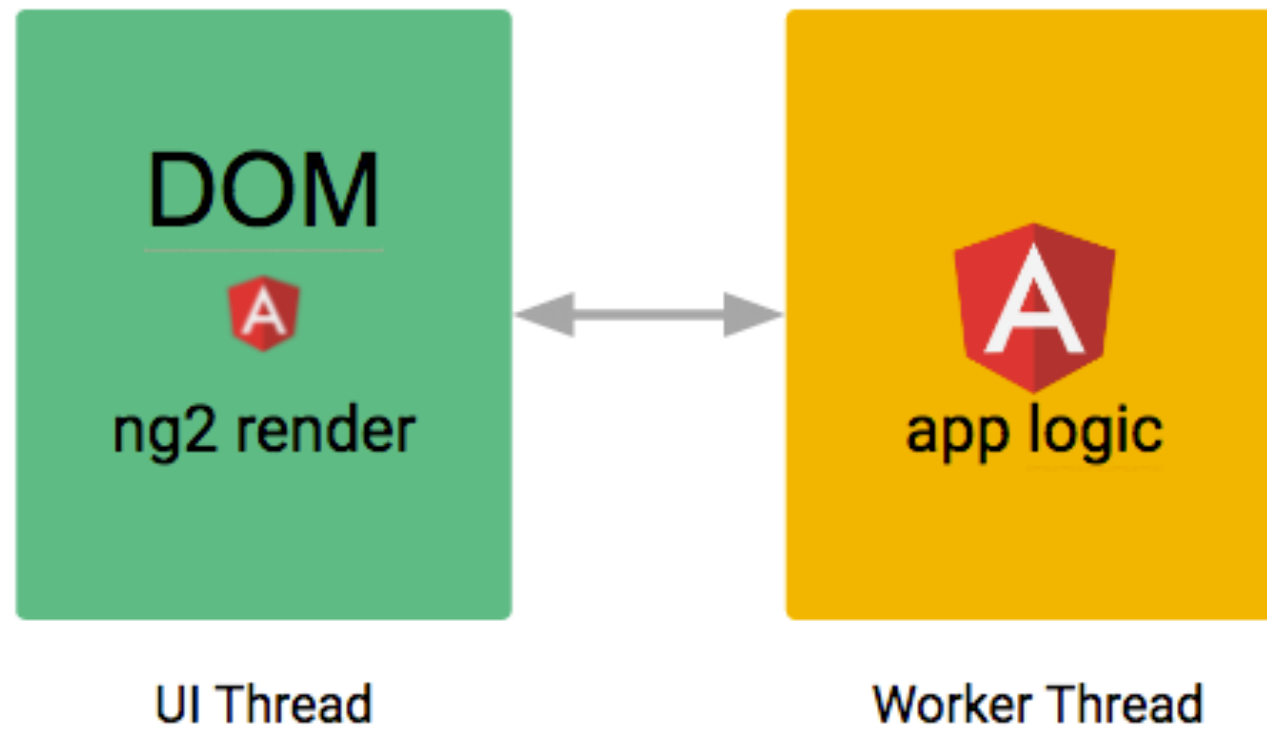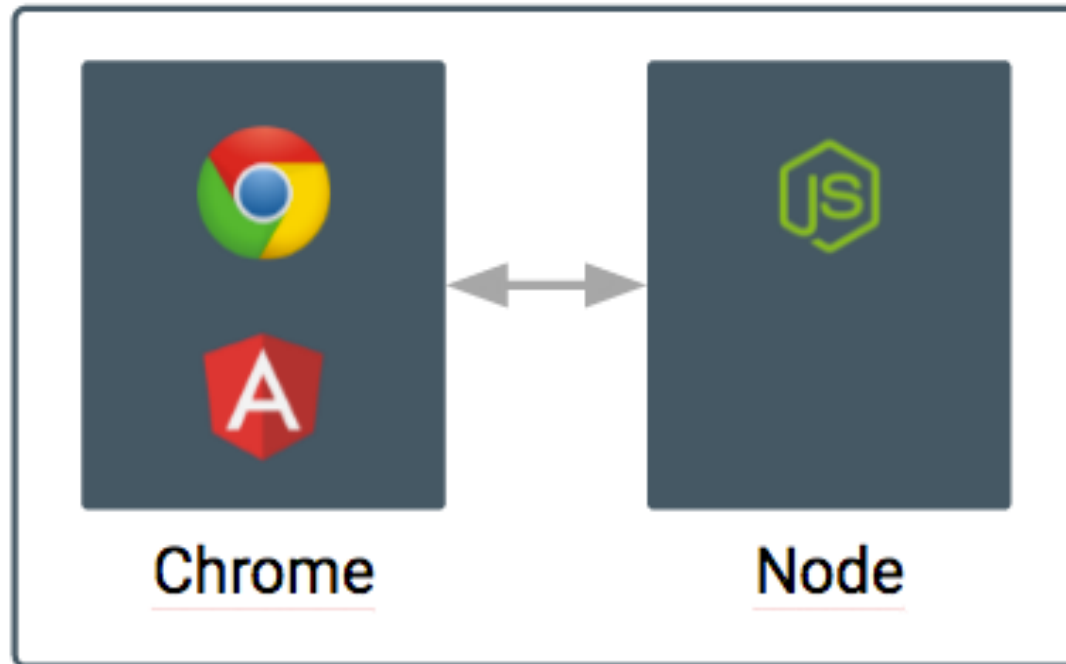
HTML + JS

Win/Mac/Linux

Menus, notifications, etc.

link: https://github.com/angular/angular-electron

# Exp.: Web Worker / Desktop



Installed Desktop

Chrome ↔ Node

Electron http://electron.atom.io/
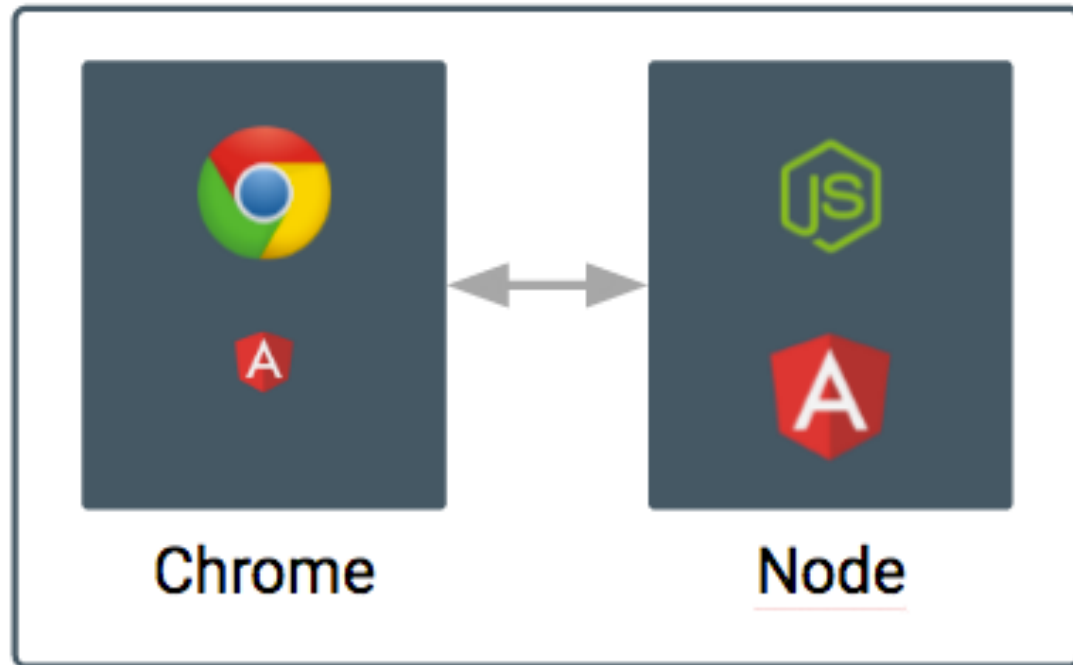
Faster

Platform APIs

Auth, DB, hardware

# Angular2 is a ~~Framework~~ Platform

| | | | |
|---|---|---|---|
| Animation | Renderer | Universal | Mobile / PWA Service Worker |
| Router | Dependency Injection | Change Detection | Compile |
| i18n | Material | @Decorators | Zones |
| ngUpgrade | CLI | TS Language Services | Augury |

# Confartigianato
## Imprese Veneto

Using NG2 CLI
```
> ng new jumpstart
> cd jumpstart
> code .
```

link: https://github.com/dmorosinotto/xe-ng2-
jumpstart

Using NG2 CLI
> ng new jump
> cd jumpstart
> code .

```
[~/GIT$ ng new xe-ng2-jumpstart
Could not start watchman; falling back to NodeWatcher for file system events.
Visit http://ember-cli.com/user-guide/#watchman for more info.
installing ng2
  create .editorconfig
  create README.md
  create src/app/app.component.css
  create src/app/app.component.html
  create src/app/app.component.spec.ts
  create src/app/app.component.ts
  create src/app/environment.ts
  create src/app/index.ts
  create src/app/shared/index.ts
  create src/favicon.ico
  create src/index.html
  create src/main.ts
  create src/system-config.ts
  create src/tsconfig.json
  create src/typings.d.ts
  create angular-cli-build.js
  create angular-cli.json
  create config/environment.dev.ts
  create config/environment.js
  create config/environment.prod.ts
  create config/karma-test-shim.js
  create config/karma.conf.js
  create config/protractor.conf.js
  create e2e/app.e2e-spec.ts
  create e2e/app.po.ts
  create e2e/tsconfig.json
  create e2e/typings.d.ts
  create .gitignore
  create package.json
  create public/.npmignore
  create tslint.json
  create typings.json
Successfully initialized git.
 Installing packages for tooling via npm
├── es6-shim (ambient)
├── angular-protractor (ambient dev)
├── jasmine (ambient dev)
└── selenium-webdriver (ambient dev)
Installed packages for tooling via npm.
~/GIT$
```

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jumpstart

```typescript
import { Component } from '@angular/core';

@Component({
  selector: 'app-databind',
  template: `
    <p>Who are you? <input [(ngModel)]="name"></p>
    <h3 *ngIf="name.length>0">
      Hi {{name}}! <button (click)="clear()">X</button>
    </h3>
  `,
  styles: [
    'button { border: 1px solid; font: Arial; color: red }
  ]
})
export class DatabindComponent {
  name: string;
  constructor() {
    this.clear();
  }

  clear() {
    this.name = '';
  }
}
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  create src/app/environment.ts
  create src/app/index.ts
  create src/app/shared/index.ts
  create src/favicon.ico
  create src/index.html
  create src/main.ts
  create src/system-config.ts
  create src/tsconfig.json
  create src/typings.d.ts
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export class DatabindComponent {
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  constructor() {
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  }

  clear() {
    this.name = '';
  }
}
```

Who are you? Pippo

**Hi Pippo!** X

```
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Could not start watchman; falling back to NodeWatcher for file system events.
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  create src/app/app.component.ts
  create src/app/environment.ts
  create src/app/index.ts
  create src/app/shared/index.ts
  create src/favicon.ico
  create src/index.html
  create src/main.ts
  create src/system-config.ts
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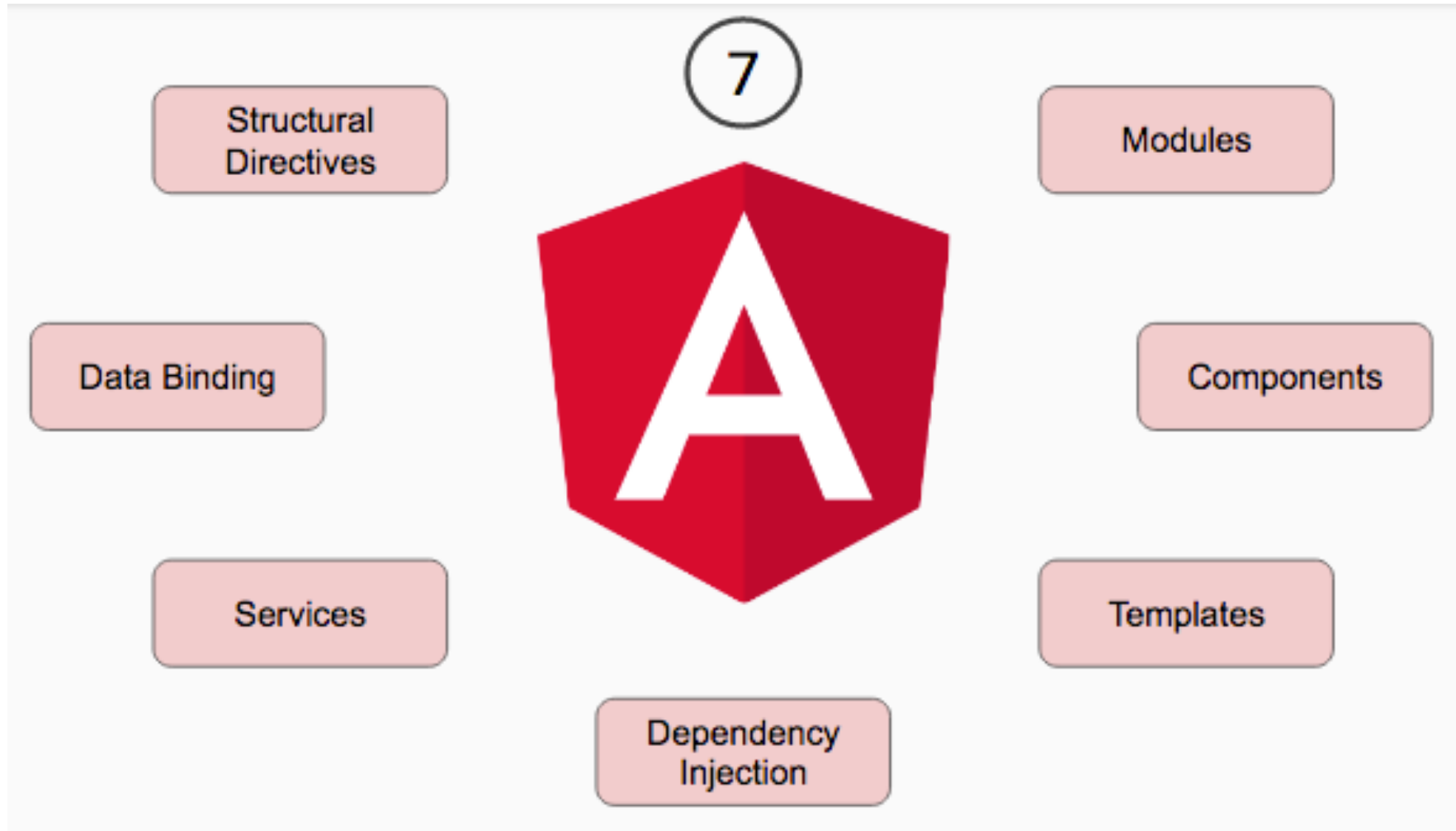
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# 7 Key Concepts



7

Structural Directives

Modules

Data Binding

Components

Services

Templates

Dependency Injection

# Contacts & Feedback

## Daniele Morosinotto
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*JavaScript enthusiast*

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🐦 @dmorosinotto

Si ringrazia per l'ospitalità
http://www.h-farm.com/

H-FARM

Confartigianato
Imprese Veneto

FRAV