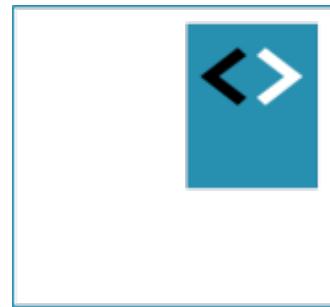




Angular Fundamentals

Module - Inleiding



Peter Kassenaar –
info@kassenaar.com

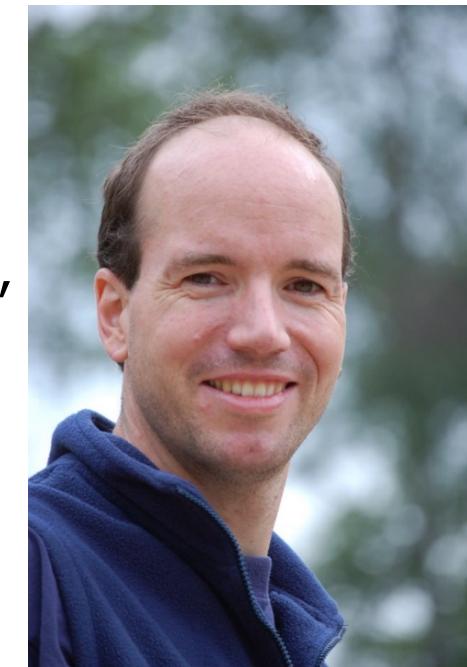
Peter Kassenaar

- Trainer, author, developer – since 1996
- Specialty: "*Everything JavaScript*"
- JavaScript, ES6, Angular, NodeJS, TypeScript, jQuery, PhoneGap, Ionic

www.kassenaar.com/blog

info@kassenaar.com

Twitter: [@PeterKassenaar](https://twitter.com/@PeterKassenaar)



Angulartraining.nl

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2018 dates now available!

```
const routes: Routes = [
  { path: '', redirectTo: 'home', pathMatch: 'full' },
  { path: 'home', loadChildren: './home/home.module#HomeModule' },
  { path: 'training', loadChildren: './training/training.module#TrainingModule' },
];
const config: ExtraOptions = {
  enableTracing: false,
  preloadingStrategy: PreloadAllModules
};
@NgModule({
  imports: [RouterModule.forRoot(routes, config)],
  exports: [RouterModule]
})
export class AppRoutingModule { }
```

A

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www.angulartraining.nl

github.com/PeterKassenaar/sigmax

About you...



Voorkennis webdevelopment, (mobile/web-) apps?

Kennis AngularJS 1.x?

Voorkennis andere (web)talen?

Verwachtingen van de cursus?

Concrete projecten?

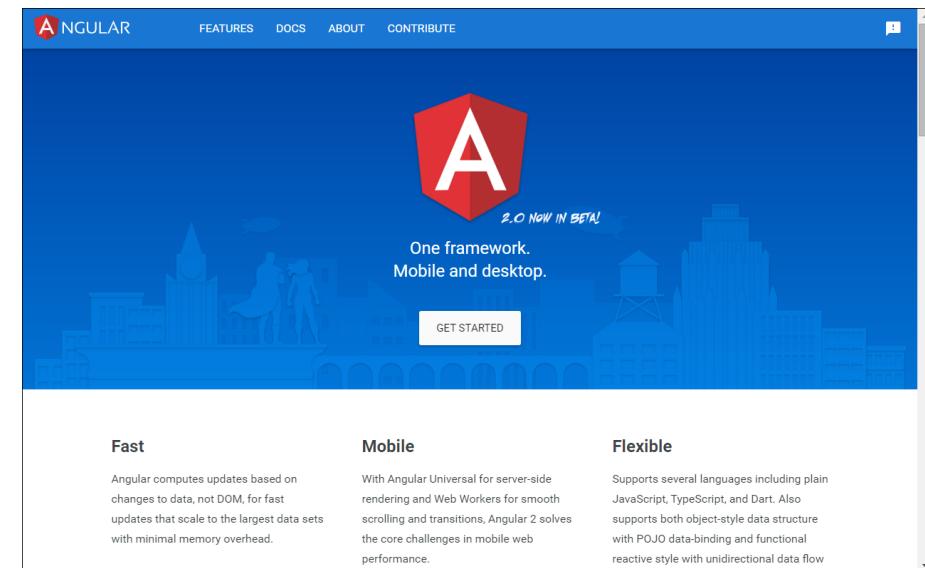
Materialen

Software (downloads)

Handouts (Github - PDF)

Oefeningen (Github)

Websites (online)



angular.io/

Agenda - 3 dagen

- Dag 1
 - Theorie - Introductie & geschiedenis - waarom Angular (2)?
 - Angular vs. AngularJS
 - Hello World in Angular – inzicht in boilerplate-code
 - Components
 - ECMAScript 2015 + TypeScript
 - Data binding
- Dag 2
 - Dependency Injection (DI) – more components
 - Services en HTTP,
 - Observables (RxJS)
 - Component Communication
 - Case

Agenda

- Dag 3 – “Advanced” stuff
 - Vervolg Observables & Events
 - Routing
 - Formulieren
 - ...
 - Examen

OVERALL:

BEST PRACTICES / STYLE GUIDE

2 Richtlijnen

1. Oefeningen

- Maar: neem ook vooral zijpaden, experimenteer, lees verder, maak een eigen project, app, website...

2. Voorbeeldcode

- Als ondersteuning bij de oefeningen, zie boven
- Work in progress – check de Angular-site!
- github.com/PeterKassenaar/voorbeeldenAngular2

Globale werkwijze



...
...

Vragen?



Angular 1 vs. Angular 2

Differences, similarities, new features



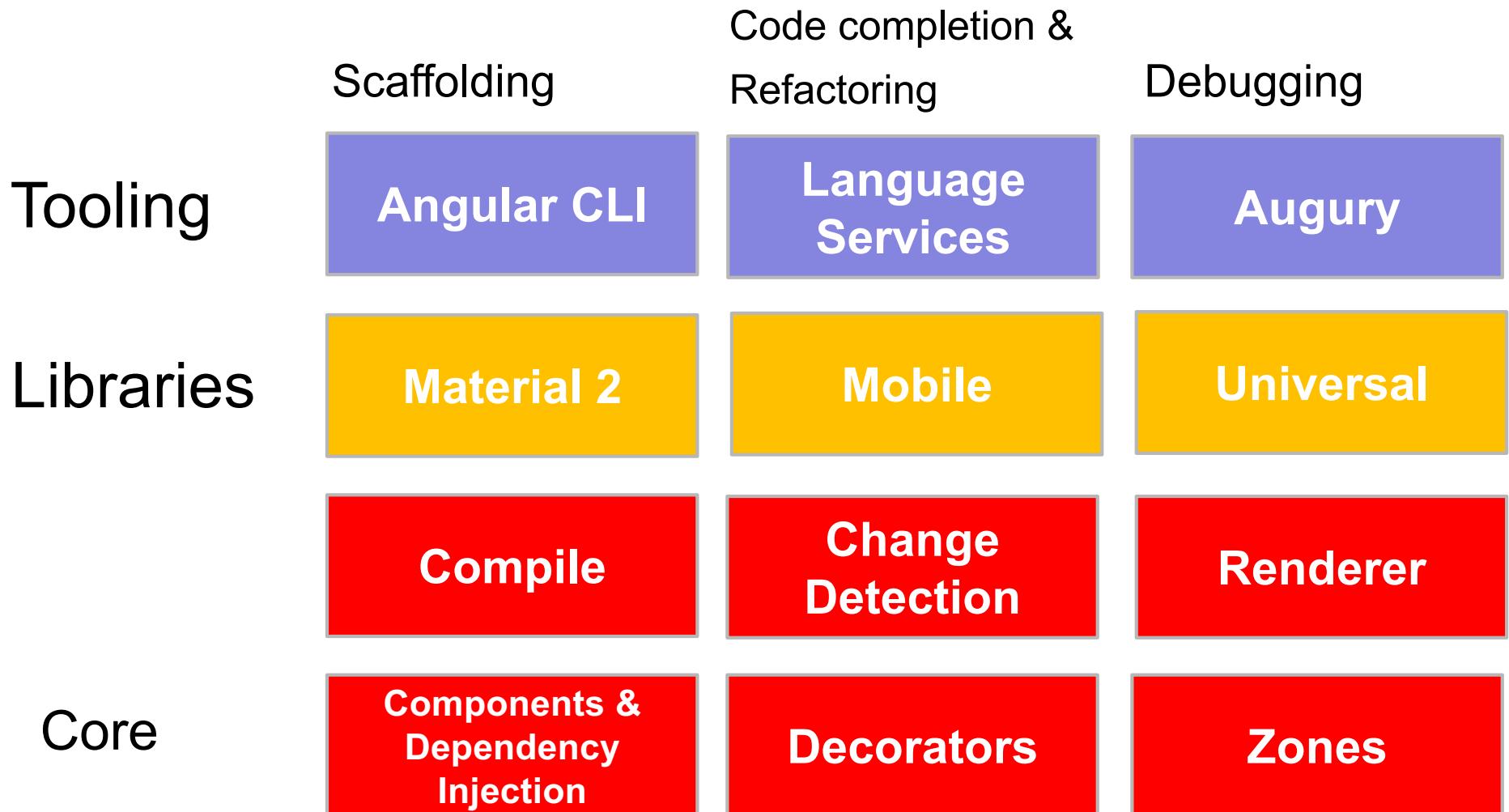
MV*

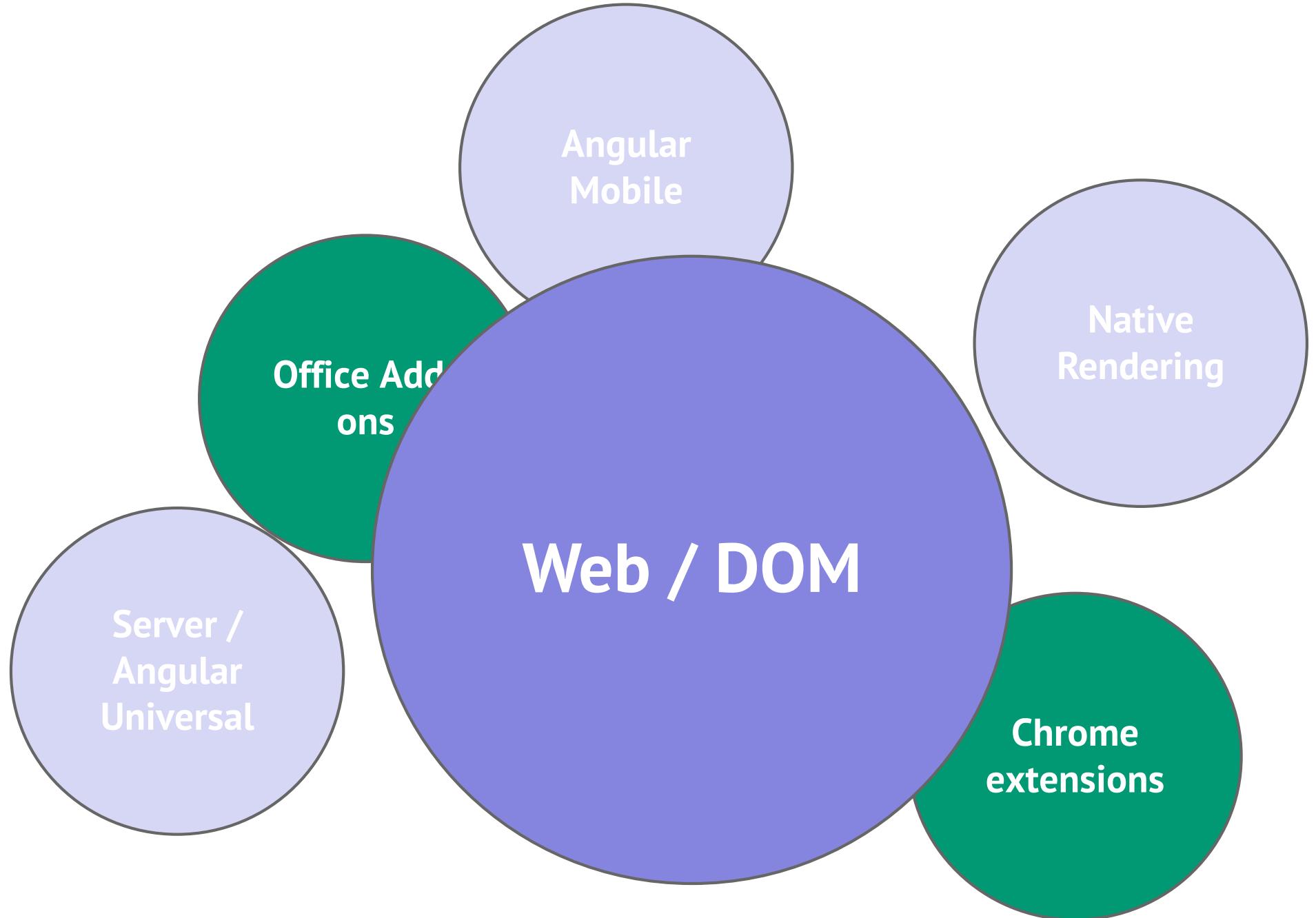
Framework



Platform

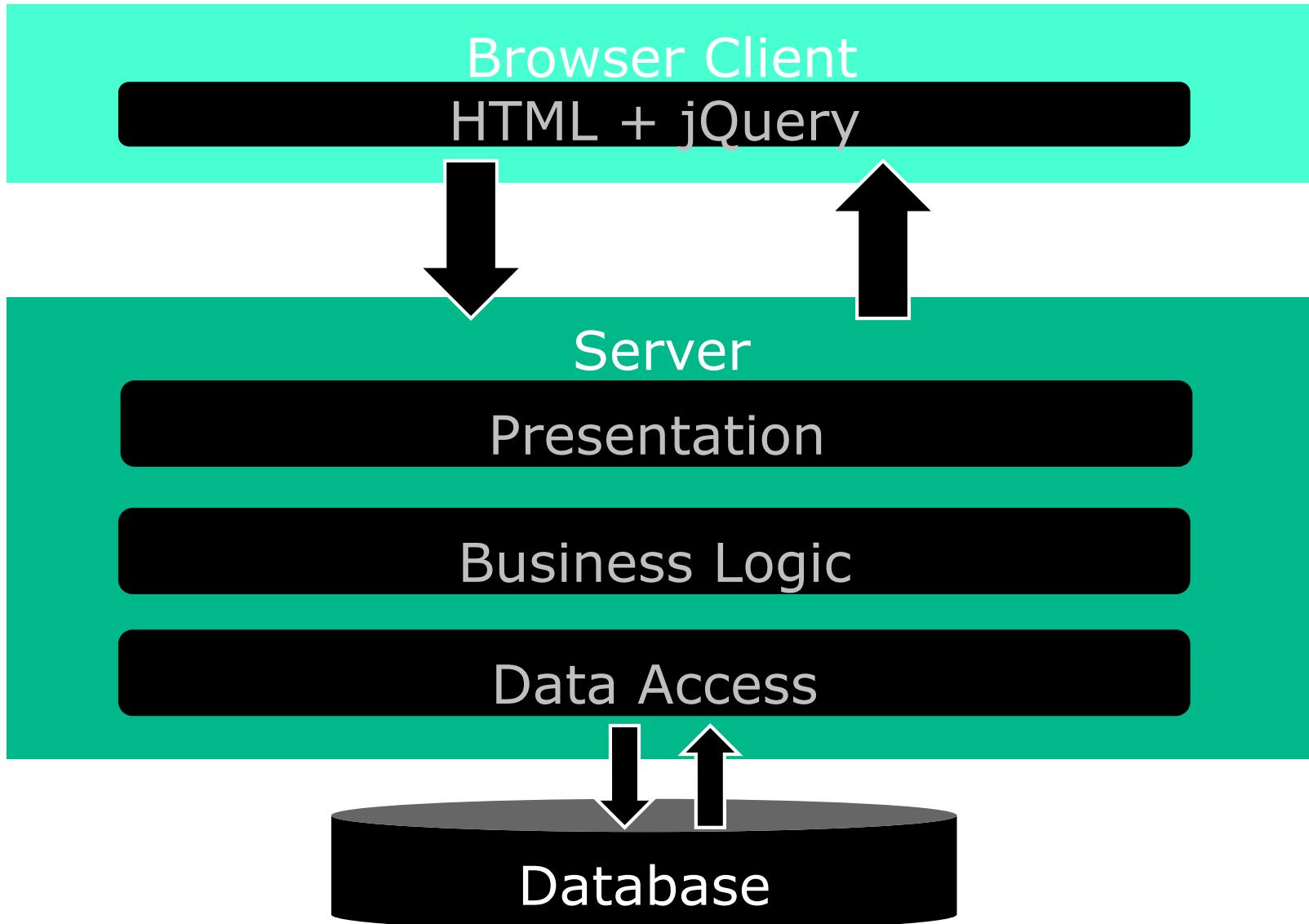
Framework to Platform



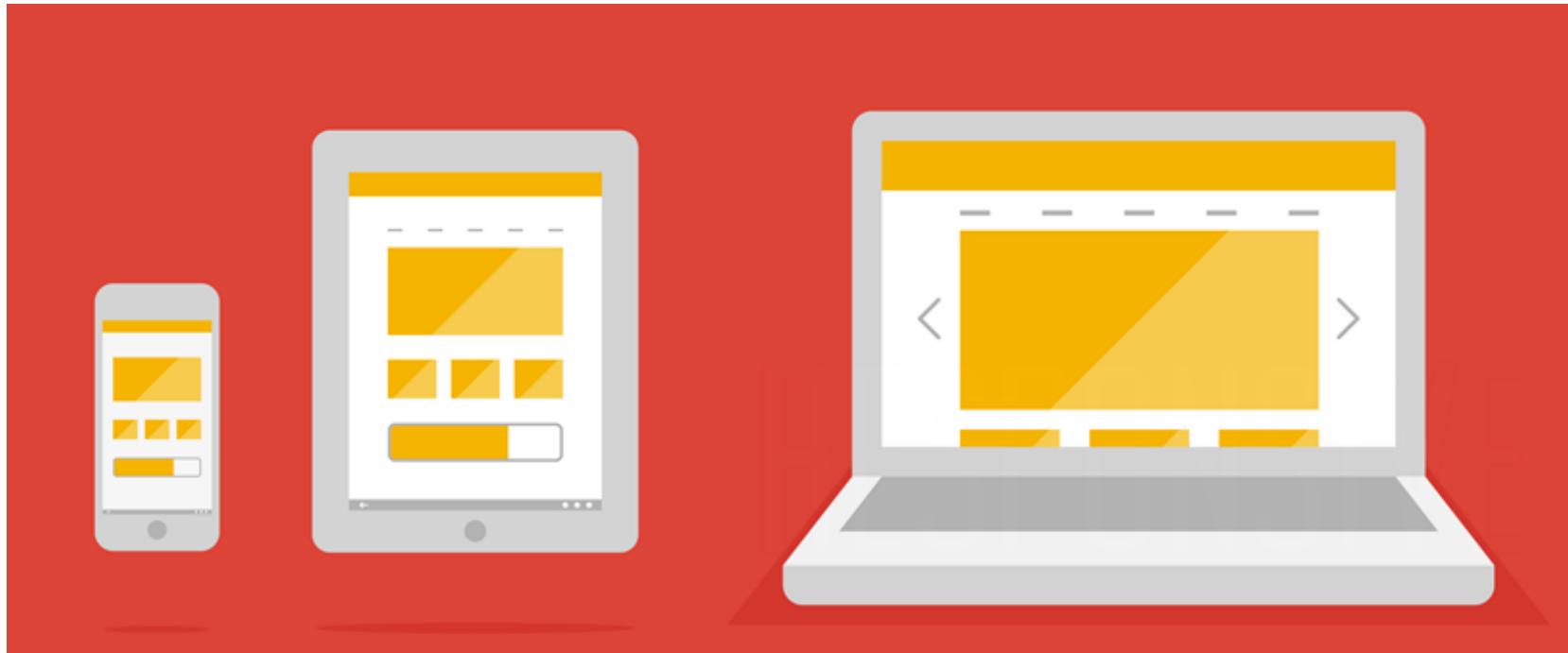


Conventional Web App

2000 - 2013

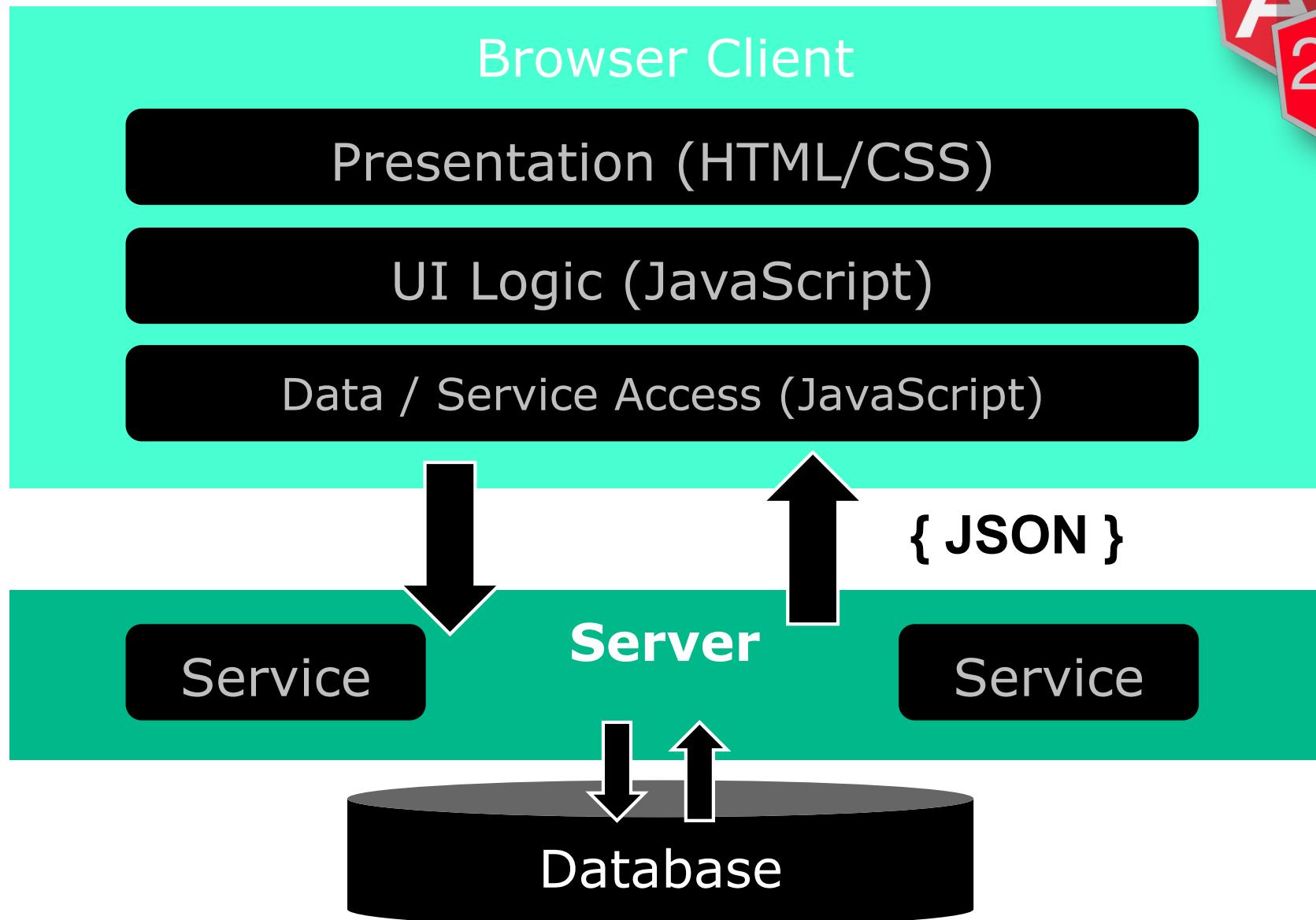


Maar: ca. 2010 -



Single Page Application

2010 – 20??





Angular 4

March 2017

Backwards Compatible w/ Angular 2



Predictable, Transparent & Incremental Evolution

Angular 5 - September / October 2017

Angular 6 - March 2018

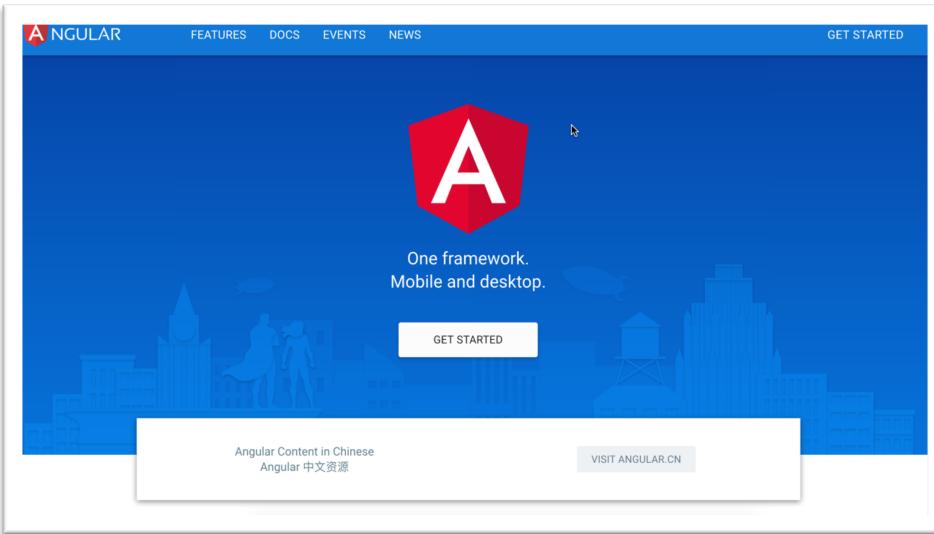
Angular 7 - September / October 2018

(tentative schedule)

"It's just

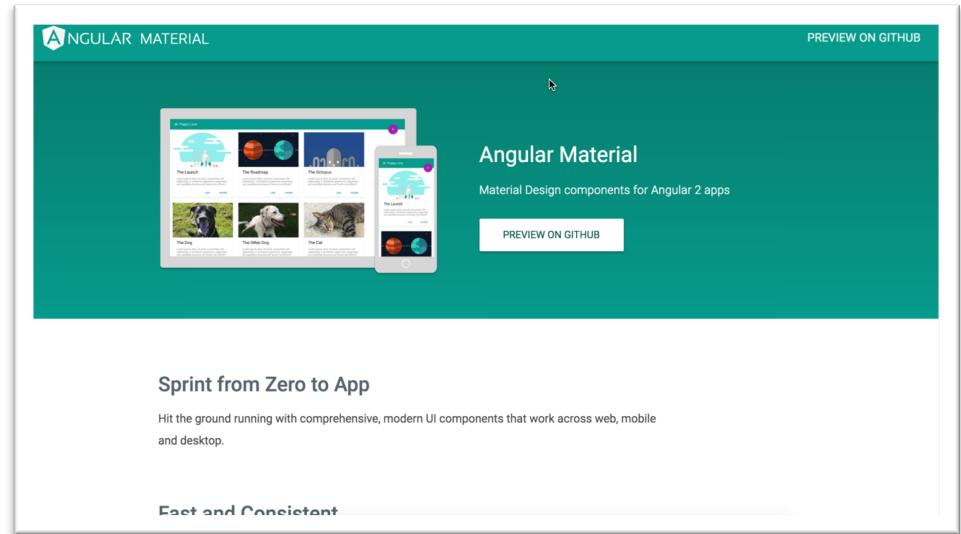
Angular

Angular as a Platform



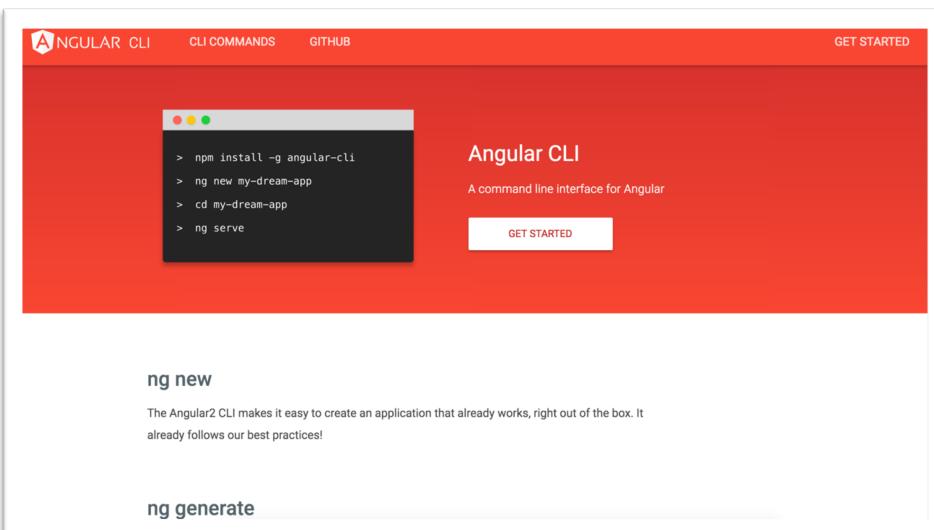
The Angular homepage features a large red Angular logo at the top left. Below it, the text "One framework. Mobile and desktop." is displayed. A "GET STARTED" button is located in the center. At the bottom, there's a callout box with "Angular Content in Chinese" and "Angular 中文资源", along with a "VISIT ANGULAR.CN" link.

<https://angular.io/>



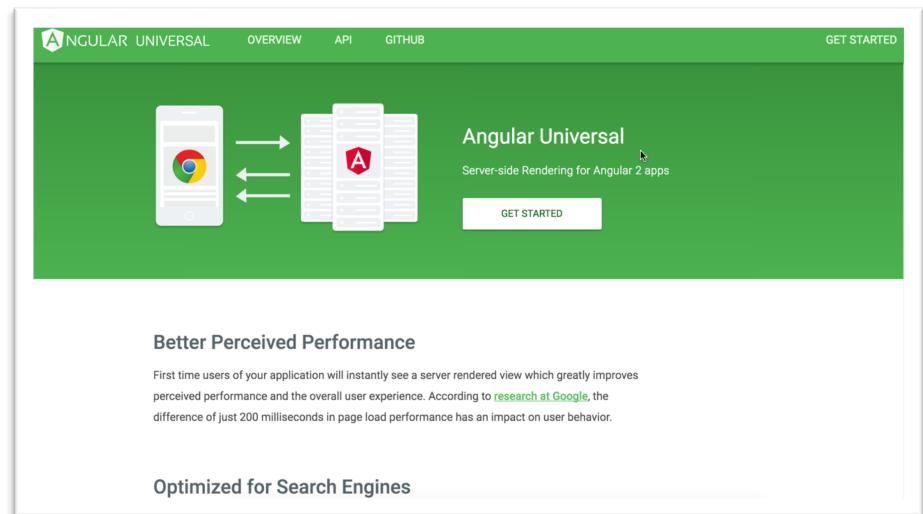
The Angular Material homepage has a teal header with the Angular Material logo and a "PREVIEW ON GITHUB" button. It features a grid of cards showing mobile and desktop app designs. Below this, a section titled "Sprint from Zero to App" includes a sub-section "Fast and Consistent".

<https://material.angular.io/>



The Angular CLI homepage has a red header with the Angular CLI logo and links for "CLI COMMANDS" and "GITHUB". It shows a terminal window with commands: "npm install -g angular-cli", "ng new my-dream-app", "cd my-dream-app", and "ng serve". A "GET STARTED" button is present. Below the header, there's a "ng new" section with a description and a "ng generate" section.

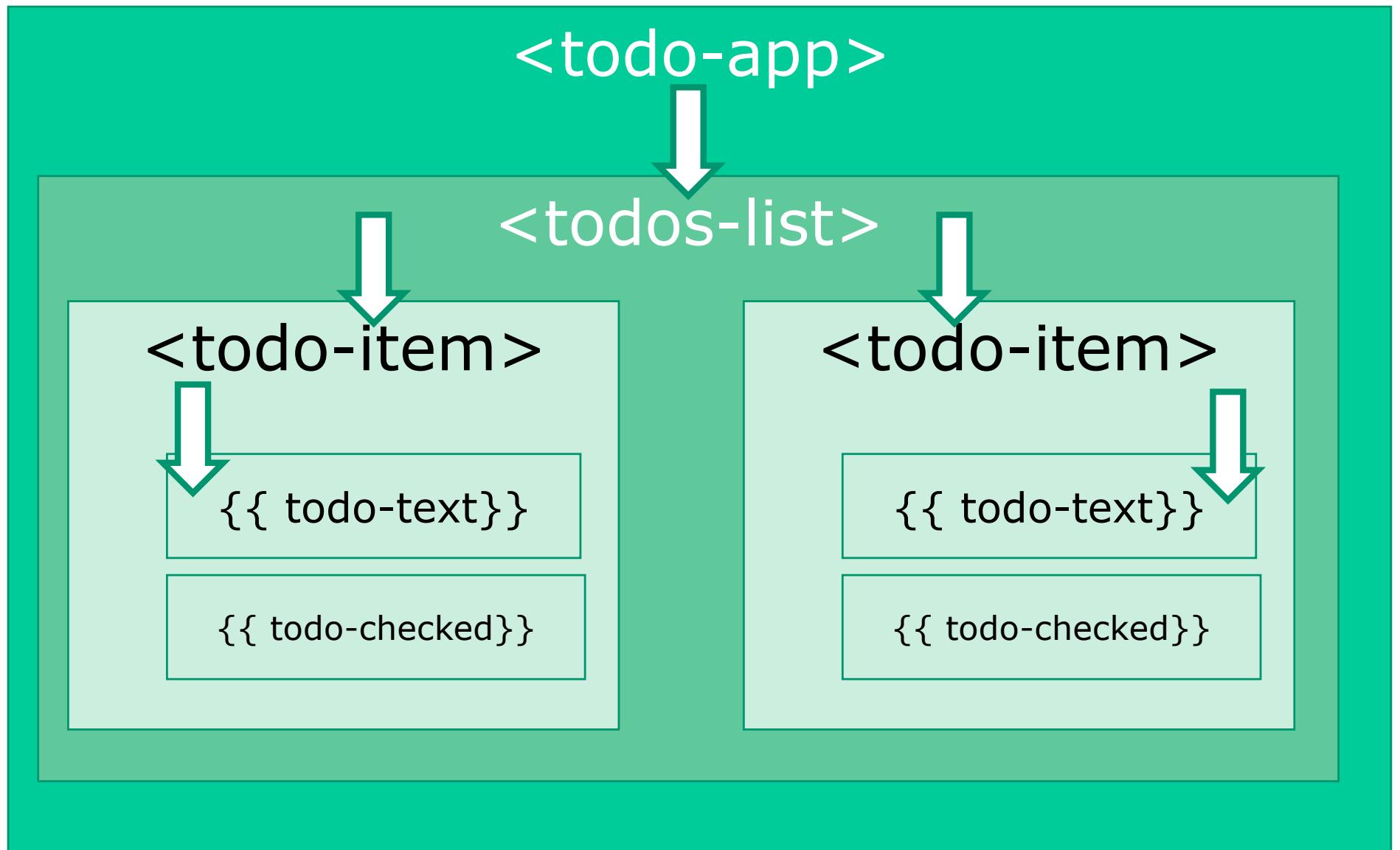
<https://cli.angular.io/>



The Angular Universal homepage has a green header with the Angular Universal logo and links for "OVERVIEW", "API", and "GITHUB". It features a diagram showing a smartphone connected to a server cluster via double-headed arrows. A "GET STARTED" button is available. Below the diagram, sections discuss "Better Perceived Performance" and "Optimized for Search Engines".

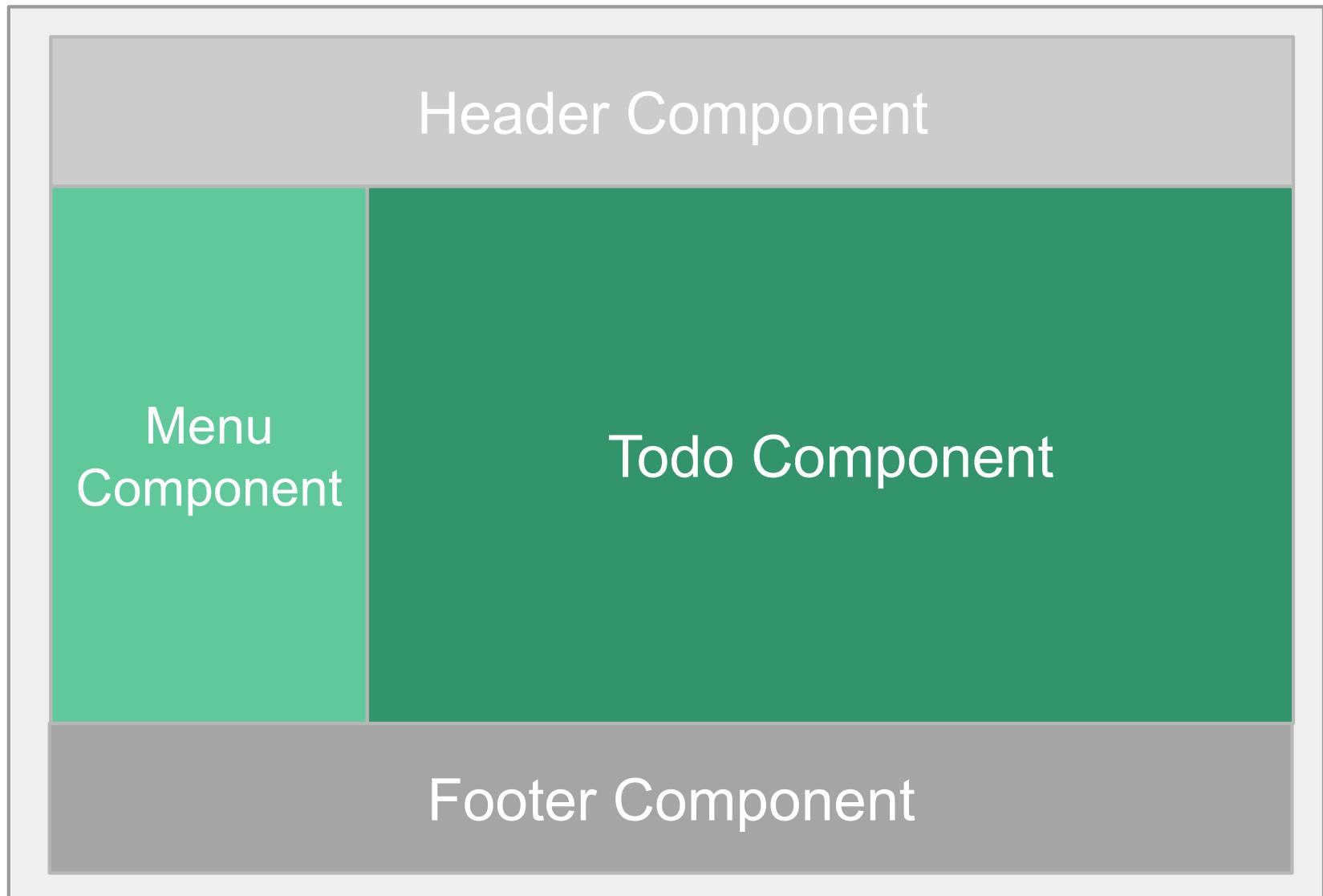
<https://universal.angular.io/>

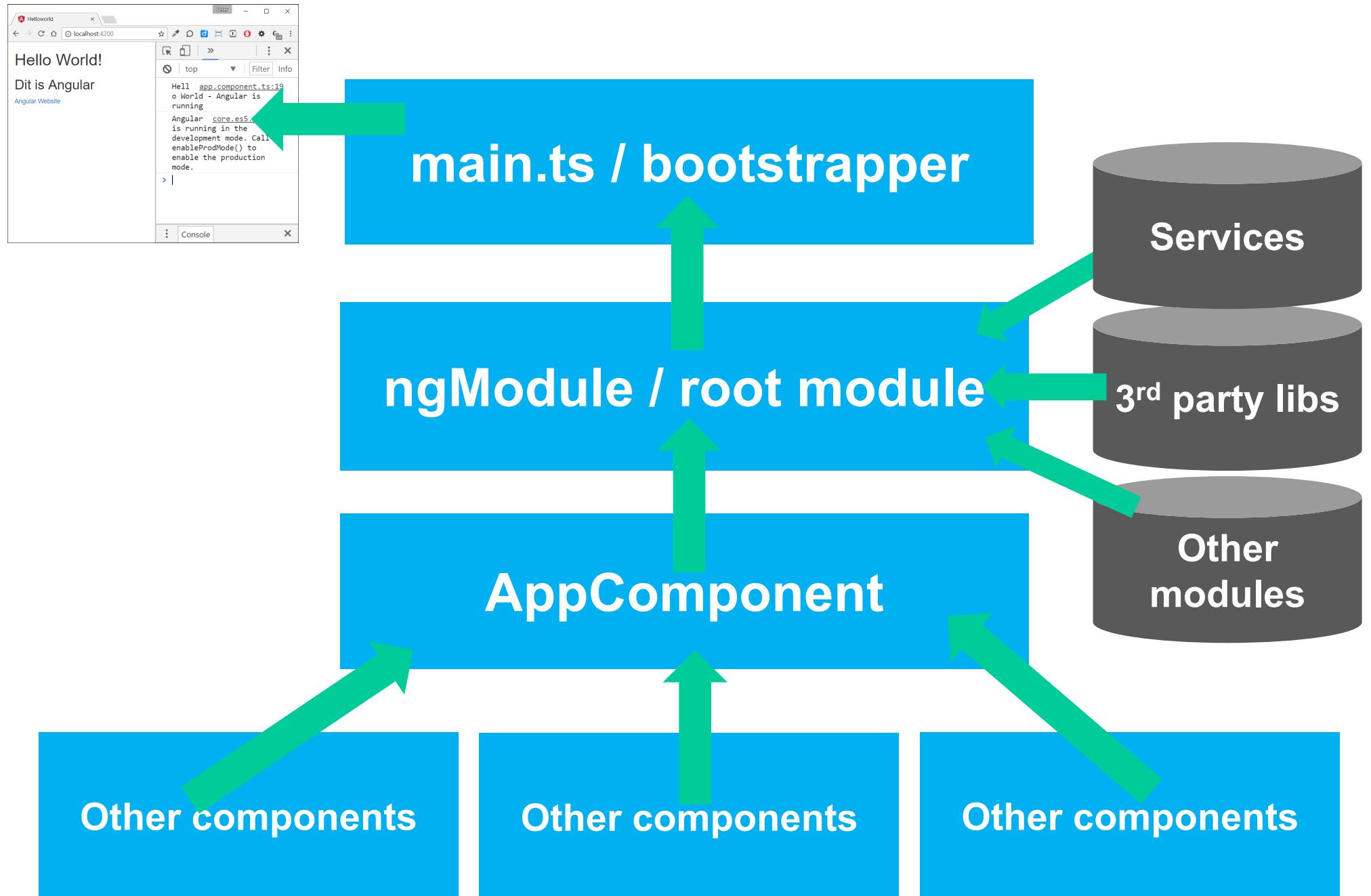
Angular 2 - components



*"An Angular-app is a tree
of components"*

Components – visual representation





Angular 2

Components

Data binding

Services

TypeScript

Routing

Classes

Form

Event binding

Observables

Templates

Pipes

Views

...



Let's write some code

Hello World in Angular 2

Angular 1:

```
<script src="angular.min.js"></script>
```

Angular dependency: NodeJS 6.9+



The screenshot shows the official Node.js website. At the top, there's a navigation bar with links for HOME, ABOUT, DOWNLOADS, DOCS, FOUNDATION, GET INVOLVED, SECURITY, and NEWS. Below the navigation is a large banner featuring a city skyline at sunset. On the left side of the banner, the Node.js logo is displayed with the text "node.js Interactive NORTH AMERICA Vancouver, Canada October 4-6, 2017". To the right of the banner, text reads "Join us for Node.js Interactive happening in Vancouver, Canada October 4 - 6, 2017". The main content area below the banner contains a paragraph about Node.js, mentioning its V8 engine, event-driven model, and large package ecosystem. It also highlights the "npm" package manager. Two download buttons are visible: one for "v6.10.3 LTS" (labeled "Recommended For Most Users") and another for "v7.10.0 Current" (labeled "Latest Features"). At the bottom, there are links for "Other Downloads", "Changelog", and "API Docs" for both versions.

Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient. Node.js' package ecosystem, npm, is the largest ecosystem of open source libraries in the world.

Download for Windows (x64)

v6.10.3 LTS
Recommended For Most Users

v7.10.0 Current
Latest Features

Other Downloads | Changelog | API Docs Other Downloads | Changelog | API Docs

Exercise

- Download or clone
<https://github.com/PeterKassenaar/voorbeeldenAngular2>

```
cd oefeningen
```

```
cd 100-helloworld
```

```
npm install (or yarn install)
```

```
npm start
```

- Go to browser: <http://localhost:4200>

The screenshot shows a development environment with two main panes. The left pane displays a web browser window with the URL `localhost:4200`. The page content includes the text "Hello World!" and "Dit is Angular". The right pane is a code editor or IDE interface with the following details:

- Title Bar:** Shows the title "Angular Website" and a toolbar with various icons.
- Project Explorer:** A tree view of the project structure under the root folder "01-helloworld".
 - node_modules**: Labeled as "library root".
 - src**: Contains:
 - app**: Contains `app.component.ts` and `app.module.ts`.
 - assets**
 - environments**: Contains `favicon.ico`, `index.html`, `main.ts`, `polyfills.ts`, and `styles.css`.
 - tsconfig.app.json**
 - .angular-cli.json**
 - .gitignore**
 - package.json**
 - tsconfig.json**
 - tslint.json**
 - yarn.lock**
 - External Libraries**
- Search and Navigation:** On the right side, there are four buttons with text labels: "Search Everywhere", "Go to File Ctrl+Shift+F", "Recent Files Ctrl+E", and "Navigation Bar Alt+F1".

Boilerplate code for Hello World

Steps

1. Set up environment, boilerplate & libraries
2. Write Angular Root Component
3. Write @NgModule Component
4. Bootstrap component
5. Write HTML-pagina (`index.html`)



Boilerplate files #1 - package.json

```
{  
  "name"          : "hello-angular",  
  "version"       : "1.0.0",  
  "scripts"       : {  
    "start"        : "tsc && concurrently \"npm run tsc:w\" \"npm run lite\"",  
    "lite"         : "lite-server",  
    "postinstall"  : "typings install",  
    "tsc"          : "tsc",  
    "tsc:w"        : "tsc -w",  
    "typings"      : "typings"  
  },  
  "license"       : "ISC",  
  "dependencies"  : {  
    "@angular/compiler"           : "^4.0.0",  
    "@angular/core"              : "^4.0.0",  
    ...  
    "rxjs"                      : "5.0.0-beta.6",  
    "zone.js"                   : "^0.6.12",  
    "angular2-in-memory-web-api" : "0.0.7",  
    "bootstrap"                 : "^3.3.6"  
  },  
  "devDependencies": {  
    "concurrently"   : "^2.0.0",  
    "lite-server"    : "^2.2.0",  
    "typescript"     : "^1.8.10",  
    "typings"        : "^0.8.1"  
  },  
  "author"        : "Peter Kassenaar <info@kassenaar.com>"  
}
```

Boilerplate files #2 - `tsconfig.json`

Instructies voor configuratie TypeScript compiler

```
{  
  "compileOnSave": false,  
  "compilerOptions": {  
    "outDir": "./dist/out-tsc",  
    "baseUrl": "src",  
    "sourceMap": true,  
    "declaration": false,  
    "moduleResolution": "node",  
    "emitDecoratorMetadata": true,  
    "experimentalDecorators": true,  
    "target": "es5",  
    "typeRoots": [  
      "node_modules/@types"  
    ],  
    "lib": [  
      "es2016",  
      "dom"  
    ]  
  }  
}
```

Boilerplate files #3 - .angular-cli.json

```
{  
  "$schema": "./node_modules/@angular/cli/lib/config/schema.json",  
  "project": {  
    "name": "helloworld"  
  },  
  "apps": [  
    {  
      "root": "src",  
      "outDir": "dist",  
      "assets": [  
        "assets",  
        "favicon.ico"  
      ],  
      "index": "index.html",  
      "main": "main.ts",  
      "prefix": "app",  
      "styles": [  
        "styles.css"  
      ],  
      "scripts": [],  
      "environmentSource": "environments/environment.ts",  
      ...  
    }  
  ].....  
}
```

"Nice to have" - non-essential files

The screenshot shows a GitHub repository page for 'angular / quickstart'. The repository has 250 stars and 2,567 forks. The 'Code' tab is selected, showing the file 'non-essential-files.txt'. The file was last updated by 'wardbell' on branch 'master' with commit 'df3'. It contains 16 lines (15 sloc) and 226 Bytes. The file lists various configuration and test files:

```
1 .git
2 .gitignore
3 .travis.yml
4 *.spec*.ts
5 bs-config.e2e.json
6 CHANGELOG.md
7 e2e
8 favicon.ico
9 karma.conf.js
10 karma-test-shim.js
11 LICENSE
12 non-essential-files.txt
13 non-essential-files.osx.txt
14 protractor.config.js
15 README.md
```

<https://github.com/angular/quickstart/blob/master/non-essential-files.txt>

Step 2 – Component

Convention - components in directory /src/app

Or: edit in .angular-cli.json

Filename: src/app/app.component.ts

```
import {Component} from '@angular/core';
@Component({
  selector: 'hello-world',
  template: '<h1>Hello Angular 2</h1>'
})
export class AppComponent {
```

Step 3 – @NgModule

Convention - filename: /src/app.module.ts

```
// Angular Modules
import {NgModule}      from '@angular/core';
import {BrowserModule} from '@angular/platform-browser';

// Custom Components
import {AppComponent} from './app.component';

// Module declaration
@NgModule({
  imports      : [BrowserModule],
  declarations: [AppComponent],
  bootstrap    : [AppComponent]
})
export class AppModule {
```

This is the entry point of the application

Some background info on Root Module

The screenshot shows a blog post titled "Introducing Angular Modules - Root Module" by John Papa. The post is dated September 5, 2016. It discusses the @NgModule decorator and its purpose in organizing applications. The sidebar features a bio for John Papa and links to his most recent posts.

HOME SPEAKING VIDEOS ARTICLES ABOUT CONTACT

Angular Modules

Introducing Angular Modules - Root Module

05 SEPTEMBER 2016

The `@NgModule` is a new decorator that has recently been added in Angular 2. `NgModule` defines an Angular Module, which (from the official docs) are defined as "Angular Modules help organize an application into cohesive blocks of functionality."

John

Hi, I'm John Papa. I author this blog, create courses for Pluralsight and am a Google Developer Expert and Microsoft Regional Director. I speak at events and I train technology thought leaders →

Most Recent

[Introducing Angular Modules - Root Module](#)
[Learning Angular 2 this Fall](#)
[The Ultimate Angular 2 Workshop in Ft](#)

<https://johnpapa.net/introducing-angular-modules-root-module/>

Step 4 - bootstrap component

Best practice: bootstrap app in separate component

Convention: main.ts, **of** app.main.ts.

```
import {enableProdMode} from '@angular/core';
import {platformBrowserDynamic} from '@angular/platform-browser-dynamic';

import {AppModule} from './app/app.module';
import {environment} from './environments/environment';

if (environment.production) {
  enableProdMode();
}

platformBrowserDynamic().bootstrapModule(AppModule);
```

Step 5 – index.html

index.html - simple HTML file - expanded at runtime by WebPack

Header:

```
<html>

<head>

  <meta charset="utf-8">
  <title>Helloworld</title>
  <base href="/">

  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="icon" type="image/x-icon" href="favicon.ico">
  <link rel="stylesheet" href="../node_modules/bootstrap/dist/css/bootstrap.min.css">

</head>
```

Body van index.html

Verwijzing naar de root-component:

```
<body>  
  <hello-world>  
    Bezig met laden...  
  </hello-world>  
</body>
```

App draaien

npm start – draait de scriptopdracht start uit package.json.

ng serve - start globale angular-cli instantie

The terminal window shows the following output:

```
Terminal
+ chunk {0} polyfills.bundle.js, polyfills.bundle.js.map (polyfills) 157 kB {4} [initial] [rendered]
x
chunk {1} main.bundle.js, main.bundle.js.map (main) 3.73 kB {3} [initial] [rendered]
chunk {2} styles.bundle.js, styles.bundle.js.map (styles) 9.78 kB {4} [initial] [rendered]
chunk {3} vendor.bundle.js, vendor.bundle.js.map (vendor) 2.1 MB [initial] [rendered]
chunk {4} main.bundle.js, main.bundle.js.map (main) 3.73 kB {1} [initial] [rendered]
webpack: C:\Users\...{[redacted]}
```

The browser screenshot shows a simple Angular application with the following content:

Hello World!

Dit is Angular

Angular Website

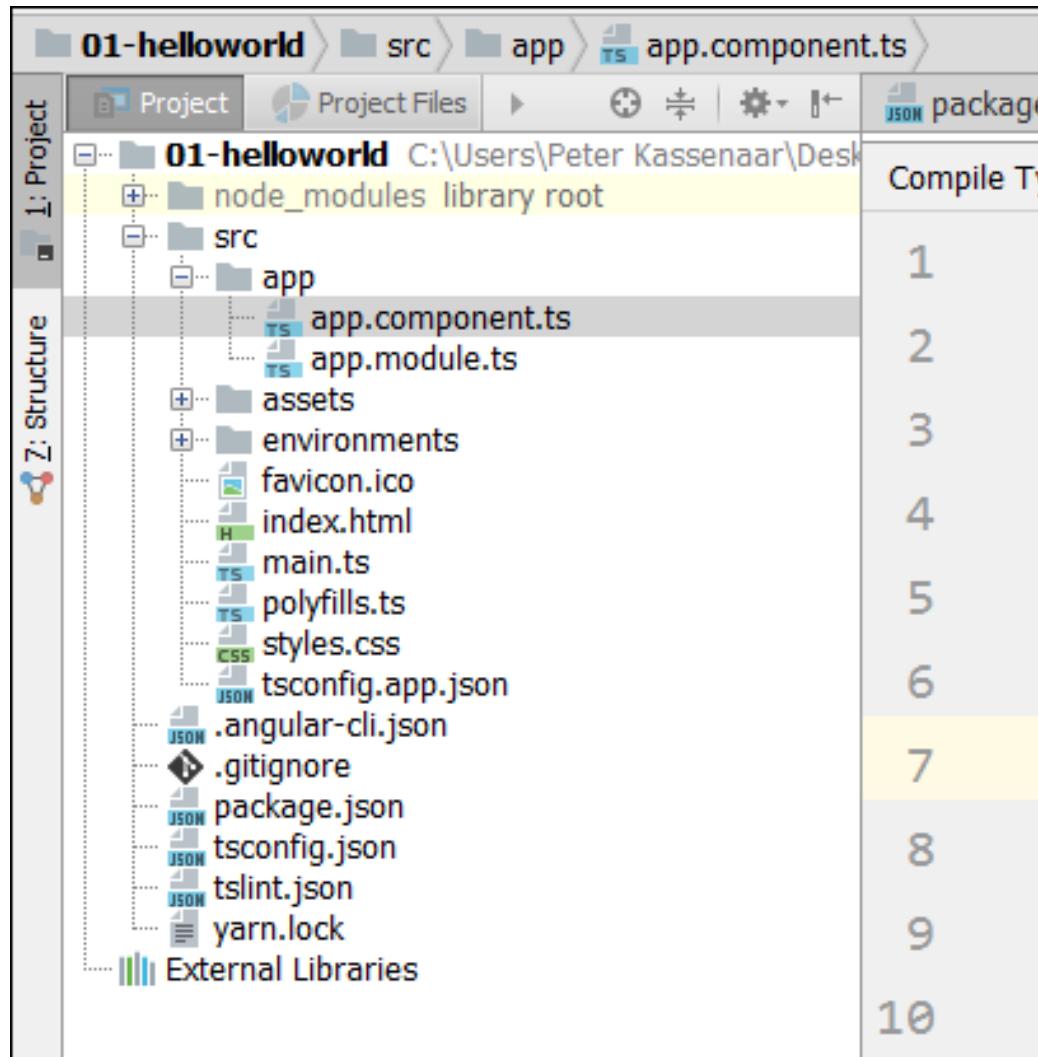
The browser's developer tools Console tab shows the following logs:

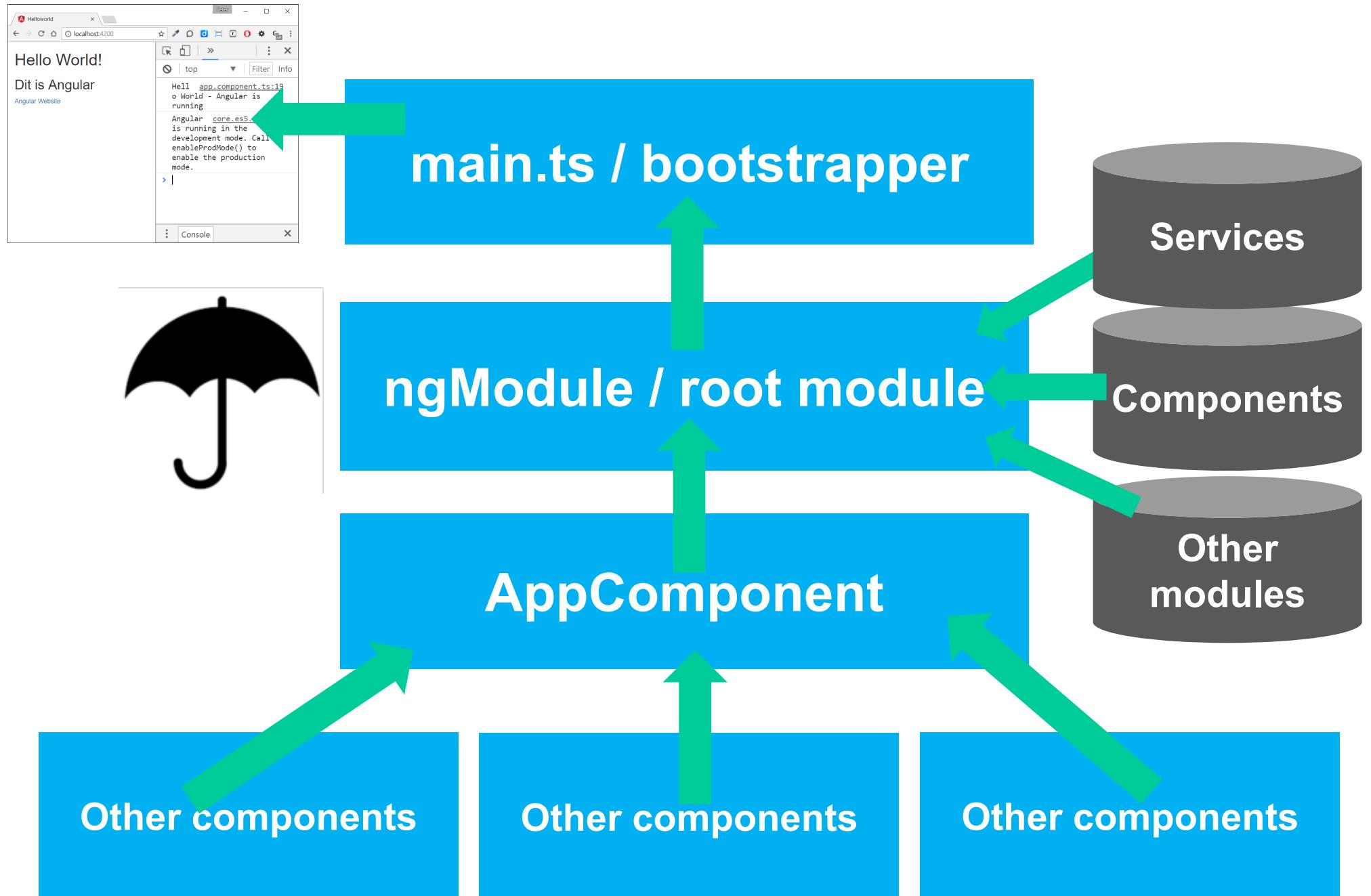
- Hello World - Angular is running app.component.ts:19
- Angular is running in the development mode. Call enableProdMode() to enable the production mode. core.es5.js:3025

Daarna: wijzigingen aanbrengen in app.component.ts

– worden opgepikt door Live Reload

Structuur

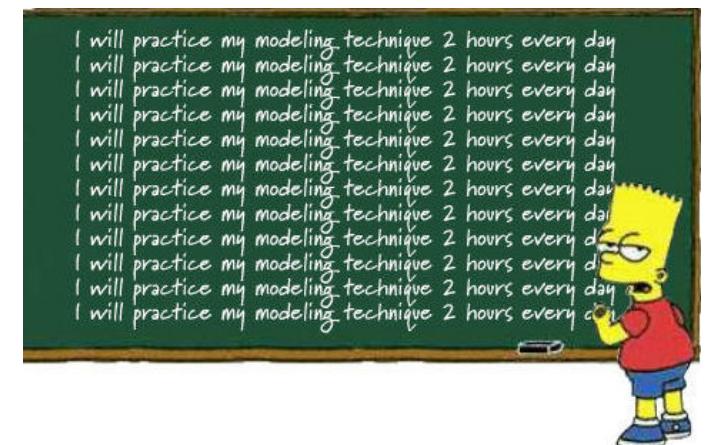




Checkpoint

- Er is aardig wat boilerplate code nodig om een Angular-app te starten
- Vier stappen
 1. Set up environment, boilerplate & libraries
 2. Schrijf Angular Root Component voor de app
 3. Bootstrap de component
 4. Schrijf HTML-pagina (`index.html`)
- Daarna: app gaan uitbreiden

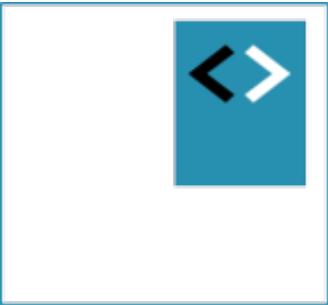
Oefening....



Assets

github.com/PeterKassenaar/voorbeeldenAngular2

Oefeningen en meer voorbeeldcode



Angular CLI

Snel nieuwe projecten instellen via de command line

Angular-CLI to the rescue

- Het *is* mogelijk nieuwe Angular-projecten from scratch te starten.
- Met de CLI is eenvoudiger.
- CLI-options:
 - Scaffolding
 - Generating
 - Testing
 - Building
 - AOT-Compiling
 - ...



Mike Brocchi

@Brocco

What is/was your largest barrier to getting started with Angular 2?

26% Environment setup

17% Lack of documentation

22% Too complicated

35% Other interests

9:37 AM - 25 Mar 2016



Mike Brocchi
Brocco

What is/was your largest barrier to getting started with Angular 2?

26% Environment setup

17% Lack of documentation

22% Too complicated

35% Other interests

9:37 AM - 25 Mar 2016

Scaffolding - Angular CLI

Projecten, componenten, routes en meer definiëren
vanaf de command line

<https://github.com/angular/angular-cli>

en

<https://cli.angular.io/>

The screenshot shows the GitHub repository page for 'angular/cli'. At the top, there's a commit for 'chore(): add typings files to assist devs' made 4 months ago. Below the commit, the README.md file is displayed. The README contains the title 'Angular-CLI', a 'chat on gitter' button, and several status badges: 'build passing', 'dependencies up to date', 'devDependencies up to date', and 'npm v1.0.0-beta.5'. A note below the badges states: 'Prototype of a CLI for Angular 2 applications based on the [ember-cli](#) project.' The 'Note' section below the badge notes that the project is still a work in progress and encourages collaboration via issues. The 'Prerequisites' section mentions Node 4 or greater. The 'Table of Contents' section lists various command topics.

Angular-CLI

chat on gitter

build passing dependencies up to date devDependencies up to date npm v1.0.0-beta.5

Prototype of a CLI for Angular 2 applications based on the [ember-cli](#) project.

Note

This project is very much still a work in progress.

We still have a long way before getting out of our alpha stage. If you wish to collaborate while the project is still young, check out [our issue list](#).

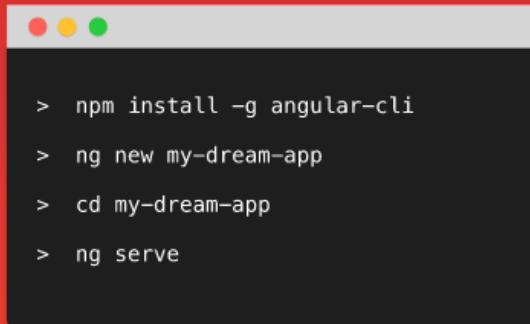
Prerequisites

The generated project has dependencies that require [Node 4 or greater](#).

Table of Contents

- Installation
- Usage
- Generating a New Project
- Generating Components, Directives, Pipes and Services
- Generating a Route
- Creating a Build
- Running Unit Tests
- Running End-to-End Tests
- Deploying the App via GitHub Pages
- Linting and formatting code
- Support for offline applications
- Commands autocomplete
- CSS preprocessor integration
- 3rd Party Library Installation

```
npm install -g @angular/cli
```



```
> 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 the box. It already follows our best practices!

ng generate

Generate components, routes, services and pipes with a simple command. The CLI will also create simple test shells for all of these.



<https://www.youtube.com/watch?v=wHZe6gGI5RY>

Main commands

ng new

```
ng new PROJECT_NAME
```

```
cd PROJECT_NAME
```

```
ng serve
```

Project is served on <http://localhost:4200>



<https://www.youtube.com/watch?v=wHZe6gGI5RY>

The image shows the Scotch.io website homepage. On the left, there's a sidebar with the Scotch logo (a glass with a single rock) and the text "scotch.io code on the rocks". Below this are sections for "LEARN" (Tutorials, Bar Talk, Community, Scotch School), "OUR STUFF" (About, Shop, Join Us On Slack, Hire Us), and a "Popular Scotchers" sidebar listing nine profiles with names like Chris Sevilleja, Nicholas Cerminara, Holly Lloyd, Ado Kukic, Ryan Chenkie, Ken Wheeler, Alex Sears, and Chris Nwamba, along with a "Become a Scotcher!" button. The main content area has a red header with the Angular logo and the title "Use the Angular CLI for Faster Projects". Below this, a large section features the same title and a sub-section "Use the Angular CLI For Faster Angular 2 Projects". A paragraph explains that creating Angular 2 projects is faster with the Angular CLI. At the bottom, there's a small circular profile picture.

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Nicholas Cerminara

Holly Lloyd

Ado Kukic

Ryan Chenkie

Ken Wheeler

Alex Sears

Chris Nwamba

Become a Scotcher!

angular2 angularJS javascript

Use the Angular CLI for Faster Projects

Use the Angular CLI For Faster Angular 2 Projects

Creating Angular 2 projects has never been faster than with the Angular CLI

<https://scotch.io/tutorials/use-the-angular-cli-for-faster-angular-2-projects>

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JavaScript - April 25, 2017 - By Jurgen Van de Moere

The Ultimate Angular CLI Reference Guide



[f](#) [in](#) [t](#)

2017.04.25: As of March 24, Angular CLI v1.0 was released. This article has been updated to reflect the latest changes. If you want to add the latest features of Angular CLI v1.0 to your existing Angular project that was generated with an earlier version of Angular CLI, check out the [Angular CLI v1.0 migration guide](#).

2017.02.17: As of February 9, 2017, the `ng deploy` command has been removed

Related Topics:

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An Introduction to Component Routing with Angular Router
Jurgen Van de Moere, 12 hours ago



<https://www.sitepoint.com/ultimate-angular-cli-reference/>

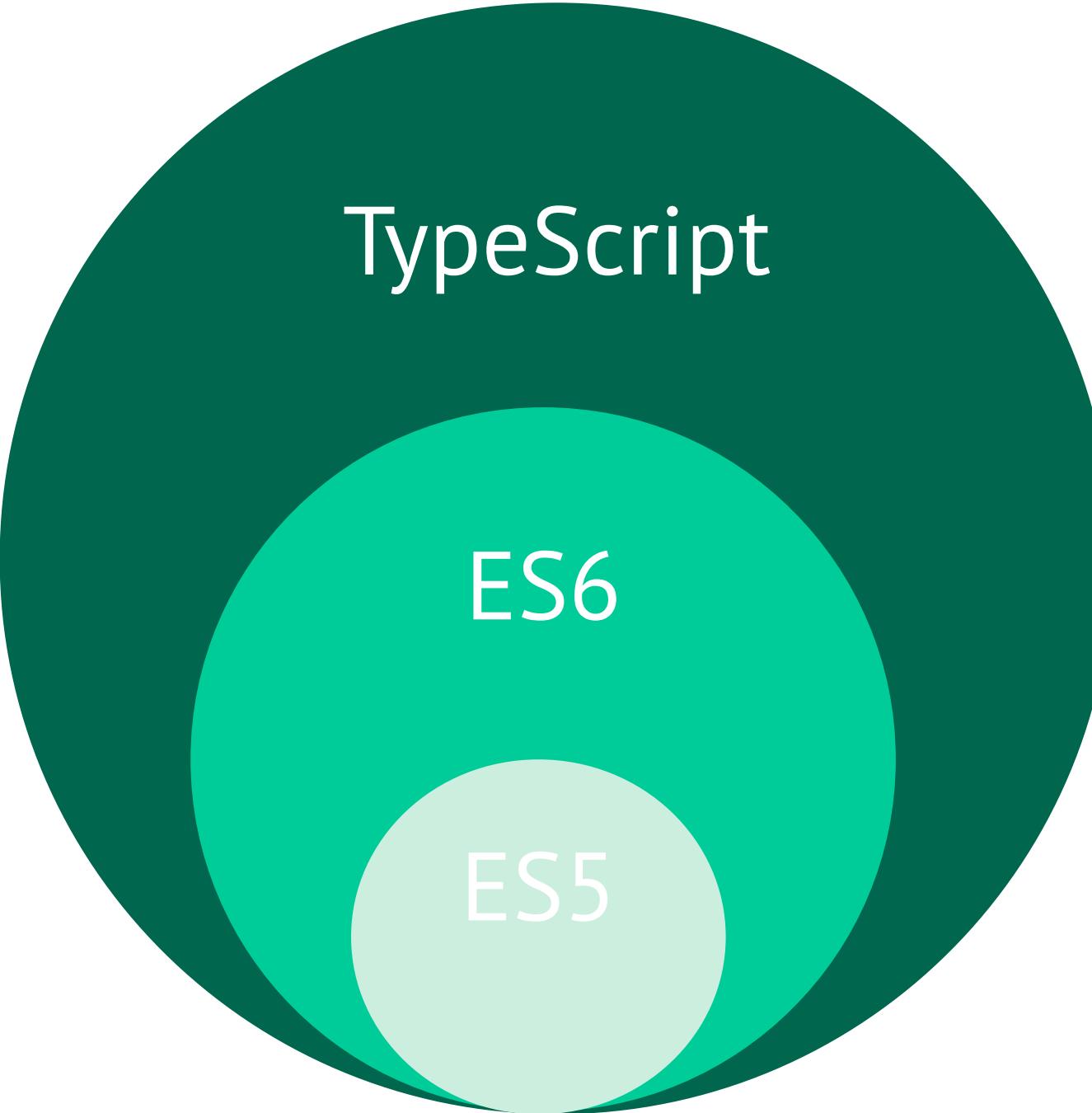


Angular 2 Code - Backend

Kort over TypeScript en ES6

Programmeertalen





TypeScript

ES6

ES5

ES6 en TypeScript

De toekomst van JavaScript is ES6/ES2015

Major update van JavaScript als programmeertaal

Modules, classes en meer

Helpt bij het ontwikkelen in Angular 2

TypeScript breidt ES6 verder uit

Annotaties & types

Interfaces

Compiler

TypeScript – tooling support

Types, Autocompletion.

Compile-time checking in editors.

Alles is *optioneel*. Je kunt altijd nog gewoon
JavaScript gebruiken.

Onderdelen van een Component Class

imports

```
import { Component } from 'angular2/core';
import { DataService } from './services/data-service';
```

annotations

```
@Component({
  selector: 'orders',
  directives: [DataService],
  templateUrl: 'orders-component.html',
})
```

class

```
export class OrdersComponent {
  ...
}
```

Checkpoint

- Angular 2 is een totaal ander framework dan Angular 1
- Component-based vs. Page-based
- Nieuwe syntaxis
- Nieuwe programmeertalen en andere nieuwe kenmerken
- Concepten komen – deels – overeen
- Voorlopig: veel boilerplate-code nodig voor een Quickstart
- Daarna: niet meer naar omkijken. Concentreren op de componenten