

Angular 2

Module 1 - Inleiding



Peter Kassenaar –
info@kassenaar.com



Peter Kassenaar

- Trainer, auteur, developer – sinds 1996
- Specialisme: *"Everything JavaScript"*
- JavaScript, ES6, Angular, NodeJS, TypeScript, jQuery, PhoneGap, Ionic

www.kassenaar.com/blog

info@kassenaar.com

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



ING

OHRA

euricom
A DIMENSION DATA COMPANY

sanoma

delta lloyd

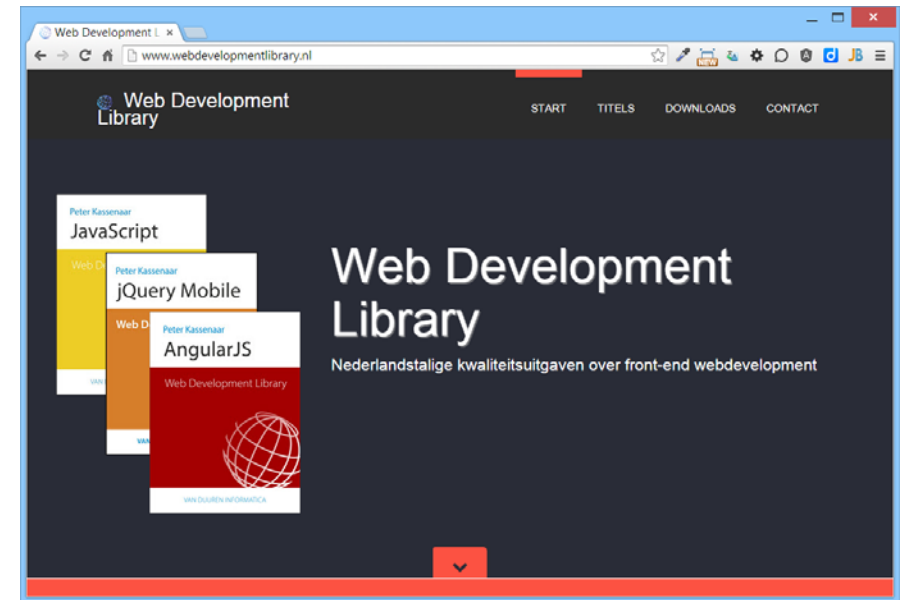
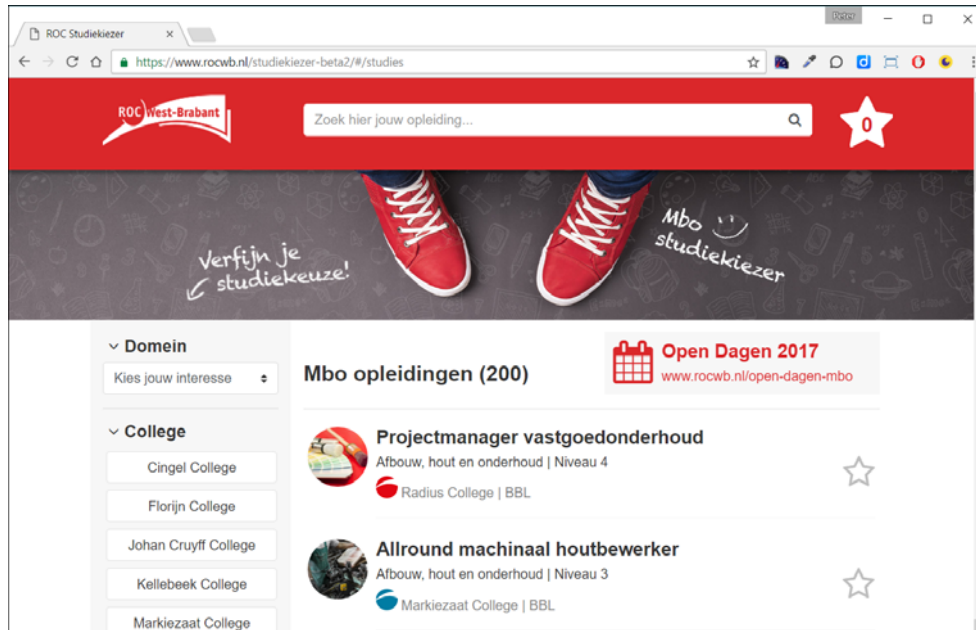
zenito
BETERE ZEKERHEID
VOOR ONDERNEMERS

Atos

woonbron
OBERON INTERACTIVE

ROC West-Brabant

the eforum
FACTORY





Over jullie...





Voorkennis webdevelopment, (mobile/web-) apps?

Kennis AngularJS 1.x?

Voorkennis andere (web)talen?

Verwachtingen van de cursus?

Concrete projecten?



Materialen

Software (downloads)

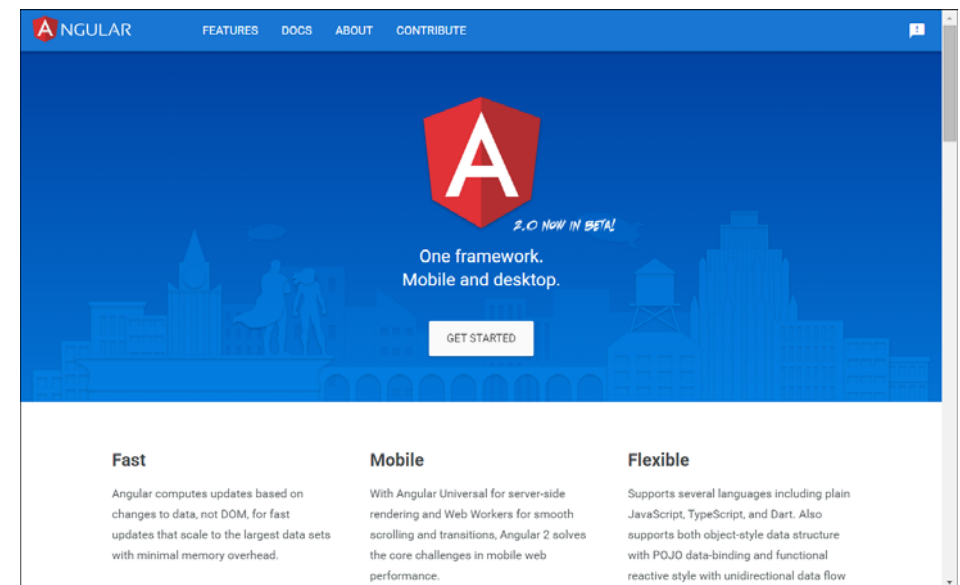
Handouts (PPTX/PDF)

Oefeningen (papier)

Websites (online)



www.webdevelopmentlibrary.nl



angular.io/



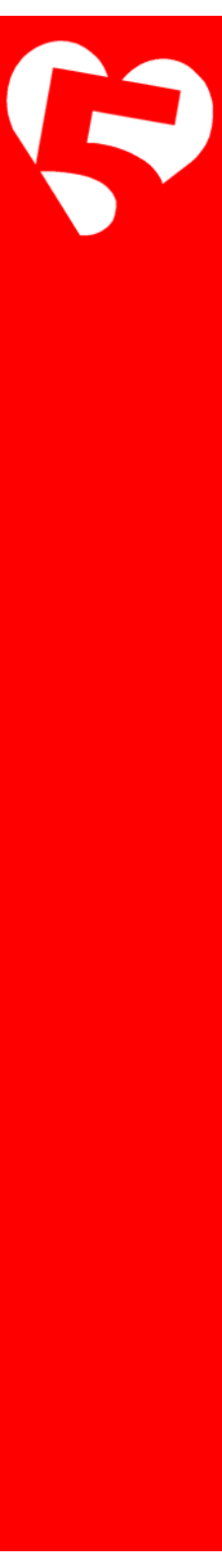
Geluk



Pech



Disclaimer...



14-Sept-2016

*Angular has changed! Don't trust older
blog posts or Stack Overflow-questions.*

Always check date and version!



Agenda - 3 dagen

- Introductie & geschiedenis - waarom Angular 2?
- Angular 2 vs. Angular 1
- Hello World in Angular 2 – inzicht in boilerplate-code
- Angular 2 in depth:
 - Components
 - ECMAScript 2015 + TypeScript
 - Data binding
 - Dependency Injection (DI) – more components
 - Services en http, Observables (RxJS)
 - Routing
- BEST PRACTICES / STYLE GUIDE



2 Richtlijnen

1. Oefeningen

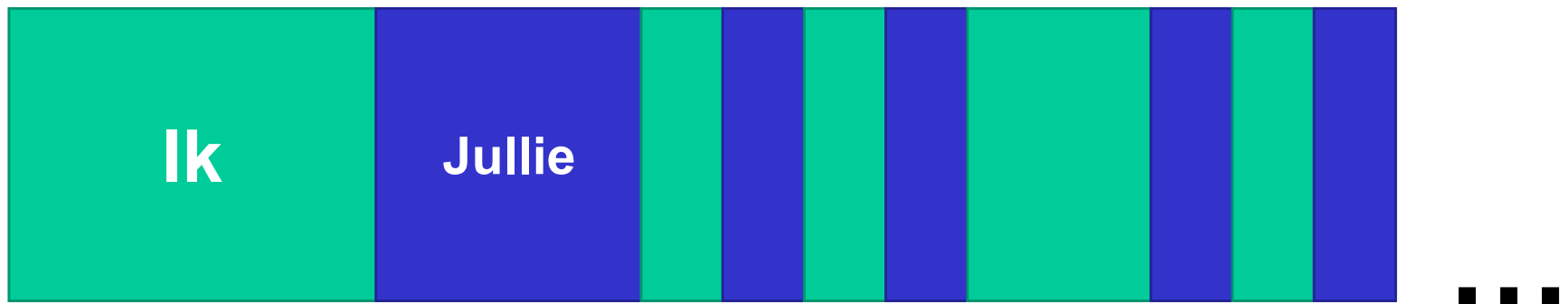
- Maar: neem ook vooral zijpaden, experimenteer, lees verder, maak een eigen project, app, website...

2. Voorbeeldcode

- Als ondersteuning bij de oefeningen, zie boven
- Work in progress – check de Angular2-site!
- <https://github.com/PeterKassenaar/voorbeeldenAngular2>



Globale werkwijze





Vragen?



Angular 1 vs. Angular 2

Verschillen, overeenkomsten, nieuwe onderdelen



MV*

Framework



Platform



Framework to Platform

	Scaffolding	Code completion & Refactoring	Debugging
Tooling	Angular CLI	Language Services	Augury
Libraries	Material 2	Mobile	Universal
	Compile	Change Detection	Renderer
Core	Components & Dependency Injection	Decorators	Zones



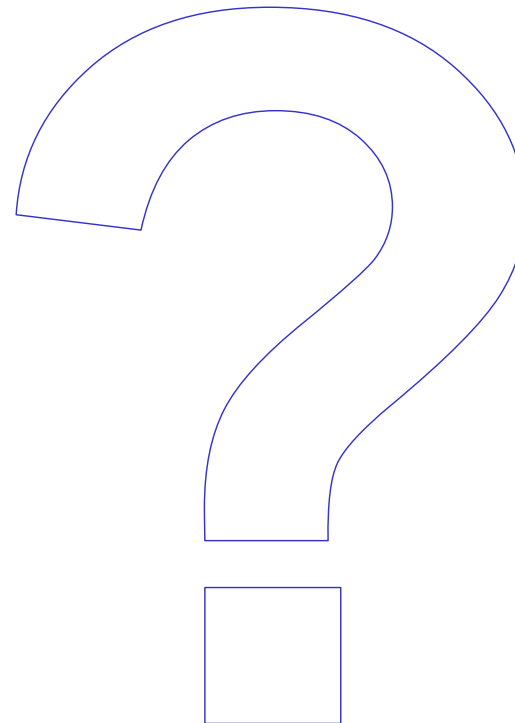
Upgrading – Angular 1 naar 2

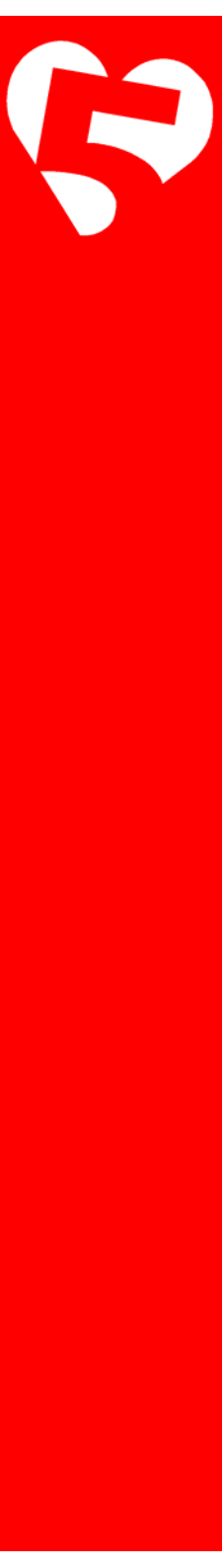
ngUpgrade

Router

Animation

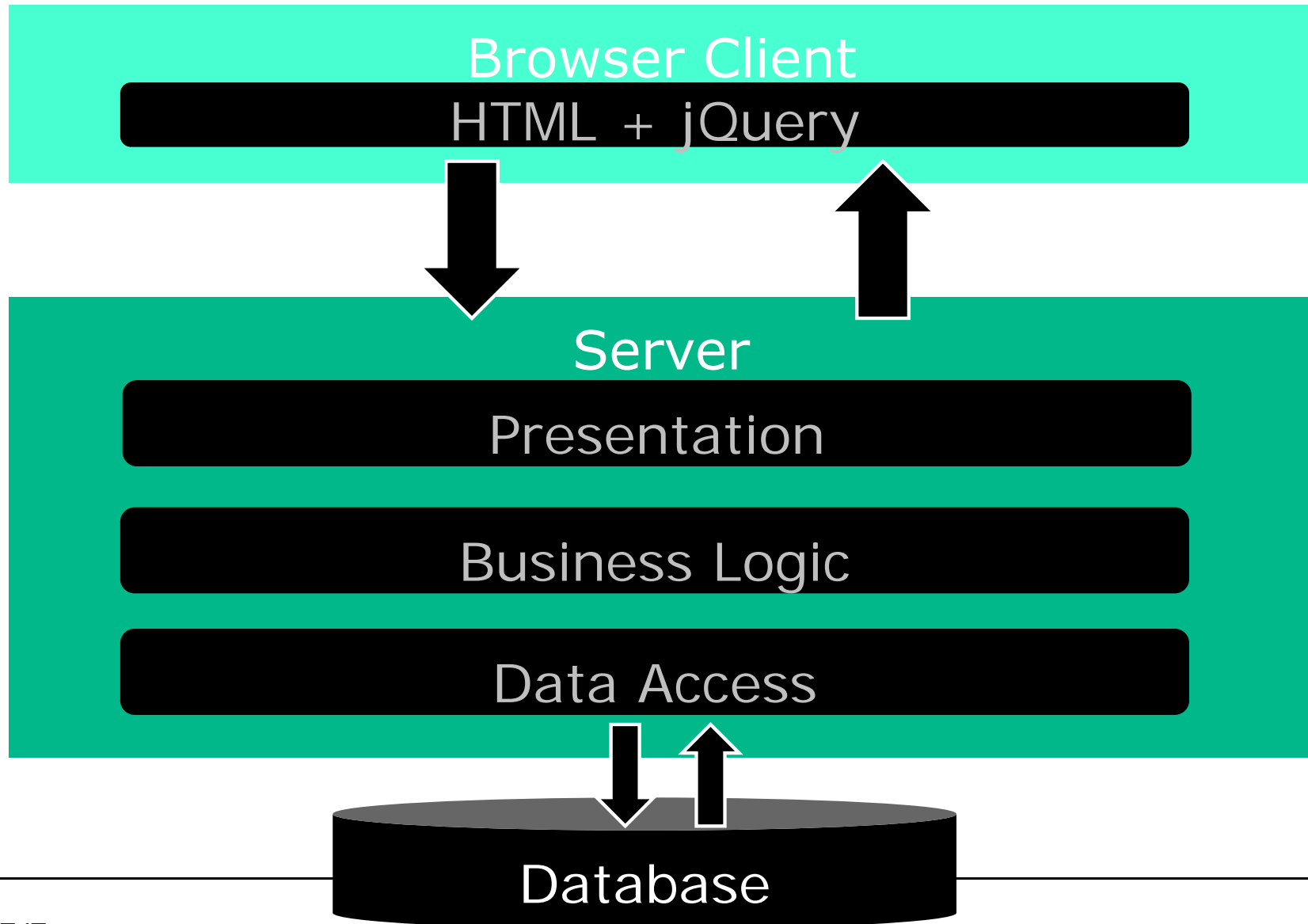
i18n

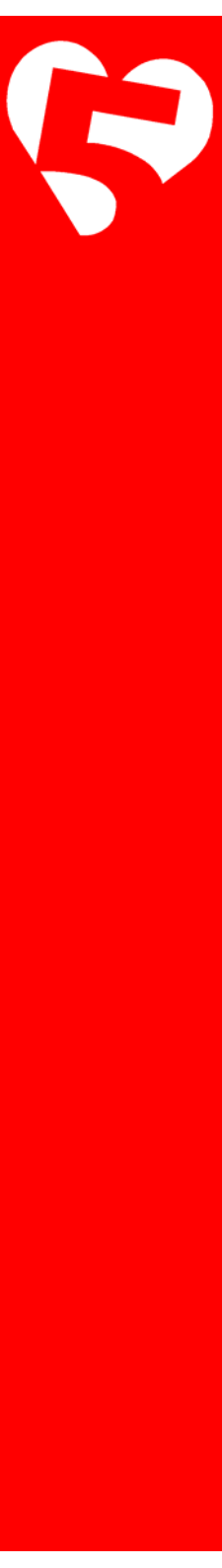




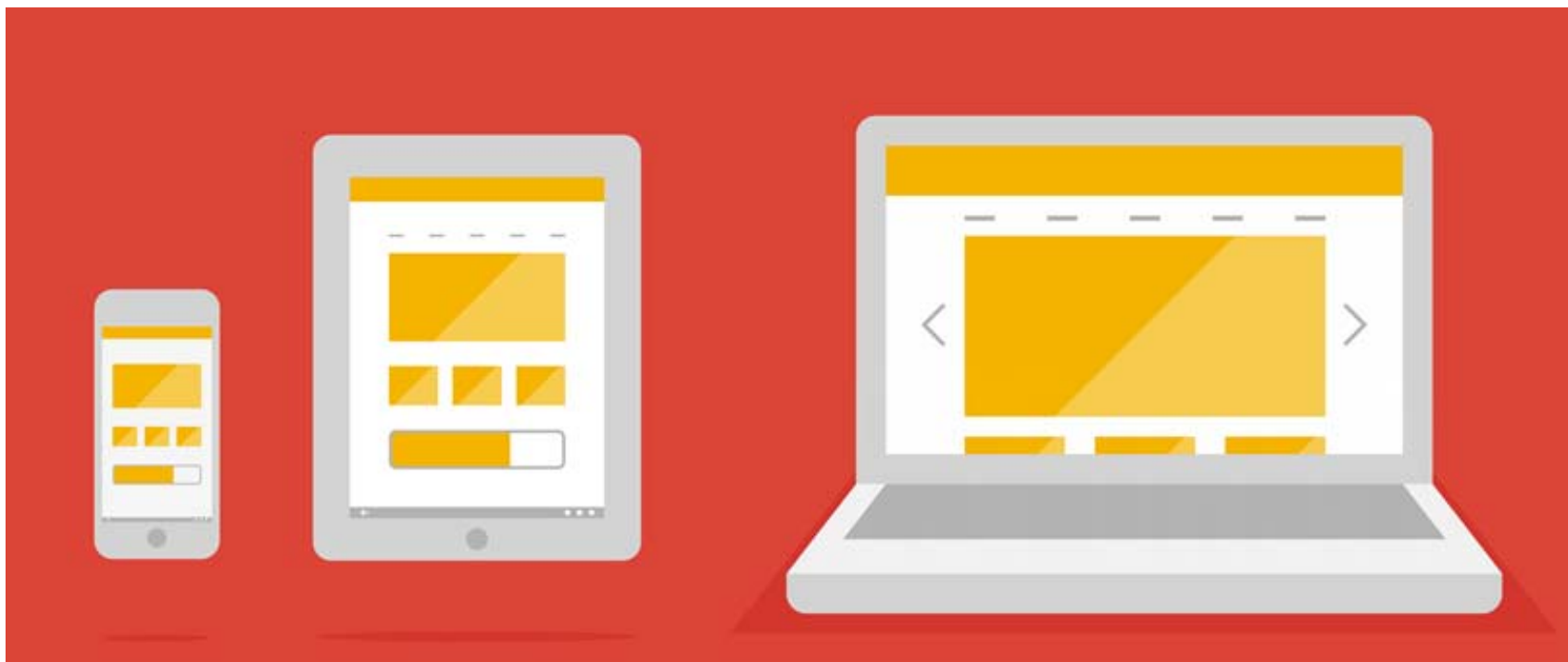
Conventional Web App

2000 - 2013



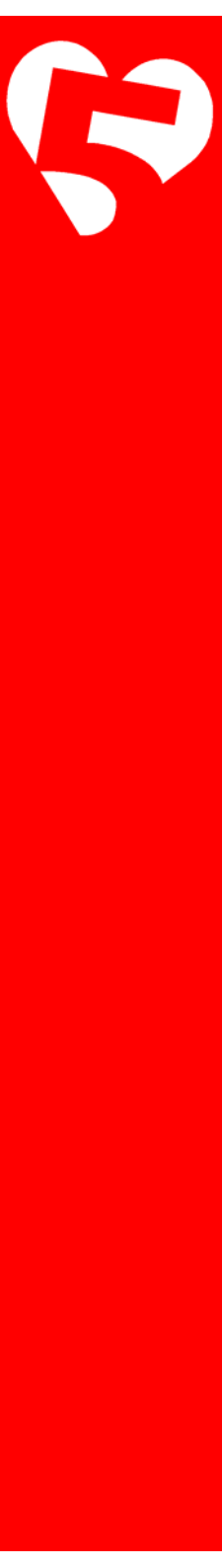


Maar: ca. 2010 -



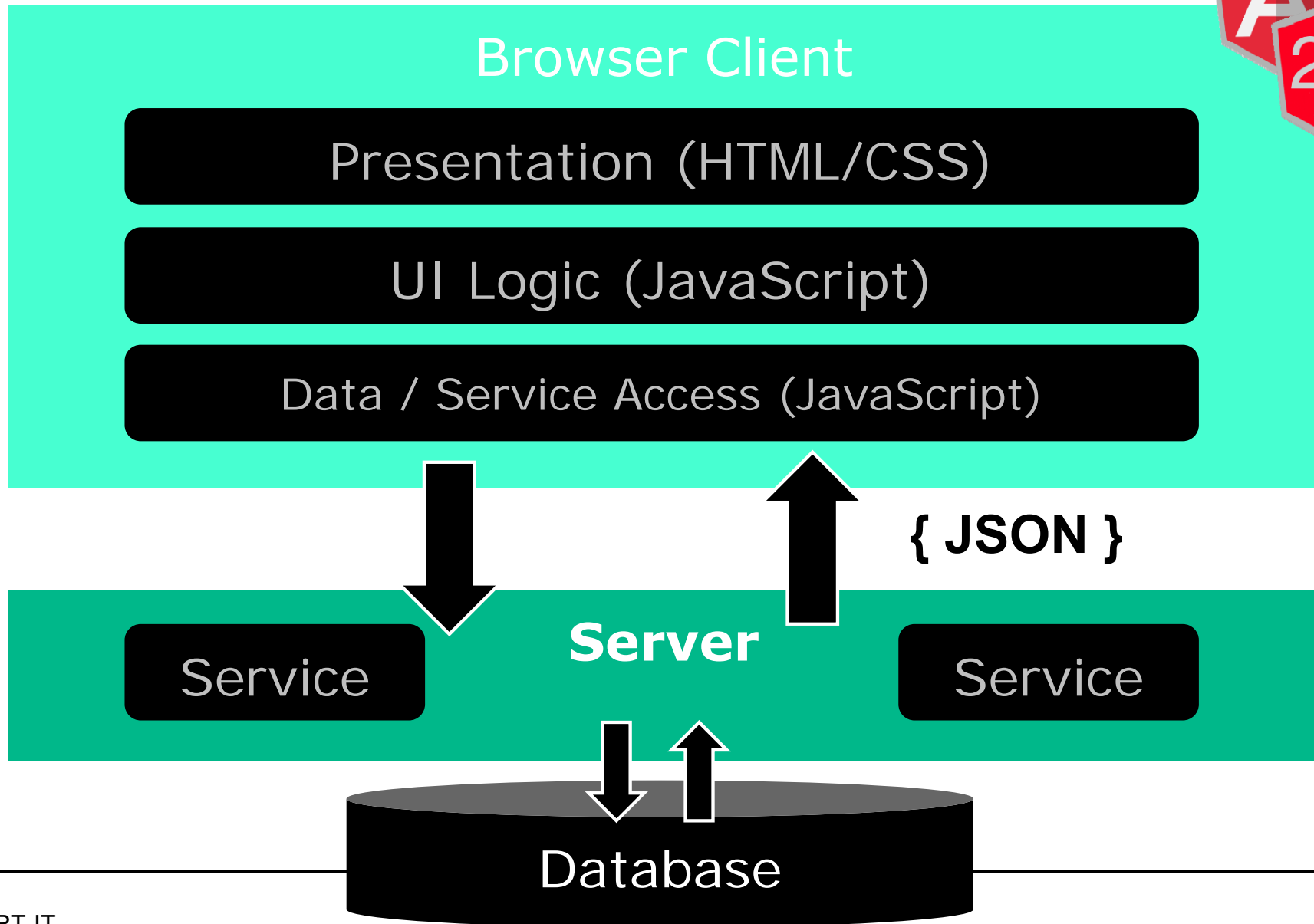
+

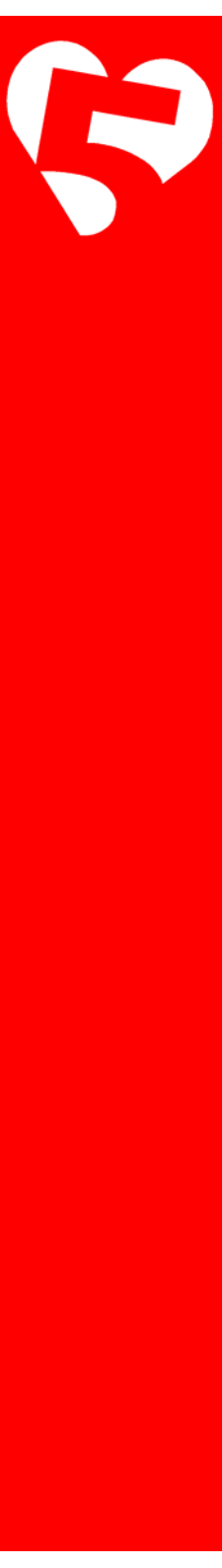
No Plugins



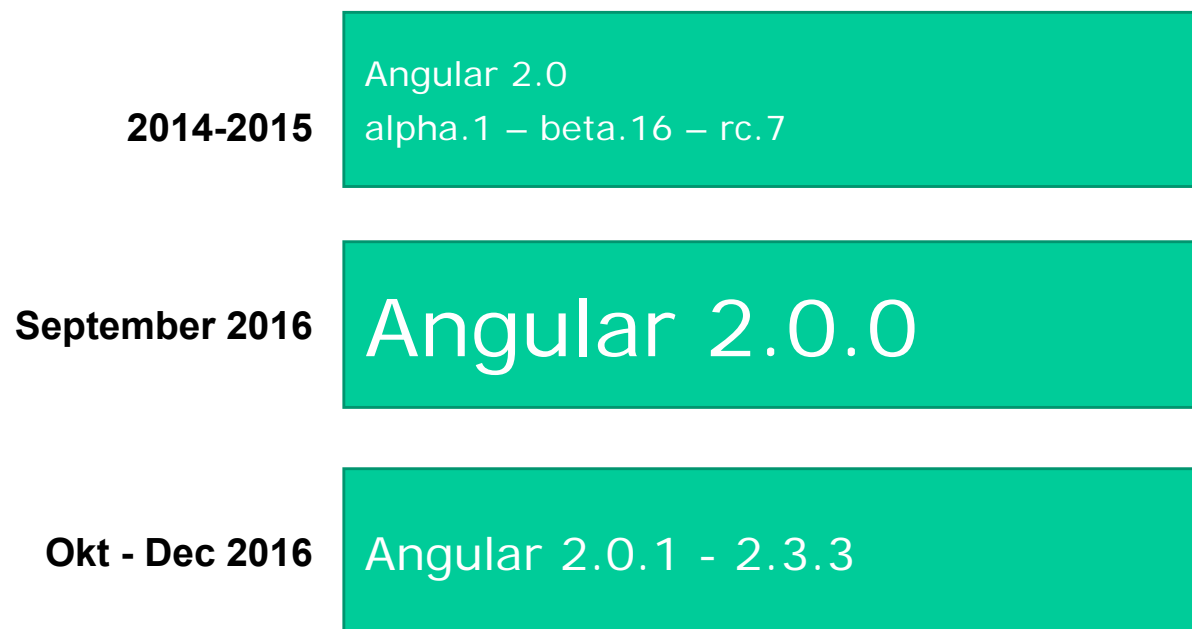
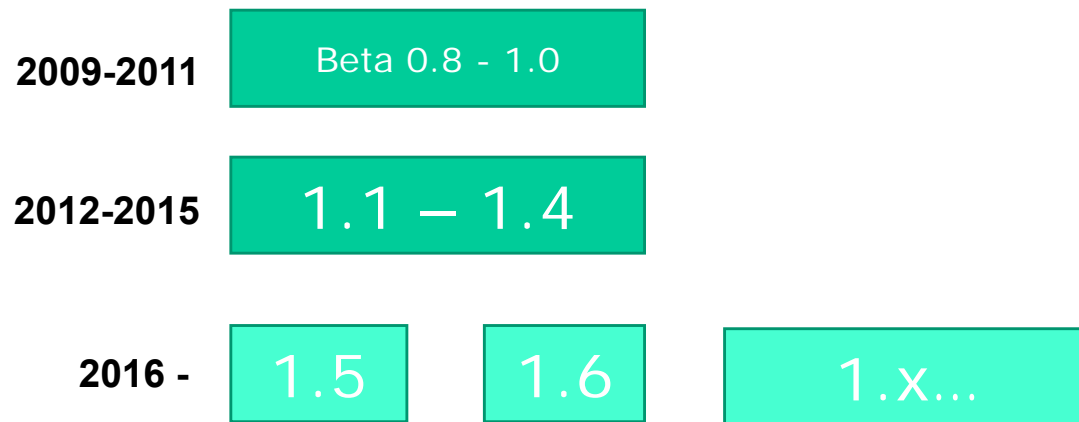
Single Page Application

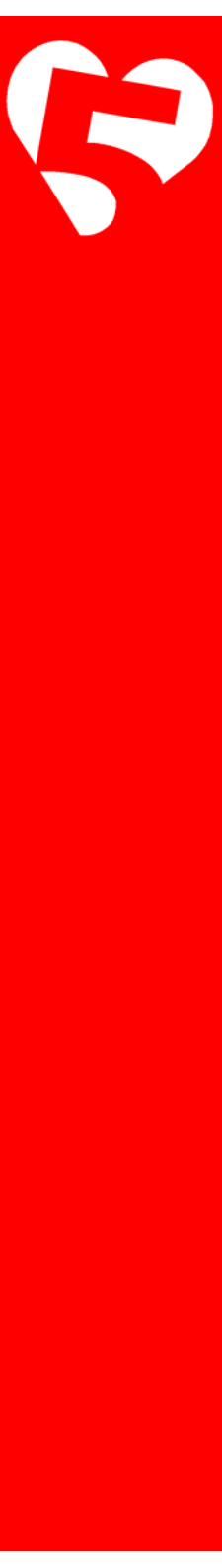
2010 – 20??





Angular - Timeline





Summary

Angular 4

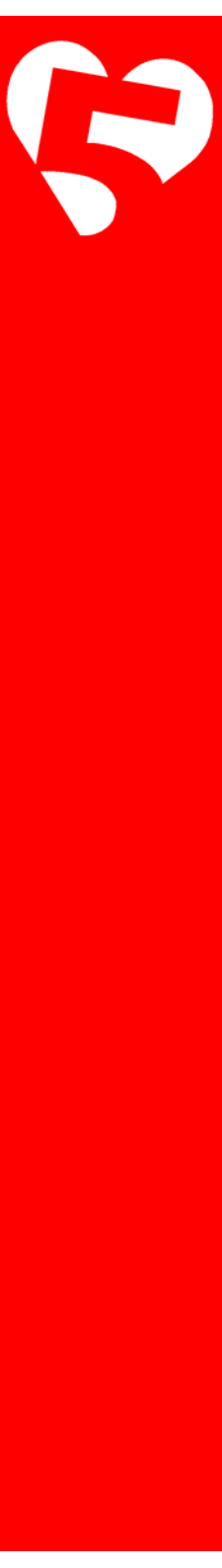
March 2017

Backwards Compatible w/ Angular 2

⏮ ⏪ ⏩ ⏭ Dia 28 ⚡ ⌛ ⚙

@IgorMinar, https://www.youtube.com/watch?v=aJIMoLgqU_o

Dec. 9, 2016



Evolving Angular

Predictable, Transparent & Incremental Evolution

Angular 5 - September / October 2017

Angular 6 - March 2018

Angular 7 - September / October 2018

(tentative schedule)



"It's just

Angular



Meer Angular kenmerken

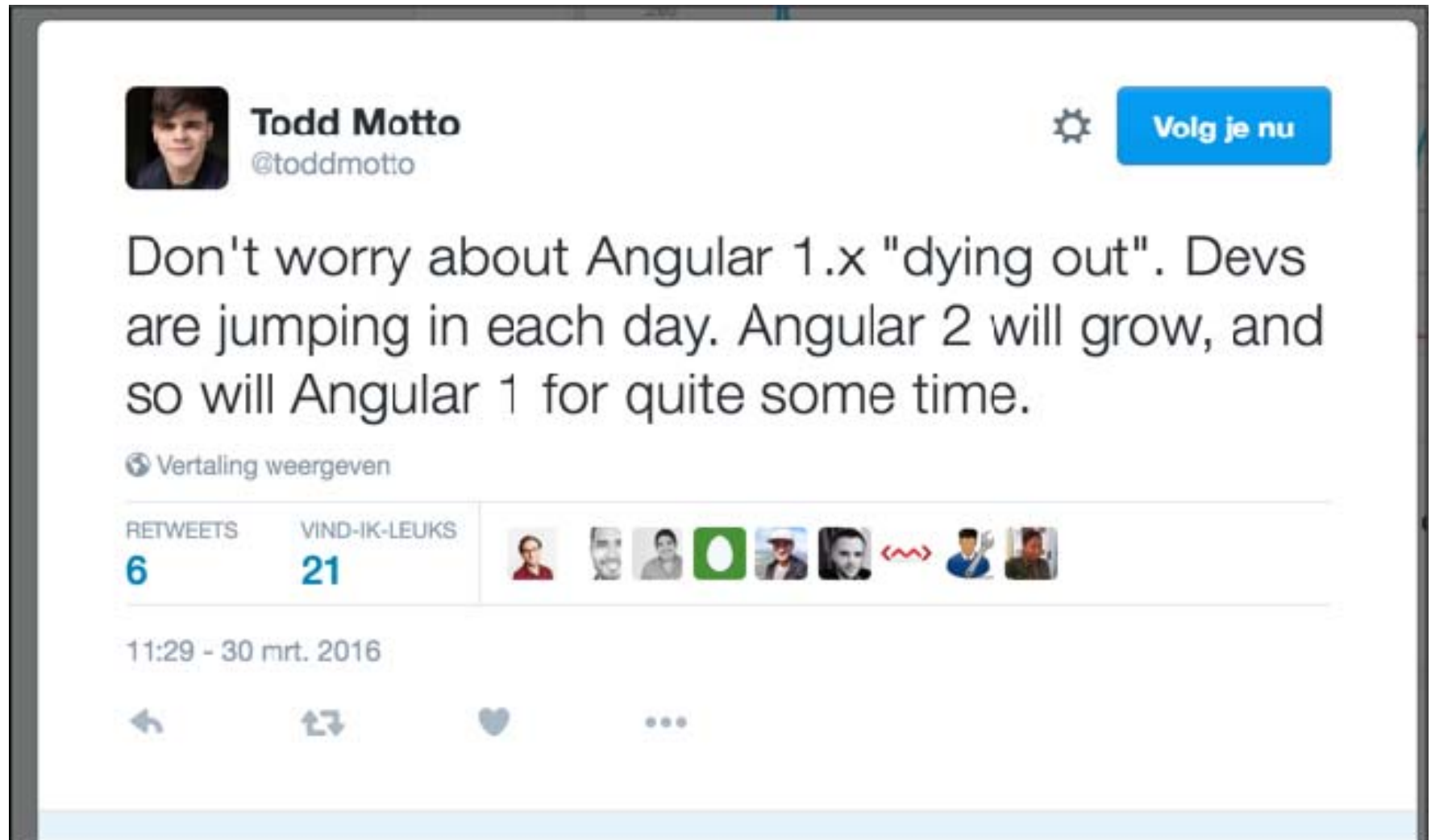
Community

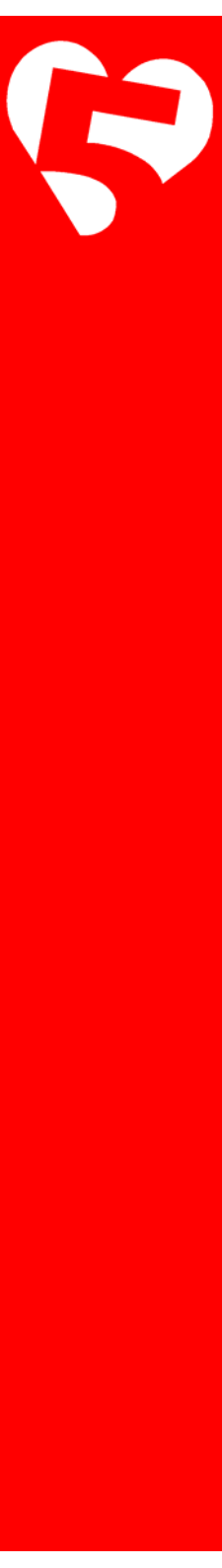
Speed

**Simplicity &
Consistency**



30 maart 2016





**Todd Motto** @toddmotto · 12 uur
Don't worry about Angular 1.x "dying out". Devs are jumping in each day. Angular 2 will grow, and so will Angular 1 for quite some time.

 10  29 

**Brad Green**
@bradlygreen

 [Volg je nu](#)

[@toddmotto](#) It's true! Both are growing. We've seen a 300K dev bump on ng2 and a 200K jump on ng1 in the past 6 months.

 Vertaling weergeven

VIND-IK-LEUKS
3



22:42 - 30 mrt. 2016



Community



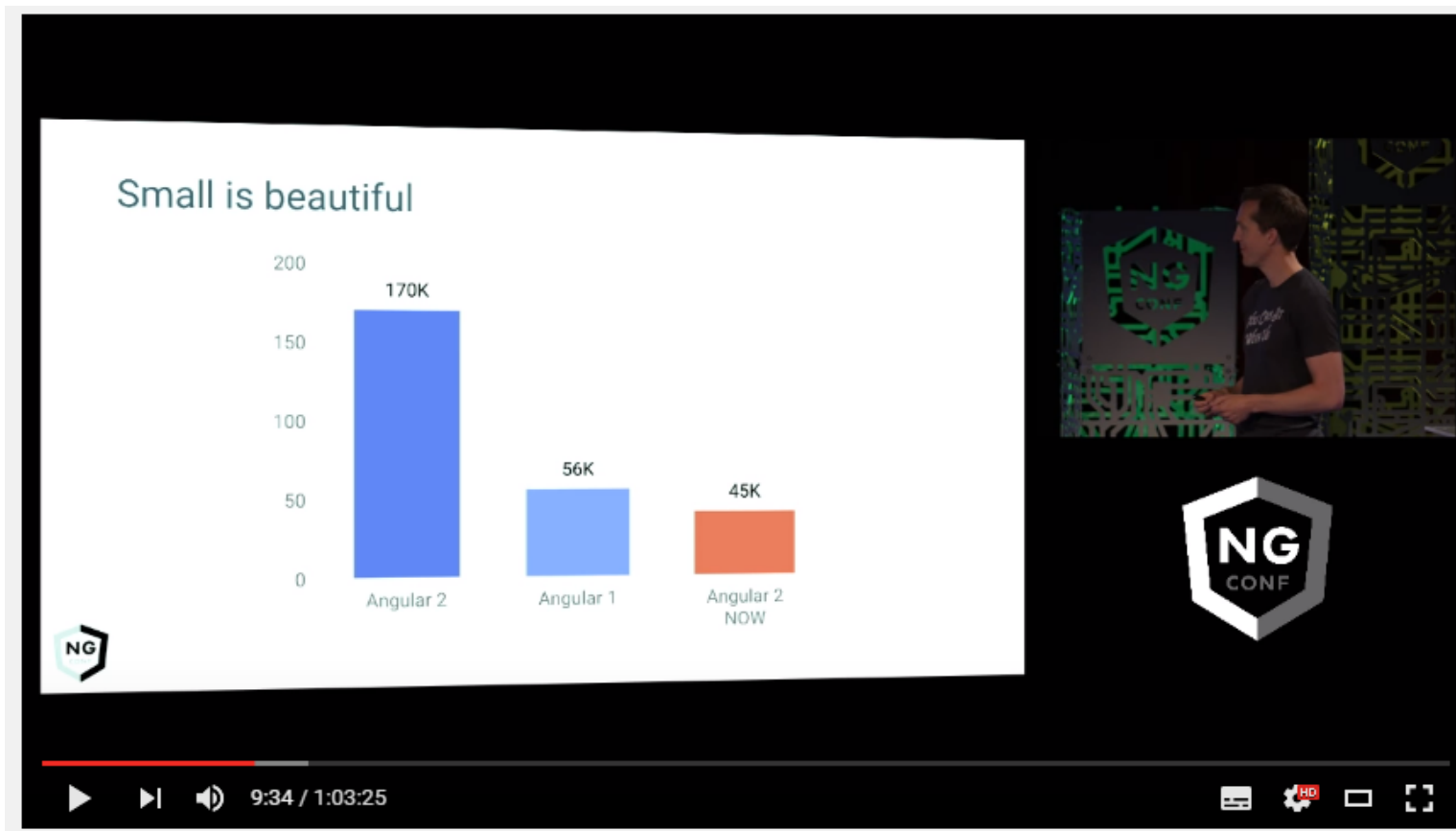
<https://www.youtube.com/watch?v=wpxnU62mNJ4>



Speed

Snelheid rendering & performance

Snelheid van laden



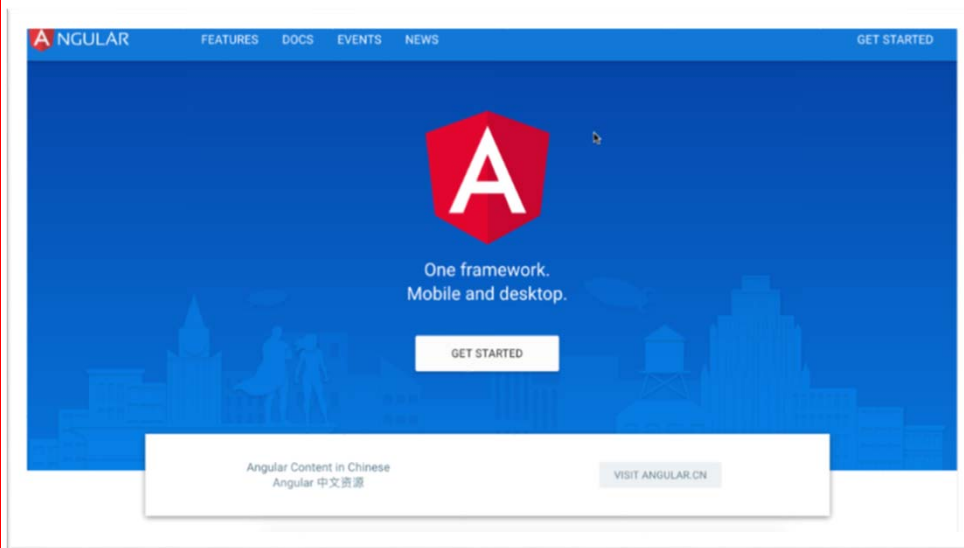


Consistency & simplicity

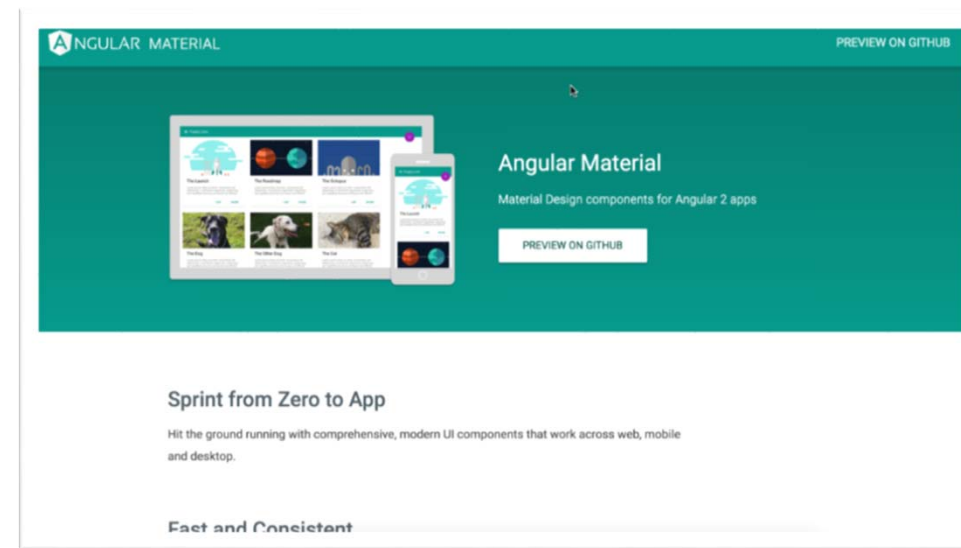
Consistente naamgeving & architectuur

Consistente data binding

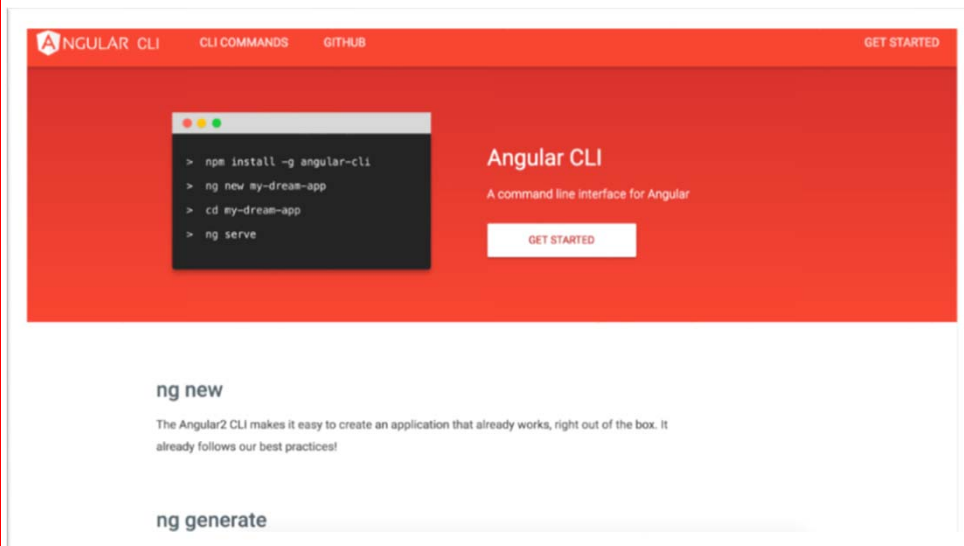




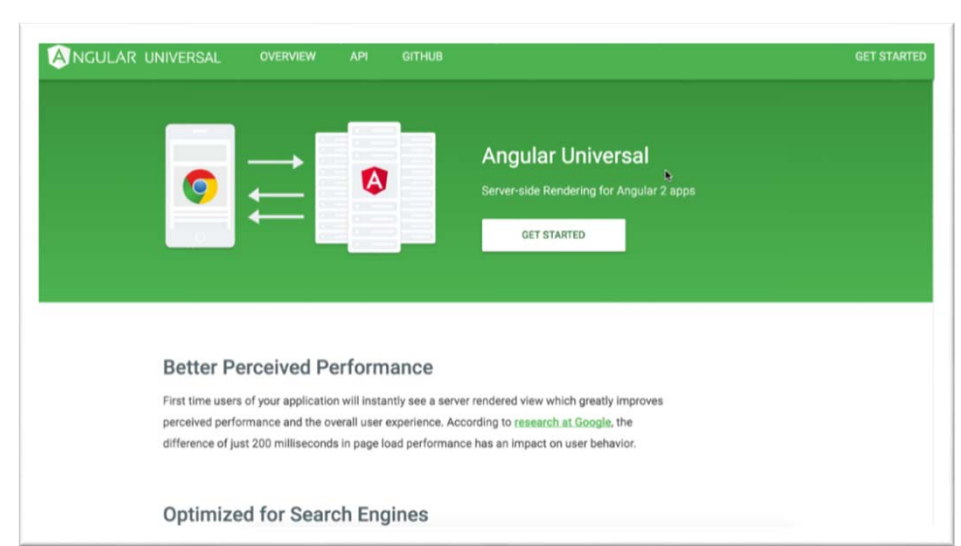
<https://angular.io/>



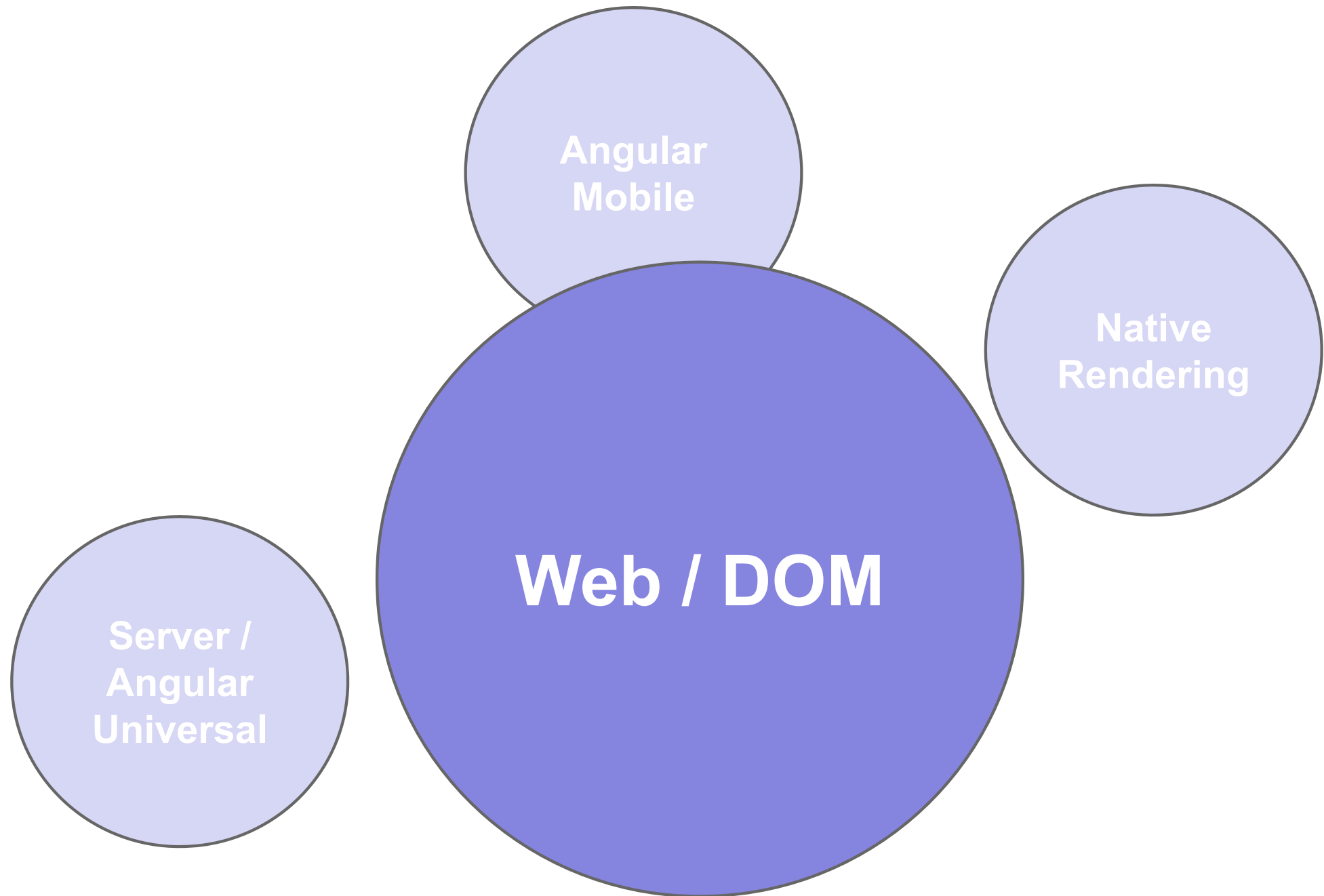
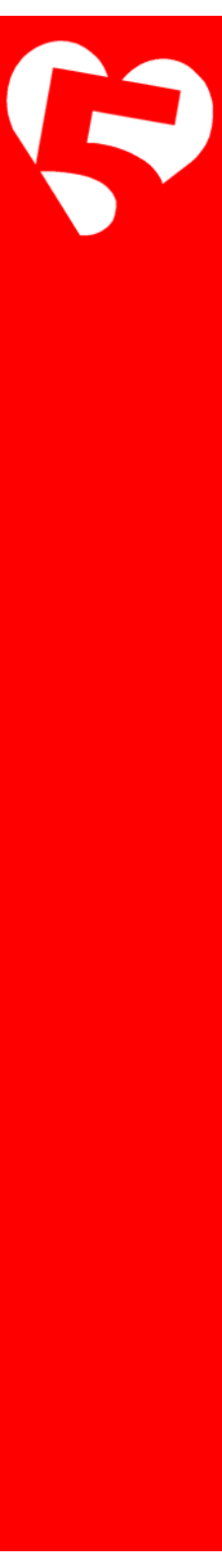
<https://material.angular.io/>



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

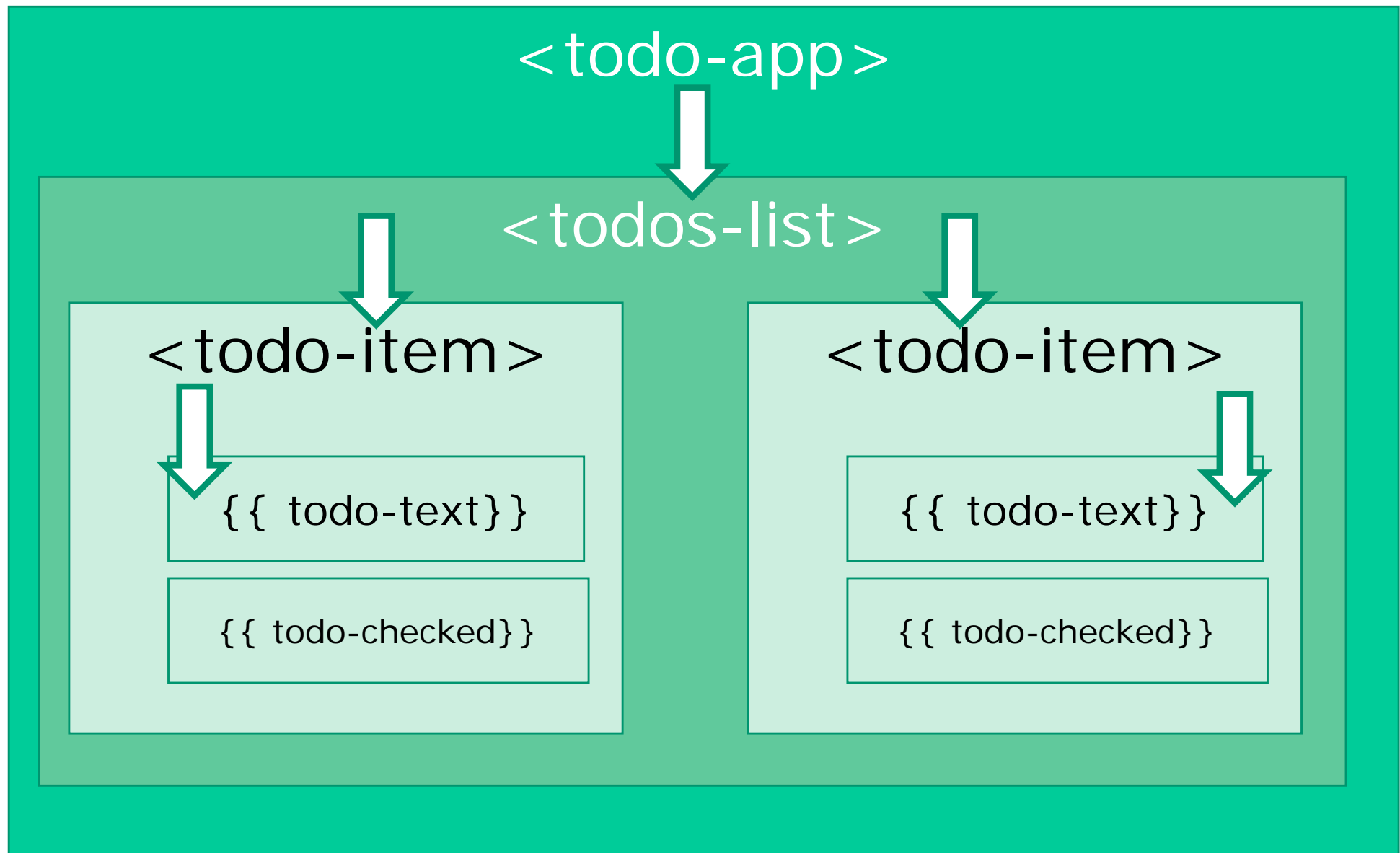


<https://universal.angular.io/>





Angular 2 - components

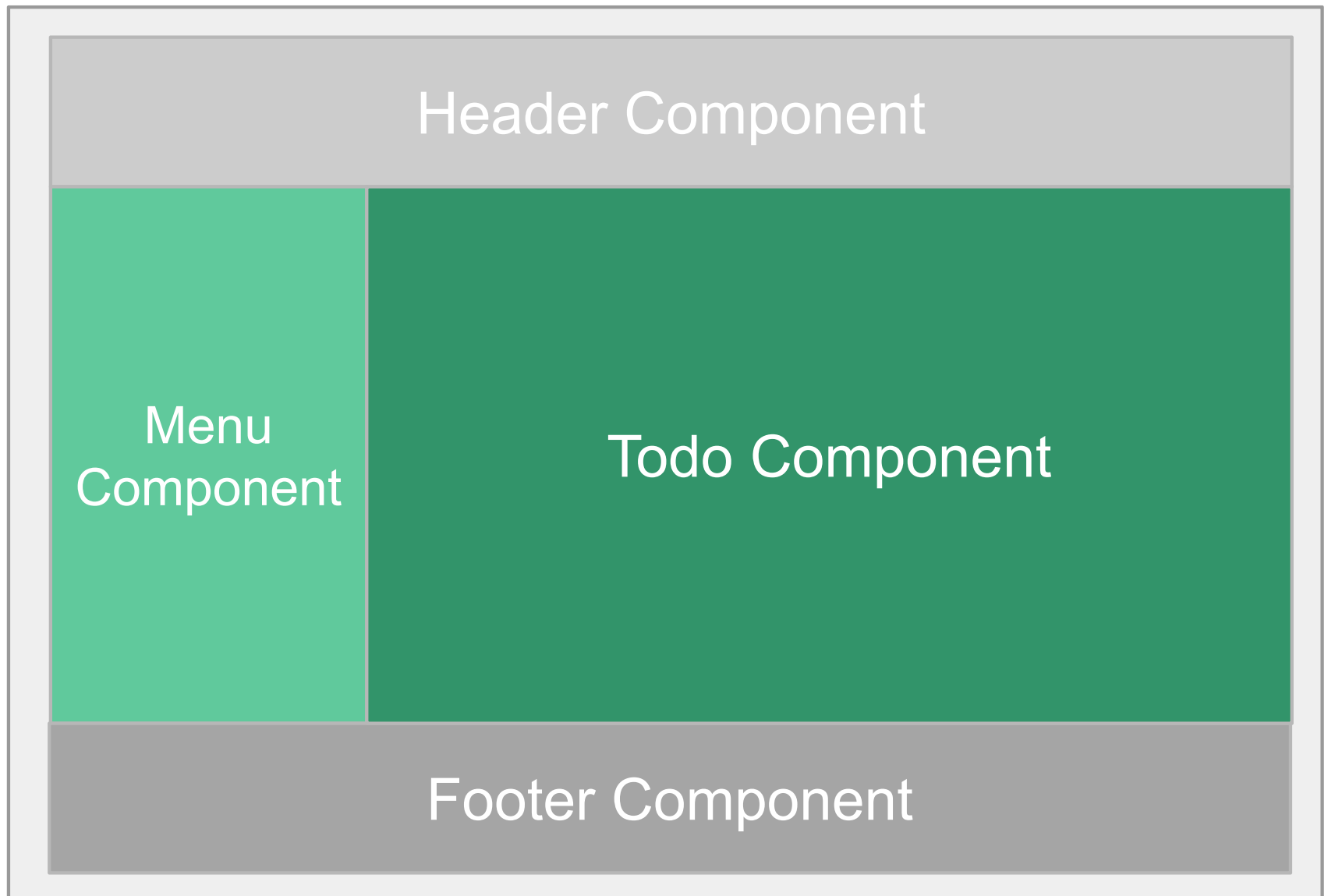




*“Een Angular 2 app is een tree
van componenten”*



Componenten – visueel

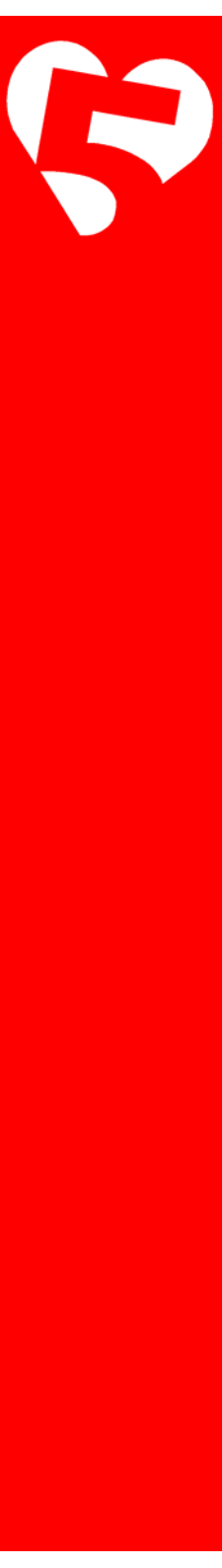




Since .rc5 – new annotation `@ngModule`

- New: an 'umbrella' component (aka *Module*), holding all the dependencies that the Injector needs
- TypeScript annotation: `@ngModule({ ... })`
- Inject other components
- Inject Services / Providers
- Bootstrap the Root component





Angular 2

Components

Data binding

Services

TypeScript

Routing

Classes

Form

Event binding

Observables

Templates

Pipes

Views

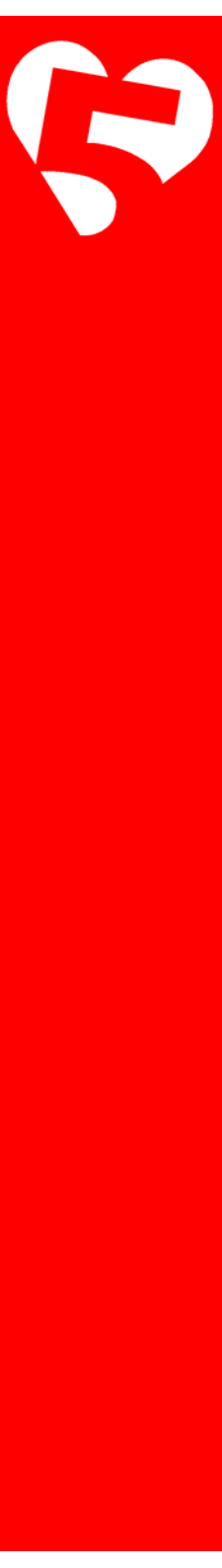
...





Let's write some code

Hello World in Angular 2

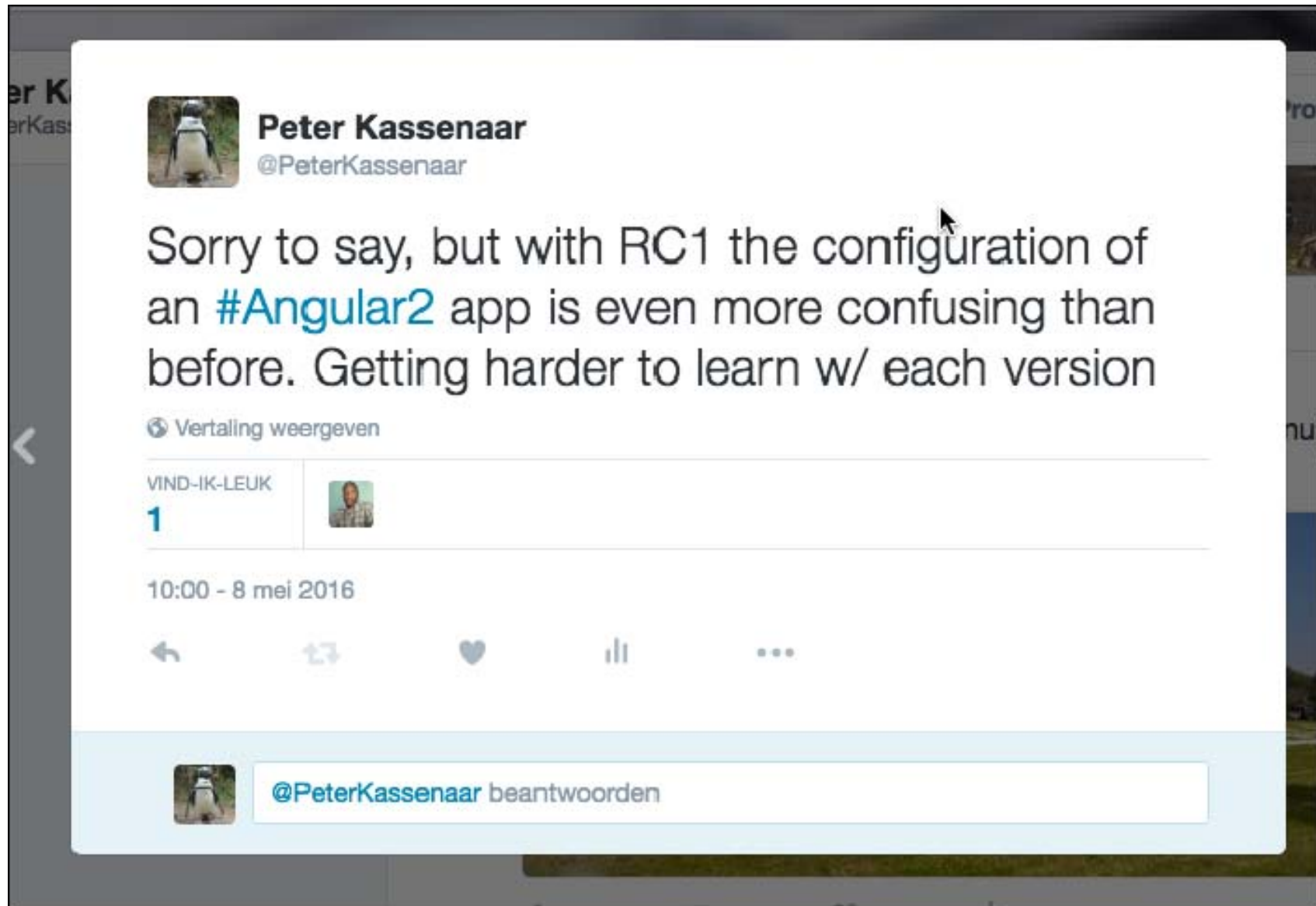
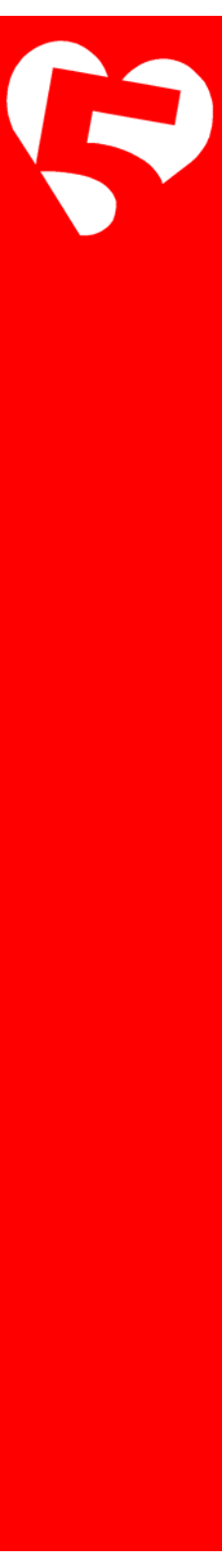


Hoofdstuk 2

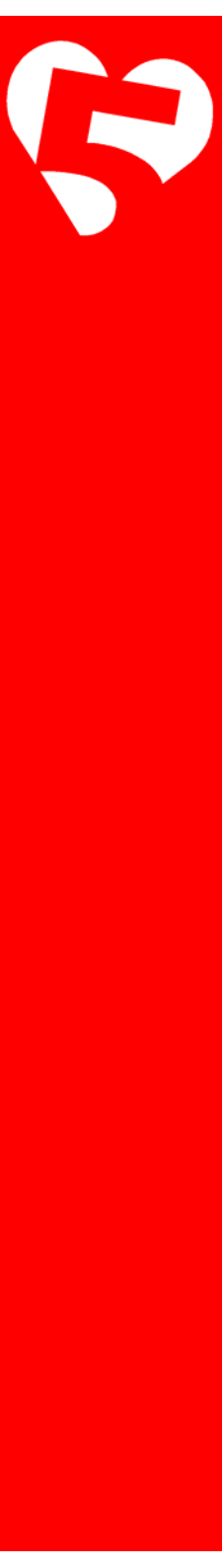


Angular 1:

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



<https://twitter.com/PeterKassenaar/status/729219441200877569>



Mike Brocchi

Brocco

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

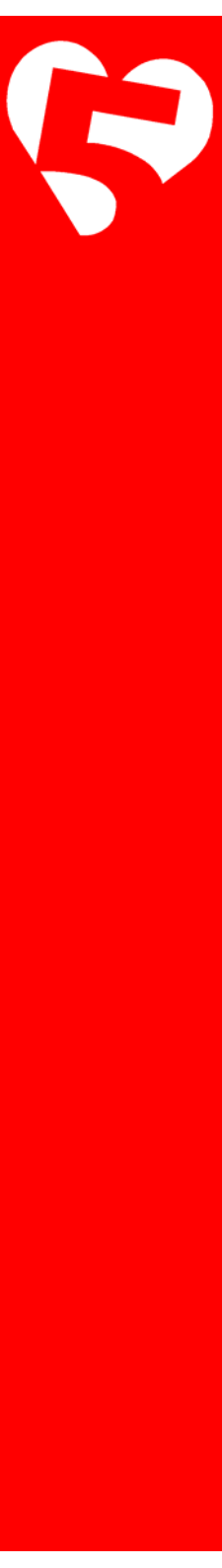
26% Environment setup

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

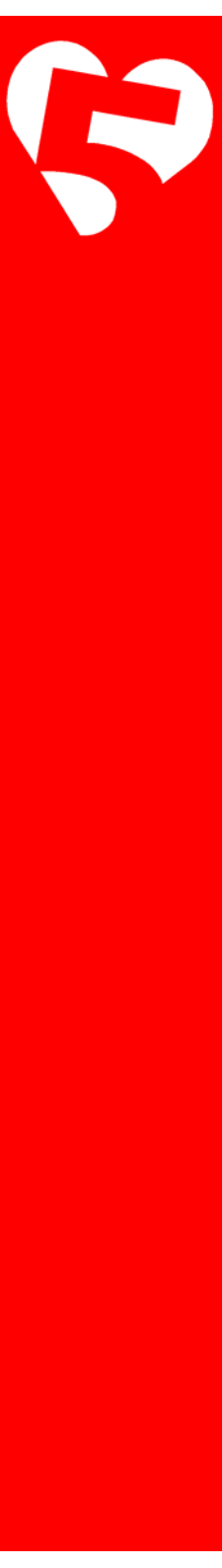


Boilerplate code en Hello World

Stappenplan

1. Set up environment, boilerplate & libraries
2. Schrijf Angular Root Component voor de app
3. (.rc5+ Write ngModule Component)
4. Bootstrap de component
5. Schrijf HTML-pagina (`index.html`)





Dependency: NodeJS 4.x+

The screenshot shows the Node.js website homepage. At the top is a dark navigation bar with the Node.js logo and links for HOME, ABOUT, DOWNLOADS, DOCS, FOUNDATION, GET INVOLVED, SECURITY, and NEWS. Below the navigation bar, the main content area has a white background. It starts with a paragraph describing Node.js as a JavaScript runtime built on Chrome's V8 JavaScript engine, highlighting its event-driven, non-blocking I/O model and the npm package ecosystem. A light green banner below this text announces 'Important security upgrades for recent V8 vulnerability'. Underneath, the heading 'Download for OS X (x64)' is centered. Two green buttons are displayed: 'v4.5.0 LTS' with the subtext 'Recommended For Most Users', and 'v6.5.0 Current' with the subtext 'Latest Features'. Below these buttons are links for 'Other Downloads', 'Changelog', and 'API Docs' for both versions. At the bottom of the main content area, a link says 'Or have a look at the LTS schedule.' The footer of the website features a dark, stylized image of a city skyline.

node

HOME | ABOUT | DOWNLOADS | DOCS | FOUNDATION | GET INVOLVED | SECURITY | NEWS

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.

Important [security upgrades](#) for recent V8 vulnerability

Download for OS X (x64)

v4.5.0 LTS
Recommended For Most Users

v6.5.0 Current
Latest Features

[Other Downloads](#) | [Changelog](#) | [API Docs](#) [Other Downloads](#) | [Changelog](#) | [API Docs](#)

Or have a look at the [LTS schedule](#).



Stap 1 – environment en boilerplate code

Globale volgorde “Angular 2 quickstart”, op

<https://angular.io/docs/ts/latest/quickstart.html#>

1. Directory maken, `package.json` etc. toevoegen en dependencies installeren.

```
mkdir Angular2-demo
```

```
cd      Angular2-demo
```




Maak tsconfig.json

Instructies voor configuratie TypeScript compiler

```
{
  "compilerOptions": {
    "target"                : "es5",
    "module"                : "system",
    "moduleResolution"      : "node",
    "sourceMap"             : true,
    "emitDecoratorMetadata" : true,
    "experimentalDecorators": true,
    "removeComments"        : false,
    "noImplicitAny"         : false
  },
  "exclude"                : [
    "node_modules",
    "typings/main",
    "typings/main.d.ts"
  ]
}
```



Maak typings.json

- Instructies TypeScript Definition files
- Help de TypeScript compiler andere libraries te begrijpen

```
{  
  "ambientDependencies": {  
    "es6-shim": "registry:dt/es6-shim#0.31.2+20160317120654",  
    "jasmine" : "registry:dt/jasmine#2.2.0+20160412134438"  
  }  
}
```



Maak package.json

```
{
  "name"          : "ng2-base",
  "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"      : "2.0.0",
    "@angular/core"         : "2.0.0",
    ...
    "systemjs"              : "0.19.27",
    "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>"
}
```



Maak systemjs.config.js

```
(function(global) {  
  
    // map tells the System loader where to look for things  
    var map = {  
        'app':                'app', // 'dist',  
        'rxjs':               'node_modules/rxjs',  
        'angular2-in-memory-web-api': 'node_modules/angular2-in-memory-web-api',  
        '@angular':           'node_modules/@angular'  
    };  
  
    ...  
    var packageNames = [  
        '@angular/common',  
        '@angular/compiler',  
        '@angular/core',  
        '...',  
    ];  
  
    // add package entries for angular packages in the form '@angular/common': { main: 'index.js', defaultExtension: 'js' }  
    packageNames.forEach(function(pkgName) {  
        packages[pkgName] = { main: 'index.js', defaultExtension: 'js' };  
    });  
  
    var config = {  
        map: map,  
        packages: packages  
    };  
  
    ...  
    System.config(config);  
  
})(this);
```



Installeer dependencies

```
npm install
```

- Angular, TypeScript, SystemJS en andere dependencies worden geïnstalleerd.



Step 2a – NgModule component (.rc5+)

```
app/app.module.ts

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

@NgModule({
  imports:      [ BrowserModule ]
})
export class AppModule { }
```

This is the entry point of the application



Stap 2b – Component maken

Conventie - componenten in directory \app

Maak bestand: app/app.component.ts

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



Edit Module Component

```
app/app.module.ts

1. import { NgModule }      from '@angular/core';
2. import { BrowserModule } from '@angular/platform-browser';
3.
4. import { AppComponent }   from './app.component';
5.
6. @NgModule({
7.   imports:      [ BrowserModule ],
8.   declarations: [ AppComponent ],
9.   bootstrap:    [ AppComponent ]
10. })
11.
12. export class AppModule { }
```

Two blue arrows are present. One points from the right towards the import statement on line 4: `import { AppComponent } from './app.component';`. The other points from the right towards the declarations array on line 8: `declarations: [AppComponent],`.



Some background info on Root Module

The screenshot shows a blog post titled "Introducing Angular Modules - Root Module" by John Papa, dated 05 SEPTEMBER 2016. The post is from the website "Angular Modules". The header includes navigation links: HOME, SPEAKING, VIDEOS, ARTICLES, ABOUT, and CONTACT. Social media icons for Twitter, G+, LinkedIn, and RSS are also present. The main content area features the title "Introducing Angular Modules - Root Module" and a sub-header "Root Module". Below the title are social sharing icons for Twitter, Facebook, G+, LinkedIn, and Reddit. The date "05 SEPTEMBER 2016" is displayed. The text of the post begins with "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.'". The right sidebar includes the author's name "John", a bio, and a "Most Recent" section with links to "Introducing Angular Modules - Root Module", "Learning Angular 2 this Fall", and "The Ultimate Angular 2 Workshop in Ft".

HOME SPEAKING VIDEOS ARTICLES ABOUT CONTACT

Twitter G+ LinkedIn RSS

Angular Modules

Introducing Angular Modules - Root Module

Twitter Facebook G+ LinkedIn Reddit

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/>



Stap 3 - bootstrap component

Best practice: bootstrap de app in aparte component

Conventie: `main.ts`, of `app.main.ts`.

Inhoud is (voorlopig) simpel:

```
// import dependencies (don't forget to import your component!)  
import {bootstrap} from '@angular/platform-browser-dynamic';  
import {AppComponent} from './app.component';  
  
// bootstrap our app  
bootstrap(AppComponent);
```



Stap 4 – index.html

Voeg index.html toe met scriptreferenties en configuratie van module loader

| `<head>`

```
<title>Angular 2 Base Project</title>
```

```
<!-- 1. Load Libraries -->
```

```
<!-- Polyfill(s) for older browsers -->
```

```
<script src="node_modules/es6-shim/es6-shim.min.js"></script>
```

```
<script src="node_modules/zone.js/dist/zone.js"></script>
```

```
<script src="node_modules/reflect-metadata/Reflect.js"></script>
```

```
<script src="node_modules/systemjs/dist/system.src.js"></script>
```

...



SystemJS configureren

Module loader – configureren, ook in header

...

```
<!-- 2. Configure SystemJS -->
```

```
<script src="systemjs.config.js"></script>
```

```
<script>
```

```
    System.import('app').catch(function(err){ console.error(err); });
```

```
</script>
```

```
<!-- 3. Add some styling -->
```

```
<link rel="stylesheet" href="node_modules/bootstrap/dist/css/bootstrap.min.css">
```

```
</head>
```



Body van index.html

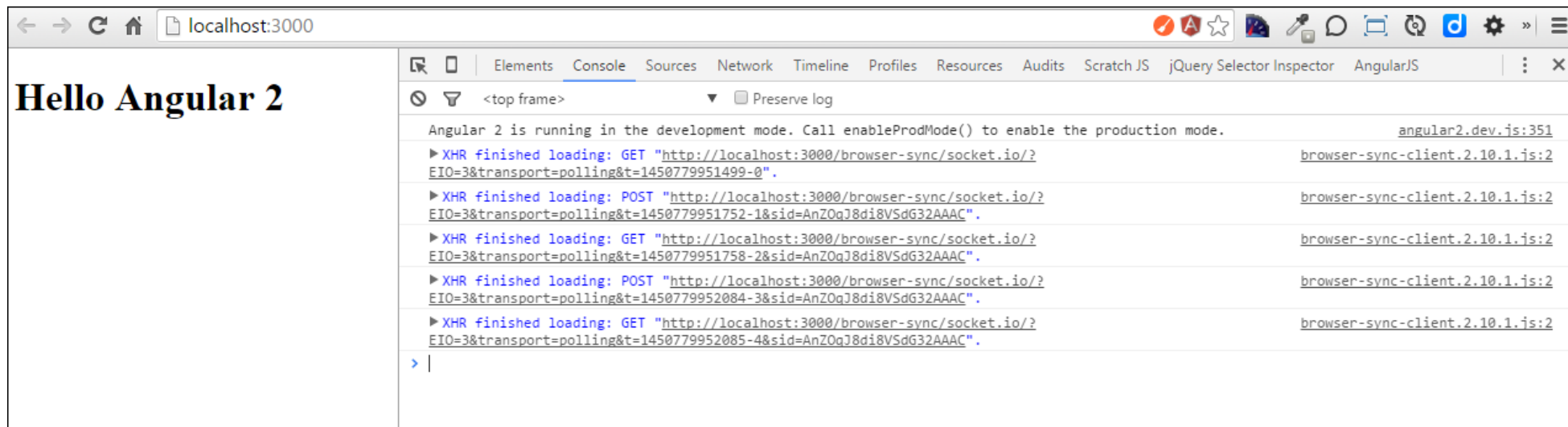
Verwijzing naar de root-component:

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



App draaien

`npm start` – draait de script opdracht start uit `package.json`.

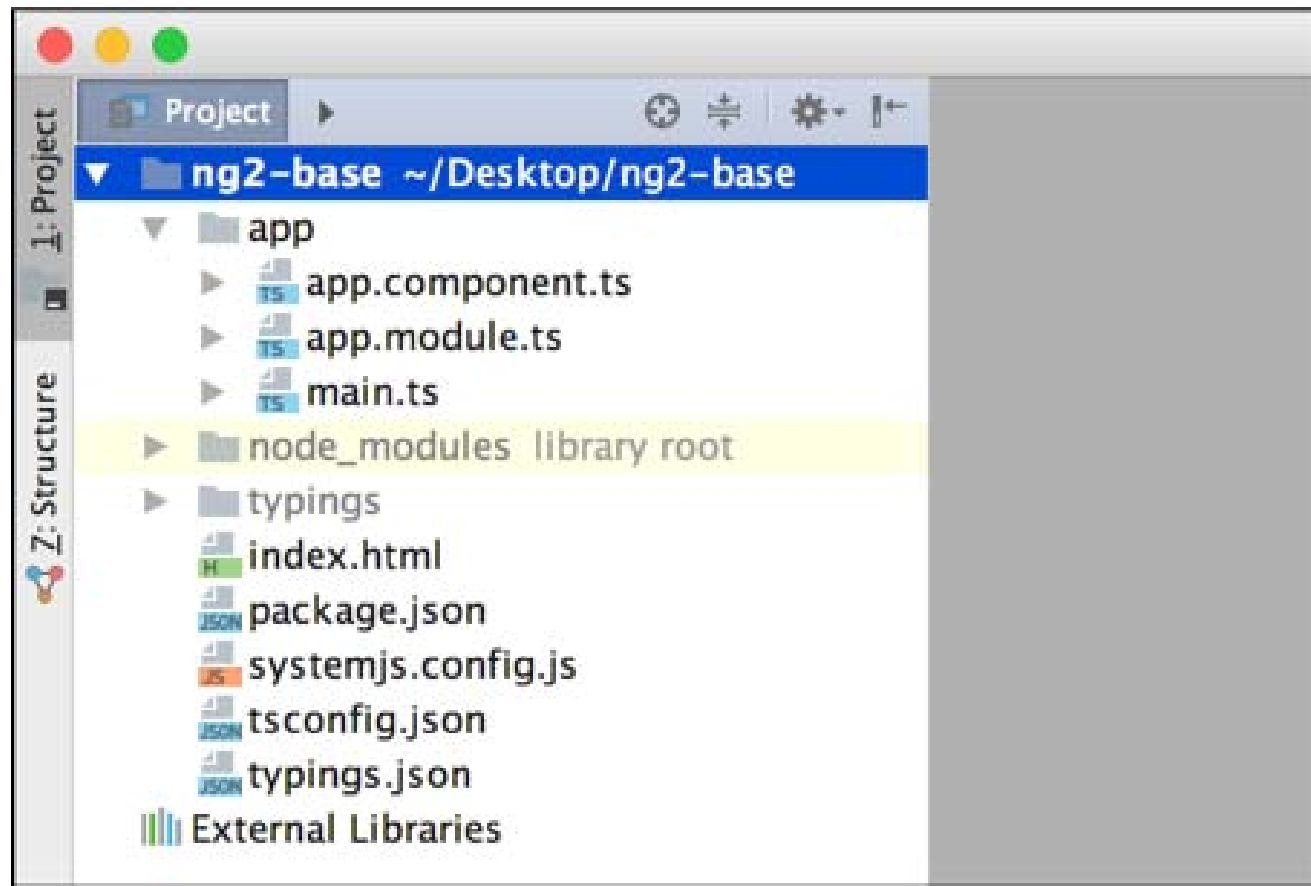


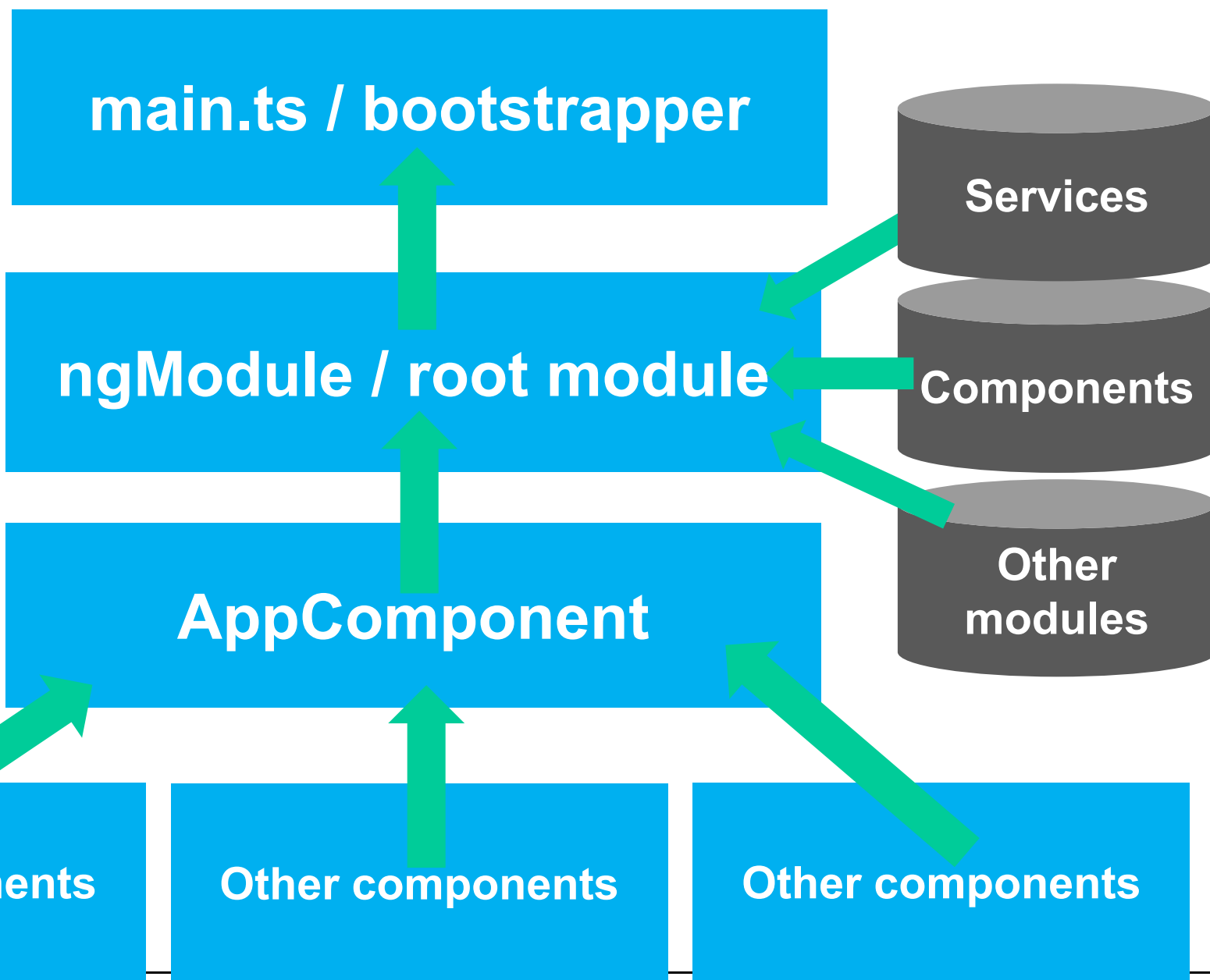
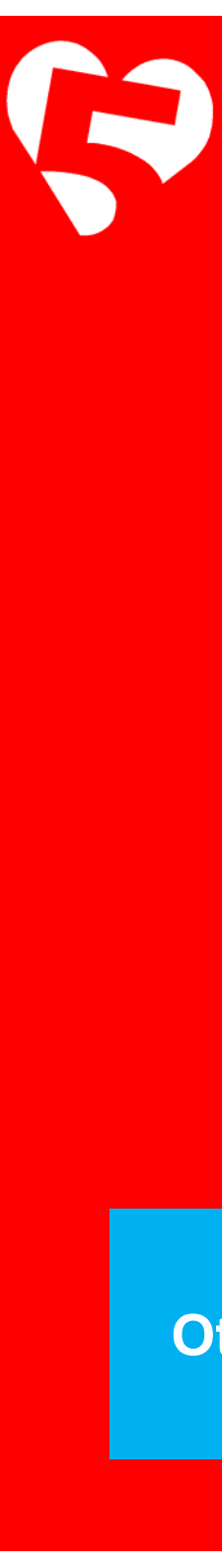
Daarna: wijzigingen aanbrengen in `app.component.ts`

– worden opgepikt door Live Reload



Structuur



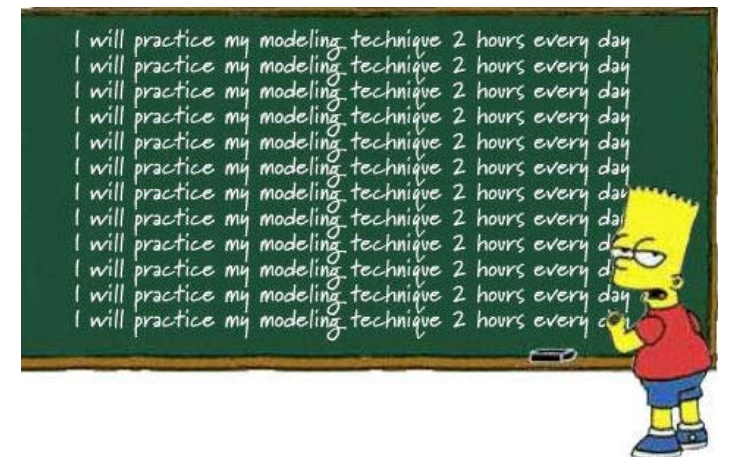




Checkpoint

- 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

<https://github.com/PeterKassenaar/ng2-base>

Voorbeeldproject, inclusief typings, package.json, enzovoort

<https://github.com/PeterKassenaar/voorbeeldenAngular2>

Oefeningen en meer voorbeeldcode



Angular CLI

Snel nieuwe projecten instellen via de command line



Scaffolding - Angular CLI

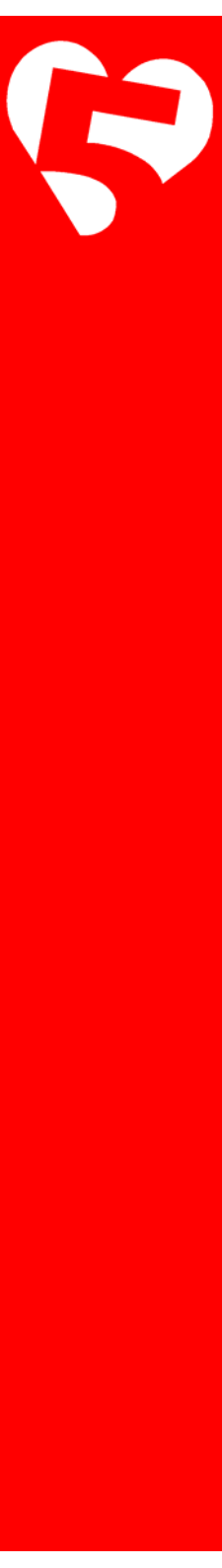
Nog niet gereed – al wel ver op weg

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

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

en

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



typings.json

chore(): add typings files to assist devs

4 months ago

README.md

Angular-CLI

chat on github

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.

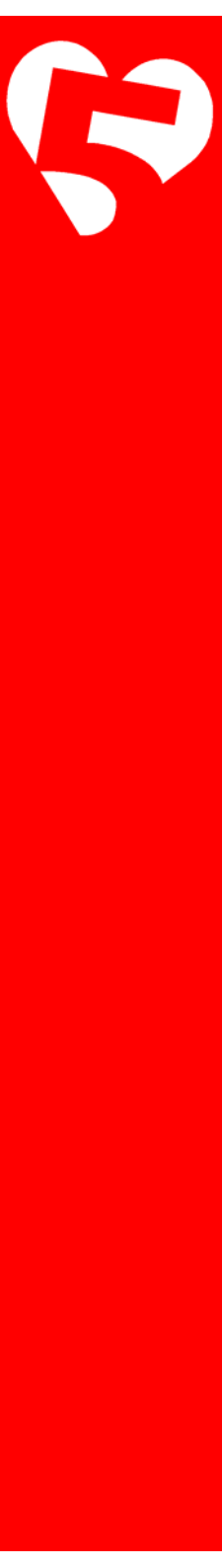
Prerequisites


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 autocompletion
- CSS preprocessor integration
- 3rd Party Library Installation

```
npm install -g angular-cli
```

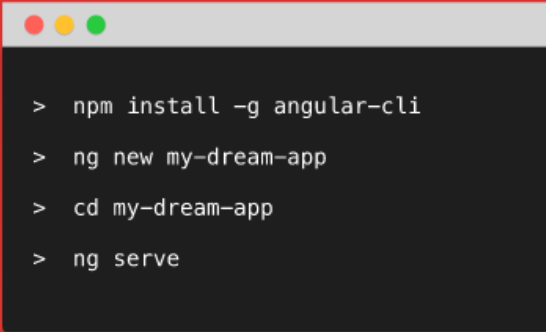


 **ANGULAR CLI**

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

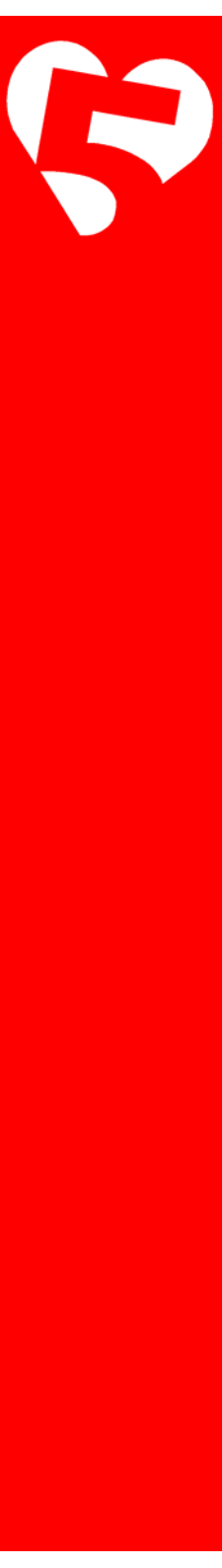
[GET STARTED](#)

ng new

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



CLI can...

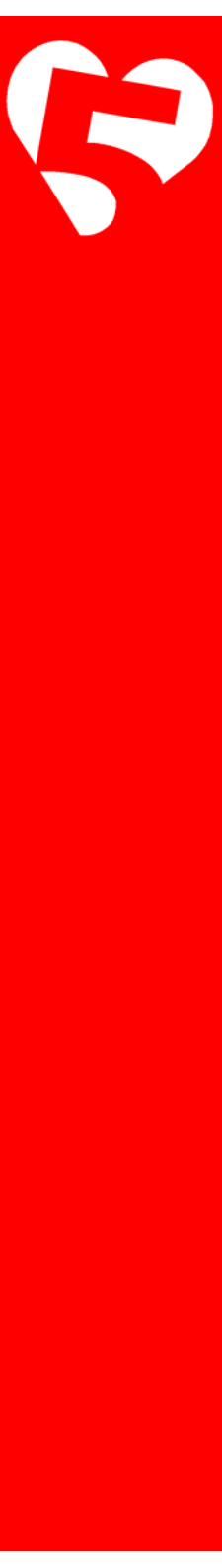
```
> ng generate component my-comp
```




4:50 / 23:39

Learn Clingon - Mike Brocchi

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





scotch.io
code on the rocks

LEARN

- Tutorials
- Bar Talk
- Community

Scotch School

OUR STUFF










- About
- Shop
- Join Us On Slack
- Hire Us

Search Scotch for Cool Stuff

Login / Sign Up Write a Post More

Advertise Here

Popular Scotchers

-  Chris Sevilleja
-  Nicholas Cerminara
-  Holly Lloyd
-  Ado Kukic
-  Ryan Chenkie
-  Ken Wheeler
-  Alex Sears
-  Chris Nwamba
-  Become a Scotcher!

Use the Angular CLI for Faster Projects

angular2 angularJS javascript

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>



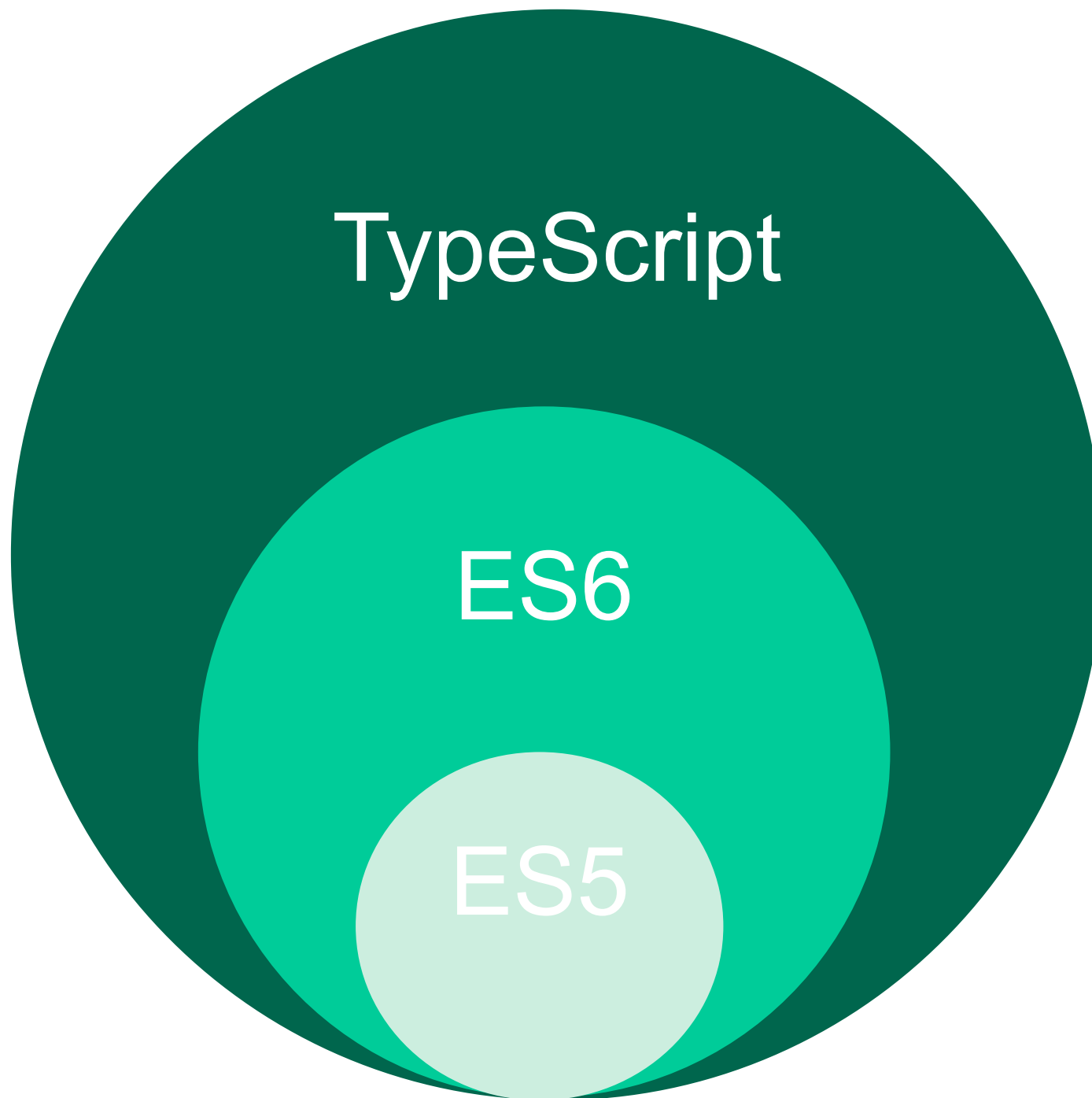
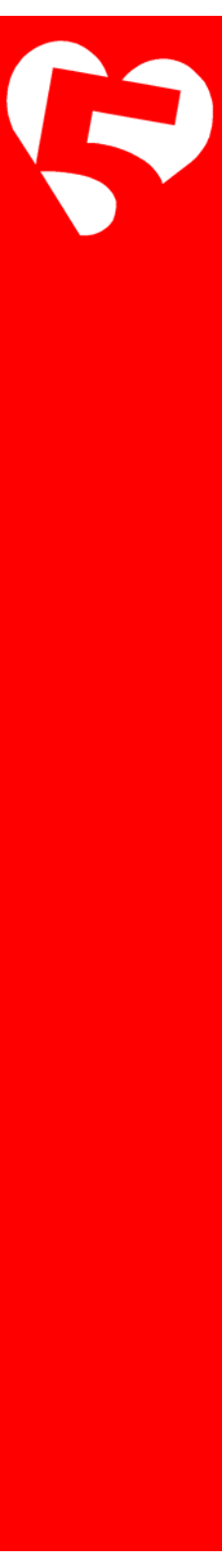
Angular 2 Code - Backend

Kort over TypeScript en ES6



Programmeertalen







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.

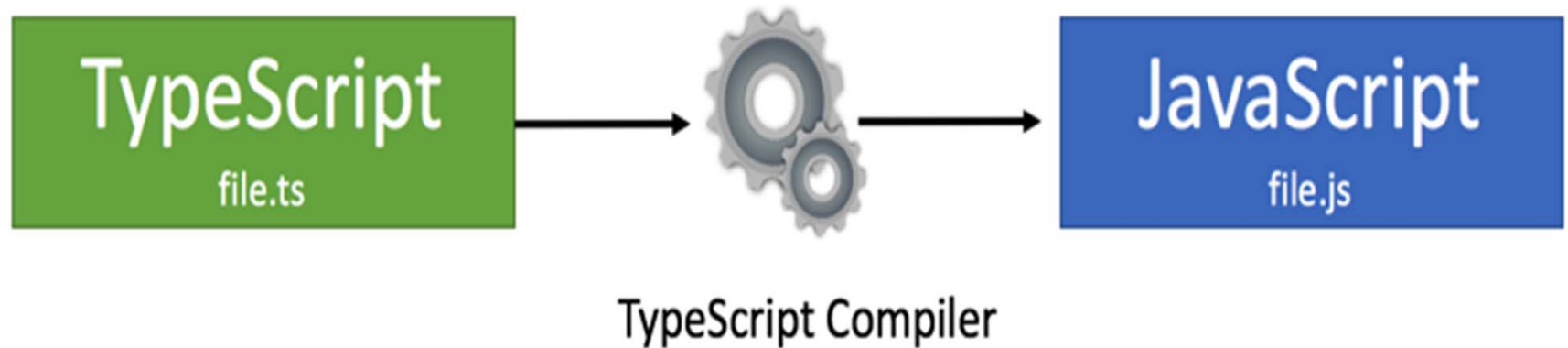
Alles is optioneel. Je kunt altijd nog gewoon JavaScript gebruiken.



TypeScript Compilation

Zowel TypeScript als ES 6: compilatie nodig,

Huidige generatie browsers begrijpt ES6 en TypeScript niet.





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. Module-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