GETTING STARTED

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Objectives

- Angular History
- Getting Started with Angular
- Identify Angular dependencies
- Develop basic Angular component
- Use @angular/cli

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Industry Trends

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Angular

- Now at version 6
- AngularJS is based on concepts rooted at 2009
- Angular aims to “upgrade” AngularJS with new 2016/2017 concepts
- Not backward compatible
- Does support side by side execution with AngularJS

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New Concepts

- Component based architecture
- Unidirectional data flow
- Server side rendering
- Running inside web workers
- Native development
- Pre compilation of views
- Observables
- Hierarchical Dependency Injection

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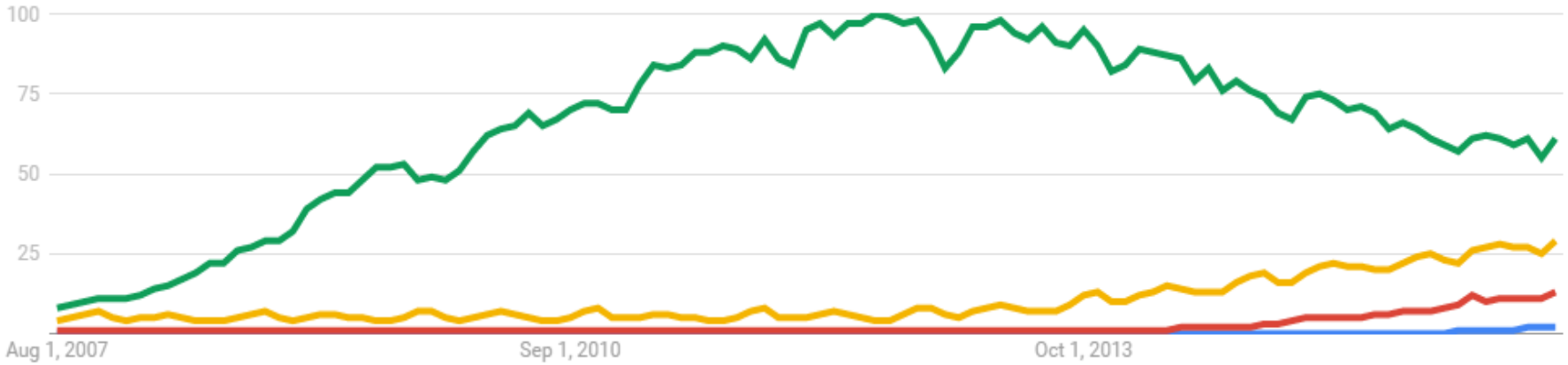
Angular vs. Others



- jQuery
- Angular
- React
- Angular2

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Getting Started

- The easiest way is to use @angular/cli
  - Module
  - Component
  - Bootstrapping
  - Polyfills
  - Typescript
  - Webpack

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@angular/cli

- Even when using Webpack, implementing build scripts is considered a complex task
- So the Angular team created an abstraction layer on top of Webpack
  - So now you need to learn both …
- Starting with @angular/cli is easy
- At the long term you understand that customization capabilities resides inside Webpack and not inside angular/cli

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@angular/cli

- Very opinionated
- A complete technology stack
- Strict directory structure
- Supports unit testing + E2E
- Development server
- Production build
- Scaffolding

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@angular/cli Getting Started

- Install CLI tool globally
  - npm install -g @angular/cli
  - yarn global add @angular/cli
- Verify installation: ng –v
- Create new project

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Create new project

- ng new my-project
- A new directory is created with all source files
  - package.json
  - tsconfig.json
  - angular.json
  - e2e – End to end testing
  - src/app – Component & Services
  - src/assets – Runtime assets
  - More ...

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Angular Dependencies

- @angular/platform-browser-dynamic
- @angular/core
- @angular/compiler
- @angular/platform-browser
- @angular/common
- rxjs
- zone.js

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Angular Polyfills

- Depends on your browser
- At minimum
  - reflect-metadata
    - Reflect API
  - zone.js
    - Not really a polyfill
    - Helps Angular handle asynchronous code

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Angular "Minimal" Ingredients

- Module
- Component
- Bootstrapping

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Angular Module


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

Enjoy the public content of other modules

Make these components available to the application

The component to be loaded when this module is bootstrapped

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Angular Module

- Consolidates components, directives and pipes into cohesive blocks of functionality
- Provides services
- Can be lazy loaded
- Usually per feature or per library
- Has public/private interfaces

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Angular Component

Component metadata is injected using decorators

```
1 import {Component} from "@angular/core";
2
3 @Component({
4   selector: "my-app",
5   template: "<h1>Hello Angular 2</h1>"
6 })
7 export class AppComponent {
8 }
```

HTML element name

The template that will be injected into the component host element

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Angular Component

- The term “controller” is no longer being used by Angular
  - Resembles the industry shift from MVC to component based architecture
- A component consist of
  - Name
  - Logic
  - Template
  - Styles
  - Metadata

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Bootstrapping

Browser is not the only supported platform

```
import { platformBrowserDynamic } from '@angular/platform-browser-dynamic';
import { AppModule } from './app.module';

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

Why not just name it “bootstrap“ ?

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Bootstrapping

- No automatic bootstrapping ☺
- You must tell Angular when to initialize the application
  - Allows for easier integration with 3rd party libraries
- Just like AngularJS you specify the root module and Angular does the magic

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ng new options

- --directory: Name of directory to create, by default this is the application name
- --prefix: Component selector prefix
  - Can be overridden per component
- --inline-style: Do not generate CSS file
  - Can be overridden per component
- --inline-template: Do not use inline templates
  - Can be overridden per component

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angular.json

- This is @angular/cli configuration file
- Use it to customize aspects of @angular/cli
- For example,
  - defaults/serve/port
  - apps[0]/prefix
  - app[0]/environments

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ng serve

- Same as npm start
- Starts a development server on port 4200
- JavaScript bundles are created in memory
- Bundles are injected into Index.html
- Any change to the file system triggers re-build
- Use --open option to open a browser
  - Can fix the “npm start” command

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--routing

- Commonly used cli command option to create a new project and automatically add a routing file in order to implement routing in angular app
- ng new myapp --routing

The project files tree after the command.
A routing module file is now available

```
src
-app
----app.component.css
----app.component.html
----app.component.spec.ts
----app.component.ts
----app.module.ts
----app-routing.module.ts
-assets
-environments
-favicon.ico
-index.html
-polyfills.ts
-main.ts
-styles.css
-test.ts
-tsconfig.app.json
-typings.d.ts
-tsconfig.spec.json
```

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ng generate

- Assists in creating features to the app such as components, modules, services, pipes & directives
- Some options are derived from project level definition
- Some options can be re-defined
- Also have other options such as:
  - --inline-template use an inline template instead of a separate HTML file
  - --inline-style use inline styles instead of a separate CSS file
  - --prefix change prefix selector

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--flat

- Do not generate a parent directory when generating a new component
- ng g component contactList --flat
- Probably you will want to use it when defining a new root component per feature module
  - To be consistent with app.component.ts

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assets

- By default all static files are rejected
  - Except Webpack bundles
- Solution,
  - Put the asset inside the assets directory
  - The directory is part of production build
- In case of images consider using background-image
  - Thus the image is bundled

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Request an asset

- Inject HttpClient into a component
- import the HttpClientModule

```
export class AppComponent {
  contacts: Contact[];

  constructor(private httpClient: HttpClient) {
  }

  ngOnInit() {
    this.httpClient.get<Contact[]>("/assets/contacts.json").subscribe(contacts => {
      this.contacts = contacts;
    });
  }
}

interface Contact {
  id: number;
  name: string;
}
```

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Request as asset

- Can use async/await syntax

```
export class AppComponent {
  contacts: Contact[];

  constructor(private httpClient: HttpClient) {
  }

  async ngOnInit() {
    this.contacts = await this.httpClient.get<Contact[]>("/assets/contacts.json").toPromise();
  }
}

interface Contact {
  id: number;
  name: string;
}
```

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SCSS

- By default @angular/cli uses simple CSS files
- You may fix that
  - defaults/styleExt → scss
- You should also rename app/styles.css

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src/style.css

- A global CSS that is injected into index.html
- Use it to
  - Define styling prior Angular load
  - Global application theme

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More Commands

- https://github.com/angular/angular-cli/wiki
- ng lint
- ng test
- ng e2e
- ng build
- ng get/set
- ng eject

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@angular/cli stories

- https://github.com/angular/angular-cli/wiki/stories
- HMR
- Proxy
- Routing
- Bootstrap
- Many more

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Summary

- @angular/cli is an abstraction layer on top of Webpack
- As such it makes life easier (short term)
- Consider use ng eject and work directly with Webpack configuration