Angular Basics & First Component

Alex Thalhammer

Outline

- Motivation

- First steps

- HTTP access with Angular HTTP client

- Your first Component

- Built-in Angular Directives
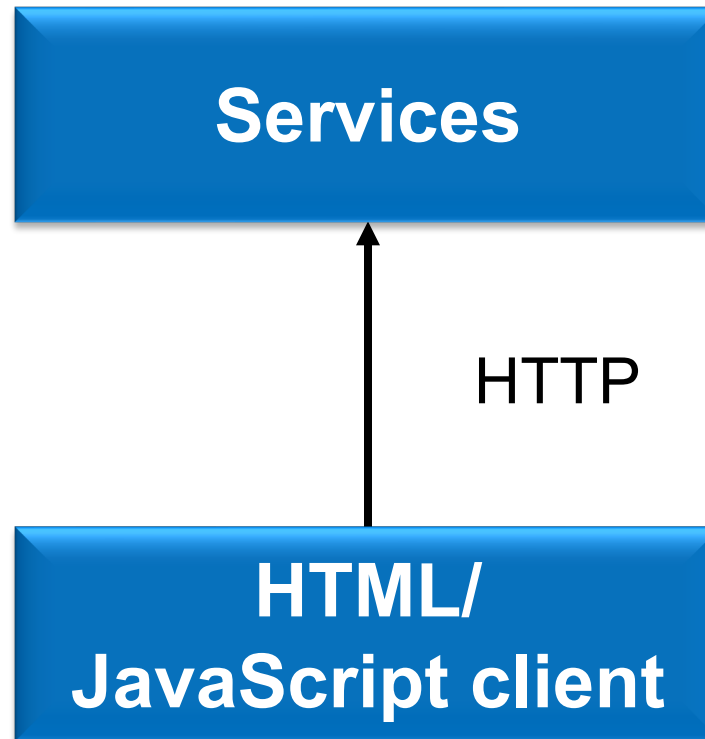
Motivation

Platforms and Usability

HTML + JavaScript

Single Page Application (SPA)

HTML + JavaScript = Complexity

Frameworks make SPA manageable

Google

Community

Angular
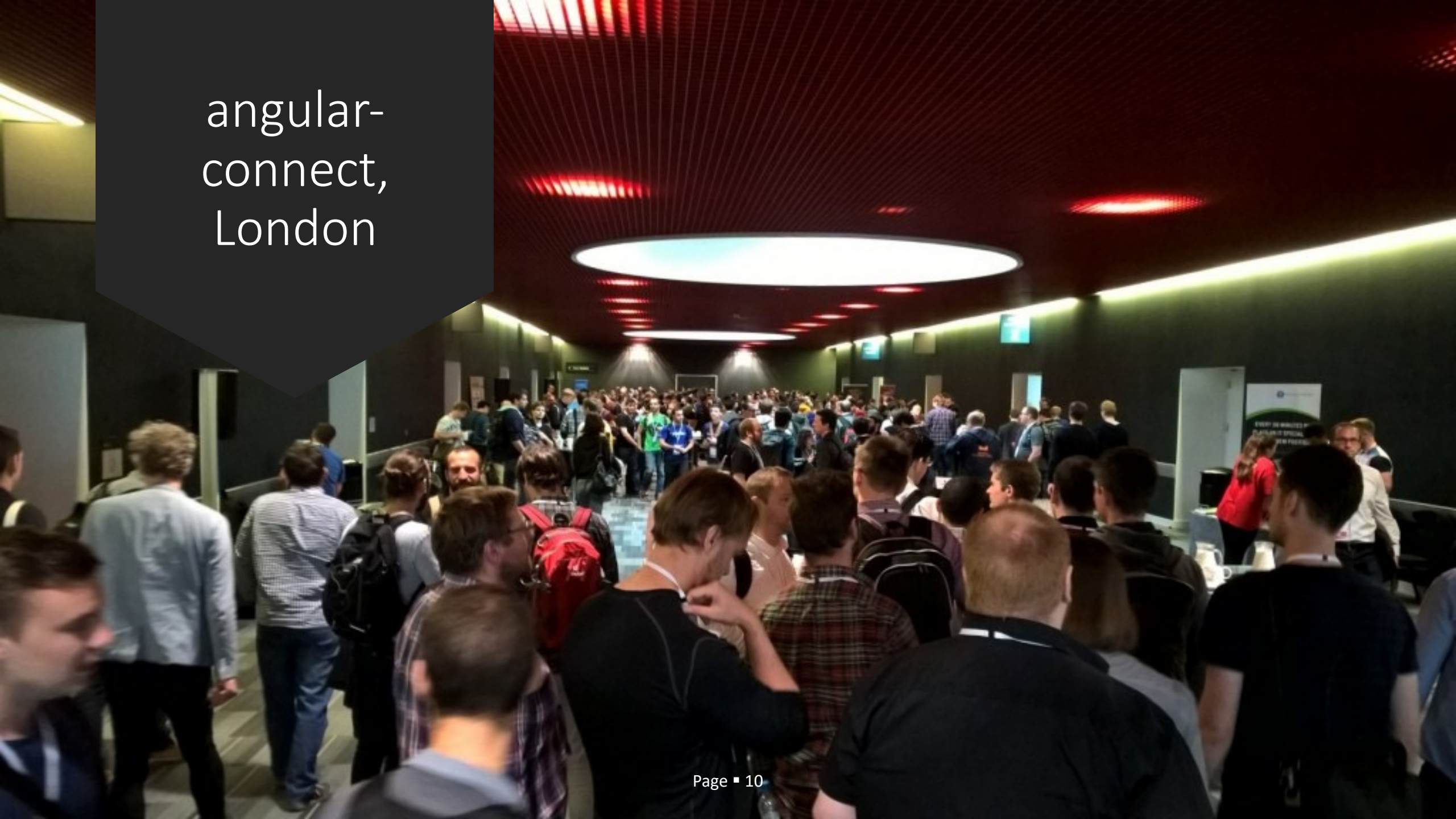>2M Devs

angular-
connect,
London

angular-connect, London

JavaScript vs TypeScript

ES 5 | ES 2015+ | TypeScript
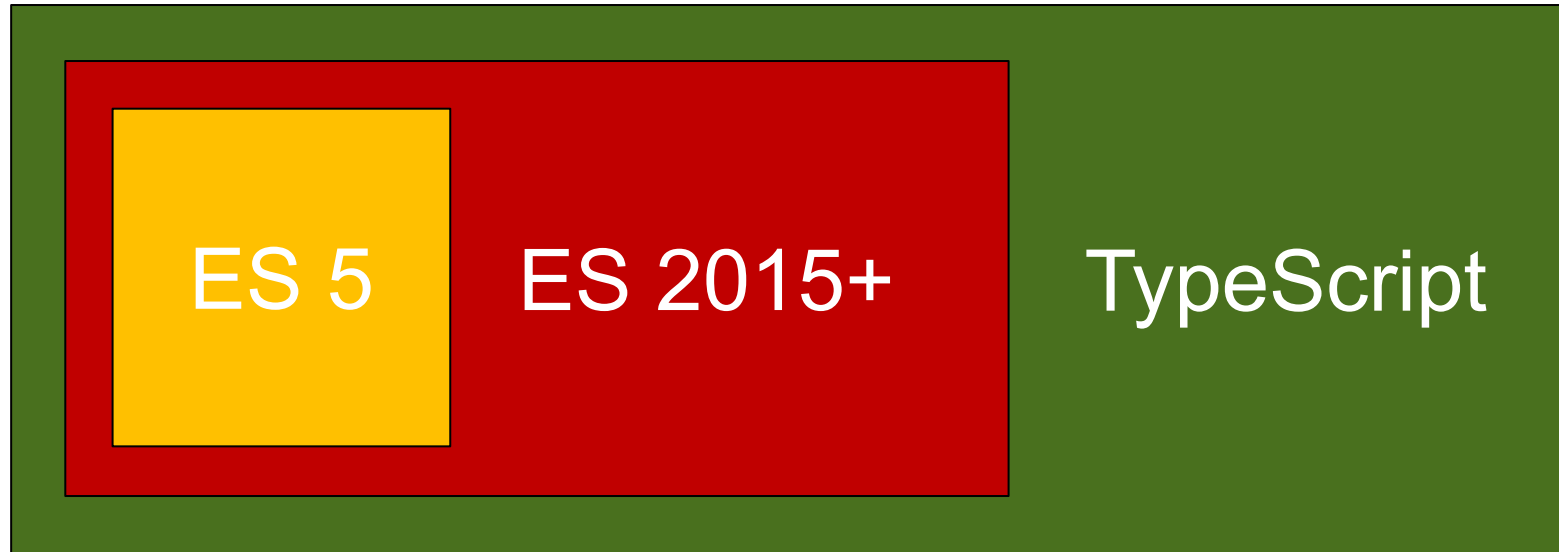
compilation

First steps with Angular

App == component tree

Root-Component

AppComponent

FlightSearch
Component

Angular Dev Tools

- https://chrome.google.com/webstore/detail/angular-devtools/ienfalfjdbdpebioblfackkekamfmbnh
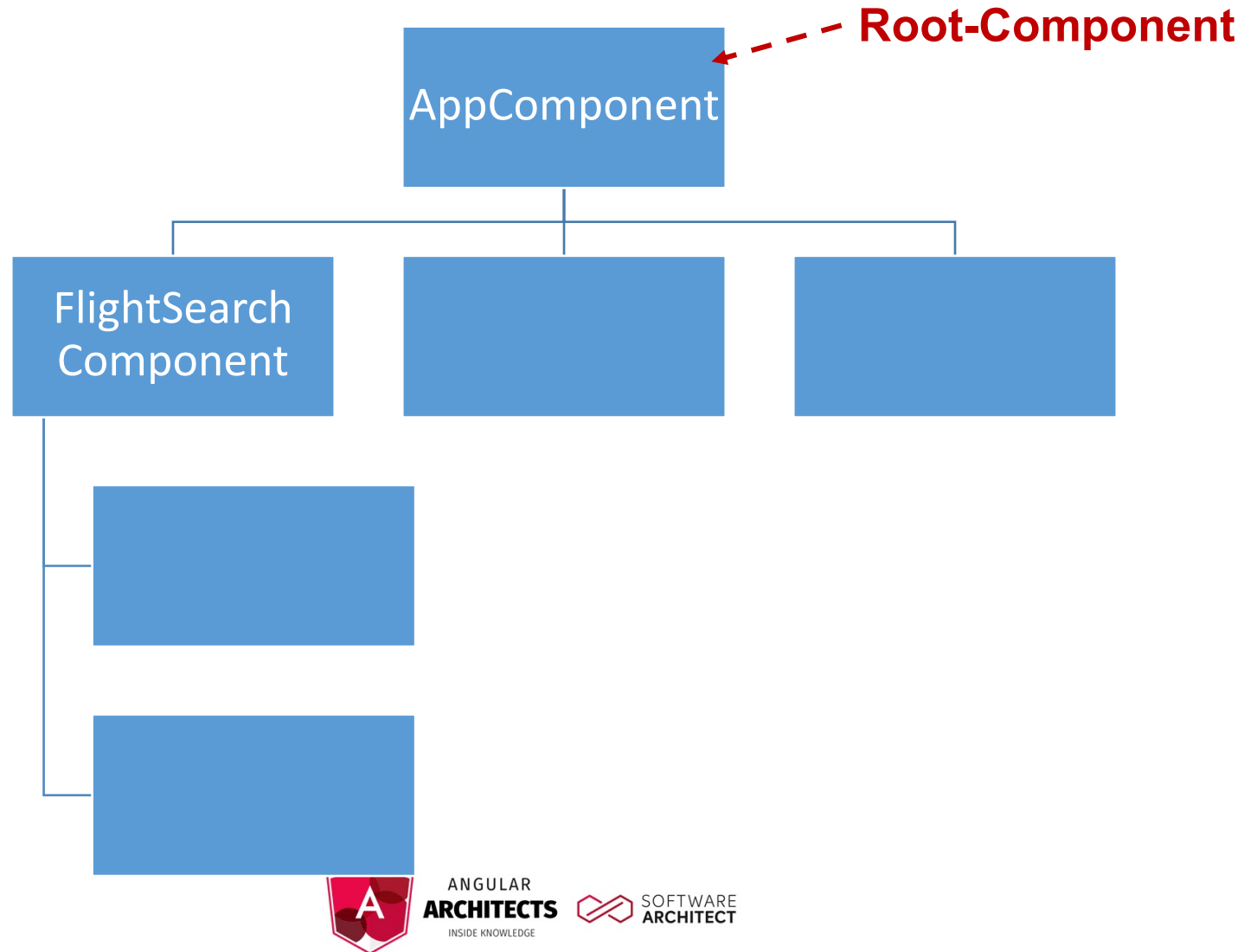
DEMO

AppComponent

```typescript
@Component({
    selector: 'flight-app',
    templateUrl: './app.component.html'
})
export class AppComponent {
    title = 'Hello World!';
}
```

AppComponent

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

@Component({
    selector: 'flight-app',
    templateUrl: './app.component.html'
})
export class AppComponent {
    title = 'Hello World!';
}
```

Library
E.g.: @angular/core

Own project
E.g.: ../entities/flight
No ending ".ts"

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

AppComponent

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

@Component({
    selector: 'flight-app',
    templateUrl: './app.component.html'
})
export class AppComponent {
    title = 'Hello World!';
}
```

```html
<h1>{{title}}</h1>

<div class="container">
    <flight-search></flight-search>
</div>
```
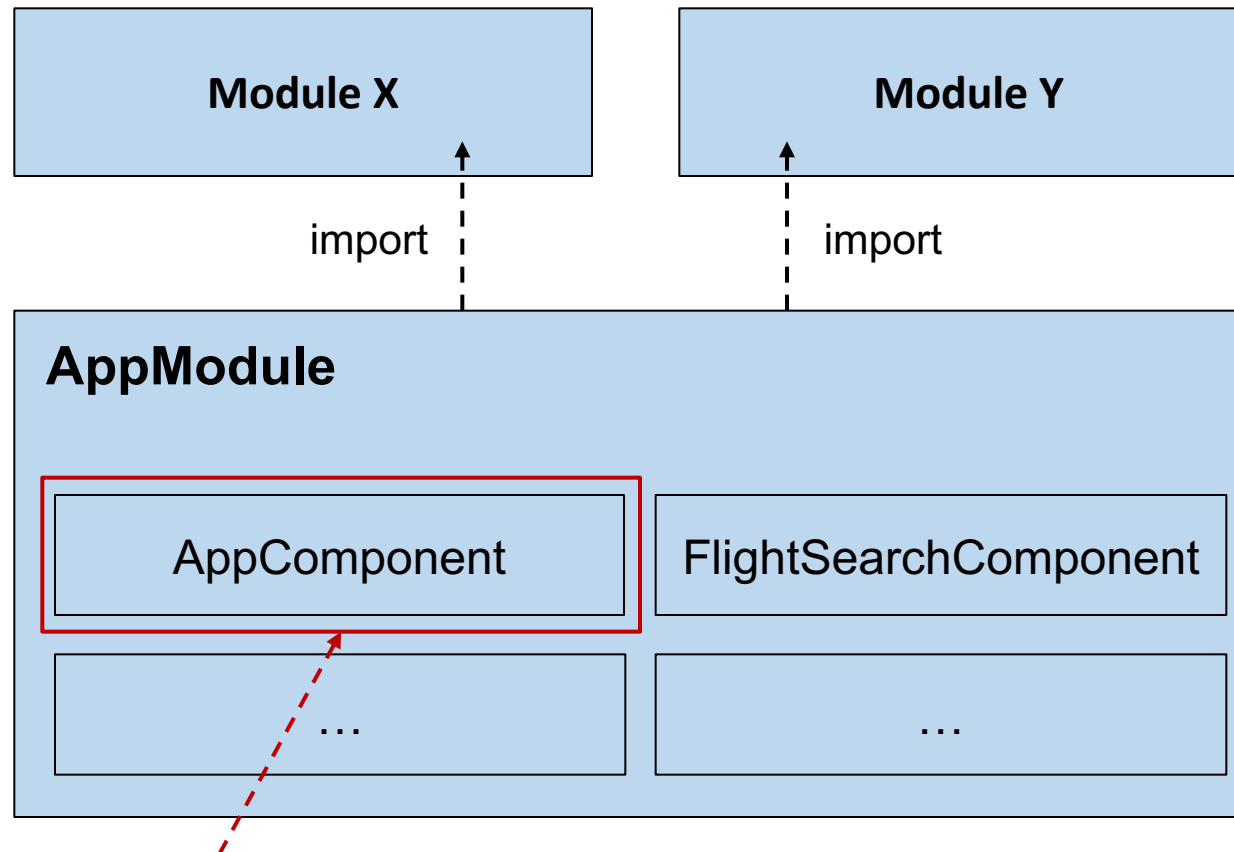
Module

Root-Component

AppModule

```
@NgModule({
    imports: [
        BrowserModule, HttpClientModule, FormsModule
    ],
    declarations: [
        AppComponent, FlightSearchComponent
    ],
    bootstrap: [
        AppComponent
    ]
})
export class AppModule {
}
```

Bootstrapping

- Starting Angular

- Loading
  - RootModule/AppModule with
    - RootComponent/AppComponent

Bootstrapping

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

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT
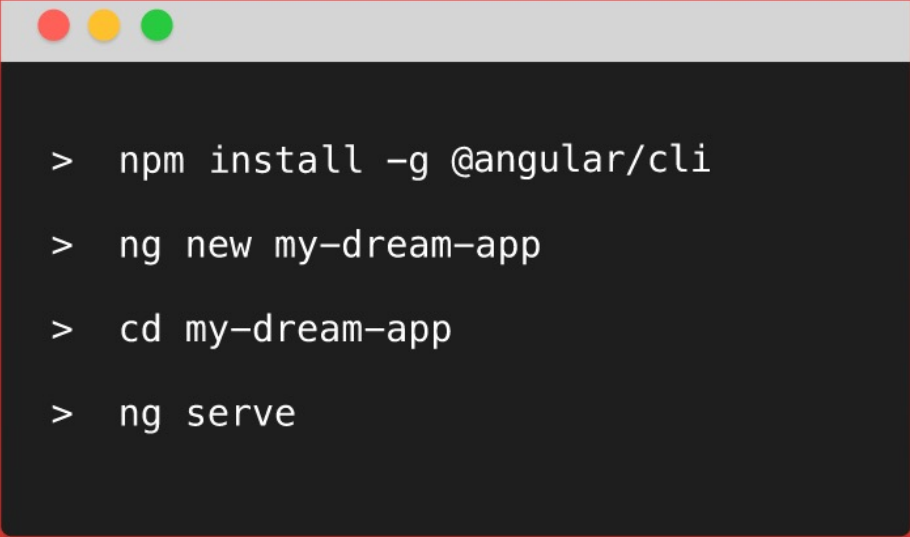
index.html

```
[…]

<body>

  <flight-app></flight-app>

  <script src="..."></script>

</body>

[…]
```

A new Angular project

Angular CLI

Our Starterkit

- ng new starter

- cd starter

- npm i bootstrap –save

- Adding global styles in *angular.json*

```
[...]
"styles": [
    "styles.css",
    "../node_modules/bootstrap/dist/css/bootstrap.css",
    [...]
],
[...]
```

DEMO

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Let's get it on

- Pull the repo https://github.com/L-X-T/pv-wien-essentials

- Please get started with lab 00_getting_started

- Yarn (or npm i) and then Yarn start (or npm start)

- Take a closer look at the starter kit

- VS Code: You may add the plugins mentioned

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Your first component

Component as TypeScript class

```typescript
@Component({
    selector: 'flight-search',
    templateUrl: './flight-search.html'
})
export class FlightSearchComponent {

    from: string;
    to: string;
    flights: Flight[];

    search(): void { [...] }
    select(flight: Flight): void { [...] }
}
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Template

Two Way Binding

```
<input [(ngModel)]="from">
<input [(ngModel)]="to">
```

Event (/Output) Binding

```
<button [disabled]="!from || !to" (click)="search()">
    Search
</button>
```

Property (/Input) Binding

```
<table>
    <tr *ngFor="let flight of flights">
        <td>{{flight.id}}</td>
        <td>{{flight.date}}</td>
        <td>{{flight.from}}</td>
        <td>{{flight.to}}</td>
    </tr>
</table>
```

Template

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

DEMO

Access HTTP ressources

HttpClient

- get(url, options)
- post (url, body, options)
- put(url, body, options)
- delete(url, options)
- …

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

HttpClient

- get<T>(url, options)
- post<T>(url, body, options)
- put<T>(url, body, options)
- delete<T>(url, options)
- …

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Inject HttpClient

```
@Component({
    selector: 'flight-search',
    templateUrl: './flight-search.html'
})
export class FlightSearchComponent {

    from: string;
    to: string;
    flights: Flight[];

    constructor(private http: HttpClient) { […] }

    search(): void { [...] }
    select(flight: Flight): void { [...] }
}
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Use HttpClient (I)

```
const url = 'http://www.angular.at/api/flight';
```

Use HttpClient (II)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);
```

Use HttpClient (III)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Use HttpClient (IV)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');

this.http.get<Flight[]>(url, { params: params, headers: headers })
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Use HttpClient (V)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');

this.http.get<Flight[]>(url, { params, headers })
```

Short hand

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Use HttpClient (VI)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');

this.http.get<Flight[]>(url, { params, headers })
    .subscribe(
        function(flights) { […] }
    );
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Use HttpClient (VII)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');

const that = this;
this.http.get<Flight[]>(url, { params, headers })
    .subscribe(
        function(flights) {
                that.flights = flights;
        }
);
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Use HttpClient (VIII)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');

this.http.get<Flight[]>(url, { params, headers })
    .subscribe(
        (flights) => {
            this.flights = flights;
        }
    );
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Use HttpClient (IX)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');

this.http.get<Flight[]>(url, { params, headers })
    .subscribe({
        next: (flights) => { this.flights = flights; },
        error: (err) => { console.error('Error loading', err); }
    });
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

DEMO

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

LAB

Use HttpClient (X)

```
const url = 'http://www.angular.at/api/flight';

const params = new HttpParams().set('from', this.from).set('to', this.to);

const headers = new HttpHeaders().set('Accept', 'application/json');

this.http.get<Flight[]>(url, { params, headers })
    .subscribe({
        next: (flights) => { this.flights = flights; },
        error: (err) => { console.error('Error loading', err); }     <----- Observable
    });
```
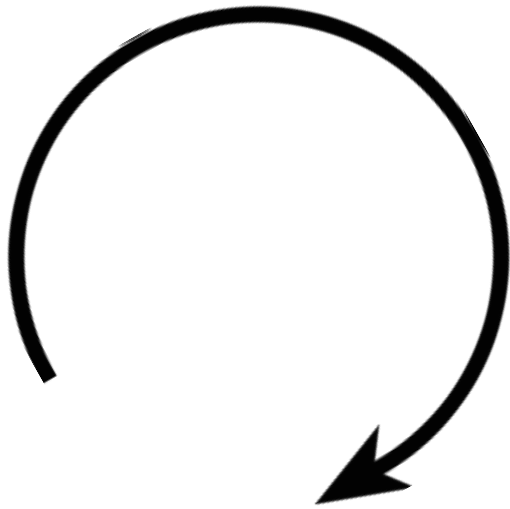
ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Observable „Source"

Operator (z. B. map)

Observer „Target"

ANGULAR ARCHITECTS INSIDE KNOWLEDGE

SOFTWARE ARCHITECT

Observable

```
.subscribe({
    next: (result) => { ... },
    error: (error) => { ... },
    complete: () => { ... }
});
```

Observable   Observer

Use Angular Directives

What are Directives?

- Add behaviour to html elements

- Are used as html attributes

- Examples:
  - <input **[(ngModel)]**="from">
  - <div ***ngFor**="let flight of flights">...</div>

Types of Directives?

- Structural Directives
  - *ngIf="statement"
  - *ngFor="let element of array"
  - *ngSwitch="something"

- Attribute directives
  - Built-ins
    - [(ngModel)]
    - [ngClass] or [ngStyle]
  - Custom ones

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Examples (I)

```
<tr *ngFor="let flight of flights">
    <td>{{flight.id}}</td>
</tr>
```

```
<table *ngIf="flights.length > 0">
…
</table>
```

```
<tr [ngClass]="{ 'active': flight === selectedFlight }">
…
</tr>
```

```
<tr [ngStyle]="{ 'background-color':
    (flight === selectedFlight) ?
    'orange' : 'blue' }">
</tr>
```

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT

Examples (II)

```
<tr *ngFor="let flight of flights">
    <td>{{flight.id}}</td>
</tr>
```

```
<table *ngIf="flights.length > 0">
…
</table>
```

```
<tr [ngClass]="{ 'active': flight === selectedFlight }">
…
</tr>
```

```
<tr [class.active]="flight === selectedFlight">
</tr>
```

```
<tr [ngStyle]="{ 'background-color':
    (flight === selectedFlight) ?
    'orange' : 'blue' }">
</tr>
```

DEMO

ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

SOFTWARE
ARCHITECT