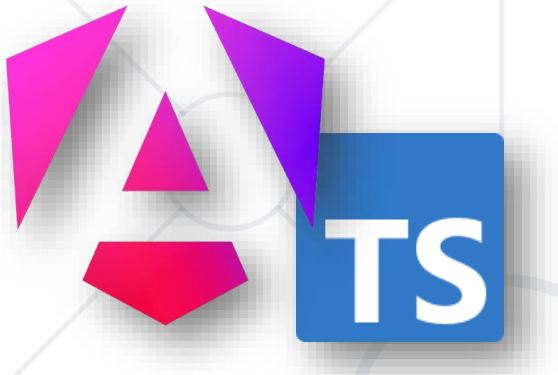
Intro to Angular

HTTP Basics, Angular Overview, TypeScript Syntax



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#angular

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HTTP Basics

HTTP Server - Client

HTTP

- Hyper Text Transfer Protocol (HTTP)
  - Client-server protocol for transferring Web resources
- Important properties of HTTP
  - Request-response model
  - Text-based format
  - Relies on a unique resource URLs
  - Provides resource metadata (e.g., encoding)
  - Stateless (cookies can overcome this)

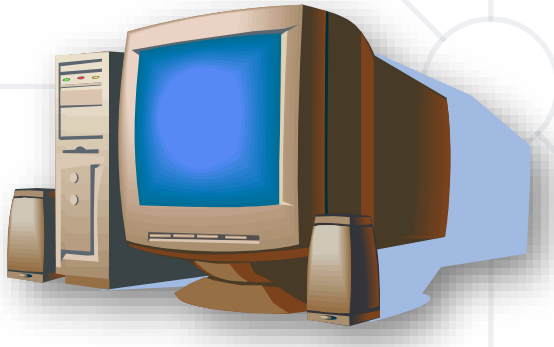
HTTP: Request-Response Protocol

- **Client** program
  - Running **on end host**
  - E.g. Web browser
  - Requests a resource
- **Server** program
  - Running at the **server**
  - E.g. Web server
  - Provides resources

HTTP: Request-Response Protocol

```
GET /index.html
HTTP/1.0
```

```
HTTP/1.0 200 OK
"Welcome to our
Web site!"
```



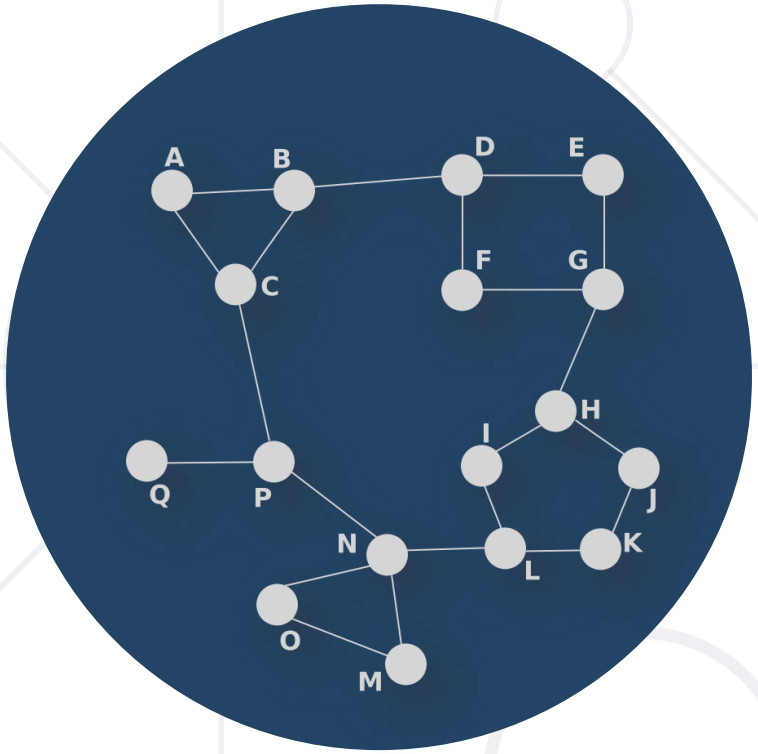
Example: Hyper Text Transfer Protocol

- HTTP request

```
GET /courses/about.aspx HTTP/1.1
Host: www.softuni.com
User-Agent: Mozilla/5.0
<CRLF>
```

- HTTP response

```
HTTP/1.1 200 OK
Date: Mon, 5 Jul 2010 13:09:03 GMT
Server: Microsoft-HTTPAPI/2.0
Last-Modified: Mon, 12 Jul 2010 15:33:23 GMT
Content-Length: 54
<CRLF>
<html><title>Hello</title>Welcome to our site</html>
```

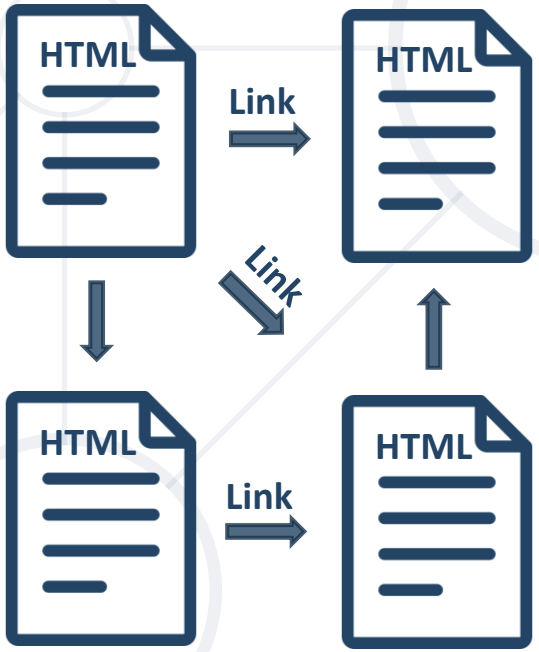


Routing Overview

Navigation for Single Page Apps

What is Routing?

- Allows navigation, **without reloading** the page
- Pivotal element of writing **Single Page Applications**



Standard Navigation

Navigation using Routing

Single Page Applications

- A **Router** loads the appropriate content when the **location changes**
  - E.g. when the user manually **enters an address**
- Conversely, a change in content is reflected in the address bar
  - E.g. when the user **clicks on a link**
- Benefits
  - Load all scripts **only once**
  - **Maintain state** across multiple pages
  - Browser **history** can be used
  - Build User Interfaces that **react quickly**

Angular Overview

Web Application Platform

What is Angular?

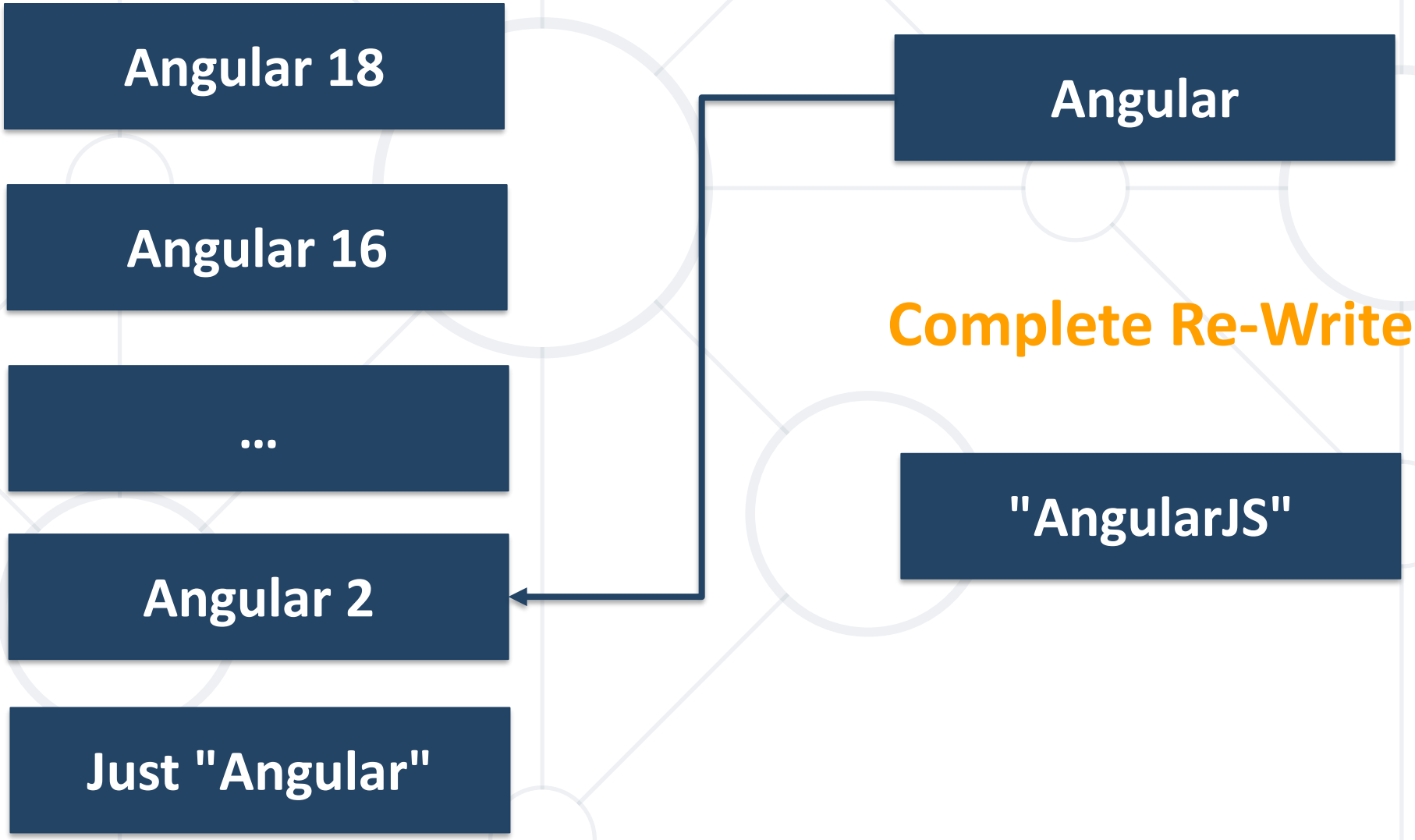
- **Angular is a platform** for building complex front-end apps
- Focused on end-to-end **tooling** and **best practices**
- **Developed** by the Angular team at **Google**

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

@Component({
  selector: 'my-app',
  template: `<h1>Hello {{name}}</h1>`
})

export class AppComponent { name = 'Angular'; }
```

Angular Versions



Introduction to TypeScript

A JavaScript Superset

Introduction to TypeScript

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- Install globally via npm

```
npm install -g typescript
```

- TypeScript uses the .ts file extension (supported by VS Code)

```
tsc myfile.ts
```

- To compile your code
- Compilation output is plain JavaScript

Variable Types

```
let isDone: boolean = false;
```

```
let decimal: number = 6;
let hex: number = 0xf00d;
let binary: number = 0b1010;
let octal: number = 0o744;
```

```
let color: string = "blue";
color = 'red';
```

```
let list: number[] = [1, 2, 3];
let list: Array<number> = [1, 2, 3];
```

More at https://www.typescriptlang.org/docs/handbook/intro.html

Classes

Access modifier could be public / private / protected

```
class Greeter {
  public greeting : string;
  constructor(message : string) {
    this.greeting = message;
  }
  greet() : string {
      return `Hello, ${this.greeting}`;
  }
}

let greeter : Greeter = new Greeter("world!");
console.log(greeter.greet());
```

Functions could also have a return type

Inheritance

```
class Animal {
  move(distanceInMeters: number = 0) : void {
    console.log(`Animal moved ${distanceInMeters}m.`);
  }
}
class Dog extends Animal {
  bark() : void {
   console.log('Woof! Woof!');
  }
}
const dog = new Dog();
dog.bark();
dog.move(10);
dog.bark();
```

Interfaces

```
function printLabel(labelledObj: { label: string }) {
    console.log(labelledObj.label);
}

let myObj = {size: 10, label: "Size 10 Object"};
printLabel(myObj);
```

Property assertion

```
interface LabelledValue {
    label: string;
}

function printLabel(labelledObj: LabelledValue) { … }
```

Generics and Enumerations

```
function identity<T>(arg: T): T {
    return arg;
}

let output = identity<string>("myString");
// type of output will be 'string'

let output = identity(5);
// type of output will be 'number'
```

Type inference

```
enum Direction {
    Up = 1,
    Down,
    Left,
    Right,
}
```

Modules

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```
export default interface StringValidator {
    isAcceptable(s: string): boolean;
}
```

```
export { ZipCodeValidator };
export { ZipCodeValidator as mainValidator };
```

```
import { ZipCodeValidator } from "./ZipCodeValidator";
```

```
import * as validator from "./ZipCodeValidator";
```

```
import num from "./OneTwoThree";
```

Angular Installation

Packages, Setup, Structure

Creating A New App

- Install globally via **npm**

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

- **Create** new project

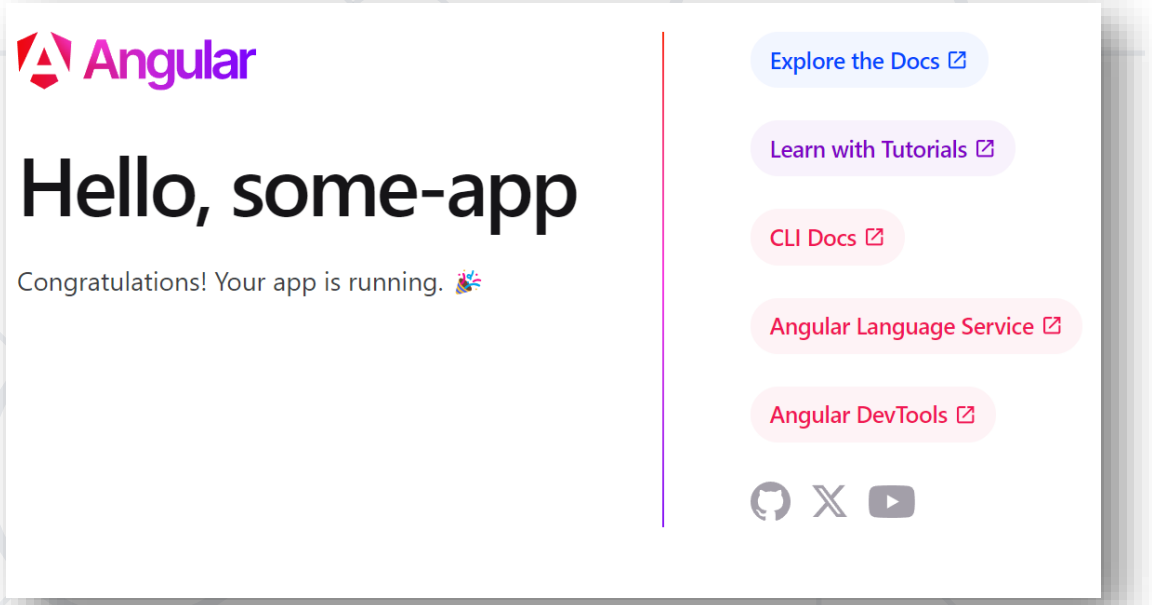
```
ng new some-app
cd some-app
```

- **Start** a dev server on port 4200

```
ng serve
```

- Create a new **standalone** component

```
ng new my-app --standalone
```



Finding Information

- Visit the **official website**

  https://angular.dev

- Documentation

  https://angular.dev/overview

- Online sandbox

  https://plnkr.co/

IDE Support

- **Visual Studio Code** fully supports TypeScript
  - You may use your favorite IDE (most have **plugins**)
- By using the **Angular CLI**
  - You do not need to use a **linter**
  - You do not need install any specific **plugin**
  - **Everything** is included

Summary

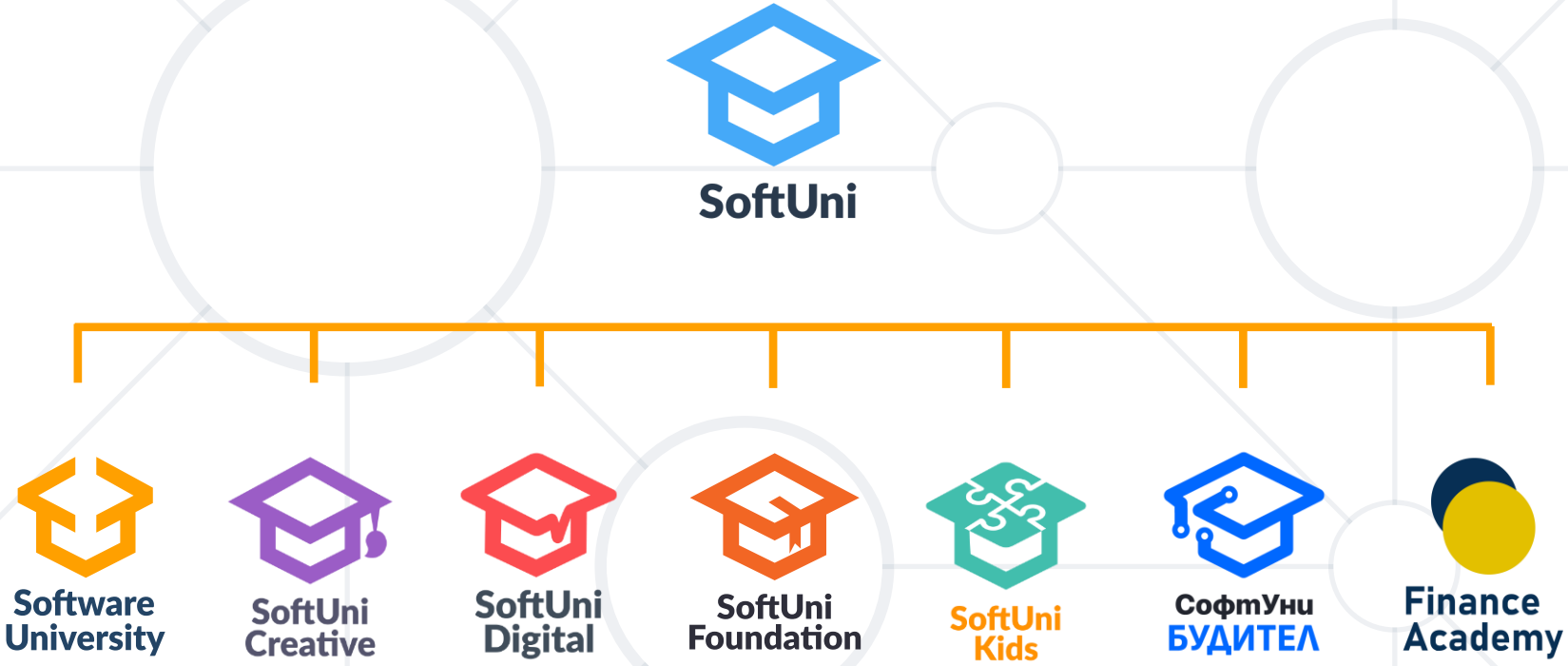
- Angular is a framework for front-end apps
- TypeScript is JavaScript superset language

```
interface LabelledValue {
    label: string;
}

function print(labelledObj: LabelledValue) { … }
```

- The Angular CLI is a complete toolkit for working with Angular

Questions?



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