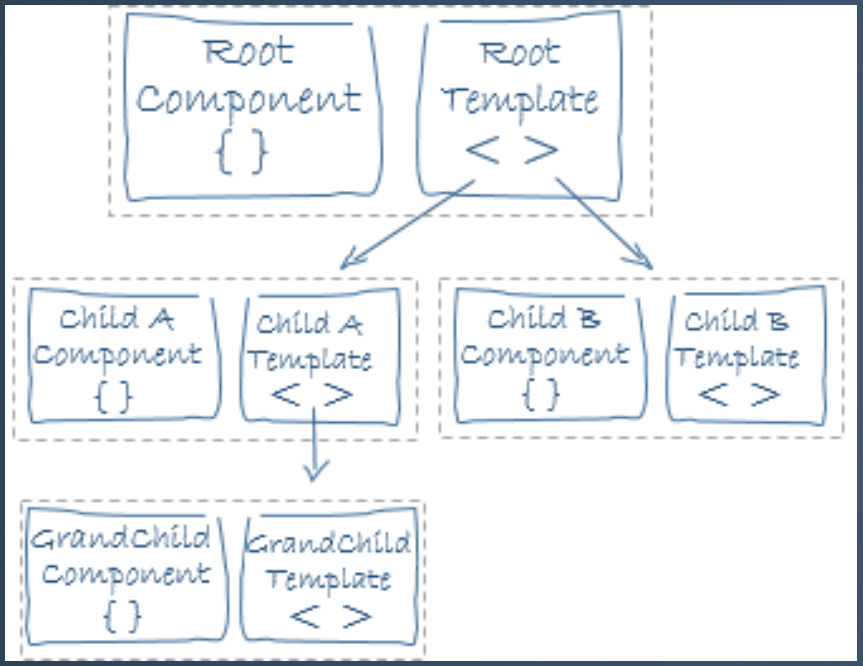
Angular 2 - Basics

Angular 2 -what?

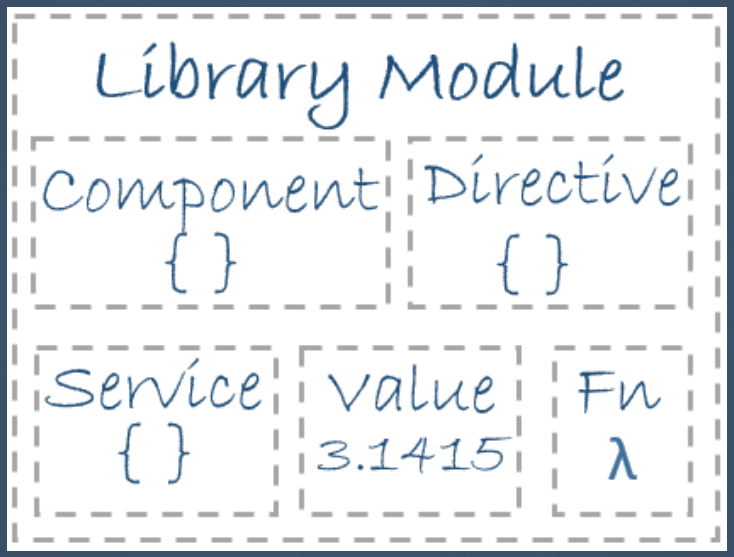
- Advance SPA framework
- Designed for big application, with complex GUI interfaces and logic (?)
- Build using TypeScript and modern tools for web development
- Strong push towards modularity and clean architecture

High level architecture

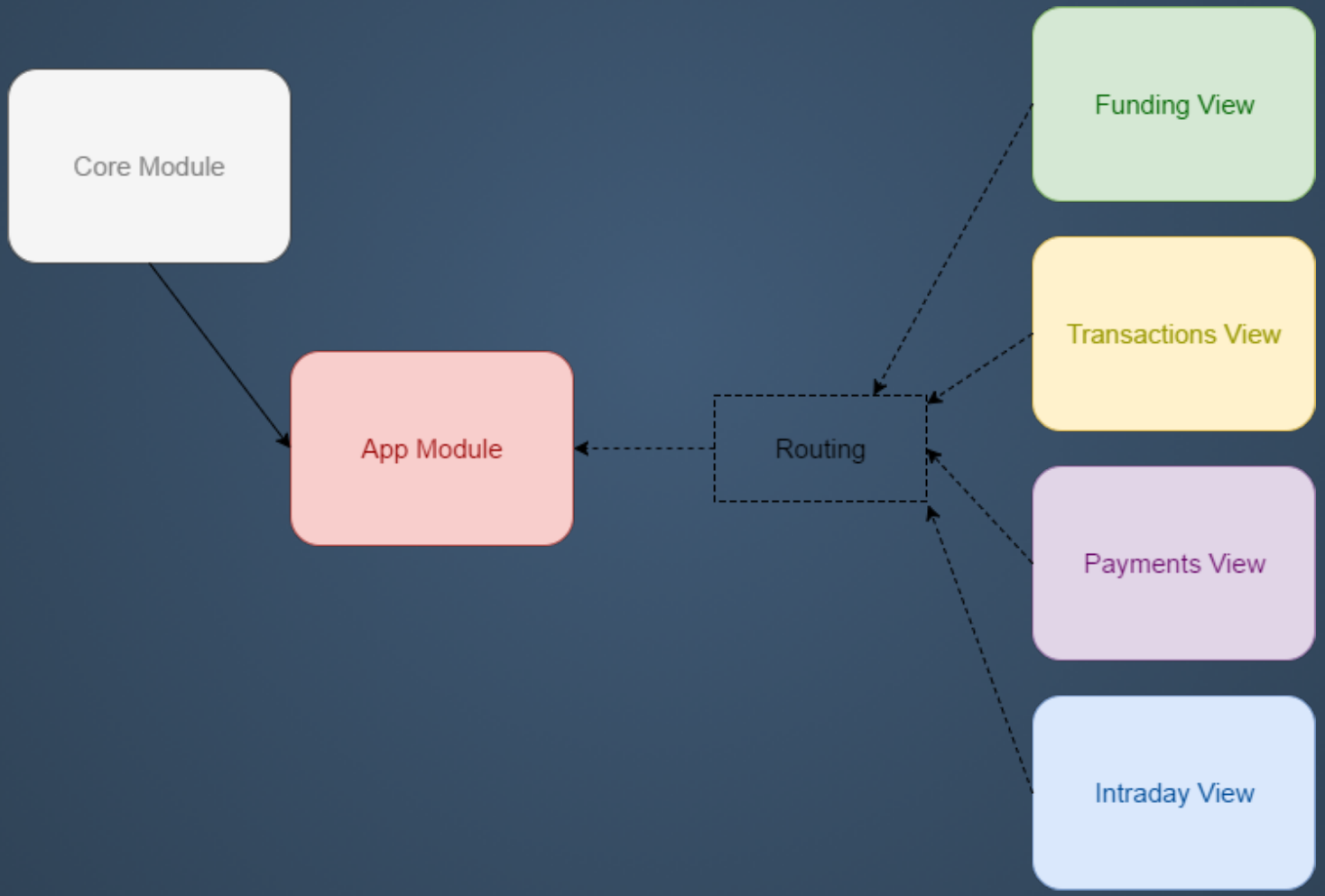


- Components as building blocks
- Application is a tree of components
- Clear communication patterns
- Clearly separated template (HTML) and the logic (TypeScript)
- Dependencies resolved using Dependency Injection
- Application divided in modules

What is a module in NG2?



What is a module in NG2?



Application module

Simple application might have only one module (AppModule). Bigger have multiple ones, containing encapsulated functionalities.

```
import { NgModule }      from '@angular/core';
import { BrowserModule } from '@angular/platform-browser';
import { ModalsModule } from '@dcafii/modals';

import { Logger } from './services/logger';
import { AppComponent } from './app.component';

@NgModule({
  imports:      [ BrowserModule, ModalsModule ],
  providers:    [ Logger ],
  declarations: [ AppComponent, OtherComponent, ExportedComponent ],
  exports:      [ ExportedComponent ],
  bootstrap:    [ AppComponent ]
})

export class AppModule { }
```

NgModule is a decorator

- **declarations -** the view classes that belong to this module. For example: components, directives, and pipes.
- **exports -** the subset of declarations that should be visible and usable in the component templates of other modules.
- **imports -** other modules whose exported classes are needed by component templates declared in this module.
- **providers -** creators of services that this module contributes to the global collection of services; they become accessible in all parts of the app.
- **bootstrap -** the main application view, called the root component, that hosts all other app views. Only the root module should set this bootstrap property.

Components module

Example of a feature module: Set of components

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

@NgModule({
  providers:    [ SomeModalsRelatedService ],
  declarations: [ ButtonComponent, OtherComponent,
                  ModalComponent, PromptComponent, FlyoutComponent
                ],
  exports:      [ ModalComponent, PromptComponent, FlyoutComponent ],
})
export class ModalsModule { };
```

Component

The building block of Angular 2 app

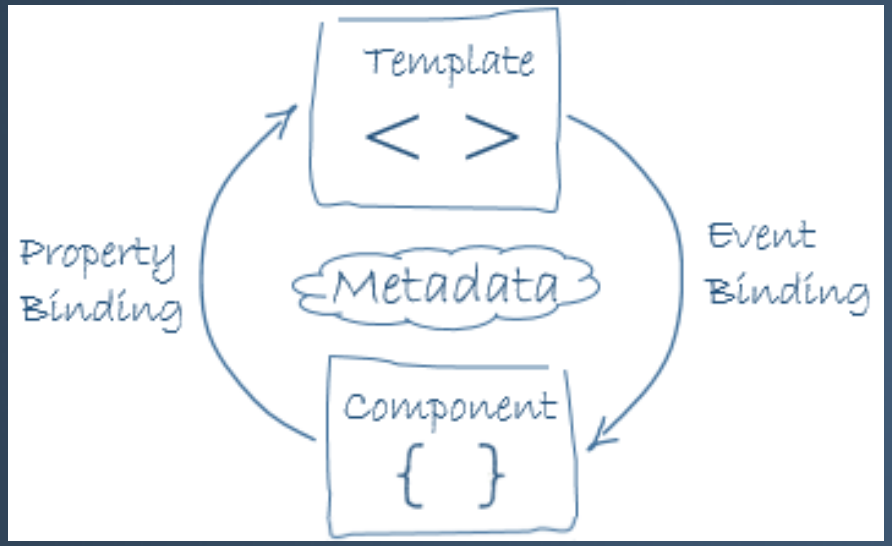
Simple component

```
@Component({
  selector:    'person',
  templateUrl: 'person.component.html'
})

export class PersonComponent {

  person: Person,

  showMessage: boolean;

  constructor() {
     this.person = new Person({ login: 'sosnowsd', name: 'Damian' });
     this.showMessage = false;
  }

  toggleMessage() {
    this.showMessage = !this.showMessage;
  }
}
```

Simple component template

```
<section>
    <h1>Person data</h1>
    <p>Name: {{person.name}}</p>
    <p>Login: {{person.login}}</p>

    <button (click)="toggleMessage()">Toggle message</button>

    <section *ngIf="showMessage">
        <p>Hi there! Have you heard about our lord and savior, Angular?</p>
    </section>
</section>
```

Components



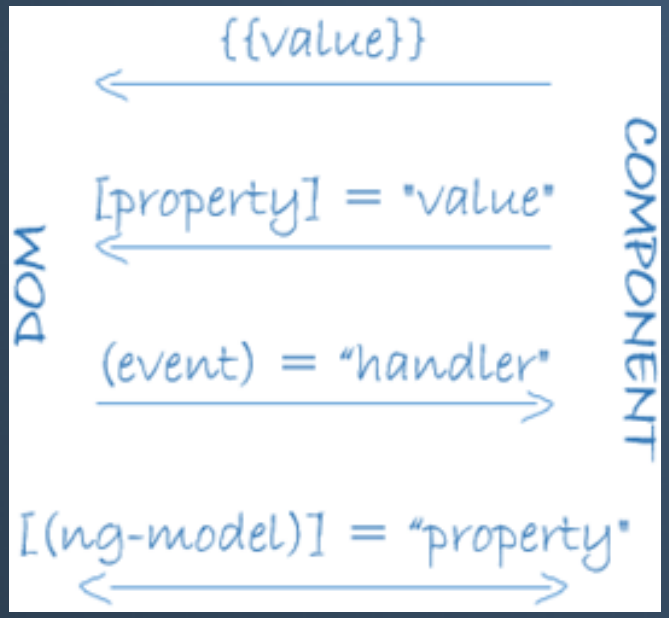
- Responsible for the given part of the screen
- Represents part of GUI functionality
- Encapsulated logic and data
- Defines data displayed in the template
- Reacts on template events

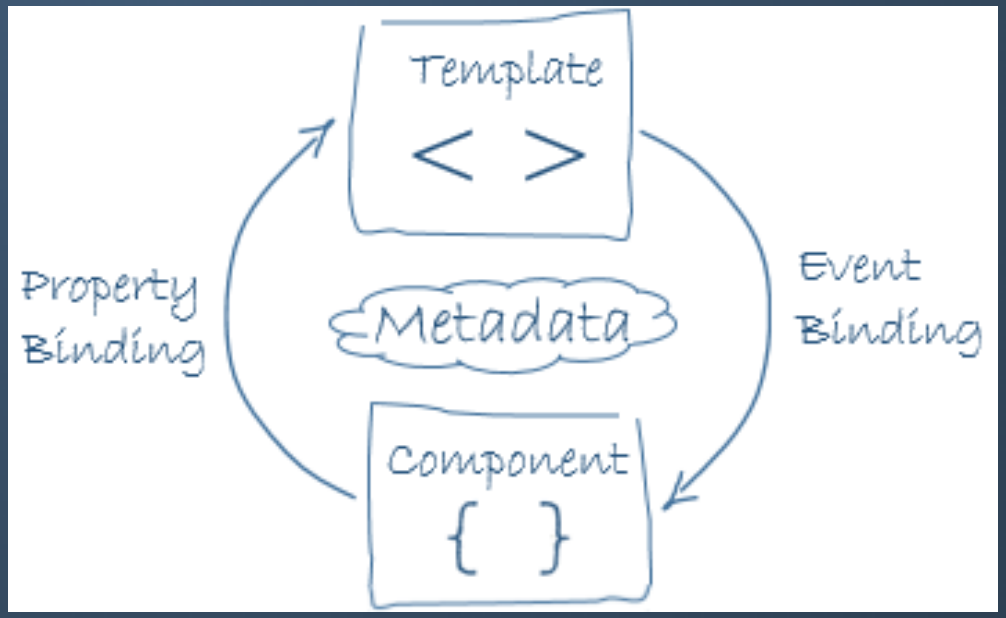
@Component decorator

- **selector**: CSS selector that tells Angular to create and insert an instance of this component where it finds a <person> tag
- **templateUrl**: module-relative address of this component's HTML template, shown above.
- **template:** HTML string template

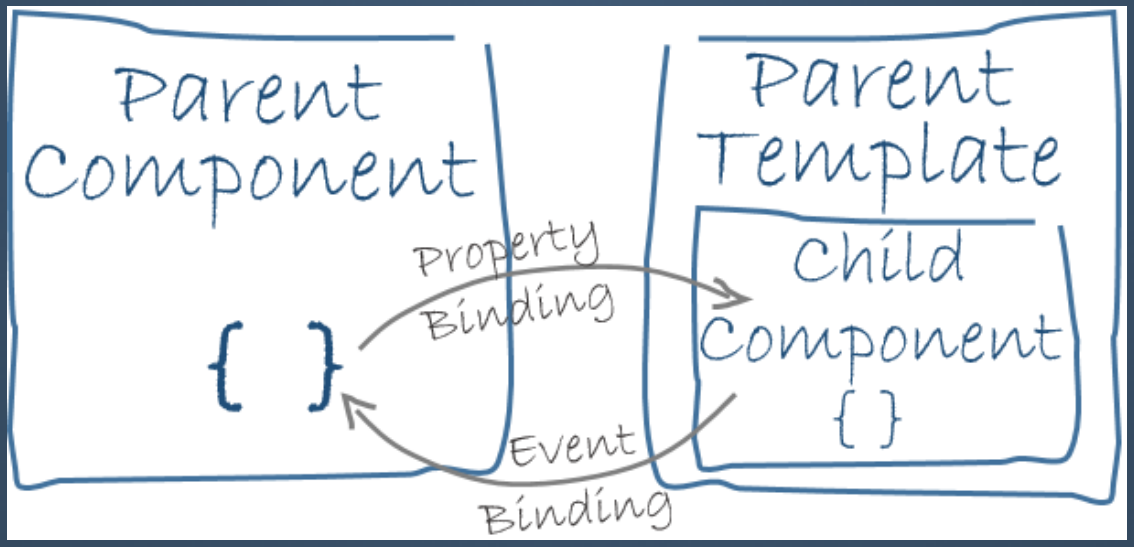
Template bindings

```
<section>
    <h1>Person data</h1>
    <p>Name: {{person.name}}</p>
    <p>Login: {{person.login}}</p>

    <button (click)="toggleMessage()">Toggle message</button>

    <section *ngIf="showMessage">
        <p>Hi there! Have you heard about our lord and savior, Angular?</p>
    </section>
</section>
```





Component communication



Passing data to the component

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

@Component({
  selector: 'person-details',
  //....
})
export class PersonDetailsComponent {

    @Input()
    person: Person;

    constructor() {

    }
}

// usage inside app.component.html

<person-details [person]="selectedRecord"></person-details>
```

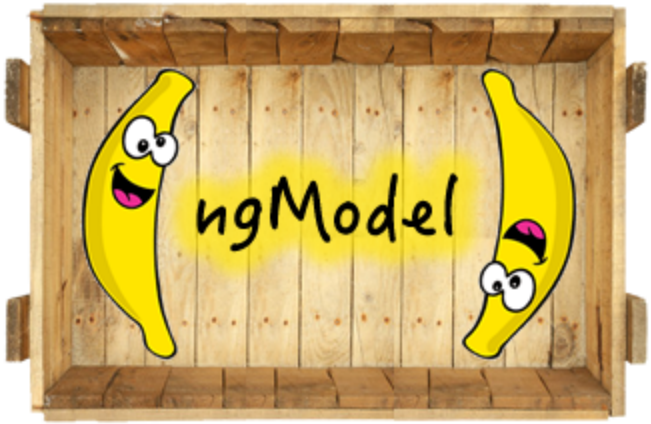
Passing data from the component

```
import { Component, EventEmitter, Input, Output } from '@angular/core';

@Component({
  selector: 'person-details',
  //....
})
export class PersonDetailsComponent {

    @Input() person: Person;

    @Output() onDelete = new EventEmitter<Person>();

    //this is executed in the template, f.e. when the button is clicked
    onButtonClick() {
        this.onDelete.emit(this.person);
    }
}


// PersonDetails template
<p>Click me to emit event: </p>
<button (click)="onButtonClick()">Click to emit</button>
```

```
// usage inside app.component.html
<person-details [person]="selectedRecord" (onDelete)="parentDeleteMethod($event)">
</person-details>
```

[(ngModel)]

[(ngModel)] = "someValue"



= "someValue"

Forms

Template based forms

Simple form

```
<form (ngSubmit)="onSubmit()" #personForm="ngForm">

Person Name: <input type="text" required name="name" [(ngModel)]="person.name"/>

Person Login: <input type="text" name="login" [(ngModel)]="person.login"/>

<button type="submit" [disabled]="!personForm.form.valid"></button>

</form>
```

Let's code

BMI calculator ng2

```
//python and visual c++ required

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

If failed try:

```
npm install --global --production windows-build-tools

npm install -g node-gyp
```

If instalation successful

```
ng new ngbmi

cd ngbmi
```

remove protractor from package.json

```
  "devDependencies": {
    "@angular/cli": "1.0.6",
    "@angular/compiler-cli": "^4.0.0",
    "@types/jasmine": "2.5.38",
    "@types/node": "~6.0.60",
    "codelyzer": "~2.0.0",
    "jasmine-core": "~2.5.2",
    "jasmine-spec-reporter": "~3.2.0",
    "karma": "~1.4.1",
    "karma-chrome-launcher": "~2.1.1",
    "karma-cli": "~1.0.1",
    "karma-jasmine": "~1.1.0",
    "karma-jasmine-html-reporter": "^0.2.2",
    "karma-coverage-istanbul-reporter": "^0.2.0",
    // "protractor": "~5.1.0",
    "ts-node": "~2.0.0",
    "tslint": "~4.5.0",
    "typescript": "~2.2.0"
  }
```

add polyfills at polyfills.ts

```
/***************************************************************************************************
 * BROWSER POLYFILLS
 */

/** IE9, IE10 and IE11 requires all of the following polyfills. **/
import 'core-js/es6/symbol';
import 'core-js/es6/object';
import 'core-js/es6/function';
import 'core-js/es6/parse-int';
import 'core-js/es6/parse-float';
import 'core-js/es6/number';
import 'core-js/es6/math';
import 'core-js/es6/string';
import 'core-js/es6/date';
import 'core-js/es6/array';
import 'core-js/es6/regexp';
import 'core-js/es6/map';
import 'core-js/es6/set';
```

Install and run

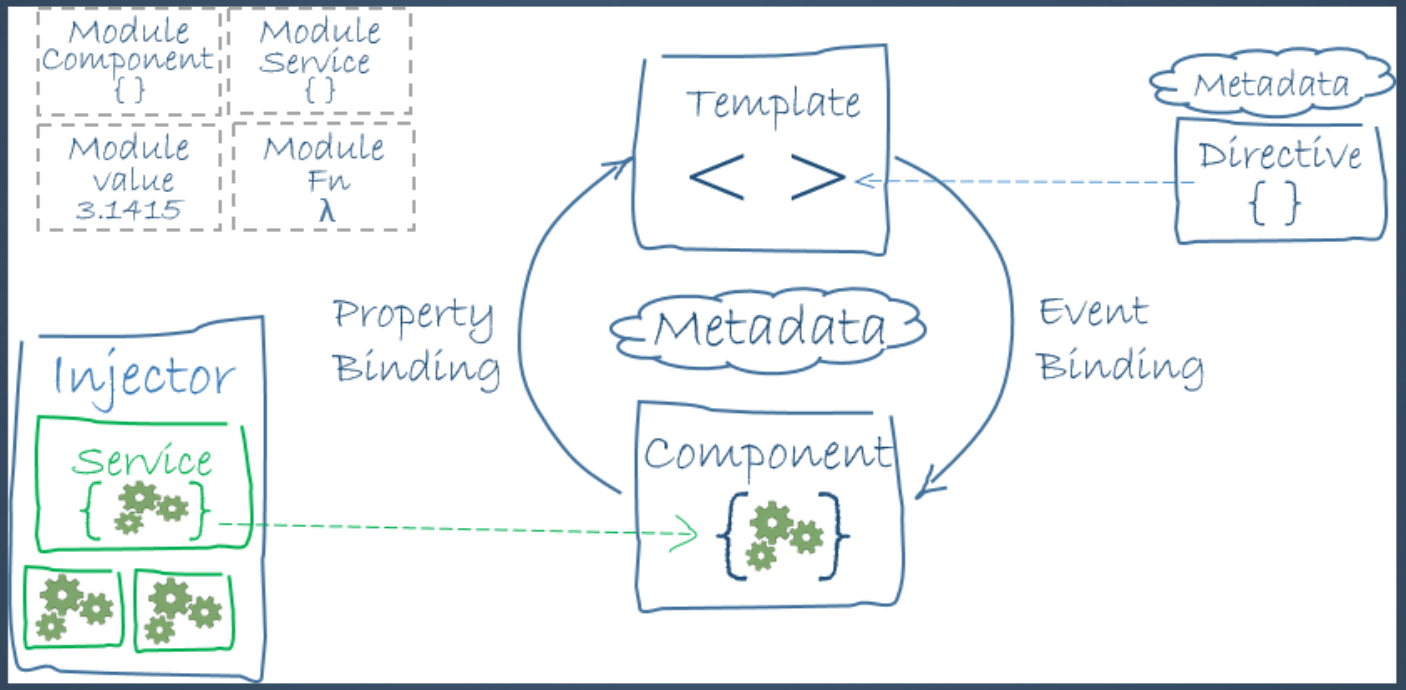
```
npm install

ng serve
```

Let's code

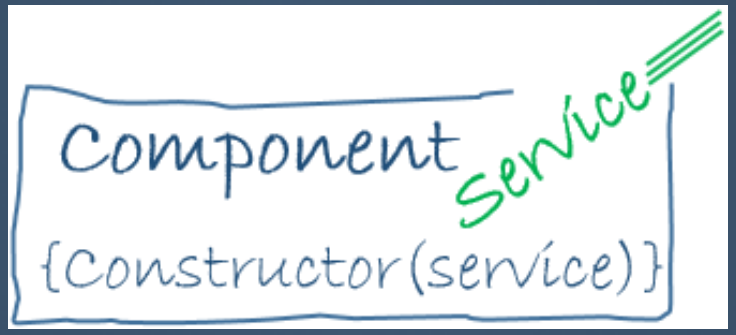
BMI calculator ng2

- Main Component
- Form Component
  - Model
  - Form template
- Slider components

Services and Dependency Injection



What is DI?



Creating a Service

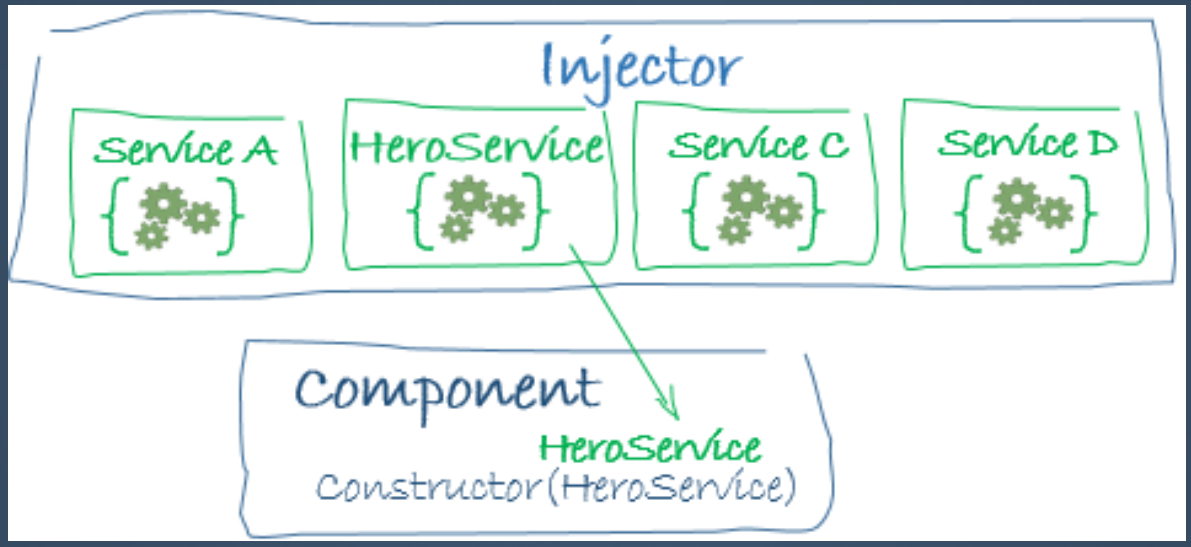
```
import { Injectable } from '@angular/core';


@Injectable()

export class Logger {

  logs: string[] = [];

  log(message: string) {
    this.logs.push(message);
    console.log(message);
  }

}
```

Using a service

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

import { Logger } from './services/logger';

@NgModule({
  providers:    [ Logger ],
  declarations: [ AppComponent, OtherComponent ],
  bootstrap:    [ AppComponent ]
})

export class AppModule { }
```

```
@Component({
  selector: 'person',
  // ....
})

export class PersonComponent {

  constructor(logger: Logger) {
     this.logger = logger;
  }

  someAction() {
    this.logger.log('Some action');
    // ...
  }
}
```

How does it work?



Let's code

BMI Calculator service