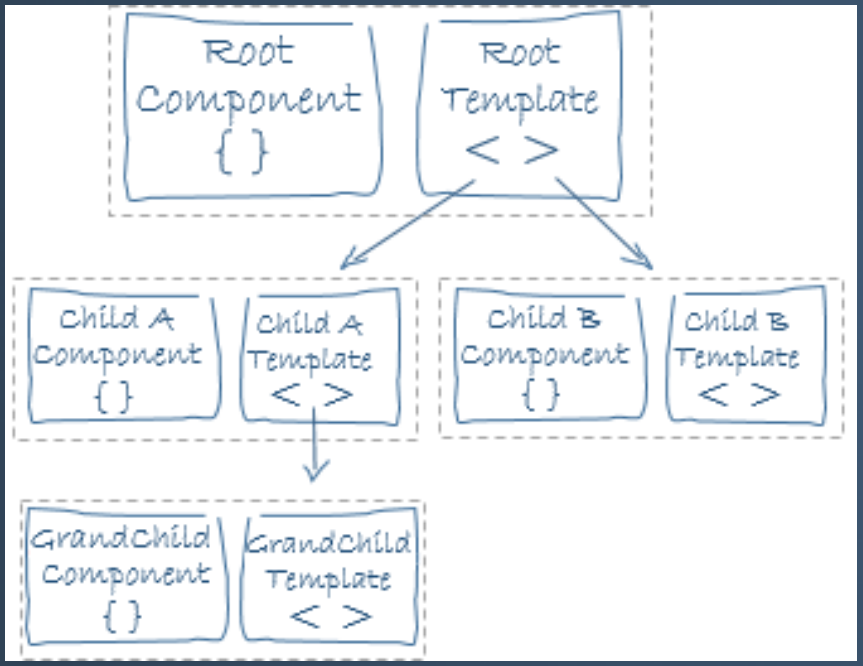
Angular 2 - Basics

Angular 2 -what?

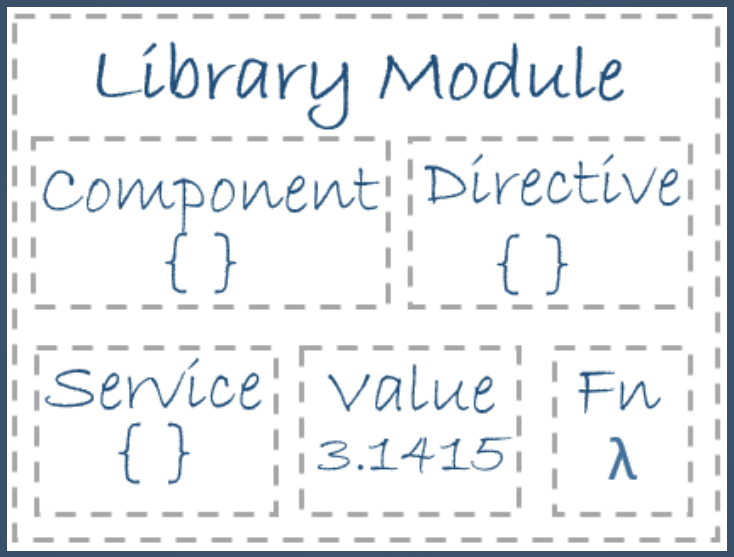
- Advance SPA framework
- Designed for big application, with complex GUI interfaces and logic (?)
- Build using TypeScript and modern tools for web development
- Strong push towards modularity and clean architecture

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

Module


Library Module
Component
{}
Directive
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Service
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Fn
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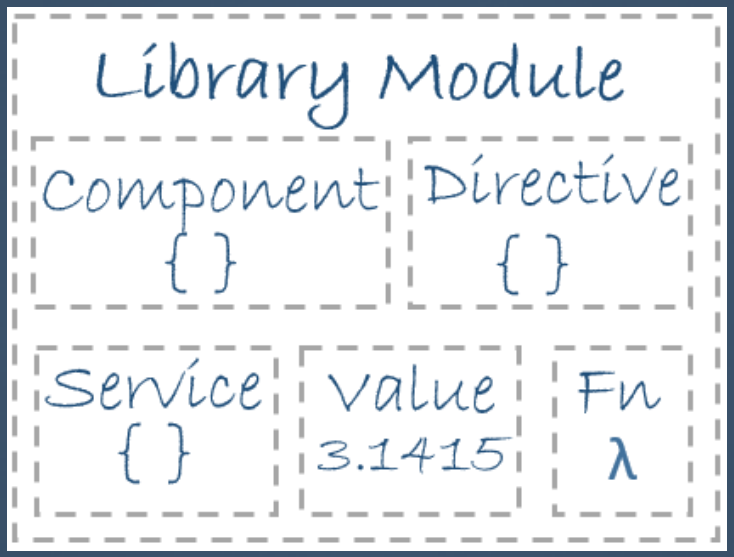
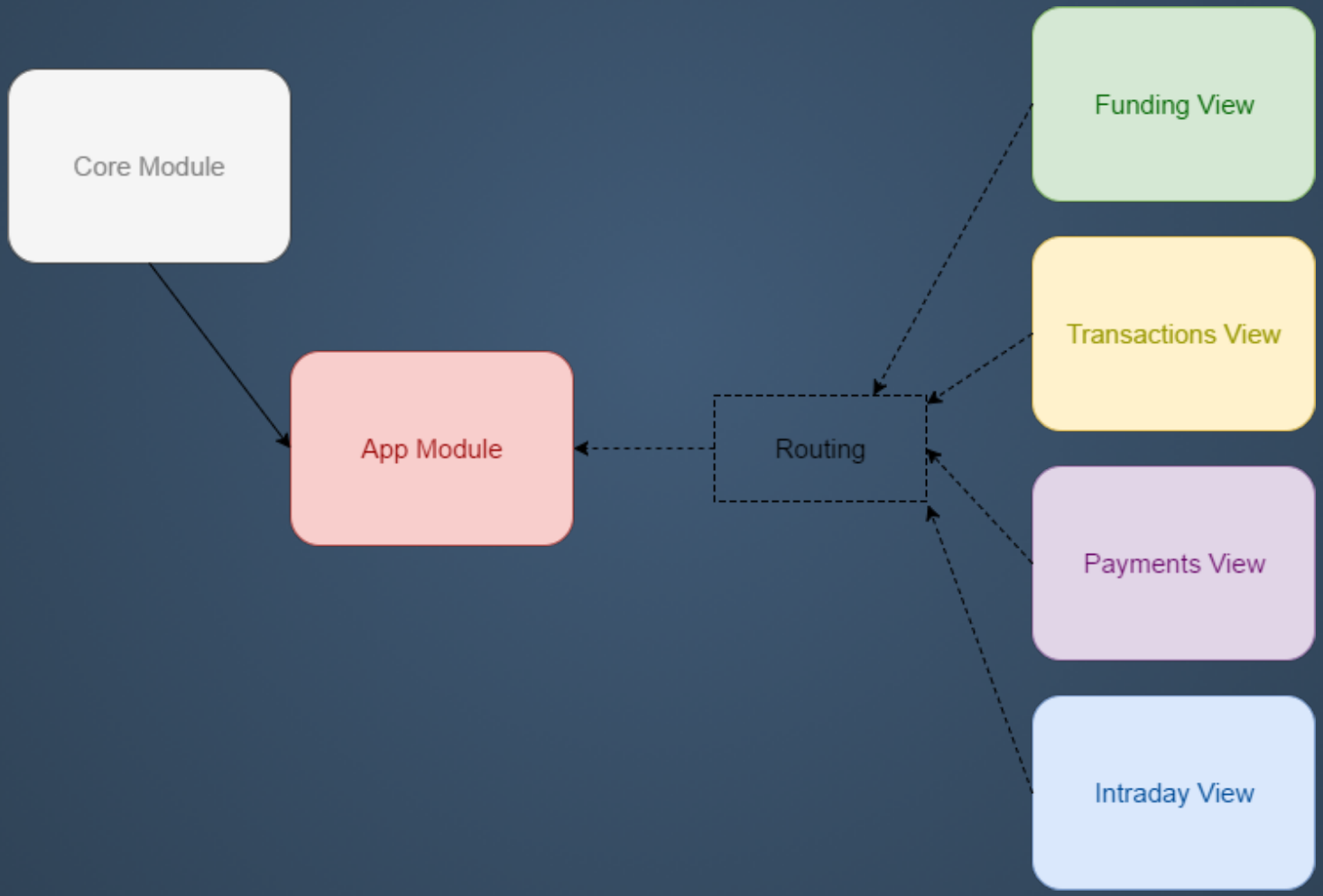
What is a module in NG2?



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';

@NgModule({
  imports:      [ BrowserModule, ModalsModule ],
  providers:    [ Logger ],
  declarations: [ AppComponent, OtherComponent ],
  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 ],
  exports:      [ ModalComponent, PromptComponent, FlyoutComponent ],
})
export class ModalsModule { };
```

Component

The building block of Angular 2 app

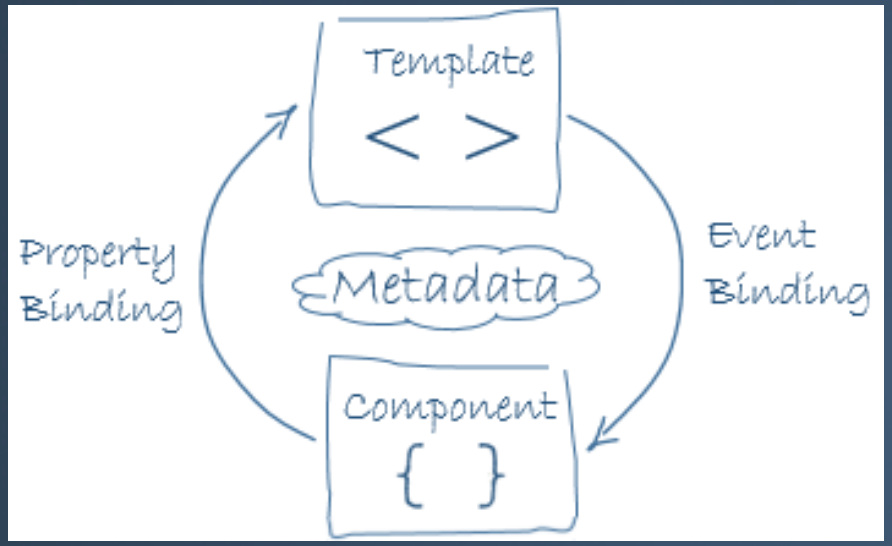
Simple component

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

export class PersonComponent {

  person: Person,

  showMessage: boolean;

  constructor() {
     this.person = new Person({ some: 'data' });
     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



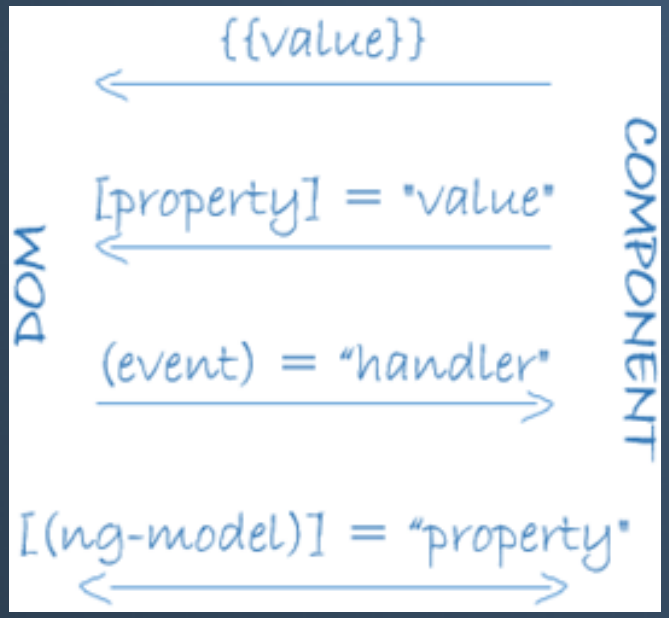
- Responsible for the given part of the screen
- Represents part of GUI functionality
- Encapsulated logic and data
- Defines data displayed in the template
- Reacts on template events

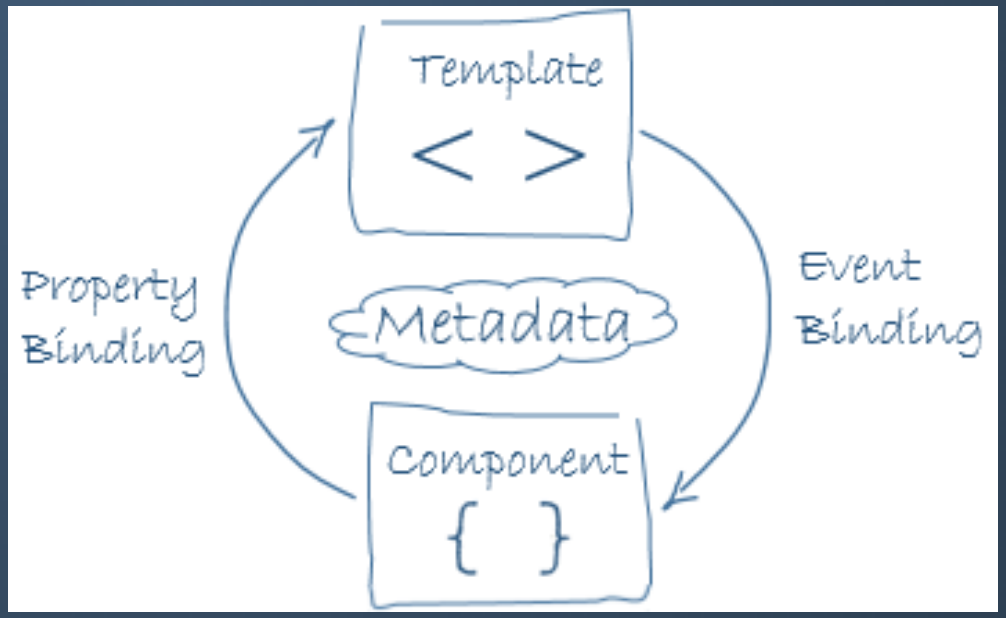
@Component decorator

- **moduleId**: sets the source of the base address (module.id) for module-relative URLs such as the templateUrl.
- **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.
- **providers**: array of dependency injection providers for services that the component requires

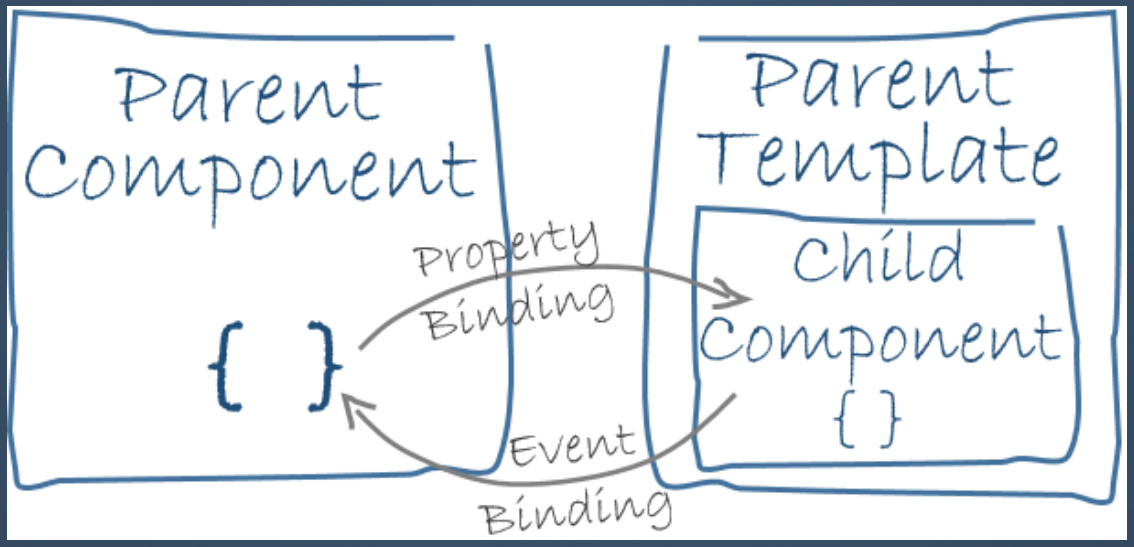
Template bindings

```
<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

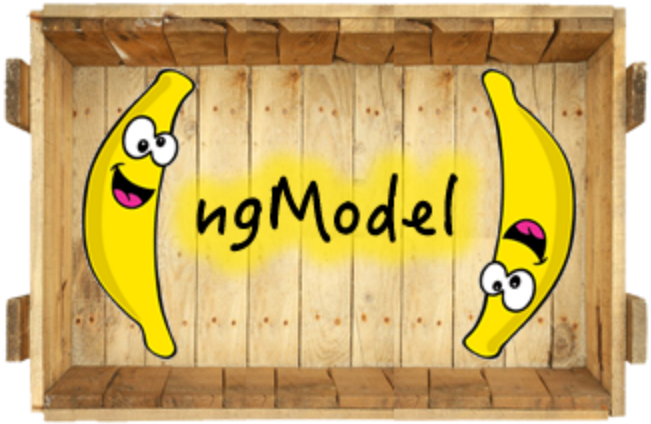
```
import { Component, Input } from '@angular/core';

@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',
  //....
})
export class PersonComponent {

    @Input() person: Person;

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

    //this is executed in the template, f.e. when the button is clicked
    delete() {
        this.onDelete.emit(this.person);
    }
}
// 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" name="name" [(ngModel)]="person.name" #spyField/>

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

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

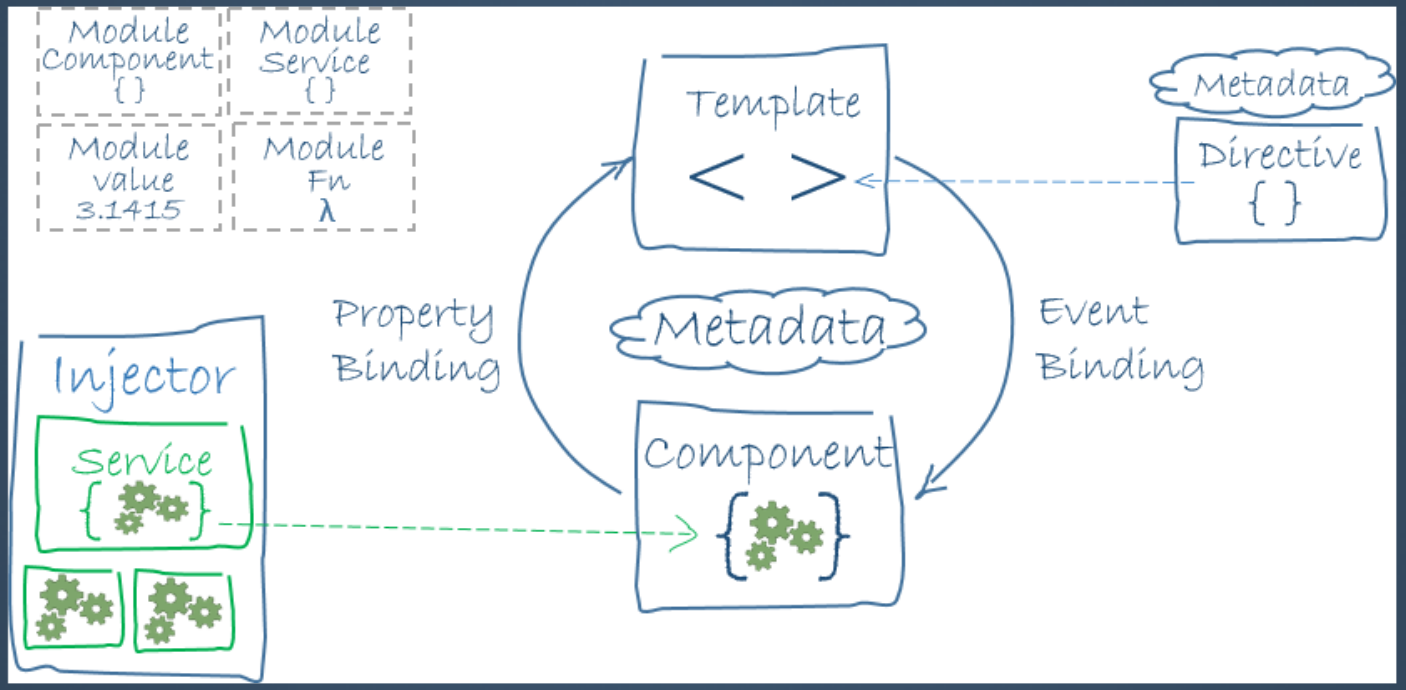
```
ng new ngbmi

cd ngbmi

ng serve
```

Let's code

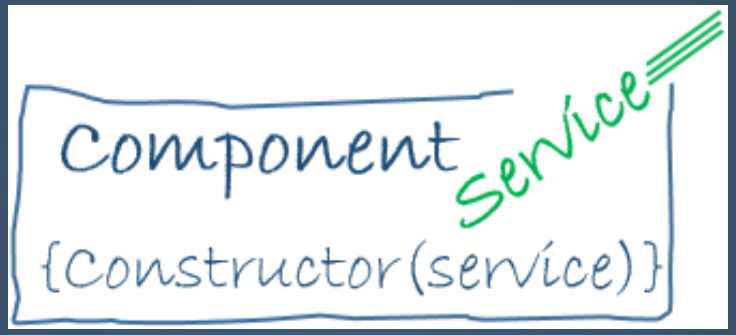
BMI calculator ng2

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

Services and Dependency Injection



What is DI?



Creating a Service

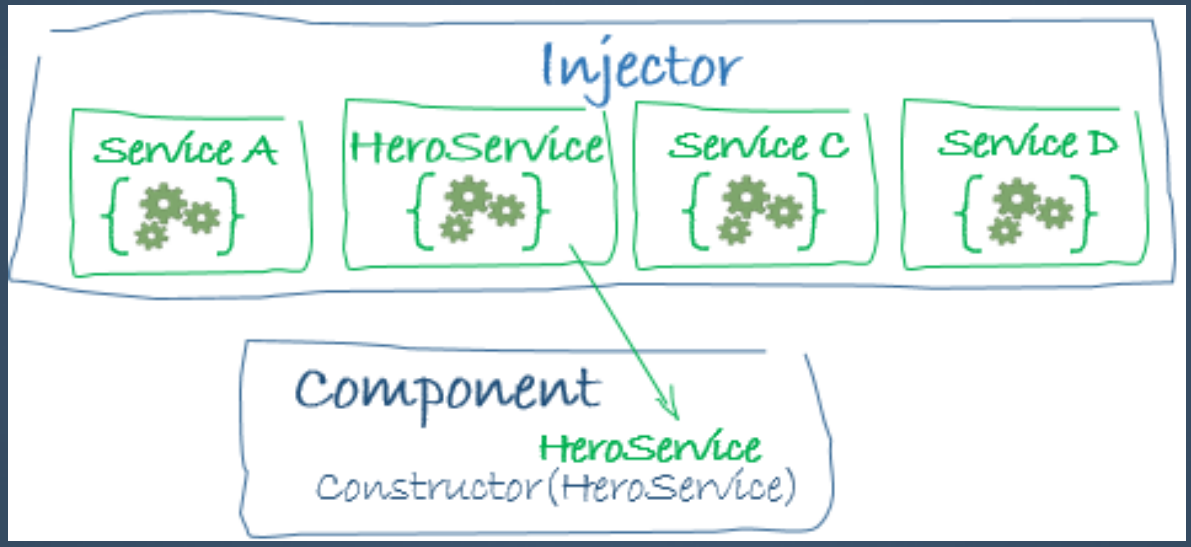
```
import { Injectable } from '@angular/core';


@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