Angular

2021/03/03

王晨帆 - Joseph

主題

- 1. Angular 簡介、Typescript介紹、Component
- 2. Service、Pipe、HttpClient與 Rxjs
- 3. Workshop

Angular 簡介

Angular 簡介

- 預設使用 Typescript作為開發語言，搭配 RxJS 處理非同步事件
- 搭配 Angular CLI 協助打包與專案開發
- Angular 內建已存在相當多功能，如 i18N 、SSR 、PWA等

Angular 簡介

- Angular 2 以後版本皆稱為 Angular，語法上差異不大，大多為底層效能優化
- 版本升級指南：NgUpgradeGuide
- Debug工具：Augury

IE Support

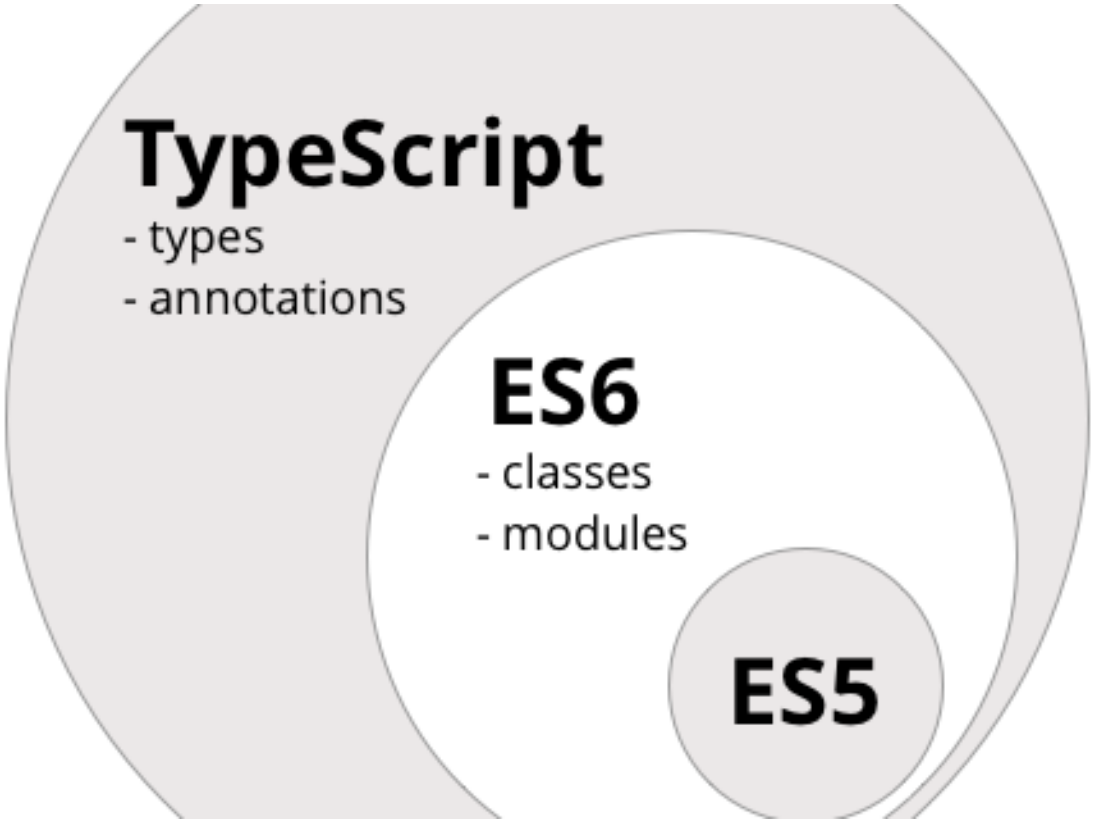
- Angular 10 Deprecating support IE 9、IE 10、IE mobile
- IE9, IE10 and IE mobile are no longer officially supported with Angular v11 and higher.
- IE 9, 10, and IE mobile support

Typescript

Typescript

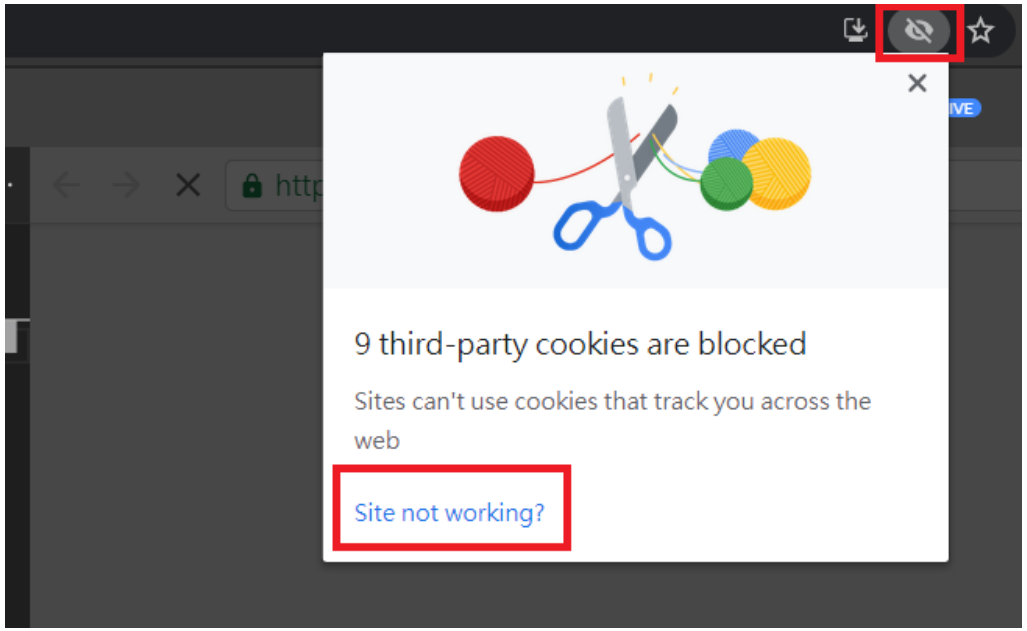
- Typescript = Javascript + 型別系統
- 協助在開發時期找出錯誤與降低錯誤，但無法100%避免錯誤
- 透過type 宣告偵測程式碼
- 只存在於開發時期，最終會被編譯成javascript
- 提供程式碼自動補完功能、定義跳轉與重構功能

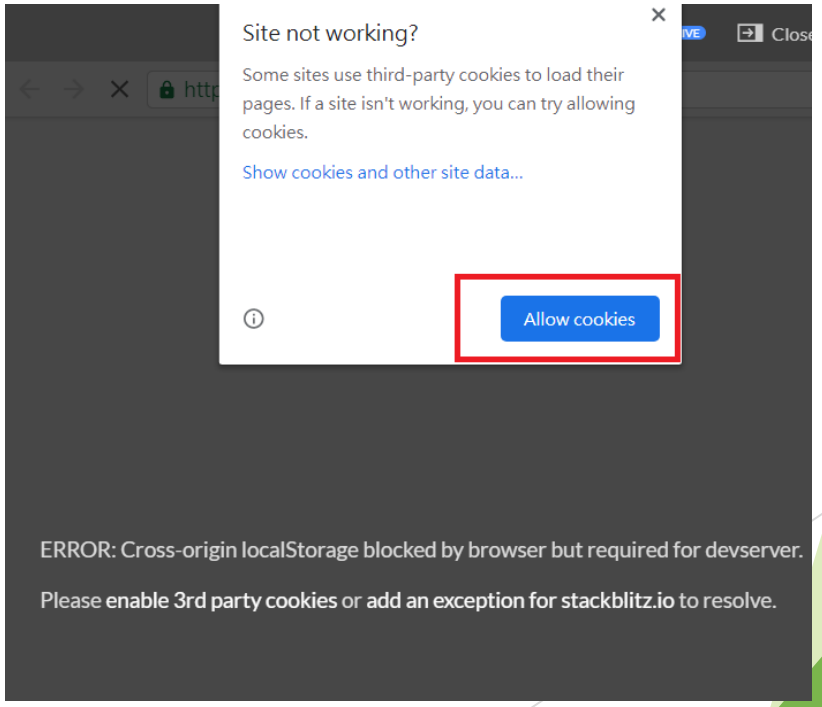
Typescript



Stackblitz

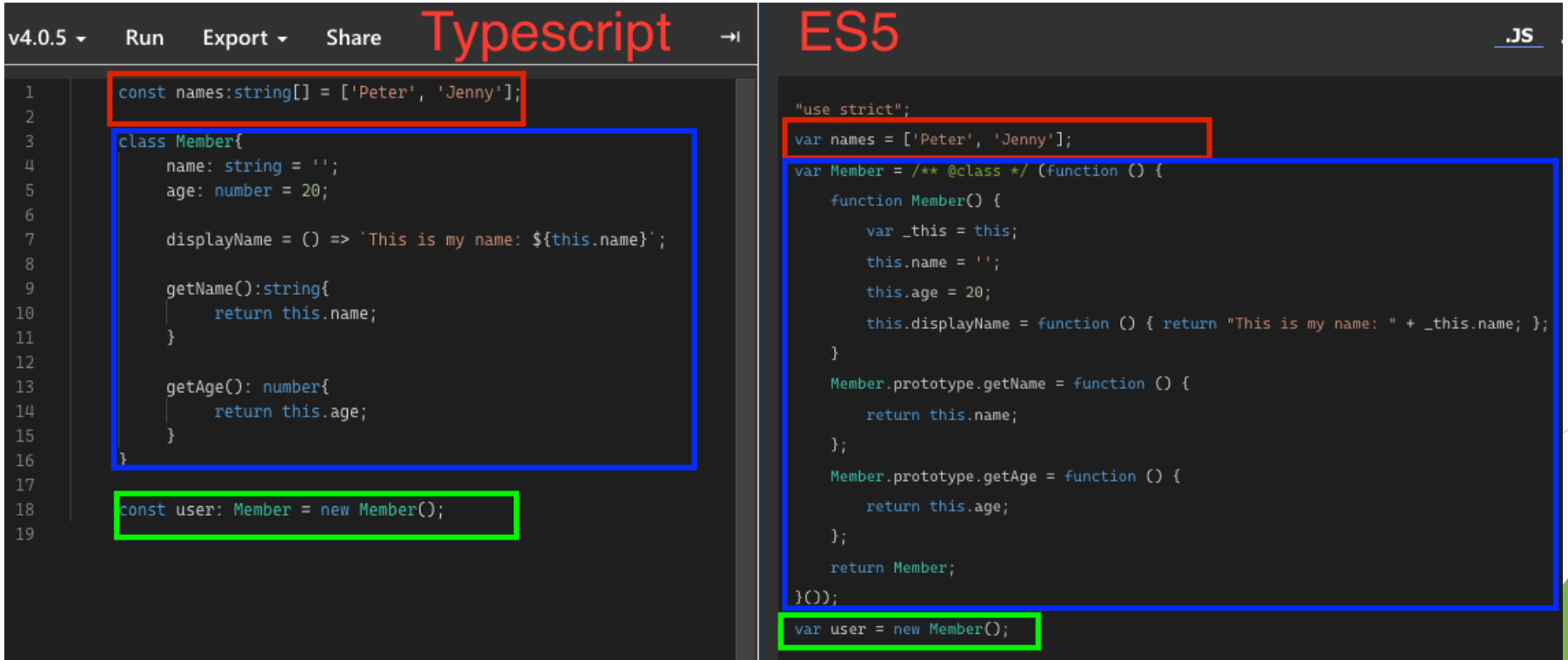
- Chrome 上需要允許3rd party cookie 才可正常使用





Typescript

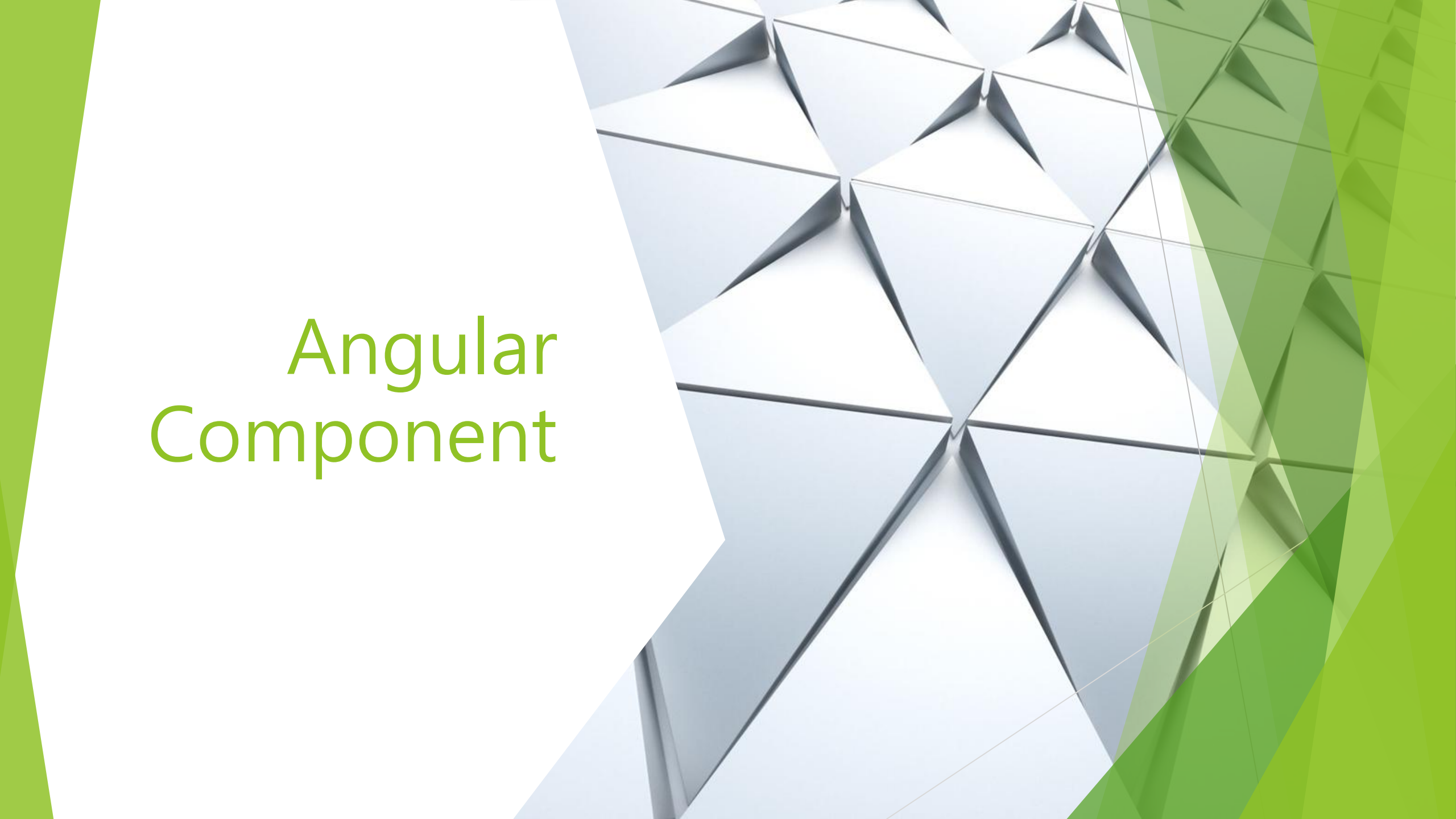
- Typescript in Angular demo
- Typescript Playground



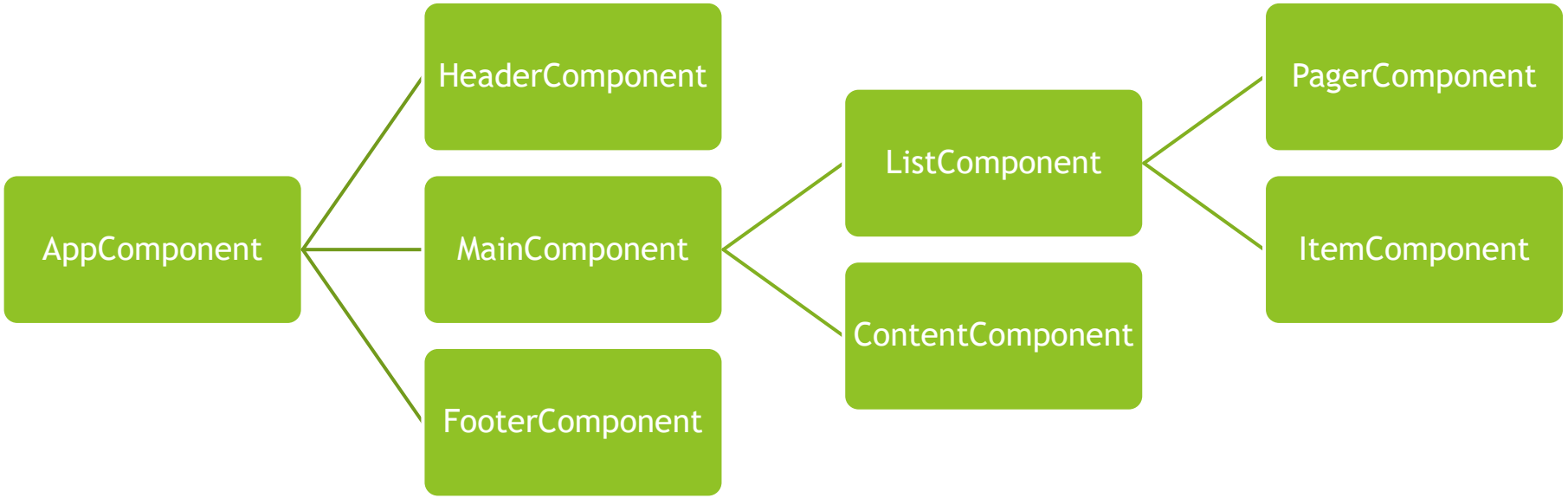
Typescript
相關網站

- Typescript
- Typescript新手指南

Angular Component



Component


AppComponent
HeaderComponent
MainComponent
FooterComponent
ListComponent
ContentComponent
PagerComponent
ItemComponent

Component

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

@Component({
  selector: 'app-my-app',
  templateUrl: './my-app.component.html',
  styleUrls: ['./my-app.component.css']
})
export class MyAppComponent implements OnInit {

  constructor() { }

  ngOnInit(): void {
  }

}
```

- 使用方式：在 html上使用

<app-my-app></app-my-app>

Component

import statement	Metadata/ Decorator	Typescript class
• import 相關 type	• 宣告 component selector • 指定 component template url 或是 inline template • 指定 component css 檔案或是 inline style	• 主要程式邏輯 • 呈現於畫面上之變數

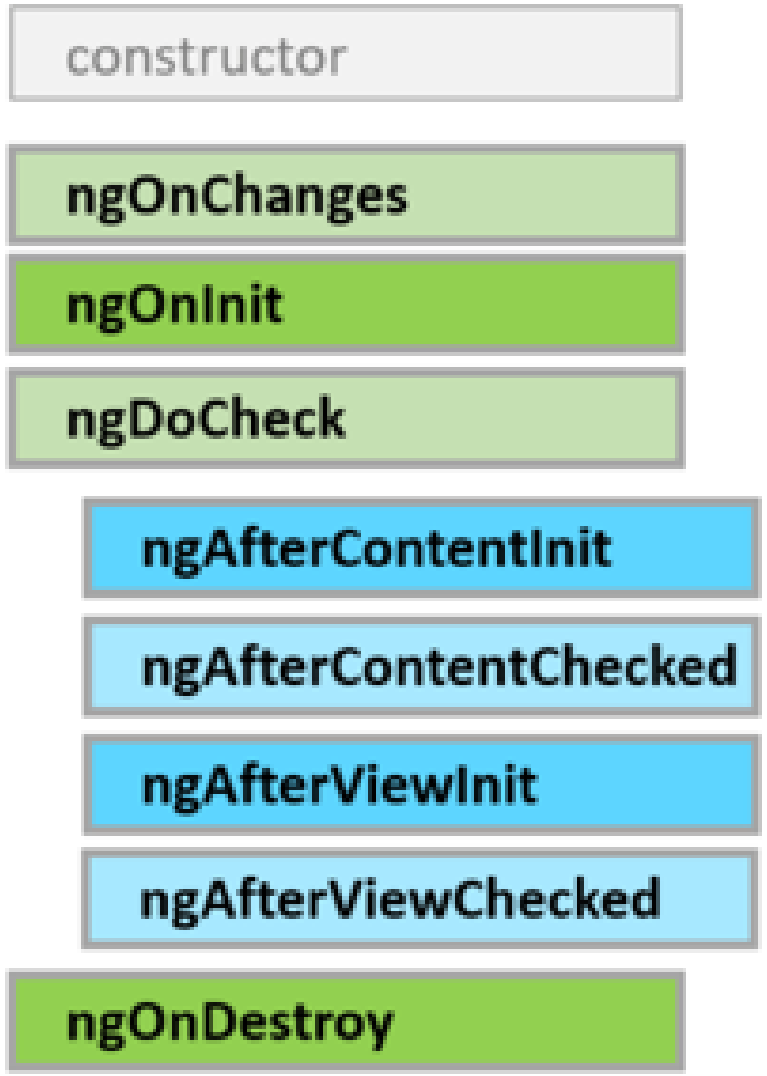
Component建立

- 透過 ng generate component my-app
  - 建立my-app目錄
  - 建立 my-app.component.(ts| html|spec|css)
  - 更新Module.declarations
  - 指令可簡寫為 ng g c my-app

Component Lifecycle Hooks

- **ngOnInit**: 當 Angular 完成目前 component 下所有@Input() 初始化後觸發

- **ngOnDestroy**: 當 Component要被銷毀時觸發



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Component
資料呈現與綁定

Interpolation

- 使用 {{ expression }} 可在畫面上呈現 expression結果
- Interpolation 範例
- 官網

Attribute Binding

- 使用 [attr] = "expression" 讓HTML屬型參考到 expression 結果
- Attribute Binding 範例
- 官網

Event Binding

- 以 (event) = “expression” 方式處理事件觸發，
- Event 發出的內容會指派到 $event 變數
- Event Binding 範例
- 官網

Two-way Binding

- 使用 [(ngModel)] = "varaible" 建立雙向連結，主用於 html input element上，如 input、 select
- *必須先在 Module import 處加入 FormsModule，否則會出現錯誤
- Two-way Binding 範例
- 官網

```
Can't bind to 'ngModel' since it isn't a known property of 'input'. ng
Peek Problem (⌥F8)    No quick fixes available
<input [(ngModel)]="title" />
```

```
@NgModule({
  declarations: [
    AppComponent,
    Comp1Component,
    Comp2Component,
  ],
  imports: [
    BrowserModule,
    FormsModule
  ],
  providers: [],
  bootstrap: [AppComponent]
})
export class AppModule { }
```

Structural Directives

- 在 template上會刪除或新增 element至 DOM中的語法，稱為 structural directive
  - *ngIf
  - *ngFor
- 加上 * 表示為語法糖，是簡寫過後的語法，如*ngIf
- 同一個 element上只可存在一個 structural directive
- Structural Directives

*ngIf

- 在給定條件滿足時，才將 element 加入 DOM中
- <elem *ngIf="condition | expression">Hello World</elem>
- *ngIf 範例程式

*ngIf

```
<app-root _nghost-kxn-c40="" ng-version="11.1.2">
  <label _ngcontent-kxn-c40="" for="">NgIf Test</label>
  <!--bindings={ "ng-reflect-ng-if": "true" }-->
  <button _ngcontent-kxn-c40="">Click me</button> event
</app-root>
```

點擊前

```
<app-root _nghost-nao-c40="" ng-version="11.1.2">
  <!--bindings={ "ng-reflect-ng-if": "false" }-->
  <button _ngcontent-nao-c40="">Click me</button> event
</app-root>
```

點擊後

*ngFor

- 使用迴圈遍歷資料並運用於 template
- <elem *ngFor="let item of items">{{item}}</elem>
- *ngFor 範例程式

@Input 接收外部參數

- 自定義 component 接收外部傳入參數
  - 如 <app-my-comp1 [title]="'This is title'"></app-my-comp1>
- 在 component內變數加入 @Input() 於變數前即可
  - @Input() name: string;
- @Input() 範例

@Output 輸出事件

- 自訂 component提供 event binding 方法
  - 如 <app-my-comp1 (btnClicked)="onBtnClicked()"></app-my-comp1>
- 在 component變數前加入 @Output()，資料型別為 EventEmitter
- @Output 範例程式

Pipe

Pipe

- 可用來將資料轉換為其他形式呈現於畫面上，並且不異動原本之資料
- 用法為在 template 上加入 value | pipeName[:params]
- Angular Builtin Pipes

{{ 20000000 | number }} <= 2,000,000
{{ 2000000 | currency }} <= $2,000,000.00

自訂Pipe

- ng g p myCustomPipe
- 透過Angular-CLI會自動在 module declaration處加入 pipe 資訊
- 實做PipeTransform interface
- Pipe 範例程式

Service

Service

- Service負責**處理複雜邏輯**與**儲存共用資料**
- Component中以 DI 方式使用Service
- 依照 Service 註冊方式差異，會有所不同

Service

- ng g s service-name
- Service宣告方式：
  - 在Module.providers中註冊
  - Decorator中設定 ProvidedIn

註冊 Service

```
@Injectable({
  providedIn: 'root'
})
export class AuthService {

  constructor() { }
}
```

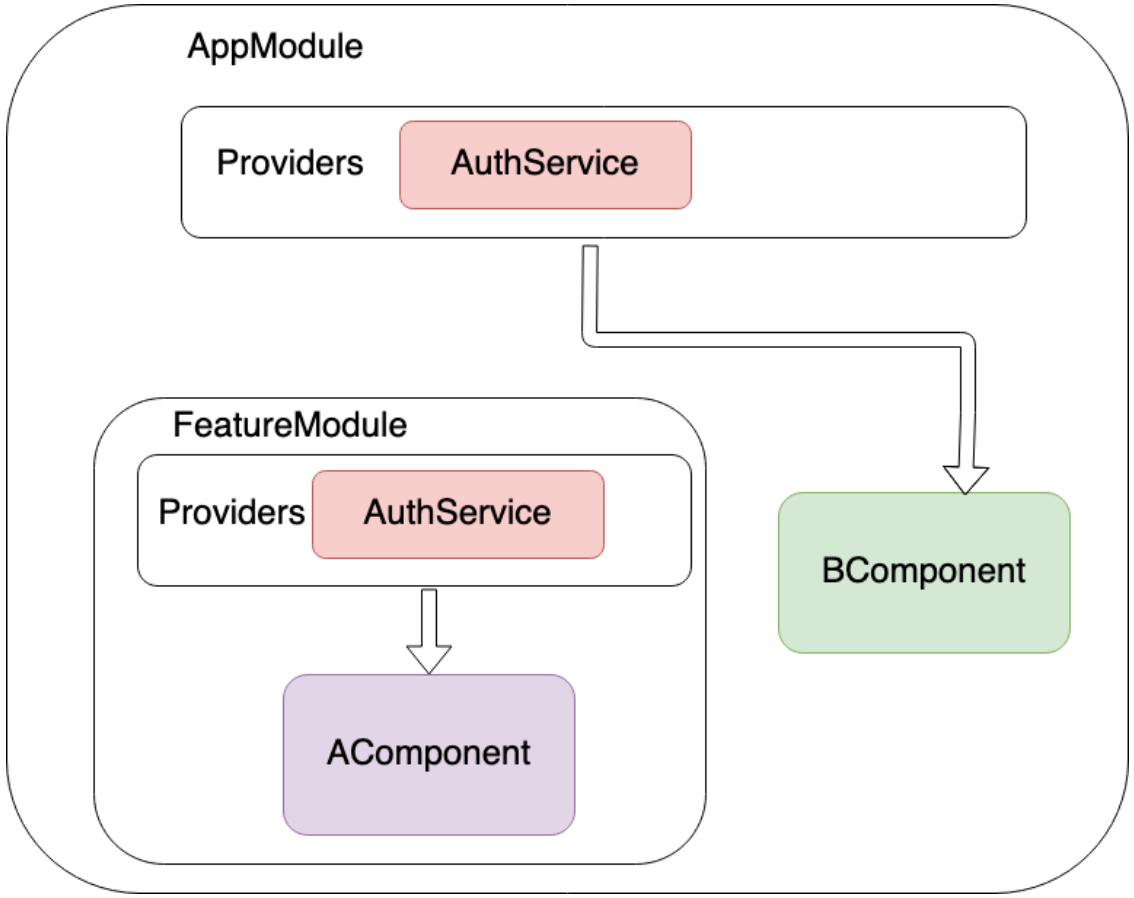
註冊 Service

```
  imports: [
    BrowserModule,
    FormsModule
  ],
  providers: [AuthService],
  bootstrap: [AppComponent]
})
export class AppModule { }
```

```
@Injectable()
export class AuthService {

  constructor() { }
}
```

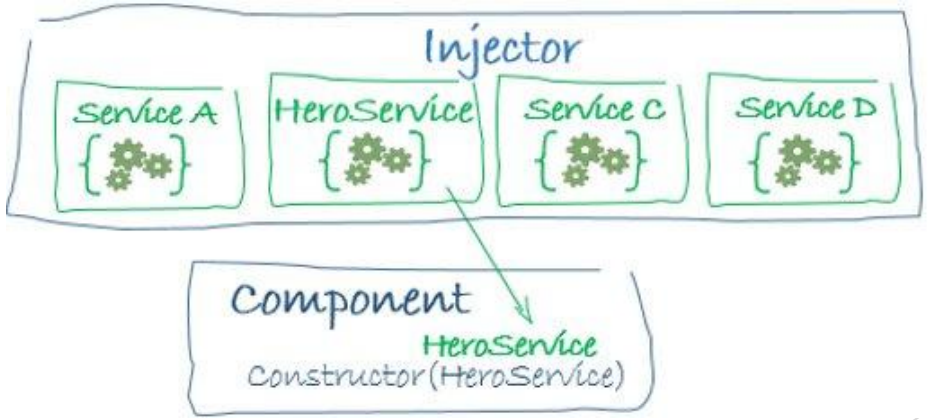
註冊 Service


AppModule
Providers
AuthService
FeatureModule
Providers
AuthService
AComponent
BComponent

Service

- 在 component constructor 參數中加入service資訊即可將 service 注入 component
  - constructor(private authService: AuthService){}
  - 如果沒有加入 private或 public，則只能在 constructor中使用

- Service範例程式



HttpClient & RxJS

HttpClient

- Angular透過HttpClient 處理 HTTP請求
- Module中必須import HttpClientModule，後續才可將HttpClient注入 compoennt或 service中
- 以DI方式注入 component或 service中
- Angular httpClient 使用 Rxjs處理非同步請求

HttpClient

- GET:
  - httpClient.get<any>('Your url', options).subscribe(x=>{...})
- POST:
  - httpClient.post<any>('Your url', body, options).subscribe(x=>{...})
- HttpClient範例程式

RxJS 簡介

- *ReactiveX is a combination of the best ideas from the Observer pattern, the Iterator pattern, and functional programming*

- *要執行訂閱(subscribe) 才會執行

- 如果有未結束的 Observable，在component destroy phase 中要記得**取消訂閱(unscribe)**

Observer

- Observer物件包含 next, error 與 complete 三個callback 提供給Observable 做使用
- next: 當observable 發出data時，會使用此 next callback
- error: Observable 中出錯即會使用 error function callback
- complete: 當 Observable 完成後，會使用 complete callback

Observable訂閱

- someObservable.subscribe(nextCallback, errorCallback, completeCallback)

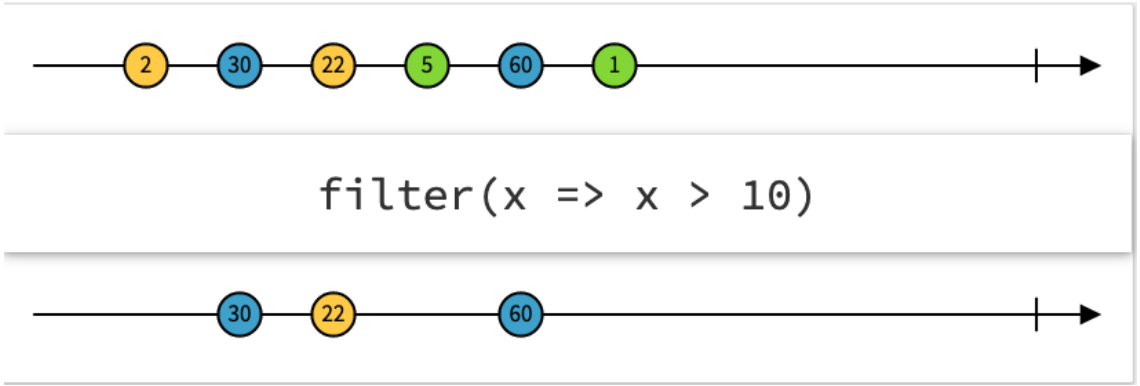
- Observable 範例

Operator

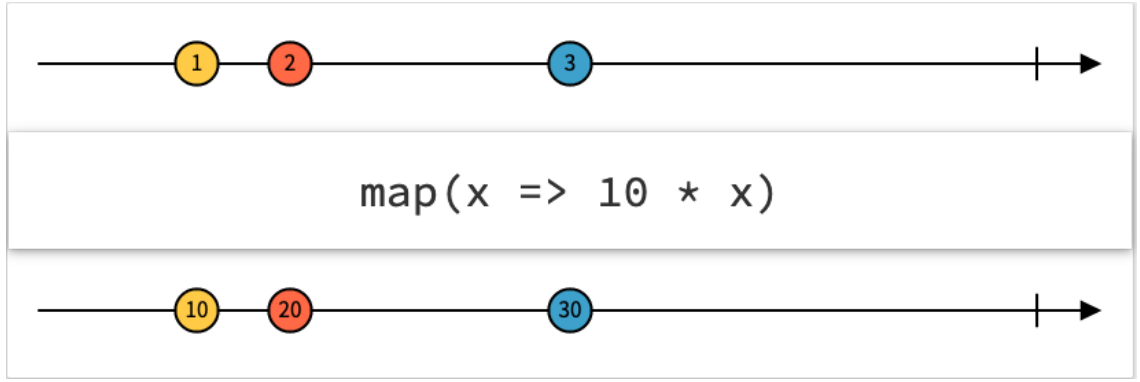
- 常用 Operator:
  - map: 將傳入的資料做轉換，並將轉換後資料往下繼續傳遞
  - filter: 篩選符合條件的資料才往下傳遞
  - tap: 可在此 operator處理任何事情，並以同一個 Observable繼續往下傳遞

Marble diagram

- Filter

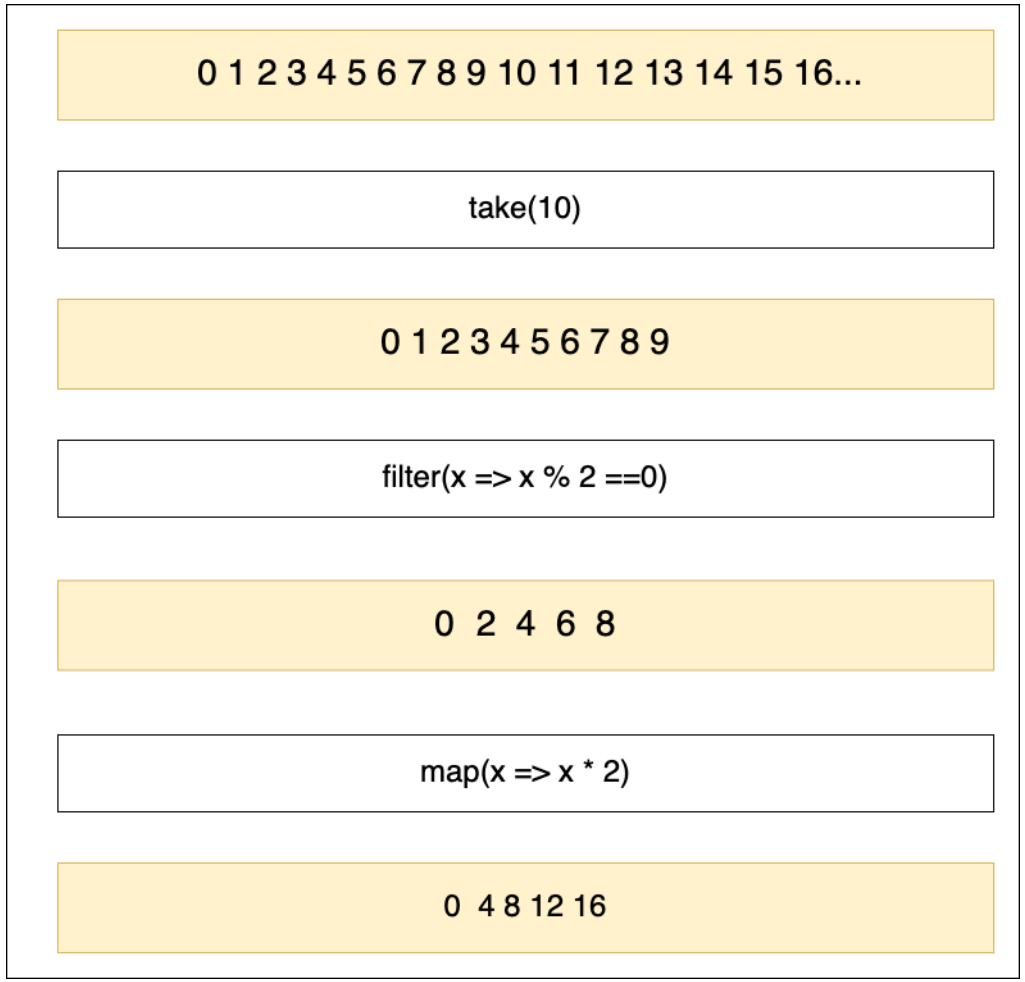


- map



Operator

- Operator 範例



map =>
tap x => 品質檢測/ 秤重
filter x => x ===
take(10)
最後只會拿到10筆結果

RxJS 相關資源

- 希望是最淺顯易懂的 RxJS 教學
- Observable on Angular
- 30 天精通 RxJS (01)：認識 RxJS
- Marble Diagram

Workshop

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- New charges allege Proud Boys prepped for Capitol insurrection - CNN
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- 'The Democratic version of John McCain' - POLITICO
- More COVID-19 vaccine megasites open nationwide, including at Yankee Stadium - CBS News
- California's governor, once praised, faces backlash over pandemic response - The Guardian
- Chiefs QB Patrick Mahomes expected to have toe surgery following season - NFL.com
- As Vaccines Raise Hope, Cold Reality Dawns: Covid-19 Is Likely Here to Stay - The Wall Street Journal
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The Hopes That Rose and Fell With GameStop - The New York Times

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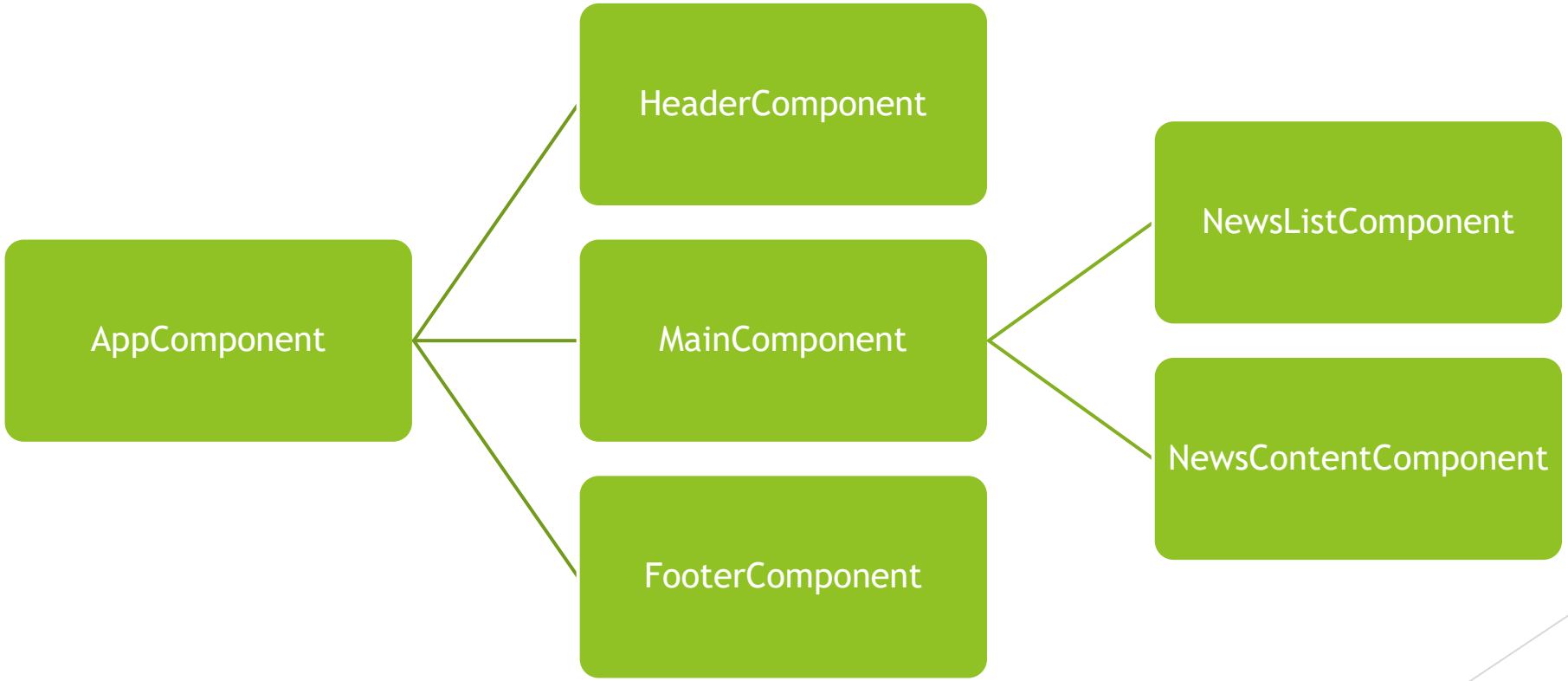
Component 設計



Header

- 1. 紀錄目前選擇國家，下次進入時畫面時套用相同國家設定，預設為**美國(us)**
- 2.切換國家時，連動切換文章列表內容

Main-Component

- 1. 預設顯示Business 類別
- 2. 頁籤切換時，連動切換文章列表內容

Main-Component

- 透過 DI注入 NewsService
- 透過 getCategory取得類別
- 透過 ngFor呈現類別資訊
- 透過 click事件紀錄目前選項
- 使用 [class.is-active]="true/false" attribute binding來決定 element 是否套用 class

News-List

- 1. 自API 抓取新聞資料
- 2. 抓完文章後，預設選取第一則新聞 ，並標示目前被選取到的新聞

News-List

- 將 news資料呈現至畫面上
- 記錄目前選取資料，預設為第一筆資料
- 透過 click 事件記錄目前 index(ngFor 中可取得目前資料 index => *ngFor="let item of items; let i = index")
- 被選取項目套用 class.has-background-primary 與 class.has-text-white-bis

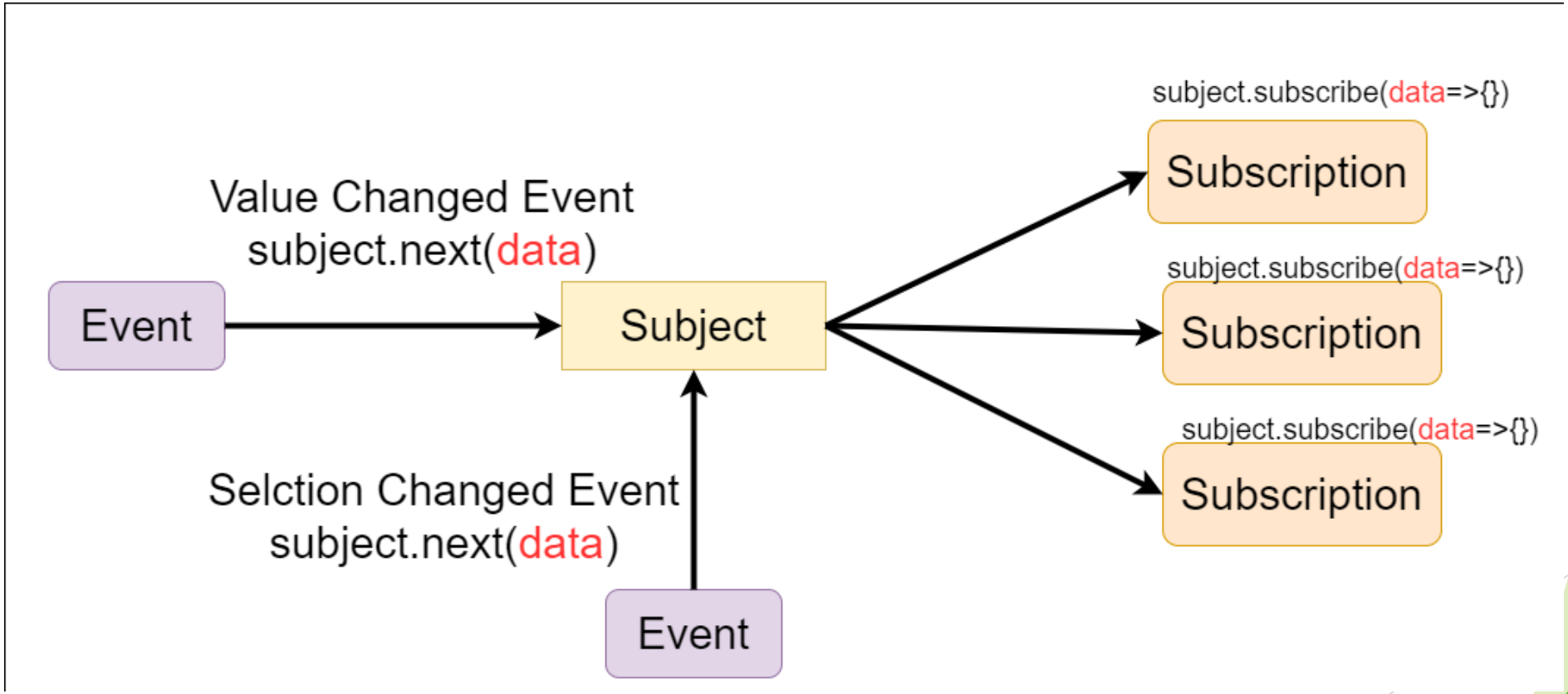
News-Content

- 1. 顯示目前被選擇到的新聞內容
- 2. 發佈時間顯示規則： N 秒前、N分鐘前、N小時前、N天前、N月前、N年前
- 3. 新聞無圖片時，不顯示圖片

News-Content

- 從 NewsList中透過 newsChangedSubject.next方法送出資料
- 從 NewsContent中訂閱 newsChanged$
- 套用 NewsContent版型
- 使用 publishAt pipe

Subject


subject.subscribe(data=>{})
Subscription
Value Changed Event
subject.next(data)
Event
Subject
subject.subscribe(data=>{})
Subscription
subject.subscribe(data=>{})
Subscription
Selction Changed Event
subject.next(data)
Event

News API

- API 連結：https://newsapi.org/docs/endpoints/top-headlines
- API key更新至 environment.ts

News API

- 開啟 environment.ts

序號	員工編號
1	87005
2	89002
3	97029
4	97060
5	99023
6	A4027
7	A9012
8	A9013
9	A9032
10	A0057
11	A9017
12	A9018
13	A9019

```
/**
 *
1: 87766146f8c44bc5abf6e30f19557a39
2: b73772ea993b4ac686aea7ccfd29a60f
3: da6264ab02ac4209aa6f571a5796156d
4: c1b17b93430c4b5db260c2f9292439f6
5: 373d6941579a44968e4e75665e6a2ebd
6: f3a45eeca2154c3984de5e85b65e46b4
7: 2ba2934ab6ee40c79f68dac51c9d8524
8: 1cce5b28383240c9b9a2600c163e66e2
9: 19d534dc985b4b5383ff6e1313765aab
10: de1019e54bb045408cfbc5c5d21e1d59
11: b074733a290641fdaff52e08c34c03f6
12: 49dfc7ea47554e89b1bd5bfe5140024d
13: 5fc4dc6e50ec47dcae93a62fe366a663
```

News API

- API網站: https://newsapi.org/docs/endpoints/top-headlines
- Url: https://newsapi.org/v2/top-headlines
- 查詢條件：
  - country: 2-letter ISO 3166-1 code
  - category:類別(business, entertainment, general, health,science and technology)
  - pageSize: 每頁筆數(開發模式下最多100筆)

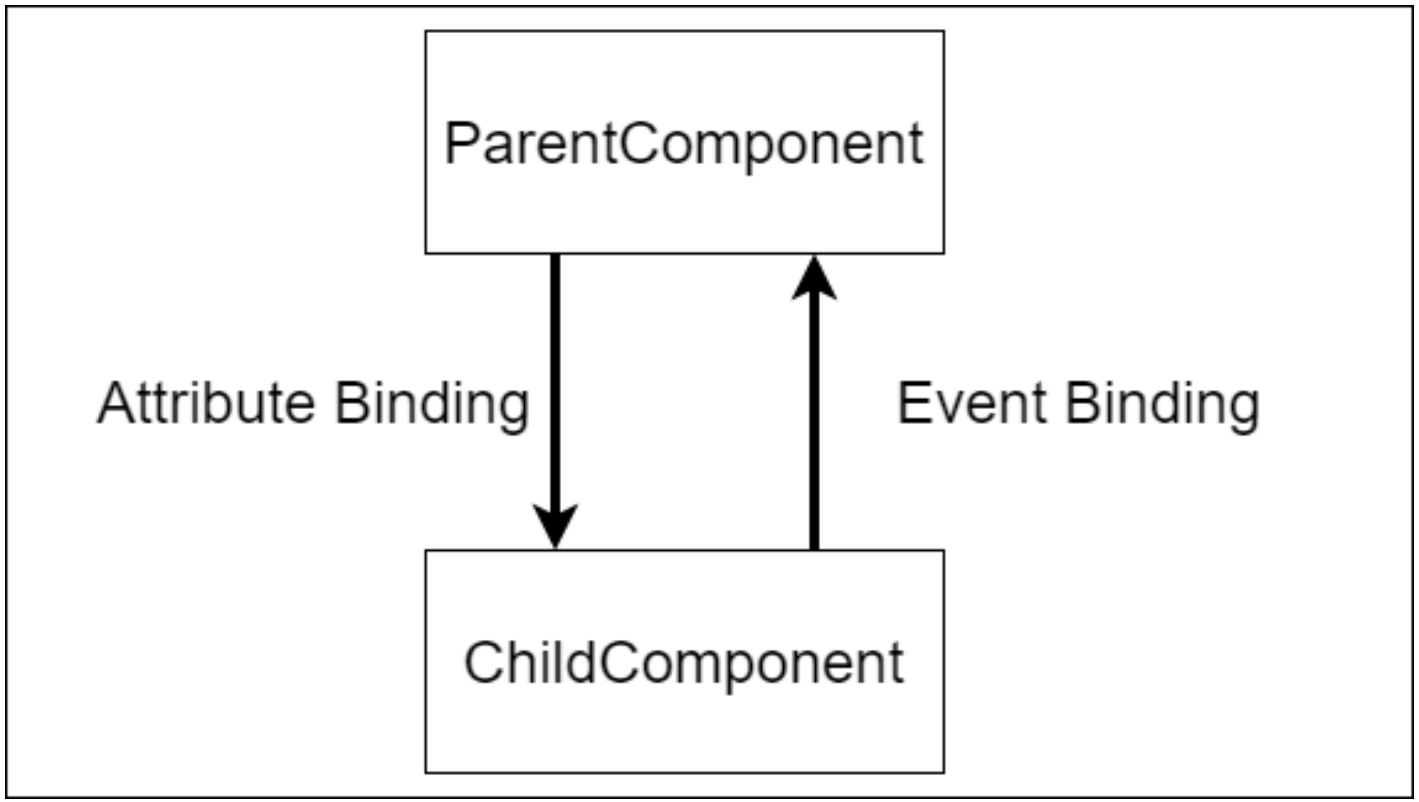
API Source

- import HttpClientModule in AppModule
- 使用 httpClient 測試抓取資料
  - https://newsapi.org/v2/top-headlines?country=us&category=general&q=&apiKey=${apikey}&pageSize=100

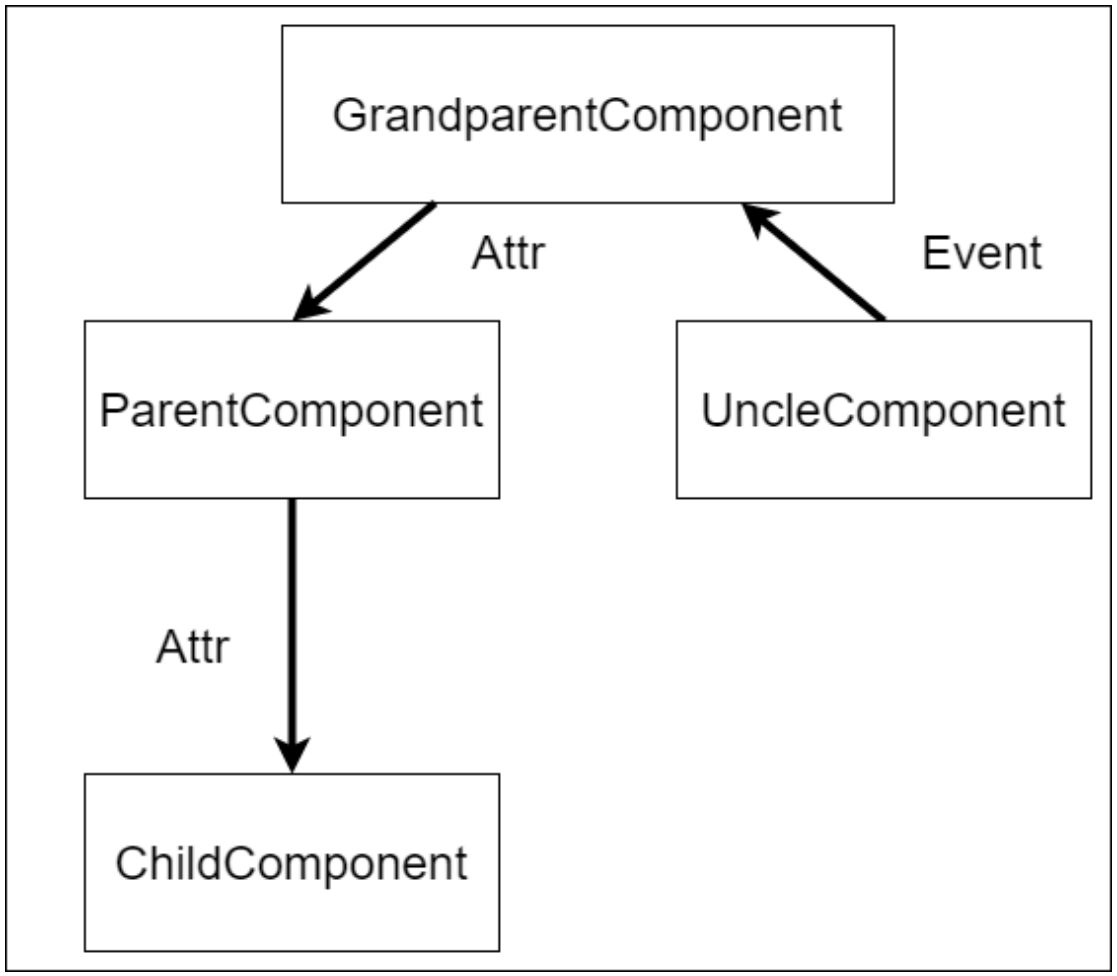
NgNews

- NewsService updateParamData中發送 next
- Header component中使用 newsService.updateParamData
- Main component中使用 newsService.updateParamData
- News-List 訂閱與取消訂閱

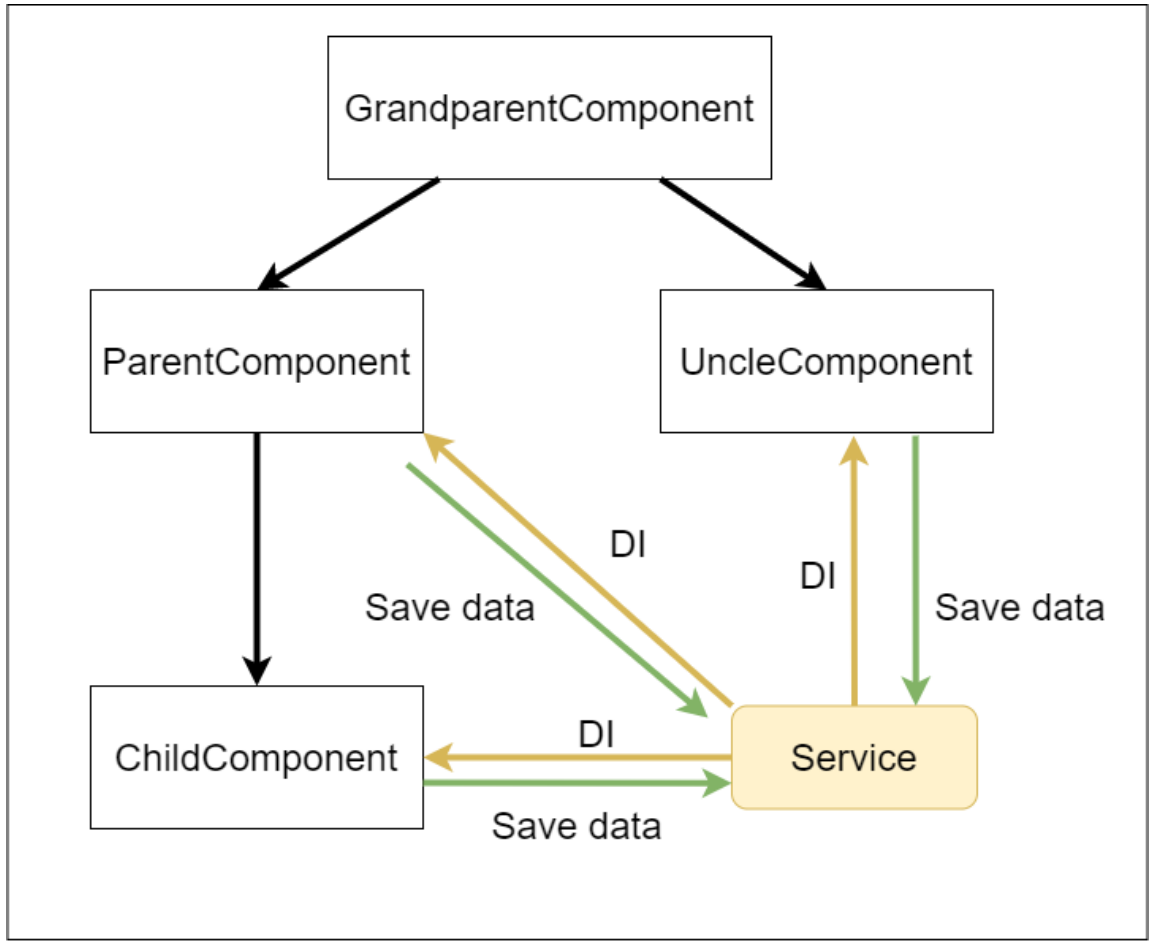
Component 資料傳遞



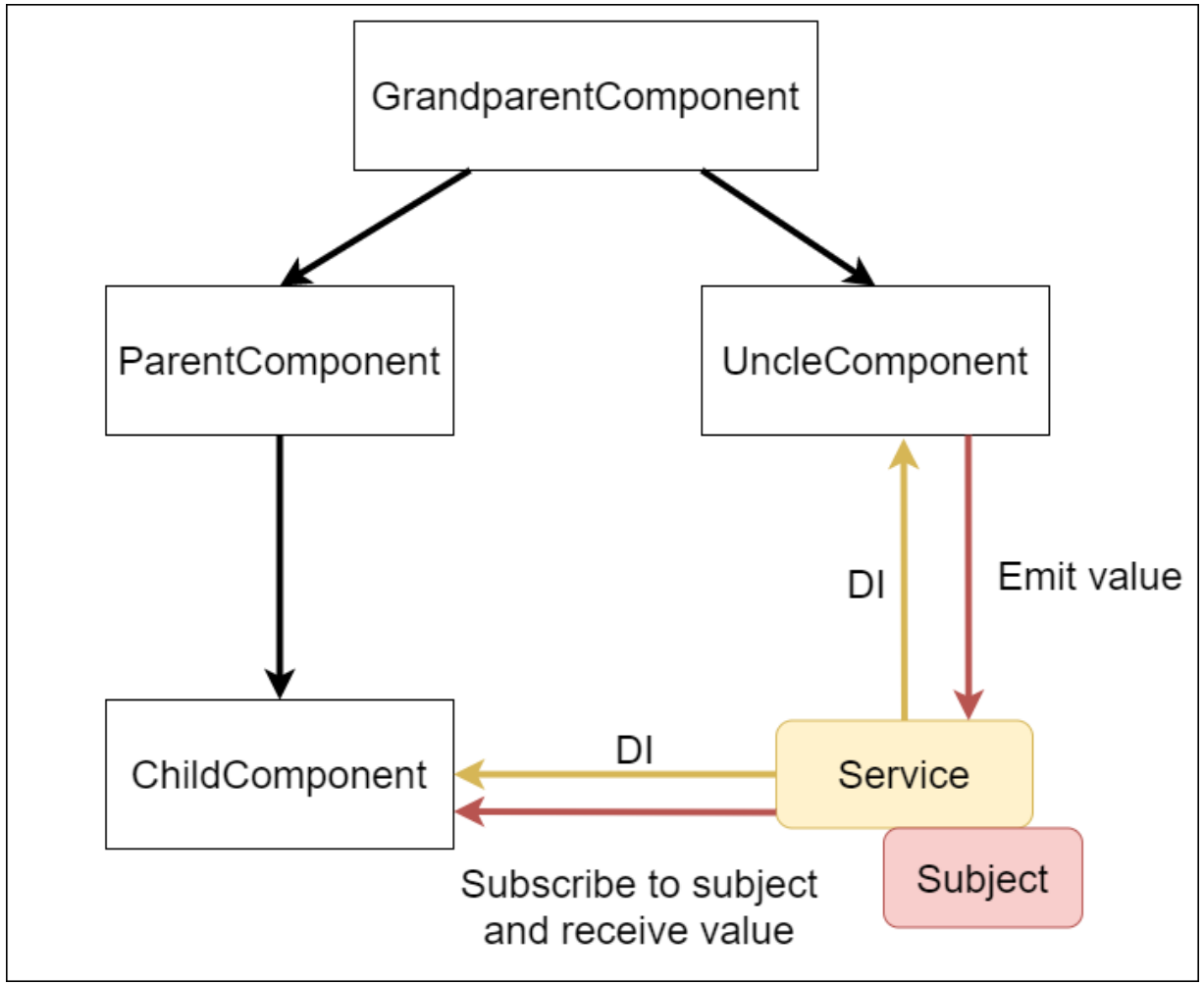
Component 資料傳遞



Component 資料傳遞



Component 資料傳遞



程式打包設定

IE不能動

- 如果要支援 IE，需要至 polyfills.ts中開啟設定
- 調整 tsconfig.json，target設定為 es5
- 調整.browserslistrc，移除 IE 前驚嘆號

baseHref

- 預設Angular 運行在 / 路徑下，如 https://helloworld.com/
- 如果要運行在 /app1 路徑下，
  如 https://helloworld.com/app1/，需要調整 baseHref 設定為 /app1/，否則會出現JS載入失敗之錯誤
  - 在angular.json上加入 baseHref，設定為 /app1/

environment

- 環境差異設定放於 environment.ts中
- environment.ts 會在打包階段提換內容
- 需要在 angular.json 中定義不同環境所使用的 environment

```
"configurations": {
  "production": {
    "fileReplacements": [
      {
        "replace": "src/environments/environment.ts",
        "with": "src/environments/environment.prod.ts"
      }
    ],
    "optimization": true,
    "outputHashing": "all",
    "sourceMap": false,
    "namedChunks": false,
```

調整package.json

- --configuration 對應到 angular.json 中build設定
- 執行 npm run build/uat/sit
- build 官方文件

```
"scripts": {
  "ng": "ng",
  "start": "ng serve",
  "build": "ng build --configuration=production",
  "uat": "ng build --configuration=uat",
  "test": "ng test",
  "lint": "ng lint",
  "e2e": "ng e2e"
},
```

其他主題

- Routing
- Directive
- Forms
- Testing

Angular 相關 Library

- Angular-Material
- Ng-Bootstrap
- Ngx-Bootstrap
- PrimeNG
- NG-ZORRO
- Nebular

Thank you

- Angular.tw
- Angular Taiwan 論壇