NG-COURSE

Become an expert in AngularJS

Angular 2.x Architecture

Eyal Vardi

Site: http://ng-course.org

Blog: eyalVardi.wordpress.com

vard;

Agenda

- What is Angular?
- Bootstrap
- Injector
- Compile
- Resolvers (link)
- Tick ($apply)

NG-COURSE

Become an expert in AngularJS

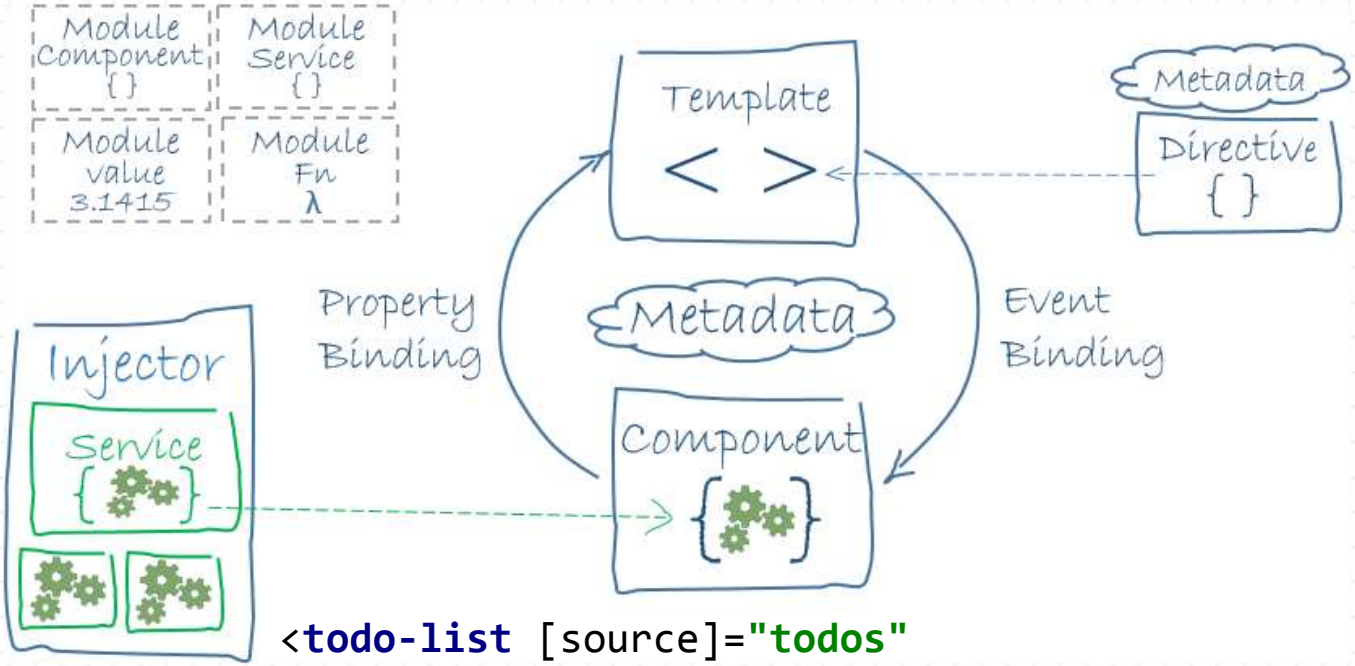
What is Angular 2?


10Bet
Lost Login?
Username/Email
Log In
Sports
Live Betting
Virtuals
Casino
Games
Live Casino
Mobile
Not a member? Join now!
Cash Out
Promotions
Banking
English
Decimal: (1.80)
19:31:47 (GMT)
March 9 Wed, 2016
Bet search
Top Events
Champions League
Europa League
Premier League
FA Cup
NBA
Live Betting
Today's Events
Soccer
Basketball
Tennis
Aussie Rules
Bandy
Badminton
Baseball
Beach Volleyball
Boxing
Cricket
Cycling
Darts
E-Sports
Floorball
Football
Golf
Handball
Horse Racing
Ice Hockey
MMA
Motor Racing
Olympic Games
Rugby League
Rugby Union
Snooker & Pool
Specials
Speedway
Table Tennis
Virtual Sports
Volleyball
Winter sports
Liverpool vs. Man Utd 10.03 | 20:05 Europa League
Liverpool 2.00 X 3.25 Man Utd
Welcome Bonus
€200
Get a 50% up to €200 bonus with your first deposit.
BONUS CODE: FD200
Join Now
Terms and Conditions Apply
Betting Highlights
09.03 | 19:45 Chelsea Paris St-Germain 2.50
10.03 | 02:30 Oklahoma City Thunder LA Clippers +5 1.95
10.03 | 18:00 Dortmund 1.55 X 4.10 Tottenham 5.70
10.03 | 18:00 Fenerbahce 1.71 X 3.55 Braga 5.10
10.03 | 18:00 Basel 3.45 X 3.40 Sevilla 2.10
Live Betting
110 Games Live Now
Soccer
2nd Half 45:00 St Pauli B 3.20 X 2.35 Hansa Luneburg 2.70
Vasalund Essinge 1.04 X 7.00 Frej 71.75
Brazil [W] 1.86 X 2.50 Canada [W] 5.60
Sport Boys Warnes 4.50 X 3.45 The Strongest 1.66
2nd Half 77:10 Deportivo Malacateco 3.5 1.76 Dep Mictlan 3.5 1.95
2nd Half 73:19 Union Comercio 2.25 X 2.00 Cajamarca UTC 5.60
HT 45:00 Vasco da Gama U20 2.10 X 2.60 Macae U20 4.00
HT 45:00 Flamengo U20 1.18 X 5.50 Madureira U20 11.50
HT 45:00 Maracana 1.14 X 6.35 Crato 12.25
2nd Half 73:21 Monte Azul 2.80 X 1.64 Batatais 6.70
2nd Half 77:23 Santo Andre 4.25 X 1.51 CA Penapolense 4.65
19:30
Betting Slip
Single
Combo
System
Number of bets 0
Total cost 0
Total return 0
Place Bets
Quick Bets
Europa League Treble
Dortmund, Sevilla, Fenerbahce to win
30.00
Win 167 EUR
New Player?
GET €200
BETTING BONUS
Go
Cash Out Your Bet
Control your single pre-match and live bets and enjoy an early payout before an event has finished!
Learn More
Virtual Sports
Virtual Soccer
Virtual Horses
Virtual Dogs
Need Help?
Our support team is here to help
Chat Live

Components

Building Blocks of an Angular 2

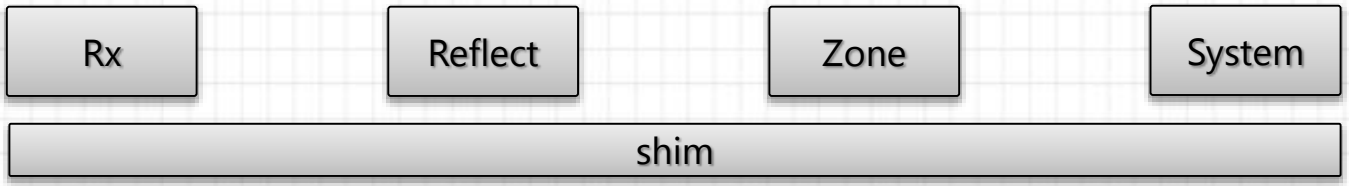
Application




```
<todo-list [source]="todos"
           (selected-change)="update($event)" />
```

Angular Frameworks

Libraries



```
@Component({
    selector: 'todo-list',
    styles: [`
    .done{
      text-decoration: line-through;
      color: grey;
    }`],
    template: `
    <ul class="list-unstyled">
      <li *ngFor="#todo of todos">
        <input type="checkbox" [(ngModel)]="todo.done">
        <span [class.done]="todo.done">{{todo.text}}</span>
      </li>
    </ul>`
})
```

```
{{exp}}
[property]="exp"
(event)   ="exp"
*ngIf     ="exp"
*ngFor    ="exp"
```

```
export class TodoList {

    @Output() selectedChange = new EventEmitter()
    @Input('source') todos: Todo[] = [];

    constructor(private db:Db, private proxy:Proxy){}
}
```

DOM Tree

```
<div class="container">
    <div class="starter-template">
        <a href="http://ng-course.org" target="_blank">
            <img src="images/ng-course.png" width="500">
        </a>
        <br>
        <my-app>Loading...</my-app>
    </div>
</div>
```

NG-COURSE

Become an expert in AngularJS

Bootstrap

Angular 2.0 Bootstrap

```
<html>
  <head>
    . . .
    <script src="shim.js"></script>
    <script src="zone.js"></script>
    <script src="Reflect.js"></script>
    <script src="system.js"></script>

    <script>
        System.import('app/main');
    </script>
  </head>
  <body>
      <my-app>Loading...</my-app>
  </body>
</html>
```

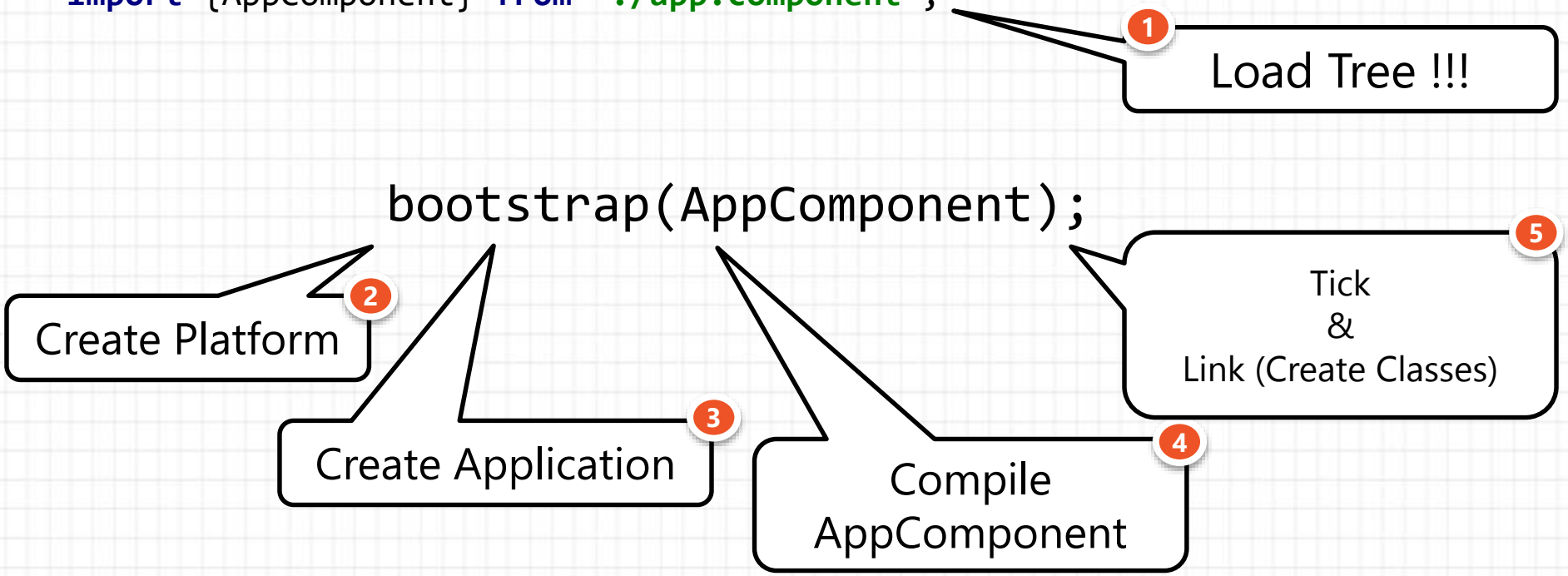
1

2

3

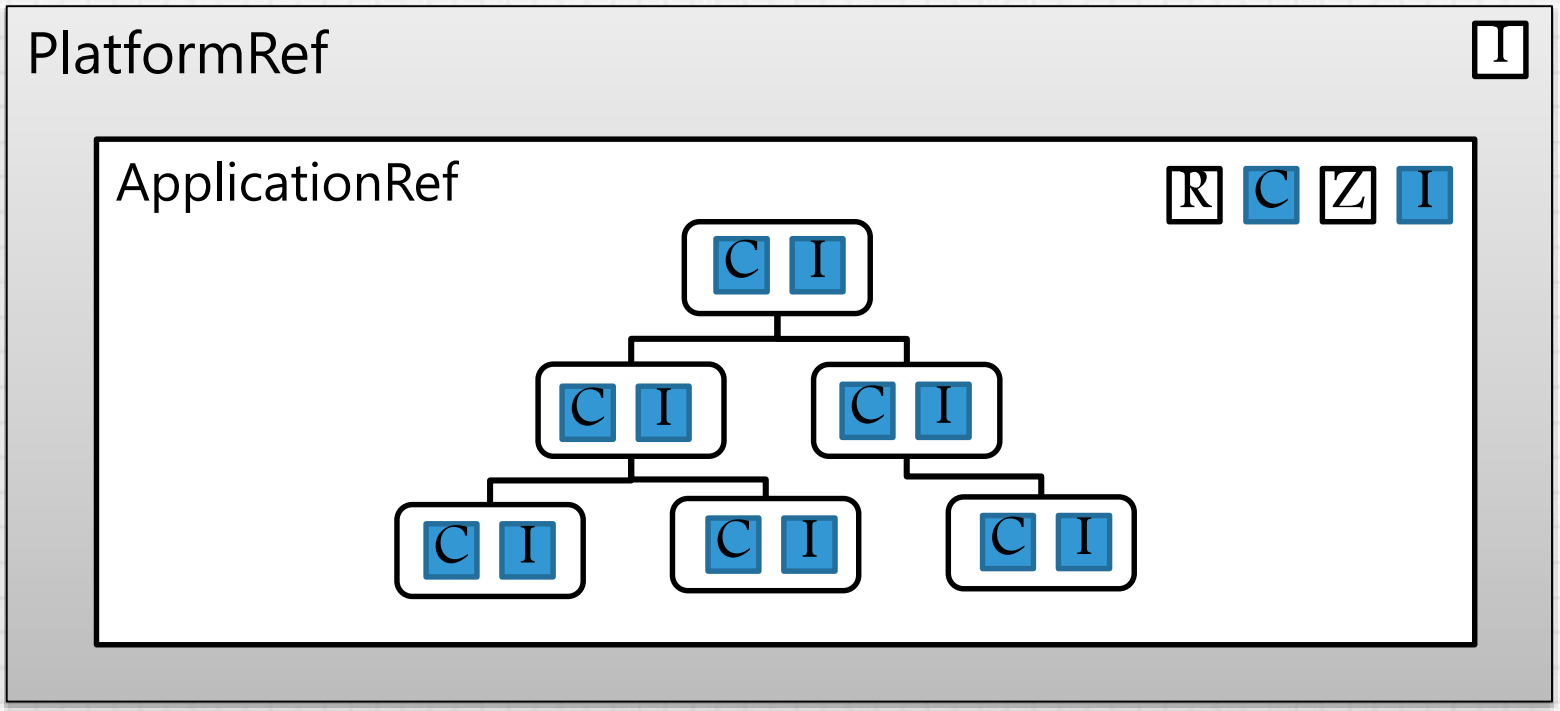
Angular 2.0 Bootstrap

```
import {bootstrap}    from '@angular/platform-browser-dynamic';
import {AppComponent} from './app.component';
```



PlatformRef

- Each page has **exactly one** platform.



I Injector Z Zone C Change Detection R Renderer

Bootstrap Code

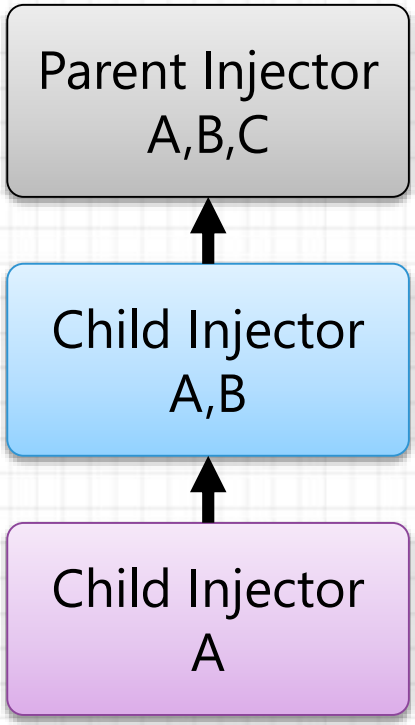
```
// Create Platform Injector
platform(BROWSER_PLATFORM_PROVIDERS)

    // Create Application Injector
    .application([
          BROWSER_APP_PROVIDERS
          BROWSER_APP_COMPILER_PROVIDERS,
          appProviders
     ]);

    // Create Injector => Compile => tick => Create Classes
    .bootstrap( MyApp );
```

NG-COURSE

Become an expert in AngularJS

Injector

Child Injector

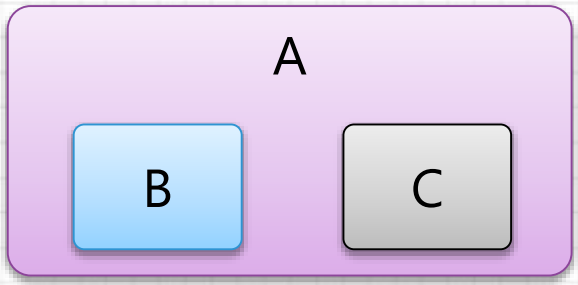



```
var p = Injector.resolveAndCreate([A,B,C])
```

```
var c1 = p.resolveAndCreateChild([A,B])
```

```
var c2 = c1.resolveAndCreateChild([A])
```

```
c2.get(A) =>
```




```
@Injectable()
class A{
  constructor(b:B,c:C){ //... }
}
```

Injectors Tree

- PLATFORM_INITIALIZER
- Reflector
- Console

Platform

BROWSER_PLATFORM_PROVIDERS

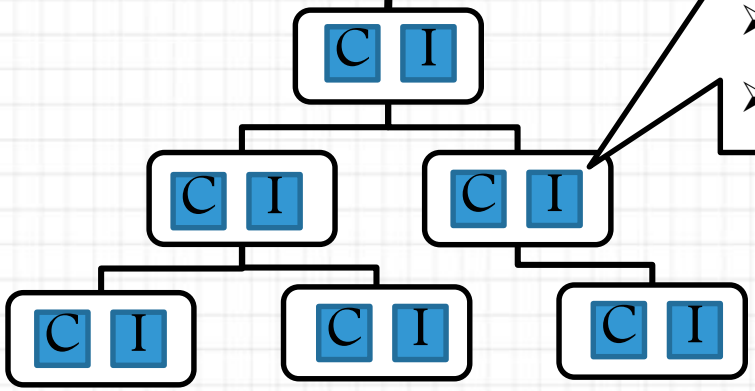
Application

BROWSER_APP_PROVIDERS & CustomProviders

- PLATFORM_PIPES
- PLATFORM_DIRECTIVES
- FORM_PROVIDERS
- DOCUMENT
- DomRootRenderer
- . . .

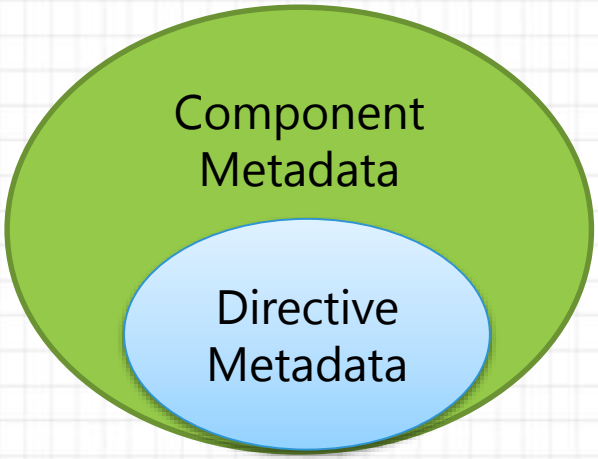
Component Metadata

- providers
- viewProviders
- directives
- pipes



Component Metadata

- **Names:**
  - selector? : string
  - exportAs? : string
- **Binding:**
  - inputs? : string[]
  - outputs? : string[]
  - host? : {[key: string]: string}
  - changeDetection?: ChangeDetectionStrategy
- **View:**
  - templateUrl? : string
  - template? : string
  - styleUrls? : string[]
  - styles? : string[]
  - encapsulation?: ViewEncapsulation
- **Injector:**
  - providers? : any[]
  - viewProviders? : any[]
  - directives? : Array<Type | any[]>
  - pipes? : Array<Type | any[]>
  - queries? : {[key: string]: any}



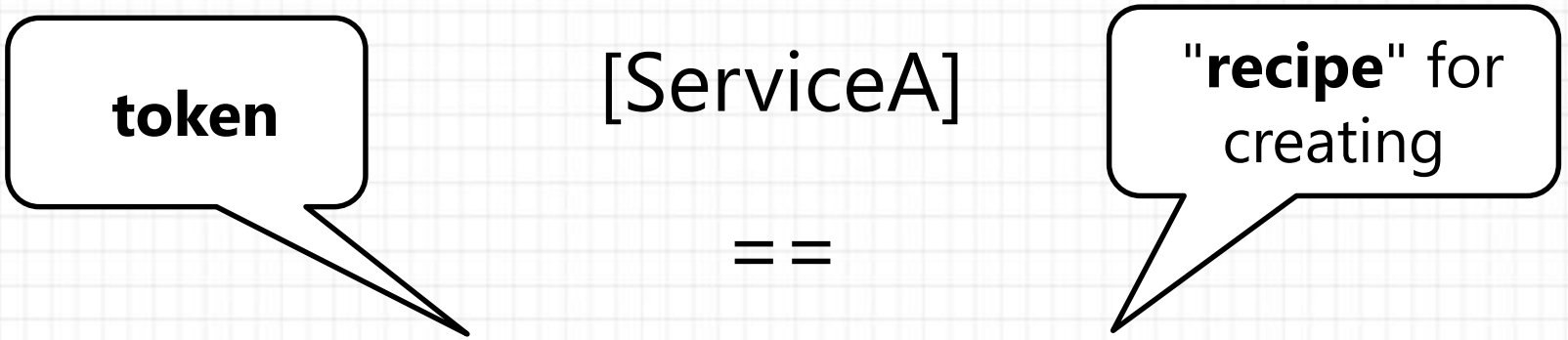
Compiletime vs. Runtime

```
import {Component} from "@angular/core";
import {Type1,Type2,Type3}  from "eyalVardi";
import {Pipe1,Directive1}   from "eyalVardi";
import {Component2}         from "eyalVardi";
import {Service1}           from "eyalVardi";

@Component({
    providers    :[Type1,Type2],
    viewProviders:[Type3],
    pipes        :[Pipe1],
    directives   :[Directive1,Component2]
})
export class MyComponent {
    constructor(
        element : ElementRef,
        type1   : Type1
    ){}
}
```

Can solve by the import?

Must solve in runtime by the Injector

The Provider Class



[{provide:ServiceA, useClass:ServiceA}]

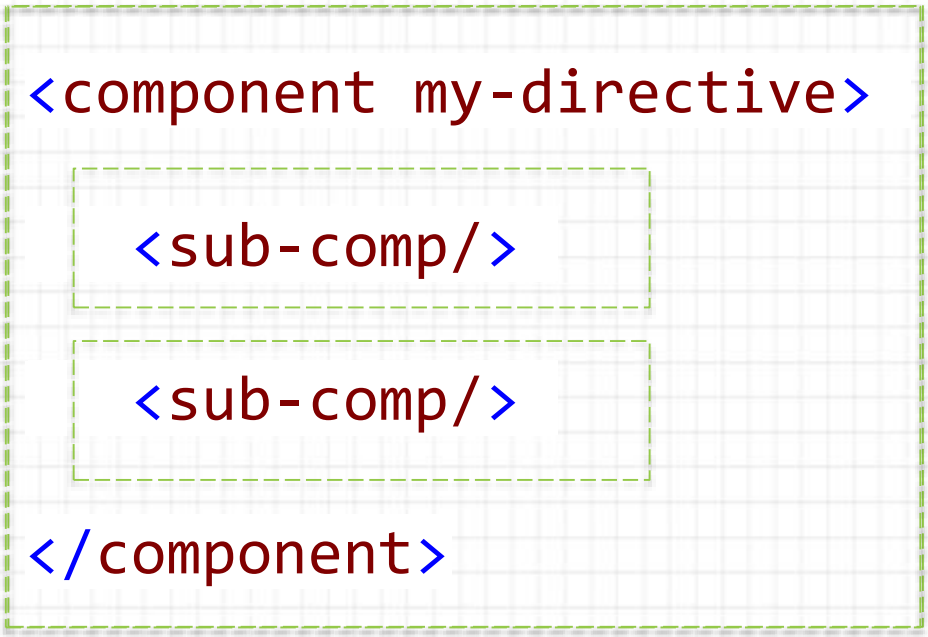
==

[new Provider(ServiceA, {useClass:ServiceA})]

Provider Class

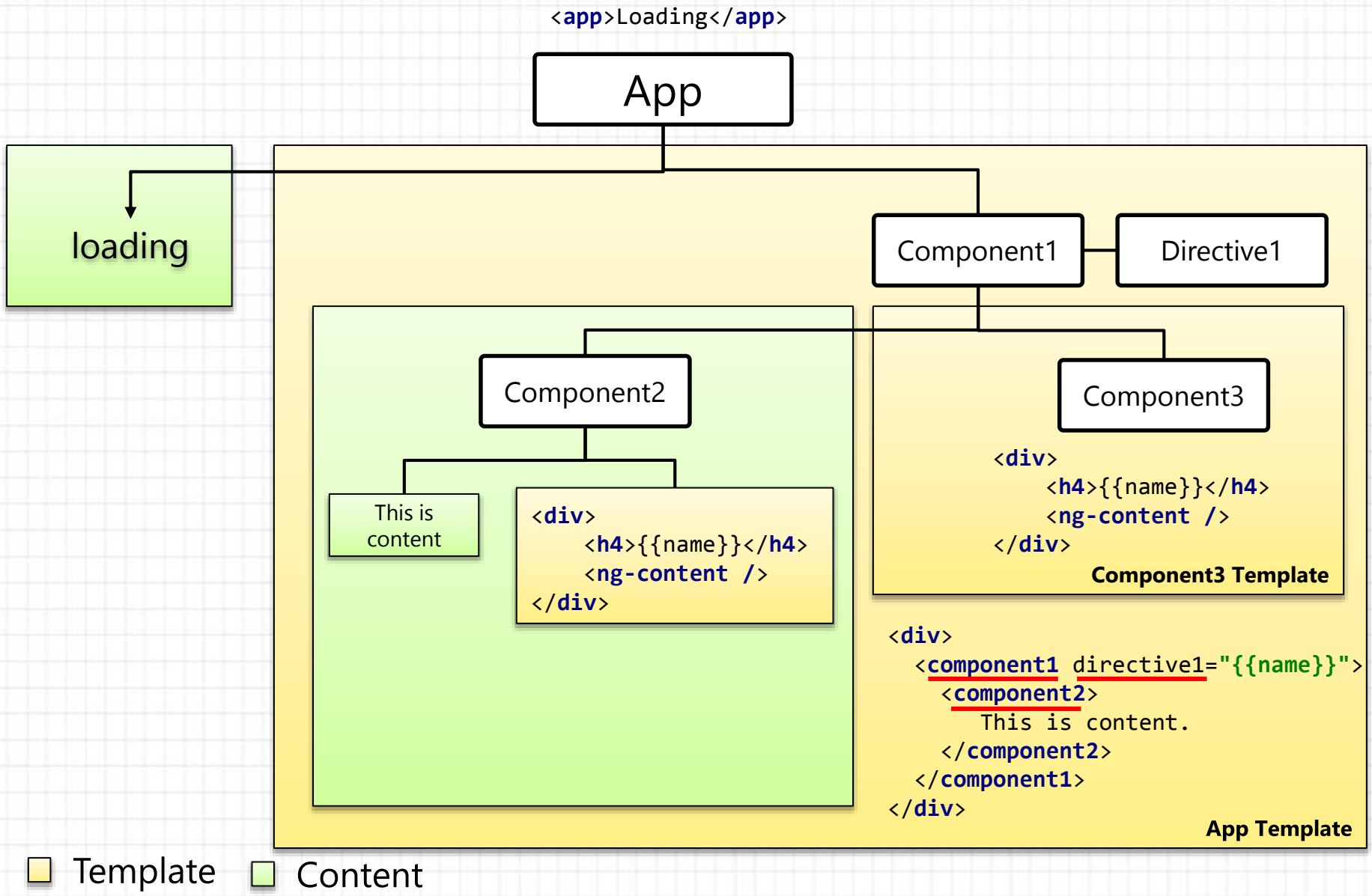
```
constructor(token: any, { useClass, useValue, useExisting,
useFactory, deps, multi }: {
  useClass?   : Type,
  useValue?   : any,
  useExisting?: any,
  useFactory? : Function,
  deps?       : Object[],
  multi?      : boolean
})
```

Component Injectors

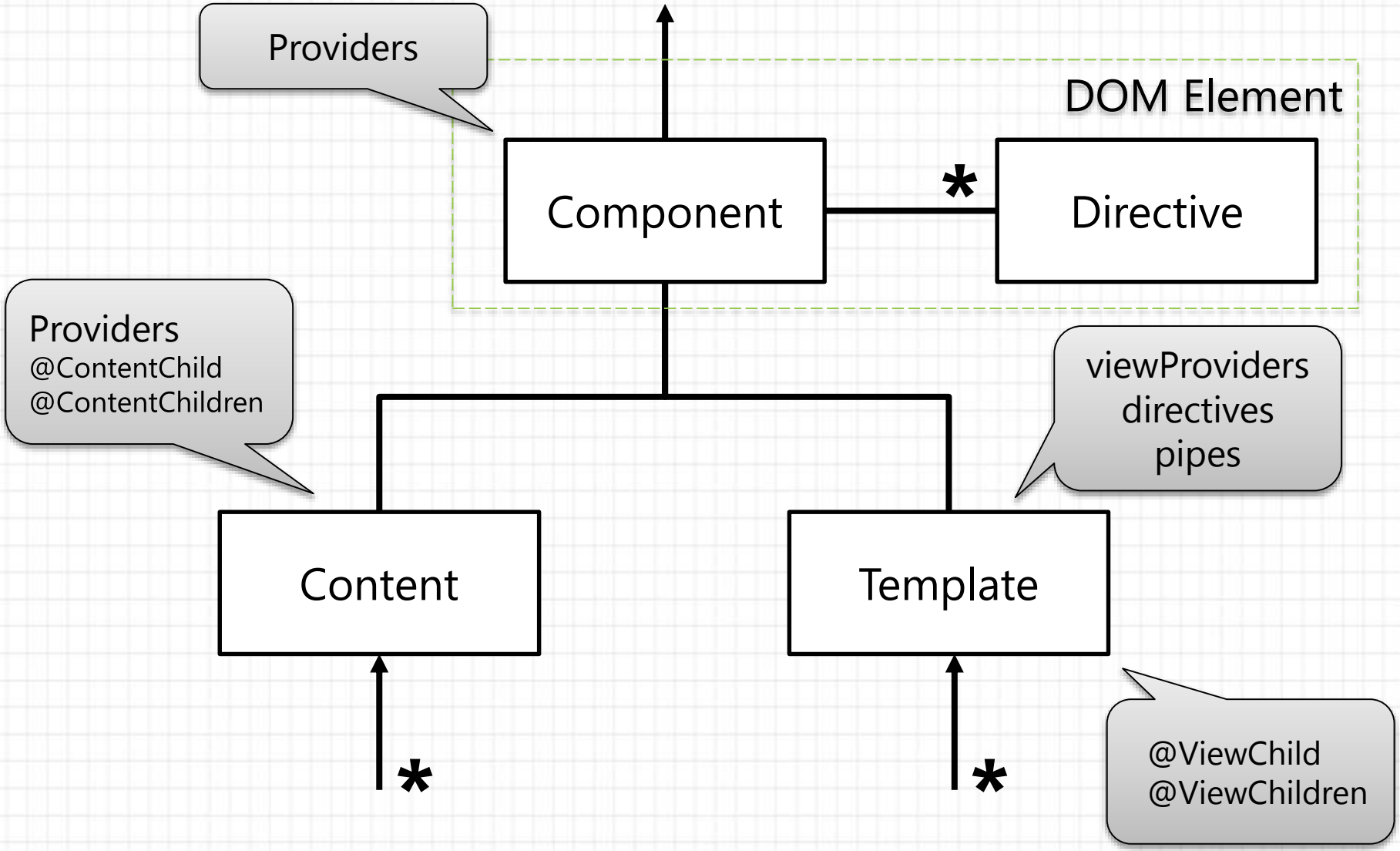


Component Injector

Tree Components



Component Injector



NG-COURSE

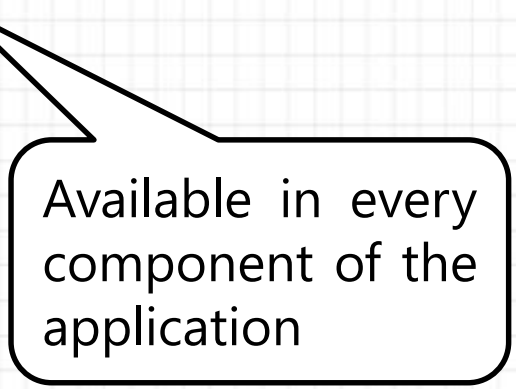
Become an expert in AngularJS

demo

Providers vs. viewProviders

Global Components & Pipes

```
bootstrap(AppComponent, [
    {provide: PLATFORM_DIRECTIVES, useValue: [myComponent], multi:true},
    {provide: PLATFORM_PIPES     , useValue: [myPipe]     , multi:true}
]);
```



NG-COURSE

Become an expert in AngularJS

demo

@Global()

NG-COURSE

Become an expert in AngularJS

demo

Tabs (@ContentChildren)

Component Interaction

- import
- @Input
- ExportAs
- Constructor
- @ContentChild & @ContentChildren
- @ViewChild & @ ViewChildren

Constructor Injection

```
@Component({...})
export class MyComponent {
    constructor(
          element        : ElementRef
        , changeDetector: ChangeDetectorRef
        , viewContainer  : ViewContainerRef
        , template       : TemplateRef
        , render         : Renderer
    ){...}
}
```

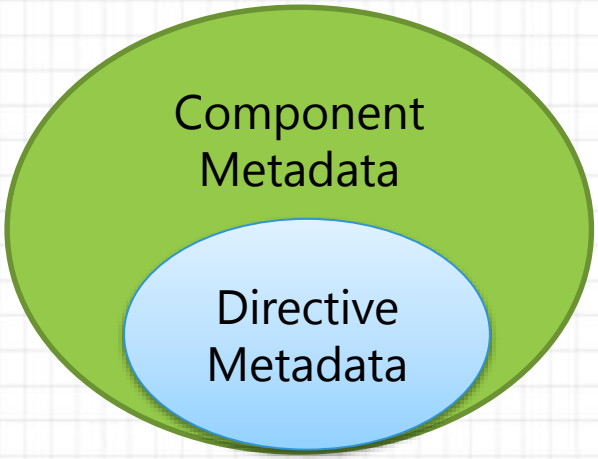
NG-COURSE

Become an expert in AngularJS

Compile

Component Metadata

- **Names:**
  - selector? : string
  - exportAs? : string
- **Binding:**
  - inputs? : string[]
  - outputs? : string[]
  - host? : {[key: string]: string}
  - changeDetection?: ChangeDetectionStrategy
- **View:**
  - templateUrl? : string
  - template? : string
  - styleUrls? : string[]
  - styles? : string[]
  - encapsulation?: ViewEncapsulation
- **Injector:**
  - providers? : any[]
  - viewProviders? : any[]
  - directives? : Array<Type | any[]>
  - pipes? : Array<Type | any[]>
  - queries? : {[key: string]: any}



Runtime Metadata Resolver

- **DirectiveResolver**

  `selector?`

  `inputs?`

  `outputs?`

  `host?`

  `providers?`

  `exportAs?`

  `queries?`

- **ViewResolver**

  `templateUrl?`

  `template?`

  `directives?`

  `pipes?`

  `encapsulation?`

  `styles?`

  `styleUrls?`

- **UrlResolver**

NG-COURSE

Become an expert in AngularJS

demo

Component Multi Views

NG-COURSE

Become an expert in AngularJS

Link

Link Function vs. Class Constructor

- `ElementRef`
- `Renderer`
- `TemplateRef`
- `ViewContainerRef`
- ~~`DynamicComponentLoader`~~
- `ComponentResolver`

NG-COURSE

Become an expert in AngularJS

demo

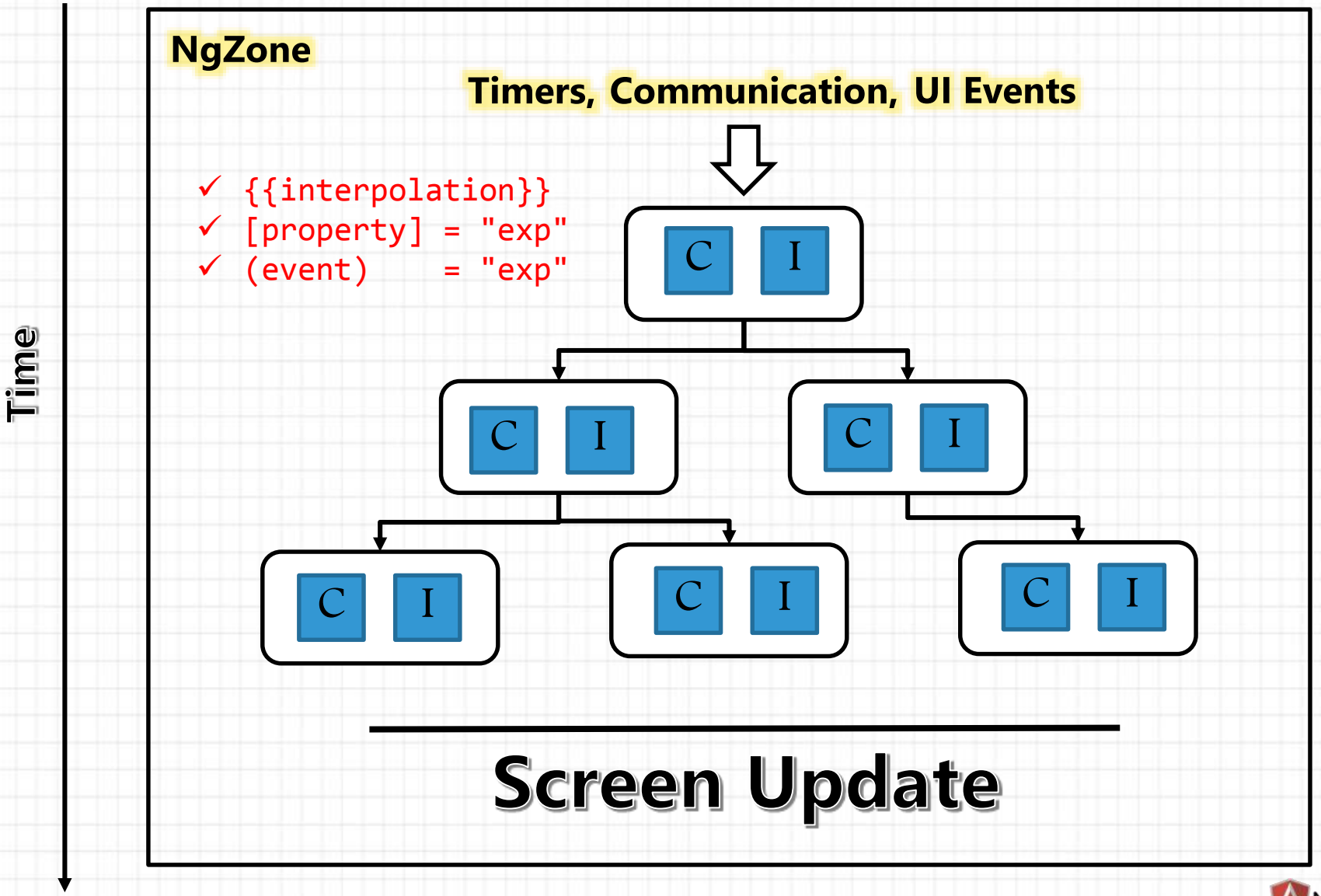
Dynamic Component

NG-COURSE

Become an expert in AngularJS

Tick

Angular 2.0 Tick Cycle

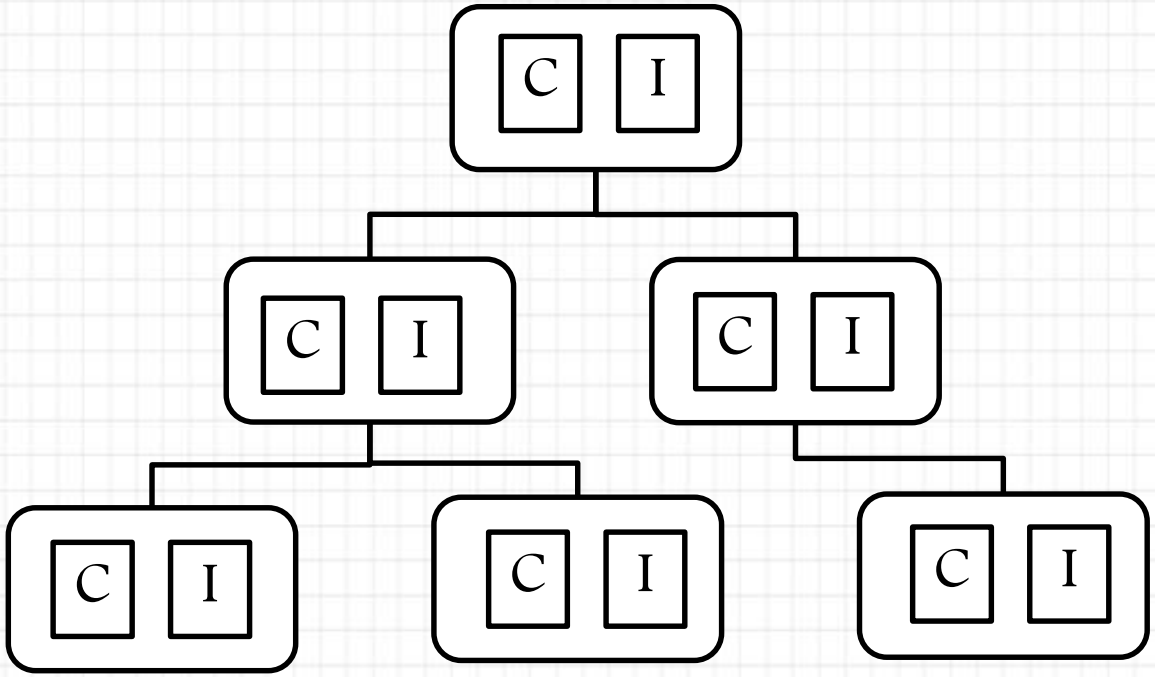


demo

Infinity Loop

Change Detector

F x Q = Time




10Bet
Lost Login?
Username/Email
Log In
Sports
Live Betting
Virtuals
Casino
Games
Live Casino
Mobile
Not a member? Join now!
Cash Out
Promotions
Banking
English
Decimal: (1.80)
19:31:47 (GMT)
March 9 Wed, 2016
Bet search
Top Events
Champions League
Europa League
Premier League
FA Cup
NBA
Live Betting
Today's Events
Soccer
Basketball
Tennis
Aussie Rules
Bandy
Badminton
Baseball
Beach Volleyball
Boxing
Cricket
Cycling
Darts
E-Sports
Floorball
Football
Golf
Handball
Horse Racing
Ice Hockey
MMA
Motor Racing
Olympic Games
Rugby League
Rugby Union
Snooker & Pool
Specials
Speedway
Table Tennis
Virtual Sports
Volleyball
Winter sports
Liverpool vs. Man Utd 10.03 | 20:05 Europa League
1X2 Full Time
Liverpool 2.00 X 3.25 Man Utd 3.85
Welcome Bonus
€200
Get a 50% up to €200 bonus with your first deposit.
BONUS CODE: FD200
Join Now
Terms and Conditions Apply
Betting Highlights
09.03 | 19:45 Chelsea 2.80 x 3.35 Paris St-Germain 2.50
10.03 | 02:30 Oklahoma City Thunder -5 1.90 LA Clippers +5 1.95
10.03 | 18:00 Dortmund 1.55 x 4.10 Tottenham 5.70
10.03 | 18:00 Fenerbahce 1.71 x 3.55 Braga 5.10
10.03 | 18:00 Basel 3.45 x 3.40 Sevilla 2.10
Live Betting
110 Games Live Now
Soccer (25)
2nd Half 45:52 0:0 St Pauli B 3.20 x 2.35 Hansa Luneburg 2.70
2nd Half 62:56 2:0 Vasalund Essinge 1.04 x 7.00 Frej 71.75
HT 45:00 0:0 Brazil [W] 1.86 x 2.50 Canada [W] 5.60
1st Half 30:15 0:1 Sport Boys Warnes 4.50 x 3.45 The Strongest 1.66
2nd Half 72:10 3:0 Deportivo Malacateco 3.5 1.76 Dep Mictlan 3.5 1.95
2nd Half 59:19 1:1 Union Comercio 2.25 x 2.00 Cajamarca UTC 5.60
HT 45:00 0:0 Vasco da Gama U20 2.10 x 2.60 Macae U20 4.00
HT 45:00 1:0 Flamengo U20 1.18 x 5.50 Madureira U20 11.50
HT 45:00 1:0 Maracana 1.14 x 6.35 Crato 12.25
2nd Half 73:21 1:1 Monte Azul 2.80 x 1.64 Batatais 6.70
2nd Half 77:23 1:1 Santo Andre 4.25 x 1.51 CA Penapolense 4.65
19:30 0:0 Burnham Hill Town 3.45 x 3.75 Boonor Regis Town 1.76
Betting Slip
Single
Combo
System
Number of bets 0
Total cost 0
Total return 0
Clear all
Place Bets
Quick Bets
Europa League Treble
Dortmund, Sevilla, Fenerbahce to win
30.00
Win 167 EUR
New Player?
GET €200
BETTING BONUS
Go
Cash Out Your Bet
Control your single pre-match and live bets and enjoy an early payout before an event has finished!
Learn More
Virtual Sports
Virtual Soccer
Virtual Horses
Virtual Dogs
Need Help?
Our support team is here to help
Chat Live

Lifecycle Hooks

- Angular calls lifecycle hook methods on directives and components as it **creates**, **changes**, and **destroys** them.

Creates:

- `OnInit`
- `AfterContentInit`
- `AfterViewInit`

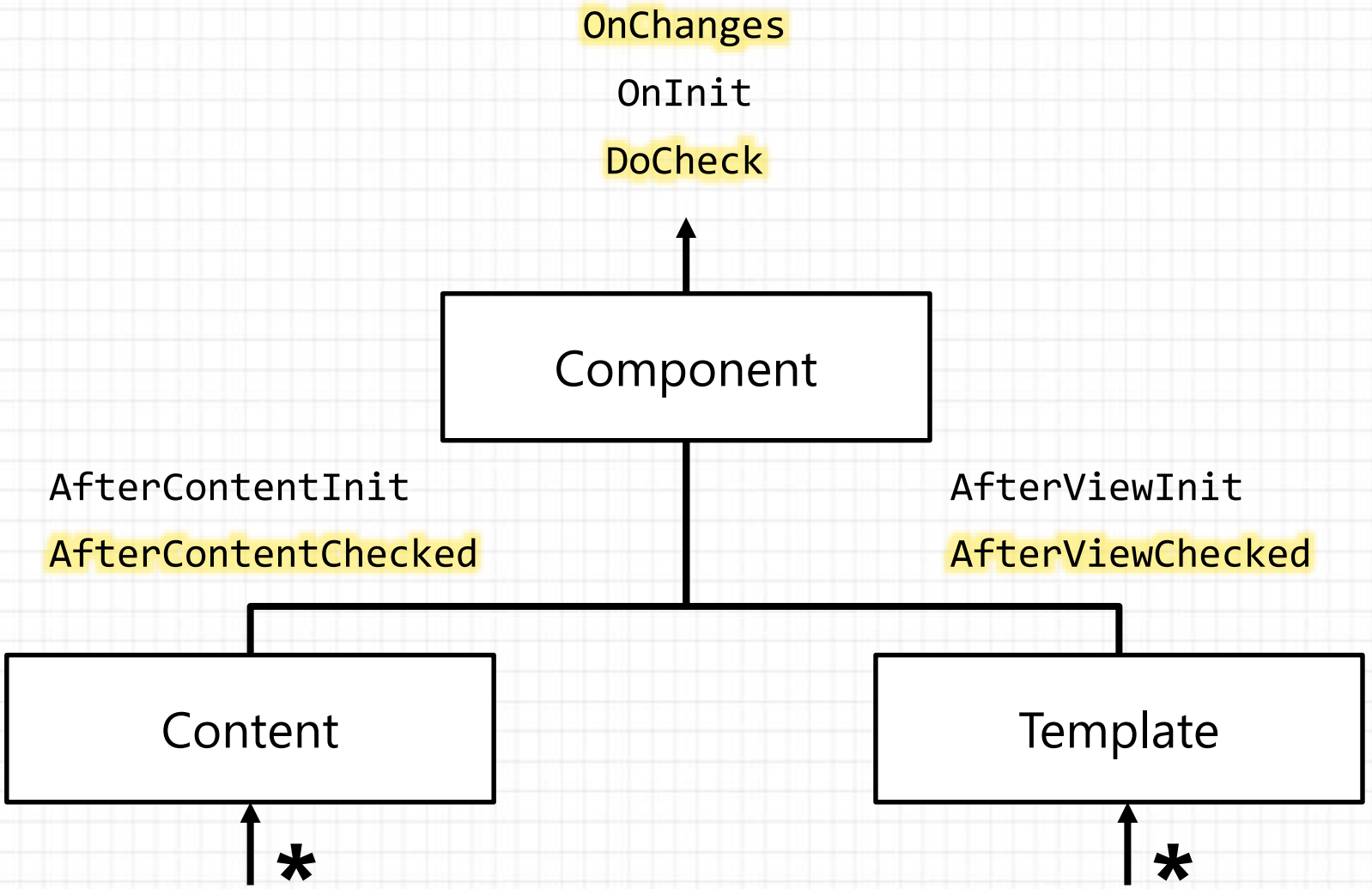
Changes:

- `DoCheck`
- `OnChanges`
- `AfterContentChecked`
- `AfterViewChecked`

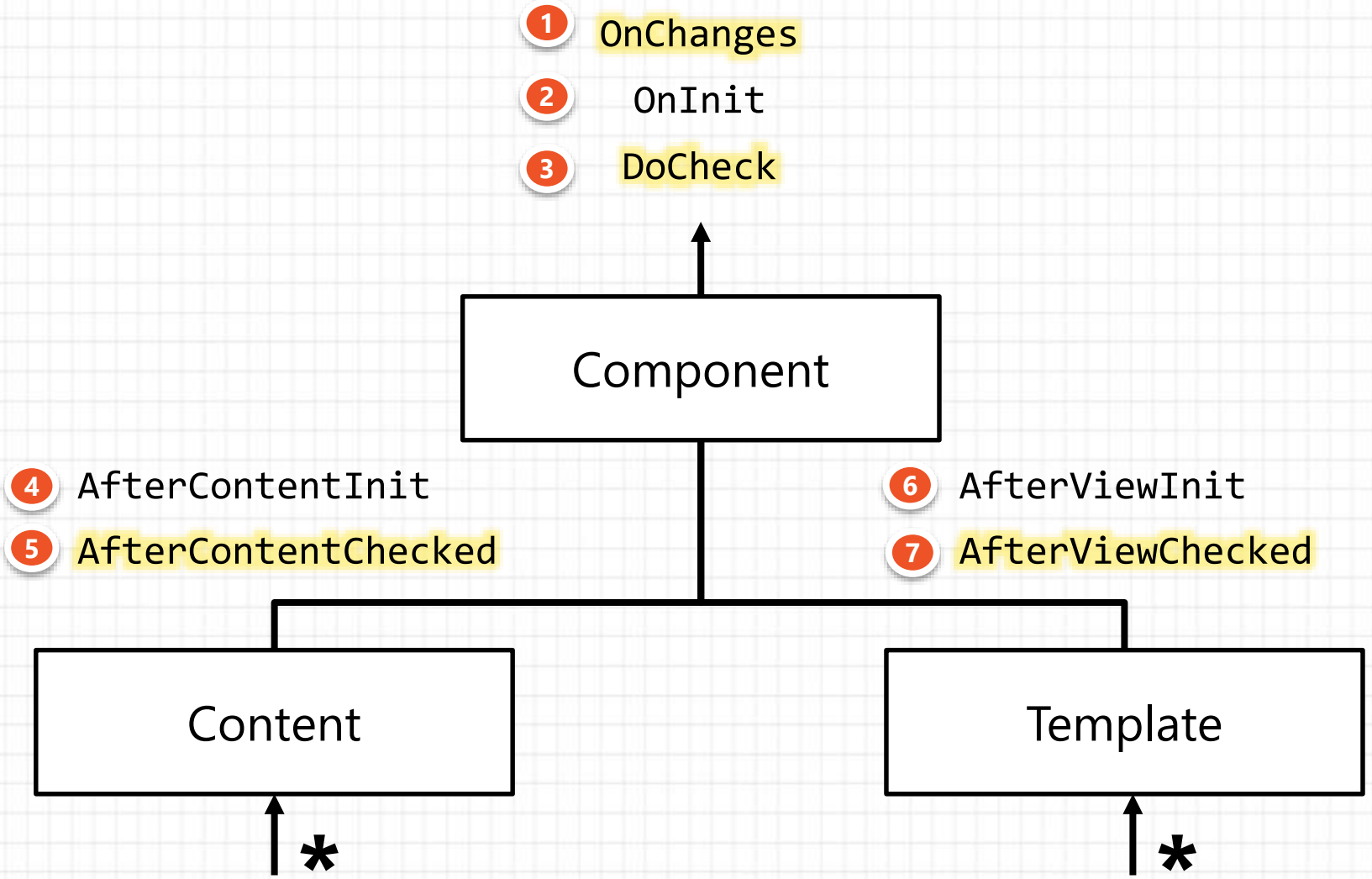
Destroys:

- `OnDestroy`

Hooks Order


OnChanges
OnInit
DoCheck
Component
AfterContentInit
AfterContentChecked
AfterViewInit
AfterViewChecked
Content
Template
*
*

Hooks Order


1 OnChanges
2 OnInit
3 DoCheck
Component
4 AfterContentInit
5 AfterContentChecked
6 AfterViewInit
7 AfterViewChecked
Content
Template
*
*

demo

Change Detector

NG-COURSE

Become an expert in AngularJS

Thanks

eyalvardi.wordpress.com

Eyal Vardi

Site: http://ng-course.org

Blog: eyalVardi.wordpress.com

vard;