

ChangeDetectionStrategy.OnPush

Optimising Angular's change detection

ChangeDetectionStrategy.OnPush

- We learned that angular can detect cd events using zone.js - automatic change detection
- When a CD event happens angular will activate CD from top to bottom for all the components
- This behaviour can have poor performance and we can optimise angular change detection to activate change detection on certain components that actually need it.
- Angular provide us with a semi automatic change detection strategy called **OnPush**
- It is set per component ChangeDetectorRef and will not activate cd on that component all the time
- If a component on push decides the component is not dirty than that component and his children won't activate cd

Set OnPush

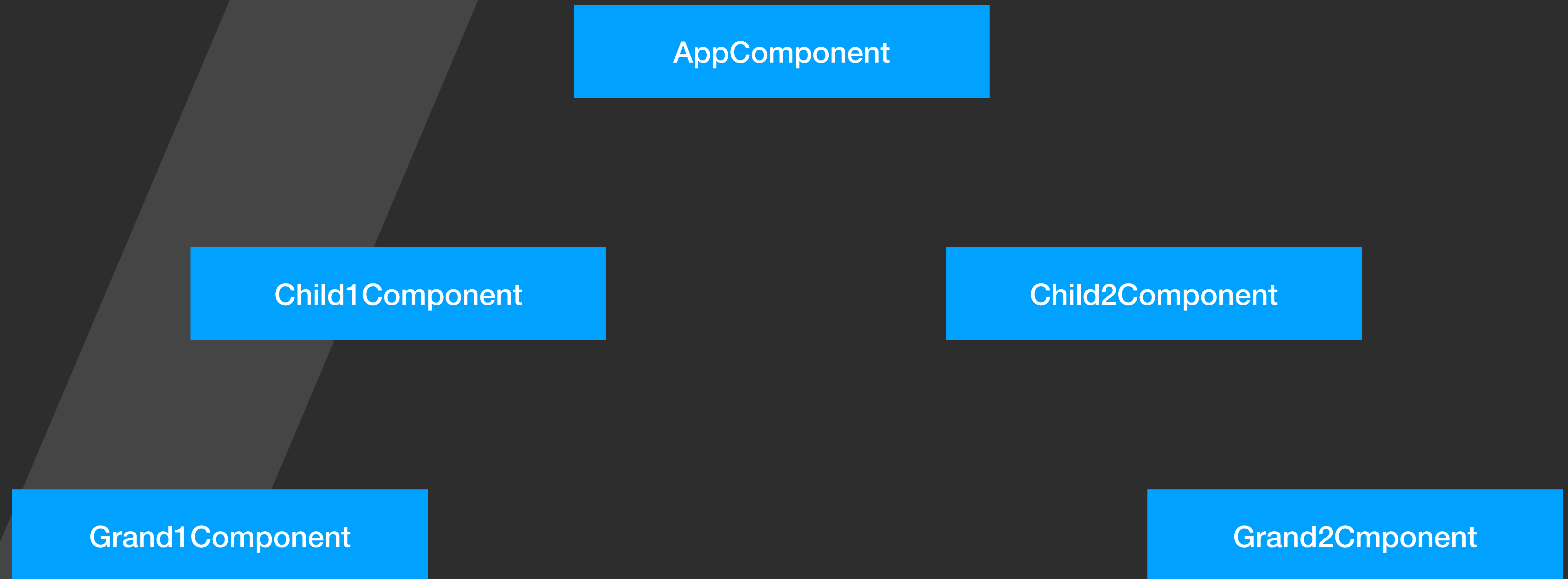
- To change the default cd strategy of a component you need to specify the **OnPush** strategy in the component metadata

```
@Component({  
  selector: 'app-root',  
  templateUrl: './app.component.html',  
  styleUrls: ['./app.component.css'],  
  changeDetection: ChangeDetectionStrategy.OnPush  
})
```

- We need to understand the OnPush strategy, when and how will it trigger cd on a component.
- For this EX we will create a pyramid of components and set all of them to OnPush
- We will use this pyramid of components to understand when OnPush triggers CD.

OnPush EX Tree

- We will build the following tree:



OnPush EX Tree - Event

- Trigger a click event on child2, which of the components will activate cd?

AppComponent

Child1Component

Child2Component

Grand1Component

Grand2Cmponent

OnPush EX Tree - Event

- From top to bottom to our component

AppComponent

Child1Component

Child2Component

Grand1Component

Grand2Component

OnPush EX Tree - @Input

- Change the @Input for Grand1Component (by reference)

AppComponent

Child1Component

Child2Component

Grand1Component

Grand2Cmponent

OnPush EX Tree - @Input

- From top to bottom to Grand1Component

AppComponent

Child1Component

Child2Component

Grand1Component

Grand2Cmponent

OnPush EX Tree - async pipe

- Async pipe on Grand2Component will trigger cd where?

AppComponent

Child1Component

Child2Component

Grand1Component

Grand2Cmponent

OnPush EX Tree - async pipe

- From top to bottom until Grand2Component is reached

AppComponent

Child1Component

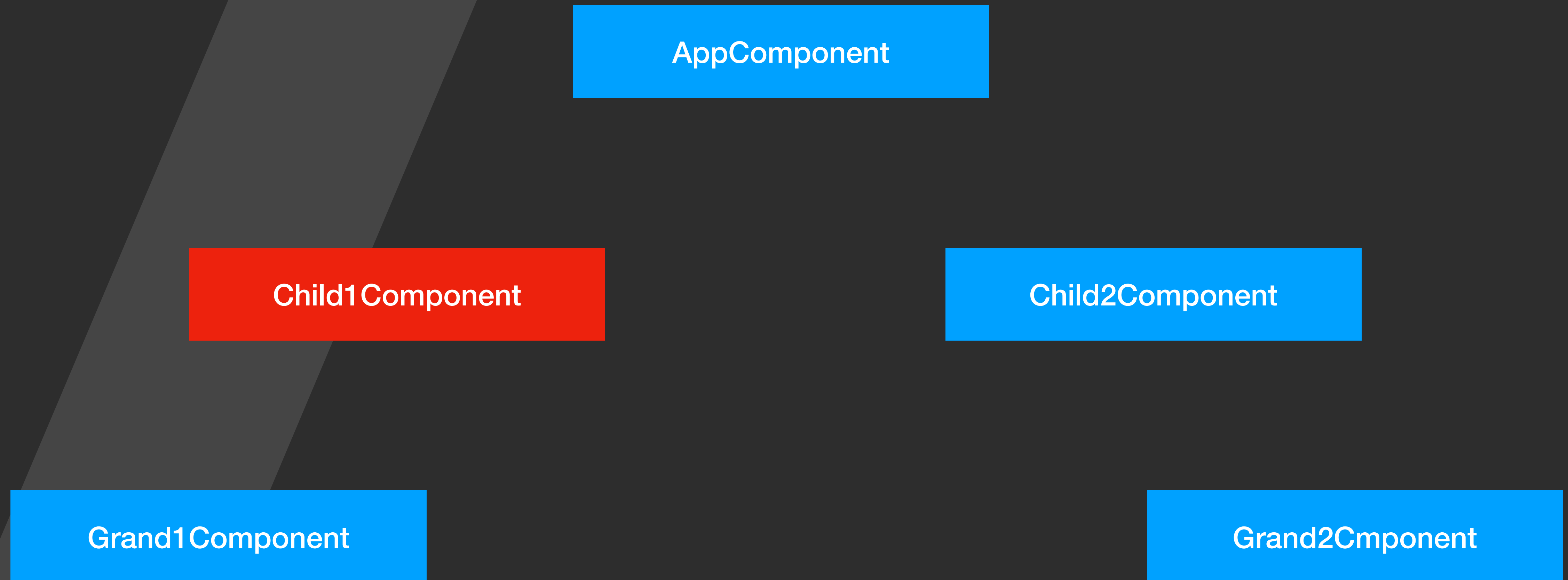
Child2Component

Grand1Component

Grand2Cmponent

OnPush EX Tree - ChangeDetectorRef

- Child1 is activating ChangeDetectorRef.detectChanges



OnPush EX Tree - ChangeDetectorRef

- detectChanges will activate cd only on me

AppComponent

Child1Component

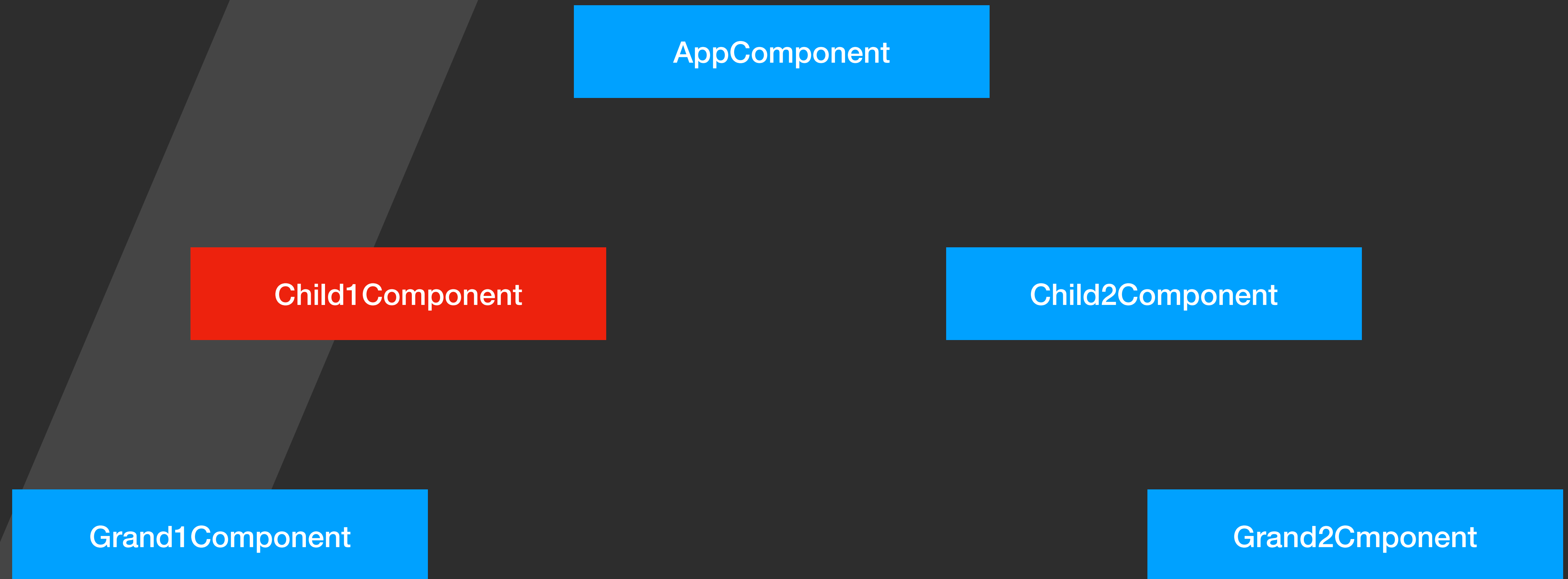
Child2Component

Grand1Component

Grand2Component

OnPush EX Tree - ChangeDetectorRef

- Let's check **ChangeDetectorRef.markForCheck** on **Child1Component**



OnPush EX Tree - ChangeDetectorRef

- markForCheck will go from top to bottom to the component

AppComponent

Child1Component

Child2Component

Grand1Component

Grand2Component

Summary

- We can change the default change detection strategy to OnPush to improve the performance of our app
- With OnPush, timers, observables, promises will not trigger cd
- Events, change in input, async pipe and manually calling cd by injecting the ChangeDetectorRef will activate cd

Thank You