Angular 4

Internals of Angular 4

Change Detection

Angular 4 can detect when component data changes and then automatically re-render the view to reflect that change though its change detection implementation.

Angular 4 at startup time overrides several low-level browser APIs for instance *addEventListener* to run change detection and update the UI.

This low-level patching of browser APIs is done by a library shipped with Angular called ***Zone.js***

The following frequently used browser mechanisms which usually cause changes are patched to support change detection

- All browser events (click, mouseover, keyup, etc.)
- Timers: setTimeout() and setInterval()
- Ajax requests : XHR - Fetching data from a remote server

Zone.js intercepts all ASYNC operations

Angular has its own zone called NgZone to control Change Detections

How Change Detection works

Angular application will have a number of components that will interact with each other which creates a dependency tree.

Each component gets a change detector, so we end up with a tree of change detectors.

When one of the components change, no matter where in the tree it is, a change detection pass is triggered for the whole tree.

- This happens because Angular scans for changes from the top component node, all the way to the bottom leaves of the tree (Unidirectional flow)
- It gives a impression that this check may be a very expensive operation but angular generates VM friendly code for better performance which an perform hundreds of thousands of such checks in a few milliseconds.

Customizing Change Detection

There are times that the built-in or default change detection mechanism may be overkill.

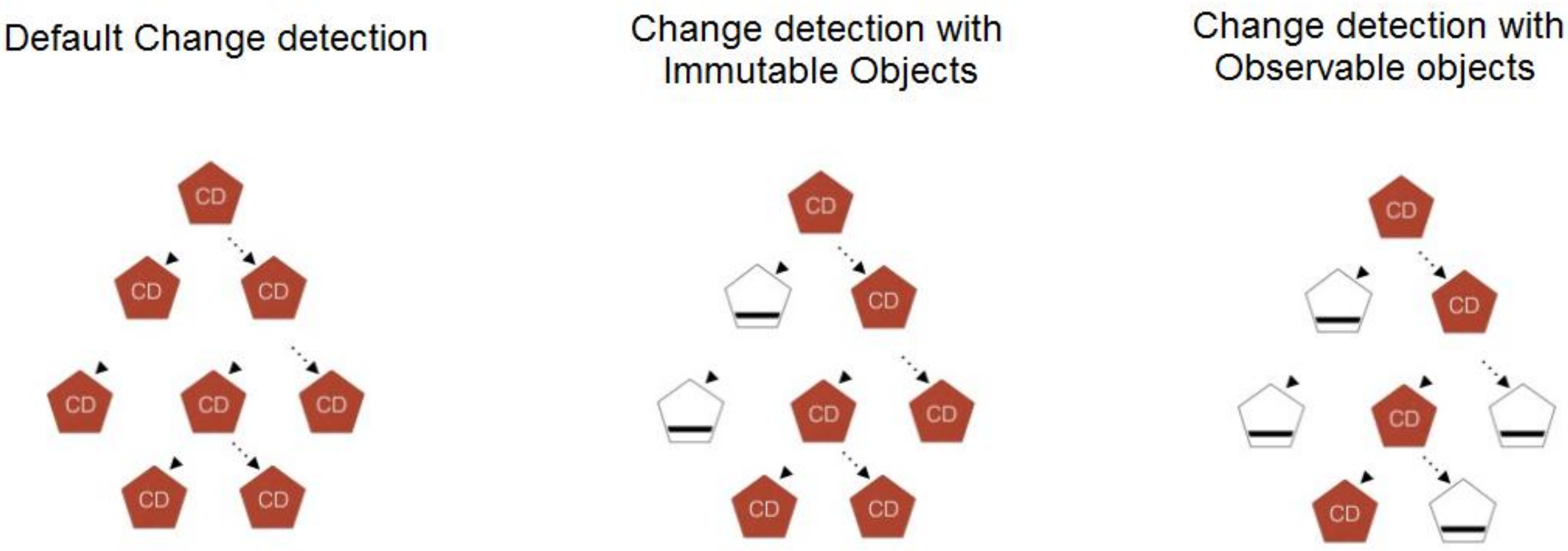
Angular provides mechanisms for configuring the change detection system such to get very fast performance.

- Change detection should be optimized using Immutable Data and Observables
- If immutable objects or observables used it checks only the parts of tree.

Change detector behavior can be changed by telling a component that it only should be checked if one of its input values change by setting its *changeDetection* attribute to *ChangeDetectionStrategy.OnPush*

- The default value for changeDetection is ChangeDetectionStrategy.Default.

Angular 4 change detection system



Default Change detection

Change detection with Immutable Objects

Change detection with Observable objects

Demo

ChangeDetection