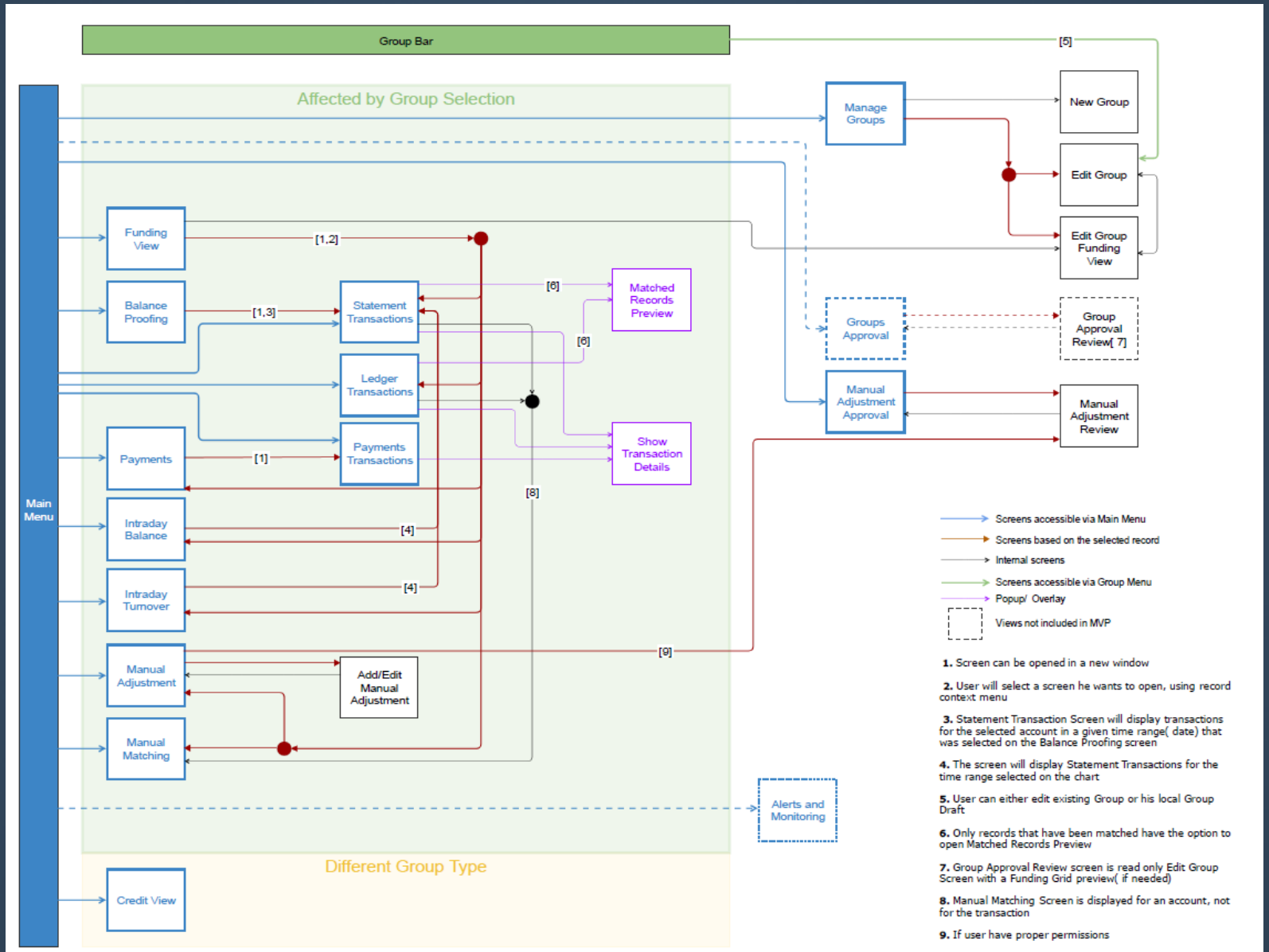
Angular 2 - advanced

Routing

One app, multiple screens

What is routing?



Why routing?

- Integrates with the browser history
- User can use "back" and "forward" buttons
- Every screen/state is accessible (represented) by the link
- Easier to navigate and to share resources

Setting the router in Angular 2

```
//index.html

<head>
  <base href="/">
```

Creating AppRoutingModule

```
import { NgModule } from '@angular/core';
import { Routes, RouterModule } from '@angular/router';

const appRoutes: Routes = [

];

@NgModule({
  imports: [RouterModule.forRoot(appRoutes)],
  exports: [RouterModule]
})
export class AppRoutingModule { }
```

Import AppRoutingModule

```
import { AppRoutingModule } from './app-routing.module';
import { AppComponent } from './app.component';

@NgModule({
  declarations: [
    AppComponent
  ],
  imports: [
    AppRoutingModule
  ],
  providers: [],
  bootstrap: [AppComponent]
})
export class AppModule { }
```

Configure main Routes (Lazy Loading)

```
const appRoutes: Routes = [
  { path: 'dashboard', loadChildren: 'path/to/dashboard.module#DashboardModule' },
  { path: 'transactions', loadChildren: 'path/to/transactions.module#TransactionsModule' },

  { path: '',   redirectTo: '/dashboard', pathMatch: 'full' },
  { path: '**', component: PageNotFoundComponent }
];

@NgModule({
  imports: [RouterModule.forRoot(appRoutes)],
  exports: [RouterModule]
})
export class AppRoutingModule { }
```

Configure child Routes

```
import { NgModule } from '@angular/core';
import { RouterModule, Routes } from '@angular/router';
import { TransactionsComponent } from './transactions/transactions.component';

let moduleRoutes: Routes = [
    {
        path: '',
        component: TransactionsComponent
    }
]

@NgModule({
  declarations: [
    TransactionsComponent
  ],
  imports: [
      RouterModule.forChild(moduleRoutes)
  ],
  providers: []
})
export class TransactionsModule { }
```

Displaying a routing view

```
<h1>App Header</h1>

<a [routerLink]="['/dahsboard']">Dashboard</a>
<a [routerLink]="['/transactions']">Display list transactions</a>

<router-outlet></router-outlet>
```

Let's code

Application routing

Parametrized routes

```
{
  path: 'user/:id',
  component: UserDataComponent
},

// creating a link

<a [routerLink]="['/user', person.id]">

<a [routerLink]="['/user', 666]">

// ...

this.router.navigate(['/user', this.selectedPerson.id]);
```

Working with Router

Extracting parameters

Extract parameters

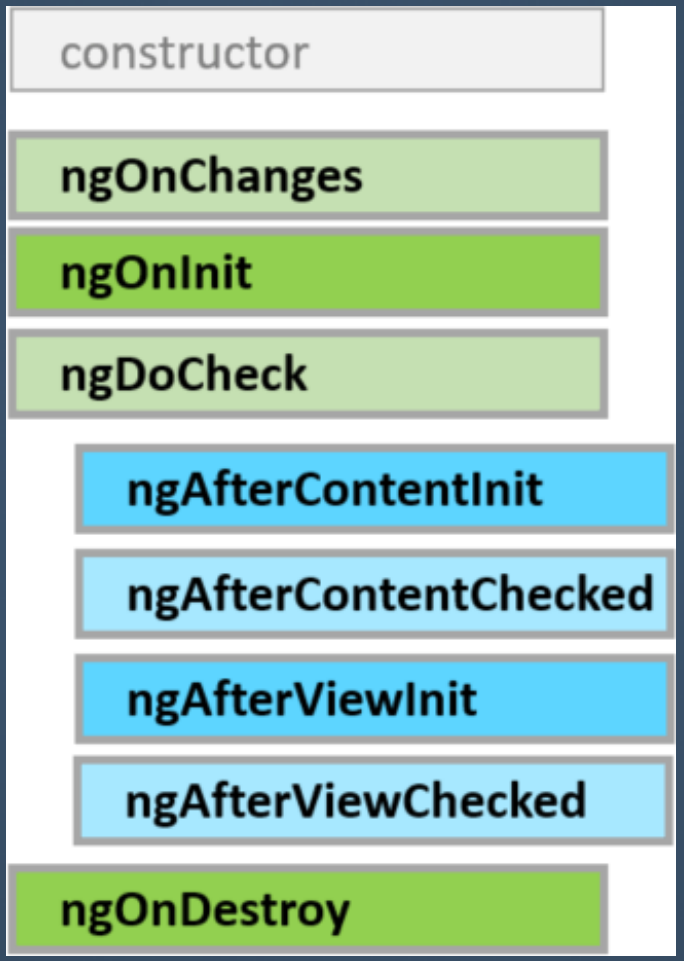
```
import { Component, Input, OnInit } from '@angular/core';
import { ActivatedRoute, Params }   from '@angular/router';


export class UserDataComponent implements OnInit {

    constructor(
      private route: ActivatedRoute
    ) {}


    ngOnInit(): void {
      this.route.params
        .subscribe((params: Params) => {
            console.log(params['id']);
        });
    }
}
```

Let's code

Display user data (id)

Life cycle hooks

List of hooks



Overview

- **ngOnChanges** - Respond when Angular (re)sets data-bound input properties. Called before ngOnInit and whenever one or more data-bound input properties change.
- **ngOnInit** - Initialize the directive/component after Angular first displays the data-bound properties and sets the directive/component's input properties. Called once, after the first ngOnChanges.
- **ngOnDestroy** - Cleanup just before Angular destroys the directive/component. Unsubscribe observables and detach event handlers to avoid memory leaks. Called just before Angular destroys the directive/component.

Server communication

HTTP Requests

Add Http module

```
import { NgModule }      from '@angular/core';
import { BrowserModule } from '@angular/platform-browser';

import { HttpModule }    from '@angular/http';

import { AppComponent }  from './app.component';

@NgModule({
  imports: [
    BrowserModule,
    HttpModule,
  ],
  declarations: [
    AppComponent,
  ],
  bootstrap: [ AppComponent ]
})
export class AppModule { }
```

```
import { Injectable }     from '@angular/core';
import { Http, Response } from '@angular/http';
import { Observable }     from 'rxjs';
import { UserData }     from './user-data';

@Injectable()

export class UserssHttpService {

  constructor(private http: Http) {}

  loadAll(): Observable<IPerson[]> {
    return this.http
                .get(`data/users.json`)
                .map((r: Response) => r.json() as UserData[]);
  }
}
```

In the component

```
export class UsersComponent {
    records: UserData[];

    constructor(private service: UsersHttpService) {

    }

    ngOnInit() {
        this.service.loadAll().subscribe((records: UserData[]) => {
            this.records = records;
        });
    }
}

// template


<div>
    <div *ngFor="let user of records">
      {{user.name}}
    </div>
</div>
```

Using | async pipe

```
export class UsersComponent {
    records: UserData[];

    constructor(private service: UsersHttpService) {

    }

    ngOnInit() {
        this.service.loadAll()
    }
}

// template


<div>
    <div *ngFor="let user of records | async">
      {{user.name}}
    </div>
</div>
```

Why Observables/Streams?

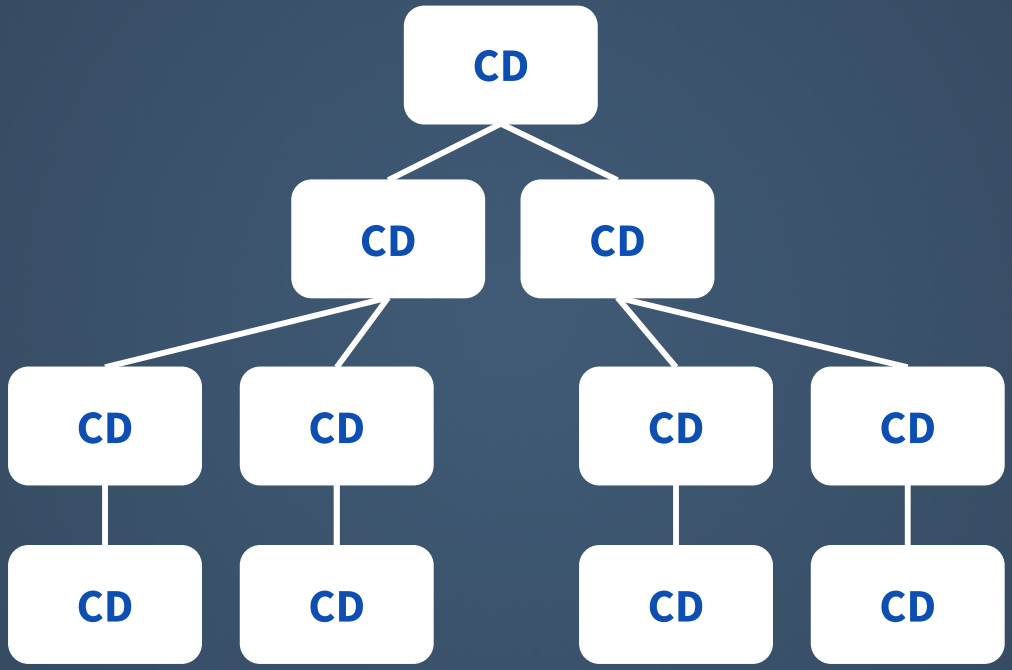
```
ngOnInit(): void {
    this.heroes = this.searchTerms

      .debounceTime(300)        // wait for 300ms pause in events

      .distinctUntilChanged()   // ignore if next search term is same as previous

      .switchMap(term => term   // switch to new observable each time

        // return the http search observable
        ? this.heroSearchService.search(term)
        // or the observable of empty heroes if no search term
        : Observable.of<Hero[]>([]))
      .catch(error => {

        // TODO: real error handling
        console.log(error);
        return Observable.of<Hero[]>([]);

      });
  }
```

Let's code

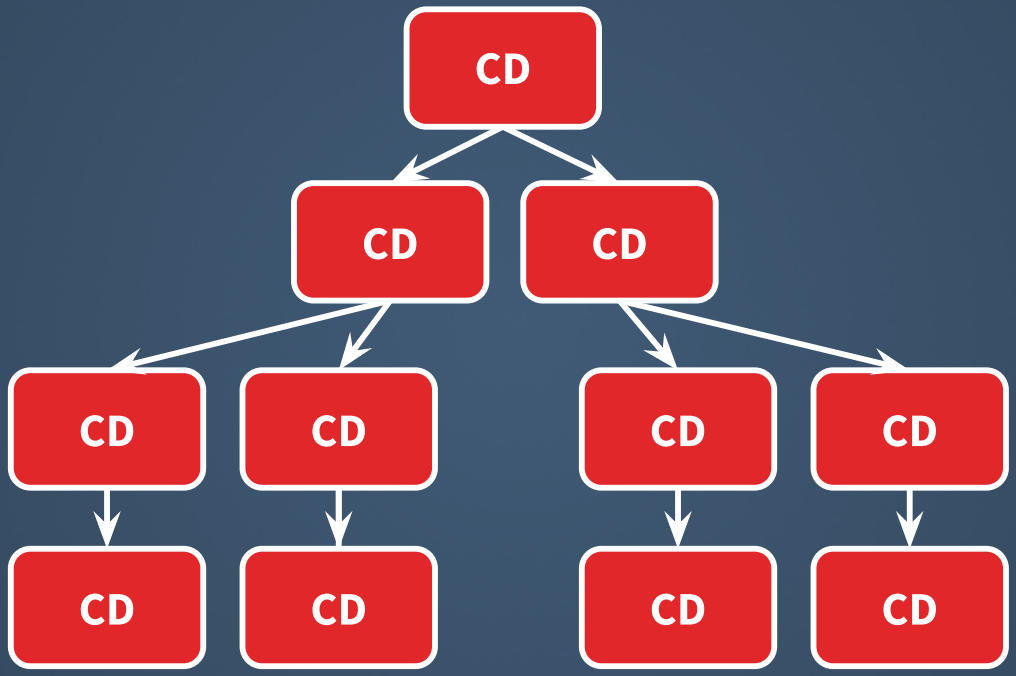
Loading data from assets/data.json

Angular Change Detection

Every Component has it's own change detector



When some event occurs, CD is triggered



Optimization

- Only one run
- Data flows from top to bottom
- CD code is generated and JIT friendly
- Possible: Primitive components

On Push Change Detection

```
@Component({
  template: `
    <h2>{{vData.name}}</h2>
    <span>{{vData.email}}</span>
  `,
  changeDetection: ChangeDetectionStrategy.OnPush
})
class VCardCmp {
  @Input() vData;
}
```

On Push Change Detection