# Angular 8 (part 4)

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# Contents

| Module | Topic |
| --- | --- |
| Module 1 | Observables / RxJS |
| Module 2 | Routes |

# Angular communication with server

There are 3 ways to handle REST call:

- ***Callbacks:*** Handling REST call using callback function is very preliminary way of communication. Once REST call sends response, suitable success / error function is called where developer can take certain action on response.
- ***Promises:*** A promise represents a value that we can handle at some point in the future. Promises allow to execute the action multiple times for a single event & hence Promises are preferred over Callbacks.
- ***Observables:*** Observables open up a continuous channel of communication in which multiple values of data can be emitted over time. Every observable is a promise plus advance features.

# Angular support for REST communication

Angular provides a separate module called ‘HttpClientModule’ in order to communicate with server. Here are the steps to include http support in Angular application:

1. Include HttpModule into app.module.ts

   *import { HttpClientModule } from '@angular/common/http';*

   *imports: [ BrowserModule, HttpClientModule ],*

2. Inject Http service in your service class

   *import { HttpClient, Response } from '@angular/common/http';*

   *export class ProductService {*

   *constructor(private _http: HttpClient) {*

   *}*

   *}*

3. Invoke REST call using http service:

   *this._http.get(‘http://localhost:8000/product’);*

# What is an Observable?

- Observable isn't an Angular specific feature, but rather a proposed standard for managing async data that will be included in the release of ES7.
- Observable is a sequence of items that arrive async over the time. However, with ‘http’ service calls it is always a single item also known as http_response.
- Since, Observable feature is not available in ES6 specification, we use Observable from a third party library called RxJS.

# RxJS

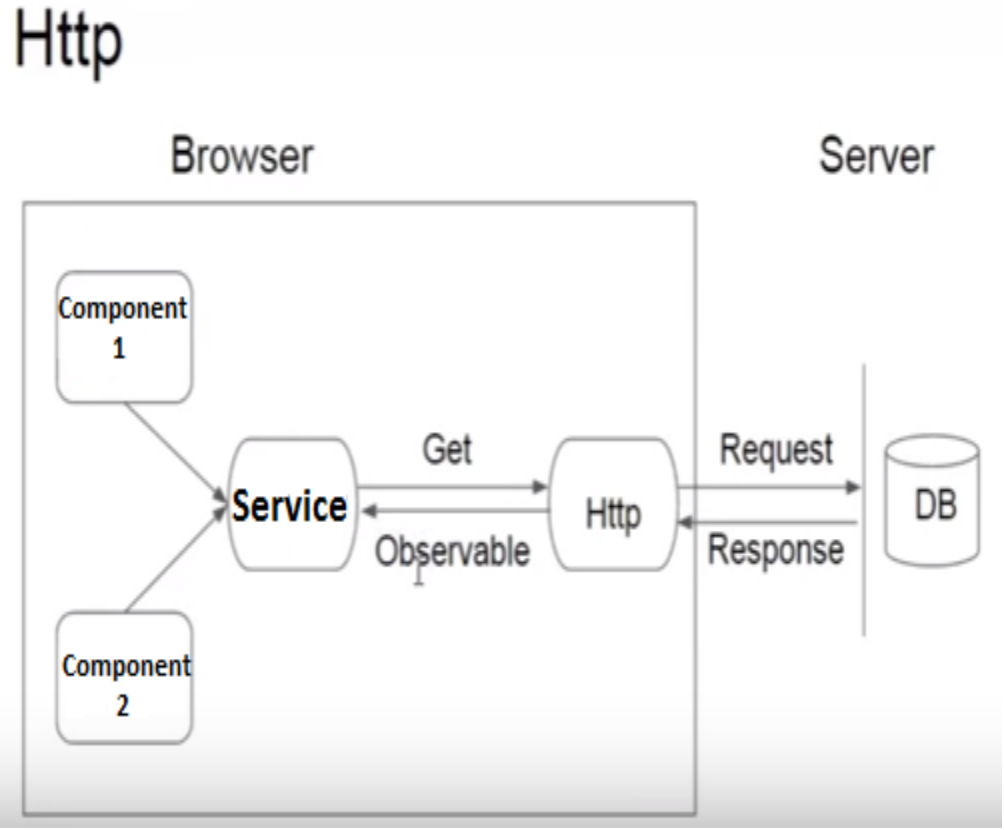
- RxJS stands for Reactive Extensions for JavaScript.
- Observable feature is not available in ES6 specification. Hence, we use Observable from a third party library called RxJS.
- In order to download RxJS in angular application, make sure you package.json has below dependency added-

*"dependencies": {*

*"rxjs": “6.5.4"*

*}*

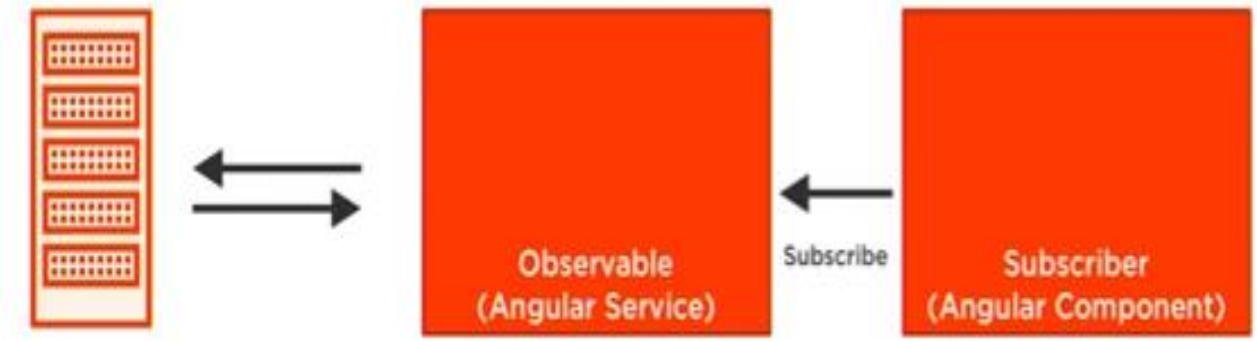
# Using Observable in Angular App




***Steps to use Observable in Angular App:***

1. Make http call from Service.
2. Receive observable.
3. Subscribe to observable in your components.
4. Render the view using received data.

# Observables & Async streams




- Angular service is responsible to send REST request to server & return Observable to respective components.
- Angular component will retrieve Observable from service & subscribe to it.
- It is possible that for one observable there can be multiple subscribers.

# Using Observable in Angular App

**app.module.ts**

```
import { HttpClientModule } from '@angular/common/http';


@NgModule({
        imports: [ BrowserModule, FormsModule, ReactiveFormsModule,
HttpClientModule ],

})
```

# Using Observable in Angular App

**ProductService.ts**

```
import { HttpClient, Response } from '@angular/common/http';
import 'rxjs/add/operator/map';

@Injectable()
export class ProductService {
        constructor(private _http: HttpClient) {
        }
        getProducts() :Observable<Object>{
 let httpHeaders = new HttpHeaders().set('allow-origin-access-control', '*')
.set('Content-type', 'application/json');
                return this._http.get(this.url) , {headers: httpHeaders};
        }
}
```

# Using Observable in Angular App

**ProductComponent.ts**

```
import { ProductService } from './products.service';
@Component({
        providers: [ProductService]
})
export class ProductComponent {
public products;
constructor(productService: ProductService) {
        productService.getProducts().subscribe((data)=> {
                this.products=data;
                console.log('Received products: ',
this.products)
        });
}
```

# Using Observable for POST call

**ProductService.ts**

```
createProduct(product: Product) {
  let httpHeaders = new HttpHeaders().set('allow-origin-access-control', '*')
            .set('Content-type', 'application/json');
  return this._httpClient.post(URL
,JSON.stringify(product), {headers: httpHeaders});
}
```

# Promises vs Observable

| Sr. No. | Promise | Observable |
|---|---|---|
| 1. | Promise cannot be cancelled. | Observable can be cancelled. |
| 2. | Promise cannot be retried. | Observables can be retried using retry() or retryWhen() functions. |
| 3. | Promise is a request with single return value. | Observable is a request that can return multiple response as an async stream. |

# What is a Router?

An Angular application is a collection of multiple components & you need to switch from one component to another based upon action performed by end user. Thus, Angular Router will help to navigate from one angular component to another.

# Steps to introduce Router in Angular App

- Set the <base> tag into index.html. It will help your application to understand how to construct url's while navigation.

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

- Import RouterModule into AppModule & mention routing details.

```
import { RouterModule } from '@angular/router';
imports: [ BrowserModule,
        RouterModule.forRoot([
                {path: 'first', component: FirstComponent},
                {path: 'second', component: SecondComponent}
        ])
```

# Steps to introduce Router in Angular App

- Add ‘active’ class in styles.css

```
nav a.active {
        color: orange;
}
```

- Finally in the navigation component, provide the links & specify router outlet to render the required component.

```
<nav>
        <a routerLink="/first" routerLinkActive="active" >First</a>
        <a routerLink="/second" routerLinkActive="active" >Second</a>
</nav>
<router-outlet></router-outlet>
```

# Route parameters

When navigating from one to other component, the current component may wish to send few parameters to another component. Here are the steps to make it possible:

- Register route url with parameter into app.module.ts

```
RouterModule.forRoot([
        {path: 'fourth/:name', component: FourthComponent}
    ])
```

- Pass the parameter while source component is navigating to target component:

```
import { Router } from '@angular/router';
export class ThirdComponent {
        constructor(private router: Router) {}
        onClick(){      this.router.navigate(['/fourth', 'Anand']);    }
}
```

# Route parameters continue…

Finally, read the supplied parameter into target component:

```
import { ActivatedRoute } from '@angular/router';
@Component({
        selector: '<fourth-comp>',
        template: '<h3>Fourth Component says Hello {{name}}</h3>'
})
export class FourthComponent implements OnInit{
        name: string;
        constructor(private activatedRoute: ActivatedRoute) {}

        ngOnInit() {
                this.name = this.activatedRoute.snapshot.params['name'];
        }
}
```

*Thank you!!*