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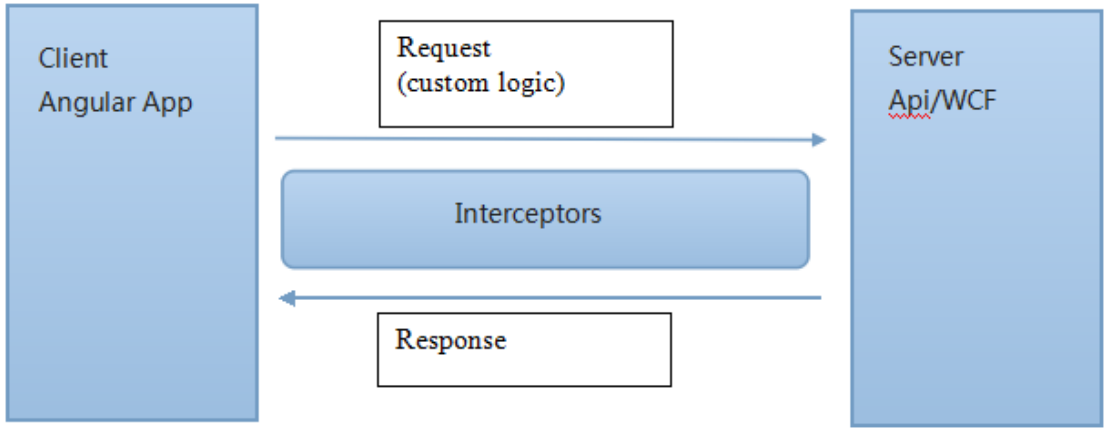
Angular 14 - 14

HTTP Client

HTTP client



- Most front-end applications need to communicate with a server over the HTTP protocol, to download or upload data and access other back-end services.
- Angular provides a client HTTP API, the **HttpClient** service class.
  - https://angular.io/guide/http
- It offers the following features:
  - The ability to request typed response objects
  - Streamlined error handling
  - Testability features
  - Request and response interception

HTTP client module

- First we will need to import the **HTTPClient** module into our ngModule

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

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

- Then inject the http client service. Usually will be used in another service.

```
import { HttpClient } from '@angular/common/http';
import { Injectable } from '@angular/core';

@Injectable()
export class ProductApiService {
  constructor(private _http:HttpClient) { }
  ...
}
```

HTTP Verbs

- In the HTTP protocol, a set of verbs is described for each query for the resources of an API.
- For a given URL, we can perform a POST GET , PUT , POST , DELETE , HEAD , and OPTIONS .
- Angular provides a set of homonymous methods to perform API access tasks.
    - **get** (url, httpOptions)
    - **post** (url, object, httpOptions)
    - **put** (url, httpOptions)
    - **delete** (url, httpOptions)
    - …

```
this._http
      .get('http://localhost:3000/products')
      .subscribe((data) => console.log('getProductsFromAPI:',data));
```

- One of the most notable improvements introduced by HTTPClient is that the response object is now **JSON by default**, so it no longer needs to be parsed again.

Query Parameters

- One thing that may not be intuitive is the way you handle query parameters.
- You cannot pass a Plain JavaScript Object and expect it to be assigned as a request parameter
- We need to use the **HttpParams** object to encapsulate the parameters

```
import { HttpClient, HttpParams } from '@angular/common/http’;

...
    const params = new HttpParams().set('code', 'GUN-0611');

    this._http
      .get('http://localhost:3000/products',{params})
      .subscribe((data) => console.log('getProductsFromAPI:',data));
```

Response with type check

- Thanks to TypeScript, you can **type the HTTP method** that is used and the response will automatically be of the same type

```
export interface IProduct {
    name:string;
    code:string;
    image:string;
    date:Date;
    price:number;
    stars:number;
}
```

```
this._http
      .get<IProduct[]>('http://localhost:3000/products', { params })
      .subscribe((data) => {
        console.log('getProductsFromAPI:', data);
        data.forEach((aD) => console.log(aD.code));
      });
```

Error Handling

- Observable's subscribe method supports the Observer pattern. We can pass an Observer to the subscription with the items:
  - **next**: enters when receive response.
  - **error**: enters when there is a error.
  - **complete**: enters when complete the transmission.
- In the example, we misspell the endpoint:

```
this._http
      .get<IProduct[]>('http://localhost:3000/product', { params })
      .subscribe({
        next: (data) => {
          console.log('getProductsFromAPI:', data);
          data.forEach((aD) => console.log(aD.code));
        },
        error: (error) => {
          console.log('getProductsFromAPI error:', error);
        },
        complete: () => console.info('complete')
      });
```

Error Handling

- Two types of errors can occur.
  - **Rsponse code errors**, like 404 or 500 status codes.
  - Something could go wrong on the client side, such as a network error preventing the request from completing successfully, or an exception being thrown in an RxJS operator. These errors produce objects of type **ErrorEvent**.
- The HttpClient catches both types of errors in its HttpErrorResponse and allows you to inspect the response.
- It is recommended to create an error handling function or method (**handleError**) and send the error to it for processing using the pipe method via catchError

```
import { HttpClient, HttpParams } from '@angular/common/http';
import { catchError, retry, throwError } from 'rxjs';
...
const request = this._http
      .get<IProduct[]>('http://localhost:3000/product', { params })
      .pipe(retry(1), catchError(this.errorHandl));

request.subscribe((data) => console.log('getProductsFromAPI:', data));
...
errorHandl = (error: any) => {
    let errorMessage = '';
    if (error.error instanceof ErrorEvent) {
      // Get client-side error
      errorMessage = error.error.message;
    } else {
      // Get server-side error
      errorMessage = `Error Code: ${error.status}\nMessage:
           ${error.message}`;
    }
    console.log(errorMessage);
    return throwError(() => {
      return errorMessage;
    });
  };
```

Sending data with POST

- The **HttpClient.post()** method is similar to get() in that it takes a type parameter and accesses a resource URL.
- POST accepts two parameters in addition to the URL:
  - **object to be sent**: the data to POST in the body of the request.
  - **httpOptions**: The method options which, in this case, specify the required headers.
- **httpOptions** allows headers to be sent to the server, such as Content-Type.
- The headers must be encapsulated in an object of type **HttpHeader**.

```
import { HttpClient, HttpHeaders, HttpParams } from
'@angular/common/http';
...
  httpOptions = {
    headers: new HttpHeaders({
      'Content-Type': 'application/json',
      Authorization: 'my-auth-token',
    }),
  };

...
const request= this._http
      .post<IProduct>(
        'http://localhost:3000/products',
        JSON.stringify(new_product),
        this.httpOptions
      )
      .pipe(retry(1), catchError(this.errorHandl));

    request.subscribe((data) =>
          console.log('addProductToAPI:', data));
```

NON-JSON data request

- Although currently working with JSON is the most common situation, there are escenarios where it will be necessary to deal with different types of data.
- This is supported through the **responseType** property.
  - `responseType ?: 'arraybuffer' | 'blobs' | 'json' | 'text'`

```
this._http('http://localhost:3000/products', {
      params,
      responseType: 'text',
    }).pipe(retry(1), catchError(this.errorHandl));
```

- In this case, you **don't need to type the response** since the responseType already does the work.

Interceptors

- **HttpInterceptor** allows to **introduce middleware logic** into the process.
- To create an interceptor we need to implement the **HttpInterceptor interface** , which basically consists of implementing the **intercept** method.

```
interface HttpInterceptor {
  intercept(req: HttpRequest<any>, next: HttpHandler): Observable<HttpEvent<any>>
}
```

- The intercept method receives an HttpRequest and must return a sequence of HttpEvents of type HttpResponse.
- You can chain various interceptor for a request.
  - Most interceptors transform the outgoing request before passing it to the next interceptor in the chain, by calling **next.handle(transformedReq)**.
  - An interceptor may transform the response event stream as well, by applying additional RxJS operators on the stream returned by **next.handle()**.

Interceptors

- In this example we define an interceptor that adds a authorization header.
  - Since the **Request and Response objects are immutable** (making them easy to predict and test), we will need to use the **clone** method to mutate the Response object.

```
import { Injectable } from "@angular/core";
import {
  HttpInterceptor, HttpRequest, HttpHandler, HttpEvent, HttpEventType,
} from "@angular/common/http";
import { Observable } from "rxjs/Observable";

export class AuthInterceptor implements HttpInterceptor {
  intercept(
    req: HttpRequest<any>,
    next: HttpHandler
  ): Observable<HttpEvent<HttpEventType.Response>> {
    const authReq = req.clone({
      setHeaders: { Authorization: `Bearer authtest` },
    });
    return next.handle(authReq);
  }
}
```

HTTP API - Interceptors

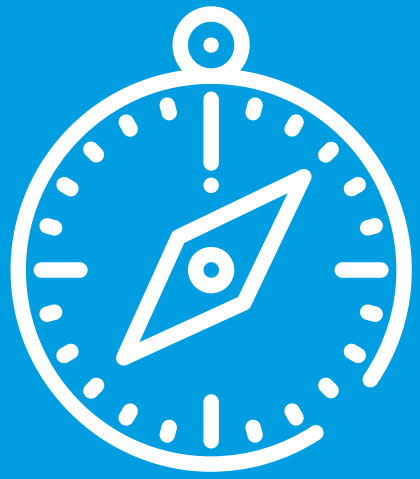
- The way to register an interceptor in the ngModule is as follows.

```
import { HttpClientModule, HTTP_INTERCEPTORS } from '@angular/common/http';
import { AuthInterceptor } from './interceptors/auth-interceptor’;
...
@NgModule({
  declarations: [...],
  imports: [...],
  providers: [
    { provide: HTTP_INTERCEPTORS, useClass: AuthInterceptor, multi: true },
  ],
  bootstrap: [AppComponent],
})
export class AppModule {}
```

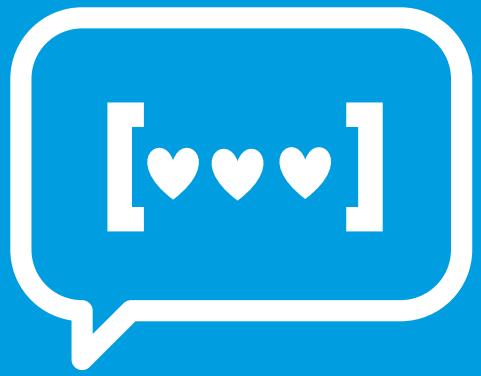
- **HTTP_INTERCEPTORS**: A multi-provider token that represents the array of registered HttpInterceptor objects.
- useClass: the implementation class.
- multi: multiple values (or classes) are going to be used.

Let's put it into practice: Tasks/Projects App

- Make the services access an API to fetch the tasks and projects .



Next steps



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