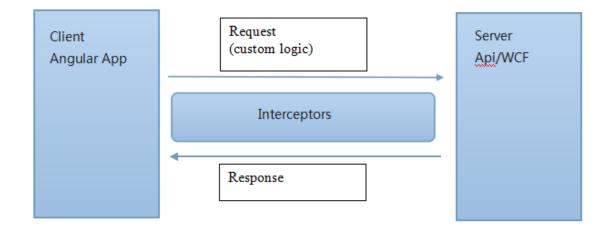


Angular 14 - 14



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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