ANGULAR 6

Lesson 08

HTTP REQUESTS / OBSERVABLES

Objectives

Http Requests / Observables

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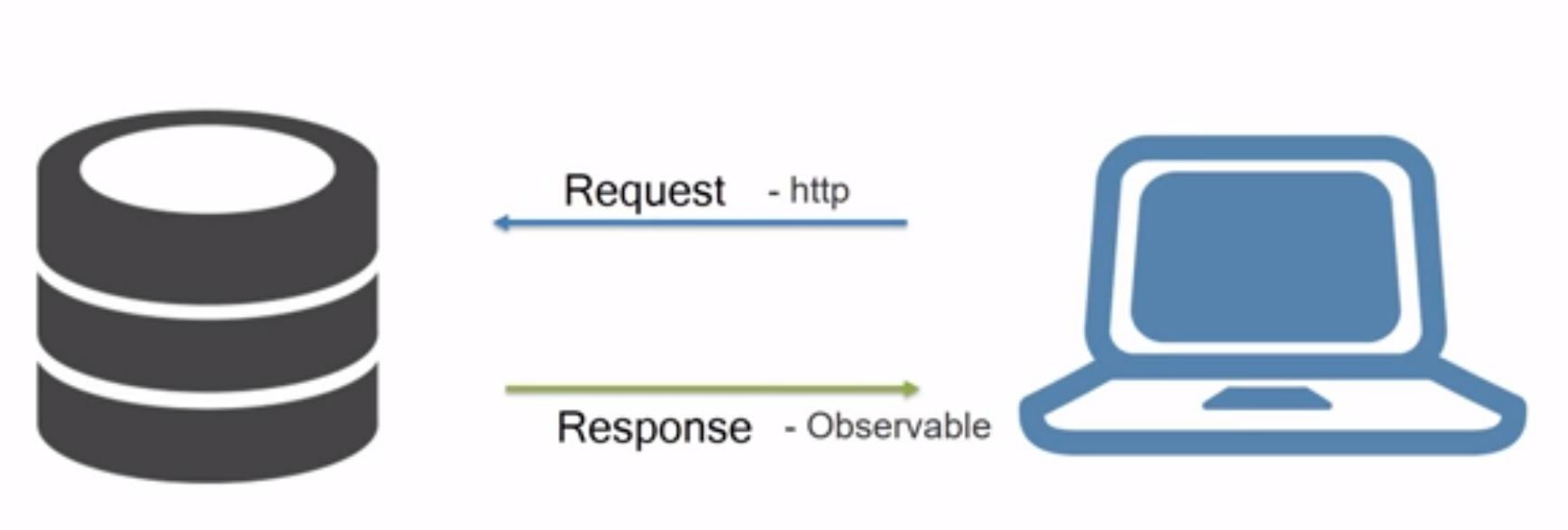
- HTTP Requests
- Sending GET Requests
- Sending a PUT Request
- Transform Responses with Observable Operators (map())
- Using the Returned Data
- Catching Http Errors
- Pipe(), map(), catchError()
- Interceptors
- Basics of Observables & Promises
- Analysing a Built-in Angular Observable
- Building & Using a Custom Observable
- Understanding Observable Operators
- Using Subjects to pass and listen to data

HTTP REQUESTS

HTTP Requests

- Angular applications often obtain data using http
- Application issues http get requests to a web server which returns http response-Observable to the application.
- Application then processes that data



Sending GET Requests

Sending a PUT Request

Introducing RxJs

- RxJs stands for Reactive Extensions for Javascript, and its an implementation of Observables for Javascript.
- It is a ReactiveX library for JavaScript.
- It provides an API for asynchronous programming with observable streams.
- ReactiveX is a combination of the best ideas from the Observer pattern, the Iterator pattern, and functional programming.
- Observable is a RxJS API. Observable is a representation of any set of values over any amount of time. All angular Http methods return instance of Observable. Find some of its operators.
- map: It applies a function to each value emitted by source Observable and returns finally an instance of Observable.
- catch: It is called when an error is occurred. catch also returns Observable.

Transform Responses with Observable Operators

- Operators are functions that build on the observables foundation to enable sophisticated manipulation of collections.
- For example, RxJS defines operators such as map(), filter(), concat(), and flatMap().
- Operators take configuration options, and they return a function that takes a source observable.
- When executing this returned function, the operator observes the source observable's emitted values, transforms them, and returns a new observable of those transformed values.

Using the Returned Data

Transform Responses with Observable Operators

- Map operator

```
import { map } from 'rxjs/operators';
const nums = of(1, 2, 3);
const squareValues = map((val: number) => val * val);
const squaredNums = squareValues(nums);
squaredNums.subscribe(x => console.log(x));
 // Logs
// 1
// 4
// 9
```

Pipe(), map(), catchError()

Catching Http Errors

- In addition to the error() handler, RxJS provides the catchError operator that lets you handle known errors in the observable recipe.
- For instance,
  - *suppose you have an observable that makes an API request and maps to the response from the server.*
  - *If the server returns an error or the value doesn't exist, an error is produced.*
  - *If you catch this error and supply a default value, your stream continues to process values rather than erroring out.*

Catching Http Errors

- Here's an example of using the catchError operator

```
import { ajax } from 'rxjs/ajax';
import { map, catchError } from 'rxjs/operators';
// Return "response" from the API. If an error happens,// return an empty array.
const apiData = ajax('/api/data').pipe(
        map(res => {
                if (!res.response) {
                        throw new Error('Value expected!');
                }
                return res.response;
        }),
        catchError(err => of([]))
);
apiData.subscribe({
        next(x) { console.log('data: ', x); },
        error(err) { console.log('errors already caught... will not run');
}
});
```

Interceptors

Demo

- Demo HttpGet
- Demo HttpDelete
- Demo HttpGetErrorHanding

OBSERVABLES

Basics of Observables & Promises

- Observables provide support for passing messages between publishers and subscribers in your application.
- Observables offer significant benefits over other techniques for event handling, asynchronous programming, and handling multiple values.
- Observables are declarative—that is, you define a function for publishing values, but it is not executed until a consumer subscribes to it. The subscribed consumer then receives notifications unti the function completes, or until they unsubscribe.

Basics of Observables & Promises

- An observable can deliver multiple values of any type—literals, messages, or events, depending on the context. The API for receiving values is the same whether the values are delivered synchronously or asynchronously. Because setup and teardown logic are both handled by the observable, your application code only needs to worry about subscribing to consume values, and when done, unsubscribing. Whether the stream was keystrokes, an HTTP response, or an interval timer, the interface for listening to values and stopping listening is the same.
- Because of these advantages, observables are used extensively within Angular, and are recommended for app development as well.

Basics of Observables & Promises

- Observables is a part of ReactiveX library also known as rxjs
  - *import { Observable } from 'rxjs/Observable';*
- Observables is like an array whose items arrived asynchronously. The role of ReactiveX to provide asynchronously programming
- Observable help to manage asynchronous data, such as data coming from a backend service. That data we are going to subscribe
- Observable work with multiple value
- Observable are cancellable
- Observable use javaScript function such as map filter & reduce

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Analysing a Built-in Angular Observable

Building & Using a Custom Observable

- Use the Observable constructor to create an observable stream of any type.
- The constructor takes as its argument the subscriber function to run when the observable’s subscribe() method executes.
- A subscriber function receives an Observer object, and can publish values to the observer's next() method.

Building & Using a Custom Observable

- Create observable with constructor

```
// This function runs when subscribe() is called
function sequenceSubscriber(observer) {
// synchronously deliver 1, 2, and 3, then complete
observer.next(1);
observer.next(2);
observer.next(3);
observer.complete();
// unsubscribe function doesn't need to do anything in this
// because values are delivered synchronously
return {unsubscribe() {}};}
 // Create a new Observable that will deliver the above sequence
const sequence = new Observable(sequenceSubscriber);
 // execute the Observable and print the result of each notification
sequence.subscribe({
 next(num) { console.log(num); },
complete() { console.log('Finished sequence'); }});
// Logs:// 1// 2// 3// Finished sequence
```

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Understanding Observable Operators

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Using Subjects to pass and listen to data