JavaScript
Beginner‘s Course
Part 4

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Agenda

1. Functions as Arguments & Callbacks
2. Object Iterator
3. JSON
4. Session Storage
5. Local Storage
6. HTTP Protocol
7. AJAX

1. Functions as Arguments

```
function whichOne(f) {
  f();
}

function a() { console.log(‘i am a‘); }
function b() { console.log(‘i am b‘); }
function c() { console.log(‘i am c‘); }

whichOne(b);
```

1. Callbacks

```
function waitForSomething(callback) {
   ... // important calculations here ...
   callback();
}

waitForSomething( function() {
   alert(‘Hallo World‘);
});
```

2. Object Iterator

- Object iteration:

```
for(key in Obj) {
    …
 }
```

1. JSON

- JSON = JavaScript Object Notation
- Data format for interchanging objects accross multiple system

```
person = {
  ‘firstname‘: ‘Jan‘,
  ‘age‘: 31 }
}
```

or

```
[ 1, 3, 4, 9, 10 ]
```

1. JSON

- JSON = JavaScript Object Notation
- Data format for interchanging objects accross multiple system

```
person = {
  “firstname“ : “Jan“,
  “age“ : 31 }
}


or


[ 1, 3, 4, 9, 10 ]
```

- **JSON keys are always strings!**

1. JSON

- Convert JavaScript Object to JSON String

```
var x = JSON.stringify( OBJ );
```

- Parse JSON String to JavaScript Object

```
var y = JSON.parse( str );
```

1. JSON

- Great tool to view JSON Data:

  http://jsonviewer.stack.hu

2. Session Storage

window.sessionStorage

- An object which has key value relationships
  - **string only**, no objects
- Until the browser is closed, data can be saved in the sessionStorage object
- Client-side storage, 5m size

- Methods:
  .setItem(key, value)
  .getItem(key)
  .removeItem(key)
  .clear( )

3. Local Storage

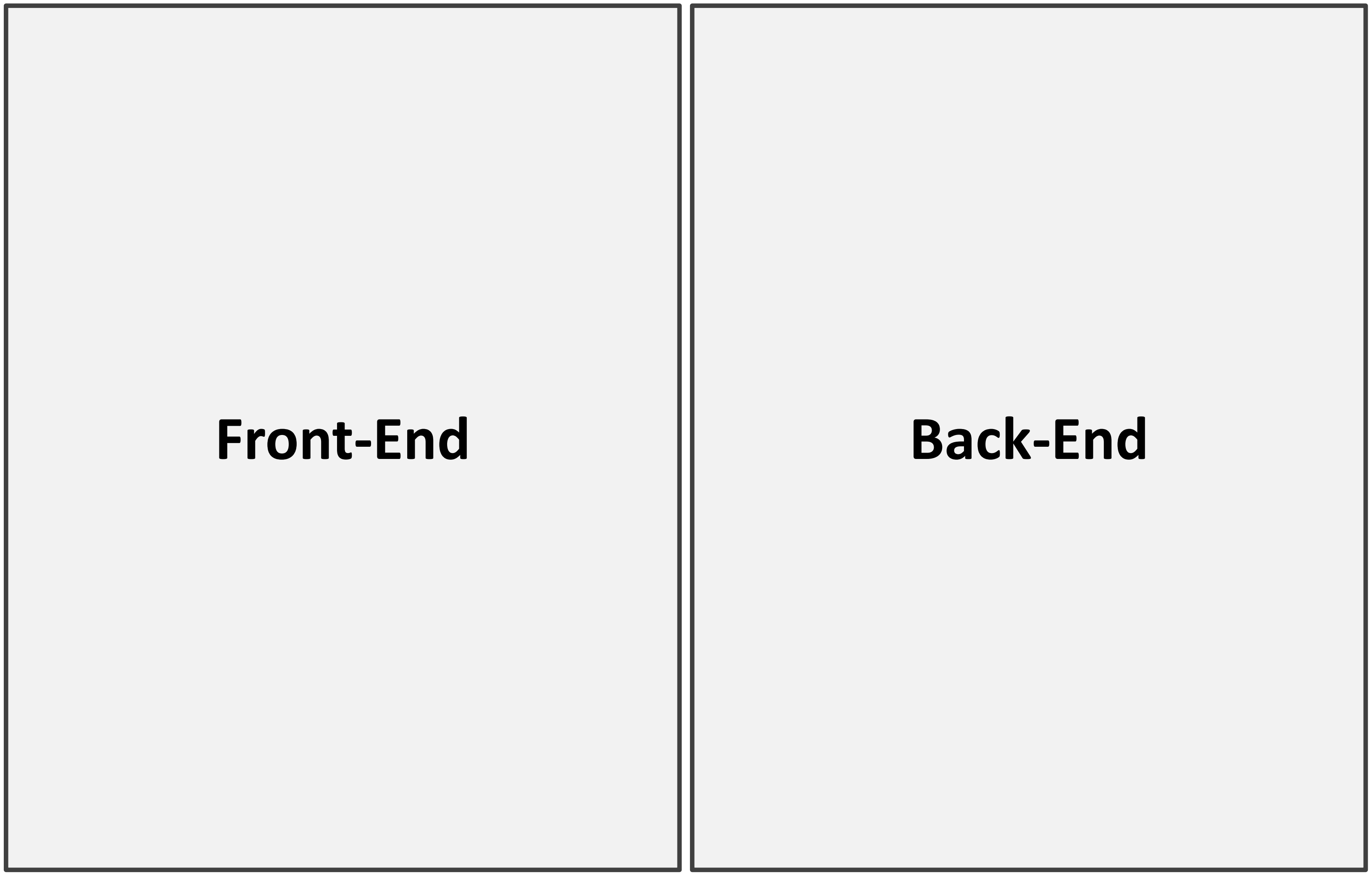
window.localStorage

= Same as sessionStorage

EXCEPT: Data is saved until user explicitly removes it,no pre-defined expiration date

and 10m size

4. HTTP



4. HTTP

Front-End

=

HTTP-Client
(Chrome, Firefox, ...)

Back-End

=

HTTP-Server
(NodeJS, PHP, ...)

4. HTTP

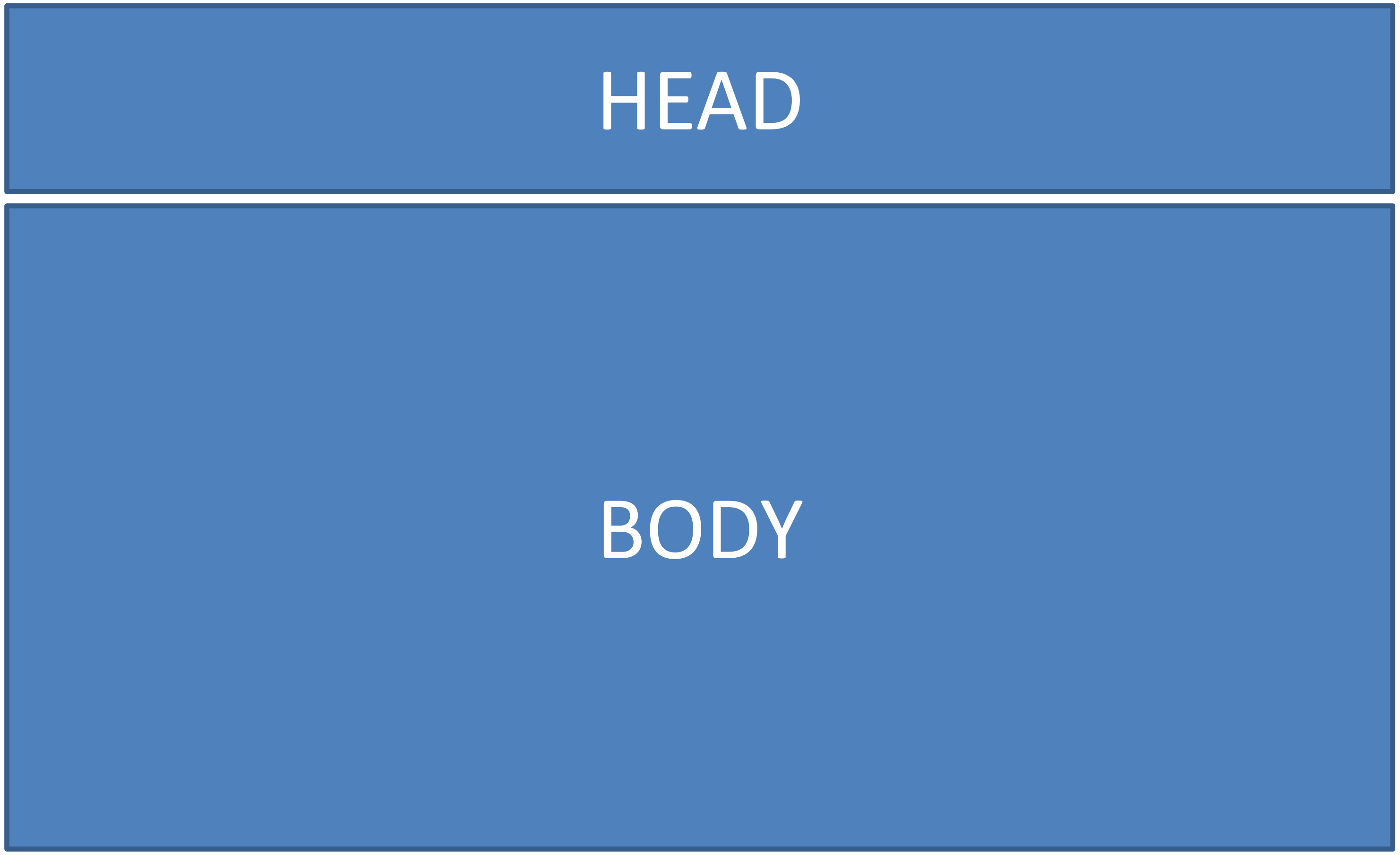
- What is HTTP?
  - HTTP: Protocol
  - Protocol = Set of commands
  - Most used HTTP-commands
    - **GET:** Reading a resource from a server
    - **POST:** Creating a new resource on a server
- Command is either a ...
  - REQUEST
  - RESPONSE

4. HTTP

- What is HTTP?
  - HT
  - Pro
  - Mo
    - G
    - P
- Comm
  - REQUEST
  - RESPONSE

How does an HTTP-command look like?

4. HTTP



4. HTTP

The request
/GET has an empty body!

4. HTTP

- There are **17 HTTP-REQUESTS**
  - GET -> show me a resource
  - POST -> create a new resource based on the information in the request‘s body
  - PUT -> change a resource based on the requests‘ body
  - DELETE -> delete a resource
  - ...

4. HTTP

- There are **50+ HTTP-RESPONSES**
  - 200 -> OK, your request was processed completely
  - 304 -> the last 200 was not modified
  - 404 -> resource not found
  - 400 -> bad request, i.e. wrong request head or body
  - 408 -> timeout, processing the request took too long

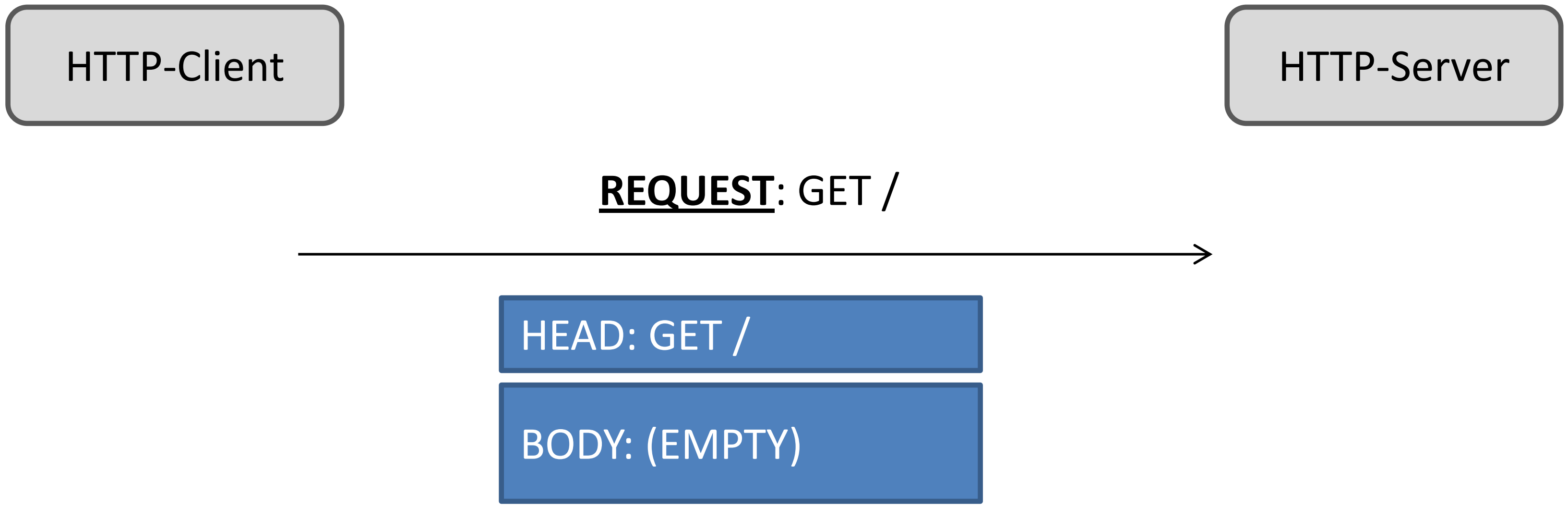
4. HTTP

- We are dealing with GET and POST requests
- **GET requests** have a head and an empty body
- **POST requests** have a head and an non-empty body

4. HTTP

<u>Client/Server communication example</u>

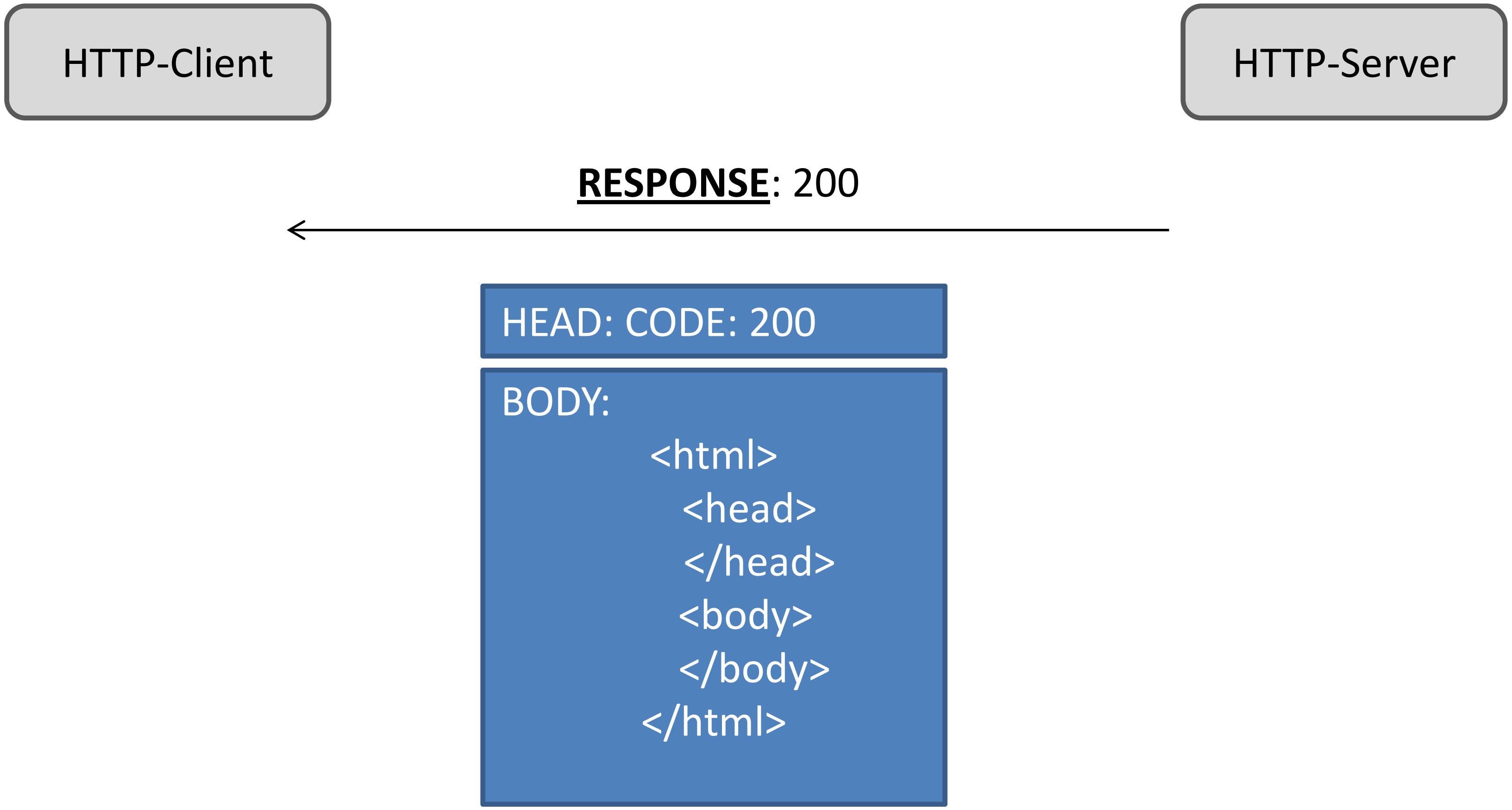
You open a website www.google.com



4. HTTP

<u>**Client/Server communication example**</u>

You receive an answer from Google.com

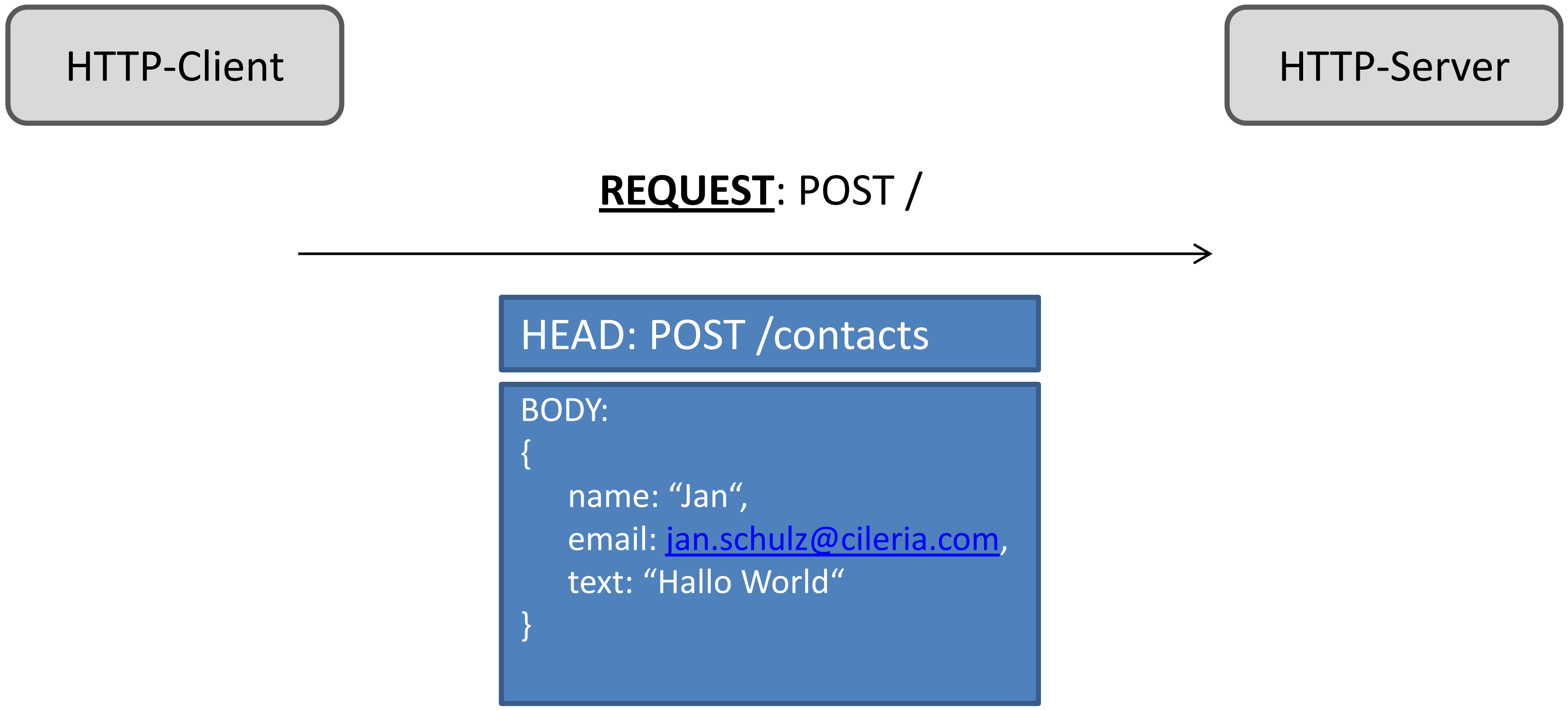


```
<html>
  <head>
  </head>
  <body>
  </body>
</html>
```

4. HTTP

<u>Client/Server communication example</u>

You post a new contact request to your localhost/contacts

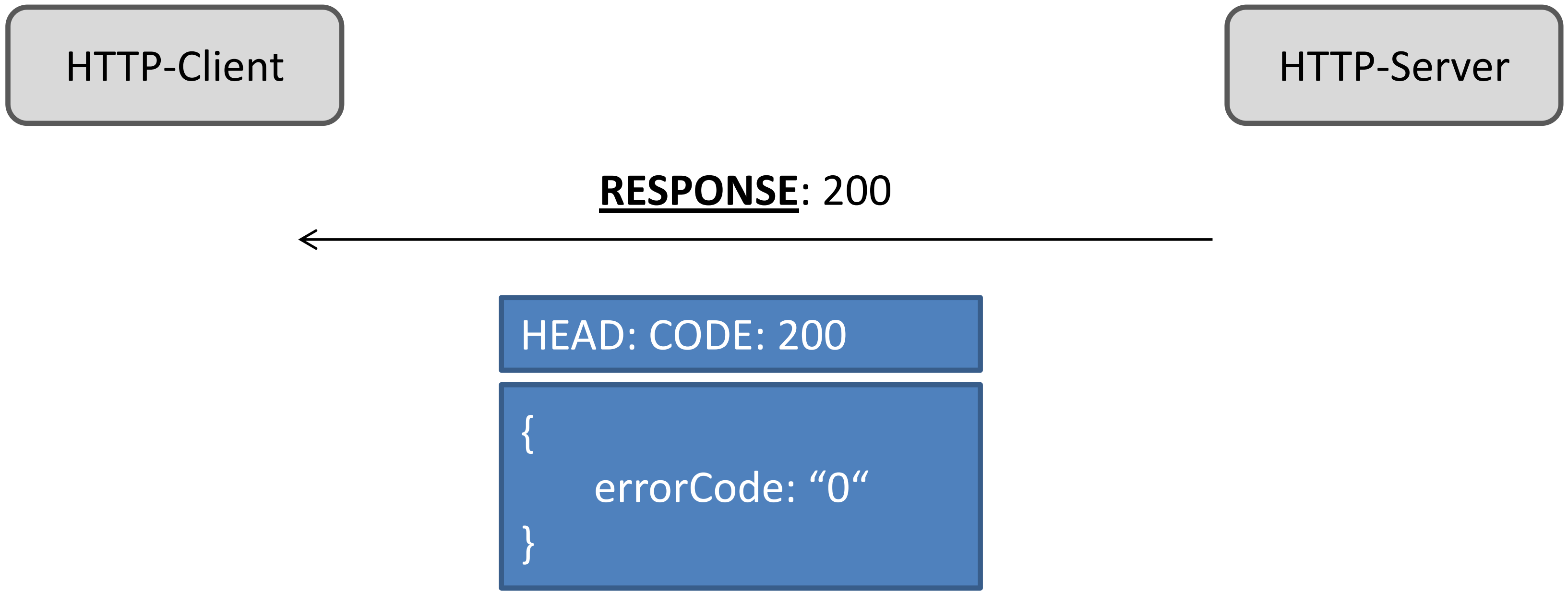


```
BODY:
{
    name: “Jan“,
    email: jan.schulz@cileria.com,
    text: “Hallo World“
}
```

4. HTTP

Client/Server communication example

You receive an answer from localhost



```
{
        errorCode: “0“
}
```

4. HTTP

- What‘s the purpose of browsers like Chrome/Firefox/etc. ?
- They
  1. GET the HTML, JavaScript and CSS
  2. **<u>Render</u>** a website using HTML and CSS

4. HTTP

- What‘s the purpose of browsers like Chrome/Firefox/etc. ?
- They
  1. GET the HTML, JavaScript and CSS
  2. **<u>Render</u>** a website using HTML and CSS
  3. **<u>Compile</u>** JavaScript and make the website interactive.

4. HTTP

Task: 15 mins

1. Describe the difference between frontend and backend development.
2. Describe the difference between JavaScript run in your browser and JavaScript run on a server.
3. Do you have access to the filesystem (i.e. “/home/user/halloworld.txt“) from our frontend JavaScript code?

4. HTTP

- Tools to test HTTP Requests
  - Postman
  - CURL
  - WGET
- Tools to parse JSON
  - JSONViewer

4. AJAX

- Asynchronouse JavaScript XML Requests
  - HTTP-Requests **that not**
    - Include Source Files like CSS, JS etc.
    - Include Initial page load like Hitting F5 + Reloading the page
  - Do not block other JavaScript code

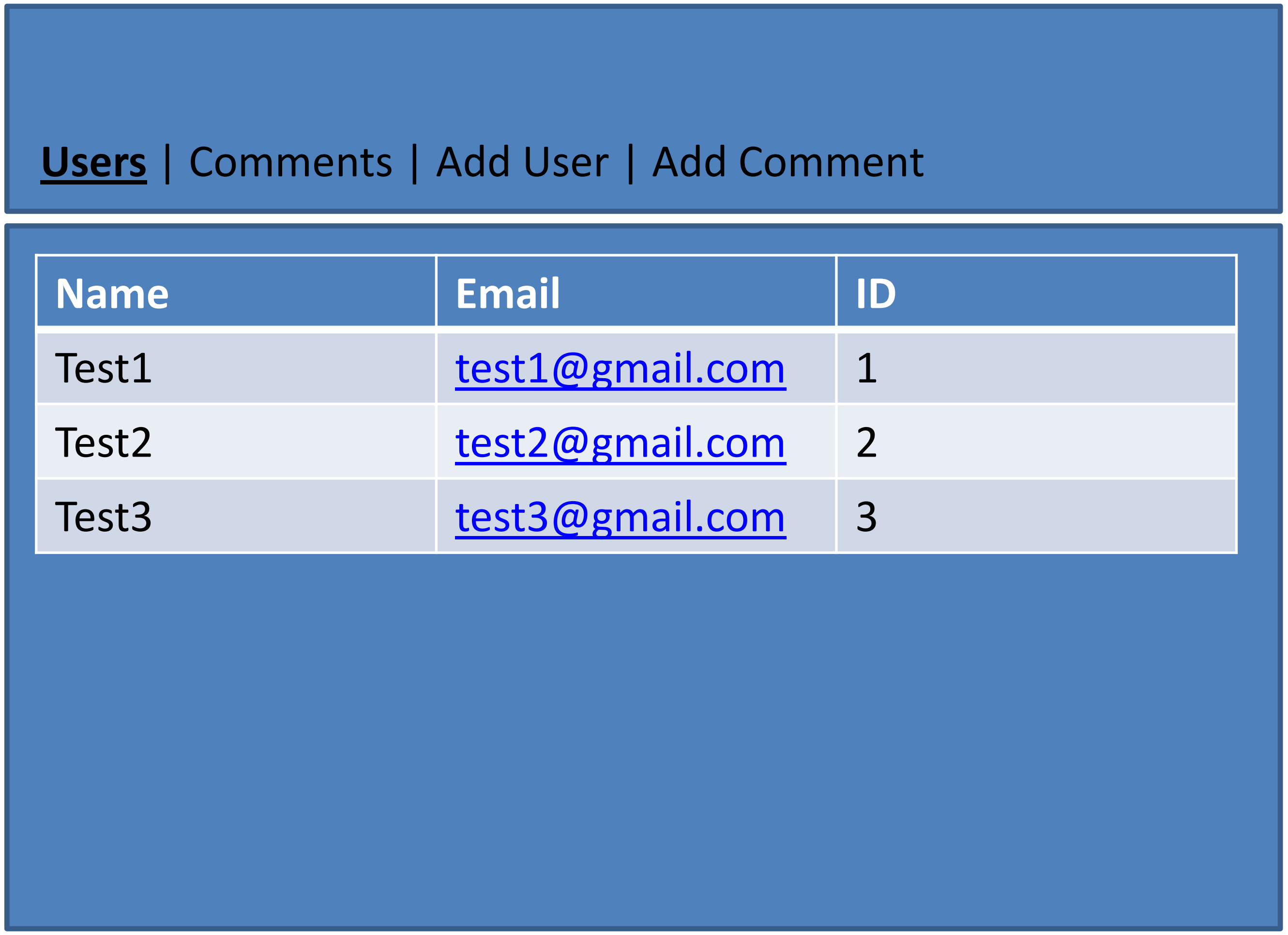
4. AJAX

- Asynchronouse JavaScript XML Requests
  - HTTP-Requests **that not**
    - Include Source Files like CSS, JS etc.
    - Initially load the page like Hitting F5 + Reloading the page
  - In total, 17 types of HTTP-Requests
    - GET – read a resource
    - POST – create a new resource
    - PUT – change an existing resource
    - DELETE – delete an existing resource
    - ...

4. AJAX

- window.XMLHTTPRequest
- Methods:
  - open(): defines the HTTP method and URL
  - onload(): defines an event that handles the response data
  - send(): actually sends the request to the server

Task

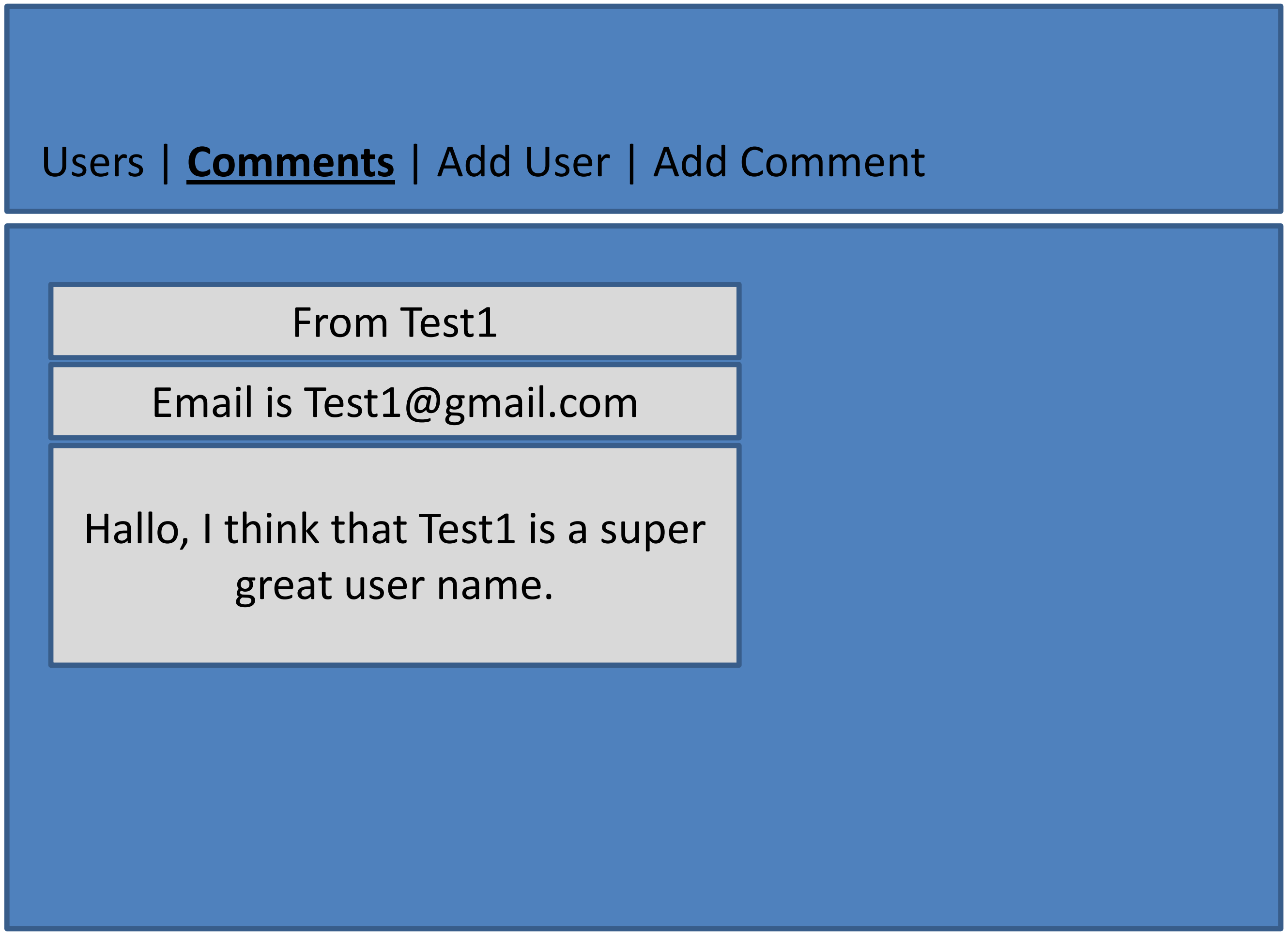


Users | Comments | Add User | Add Comment

Name	Email	ID
Test1	test1@gmail.com	1
Test2	test2@gmail.com	2
Test3	test3@gmail.com	3

Build this Webapp
And Use JavaScript
Show and Hide
HTML Elements
When switching
Navigation points

Task



From Test1

Email is Test1@gmail.com

Hallo, I think that Test1 is a super great user name.

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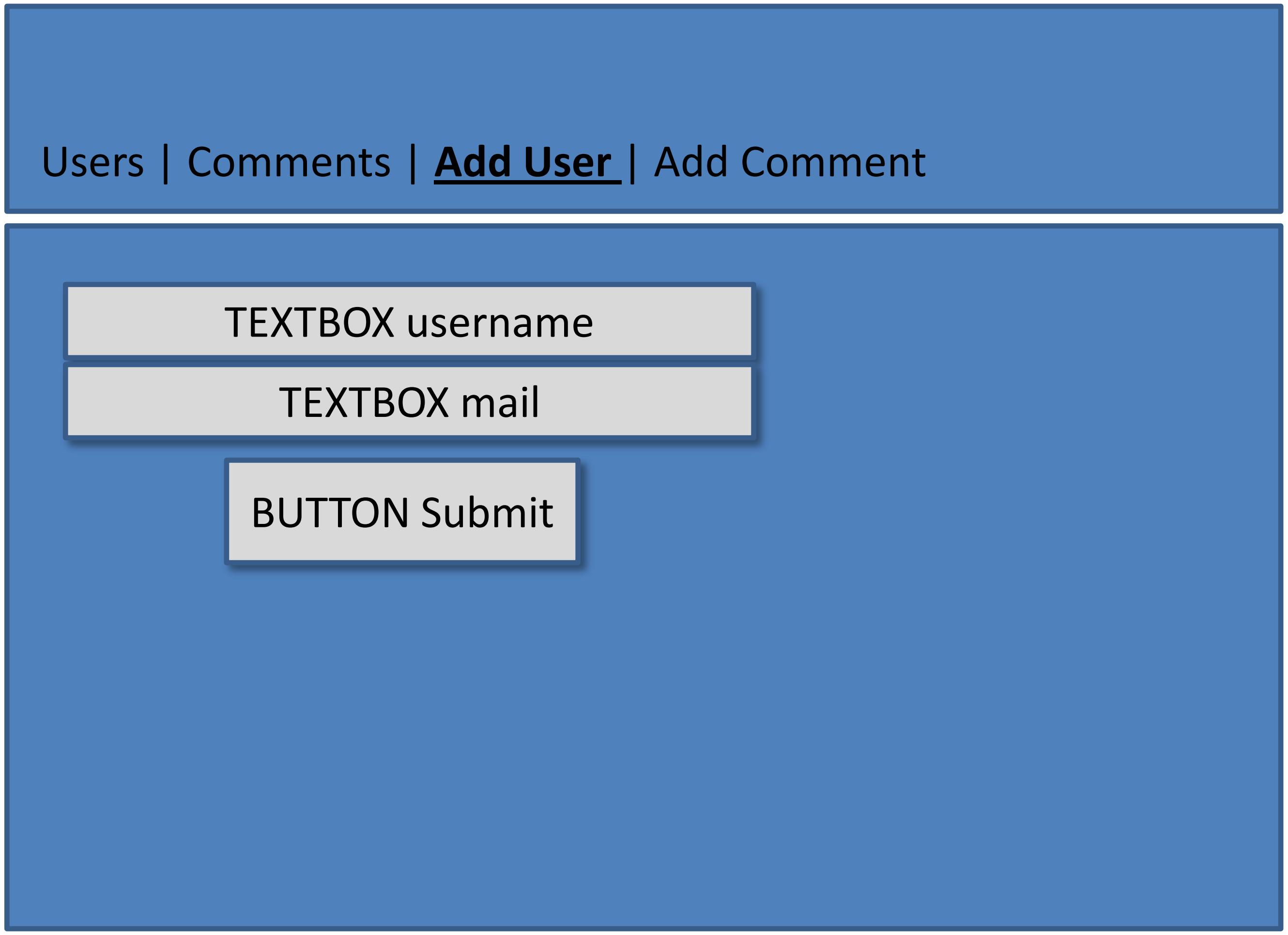
Task



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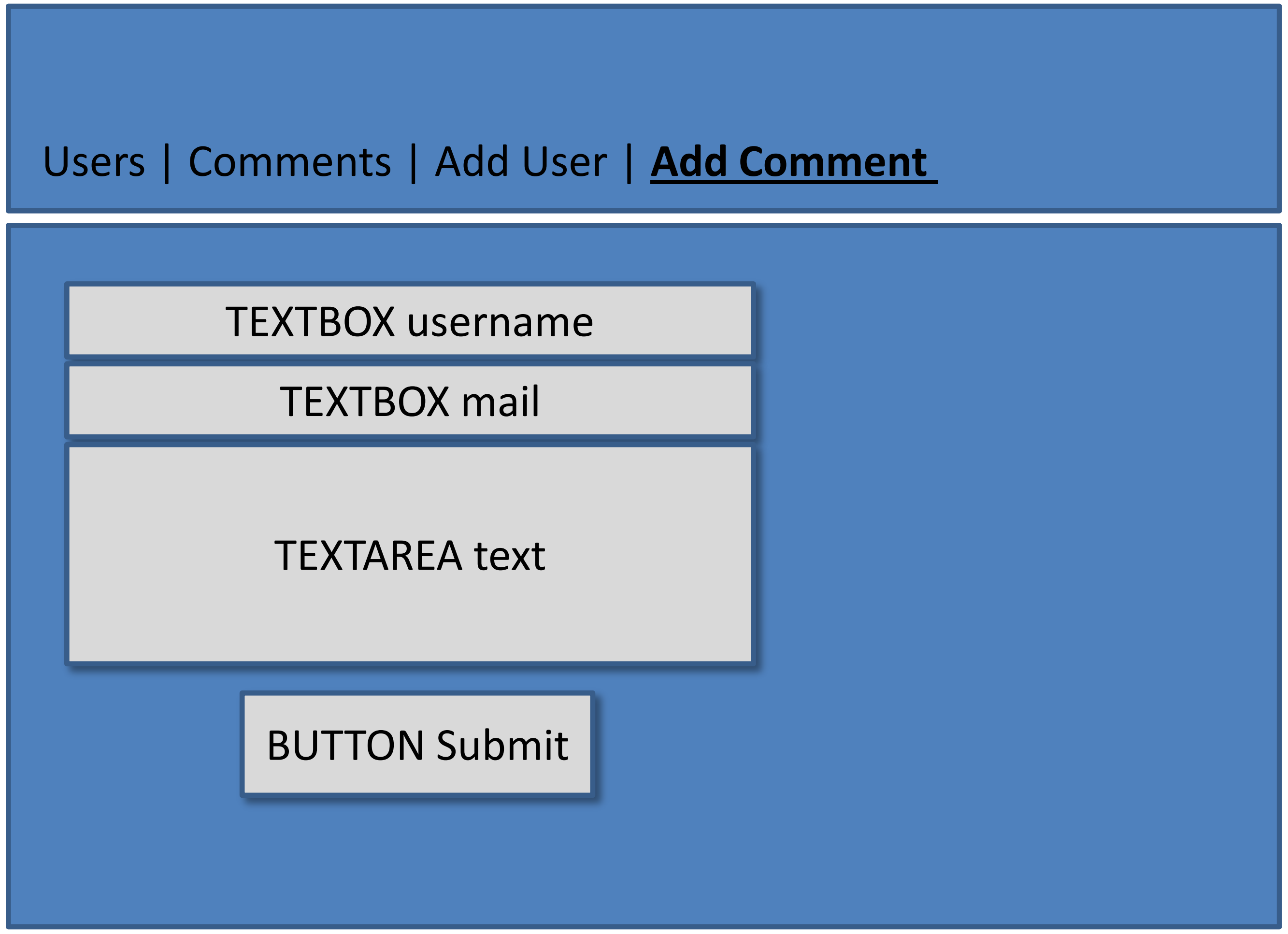

Build this Webapp
And Use JavaScript
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Task

1. Send a GET request to http://35.156.88.18:3050/users and check the response. How can you convert this to a JavaScript object?
2. Send the GET request with AJAX to the server and parse the response.
3. Use the response to create a table of users.
4. Do 1., 2. and 3. for the comments that you can get via http://35.156.88.18:3050/comments

Task

5. Send a POST request to http://35.156.88.18:3050/users with a POST body of {name: ‘Bob, ‘username: ‘Smith‘, email: ‘bob@gmail.com‘}. Use Postman for this.
6. Send the POST request with AJAX to the server based on your form data.
7. Check if a new user has been added.
8 Do 5., 6. and 7. for the comments that you can POST to http://35.156.88.18:3050/comments. This time the POST body looks like {username: ‘Bob‘, email: ‘bob@gmail.com‘, body: ‘Hallo World‘}