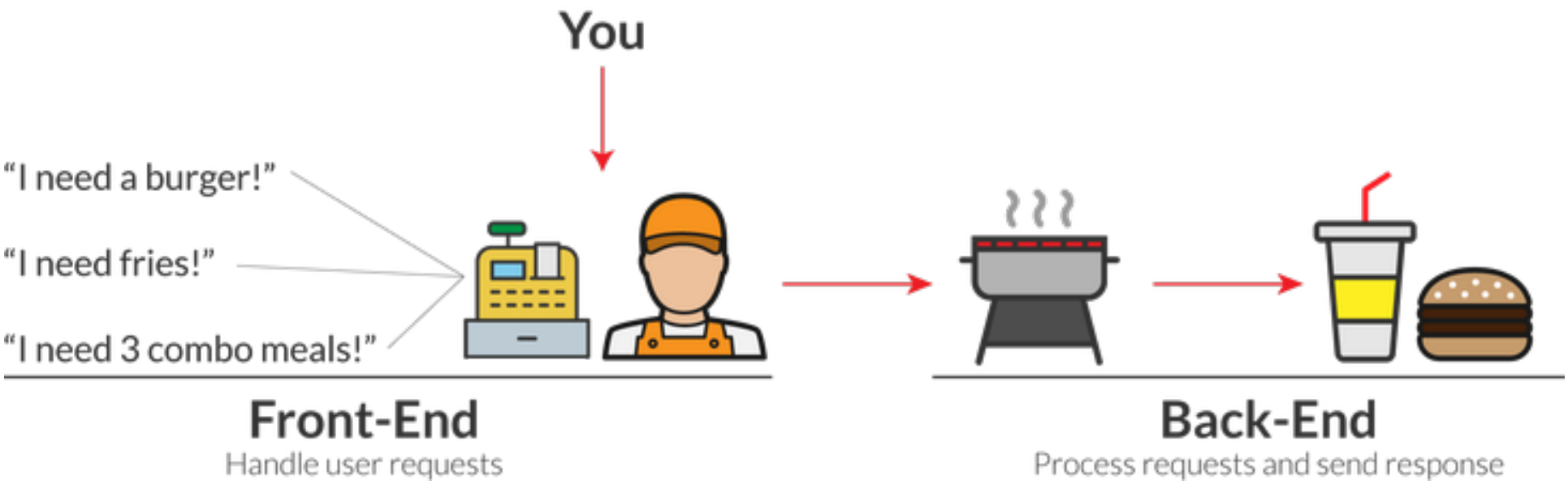
Web 4

AJAX
Polling

Elke Steegmans

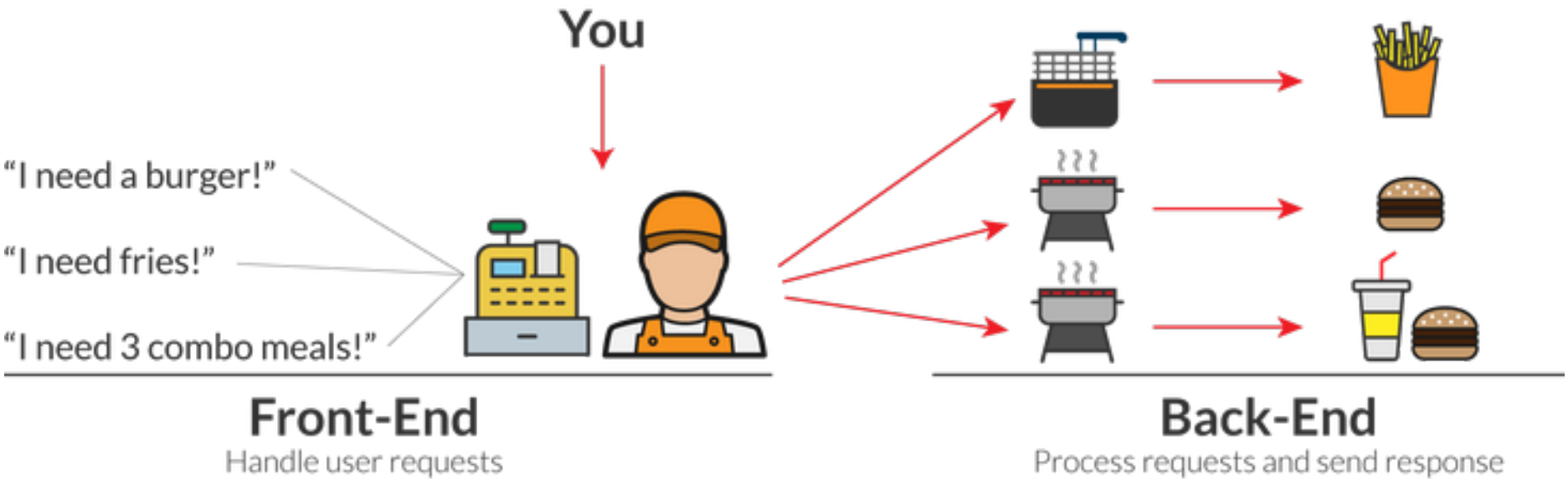

McDonald's
®


You
“I need a burger!”
“I need fries!”
“I need 3 combo meals!”
Front-End
Handle user requests
Back-End
Process requests and send response

Start!

5 Minutes Later

Another 5 Minutes Later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AJAX

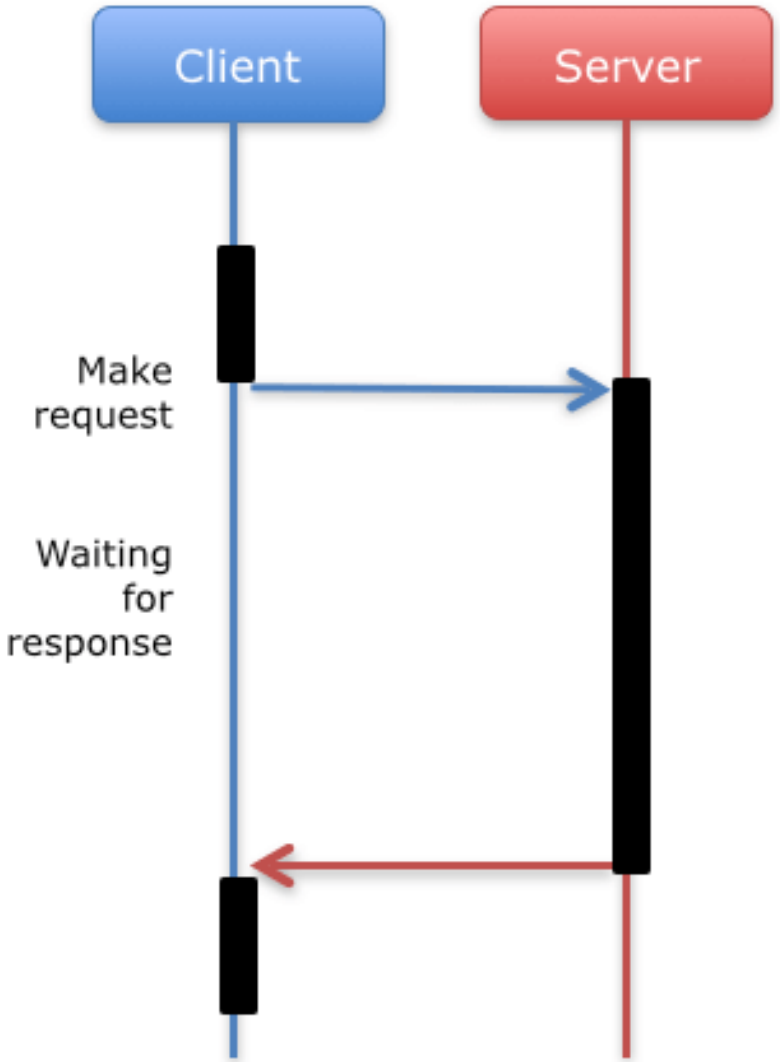
- = **A**synchronous **J**avaScript **A**nd **X**ML
- allows users to interact with your web application without completely reloading the page

Synchronous Web Model

- "request/response" cycle:
  - **enter** your data,
  - **send** the page to the server, and
  - **wait** for a response

Synchronous: user has to wait!

Synchronous



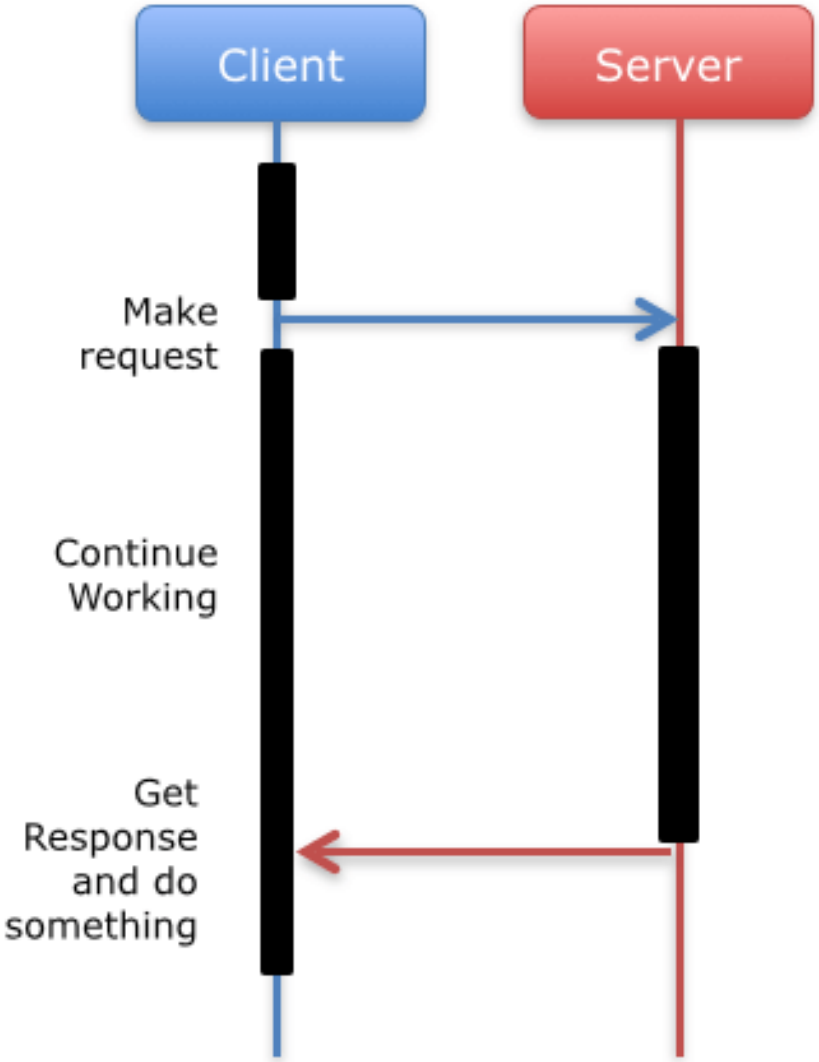
DISADVANTAGES

- "enter, send, and wait": wasted time!
- whenever you refresh a page, you are sending a new request back to the server
  - extra server processing
  - time lost while waiting for a response
  - higher bandwidth consumption caused by redundant page refreshes

Asynchronous Web Model

- introduces the idea of a "partial screen update" to the web application model
  - only the user interface elements that contain new information will be updated,
  - the rest of the user interface will be unchanged

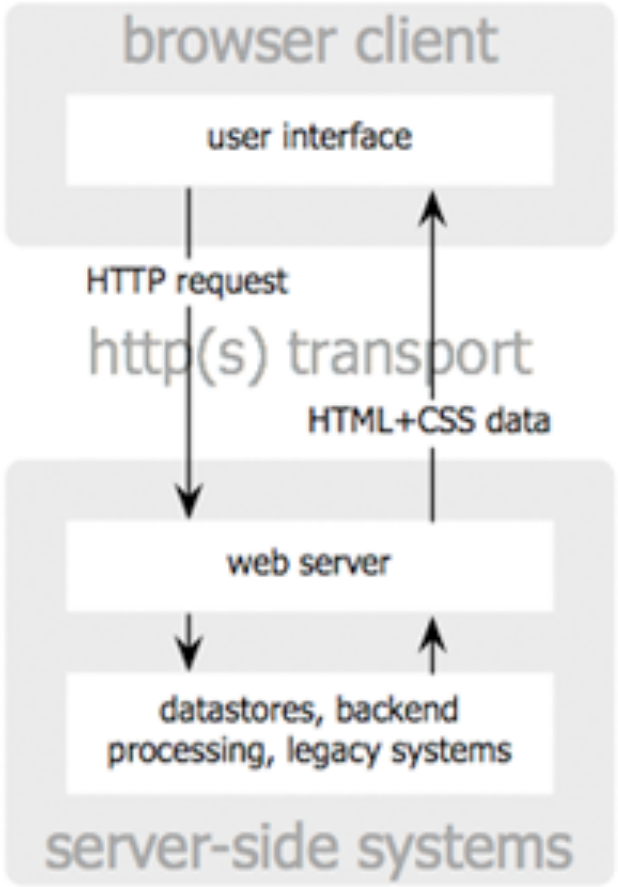
Asynchronous



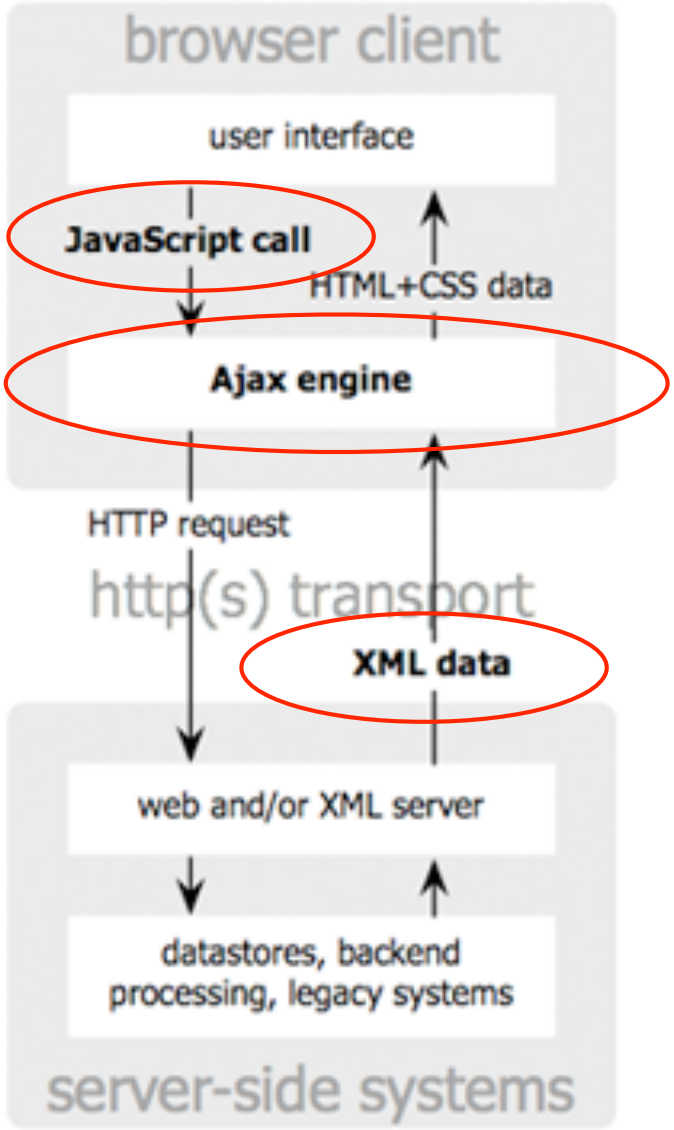
AJAX IN ACTION

AJAX TECHNOLOGIES

- **OLD**
  - HTML and JavaScript = DHTML (Dynamic HTML)
  - XMLHttpRequest Object
- **NEW**
  - JS fetch, promise, …
- JSON (in the beginning XML)
- a server-side technology



classic
web application model



Ajax
web application model

Jesse James Garrett / adaptivepath.com

RESPONSE

- Sending data from server to client
  - 3 possibilities
    - String
    - XML (old technology)
    - JSON

JSON

- = JavaScript Object Notation
- = easier alternative to XML

XML

```
<quotes>
        <quote>
            <author> Obama </author>
            <text> Yes we can! </text>
             <year> 2009 </year>
        </quote>
        <quote>
            <author> Martin Luther King </author>
            <text> I have a dream </text>
             <year> 1950 </year>
        </quote>
</quotes>
```

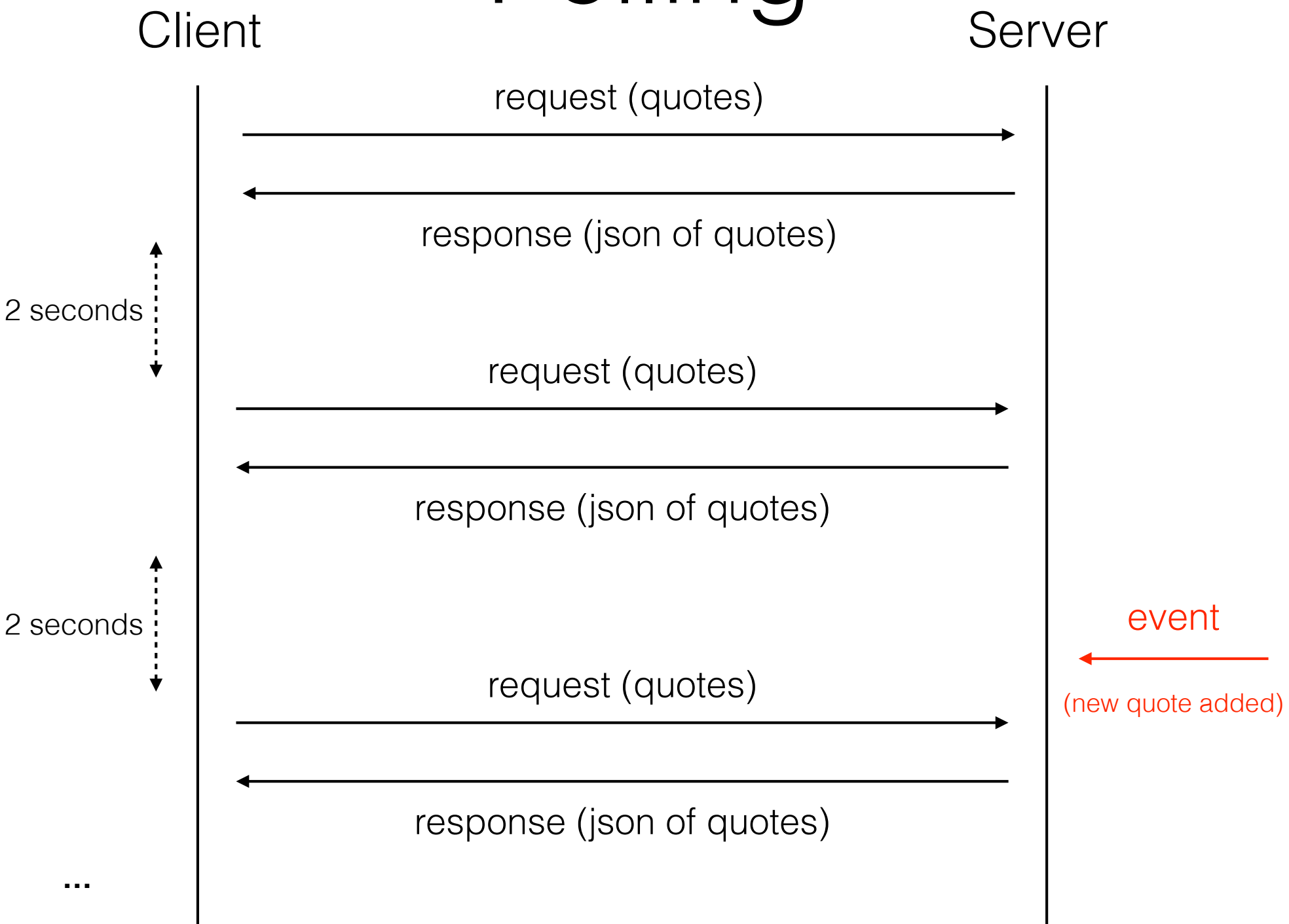
JSON

```
{ "quotes" : [
        {"author":"Obama",
        "text":"Yes we can!",
        "year":"2009"},
        {"author":"Martin Luther King",
        "text":"I have a dream",
        "year":"1950"}
] }
```

JSON

- Jackson
  - http://www.mkyong.com/java/jackson-2-convert-java-object-to-from-json/
  - add jars to lib folder (core, databind and annotations jars of jackson)
- GSON
- …

Polling


Client
Server
request (quotes)
response (json of quotes)
2 seconds
request (quotes)
response (json of quotes)
2 seconds
event
request (quotes)
(new quote added)
response (json of quotes)
...

setTimeout and setInterval

- setTimeout(function, milliseconds)
  - executes a function, after waiting a specified number of milliseconds
- setInterval(function, milliseconds)
  - same as setTimeout(), but repeats the execution of the function continuously

DEMO'S

https://github.com/UCLLWebontwikkeling4

Ajax_Polling
Ajax_Polling_Fetch

JS fetch

- https://www.javascripttutorial.net/javascript-fetch-api/
- https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Promise
- https://javascript.info/async-await

Referenties

- https://medium.com/free-code-camp/ajax-basics-explained-by-working-at-a-fast-food-restaurant-88d95f5fcb7a