

# **Inverting client-server architecture**

Aurelijus Banelis



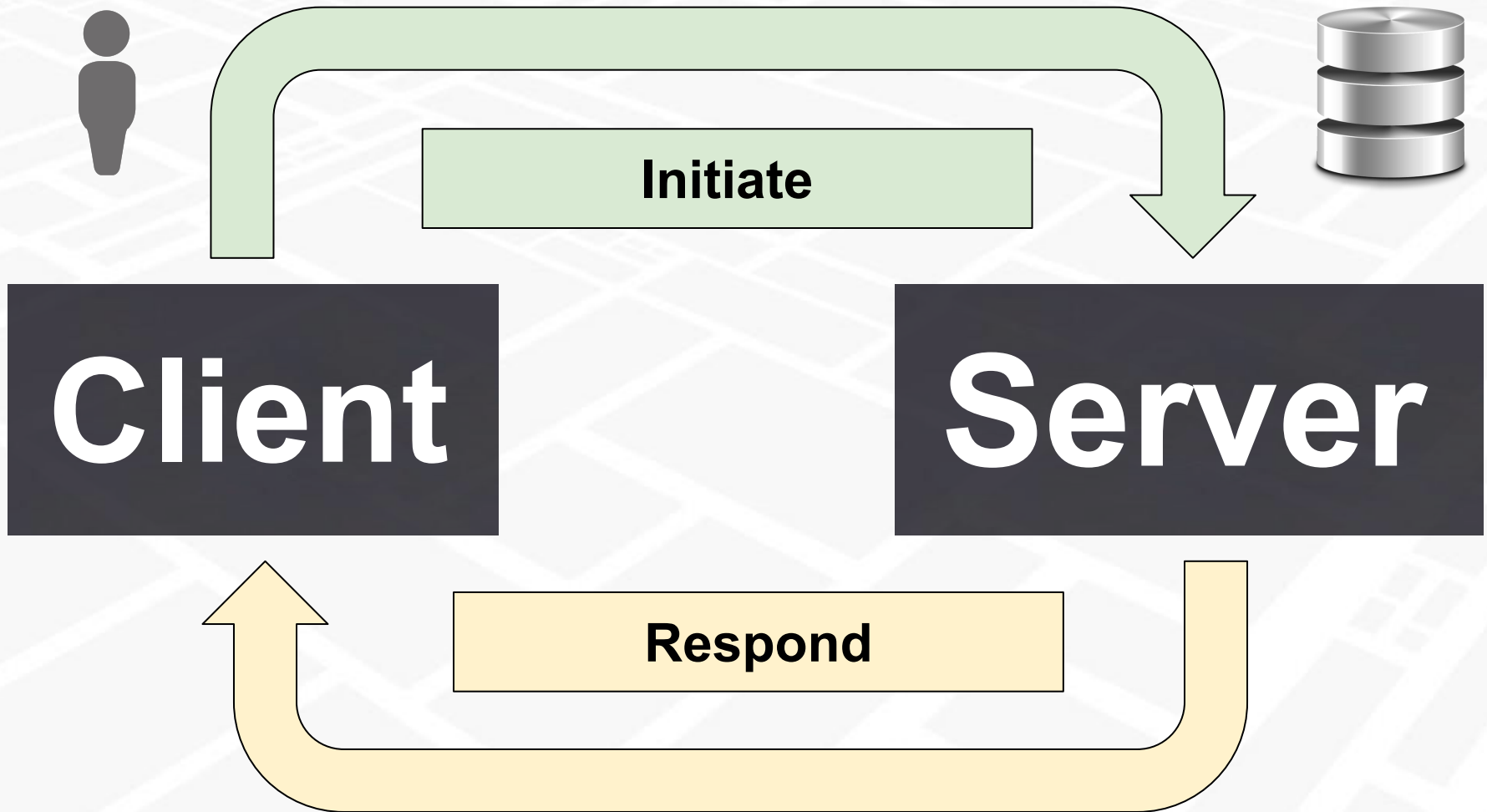
# Aurelijus Banelis

[aurelijus.banelis.lt](mailto:aurelijus.banelis.lt)

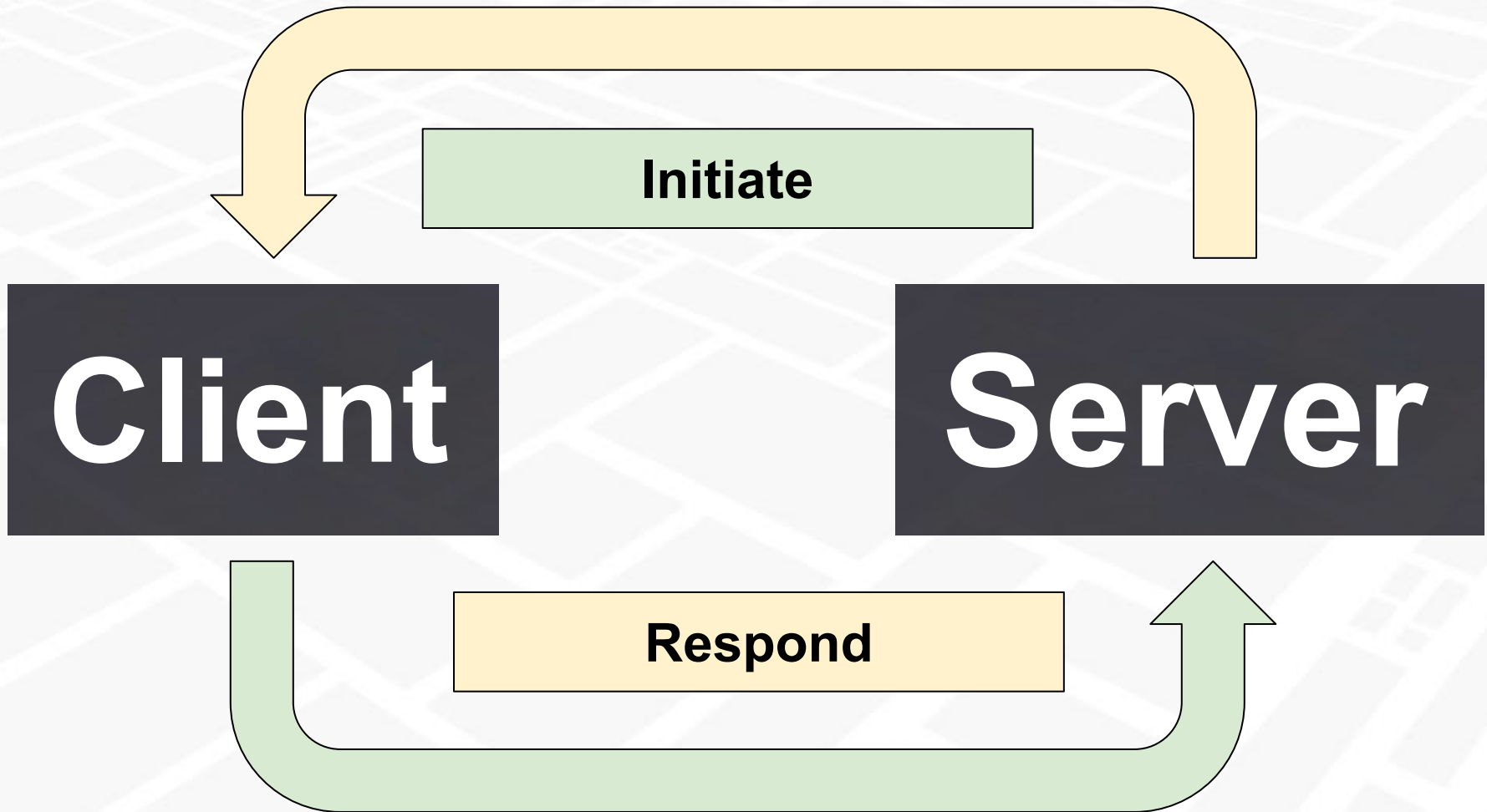
[aurelijus@banelis.lt](mailto:aurelijus@banelis.lt)



# Common practice



# Can reverse scenario be useful?



# Commonly used practice



**Client**

**Server**

**Client-side  
API**

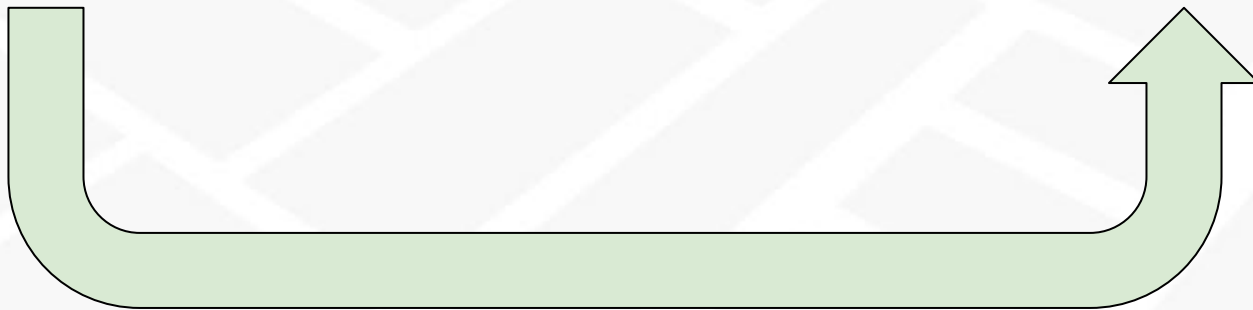
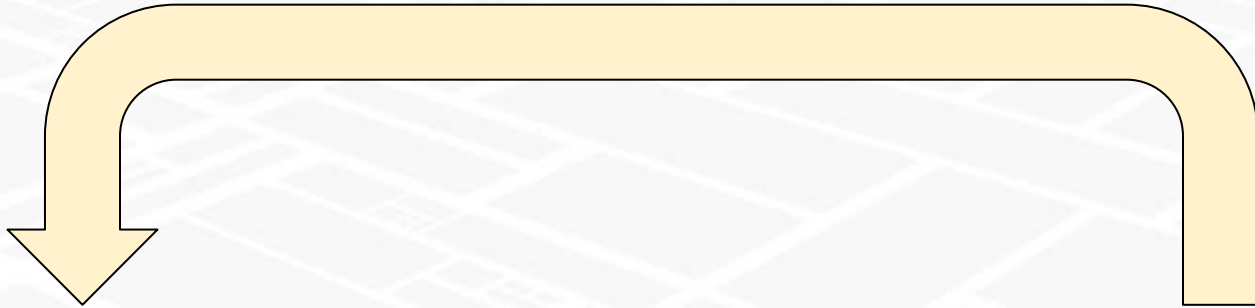
## **2 examples**

**Server-side  
Google analytics**



**Client**

**Server**





# Server-side Google Analytics

# Server-side Google analytics

**WHY**

**Privacy, loading time**

**WHAT**

**(Not)Getting**

**HOW**

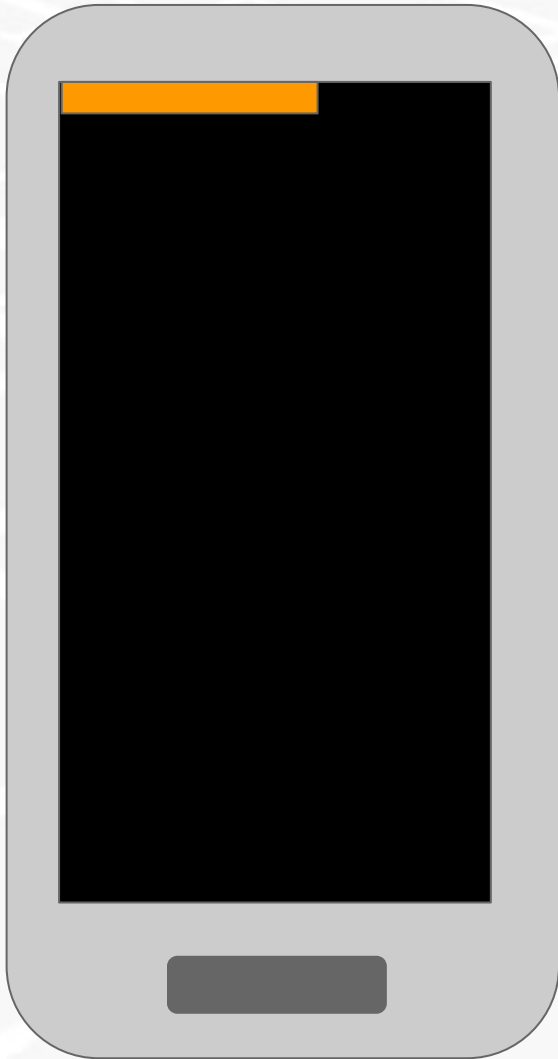
**Examples, tips**



# While in party

**Can you show  
your project?**

# Loading...

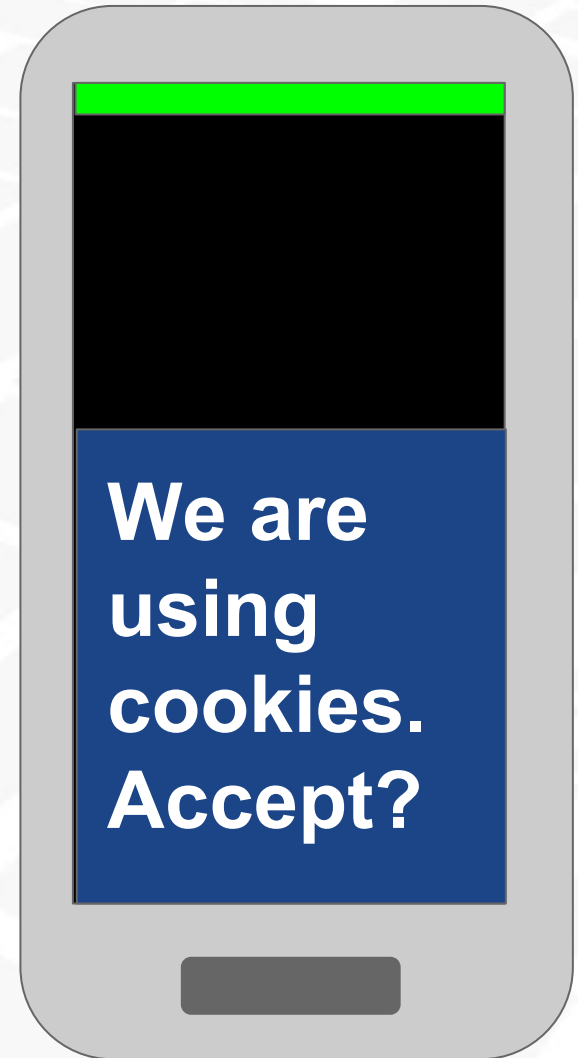
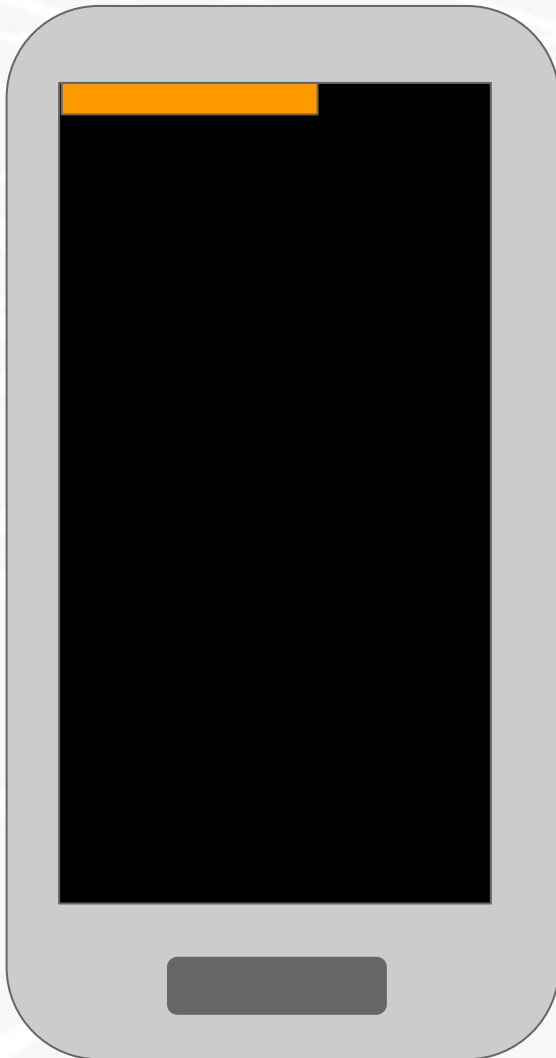


WHY

WHAT

HOW

# EU law

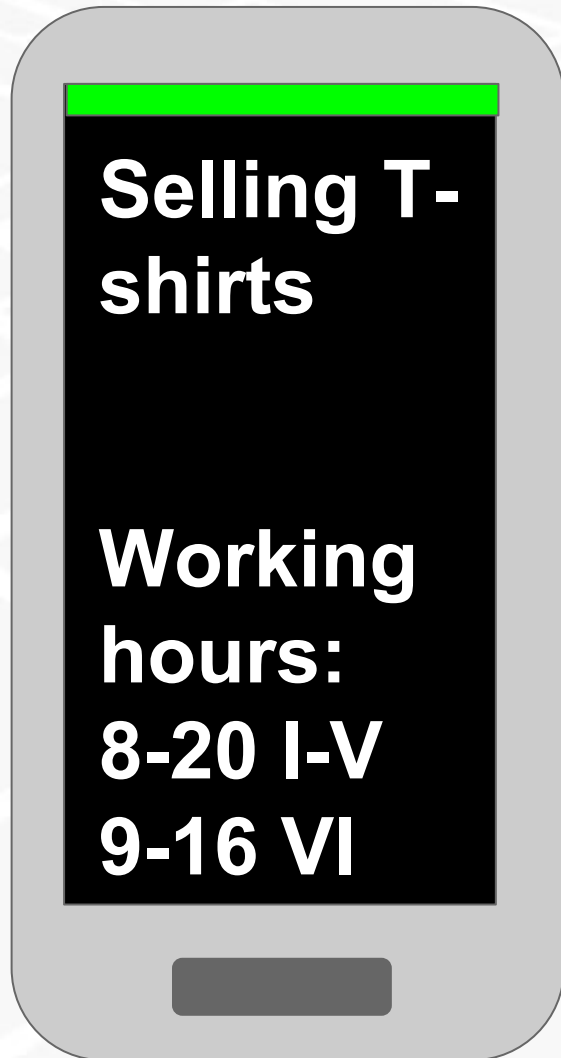


WHY

WHAT

HOW

# Customer wanted



**Can you show  
your project?**

# Customer wanted

**Selling T-shirts**

**Working  
hours:  
8-20 I-V  
9-16 VI**

**Login**

**Register**

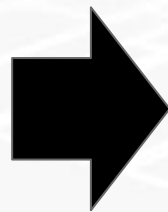
☒ **Privacy**

☒ **Terms**

**Slow  
tracking  
pixels**

**Cookies  
and  
privacy**

**Slow  
tracking  
pixels**

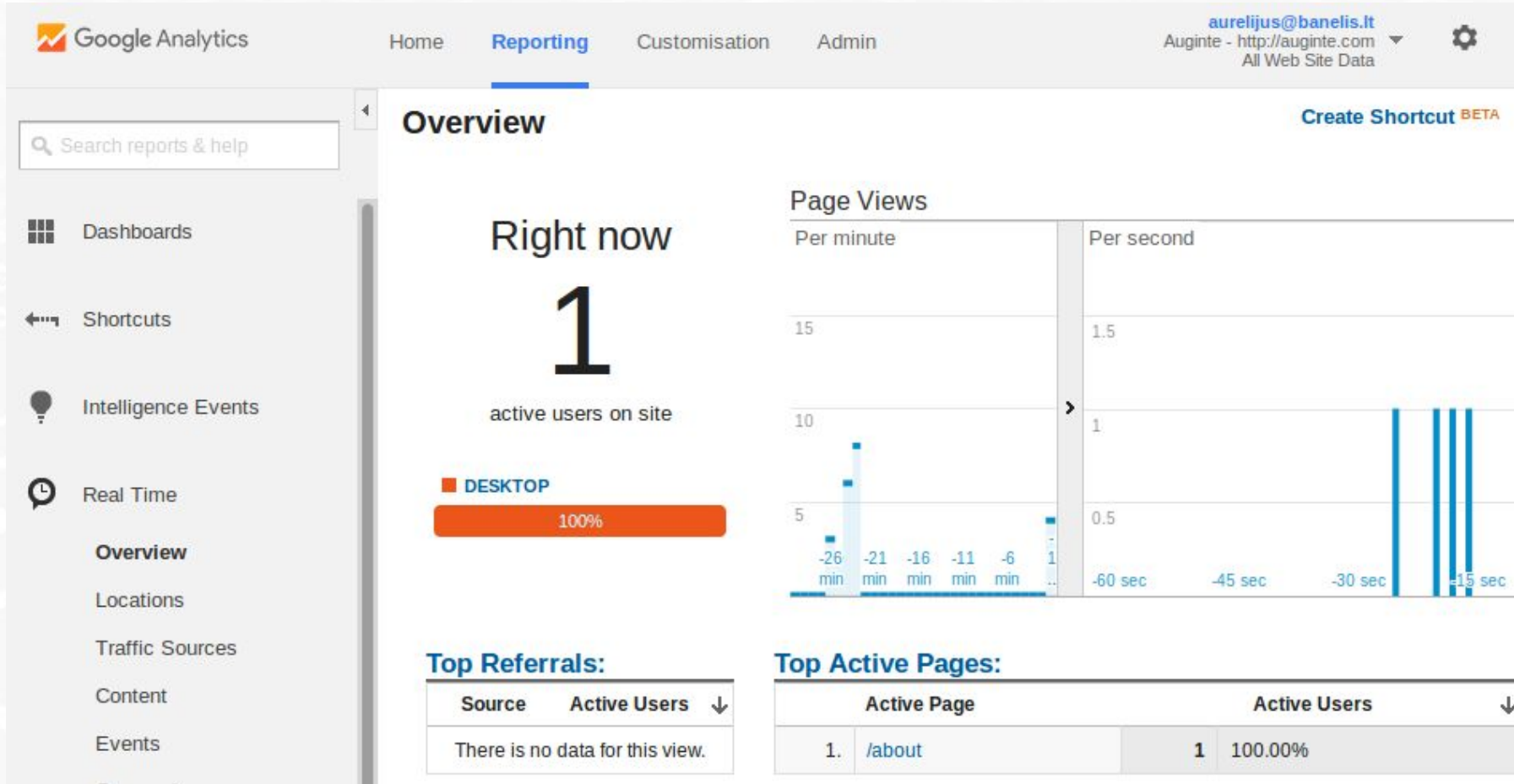


**Move to  
backend**

**Cookies  
and  
privacy**



**Track  
less  
fields**



# Who does not like Google Analytics?

## Alternative: Create your own - NO!



# **Analytics Measurement Protocol**

POST /collect HTTP/1.1  
Host: www.google-analytics.com  
User-Agent: spray-can/1.3.3  
Content-Type: application/x-www-form-urlencoded; charset=UTF-8  
Content-Length: 223

ua=Mozilla%2F5.0+%28X11%3B+Ubuntu%3B+Linux+x86\_64%3B+rv%3A44.0%29  
+Gecko%2F20100101+Firefox%2F44.0&t=pageview&ul=en-  
US&ds=web&v=1&dl=http%3A%2F%2F0%3A0%3A0%  
2F&cid=35009a79-  
&dr=&tid=UA-452371-14HTTP/1.1 200 OK

Access-Control-Allow-Origin: \*  
Date: Tue, 02 Feb 2016 19:07:28 GMT  
Pragma: no-cache  
Expires: Fri, 01 Jan 1990 00:00:00 GMT  
Cache-Control: no-cache, no-store, must-revalidate  
Last-Modified: Sun, 17 May 1998 03:00:00 GMT  
X-Content-Type-Options: nosniff  
Content-Type: image/gif  
Server: Golfe2  
Content-Length: 35|

GIF89a.....D...;POST /collect HTTP/1.1

As simple as **Post to** google-analycs.com

- tid=UA-111111-11
- cid=some-valid-uuid
- t=pageview
- dl=http://some/page
- dr=http://referrer
- ua=Real User Agent

[Intro](#) [About](#) [Products](#) [Knowledge economy](#) [Contacts](#)



# Auginte – open source platform to augment your intelligence

*Auginte changed the way I prepare for exams or*

IL

CSS

Script

Search

Clear

Persist

All

HTML

CSS

JavaScript

XHR

Images

PI

URL	Status	Domain	Size	Remote IP	Timeline ▲
GET al	200 OK	auginte.com	9,8 KB	79.98.29.106:80	8ms
1 request			9,8 KB	8ms (onload: 882ms)	



No cookies, no external  
JavaScript

Still tracking something  
but no concrete use

[Intro](#) [About](#) [Products](#) [Knowledge economy](#) [Contacts](#)



# Auginte – open source platform to augment your intelligence

*Auginte changed the way I prepare for exams or*



The screenshot shows a web browser's developer tools network tab. The top bar includes icons for various resource types (Image, CSS, Script, etc.) and a search bar. Below the bar, the 'All' filter is selected, showing a list of resources. The first resource is a 'GET' request to 'al' on 'auginte.com', with a status of '200 OK', a size of '9,8 KB', and a response time of '8ms'. The bottom summary bar indicates '1 request' with a total size of '9,8 KB' and a total time of '8ms (onload: 882ms)'.

URL	Status	Domain	Size	Remote IP	Timeline ▲
<a href="#">GET al</a>	200 OK	auginte.com	9,8 KB	79.98.29.106:80	8ms
1 request			9,8 KB	8ms (onload: 882ms)	



No cookies, no external  
JavaScript

Still tracking something,  
but not concrete users



[Intro](#) [About](#) [Products](#) [Knowledge economy](#) [Contacts](#) [License](#) [Privacy](#)

*// Doing real logic*

*ob\_end\_flush();  
flush();*

**\$h** = *curl\_init("http://www.google-analytics.com/collect");*

*// Sending analytics*



No cookies, no external  
JavaScript

*// Doing real logic*

*ob\_end\_flush();  
flush();*

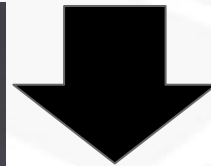
*\$h = curl\_init("http://www.google-analytics.com/collect");*

*// Sending analytics*



No cookies, no external  
JavaScript

Still tracking something,  
but not concrete users



**Be honest - do not track IPs**

/etc/httpd/conf/httpd.conf

**#CustomLog "logs/access\_log" combined**





# Server-side Google Analytics



# Client-side API



# Client-side API

**WHY**

**Common architecture,  
problems**

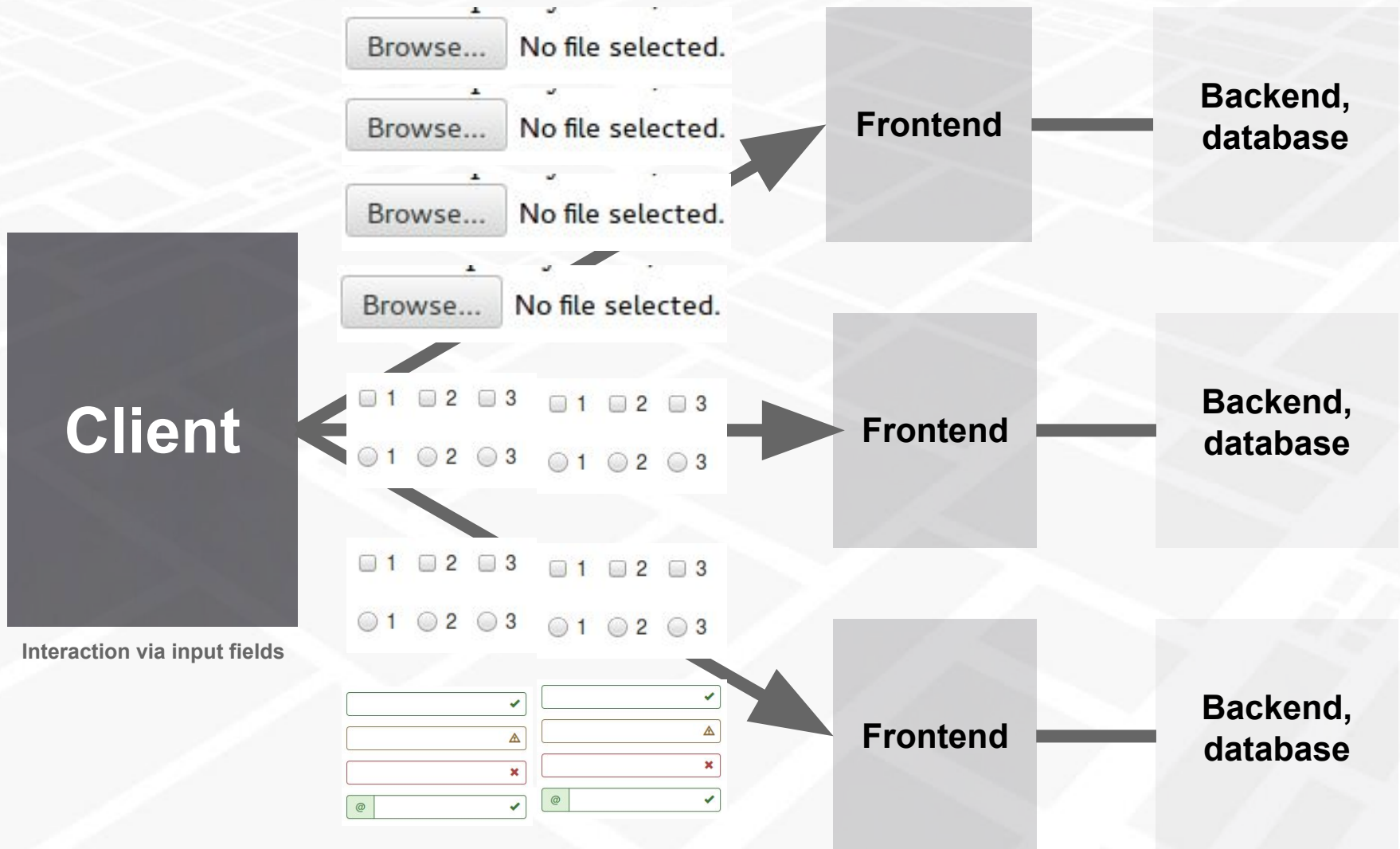
**WHAT**

**Server-client,  
advantages**

**HOW**

**Need to know, usage  
examples**

# Client → server

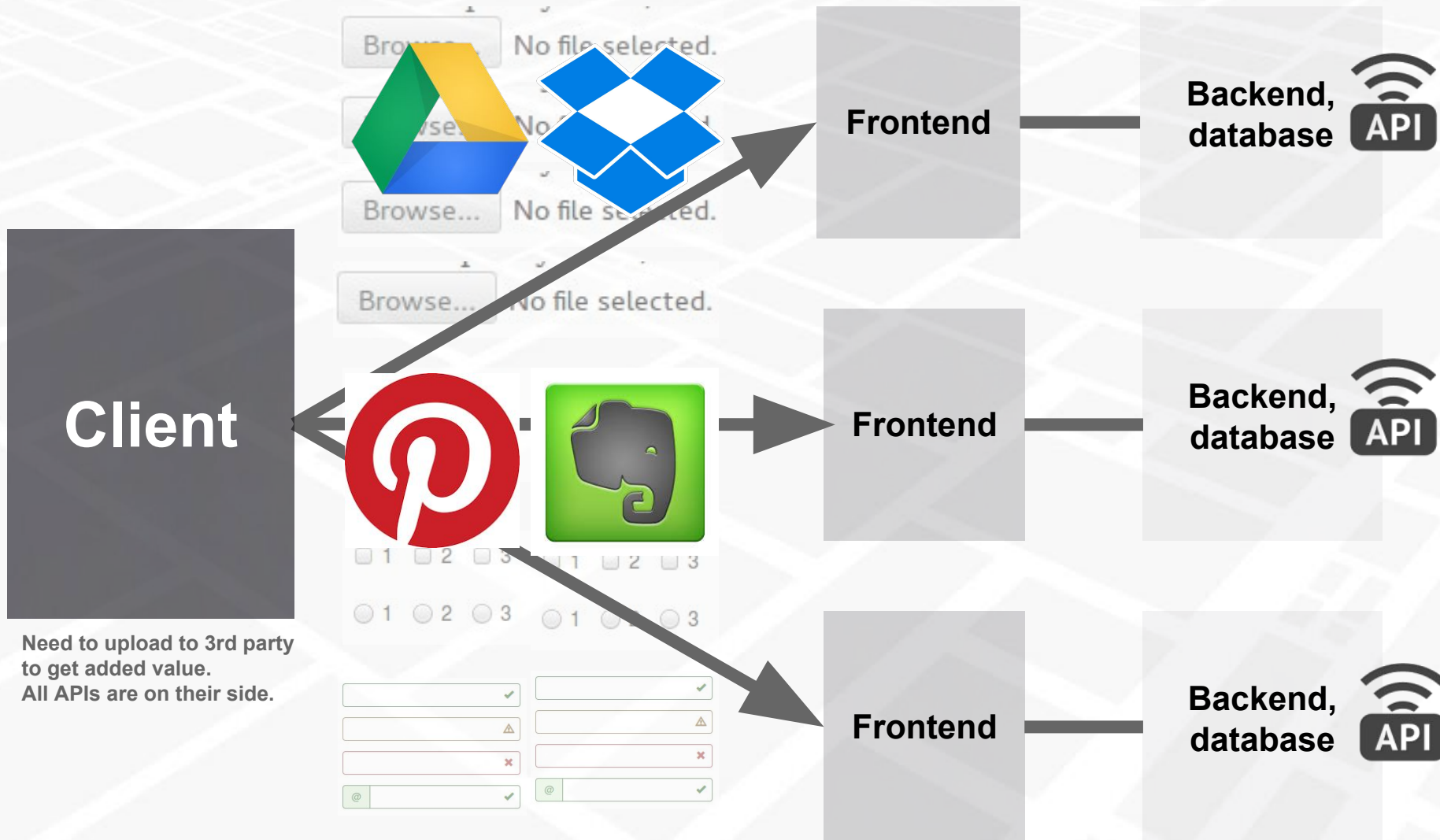


WHY

WHAT

HOW

# Client → server



Need to upload to 3rd party  
to get added value.  
All APIs are on their side.

# Problems

Repeated, lots of fields/formats

Size, cost of storage

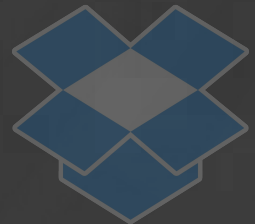
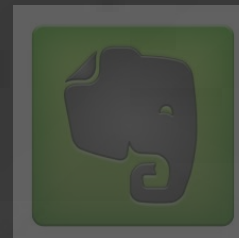
**Manual  
input**

**Upload  
everything**

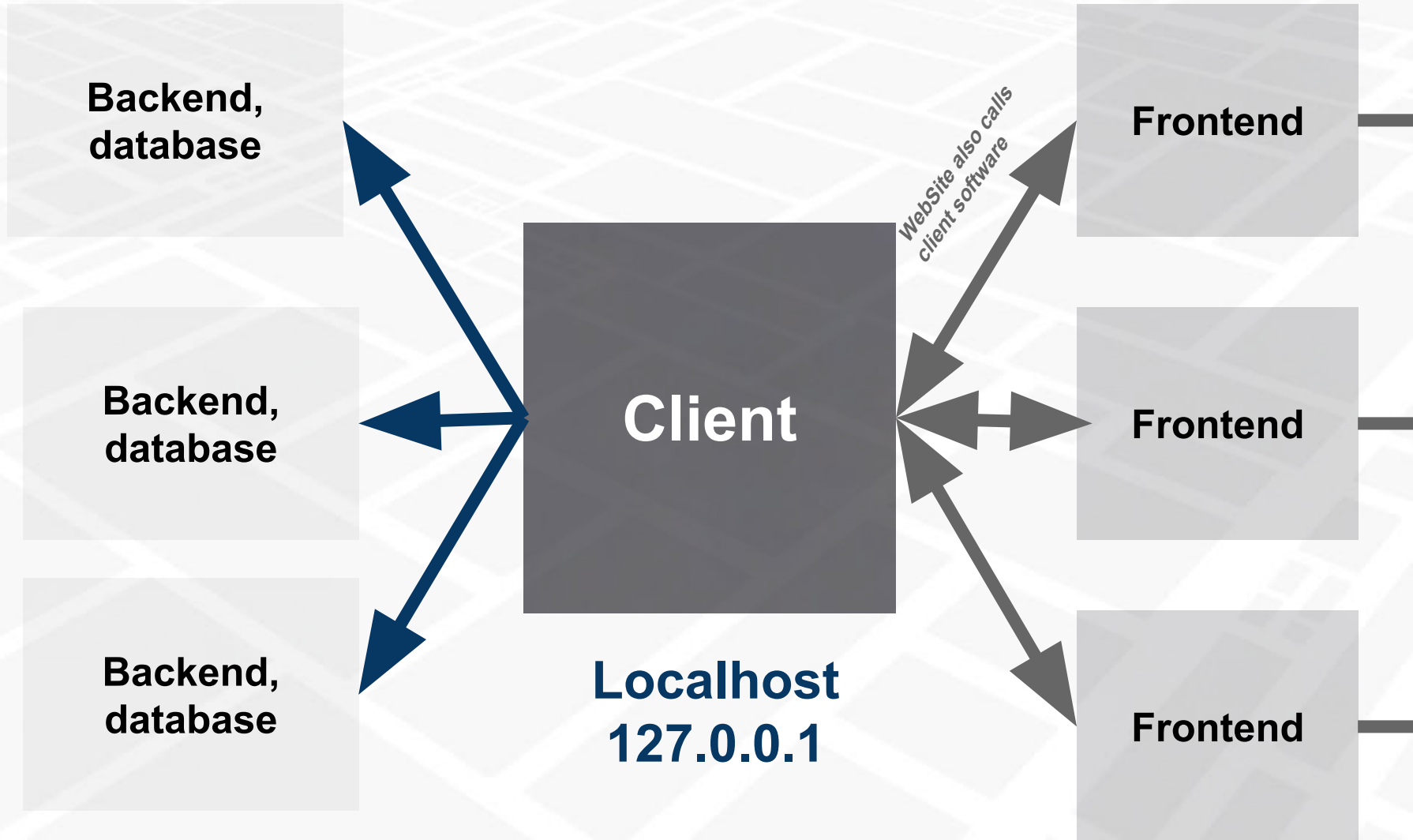
No file selected.

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3

<input type="text"/>	✓
<input type="text"/>	⚠
<input type="text"/>	✗
<input type="text" value="@"/>	✓



# Server → client

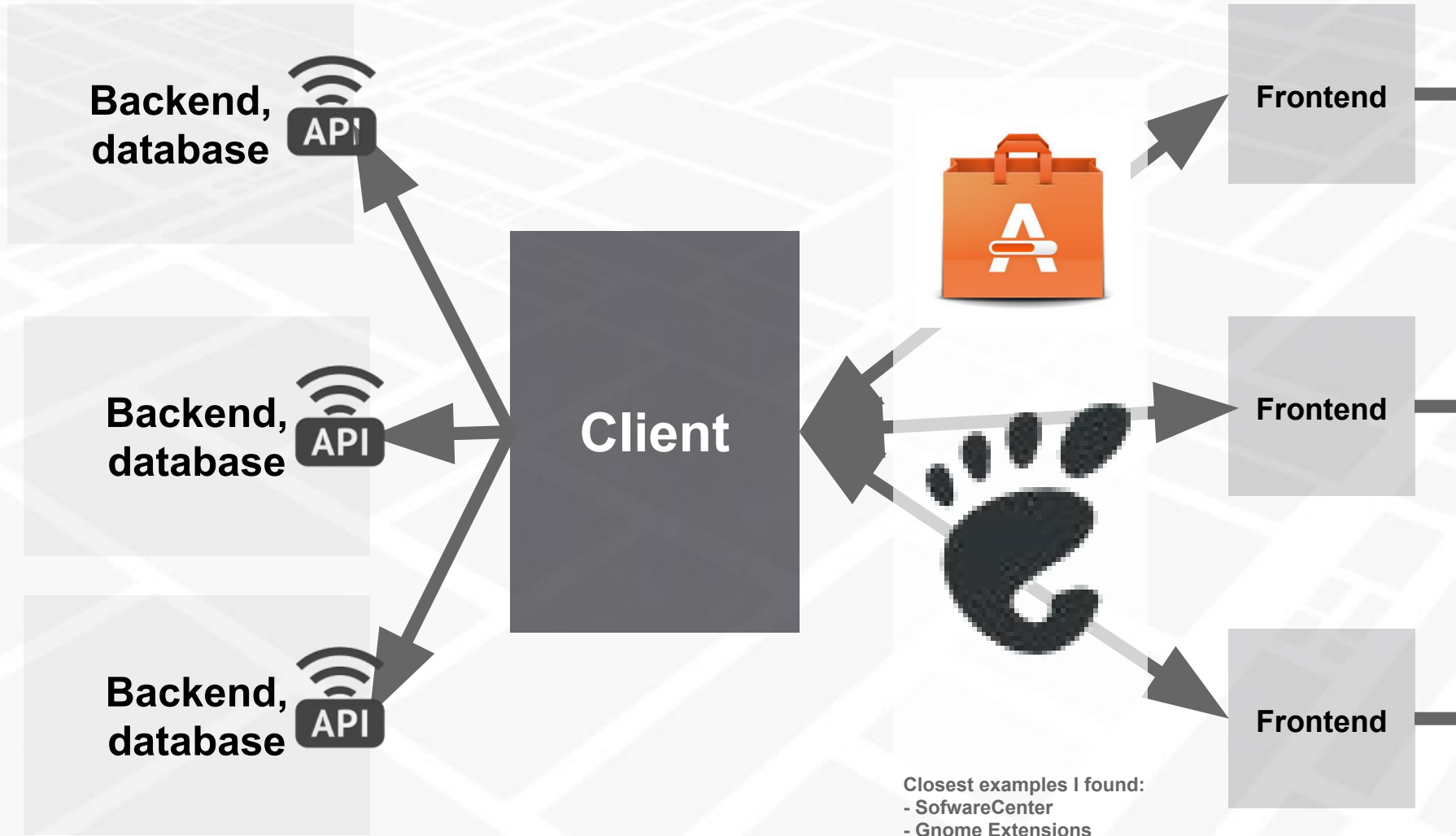


WHY

WHAT

HOW

# Server → client



WHY

# Result: Fully distributed

Main advantage of server-client

WHAT



3rd party  
scripts



3rd party  
data



HOW



Storing my own data, scripts

**Implementing: Server → Client**

# **Cross-origin resource sharing**



# Working Example (see link)

```
<?php
header('Access-Control-Allow-Origin: *');
echo $_GET['a'] + $_GET['b'];
```

```
php -S localhost:12345 localhost-server.php
```

<https://gist.github.com/aurelijusb/443892f81221ff3b61fc>

# Usage example 1



`http://127.0.0.1:12345/auth`

```
{"need": ["timesheet"]}
```

# Usage example 1



`http://127.0.0.1:12345/auth`

```
{"need": ["timesheet"]}
```

Do you trust example.com?



# Usage example 1



`http://127.0.0.1:12345/auth`

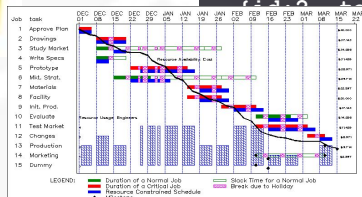
```
{ "need": ["timesheet"] }
```

Do you trust example.com?



`http://127.0.0.1:12345/timesheet`

```
{data:[ {id:1, text:"Project #1", start_date:"01-04-2013", duration:18},  
        {id:2, text:"Task #1", start_date:"02-04-2013", duration:8, parent:1},  
        {id:3, text:"Task #2", start_date:"11-04-2013", duration:8, parent:1} ...
```



# Usage example 2



`http://127.0.0.1:12345/currentRnD`

```
{ "have" : [ "pc" , "food" ] }
```

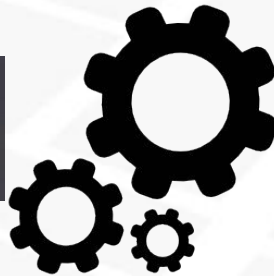
# Usage example 2



`http://127.0.0.1:12345/currentRnD`

```
{ "have" : [ "pc" , "food" ] }
```

```
{ "filter" : [ "pc" ] }
```



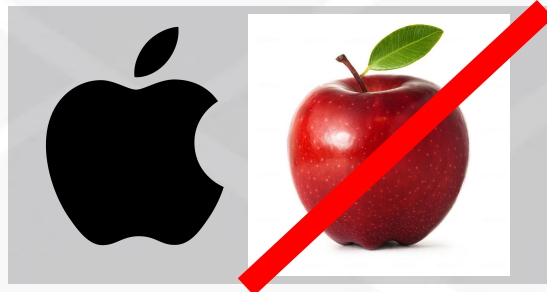
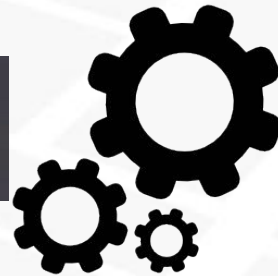
# Usage example 2



`http://127.0.0.1:12345/currentRnD`

```
{ "have" : [ "pc" , "food" ] }
```

```
{ "filter" : [ "pc" ] }
```





# Client-side API



Be

open  
minded

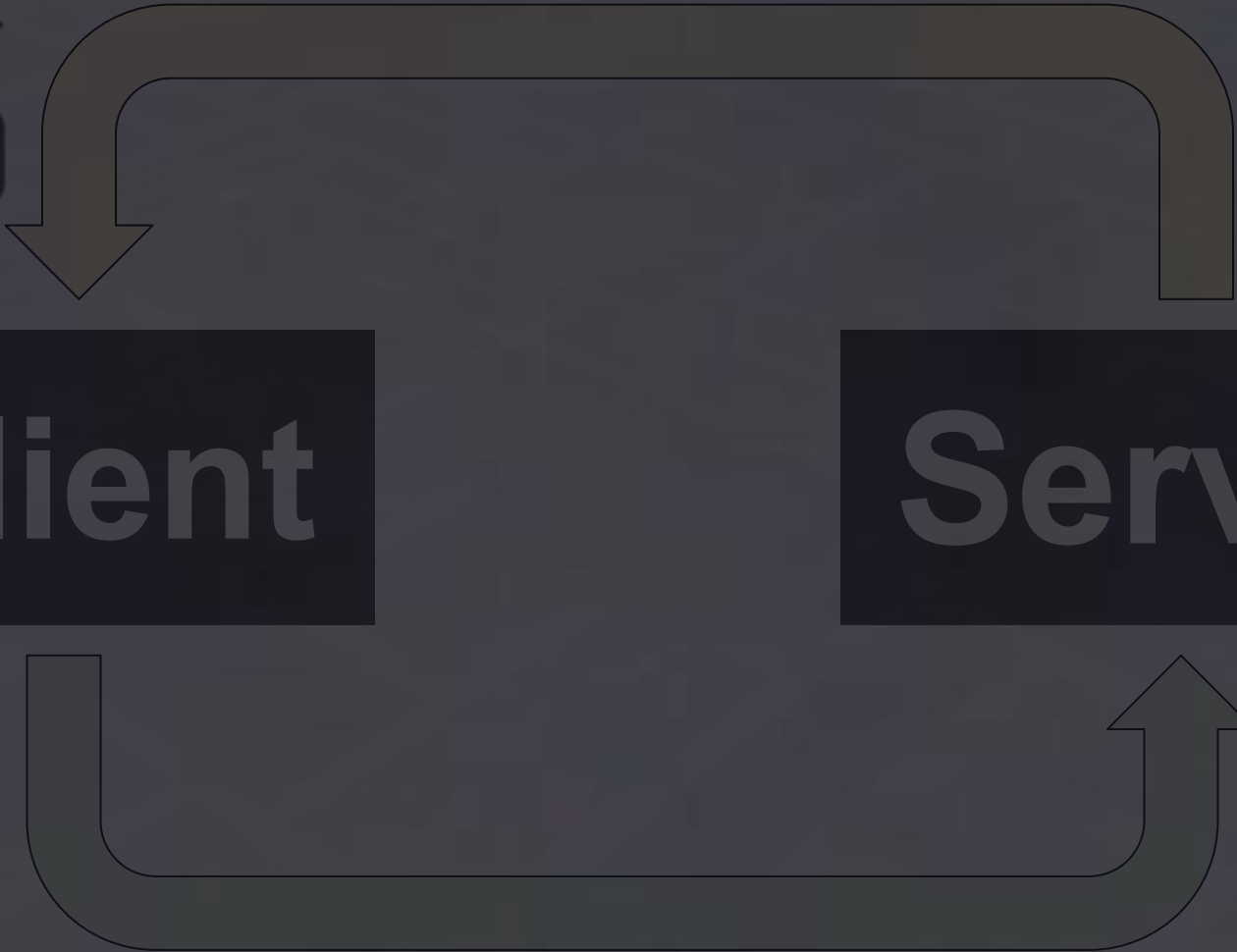
# Questions?



Google Analytics

**Client**

**Server**



# References and useful links

- <http://stackoverflow.com/questions/138374/close-a-connection-early>
- <https://developers.google.com/analytics/devguides/collection/protocol/v1/?hl=en>
- 
- [https://en.wikipedia.org/wiki/Cross-origin\\_resource\\_sharing](https://en.wikipedia.org/wiki/Cross-origin_resource_sharing)
- [https://en.wikipedia.org/wiki/Cross-site\\_scripting](https://en.wikipedia.org/wiki/Cross-site_scripting)
- <https://gist.github.com/aurelijusb/443892f81221ff3b61fc>