

Server-Sent Events

Example from practice

Aurelijus Banelis



Aurelijus Banelis

Software developer
aurelijus.banelis.lt
aurelijus@banelis.lt



Server-Sent Events

Example from practice

WHY

Problem/Context

WHAT

Short intro

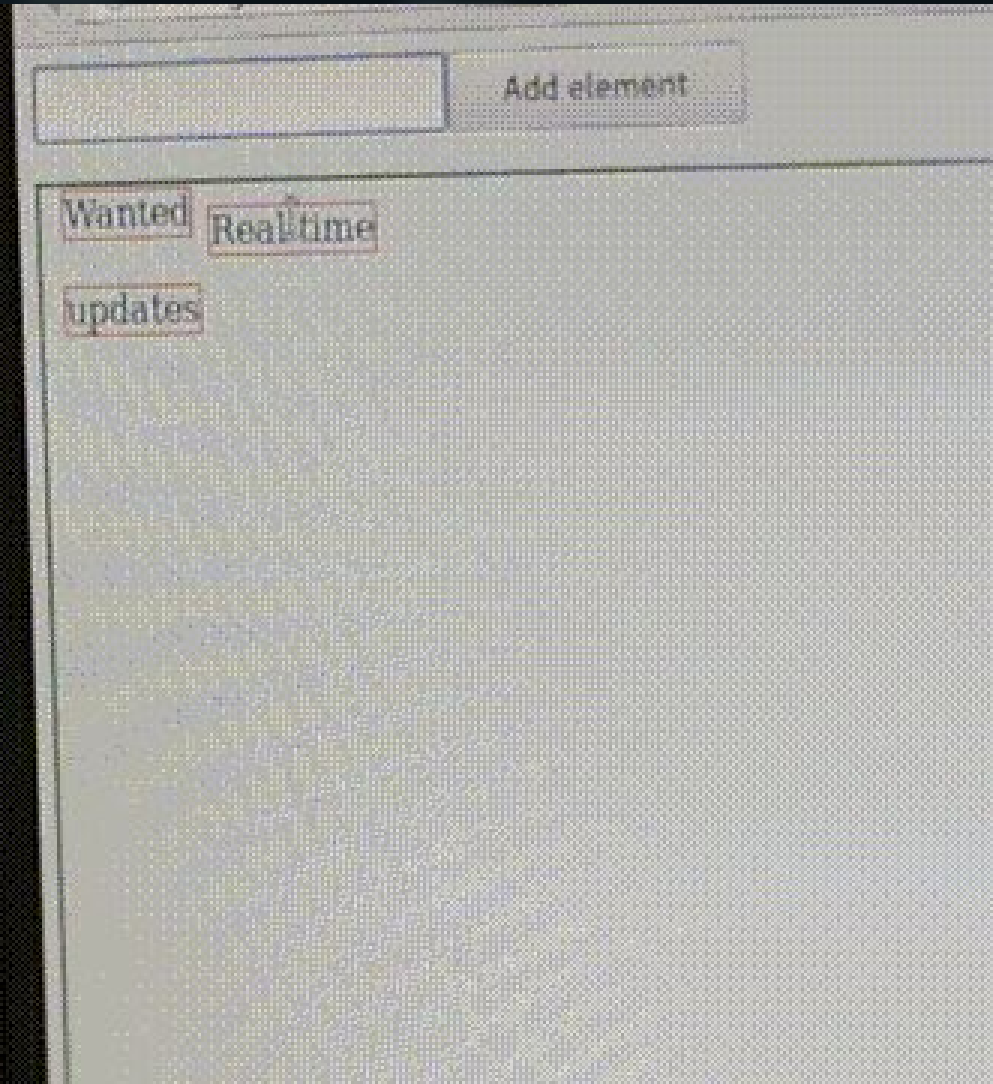
HOW

In practice

WHY

Needed real time updates, process while reading

Wanted: Updates from other clients instantly



Problem known as

**Real time
messaging**

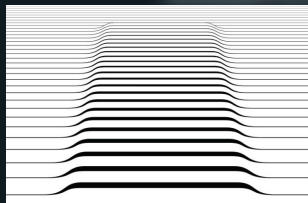
Options were



Web sockets



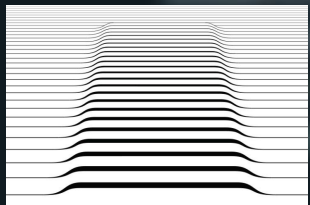
Auto refresh



Server-Sent Events

New thing to try

Needed mostly pulling



Server-Sent Events

WHY

**Needed real time updates,
process while reading**

WHAT

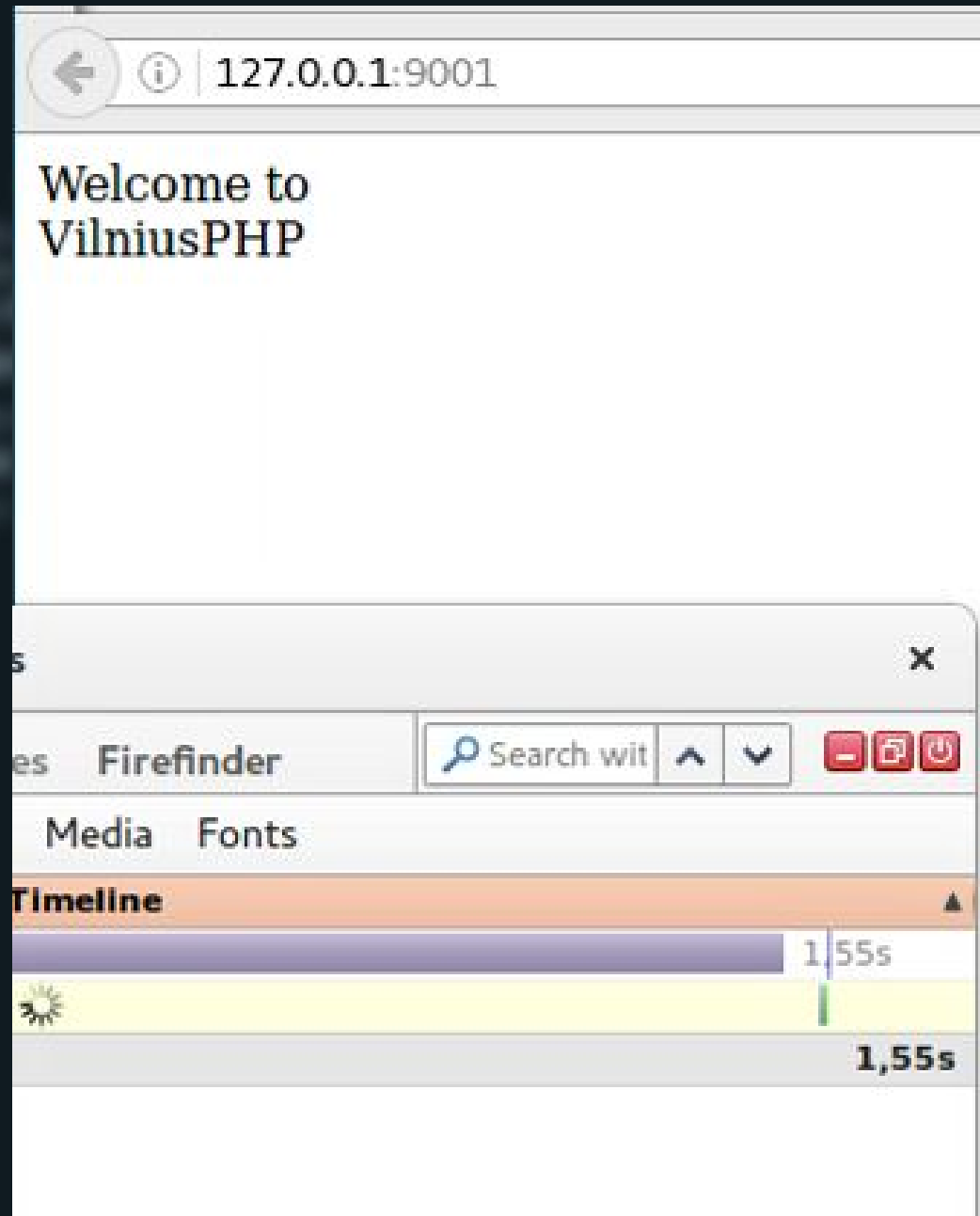
Short intro

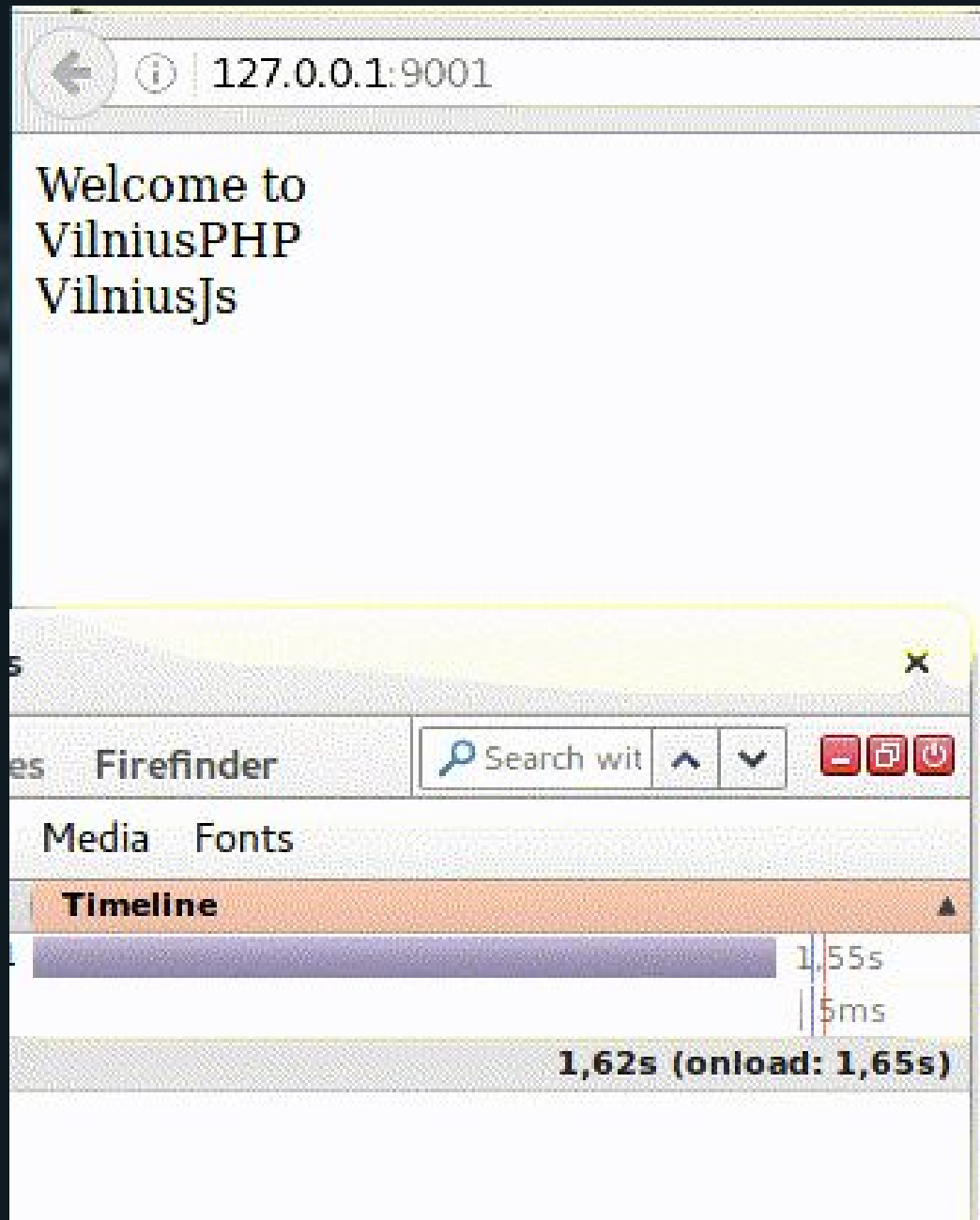
HOW

In practice

WHAT

new EventSource(...) ... flush()







← ⓘ | 127.0.0.1:9001

Welcome to
VilniusPHP
VilniusJs
VilniusPHP
VilniusJs
VilniusPHP
VilniusJs

es Firefinder Search with ^ v - [] [] []

Media Fonts

Timeline

1,55s
5s

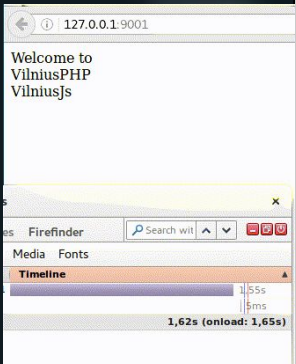
6,61s (onload: 1,65s)



```
var source = new EventSource("/stream.php");  
source.addEventListener(  
  'message',  
  function(e) {  
    document.body.innerHTML += e.data+'<br/>';  
  }, false);
```



```
header('Content-type: text/event-stream');  
for ($i = 0; $i < 10; $i++) {  
  foreach (['VilniusPHP', 'VilniusJs'] as $event) {  
    print 'data: ' . $event . "\n\n";  
    ob_flush(); flush();  
    sleep(1);  
  }  
}
```



WHY

Needed real time updates,
process while reading

WHAT

HTTP based protocol:
EventSource +
text/event-stream

HOW

In practice

HOW

4 aspects, when using in practice

Reconnect / Keep-alive

Debugging / Buffering

Resource optimisation

Browser support

Reconnects, but...

URL	Status	Domain	Size
+ GET php-tes	200 OK	php-test.local:1380	846 B
+ GET stream.	200 OK	php-test.local:1380	0 B
+ GET stream.	200 OK	php-test.local:1380	0 B
+ GET stream.	200 OK	php-test.local:1380	0 B
+ GET stream.	504 Gateway Time-out	php-test.local:1380	183 B

```
open open php-tes...al:3
error error php-tes...al:3
open open php-tes...al:3
error error php-tes...al:3
open open php-tes...al:3
error error php-tes...al:3
❌ "NetworkError: 504 Gateway Time-out -
http://php-test.local:1380/stream.php"
error error php-tes...al:3
Firefox can't establish a connection to the server at
http://php-test.local:1380/stream.php.
var source = new EventSource("/stream.php");
-----↑
```

**Auto-reconnects
if success**

**Fails
if custom error**

Reconnect: Solution 1/2

Keep-alive messages

```
print "\n\n";
```

Reconnect: Solution 2/2

Catch error and restart

```
function retryEventSource() {  
  var source = new EventSource("/stream.php");  
  source.addEventListener('error', function(e) {  
    source.close();  
    retryEventSource(); // Recursive call  
  }, false);  
}  
retryEventSource();
```

Debugging / Buffering

```
aurelijus@aurelijus-a:~$ curl -k https://php-test.local:13443/stream.php
```

```
aurelijus@aurelijus-a:~$ curl -k https://php-test.local:13443/stream.php
```

Debugging / Buffering

```
aurelijus@aurelijus-a:~$ curl -k https://php-test.local:13443/stream.php
```

```
█
```

```
aurelijus@aurelijus-a:~$ curl -k https://php-test.local:13443/stream.php
```

```
data: VilniusPHP
```

```
data: VilniusJs
```

```
data: VilniusPHP
```

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data: VilniusJs
```

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data: VilniusPHP
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data: VilniusJs
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data: VilniusPHP
```

```
data: VilniusJs
```

```
data: VilniusPHP
```

```
█
```

Debugging / Buffering

```
aurelijus@aurelijus-a:~$ curl -k https://php-test.local:13443/stream.php
data: VilniusPHP
data: VilniusJs
data: VilniusPHP
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data: VilniusPHP
data: VilniusJs
aurelijus@aurelijus-a:~$ █
```

```
aurelijus@aurelijus-a:~$ curl -k https://php-test.local:13443/stream.php
data: VilniusPHP
data: VilniusJs
data: VilniusPHP
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aurelijus@aurelijus-a:~$
```


Configure for streaming

```
fastcgi_buffering off;  
proxy_buffering off;
```

```
# If previous did not worked  
fastcgi_cache off;  
proxy_cache off;  
ssl_buffer_size 1;  
fastcgi_read_timeout 86400;
```

Easy to consume all resources



Many open connections



Need polyfills for IE

EventSource polyfill - <http://www.w3.org/TR/eventsource/>

Server-sent events  - LS

Global

84.25% + 0.02% = 84.26%

Method of continuously sending data from a server to the browser, rather than repeatedly requesting it (EventSource interface, used to fall under HTML5)

Current aligned Usage relative Show all

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
			49						
		47	51			9.2		4.4	
8	13	48	52	9.1		9.3		4.4.4	
11	14	49	53	10	39	10	all	52	51
		50	54	TP	40				
		51	55		41				
		52	56						

WHY

Needed real time updates,
process while reading

WHAT

HTTP based protocol:
EventSource +
text/event-stream

HOW

Easy for simple cases
Like WebSockets
for real use cases

Conclusion

Change perspective

Change perspective

Request

Response



Write stream

Read stream

In the context of

Offline-first

Single page app

Not blocking UI

Change perspective

Request

Response



Write stream

Read stream

Best time for questions

Thanks for listening

Slides already at:

<https://aurelijus.banelis.lt/presentations/server-sent-events-2016/ServerSent-Events-v1.pdf>

References

- https://developer.mozilla.org/en-US/docs/Web/API/Server-sent_events/Using_server-sent_events
- <http://stackoverflow.com/questions/22919638/can-i-catch-the-cant-establish-a-connection-error-for-a-failed-websocket-conn>
- <https://github.com/firehol/netdata>
- <https://github.com/hseeberger/akka-sse>
- <https://github.com/Yaffle/EventSource>
- https://developer.mozilla.org/en-US/docs/Web/API/WebSockets_API
- <https://es.auginte.com/>
- https://developer.mozilla.org/en-US/docs/Web/API/Service_Worker_API

Full animations from presentation

- <https://aurelijus.banelis.lt/presentations/server-sent-events-2016/wanted.mp4>
- <https://aurelijus.banelis.lt/presentations/server-sent-events-2016/sse-hello-world.mp4>
- <https://aurelijus.banelis.lt/presentations/server-sent-events-2016/sse-buffered.mp4>
- <https://aurelijus.banelis.lt/presentations/server-sent-events-2016/sse-real-time.mp4>