Messaging Sys.

Project Presentation

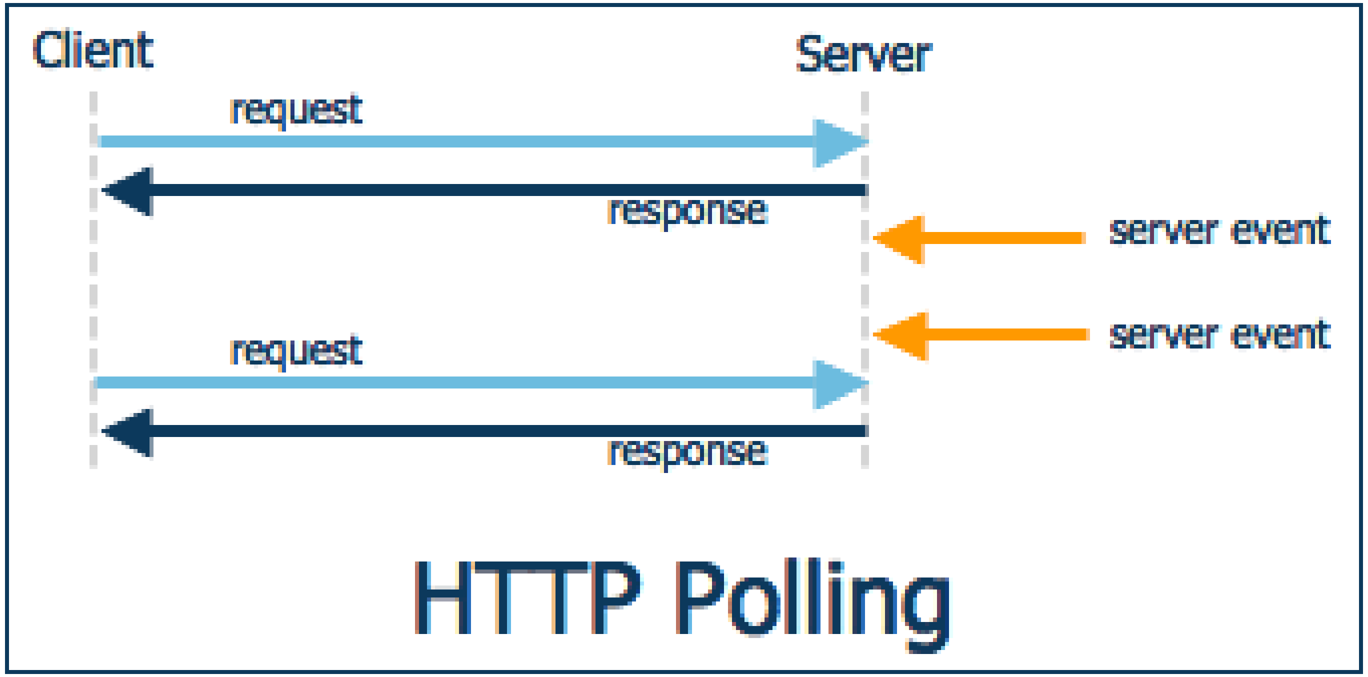
Project’s Main Features

- Message Passing (via Pusing Technology)
- URL Mapping
- Well Known Server error Handling (400, 405, 500)
- Error handling by predefined errorCode
- Password stored in BLOB and AES encryption format
- User Sessions
- Admin : Remove Users, Truncate DB

Tools and Technology Used

- Java EE 7
- JS
- Web Sockets
- JSON
- MySql
- Netbeans
- GIT SVN Repo.

Traditional web based messaging.



A request/response scenario

The current way that people get updates to feeds today on the web is polling.
That is, the subscriber sits in a loop and asks repeatedly,
"Anything new yet?"
"Anything new yet?"
"Anything new yet?"
The server (if it's smart enough to) has to check and reply,
"No, you have the most recent version."
"No, you have the most recent version."
"No, you have the most recent version."

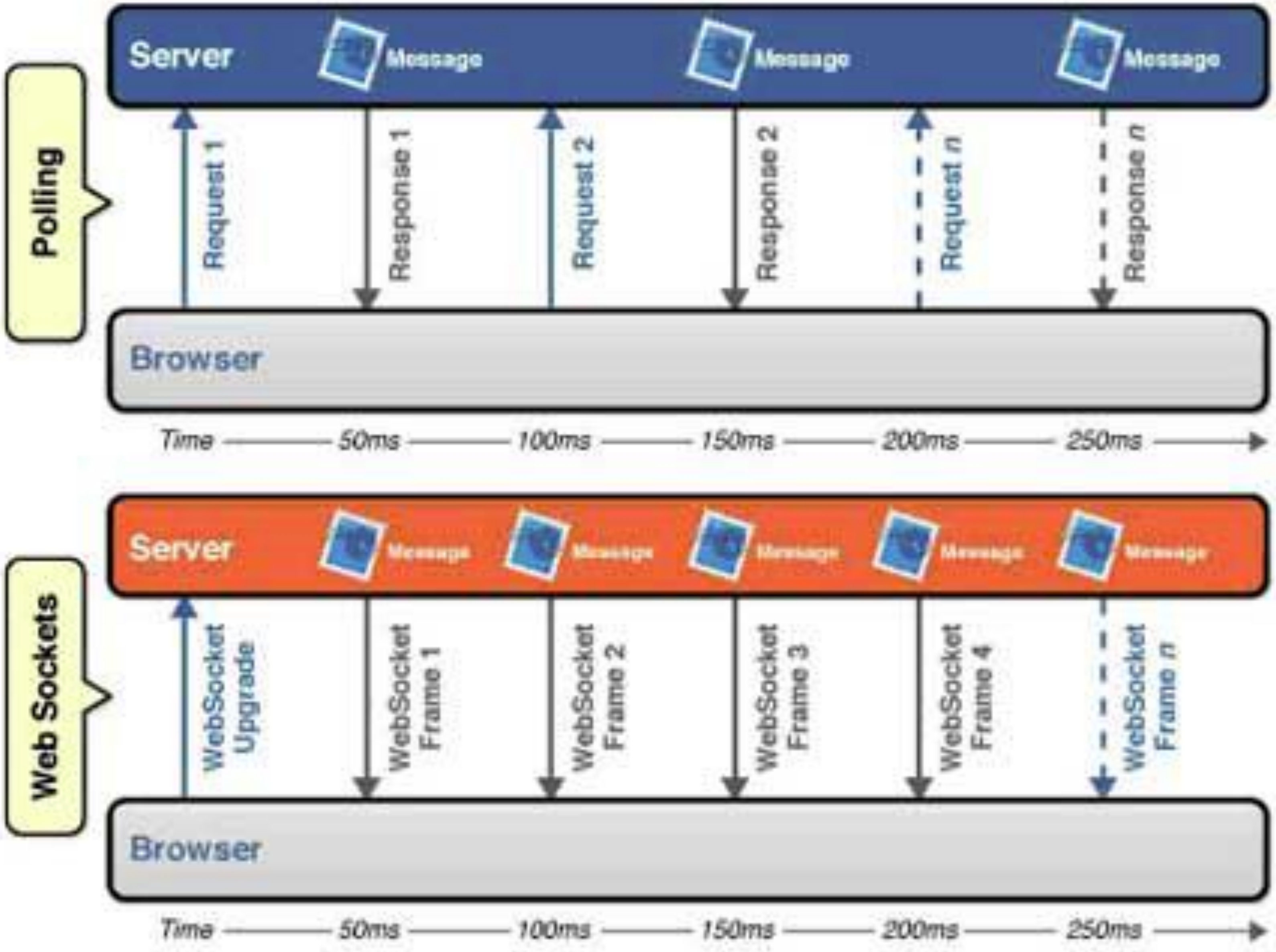
Http pushing model

- model in which a long-held HTTP request allows a web server to push data to a browser, without the browser explicitly requesting it.
- In this project pushing is achieved by
  1) WebSocket

     - Maintains client session, state and reply with message
  2) JSON

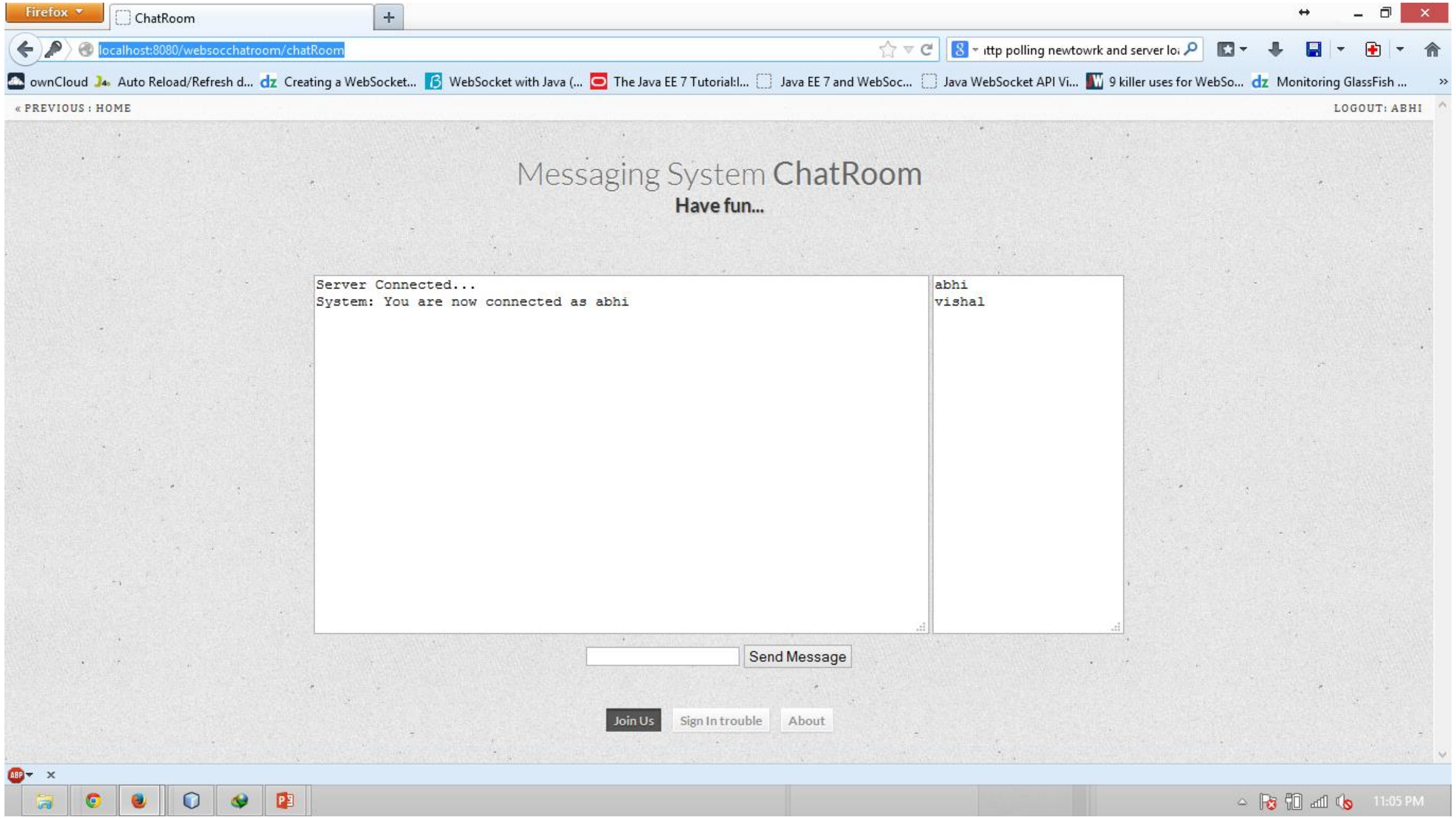
     - A message Schema
  3) JS

     - reads the JSON formatted String


Polling
Server
Message
Message
Message
Request 1
Response 1
Request 2
Response 2
Request n
Response n
Browser
Time
50ms
100ms
150ms
200ms
250ms
Web Sockets
Server
Message
Message
Message
Message
Message
WebSocket Upgrade
WebSocket Frame 1
WebSocket Frame 2
WebSocket Frame 3
WebSocket Frame 4
WebSocket Frame n
Browser
Time
50ms
100ms
150ms
200ms
250ms

Project Main Features

Message passing by Http pusing technology



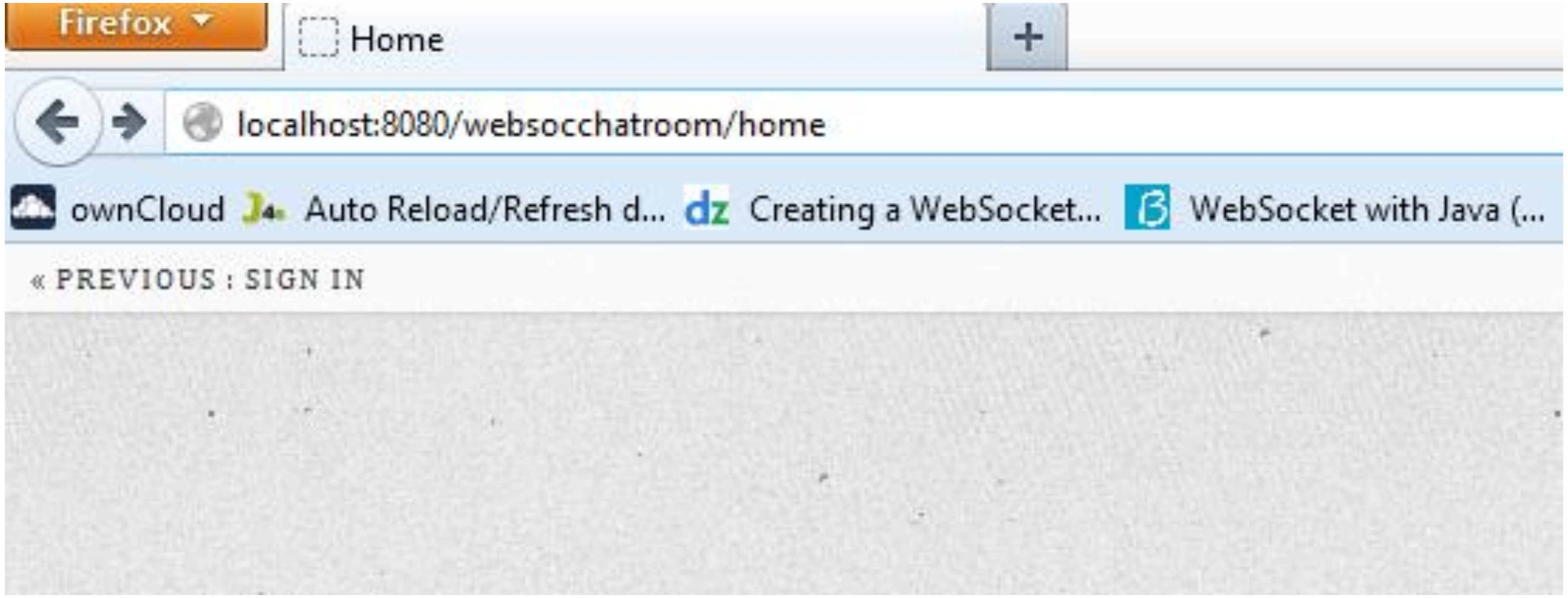
Messaging System ChatRoom

Have fun...

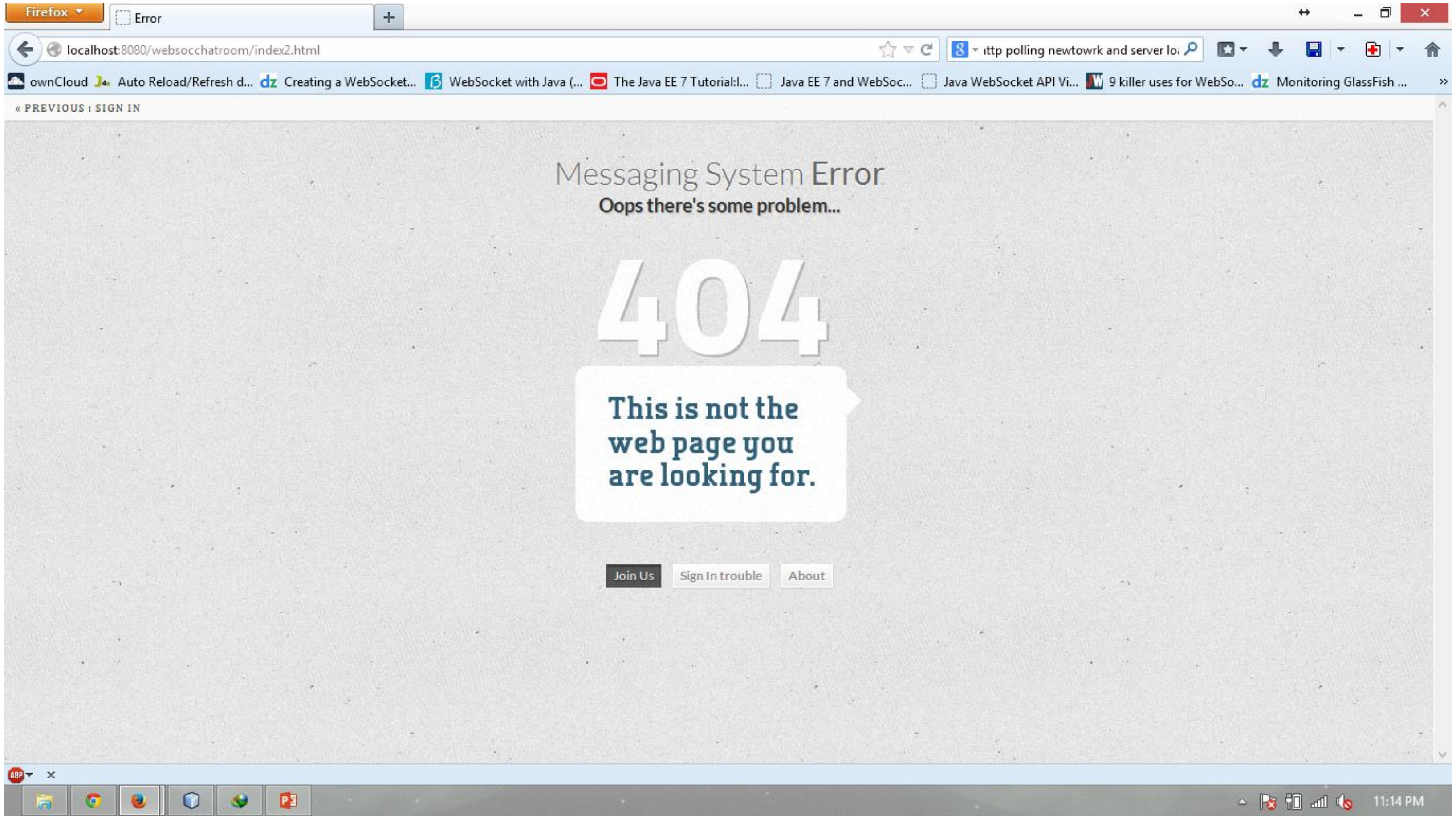
```
Server Connected...
System: You are now connected as abhi
```

```
abhi
vishal
```

URL Mapping


Firefox
Home
+
localhost:8080/websocchatroom/home
ownCloud
Auto Reload/Refresh d...
Creating a WebSocket...
WebSocket with Java (...
« PREVIOUS : SIGN IN

Server error handling 400



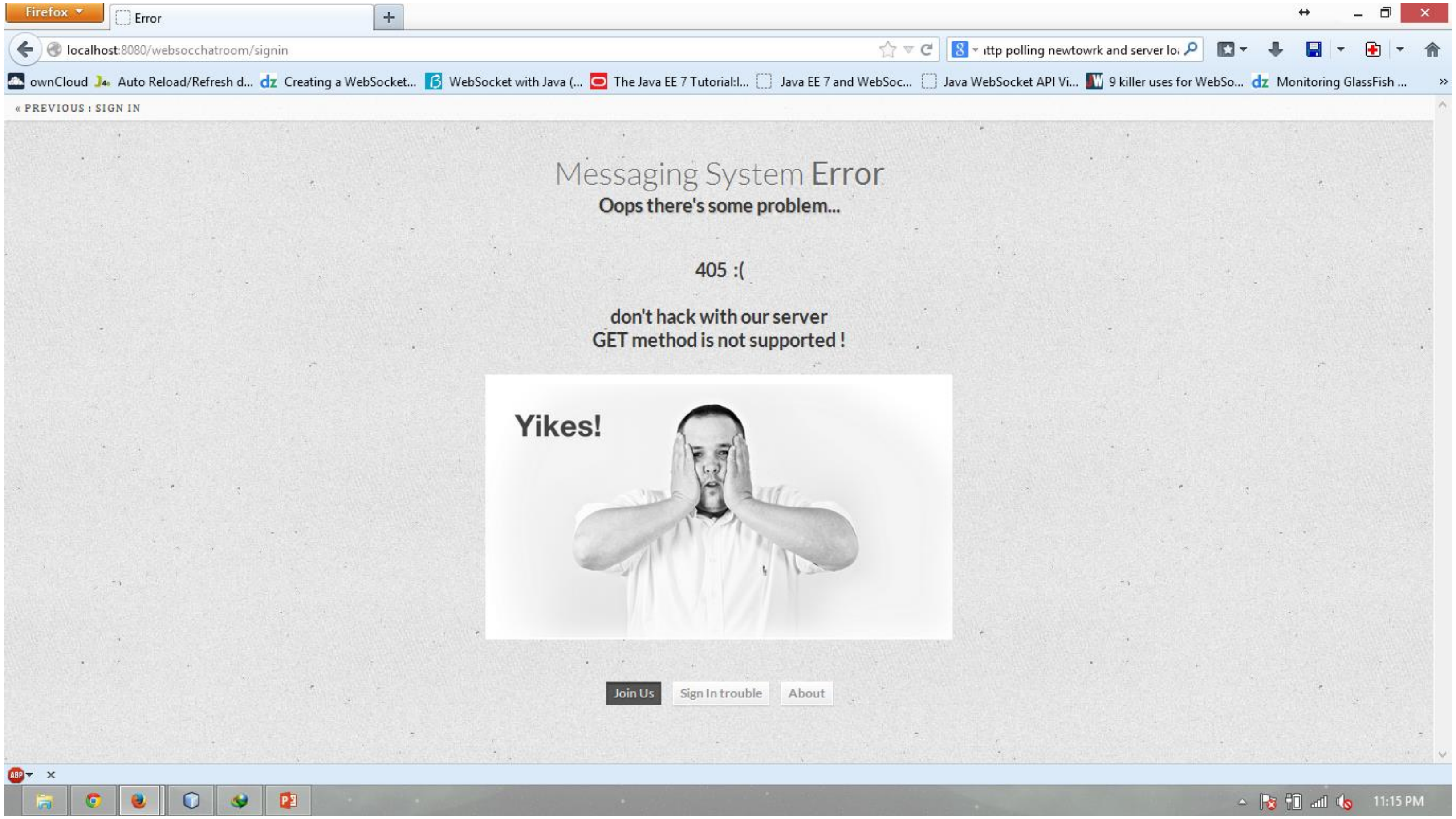
Messaging System Error

Oops there's some problem...

404

This is not the web page you are looking for.

Server error handling 405



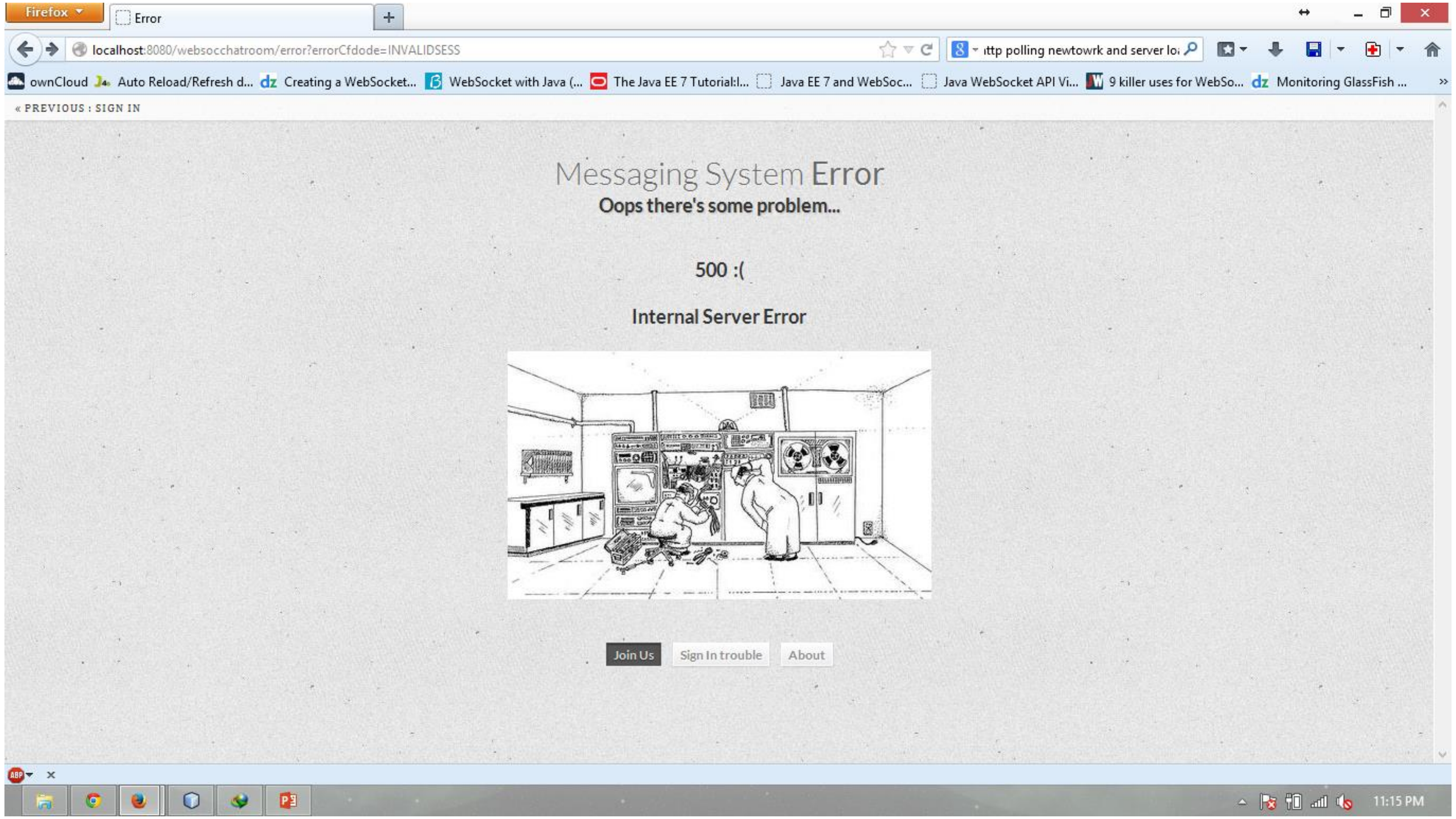
Messaging System Error

Oops there's some problem...

405 :(

don't hack with our server
GET method is not supported !

Server error handling 500



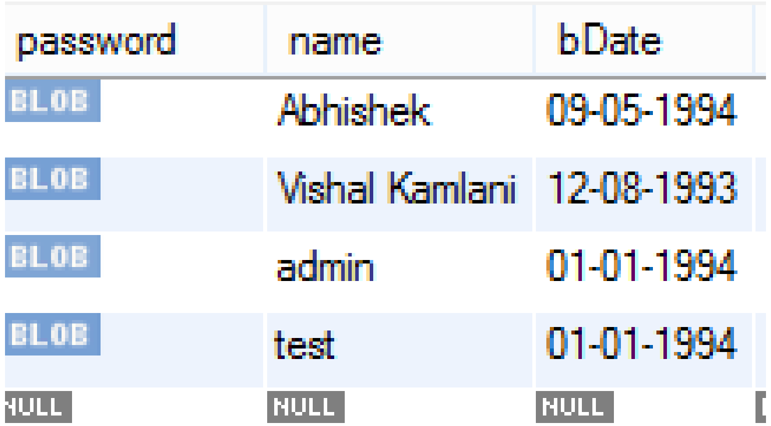
Messaging System Error

Oops there's some problem...

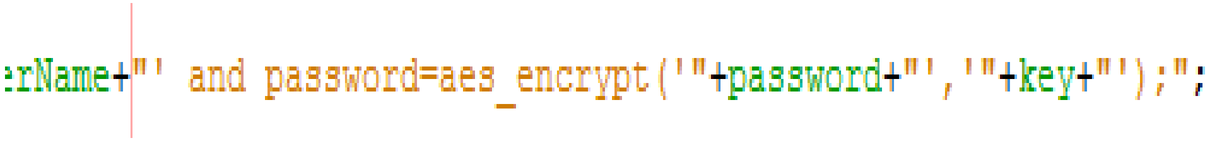
500 :(

Internal Server Error

Password Protection
via **BLOB** data type and **AES** Encryption

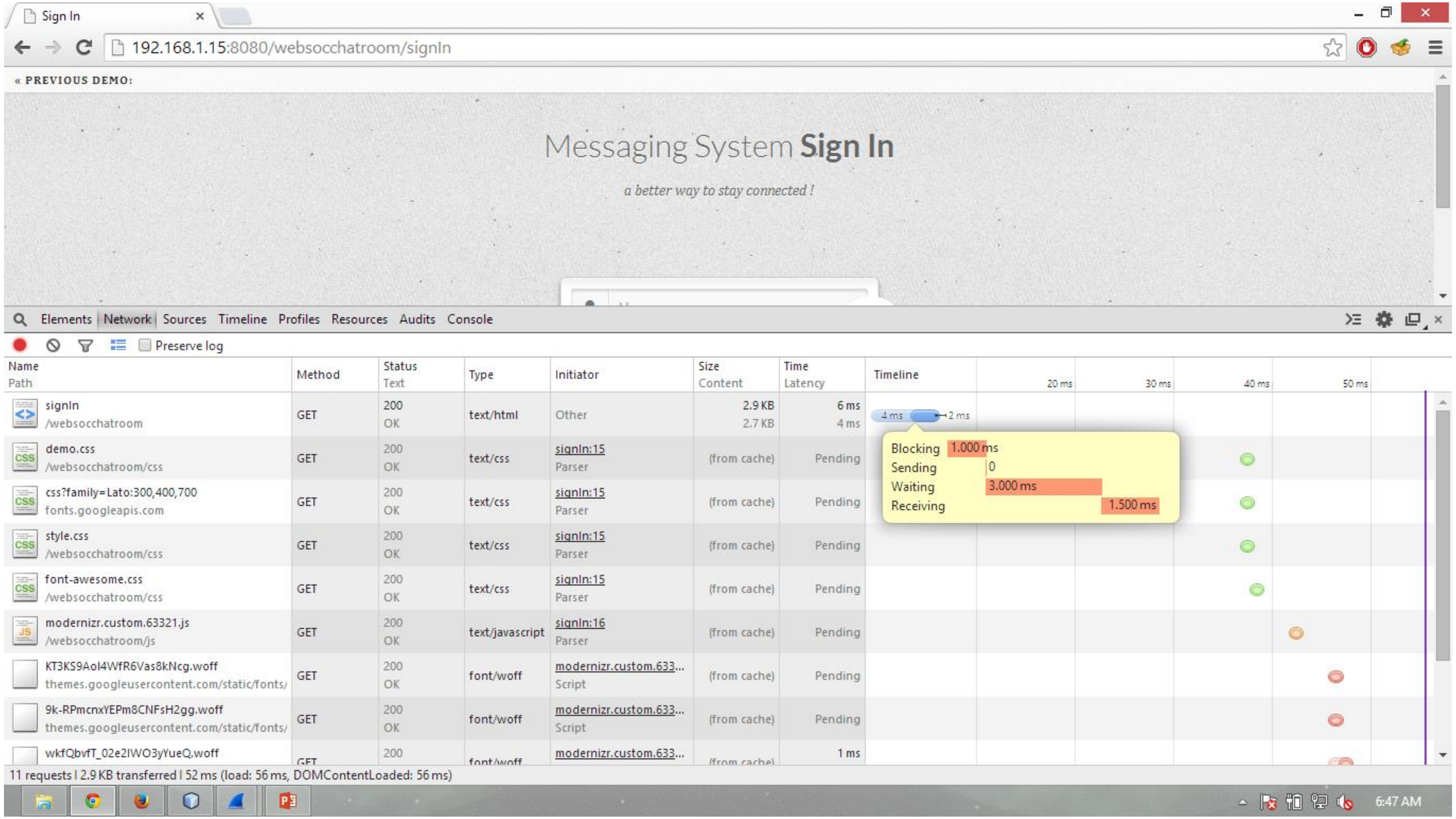


password	name	bDate
BLOB	Abhishek	09-05-1994
BLOB	Vishal Kamlani	12-08-1993
BLOB	admin	01-01-1994
BLOB	test	01-01-1994
NULL	NULL	NULL



```
rName+"' and password=aes_encrypt('"+password+"','"+key+"');";
```

monitoring

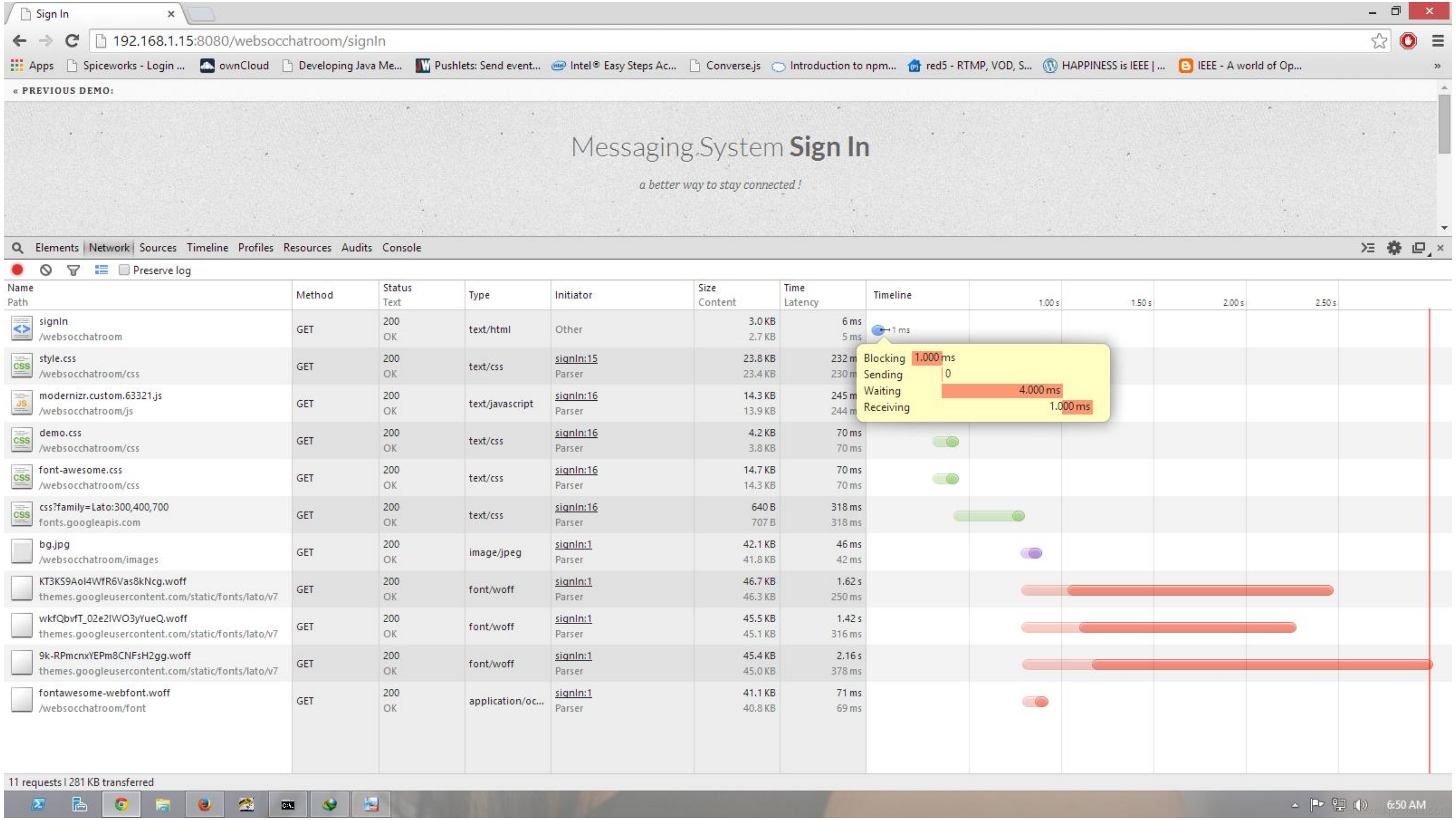


Name Path	Method	Status Text	Type	Initiator	Size Content	Time Latency	Timeline
signIn /websocchatroom	GET	200 OK	text/html	Other	2.9 KB 2.7 KB	6 ms 4 ms	4 ms 2 ms
demo.css /websocchatroom/css	GET	200 OK	text/css	signIn:15 Parser	(from cache)	Pending	
css?family=Lato:300,400,700 fonts.googleapis.com	GET	200 OK	text/css	signIn:15 Parser	(from cache)	Pending	
style.css /websocchatroom/css	GET	200 OK	text/css	signIn:15 Parser	(from cache)	Pending	
font-awesome.css /websocchatroom/css	GET	200 OK	text/css	signIn:15 Parser	(from cache)	Pending	
modernizr.custom.63321.js /websocchatroom/js	GET	200 OK	text/javascript	signIn:16 Parser	(from cache)	Pending	
KT3KS9AoI4WfR6Vas8kNcg.woff themes.googleusercontent.com/static/fonts/	GET	200 OK	font/woff	modernizr.custom.633... Script	(from cache)	Pending	
9k-RPmcnxYEPm8CNFsH2gg.woff themes.googleusercontent.com/static/fonts/	GET	200 OK	font/woff	modernizr.custom.633... Script	(from cache)	Pending	
wkfQbvfT_02e2IWO3yYueQ.woff	GET	200	font/woff	modernizr.custom.633...	(from cache)	1 ms	

Blocking	1.000 ms
Sending	0
Waiting	3.000 ms
Receiving	1.500 ms

11 requests I 2.9 KB transferred I 52 ms (load: 56 ms, DOMContentLoaded: 56 ms)

From different client



Messaging System **Sign In**

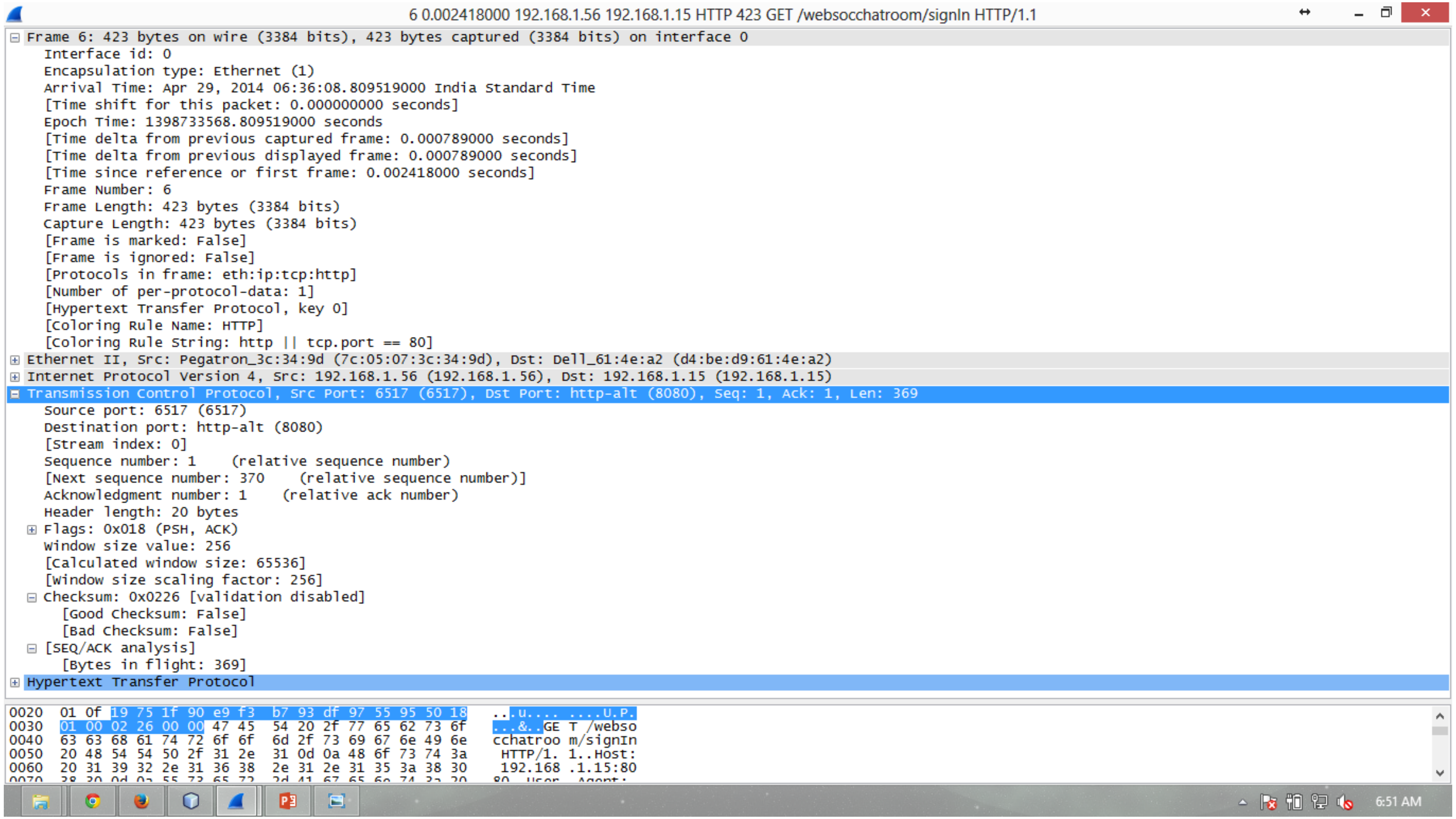
a better way to stay connected !

Name Path	Method	Status Text	Type	Initiator	Size Content	Time Latency
signIn /websocchatroom	GET	200 OK	text/html	Other	3.0 KB 2.7 KB	6 ms 5 ms
style.css /websocchatroom/css	GET	200 OK	text/css	signIn:15 Parser	23.8 KB 23.4 KB	232 m 230 m
modernizr.custom.63321.js /websocchatroom/js	GET	200 OK	text/javascript	signIn:16 Parser	14.3 KB 13.9 KB	245 m 244 m
demo.css /websocchatroom/css	GET	200 OK	text/css	signIn:16 Parser	4.2 KB 3.8 KB	70 ms 70 ms
font-awesome.css /websocchatroom/css	GET	200 OK	text/css	signIn:16 Parser	14.7 KB 14.3 KB	70 ms 70 ms
css?family=Lato:300,400,700 fonts.googleapis.com	GET	200 OK	text/css	signIn:16 Parser	640 B 707 B	318 ms 318 ms
bg.jpg /websocchatroom/images	GET	200 OK	image/jpeg	signIn:1 Parser	42.1 KB 41.8 KB	46 ms 42 ms
KT3KS9AoI4WfR6Vas8kNcg.woff themes.googleusercontent.com/static/fonts/lato/v7	GET	200 OK	font/woff	signIn:1 Parser	46.7 KB 46.3 KB	1.62 s 250 ms
wkfQbvfT_02e2IWO3yYueQ.woff themes.googleusercontent.com/static/fonts/lato/v7	GET	200 OK	font/woff	signIn:1 Parser	45.5 KB 45.1 KB	1.42 s 316 ms
9k-RPmcnxYEPm8CNFsH2gg.woff themes.googleusercontent.com/static/fonts/lato/v7	GET	200 OK	font/woff	signIn:1 Parser	45.4 KB 45.0 KB	2.16 s 378 ms
fontawesome-webfont.woff /websocchatroom/font	GET	200 OK	application/oc...	signIn:1 Parser	41.1 KB 40.8 KB	71 ms 69 ms

Blocking	1.000 ms
Sending	0
Waiting	4.000 ms
Receiving	1.000 ms

11 requests I 281 KB transferred

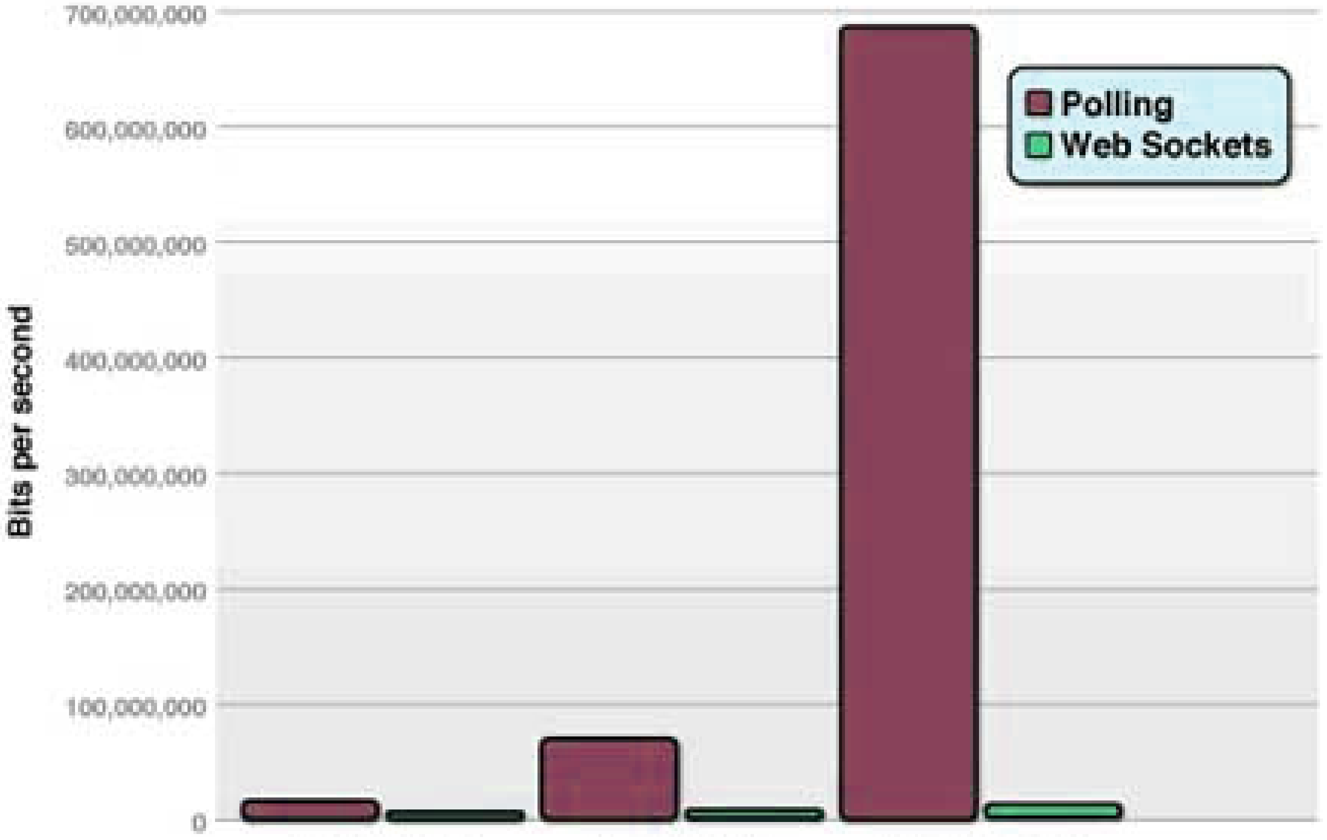
WS packet



6 0.002418000 192.168.1.56 192.168.1.15 HTTP 423 GET /websocchatroom/signIn HTTP/1.1

```
⊟ Frame 6: 423 bytes on wire (3384 bits), 423 bytes captured (3384 bits) on interface 0
    Interface id: 0
    Encapsulation type: Ethernet (1)
    Arrival Time: Apr 29, 2014 06:36:08.809519000 India Standard Time
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1398733568.809519000 seconds
    [Time delta from previous captured frame: 0.000789000 seconds]
    [Time delta from previous displayed frame: 0.000789000 seconds]
    [Time since reference or first frame: 0.002418000 seconds]
    Frame Number: 6
    Frame Length: 423 bytes (3384 bits)
    Capture Length: 423 bytes (3384 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:ip:tcp:http]
    [Number of per-protocol-data: 1]
    [Hypertext Transfer Protocol, key 0]
    [Coloring Rule Name: HTTP]
    [Coloring Rule String: http || tcp.port == 80]
⊞ Ethernet II, Src: Pegatron_3c:34:9d (7c:05:07:3c:34:9d), Dst: Dell_61:4e:a2 (d4:be:d9:61:4e:a2)
⊞ Internet Protocol Version 4, Src: 192.168.1.56 (192.168.1.56), Dst: 192.168.1.15 (192.168.1.15)
⊟ Transmission Control Protocol, Src Port: 6517 (6517), Dst Port: http-alt (8080), Seq: 1, Ack: 1, Len: 369
    Source port: 6517 (6517)
    Destination port: http-alt (8080)
    [Stream index: 0]
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 370    (relative sequence number)]
    Acknowledgment number: 1    (relative ack number)
    Header length: 20 bytes
  ⊞ Flags: 0x018 (PSH, ACK)
    Window size value: 256
    [Calculated window size: 65536]
    [Window size scaling factor: 256]
  ⊟ Checksum: 0x0226 [validation disabled]
      [Good Checksum: False]
      [Bad Checksum: False]
  ⊟ [SEQ/ACK analysis]
      [Bytes in flight: 369]
⊞ Hypertext Transfer Protocol

0020  01 0f 19 75 1f 90 e9 f3  b7 93 df 97 55 95 50 18   ...u.... ....U.P.
0030  01 00 02 26 00 00 47 45  54 20 2f 77 65 62 73 6f   ...&..GE T /webso
0040  63 63 68 61 74 72 6f 6f  6d 2f 73 69 67 6e 49 6e   cchatroo m/signIn
0050  20 48 54 54 50 2f 31 2e  31 0d 0a 48 6f 73 74 3a    HTTP/1. 1..Host:
0060  20 31 39 32 2e 31 36 38  2e 31 2e 31 35 3a 38 30    192.168 .1.15:80
0070  38 30 0d 0a 55 73 65 72  2d 41 67 65 6e 74 3a 20   80..User -Agent:
```


700,000,000
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000
0
Bits per second
🟥 Polling
🟩 Web Sockets

Conclusion

- Reducing n/w and server side overhead
- Reduce client side dependencies while using web
- Fast and reliable communication
- Useful for Real time data application
- Suitable for low latency communication
- Open full duplex connection over the web
- 2 byte of frame exchanged by webSockets compared to 8 KB while HTTP pulling

Analysis

- "If the pull interval is higher than the publish interval, some data miss will occur. If it is lower, network performance will suffer. Pull performs well only if the pull interval equals to publish interval."

Thank You

Github.com/AbhishekSolanki/websocchatroom