

# How not to flip the table using Selenium BiDi

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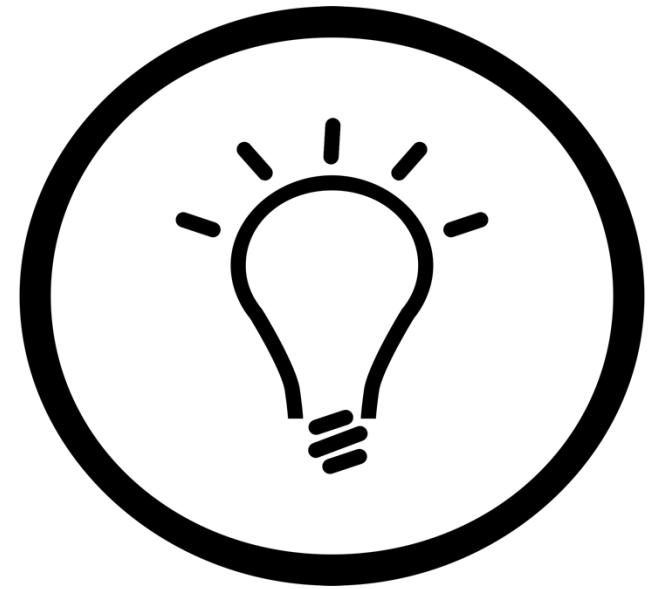
# About me

- Quality Assurance Engineer at trivago
- 8+ years in QA position
  - 5 years of back-end API testing
  - 3+ years in web and App front-end testing
- Book enthusiast



# Disclaimer

- The presentation is based on my bachelor thesis which was conducted at trivago in 2024



# Agenda

Introduction to  
Selenium BiDi



Steps to prepare  
your project



How not to flip the  
table?



Closing thoughts

# Takeaways



# Introduction to Selenium BiDi

## What is Selenium BiDirectional?



A protocol built on top of the classic Selenium WebDriver



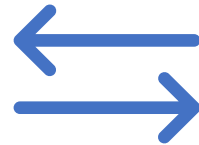
Developed together with the browser vendors



It is still being developed.

# Introduction to Selenium BiDi

## Advantages over the classic WebDriver



Provides better  
bidirectional  
communication



No request-  
response  
communication



Full-duplex  
communication is  
achieved via  
WebSockets

# Steps to prepare your project



Steps to  
prepare your  
project

## Which BiDi features can be beneficial?

Network interception

Browsing context

Steps to  
prepare your  
project

## Which BiDi features can be beneficial?

DOM mutation observation

Console logging and  
JavaScript Exception logging

Network events for measuring  
page load performance

Steps to  
prepare your  
project

## Source of data

ChatGPT

Wikipedia

Stack Overflow

GitHub

## Steps to prepare your project

### Expectations

Fast implementation

Bug free features

Easy fix for potential issues

Feedback and possible improvements

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Selenium BiDi?



# DOM mutation observation event

```
ArrayList<WebElement> domMutations = new ArrayList<>();
try {
    ((HasLogEvents) augmentedWebDriverWithLogEvents())
        .onLogEvent(domMutation(mutations →
domMutations.add(mutations.getElement())));
```

- Tests were passing locally
- The optimized step was running faster than the previous logic
- But... when the tests were run in parallel or in a cloud...

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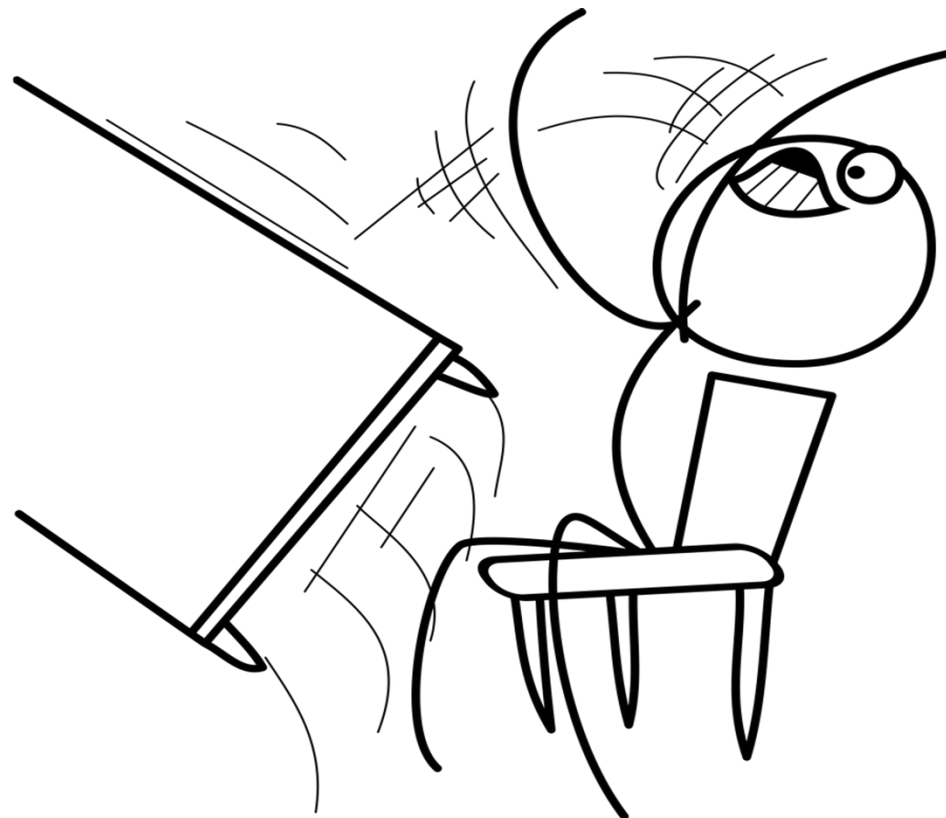
# DOM mutation observation event

```
Exception in thread "CDP Connection"  
org.openqa.selenium.devtools.DevToolsException:  
Error communicating with the remote browser"
```

- Scenario was failing after random test executions
- There was no available solution anywhere
- Fixing this problem was not feasible within my deadline

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# DOM mutation observation event



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## Follow up points

Implemented  
as a new  
scenario step

Evaluation of  
results was  
not accurate

Feature could  
not be used

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# JavaScript logging

```
public void listenToJavaScriptLogs() {  
    if (isBidiSupported()) {  
        try (LogInspector logInspector = new LogInspector(currentWebDriver)) {  
            logInspector.onJavaScriptLog(jsConsoleLogs::add);  
        }  
    }  
}
```

- Straightforward implementation
- JS errors are stored in one place
- Did you notice something “fishy”?

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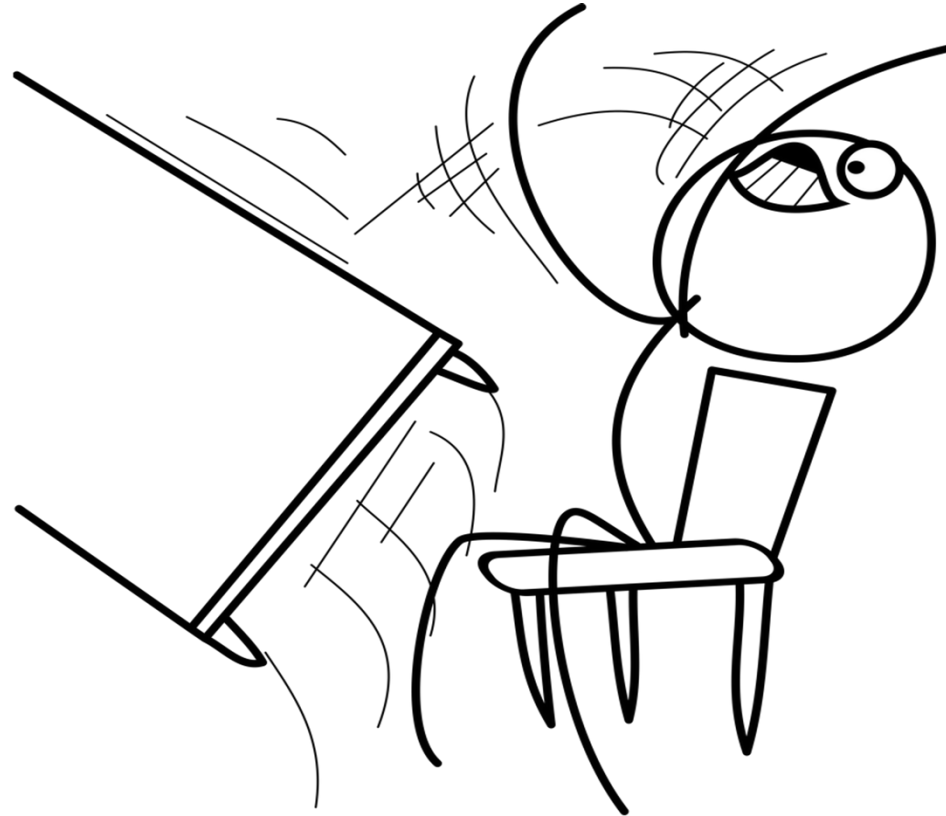
# JavaScript logging

“WebDriver instance must support BiDi protocol”

- Automation tests were failing in:
  - The open-source-software based internal grid
  - The commercial cloud grid provider

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# JavaScript logging



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# Follow up points

Implemented  
as a plugin

Additional  
Boolean  
function checks

Created global  
variable test  
specifications



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# Network events for measuring page load performance

```
List<Metric> performanceMetricsList = null;
try {
    WebDriver augmentedDriver = new Augmenter().augment(getDriver());
    DevTools devTools = ((HasDevTools) augmentedDriver).getDevTools();
    devTools.createSession();
    devTools.send(Performance.enable(Optional.empty()));
    performanceMetricsList = devTools.send(Performance.getMetrics());
} catch (Exception e) {
    logMessage("DevTools is not available for the current browser");
}
```

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# Network events for measuring page load performance

- Not entirely developed
- Implementation had to use CDP
- Documentation was not descriptive

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# Learning points



New features have less online support



Flexibility is key



Team collaboration is important



Flipping tables can be expensive and painful

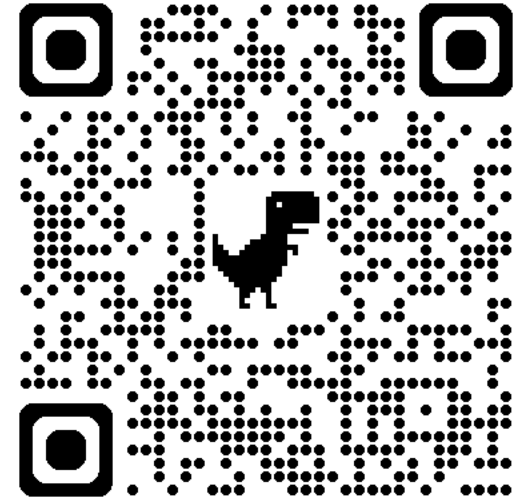
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# Who supports Selenium BiDi features now?

- [LambdaTest](#)
- [BrowserStack](#)
- Selenium Grid

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Do you have any questions?



<https://rb.gy/4e040u>

Thank you for your time!