

Selenium Manager: Automated Driver & Browser Management for Selenium WebDriver

SeleniumConf Chicago
March 29, 2023

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<https://bonigarcia.dev>

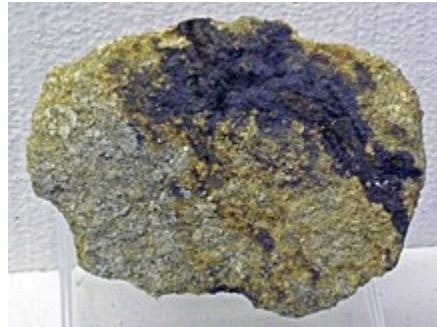


[@boni_gg](https://twitter.com/boni_gg)



<https://github.com/bonigarcia>

What is Selenium?

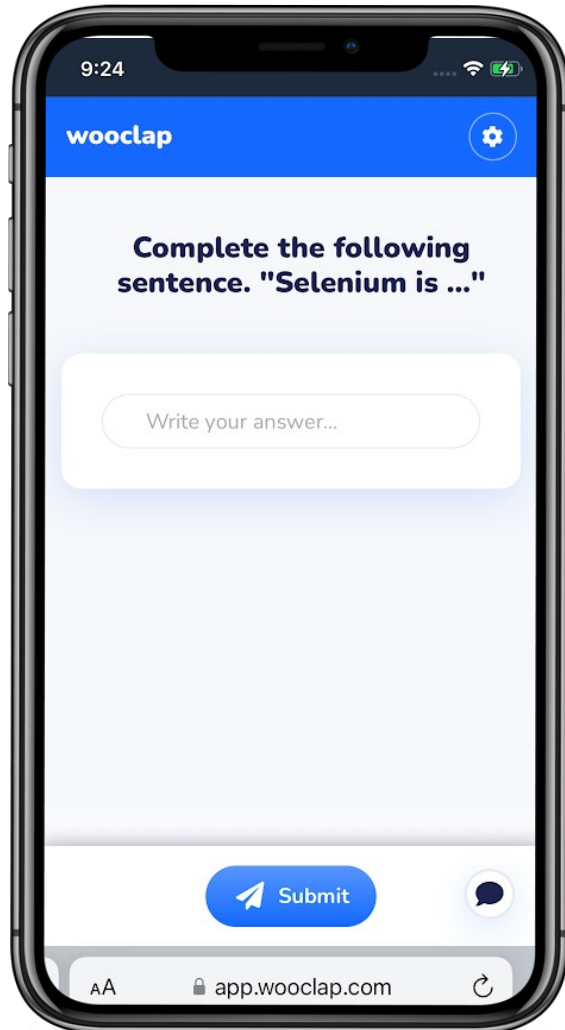


What is Selenium?

(in software development)

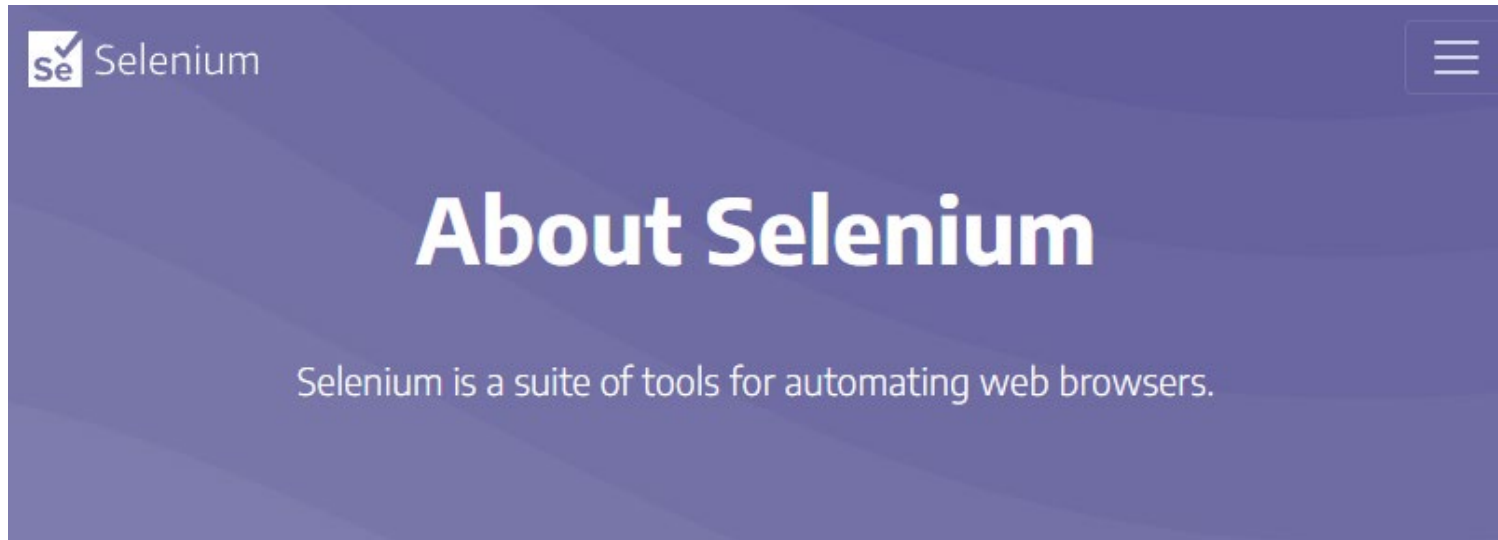


What is Selenium?



<https://app.wooclap.com/CRQSUO>

What is Selenium?



<https://www.selenium.dev/about/>



Selenium WebDriver

Library



Selenium IDE

Plugin



Selenium Grid

Infrastructure

What is Selenium?

- **Selenium WebDriver** is the heart of the Selenium project and it is often known as simply **Selenium**



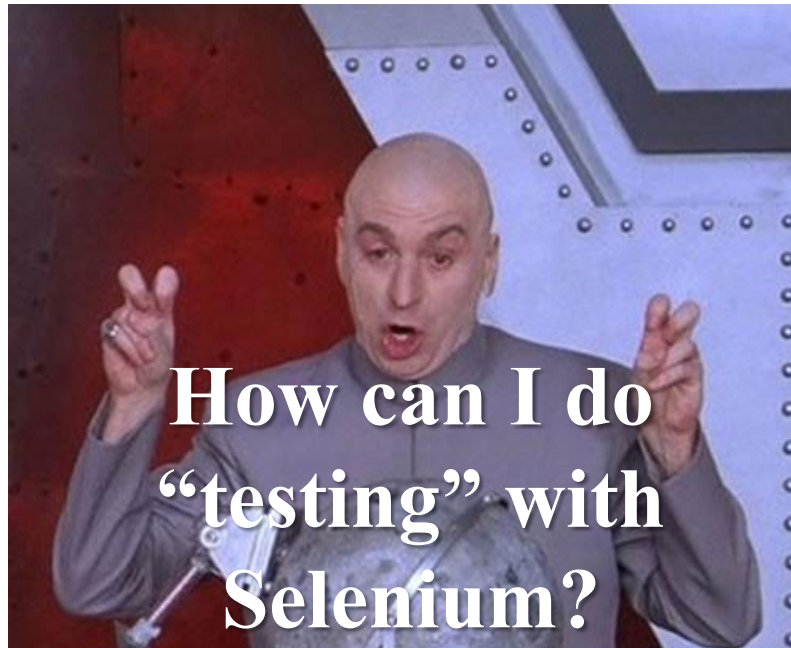
“ *Selenium is a browser automation library* ”

What is NOT Selenium?

- Selenium is NOT a testing framework



- Selenium is NOT a testing library



Testing with Selenium – Browsers

- First we need one or more browsers to be driven with Selenium



- Local



- Remote

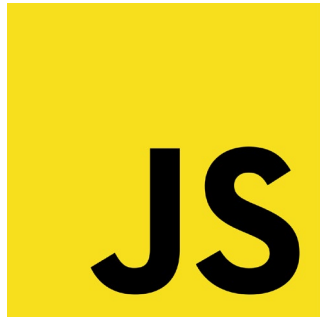


- Cloud



Testing with Selenium – Binding Languages

- Selenium provides a cross-browser **Application Programming Interface (API)** in several programming languages

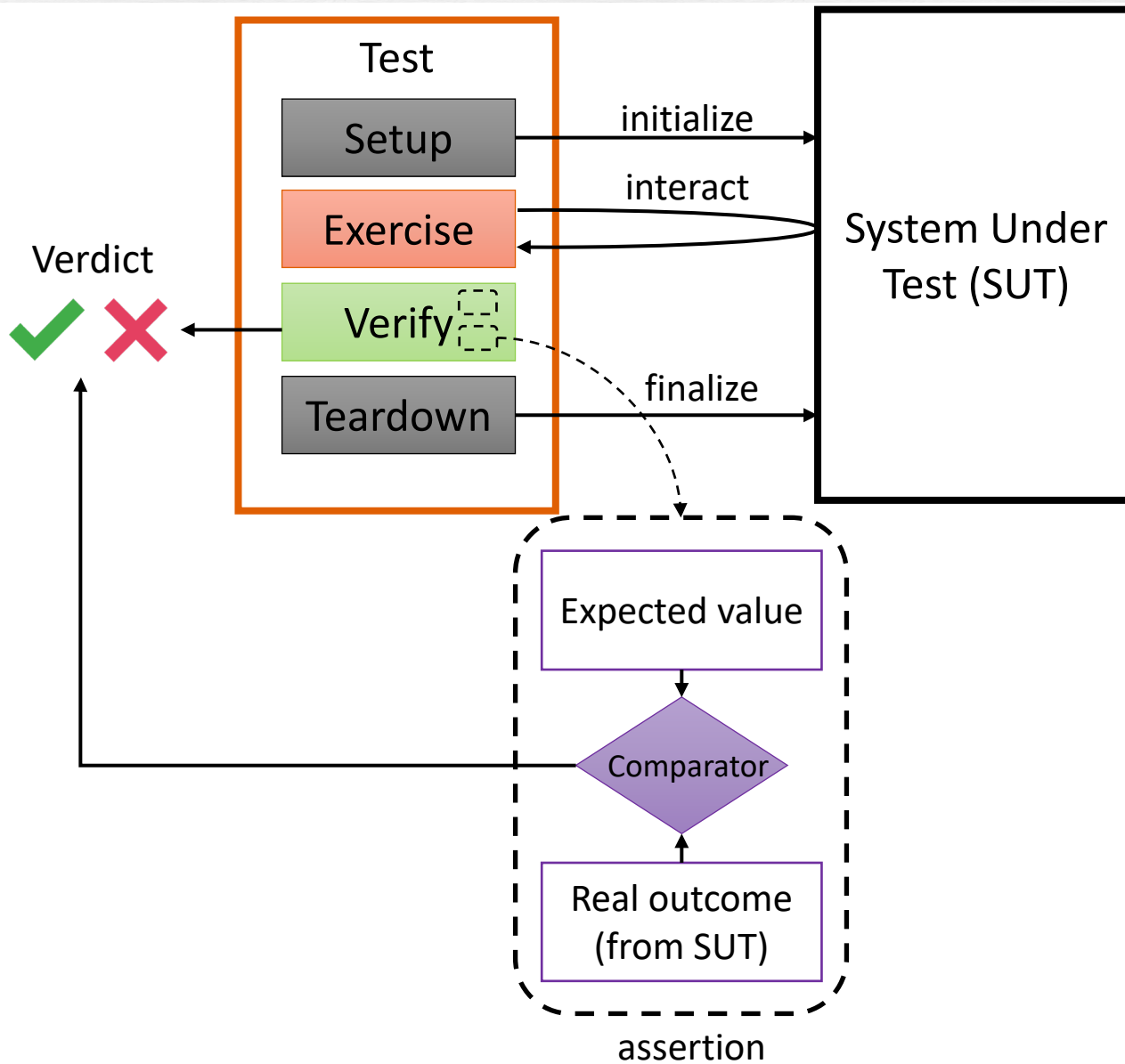


python™



We need to choose a
Selenium binding language

Testing with Selenium – Unit Testing Framework



JUnit 5

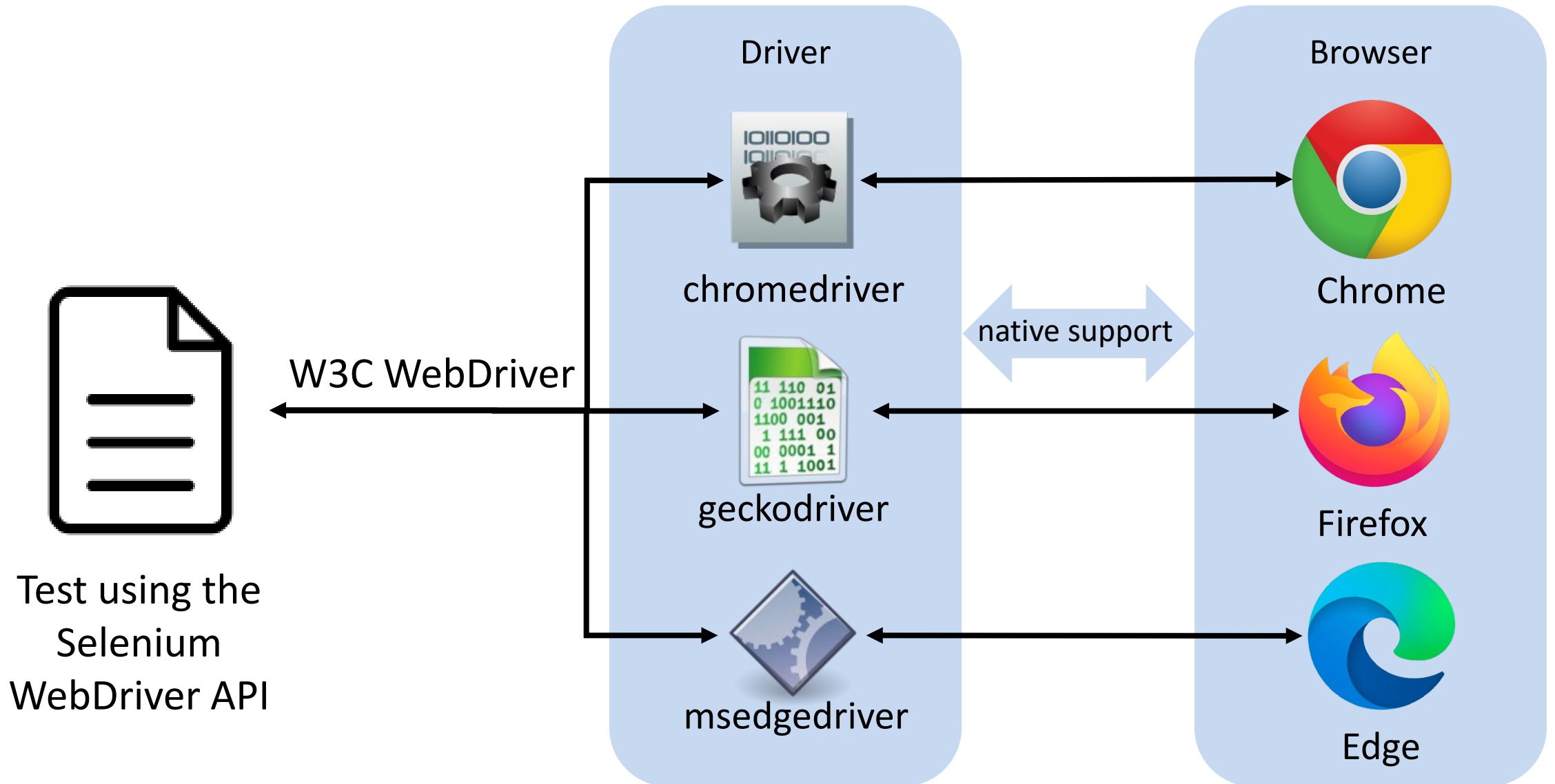


PyUnit

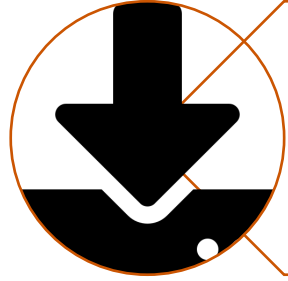
minitest



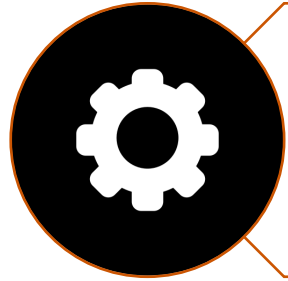
Testing with Selenium – Drivers



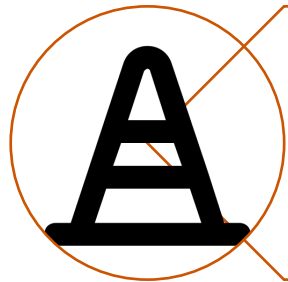
Driver Management



1. Download

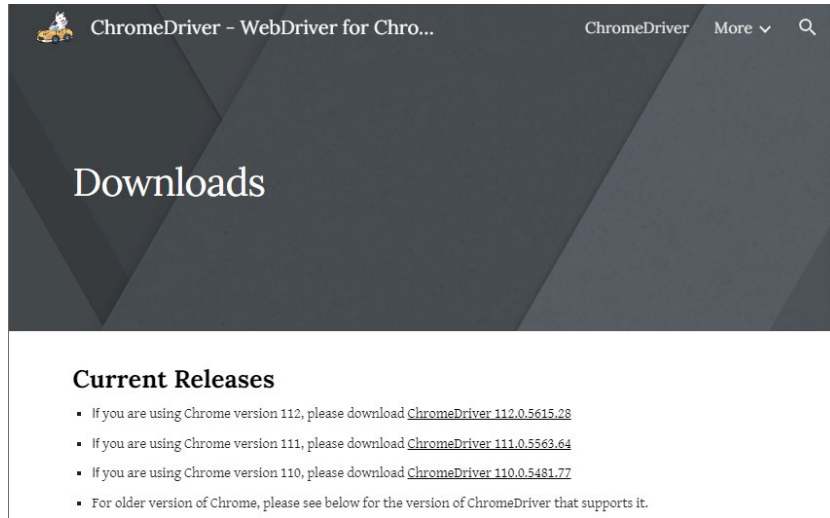


2. Setup



3. Maintenance

Driver Management - Download



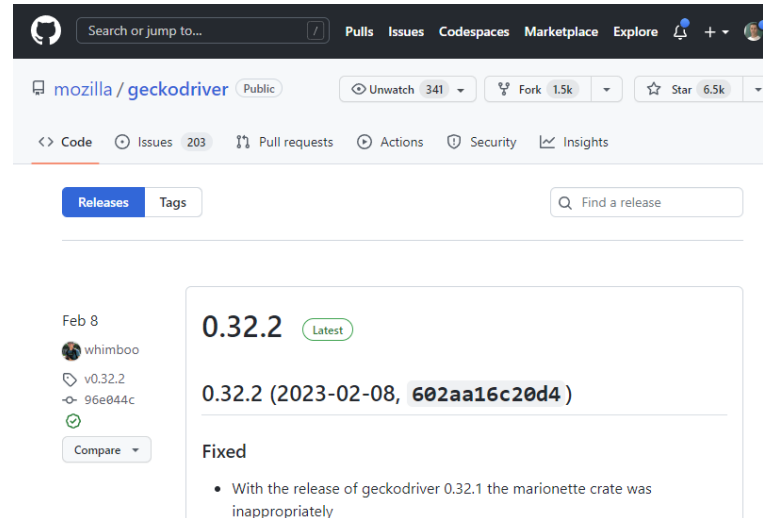
ChromeDriver - WebDriver for Chromium

Downloads

Current Releases

- If you are using Chrome version 112, please download [ChromeDriver 112.0.5615.28](#)
- If you are using Chrome version 111, please download [ChromeDriver 111.0.5563.64](#)
- If you are using Chrome version 110, please download [ChromeDriver 110.0.5481.77](#)
- For older version of Chrome, please see below for the version of ChromeDriver that supports it.

<https://chromedriver.chromium.org/downloads>



Search or jump to...

mozilla/geckodriver

Unwatch 341 Fork 1.5k Star 6.5k

Code Issues 203 Pull requests Actions Security Insights

Releases Tags Find a release

Feb 8

whimboo

v0.32.2

96e044c

Compare

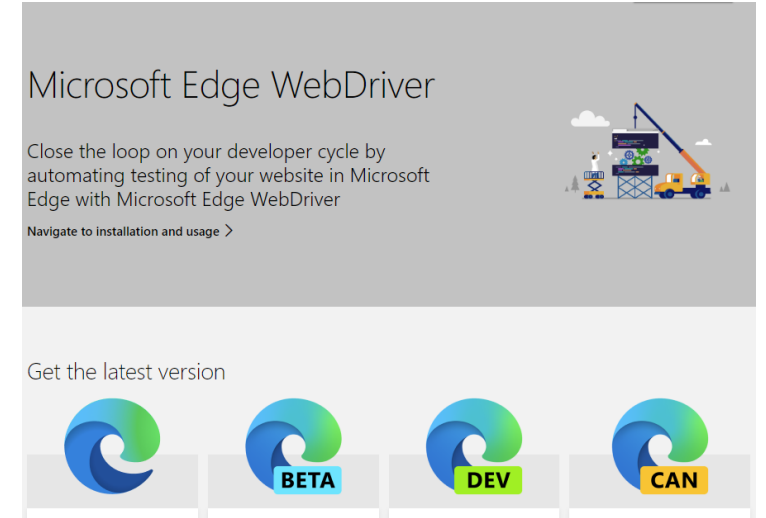
0.32.2 Latest

0.32.2 (2023-02-08, 602aa16c20d4)

Fixed

- With the release of geckodriver 0.32.1 the marionette crate was inappropriately

<https://github.com/mozilla/geckodriver/releases>







Microsoft Edge WebDriver

Close the loop on your developer cycle by automating testing of your website in Microsoft Edge with Microsoft Edge WebDriver

Navigate to installation and usage >

Get the latest version

BETA DEV CAN

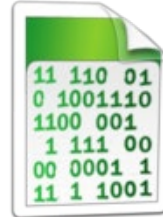
<https://developer.microsoft.com/en-us/microsoft-edge/tools/webdriver/>



Driver Management - Setup



chromedriver



geckodriver



msedgedriver

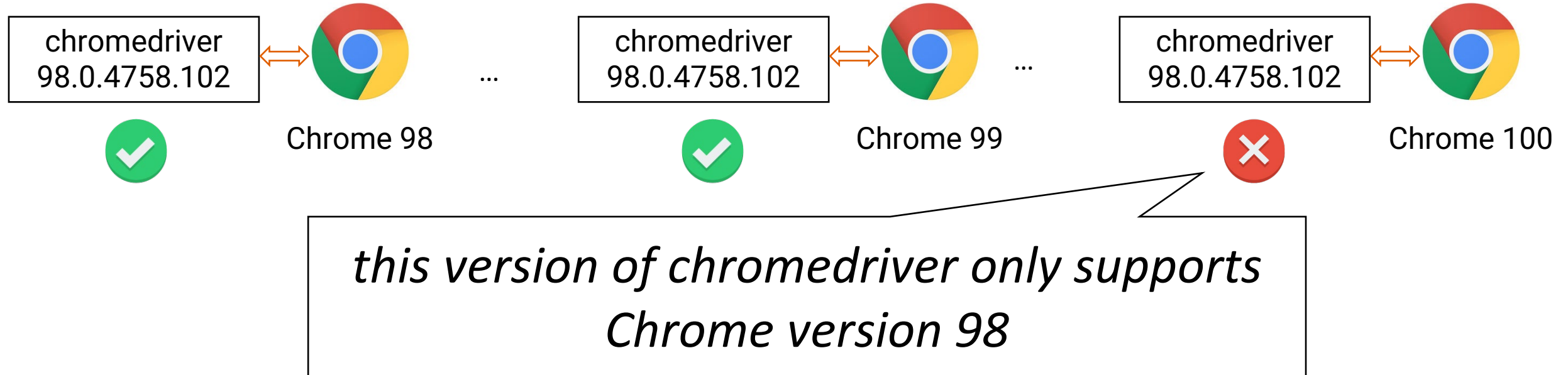
PATH
(environment variable)

```
System.setProperty("webdriver.chrome.driver", "/path/to/chromedriver");  
System.setProperty("webdriver.gecko.driver", "/path/to/geckodriver");  
System.setProperty("webdriver.edge.driver", "/path/to/msedgedriver");
```

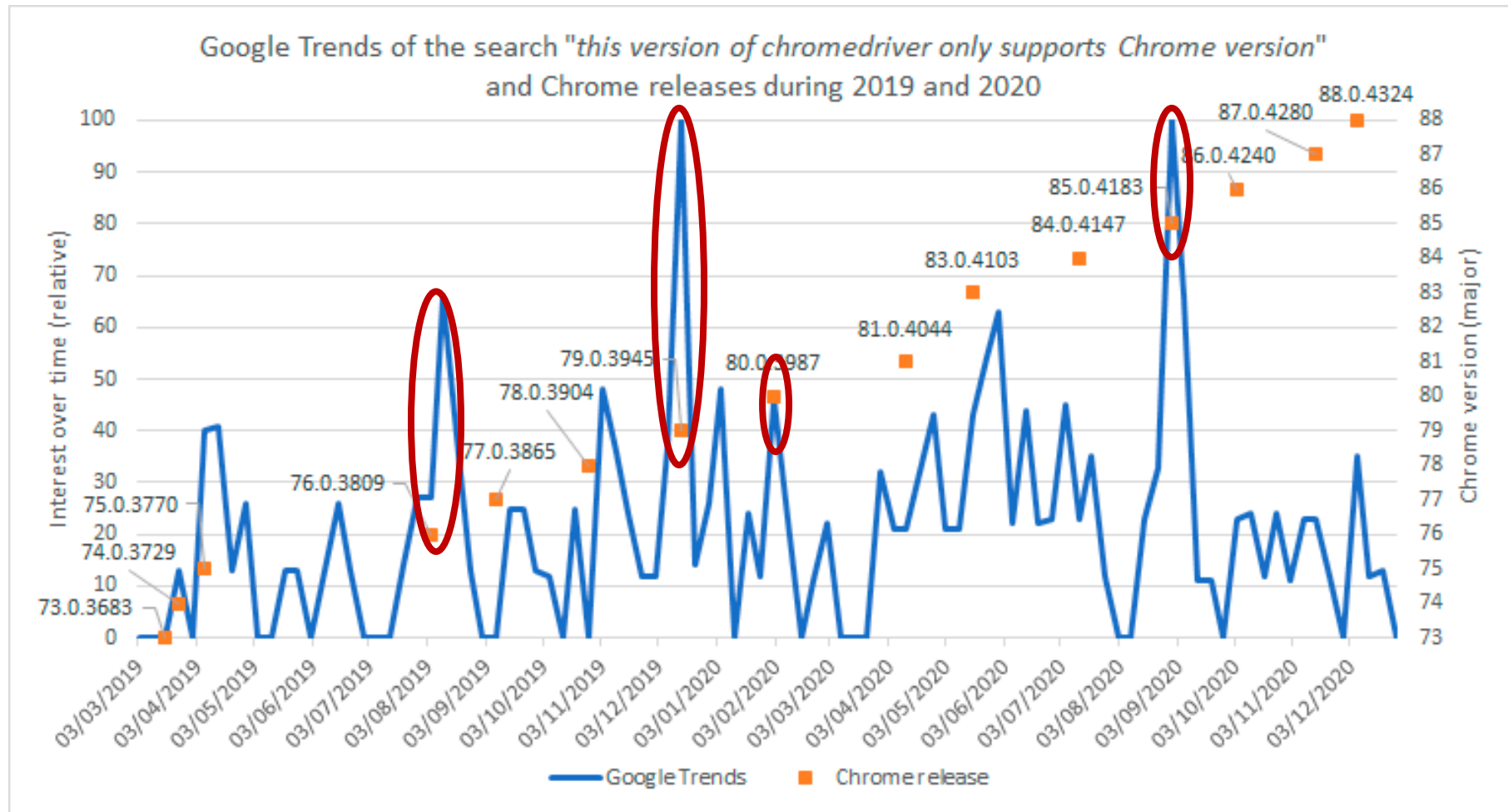


Driver Management - Maintenance

- Modern web browsers are *evergreen*



Driver Management - Maintenance



Automated Driver Management

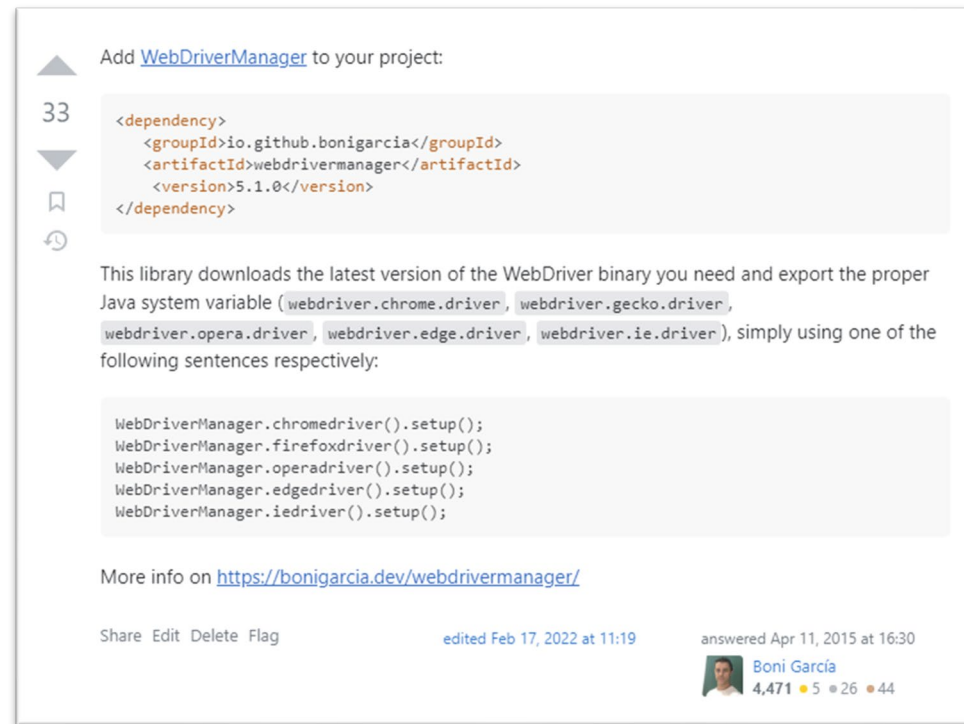
WebDriverManager 

<https://bonigarcia.dev/webdrivermanager/>

“*Automated driver management and other helper features for Selenium WebDriver in Java*”

Automated Driver Management

- Why I created WebDriverManager?
 - For helping my students at University to develop Selenium tests (in 2015)



▲ Add [WebDriverManager](#) to your project:

33

```
<dependency>
  <groupId>io.github.bonigarcia</groupId>
  <artifactId>webdrivermanager</artifactId>
  <version>5.1.0</version>
</dependency>
```

This library downloads the latest version of the WebDriver binary you need and export the proper Java system variable (`webdriver.chrome.driver`, `webdriver.gecko.driver`, `webdriver.opera.driver`, `webdriver.edge.driver`, `webdriver.ie.driver`), simply using one of the following sentences respectively:


```
WebDriverManager.chromedriver().setup();
WebDriverManager.firefoxdriver().setup();
WebDriverManager.operadriver().setup();
WebDriverManager.edgedriver().setup();
WebDriverManager.iedriver().setup();
```

More info on <https://bonigarcia.dev/webdrivermanager/>

Share Edit Delete Flag

edited Feb 17, 2022 at 11:19

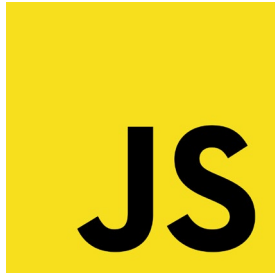
answered Apr 11, 2015 at 16:30

 **Boni Garcia**
4,471 ● 5 ● 26 ● 44

<https://stackoverflow.com/questions/7450416/selenium-2-chrome-driver/29580245>

Automated Driver Management

- The “*managers*” for Selenium WebDriver:



webdriver-manager

<https://www.npmjs.com/package/webdriver-manager>



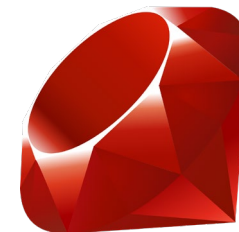
webdriver-manager

<https://pypi.org/project/webdriver-manager>



WebDriverManager.Net

<https://github.com/rosolko/WebDriverManager.Net>

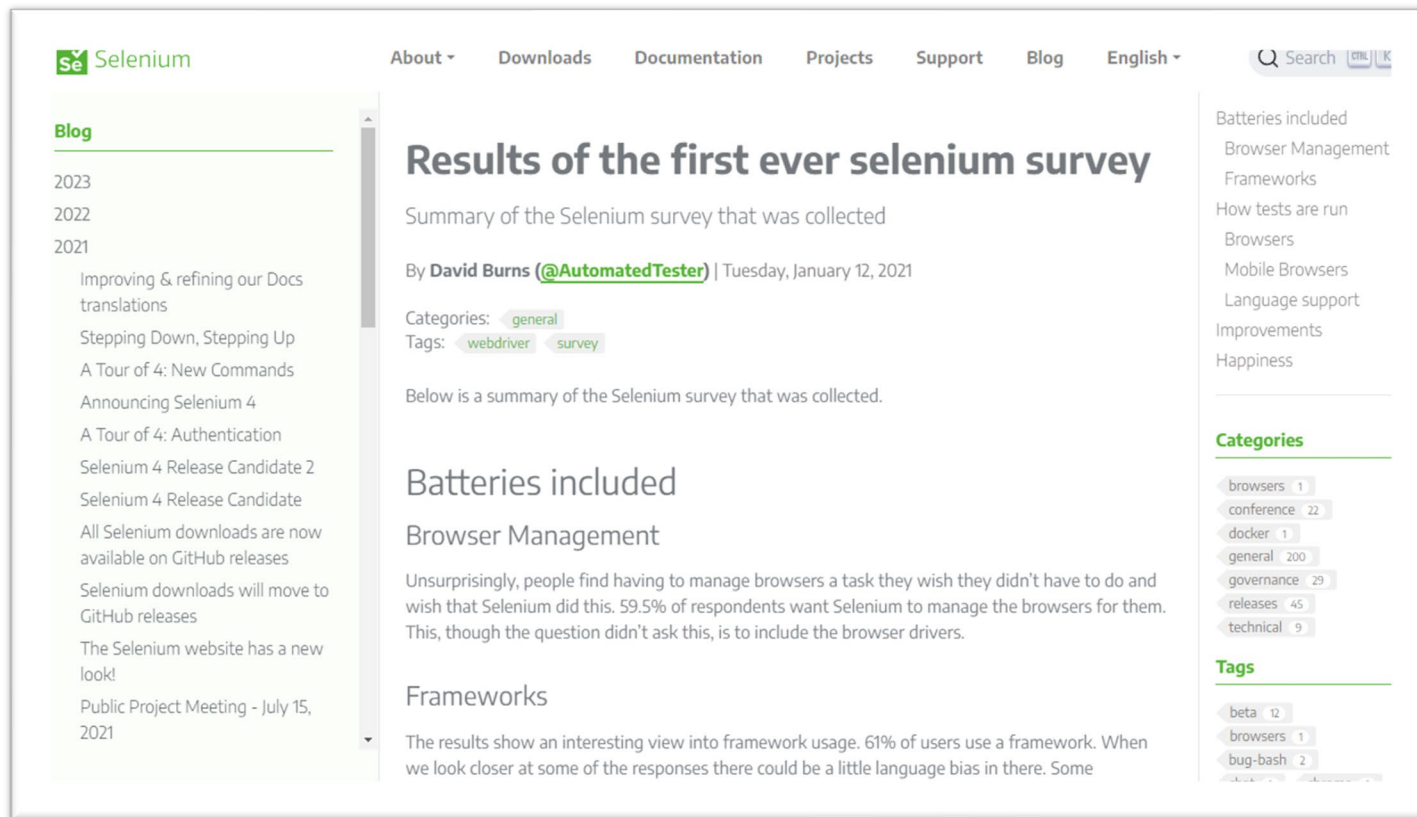


webdrivers

<https://github.com/titusfortner/webdrivers>

What did the Selenium project think about it?

- On 2021, the Selenium project published the results of the first official Selenium survey



The screenshot shows the Selenium project's blog page. The main article is titled "Results of the first ever selenium survey" by David Burns (@AutomatedTester), dated Tuesday, January 12, 2021. The article is categorized as "general" and tagged with "webdriver" and "survey". The content discusses the survey results, highlighting that 59.5% of respondents want Selenium to manage browsers, and 61% of users use a framework. The article is structured with sections: "Batteries included", "Browser Management", and "Frameworks".

Batteries included

Browser Management

Unsurprisingly, people find having to manage browsers a task they wish they didn't have to do and wish that Selenium did this. 59.5% of respondents want Selenium to manage the browsers for them. This, though the question didn't ask this, is to include the browser drivers.

Frameworks

The results show an interesting view into framework usage. 61% of users use a framework. When we look closer at some of the responses there could be a little language bias in there. Some

Categories

- browsers 1
- conference 22
- docker 1
- general 200
- governance 29
- releases 45
- technical 9

Tags

- beta 12
- browsers 1
- bug-bash 2

Respondents
wanted *batteries*
included

<https://www.selenium.dev/blog/2021/selenium-survey-results/>

The official *manager* for Selenium

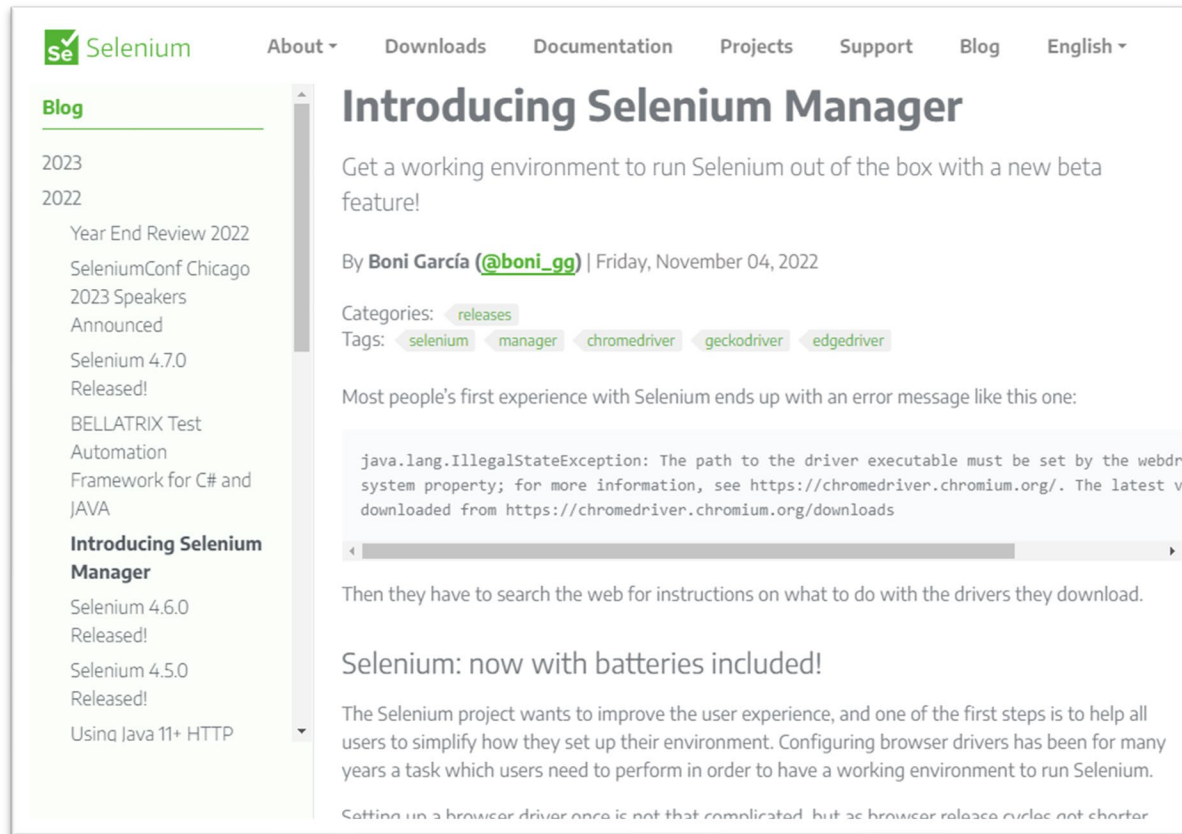
- From May 2022 to March 2023, I joined Sauce Labs as Staff Software Engineer in the Open Source Program Office
 - I become a Selenium committer on August 2022
 - My main contribution so far has been the development of **Selenium Manager**



<https://opensource.saucelabs.com/>

Selenium Manager

- **Selenium Manager** is a tool aimed to provide automated driver and browser management for Selenium



Selenium Manager
was first released
on November 2022

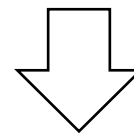
<https://www.selenium.dev/blog/2022/introducing-selenium-manager/>

Selenium Manager

- It is a CLI (Command-Line Interface) tool
 - To provide a universal interface through the shell
- It has been developed in Rust
 - To allow cross platform execution
- It has been created reusing the experience of previous managers



WebDriverManager 



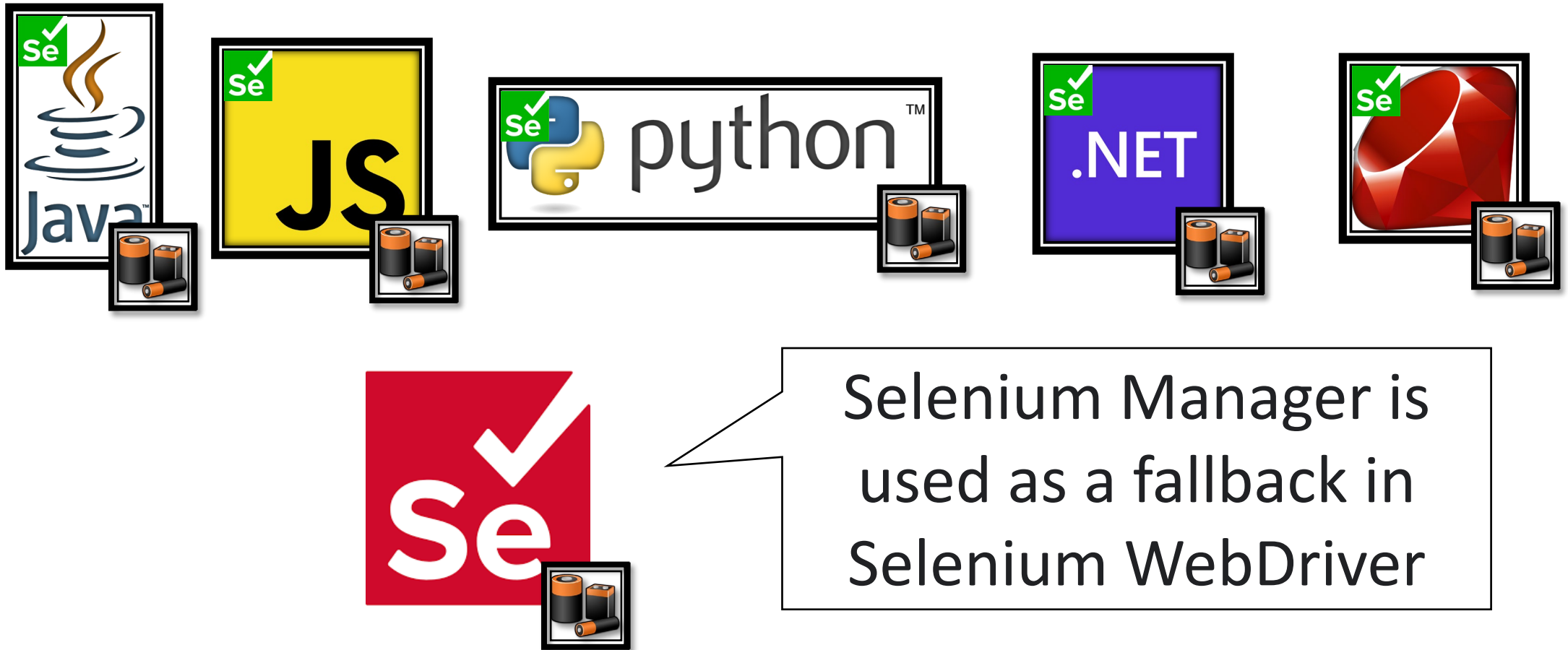
 **Selenium Manager**

Selenium Manager

- Browser version discovery
 - Using shell commands
- Driver version discovery
 - Using online info by drivers maintainers
- Driver download
 - Using an HTTP client with configurable setup (proxy, timeout)
- Local cache (~/.cache/selenium/)
 - For drivers binaries
- Local metadata
 - For discovered driver versions during a *time-to-live* (TTL)

Selenium Manager – Selenium WebDriver

- As of version 4.6, each release of **Selenium WebDriver** is shipped with Selenium Manager



Selenium Manager – Selenium Grid

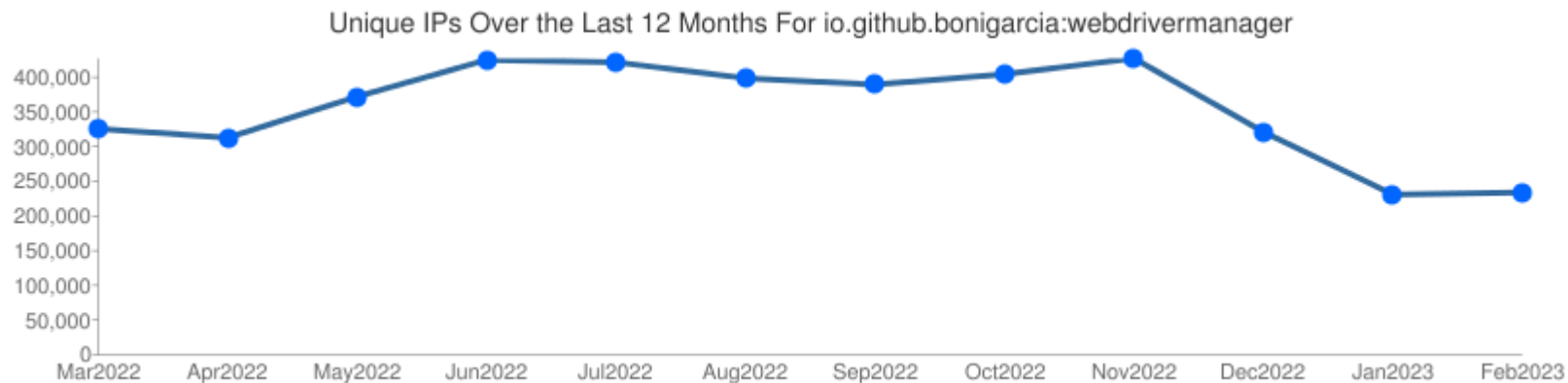
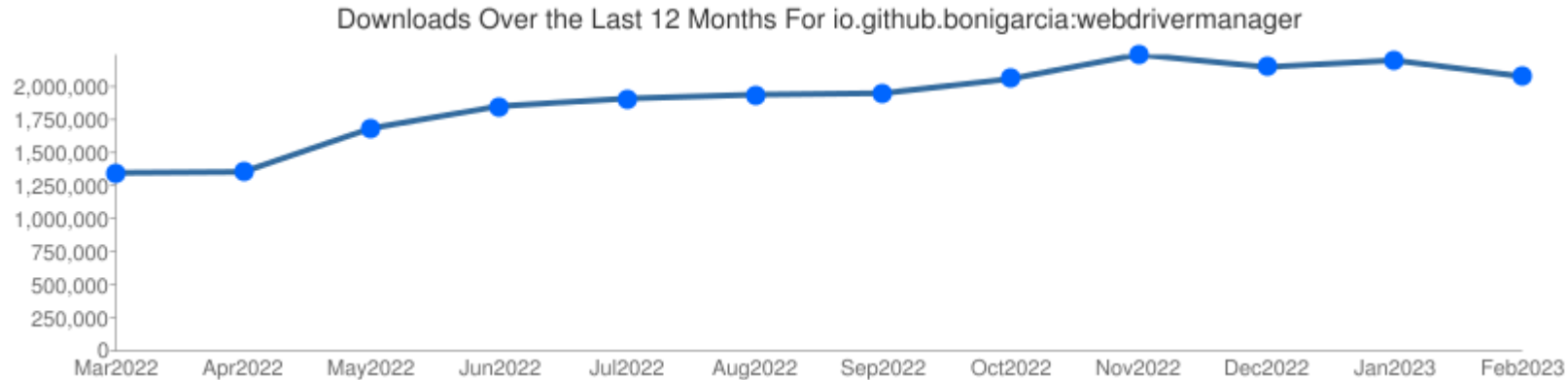
- Also, latest versions of **Selenium Grid** can use Selenium Manager to manage drivers automatically



Selenium Manager can be explicitly used (opt-in) in Selenium Grid

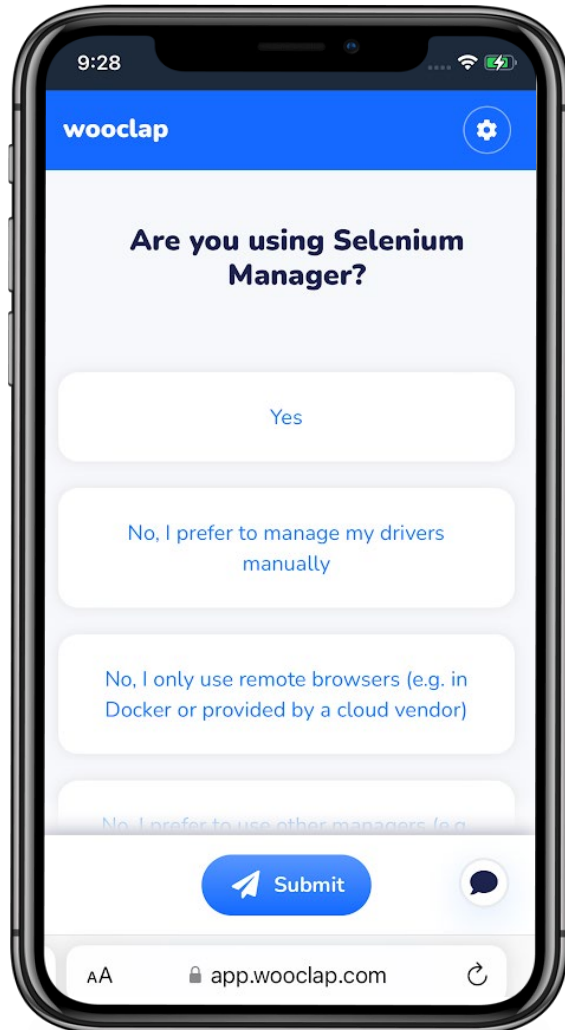
Who is using Selenium Manager?

- WebDriverManager usage statistics:



<https://oss.sonatype.org/>

Who is using Selenium Manager?



<https://app.wooclap.com/CRQSUO>

What about Browser Management?

- The next big feature of Selenium Manager, i.e., **automated browser management**, is not implemented yet



Other Possible Future Features

- CLI helper tool for Selenium
 - For instance: creating project scaffolding from the shell
- Integration with docker-selenium
 - To provide browsers in Docker containers for Selenium WebDriver in a seamless manner



Feedback and
ideas is more
than welcome!

Selenium Manager: Automated Driver & Browser Management for Selenium WebDriver

Thank you very much!
Q&A

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<https://bonigarcia.dev>



[@boni_gg](https://twitter.com/boni_gg)



<https://github.com/bonigarcia>