

# Selenium Manager: Automated Driver & Browser Management for Selenium WebDriver

SeleniumConf Chicago  
March 29, 2023

Boni García



[boni.garcia@uc3m.es](mailto:boni.garcia@uc3m.es)



<https://bonigarcia.dev>

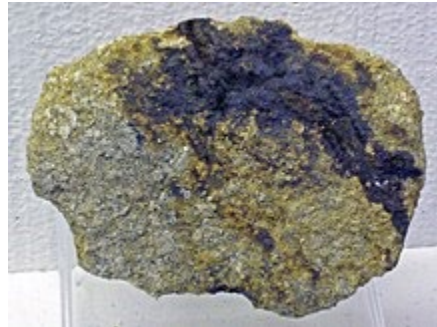


[@boni\\_gg](https://twitter.com/boni_gg)



<https://github.com/bonigarcia>

# What is Selenium?

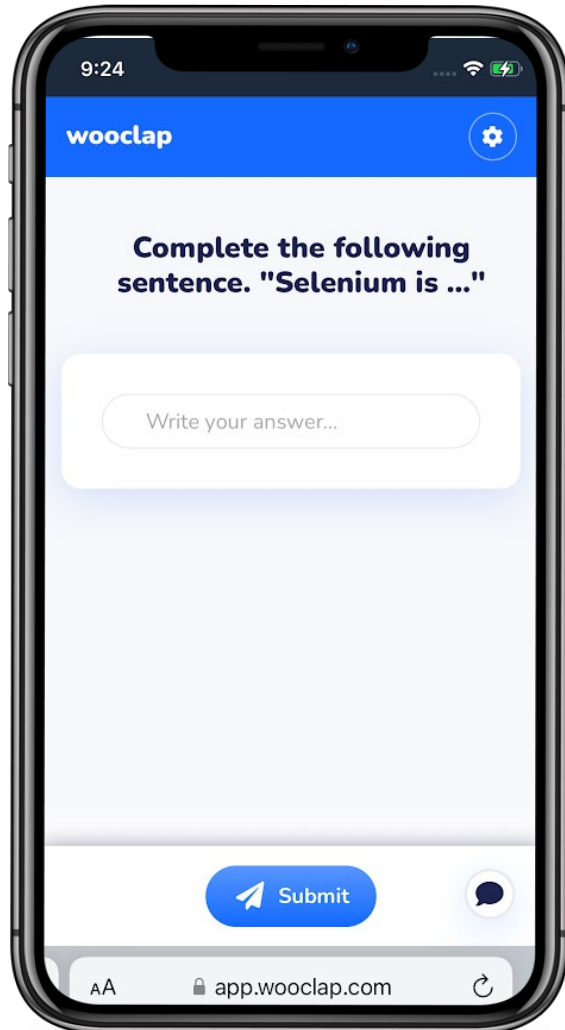


# What is Selenium?

(in software development)

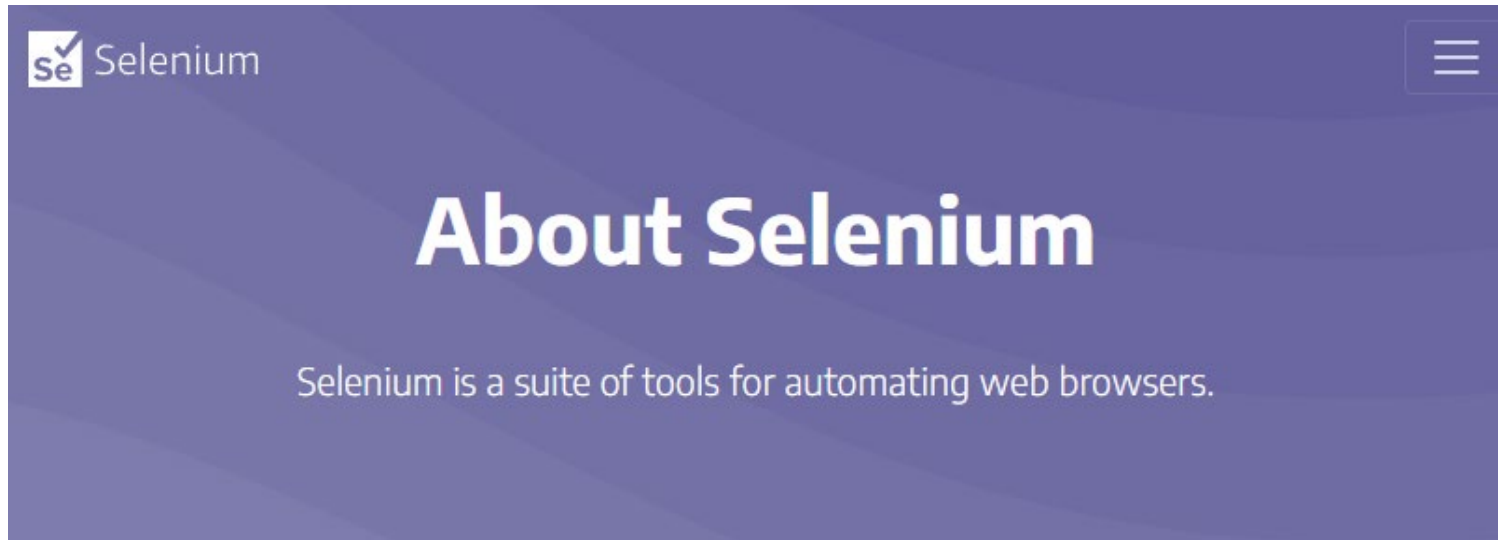


# What is Selenium?



<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* ”

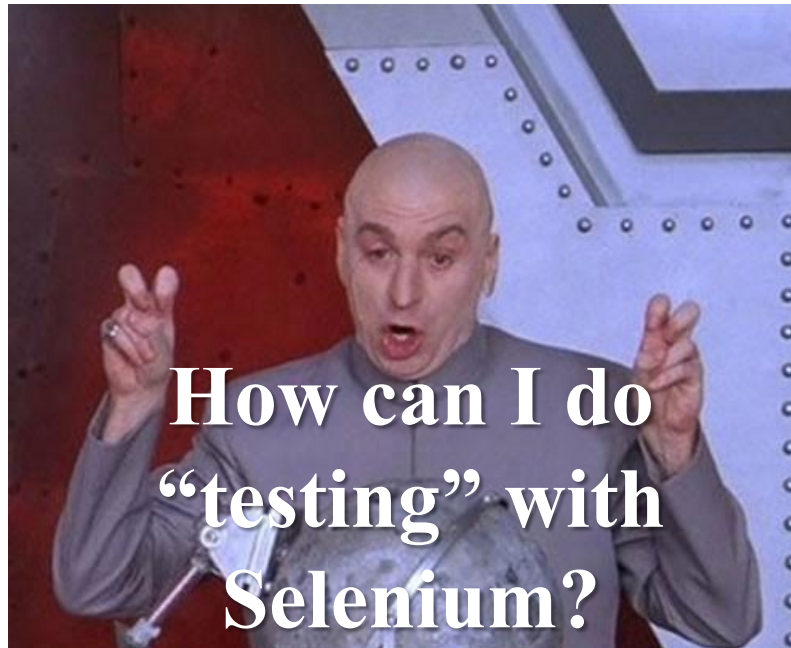


# What is NOT Selenium?

- 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

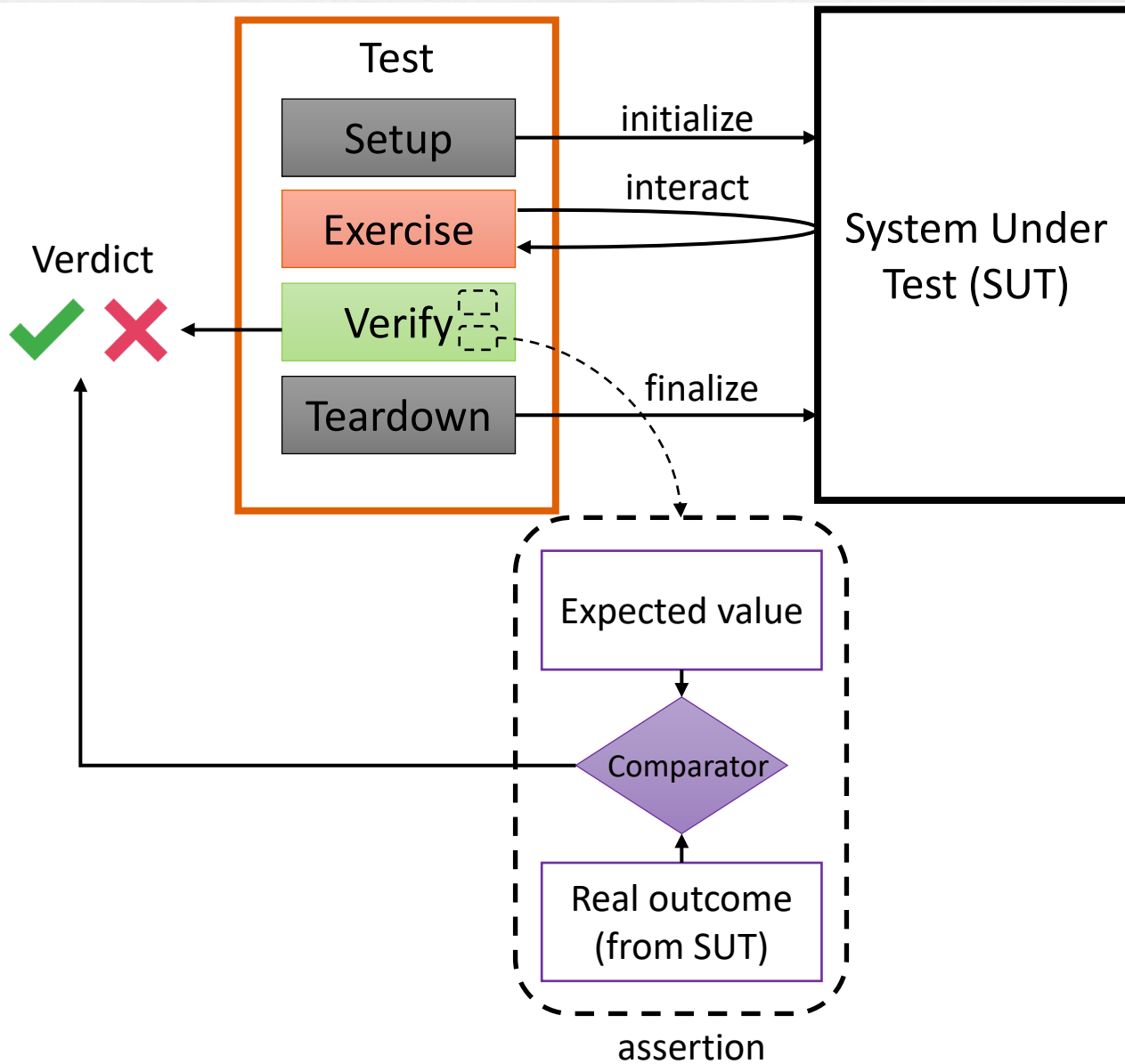


python™



We need to choose a  
Selenium binding language

# Testing with Selenium – Unit Testing Framework



JUnit 5

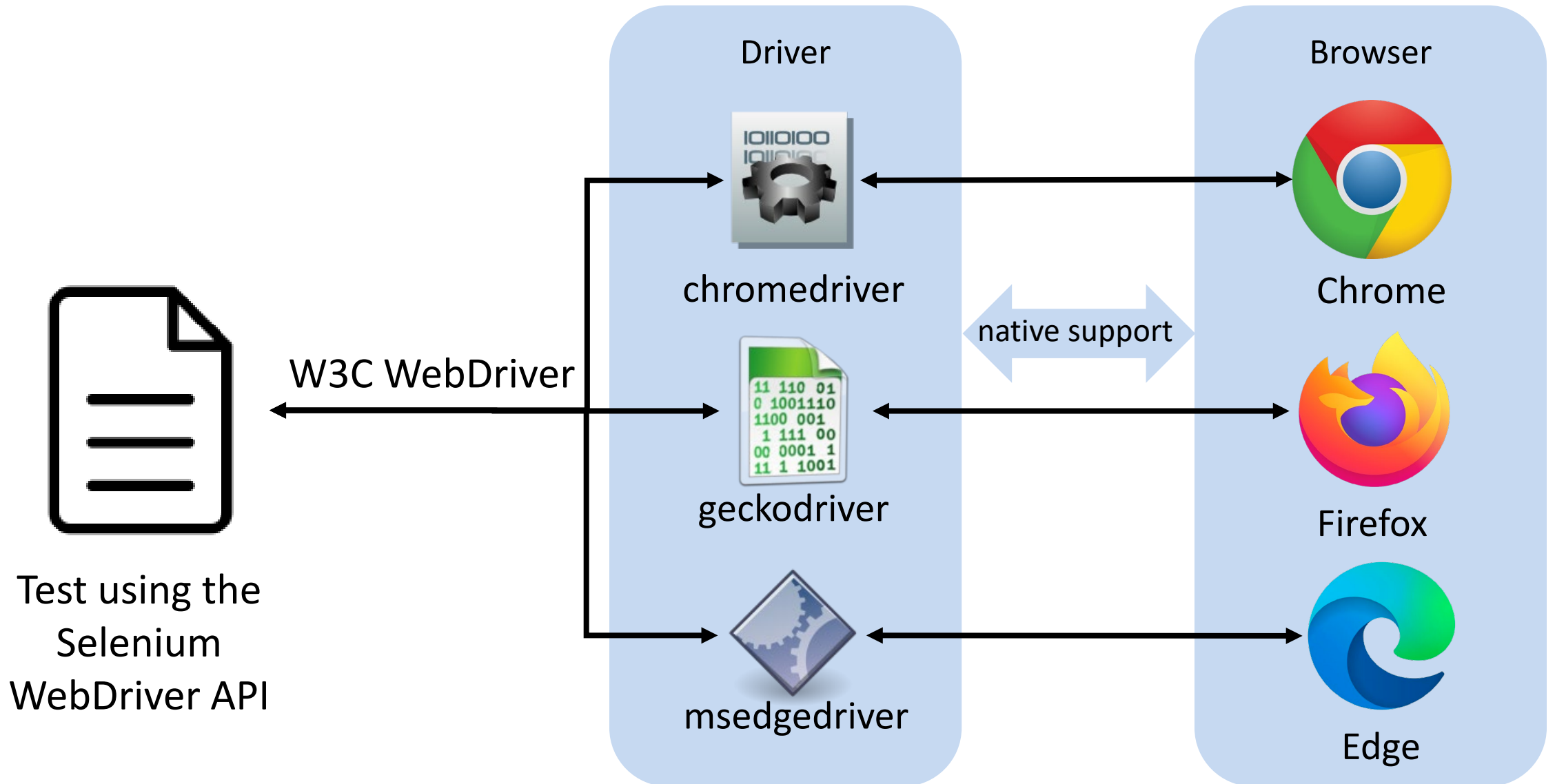


PyUnit

minitest



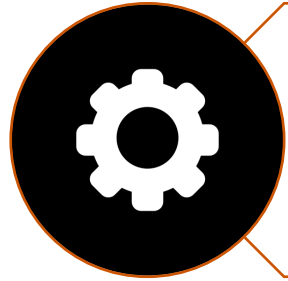
# Testing with Selenium – Drivers



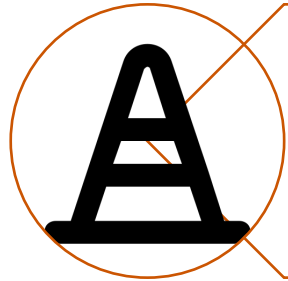
# Driver Management



1. Download

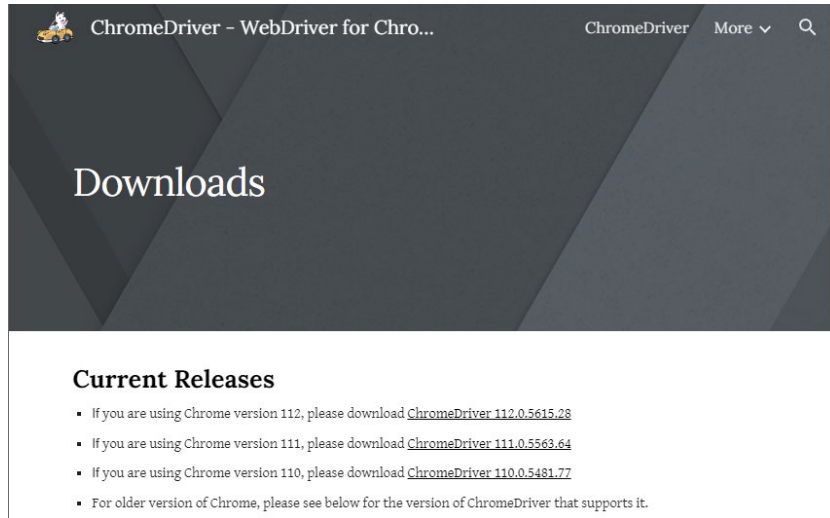


2. Setup



3. Maintenance

# Driver Management - Download



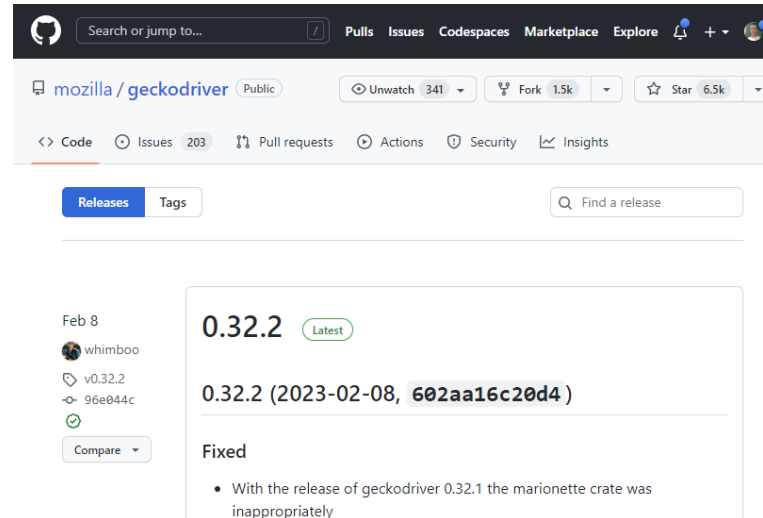
ChromeDriver - WebDriver for Chromium

## 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

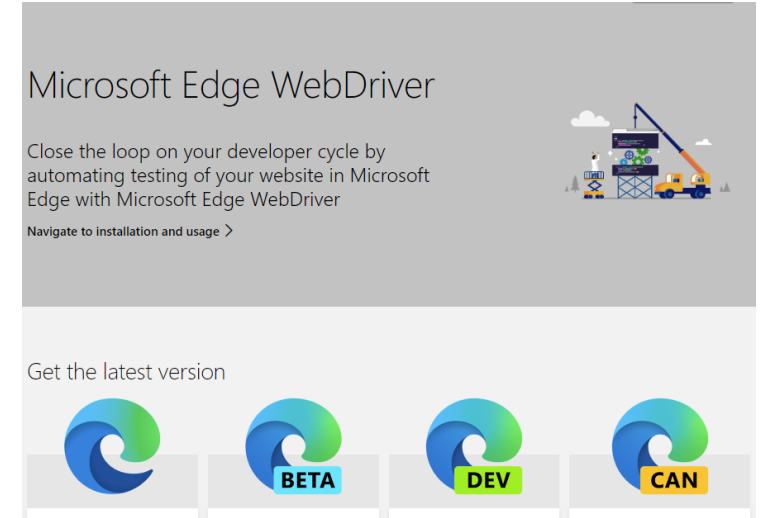
## 0.32.2 Latest

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

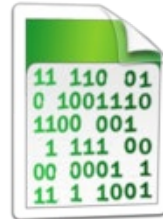
<https://developer.microsoft.com/en-us/microsoft-edge/tools/webdriver/>



# Driver Management - Setup



chromedriver



geckodriver



msedgedriver

**PATH**  
(environment variable)

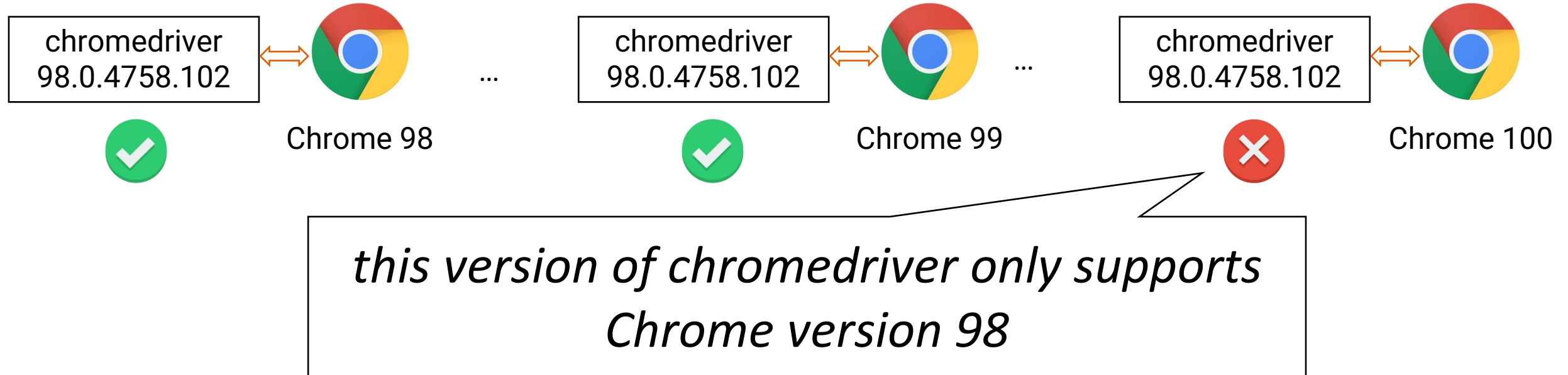
```
System.setProperty("webdriver.chrome.driver", "/path/to/chromedriver");  
System.setProperty("webdriver.gecko.driver", "/path/to/geckodriver");  
System.setProperty("webdriver.edge.driver", "/path/to/msedgedriver");
```



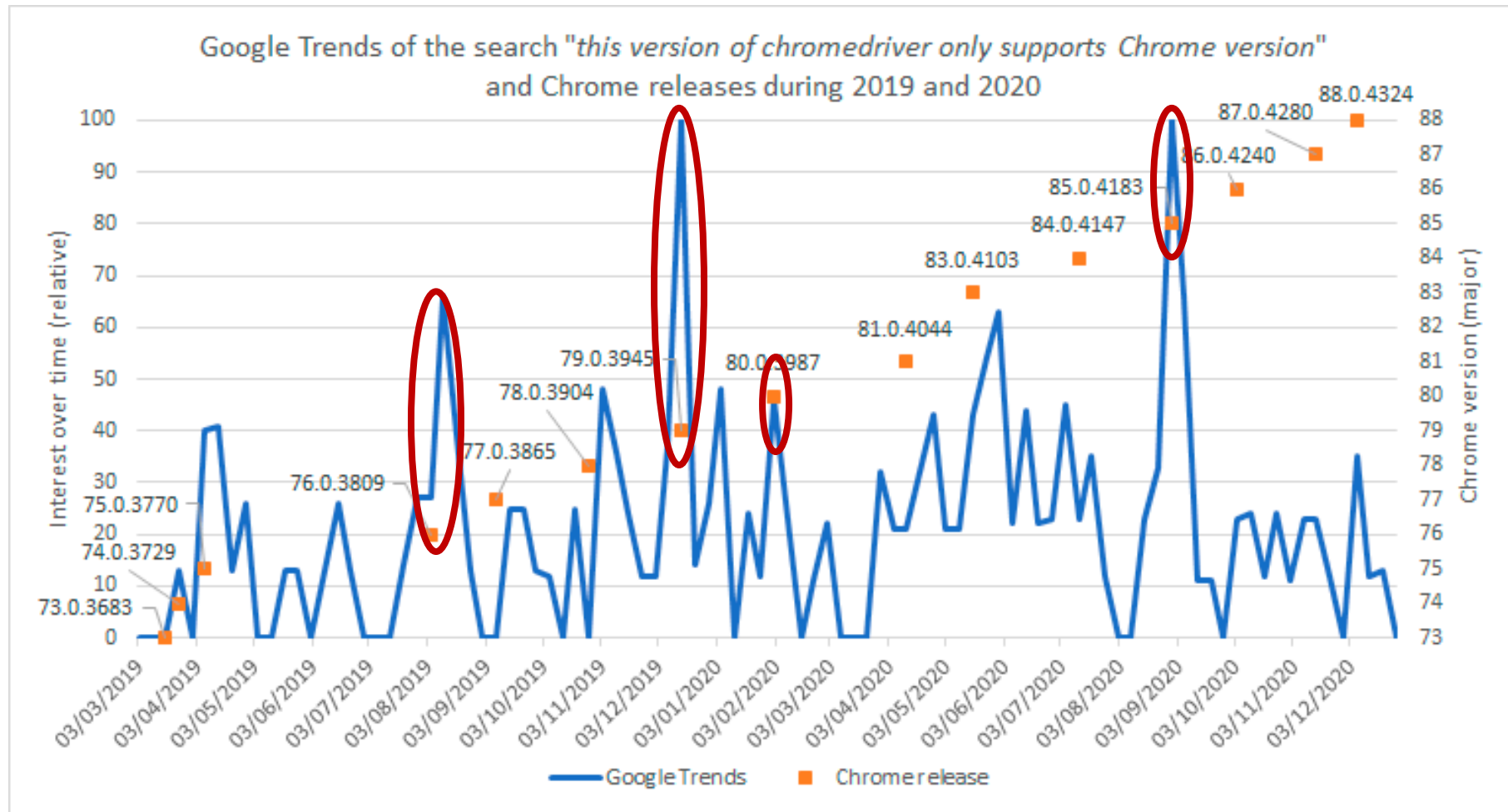


# Driver Management - Maintenance

- Modern web browsers are *evergreen*



# Driver Management - Maintenance



# Automated Driver Management

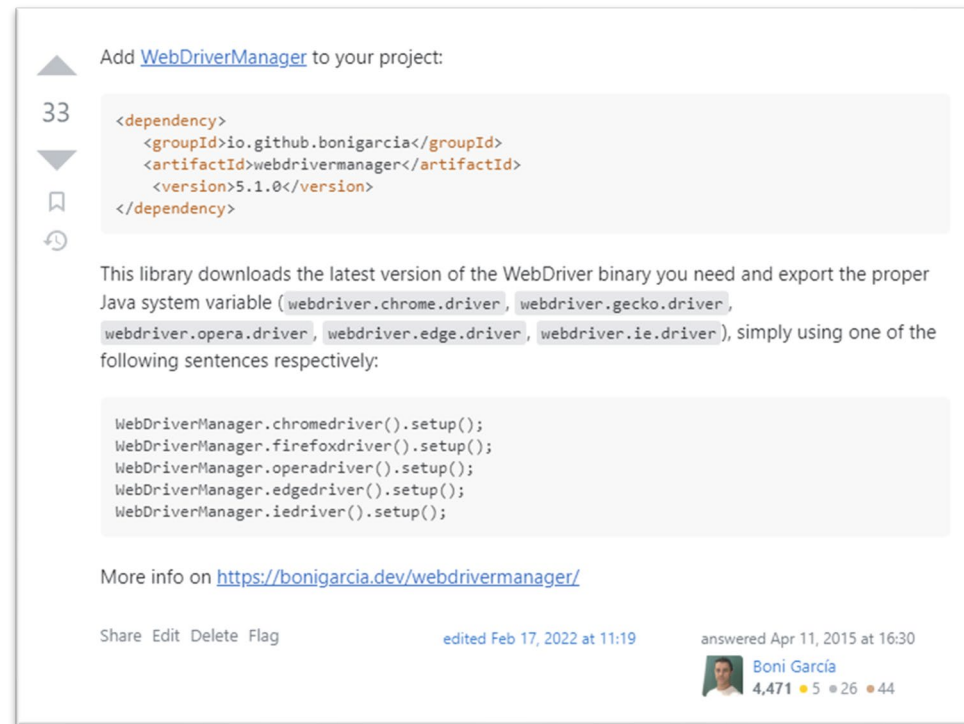
WebDriverManager 

<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

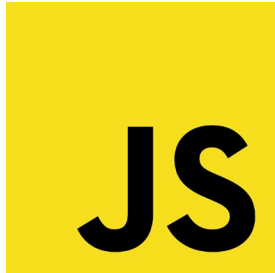
answered Apr 11, 2015 at 16:30

 **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>



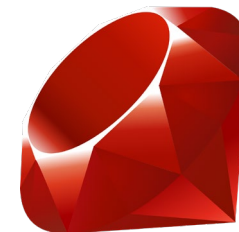
webdriver-manager

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



WebDriverManager.Net

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

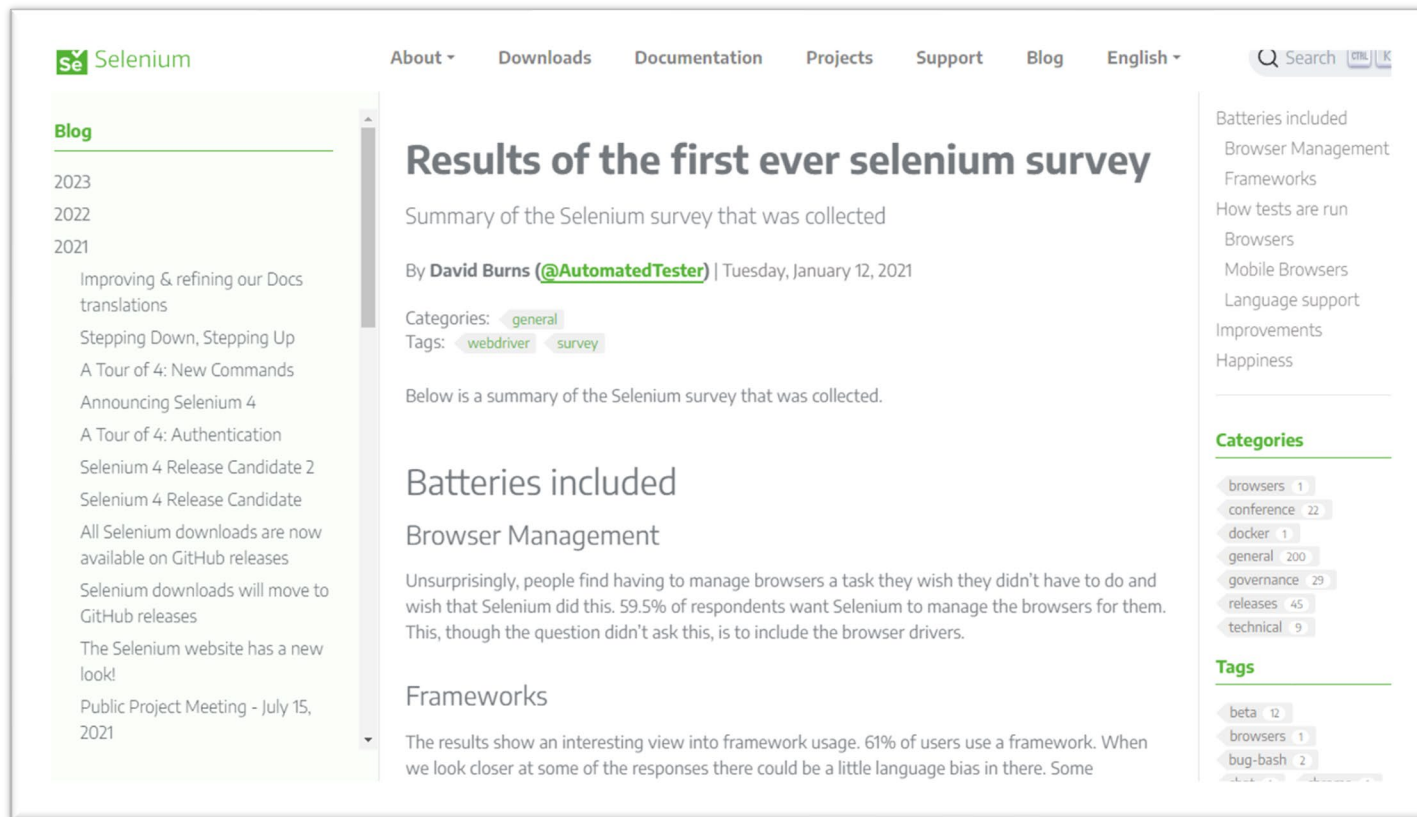


webdrivers

<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



Respondents  
wanted *batteries*  
*included*

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



# The official *manager* for Selenium

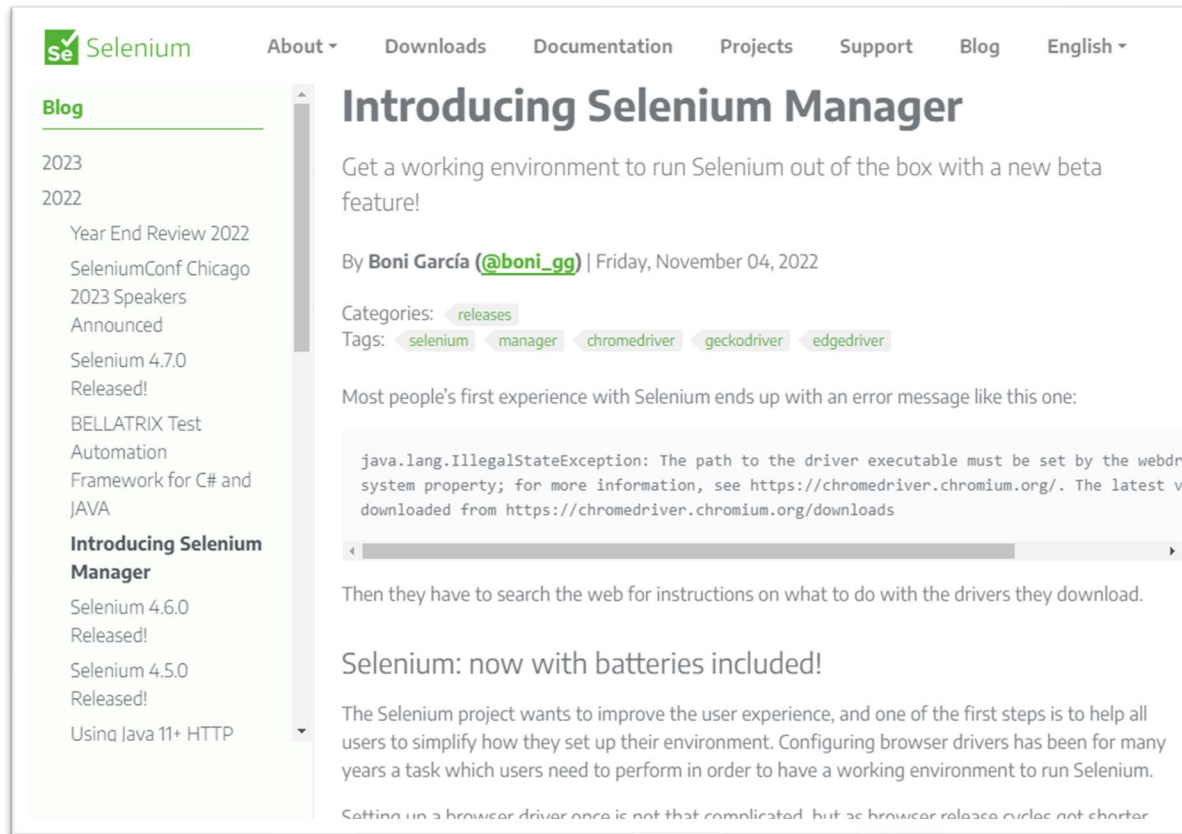
- From May 2022 to March 2023, I joined Sauce Labs as Staff Software Engineer in the Open Source Program Office
  - I become a Selenium committer on August 2022
  - My main contribution so far has been the development of **Selenium Manager**



<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

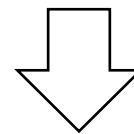
<https://www.selenium.dev/blog/2022/introducing-selenium-manager/>

# 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 



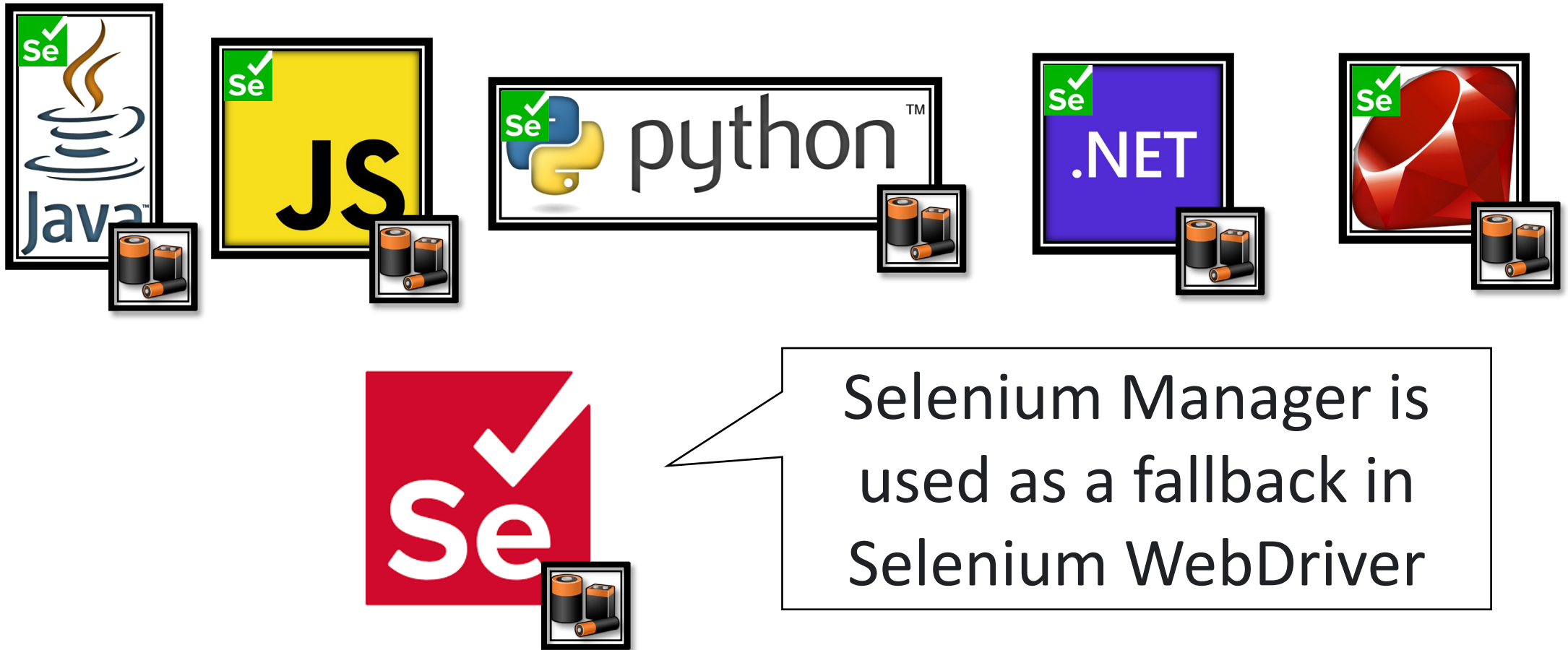
Selenium Manager

# 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

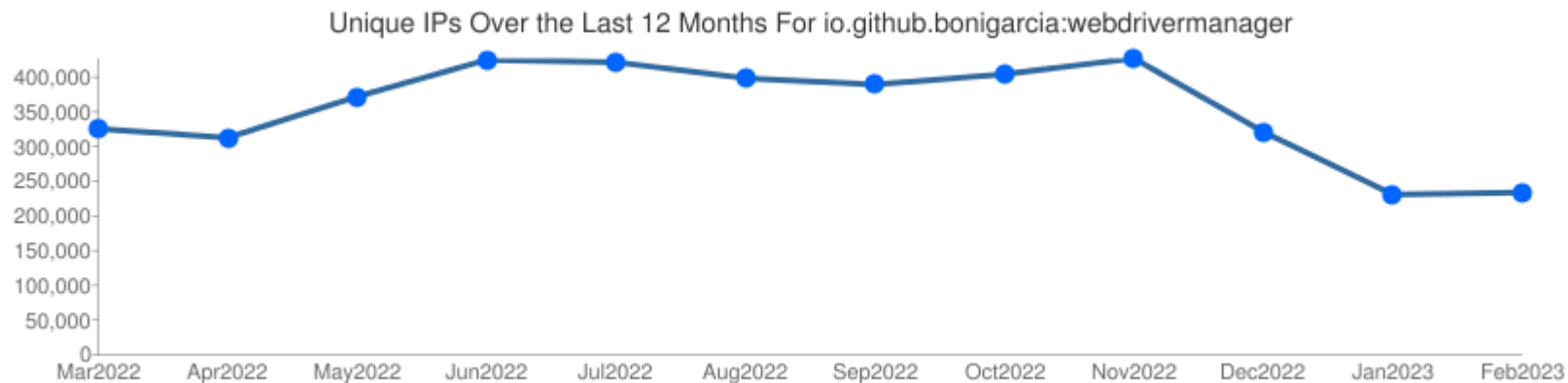
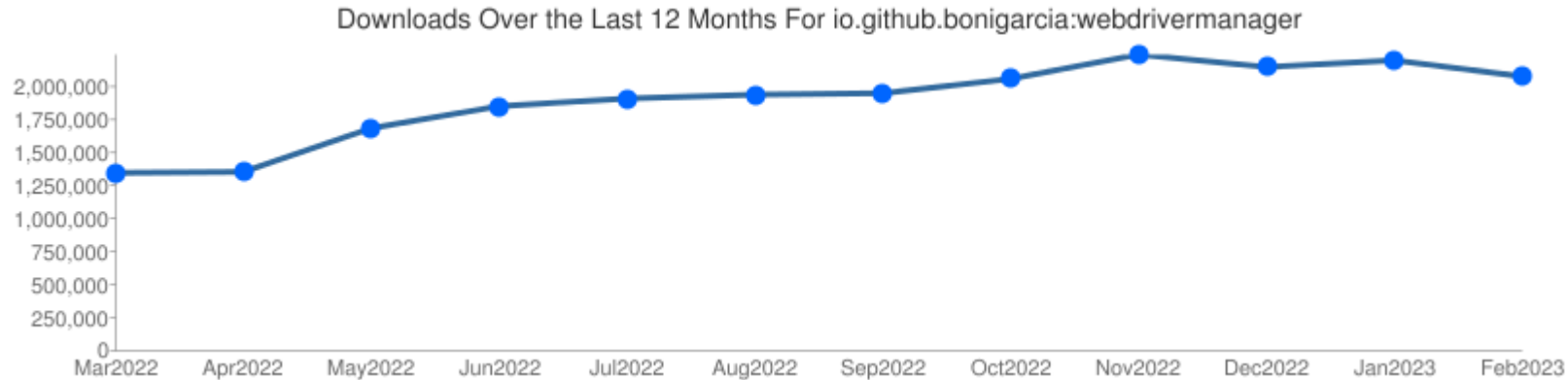


Selenium Manager can be explicitly used (opt-in) in Selenium Grid



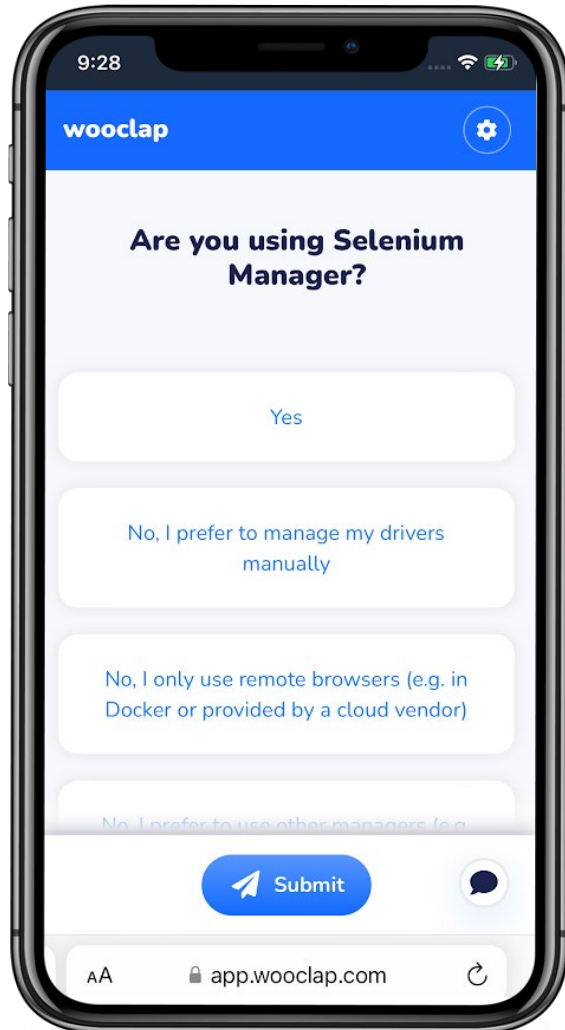
# Who is using Selenium Manager?

- 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

Boni García



[boni.garcia@uc3m.es](mailto:boni.garcia@uc3m.es)



<https://bonigarcia.dev>



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



<https://github.com/bonigarcia>