18. Introduction to Selenium WebDriver

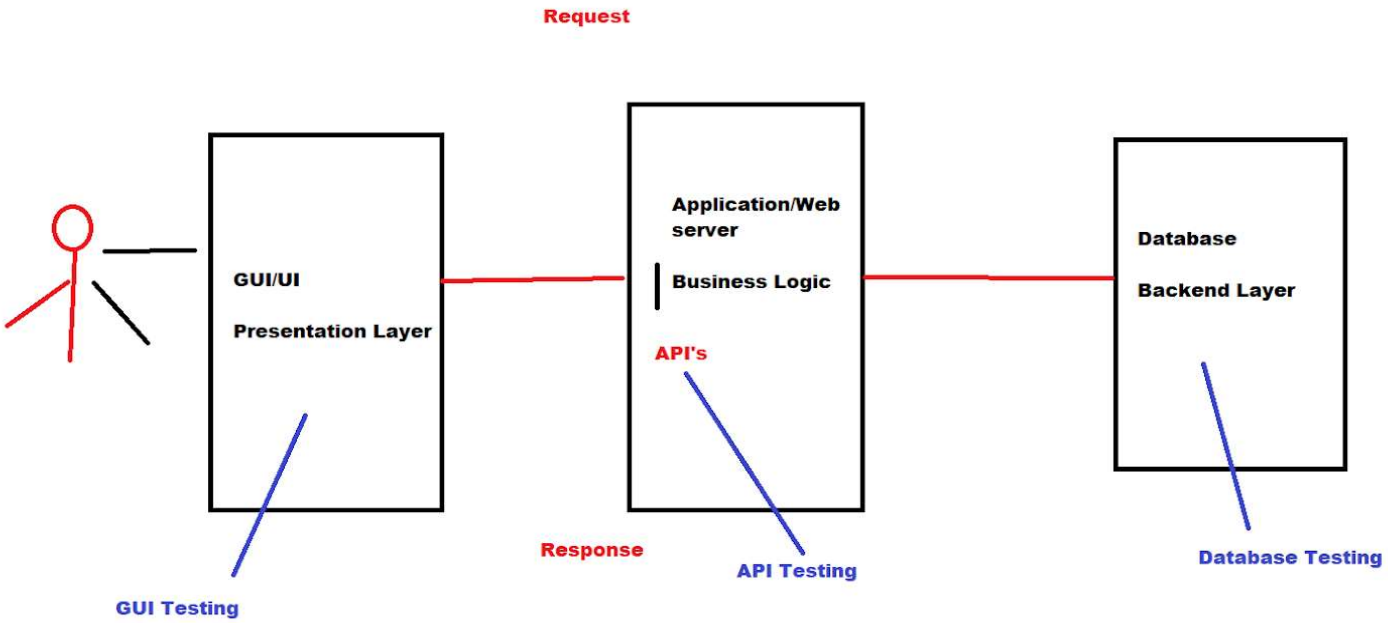
Selenium WebDriver

1. Selenium WebDriver is one of the components in Selenium Suite.

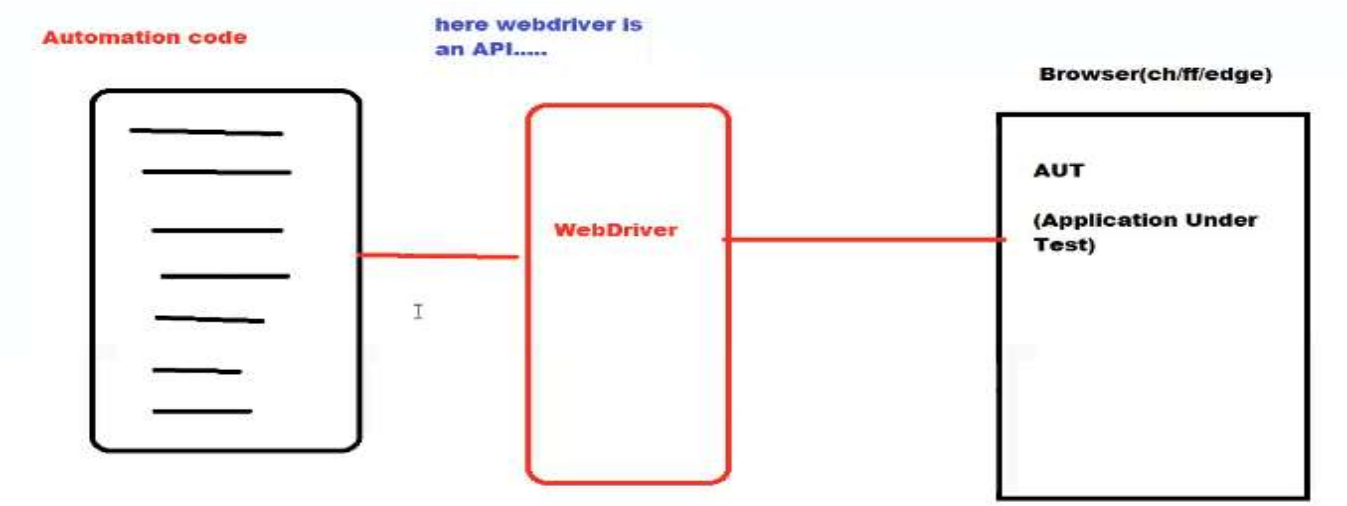
   Selenium Suite

   - ➔ **Selenium WebDriver:** Used for automating web application testing by directly interacting with web browsers via programming languages.
   - ➔ **Selenium IDE:** A browser extension that provides a record-and-playback tool for creating simple test scripts without coding.
   - ➔ **Selenium Grid:** Allows parallel execution of tests on multiple machines and browsers, enabling distributed test execution.
   - ➔ **Selenium Remote Control (RC):** Deprecated (No longer available).

2. Selenium is a **Package** and WebDriver is an **Module.**Module contains **Classes.**
   a. Each browser has different class available in webdriver module.If we want to automate/run the Test case on
      i. **Firefox Browser → Firefox() class**
      ii. **Chrome Browser → Chrome() class**
      iii. **Edge Browser → Edge() class**
3. Selenium WebDriver is used to automate web applications.
4. WebDriver acts like an API (Application Programming Interface)
   a. Every applications follows Client-Server architecture having three layers.
      i. **Presentation** Layer
      ii. **API (Application Programming Interface)** Layer
      iii. **Database** Layer
   b. Each layer has **Functional** testing and **Non Functional** Testing.
   c. API gets the request from the user and sends the same request to the database layer and processes the data and whatever response we get from the database layer the same response will be provided to the presentation layer.

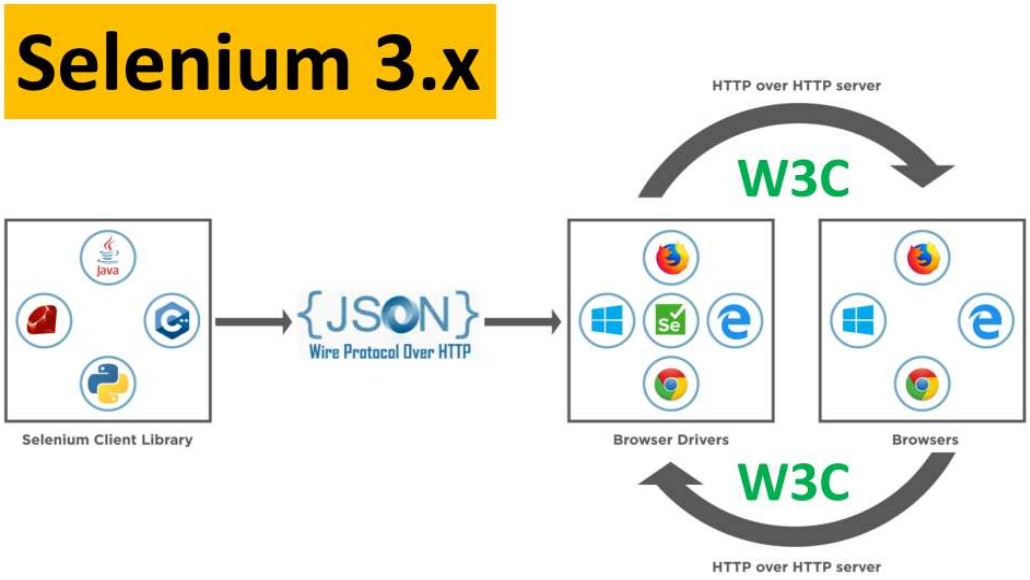


d. Similarly Automation code does not directly talk to the Browser internally requires another layer webdriver (API).

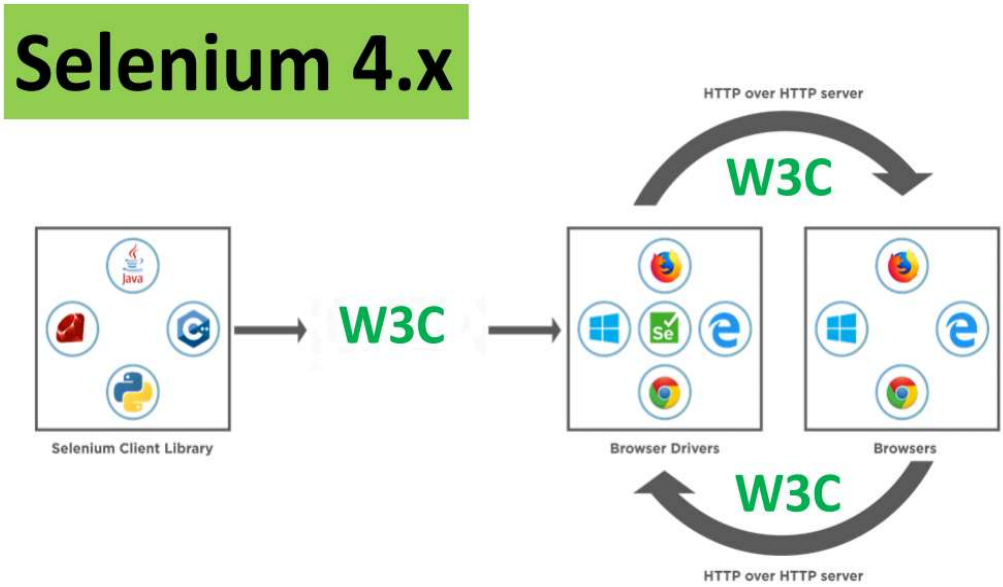


Architecture of WebDriver

Selenium3 - Selenium Language bindings → JSON Wire protocol → Browser drivers → w3c → Browsers.



Selenium4 - Selenium Language bindings → w3c protocol → Browser drivers → w3c protocol → Browsers.



- Selenium 4 WebDriver was made W3C compliant to make the communication easy and direct between the client libraries and the browser drivers. Improved communication led to more stability.

World Wide Web Consortium

- W3C stands for the World Wide Web Consortium, an international community that develops and maintains standards and guidelines for the World Wide Web. The main aim of the W3C is to ensure the long-term growth and interoperability of the Web.

Setup and Installations

➔ Python → https://www.python.org/downloads/

➔ Pycharm → https://www.jetbrains.com/pycharm/download/?section=windows

➔ Selenium webdriver

- Through **Pycharm project settings**
- **Terminal** (pip install selenium)

Automation of Title Verification → Test Case

Test Steps

1) Open Web Browser(Chrome/firefox/Edge).
2) Open URL https://www.google.com/
3) Capture title of the page.(Actual title)
4) Verify title of the page: **Google** (Expected title)
5) Close browser

example.py

```
from selenium import webdriver
                options = webdriver.ChromeOptions()  → Chrome
                or
                options = webdriver.EdgeOptions() → Edge
                or
                options = webdriver.FirefoxOptions() → Firefox
options.add_experimental_option("detach", True)
        driver = webdriver.Chrome(options=options) → Chrome driver variable initialisation
                or
          driver = webdriver.Edge(options=options) → Edge driver variable initialisation
                or
         driver = webdriver.Firefox(options=options) → Firefox driver variable initialisation
driver.get("https://www.google.com/")
driver.maximize_window()
act_title = driver.title
exp_tile = "Google"
if act_title == exp_tile:
  print("Title test Passed")
else:
  print("Title test Failed")
driver.close()
```