Selenium

Module 3

MODULE OVERVIEW

- Selenium Introduction
- The IDE
- Selenium WebDriver
- Selenium Grid
- Selenium Standalone Server

WHAT IS SELENIUM?

- Selenium is a free (open-source) automated testing framework used to validate Web applications across different browsers and platforms.

- Support for multiple programming languages like Java, C#, Python etc.

- Testing done using the Selenium testing tool is usually referred to as 'Selenium Testing'.

- Selenium Software is a suite of software comprising the following:
  - Selenium Integrated Development Environment (IDE)
  - Selenium Remote Control (RC)
  - WebDriver (2006)
  - Selenium Grid

WHERE DID IT GET ITS NAME FROM?

- First introduced in 2004.

- Originally an internal tool at ThoughtWorks, made open source that same year. The name 'Selenium' came from a joke!

- During Selenium's development, another automated testing framework was popular and made by a company called Mercury Interactive.

How selenium got its name:
Selenium removes
Mercury from the body

Selenium IDE

- Add-on to Chrome(ium), Firefox, Internet Explorer, Opera, and Safari*.
- Easy to use.
- Records user actions on Web pages.
- Replays recorded scripts.
- Allows for adding verification points.
- Has no variables, functions nor control flow structures.
- Finds sensible locators.

Selenium IDE features

- Speed Control – Helps control the speed of test cases.
- Run All – Allows execution of the entire Test Suite.
- Run – Runs the currently selected test.
- Pause/Resume – Allows a user to pause and resume a particular test case.
- Step – Helps step into each specific command in the test script.
- Rollup – Helps group all the Selenese Commands together and make them execute as a single operation.

QA Selenium IDE screenshot
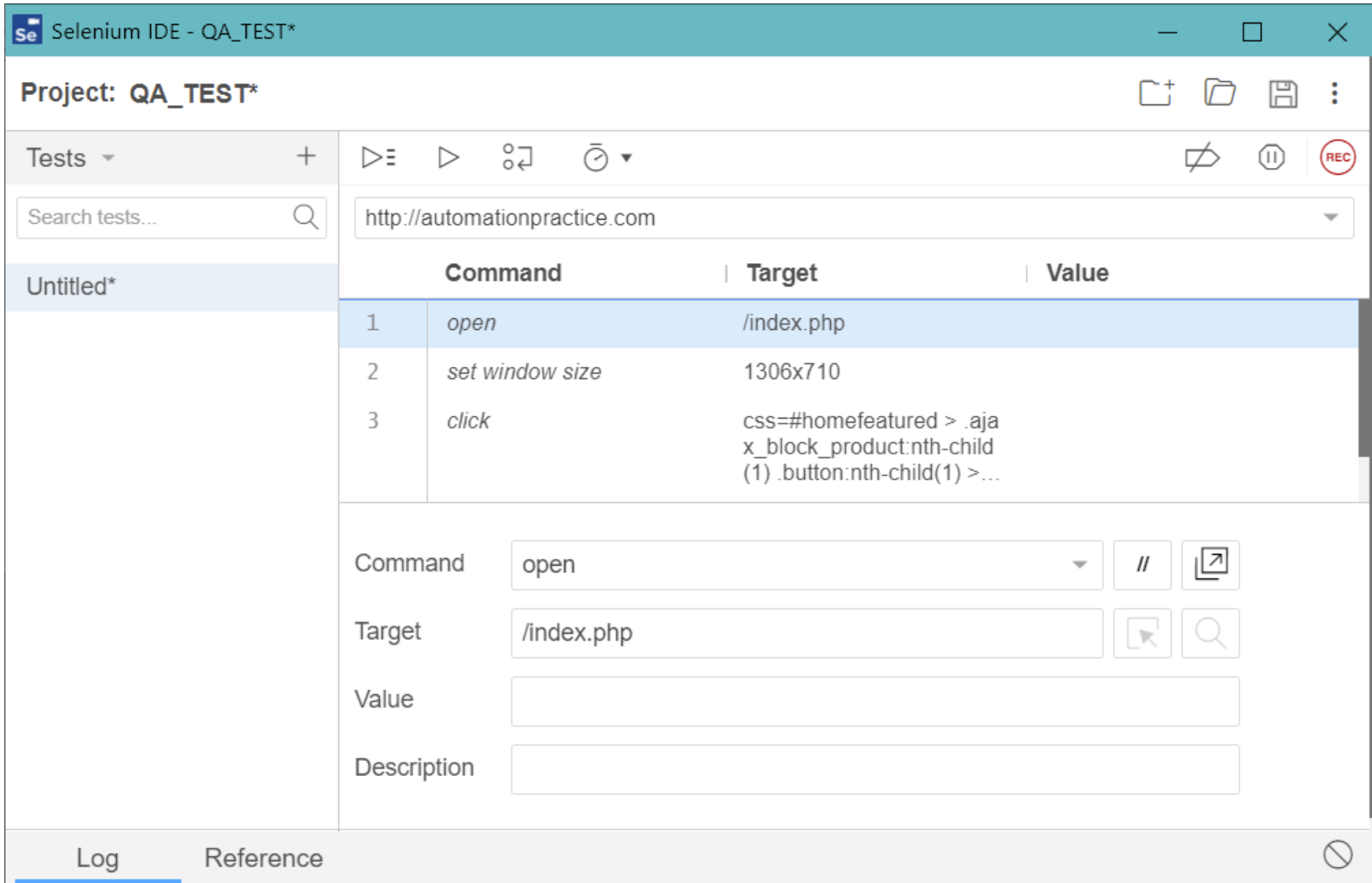
Limitations of Selenium IDE

- Not suitable for testing extensive data.
- Connections with the database can not be tested.
- Cannot handle the dynamic part of Web-based applications.
- Does not support capturing of screenshots on test failures.
- No feature available for generating result reports.

ⵟⵟ Selenium WebDriver

- WebDriver is a framework allowing test scripts to control Web browsers.
- Has APIs in many programming languages (e.g., Python, Java, C#, Ruby).
- May need drivers for specific Web browsers (downloaded separately).

This training course uses a reference implementation in Python for Selenium WebDriver.

Script ➤ **Library** ➤ **WebDriver** ➤ **Web Browser**
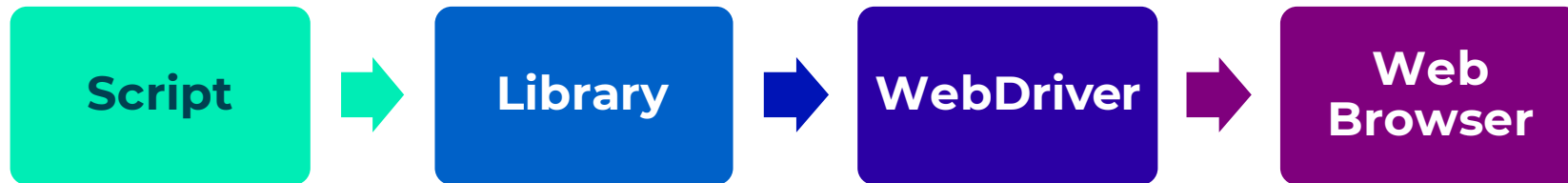
When a script creates an instance of WebDriver library object, the library starts a WebDriver process which opens the Web browser.

The script calls library commands, and the library, through WebDriver, sends the commands to the Web browser.

Selenium WebDriver browser support

Different browsers may have different behaviors.

Each driver must be installed on the test workstation to allow the test scripts to access the browsers.

Examples:

- Chrome (chromedriver.exe)
- Internet Explorer (IEDriverServer.exe)
- Edge (MicrosoftWebDriver.msi)
- Firefox (geckodriver.exe)
- Safari (safaridriver)
- HtmlUnit (HtmlUnit driver)

Selenium Grid

- Enables running test scripts across many machines with many configurations. Allows distributed and simultaneous test execution.

- Selenium Grid is very flexible.

- Selenium Grid consists of one hub and several nodes. The hub controls which test is run on which node.

- Nodes in one grid may have many OSes, web browser types and versions.
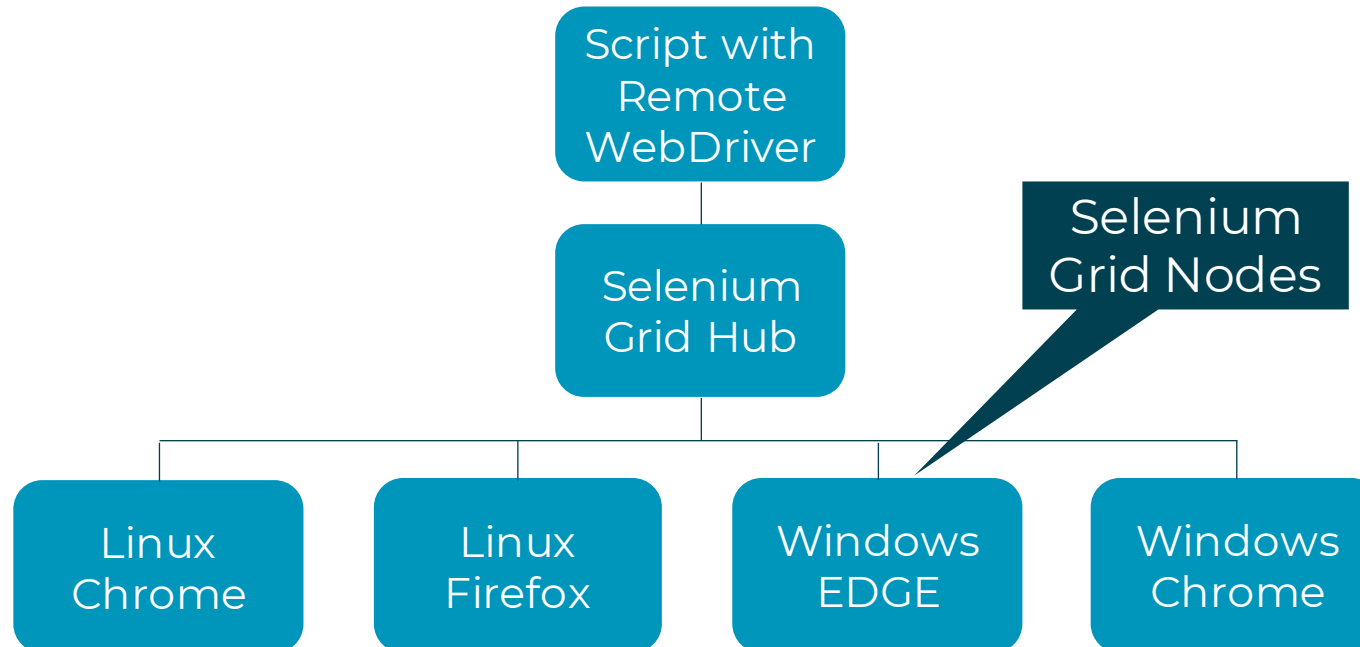
Selenium Standalone Server

- Implements hubs and nodes for Selenium Grid.

- Allows tester to run tests remotely even without a Selenium Grid.

- Written in Java, distributed as a jar file.

- Must be run separately and configured properly (outside of test scripts).

- Selenium Standalone Server enables the execution of tests on a Web browser running on a different machine.

Network

Script → Library → Selenium Server → WebDriver → Web Browser
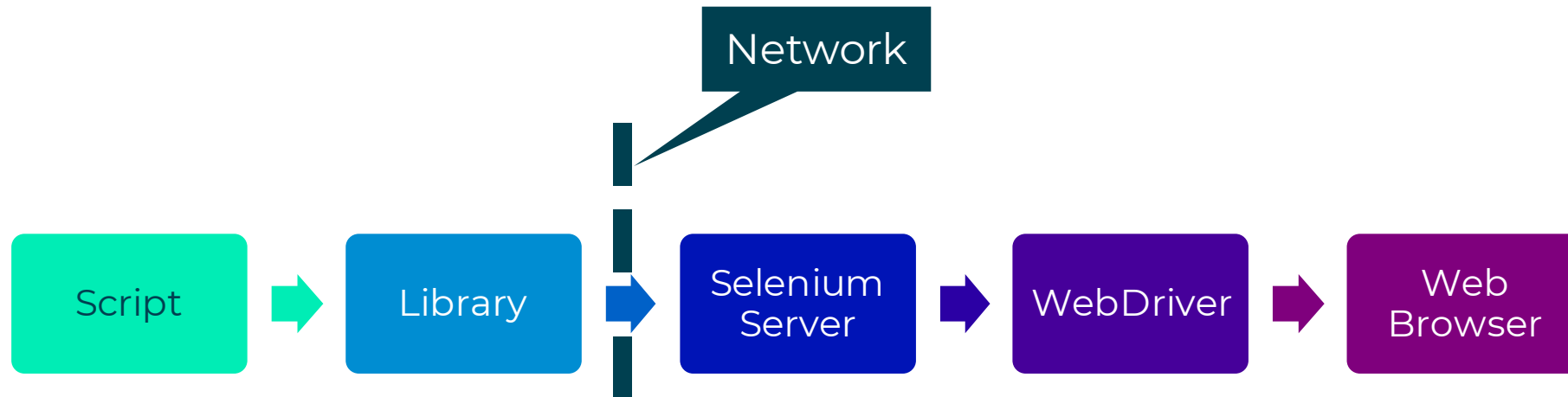
Thank you!

Hope you enjoyed this learning journey.