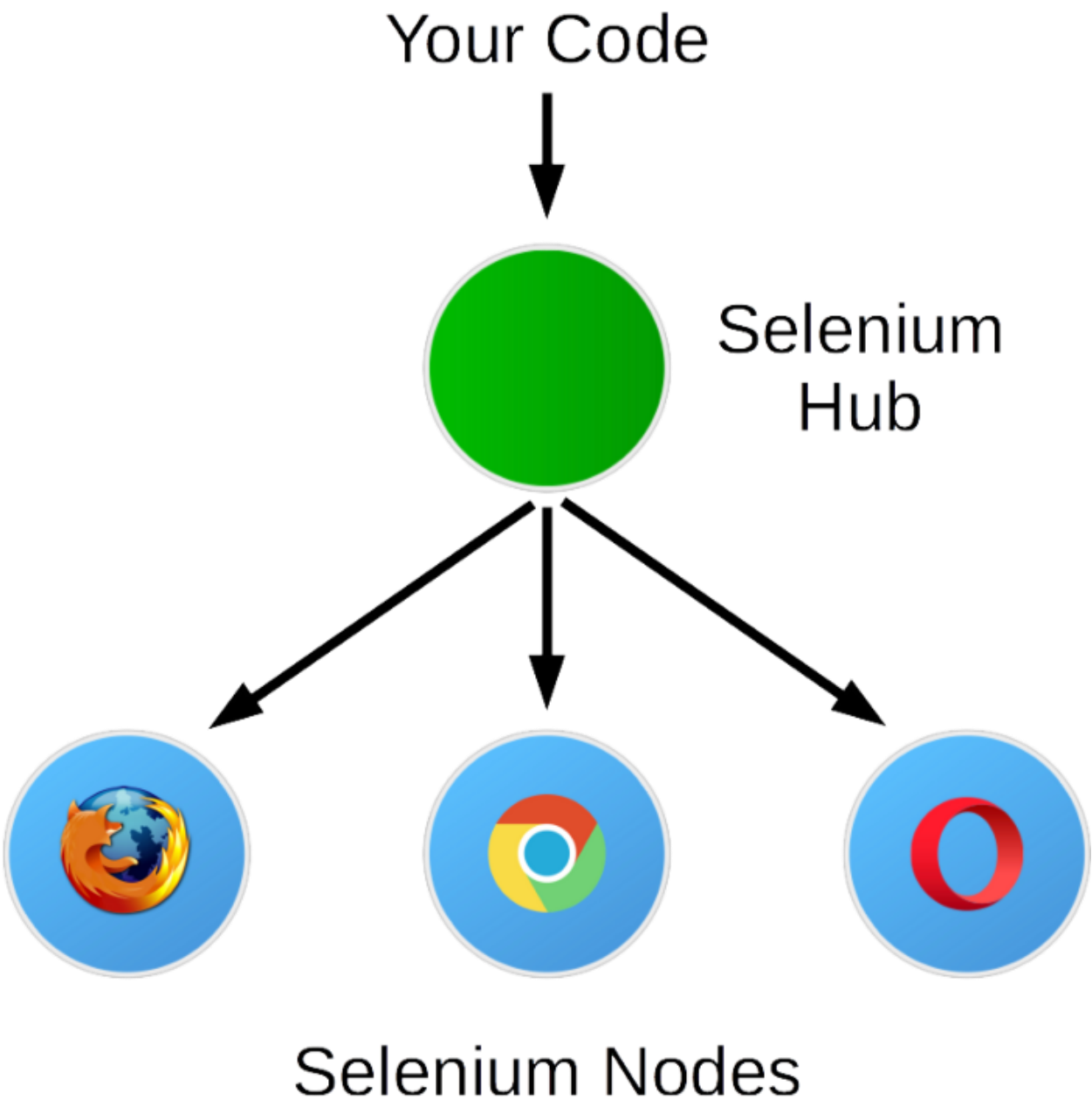
Opening Words

- Grid is just a remote runner of WebDriver.
- WebDriver is the test-framework.
- Your goal as a tester engineer in QA environment is to reduce your test-suite's run-time by running tests in parallel.
- To run tests in parallel and in different operating systems, you need to set up selenium grid 4.
- Parallel testing can be done on different local machine using WebDriver (testing framework).
- You can also configure them on a Selenium Grid

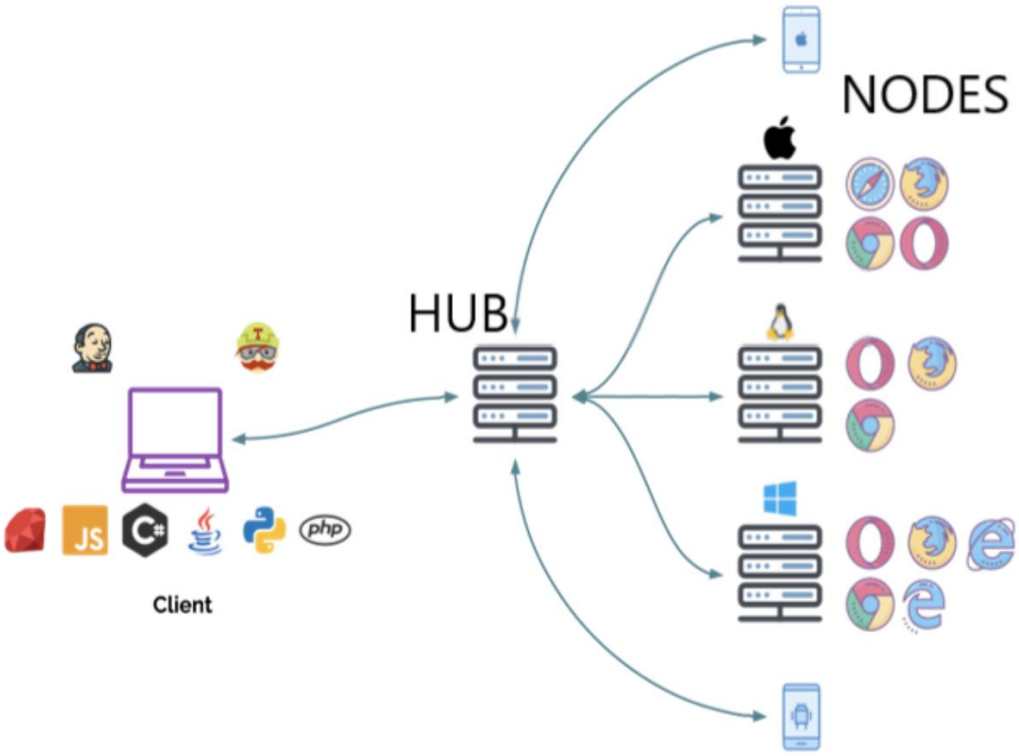
Selenium/hub

- A hub is a service that handles test requests and automatically forwards them to a node where a browser is running.
- We can say that a hub is a kind of load balancer whereas a node is a kind of worker.
- The code to be tested is in the json format.



The two major components of the Selenium Grid architecture are:

- **Hub** is a server that accepts the access requests from the WebDriver client, routing the JSON test commands to the remote drives on nodes. It takes instructions from the client and executes them remotely on the various nodes in parallel
- **Node** is a remote device that consists of a native OS and a remote WebDriver. It receives requests from the hub in the form of JSON test commands and executes them using WebDriver



Testers should use Selenium Grid in the following circumstances:

- To run tests on multiple browsers and their versions, different devices, and operating systems
- To reduce the time that a test suite takes to complete execution

Selenium Grid 4

- Selenium Grid is a smart proxy server that makes it easy to run tests in parallel on multiple machines.
- This is done by routing commands to remote web browser instances, where one server acts as the hub.
- This hub routes test commands that are in JSON format to multiple registered Grid nodes.
- Selenium Grid allows us to run tests in parallel on multiple machines, and to manage different browser versions and browser configurations centrally (instead of in each individual test).
- Selenium Grid is not a silver bullet.

- It solves a subset of common delegation and distribution problems, but will for example not manage your infrastructure, and might not suit your specific needs.
- It is used when you want to execute your tests on remote computer.
- Say, you wrote your code, and you want to execute your test among multiple **browsers and different operating systems combinations**, you can use Selenium Grid.
- You can setup Selenium Grid on the machine **where you want your tests to be execute and use RemoteWebDriver class to specify the IP of the remote machine**.

Purposes and main functionalities

- Central entry point for all tests (this is through the hub which act as a load balancer)
- Management and control of the nodes / environment where the browsers run
- Scaling – **docker-compose up -d and docker-compose down**
- Running tests in parallel
- Cross-platform testing
- Load balancing

Before we can understand these points, let us first use docker compos to set our environment.

Let add one more thing and compare with what we already know

Selenium WebDriver – WebDriver is the framework that directly communicates with the web browser and uses its native compatibility to automate unit, integration, and system testing

Selenium Grid – Selenium Grid is used to distribute your test execution on multiple platforms and environments concurrently.