**[09/13/2025]**A diagram of a computer setup

AI-generated content may be incorrect.

**Understanding Hub and Node in Selenium Grid**

**Selenium Grid is a tool that allows you to run your automated tests on multiple machines, browsers, and operating systems in parallel. This helps speed up testing and ensures your application works across different environments. The concepts of Hub and Node are central to how Selenium Grid works.**

**1. Hub**

* **Definition:** The Hub is the central point (server) that controls the test execution.
* **Role:** It receives test requests from your test scripts and decides which Node should execute them.
* **How it Works**: You start the Hub first. Your test scripts connect to the Hub, not directly to the browser.

**Think of the Hub as the manager that assigns tasks to workers (Nodes).**

**2. Node**

* **Definition:** A Node is a machine (could be a different computer or a virtual machine) that executes the tests.
* **Role:** It registers itself with the Hub and waits for instructions.
* **How it Works:** Each Node can have different browsers, operating systems, and configurations. When the Hub receives a test request, it forwards it to an appropriate Node.

**Think of Nodes as workers who actually do the testing on different browsers and platforms.**

**Example Scenario**

* You want to test your web app on Chrome (Windows), Firefox (Linux), and Safari (Mac).
* You set up three Nodes: one on Windows, one on Linux, one on Mac, each with different browsers.
* The Hub coordinates which Node runs which test, so you can test all environments in parallel.

**Benefits for Software Testers**

* **Parallel Testing:** Run multiple tests at the same time, speeding up execution.
* **Cross-Browser/Platform Testing:** Easily test on different browsers and operating systems.
* **Scalability:** Add more Nodes as your testing needs grow.

**1) Standalone Setup (Single machine acts as Hub & Node)**

-> Download <https://www.selenium.dev/downloads/> and place it some location.

-> Run the below command 🡪 java -jar [File name] standalone.

**java -jar selenium-server-4.35.0.jar *standalone***

**->** URL to see the session: <http://localhost:4444/>

**2) Distributed Setup (Multiple machines)**

**->** Download <https://www.selenium.dev/downloads/> and place it some location for both Hub and Node.

-> Run the command below to make machine as Hub 🡪 Java -jar [File name] hub

**java -jar selenium-server-4.35.0.jar *hub***

-> Run the command below to make machine as Node 🡪 Java -jar [File name] node --hub http://<hub-ip>:4444

**java -jar selenium-server-4.35.0.jar node --hub http://<hub-ip>:4444**

**->** URL to see the session: <http://localhost:4444/>

**Download Selenium Grid**<https://www.selenium.dev/downloads/>  
Latest stable version [4.35.0](https://github.com/SeleniumHQ/selenium/releases/download/selenium-4.35.0/selenium-server-4.35.0.jar)

Go to the File location of the .jar file and open the Terminal

**A screenshot of a computer

AI-generated content may be incorrect.**

**Standalone machine** (Hub & Node in Single machine)A screenshot of a computer

AI-generated content may be incorrect.

**Selenium Hub**A screenshot of a computer

AI-generated content may be incorrect.