Practical - 05.

Subject: Software Testing and Quality Assurance.
Assignment: title:- Installation of Selenium Grid and selenium web driver & java eclipse automation tools.
Semester / Year - VII Sem, 4th Year.
Instructor: Saiprasad Bhise.
Submission Date: 22/09/2025.

1] OBJECTIVE:-

To install and configure selenium web driver, Selenium grid, java development kit and eclipse IDE. for automating web application testing. The objective is to set up complete automation environment capable of executing automated test scripts locally and across multiple machines using selenium grid. improving testing efficiency.

2] Requirements -

- A computer with window, linux.
- Stable internet connection.
- Java development kit.
- Eclipse IDE
- Selenium webdriver libraries (Java bindings).
- Selenium grid standalone server JAR file.
- Browser drivers (chromedriver, geckodriver)
- Text editor or terminal for configuration.

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3] Selenium -

Selenium is an open source automation tool used for testing web applications. It supports multiple browsers, programming languages and allows execution on local machines as well as distributed environments using selenium grid. Selenium webdriver interacts directly with the browser, whereas grid allows parallel execution across multiple machines.

Use of selenium -
- Automating functional tests for web applications.
- Cross browser testing.
- Parallel and distributed test execution with selenium grid.
- Integration with CI/CD pipelines for continuous testing.

4] Installation Steps -

1. Install Java. (JDK) -
   - Download latest JDK from the official oracle site.
   - Install JDK following the on-screen instructions.
   - Set JAVA_HOME environment variable and update path variable.
   - Verify installation using java --version in the terminal.

2. Install Eclipse IDE -
   - Download eclipse IDE for java developers from official eclipse website.
   - Install eclipse by extracting the zip or using installer.
   - Launch eclipse and configure workspace directory.

3. Download selenium web driver -
   - Go to official selenium web site.
   - Download the selenium Java client driver zip file.
   - Add the selenium JAR files and libraries to eclipse projects build path.

4. Download browser drivers -
   - Download browser drivers compatible with your browser versions.
     - Chrome : chromedriver.
     - Firefox : geckodriver.
     - Edge : edgedriver.
   - Place drivers in a known directory and configure path in your scripts or system environment.

5. Setup selenium grid -
   - Download selenium server standalone JAR file from selenium website.
   - Open a terminal and start the Hub using:

```
java -jar selenium-server-standalone-x.xx.x.jar hub
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- Start nodes - machines that will execute tests using -
  java -jar selenium-server-standalone-x.xx.x.jar node -hub http://localhost:4444/grid/register
- Access selenium grid console at http://localhost:4444/grid/console/ to verify registered nodes.

6. Verify Installation -

- Write a simple Selenium script in eclipse using WebDriver.
- Execute the script locally or via Selenium grid to ensure proper setup.

5] CONCLUSION: -

The Installation and configuration of selenium web driver, grid, java, eclipse IDE enable the automation of web application testing both locally and in a distributed environment. Selenium provides robust cross-browser automation, parallel execution and integration capabilities, making it an essential tool for testing teams. With the environment successfully set up testers can create, execute and scale automated test scripts efficiently, enhancing productivity and ensuring higher application quality.