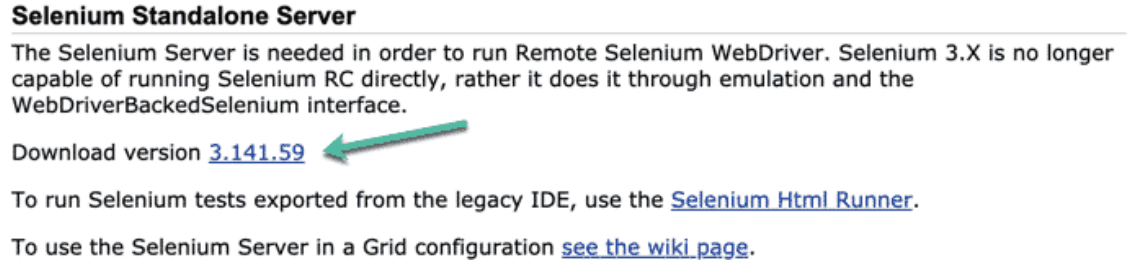
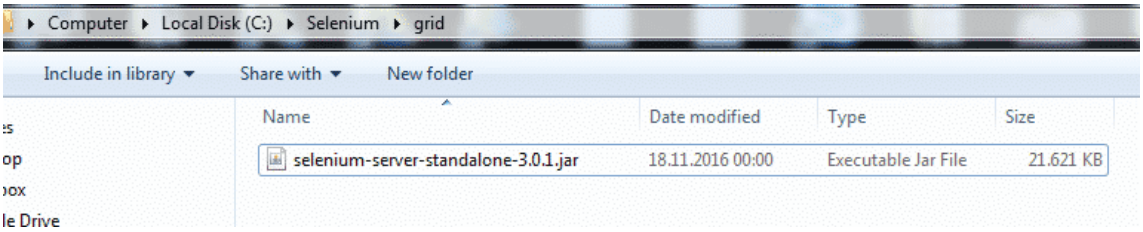
Lab 5: Working with Selenium Grid

In this lab, We will describe how to use Selenium Grid. You will learn how to install a selenium grid and how to configure it.

Go to https://www.selenium.dev/downloads/ and download **Selenium Standalone Server.** Selenium team constantly updating the versions. You may see a different version, just download it.



Then, **copy the .jar** file to *C:\Selenium\grid* folder.



What are Hub and Nodes?

Basically, we have a **Hub** which is a server that we connect from our tests and we have **Nodes,**they can be on different machines and they register with the hub.***Simply, we have a hub and several nodes, nodes are registered in our hub and the hub knows which browsers are available. Hub sends requests to the nodes based on desired capabilities and executes the tests.***

How to Start and Configure Hub and Nodes

The best way to start hub and node with .bat files for Windows also it is easier and tidier to configure them with **.json files**.

First, let's start the hub by command window.

Hub Start Command:

```
java -jar selenium-server-standalone-3.0.1.jar -role hub
```

```
C:\Selenium\grid>java -jar selenium-server-standalone-3.0.1.jar -role hub
22:35:23.756 INFO - Selenium build info: version: '3.0.1', revision: '1969d75'
22:35:23.758 INFO - Launching Selenium Grid hub
2016-11-19 22:35:25.074:INFO::main: Logging initialized @1776ms
22:35:25.088 INFO - Will listen on 4444
2016-11-19 22:35:25.152:INFO:osjs.Server:main: jetty-9.2.15.v20160210
2016-11-19 22:35:25.200:INFO:osjsh.ContextHandler:main: Started o.s.j.s.ServletContextHandler@701fc37a{/,null,AVAILABLE}

2016-11-19 22:35:25.223:INFO:osjs.ServerConnector:main: Started ServerConnector@13407b5d{HTTP/1.1}{0.0.0.0:4444}
2016-11-19 22:35:25.224:INFO:osjs.Server:main: Started @1925ms
22:35:25.225 INFO - Nodes should register to http://192.168.1.101:4444/grid/register/
22:35:25.226 INFO - Selenium Grid hub is up and running
```

and you can see the hub panel on your browser as follows.

Let's start the node

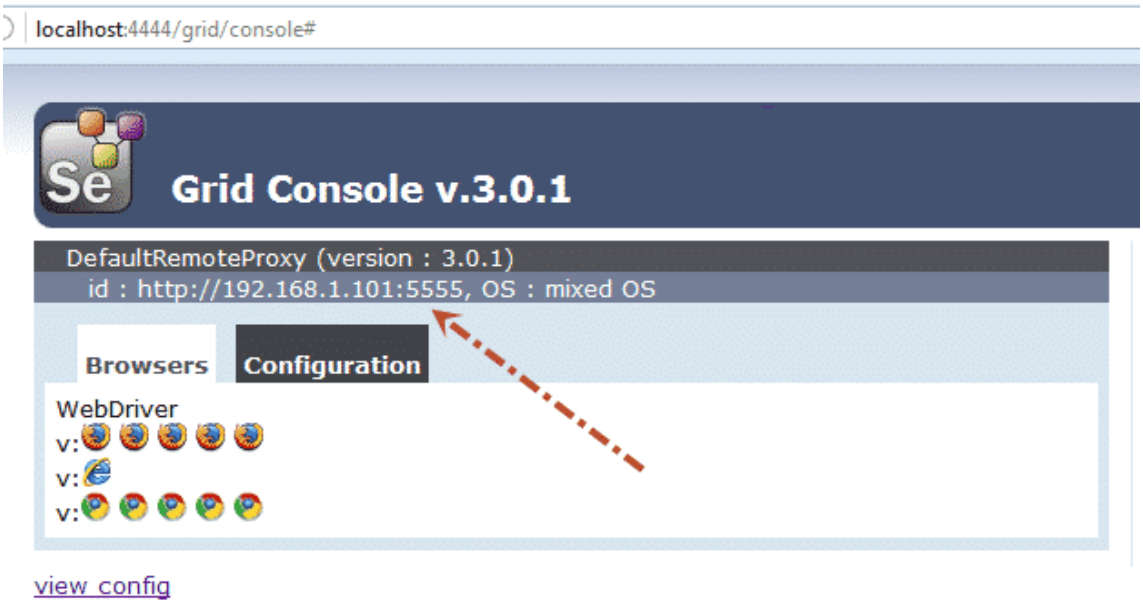
We can start the node with the command window as below command.

Node Start Command:

```
java -jar selenium-server-standalone-3.0.1.jar -role node -hub
http://localhost:4444/grid/register
```

```
C:\Selenium\grid>java -jar selenium-server-standalone-3.0.1.jar -role node -hub http://localhost:4444/grid/register
22:54:43.123 INFO - Selenium build info: version: '3.0.1', revision: '1969d75'
22:54:43.124 INFO - Launching a Selenium Grid node
2016-11-19 22:54:44.355:INFO::main: Logging initialized @1629ms
22:54:44.426 INFO - Driver class not found: com.opera.core.systems.OperaDriver
22:54:44.426 INFO - Driver provider com.opera.core.systems.OperaDriver registration is skipped:
Unable to create new instances on this machine.
22:54:44.426 INFO - Driver class not found: com.opera.core.systems.OperaDriver
22:54:44.427 INFO - Driver provider com.opera.core.systems.OperaDriver is not registered
22:54:44.434 INFO - Driver provider org.openqa.selenium.safari.SafariDriver registration is skipped:
 registration capabilities Capabilities [{browserName=safari, version=, platform=MAC}] does not match the current platfo
rm VISTA
2016-11-19 22:54:44.480:INFO:osjs.Server:main: jetty-9.2.15.v20160210
2016-11-19 22:54:44.505:INFO:osjsh.ContextHandler:main: Started o.s.j.s.ServletContextHandler@2473d930{/,null,AVAILABLE}

2016-11-19 22:54:44.527:INFO:osjs.ServerConnector:main: Started ServerConnector@34b7ac2f{HTTP/1.1}{0.0.0.0:5555}
2016-11-19 22:54:44.529:INFO:osjs.Server:main: Started @1803ms
22:54:44.529 INFO - Selenium Grid node is up and ready to register to the hub
22:54:44.542 INFO - Starting auto registration thread. Will try to register every 5000 ms.
22:54:44.543 INFO - Registering the node to the hub: http://localhost:4444/grid/register
22:54:44.884 INFO - The node is registered to the hub and ready to use
```

and when you open the grid console you can see that the node registered with the hub.



When we wanted to use a selenium grid in our tests we need to tell our grid where the required browser executable is located. Thus, we should start to the node as below command before writing our tests. **We added the blue part.**

Node Start Command with Chrome Driver Location:

```
java -jar -Dwebdriver.chrome.driver=C:\Selenium\drivers\chrome\chromedriver.exe
selenium-server-standalone-3.0.1.jar -role node -hub
http://localhost:4444/grid/register
```

Lab Solution

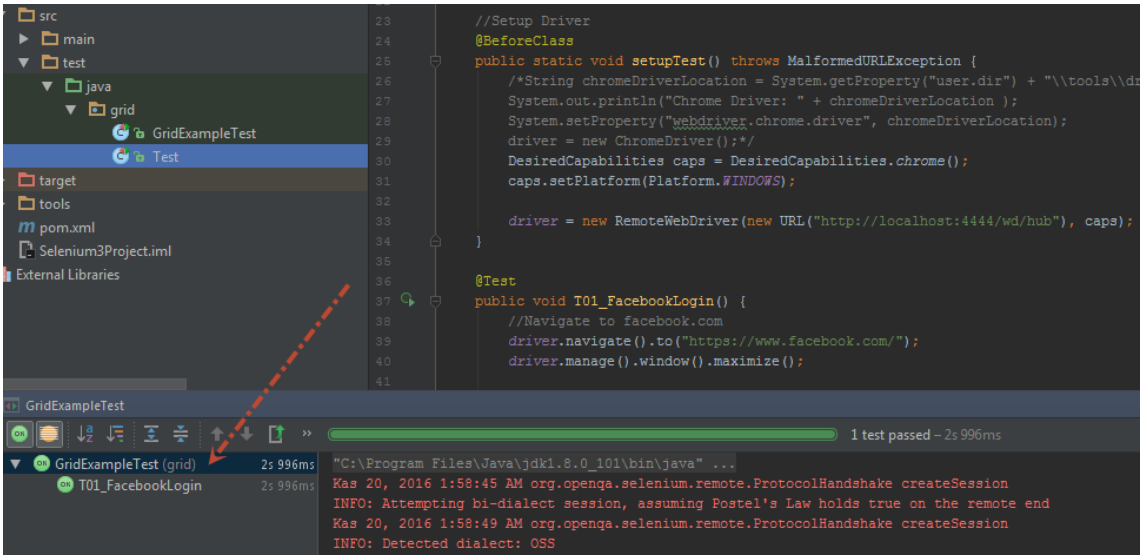
Lab solution is present in `C:\Users\fenago\Desktop\advanced-selenium-java\Lab05` folder.

Let's write a very simple test that enter inputs in the Facebook login page. Before running the below test, start the hub and the node with the above command then run the test.

```
package grid;

import org.junit.AfterClass;
import org.junit.BeforeClass;
import org.junit.Test;
import org.openqa.selenium.By;
import org.openqa.selenium.Platform;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.remote.DesiredCapabilities;
import org.openqa.selenium.remote.RemoteWebDriver;

import java.net.MalformedURLException;
import java.net.URL;

/**
 * Created by fenago
 */
```

```
public class GridExampleTest {

    static WebDriver driver;

    //Setup Driver
    @BeforeClass
    public static void setupTest() throws MalformedURLException {
        /*String chromeDriverLocation =
"C:\\Selenium\\drivers\\chrome\\chromedriver.exe";
        System.out.println("Chrome Driver: " + chromeDriverLocation );
        System.setProperty("webdriver.chrome.driver", chromeDriverLocation);
        driver = new ChromeDriver();*/
        /*DesiredCapabilities caps = DesiredCapabilities.chrome();
        caps.setPlatform(Platform.WINDOWS);

        driver = new RemoteWebDriver(new URL("http://localhost:4444/wd/hub"), caps);*/

        DesiredCapabilities caps = DesiredCapabilities.chrome();
        caps.setPlatform(Platform.WINDOWS);

        driver = new RemoteWebDriver(new URL("http://localhost:4444/wd/hub"), caps);
    }

    @Test
    public void T01_FacebookLogin() {
        //Navigate to facebook.com
        driver.navigate().to("https://web.facebook.com/");
        driver.manage().window().maximize();

        //Enter input
        WebElement emailId = driver.findElement(By.id("email"));
        emailId.sendKeys("selenium");
        WebElement password = driver.findElement(By.id("pass"));
        emailId.sendKeys("selenium");
    }

    //Close Driver
    @AfterClass
    public static void quitDriver() {
        driver.quit();
    }
}
```

Run the test! When you run the test you will see that it will pass.


src
main
test
java
grid
GridExampleTest
Test
target
tools
pom.xml
Selenium3Project.iml
External Libraries
//Setup Driver
@BeforeClass
public static void setupTest() throws MalformedURLException {
/*String chromeDriverLocation = System.getProperty("user.dir") + "\\tools\\d
System.out.println("Chrome Driver: " + chromeDriverLocation);
System.setProperty("webdriver.chrome.driver", chromeDriverLocation);
driver = new ChromeDriver();*/
DesiredCapabilities caps = DesiredCapabilities.chrome();
caps.setPlatform(Platform.WINDOWS);
driver = new RemoteWebDriver(new URL("http://localhost:4444/wd/hub"), caps);
}
@Test
public void T01_FacebookLogin() {
//Navigate to facebook.com
driver.navigate().to("https://www.facebook.com/");
driver.manage().window().maximize();
GridExampleTest
1 test passed – 2s 996ms
GridExampleTest (grid) 2s 996ms
T01_FacebookLogin 2s 996ms
"C:\Program Files\Java\jdk1.8.0_101\bin\java" ...
Kas 20, 2016 1:58:45 AM org.openqa.selenium.remote.ProtocolHandshake createSession
INFO: Attempting bi-dialect session, assuming Postel's Law holds true on the remote end
Kas 20, 2016 1:58:49 AM org.openqa.selenium.remote.ProtocolHandshake createSession
INFO: Detected dialect: OSS