

iam**neo**



# Selenium Grid

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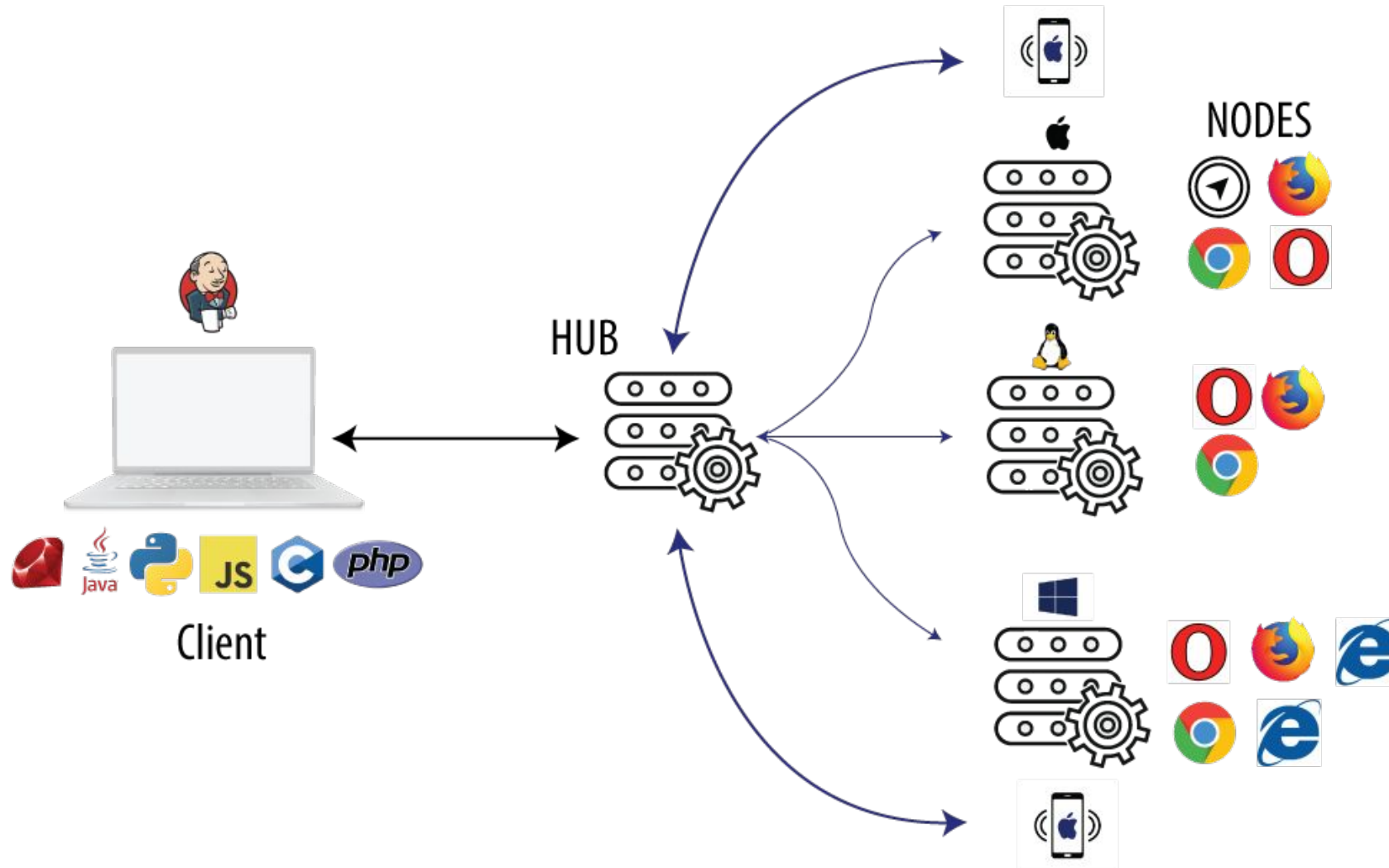


# Selenium Grid

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- The Selenium Grid is a testing tool which allows us to run our tests on different machines against different browsers.
- It is a part of the Selenium Suite which specialise in running multiple tests across different browsers, operating system and machines.
- It is achieved by routing the commands of remote browser instances where a server acts as a hub.
- A user needs to configure the remote server in order to execute the tests.

# Selenium Grid Architecture



# Selenium Grid -HUB

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- The hub is a computer which is the central point where we can load our tests into.
- Hub also acts as a server because of which it acts as a central point to control the network of Test machines.
- The Selenium Grid has only one hub and it is the master of the network.
- The hub is launched only on a single machine, say, a computer whose OS is Windows 7 and whose browser is IE.
- The machine containing the hub is where the tests will be run, but you will see the browser being automated on the node.

# Selenium Grid –NODE

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- A *node* is referred to a Test Machine which opts to connect with the Hub.
- This test machine will be used by Hub to run tests on.
- A Grid network can have multiple nodes.
- A node is supposed to have different platforms i.e. different operating system and browsers.
- The node does not need the same platform for running as that of hub.

## **Note:**

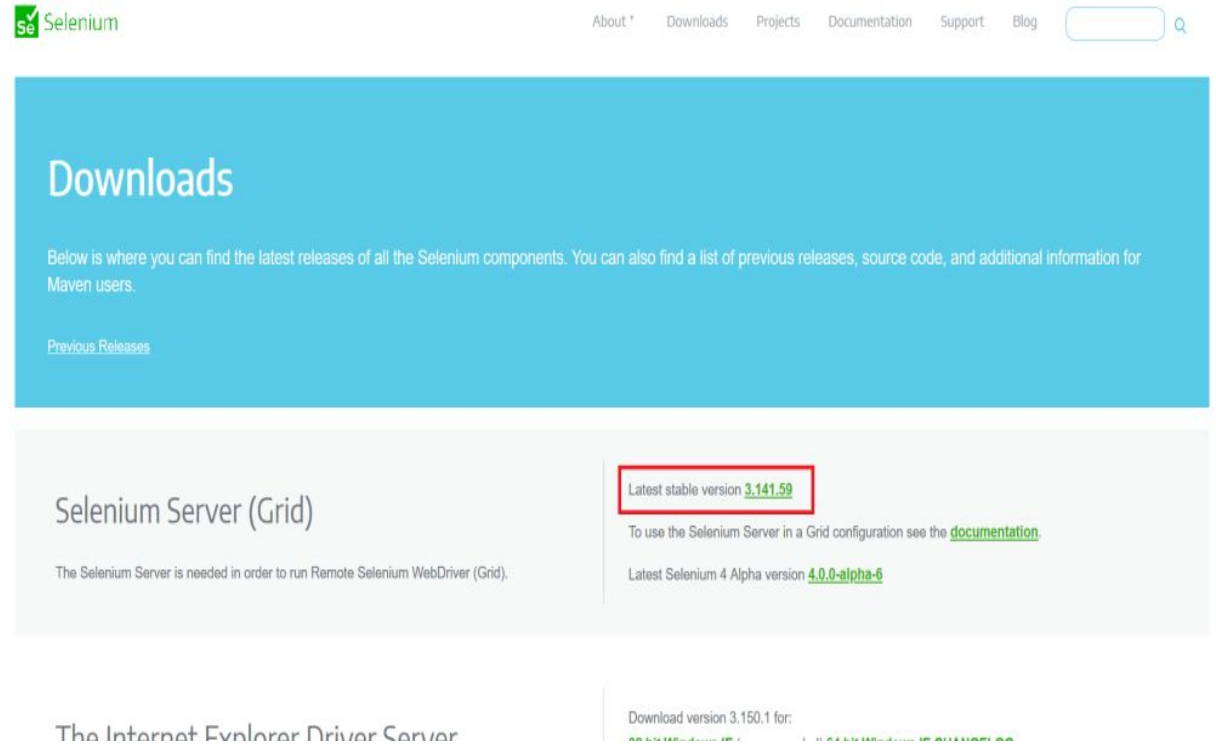
Selenium Grid uses a hub-node concept where you only run the test on a single machine called a hub, but the execution will be done by different machines called nodes.

# Selenium Grid- HUB Setup

Let us call the machine where the hub runs as “Machine A” while the machine where the node runs will be “Machine B.” It is also important to note their IP addresses. Let us say that Machine A has an IP address of 192.168.1.3 while Machine B has an IP of 192.168.1.4.

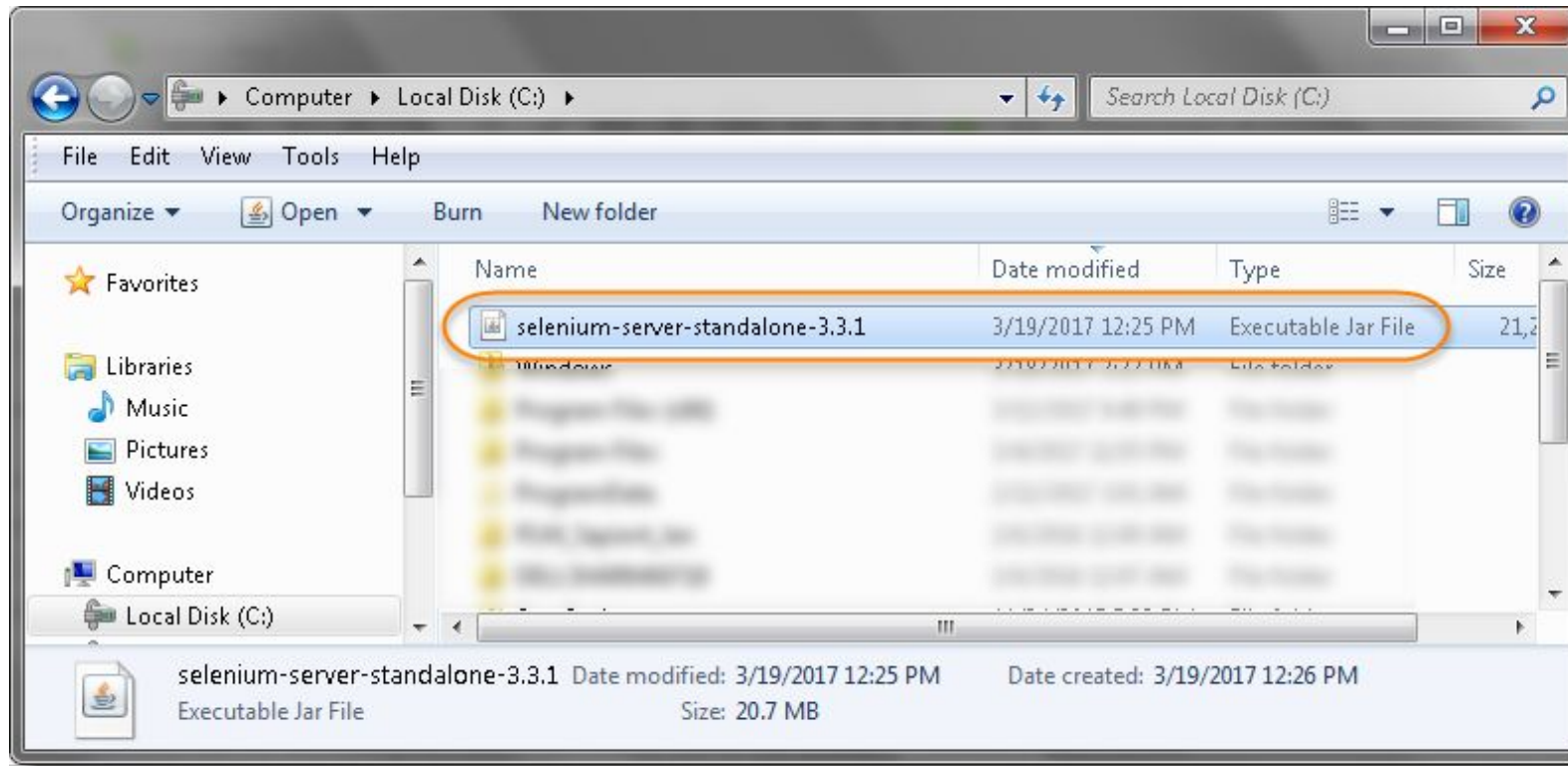
Step:1.Download the Selenium Server from the official website –

<https://www.selenium.dev/downloads/>



# Selenium Grid- HUB Setup

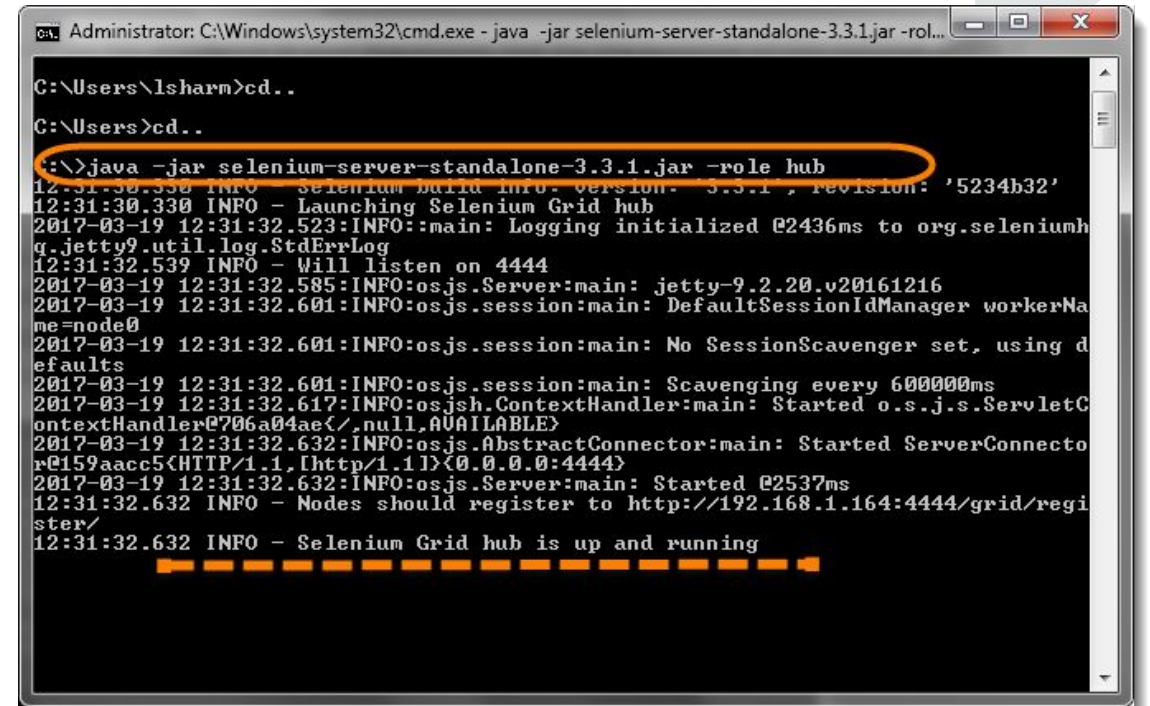
Step : 2. You can place the Selenium Server .jar file on the C drive of both Machine A and Machine B. After doing this, you are now done installing Selenium Grid.



# Selenium Grid- HUB Setup

Step : 3. We are now going to launch a hub. Go to Machine A. Using the command prompt, navigate to the root of Machine A's – C drive, because that is the directory where we placed the Selenium Server.

- On the command prompt, type `java -jar selenium-server-standalone-3.14.0.jar -role hub`
- The hub should successfully be launched.



```
Administrator: C:\Windows\system32\cmd.exe - java -jar selenium-server-standalone-3.3.1.jar -rol...
C:\Users\lsharm>cd..
C:\Users>cd..
::>java -jar selenium-server-standalone-3.3.1.jar -role hub
12:31:30.330 INFO - Selenium build info: version: '3.3.1', revision: '5234b32'
12:31:30.330 INFO - Launching Selenium Grid hub
2017-03-19 12:31:32.523:INFO::main: Logging initialized @2436ms to org.seleniumhq.jetty9.util.log.StdErrLog
12:31:32.539 INFO - Will listen on 4444
2017-03-19 12:31:32.585:INFO:osjs.Server:main: jetty-9.2.20.v20161216
2017-03-19 12:31:32.601:INFO:osjs.session:main: DefaultSessionIdManager workerName=node0
2017-03-19 12:31:32.601:INFO:osjs.session:main: No SessionScavenger set, using defaults
2017-03-19 12:31:32.601:INFO:osjs.session:main: Scavenging every 600000ms
2017-03-19 12:31:32.617:INFO:osjs.ContextHandler:main: Started o.s.j.s.ServletContextHandler@706a04ae{/null,AVAILABLE}
2017-03-19 12:31:32.632:INFO:osjs.AbstractConnector:main: Started ServerConnector@159aacc5[HTTP/1.1,[http/1.1]<0.0.0.0:4444>]
2017-03-19 12:31:32.632:INFO:osjs.Server:main: Started @2537ms
12:31:32.632 INFO - Nodes should register to http://192.168.1.164:4444/grid/register/
12:31:32.632 INFO - Selenium Grid hub is up and running
```



# Selenium Grid- HUB Setup

Step : 4. To verify whether hub is running, open the browser and navigate to <http://localhost:4444>. Now click the *Console* link and then click *View Config*. The config of the hub would be displayed like this.



The screenshot shows the Selenium Grid Console v.3.3.1 interface. The title bar includes the Selenium logo, the version number, and a 'Help' button. The main content area displays the configuration for the hub, organized into sections: 'Config for the hub', 'Config details', and 'updated with params'. The 'Config for the hub' section lists various parameters like browserTimeout, debug, help, port, role, timeout, cleanUpCycle, host, capabilityMatcher, newSessionWaitTimeout, and throwOnCapabilityNotPresent. The 'Config details' section shows the command used to launch the hub. The 'updated with params' section shows the updated parameters.

```
Grid Console v.3.3.1 Help

Config for the hub :
browserTimeout : 0
debug : false
help : false
port : 4444
role : hub
timeout : 1800
cleanUpCycle : 5000
host : 192.168.1.164
capabilityMatcher : org.openqa.grid.internal.utils.DefaultCapabilityMatcher
newSessionWaitTimeout : -1
throwOnCapabilityNotPresent : true

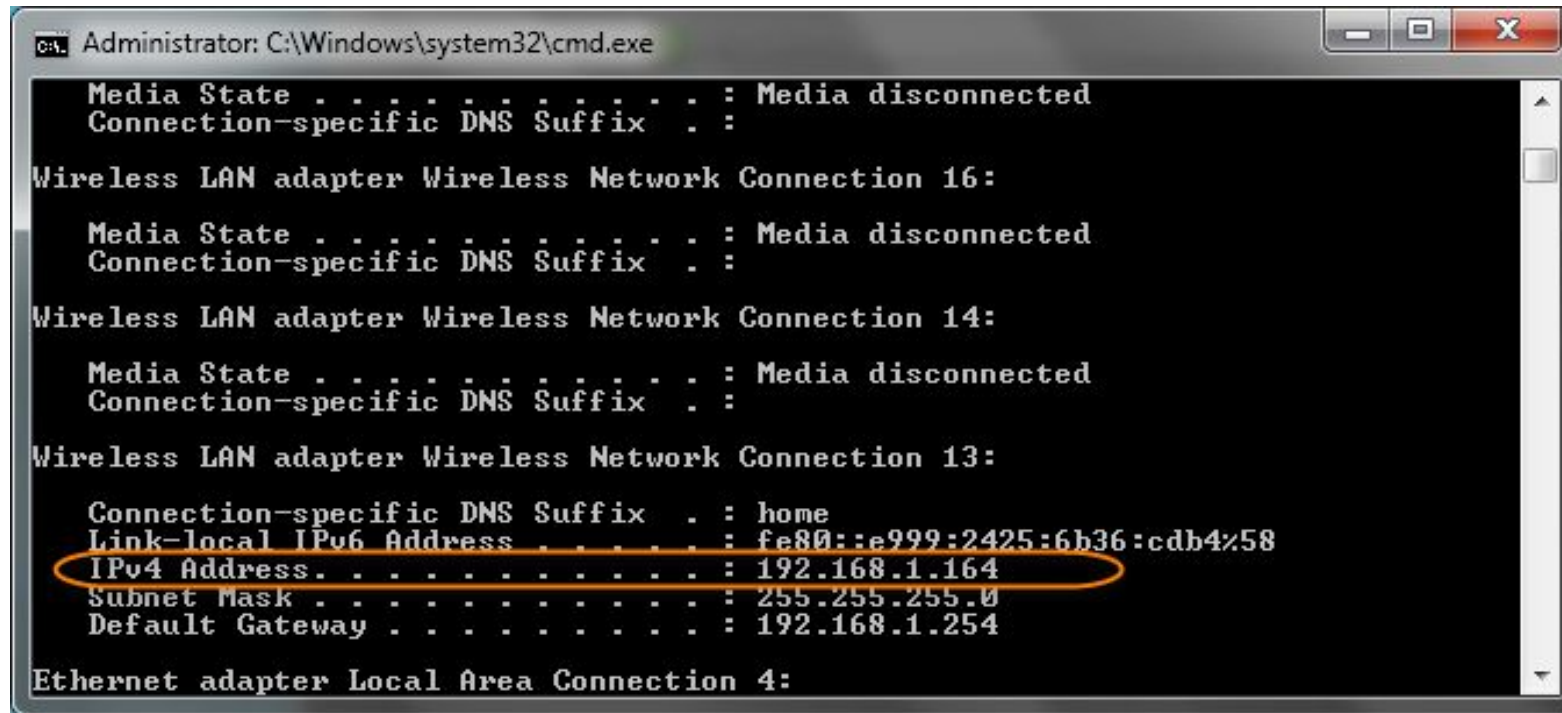
Config details :
hub launched with : -browserTimeout 0 -debug false -help false -port 4444 -role hub -timeout 1800 -cleanUpCycle 5000 -host 192.168.1.164 -capabilityMatcher
org.openqa.grid.internal.utils.DefaultCapabilityMatcher -newSessionWaitTimeout -1 -throwOnCapabilityNotPresent true

the final configuration comes from :
the default :
browserTimeout : 0
debug : false
help : false
port : 4444
role : hub
timeout : 1800
cleanUpCycle : 5000
capabilityMatcher : org.openqa.grid.internal.utils.DefaultCapabilityMatcher
newSessionWaitTimeout : -1
throwOnCapabilityNotPresent : true

updated with params :
browserTimeout : 0
debug : false
help : false
```

# Selenium Grid-Node Setup

Step 1 : Also we need to find out the IP Address of the Hub Machine. Go to Command Prompt and type IPCONFIG to find out the IP Address.



```
Administrator: C:\Windows\system32\cmd.exe

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :

Wireless LAN adapter Wireless Network Connection 16:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :

Wireless LAN adapter Wireless Network Connection 14:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :

Wireless LAN adapter Wireless Network Connection 13:

Connection-specific DNS Suffix  . : home
Link-local IPv6 Address . . . . . : fe80::e999:2425:6b36:cdb4%58
IPv4 Address. . . . . : 192.168.1.164
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.1.254

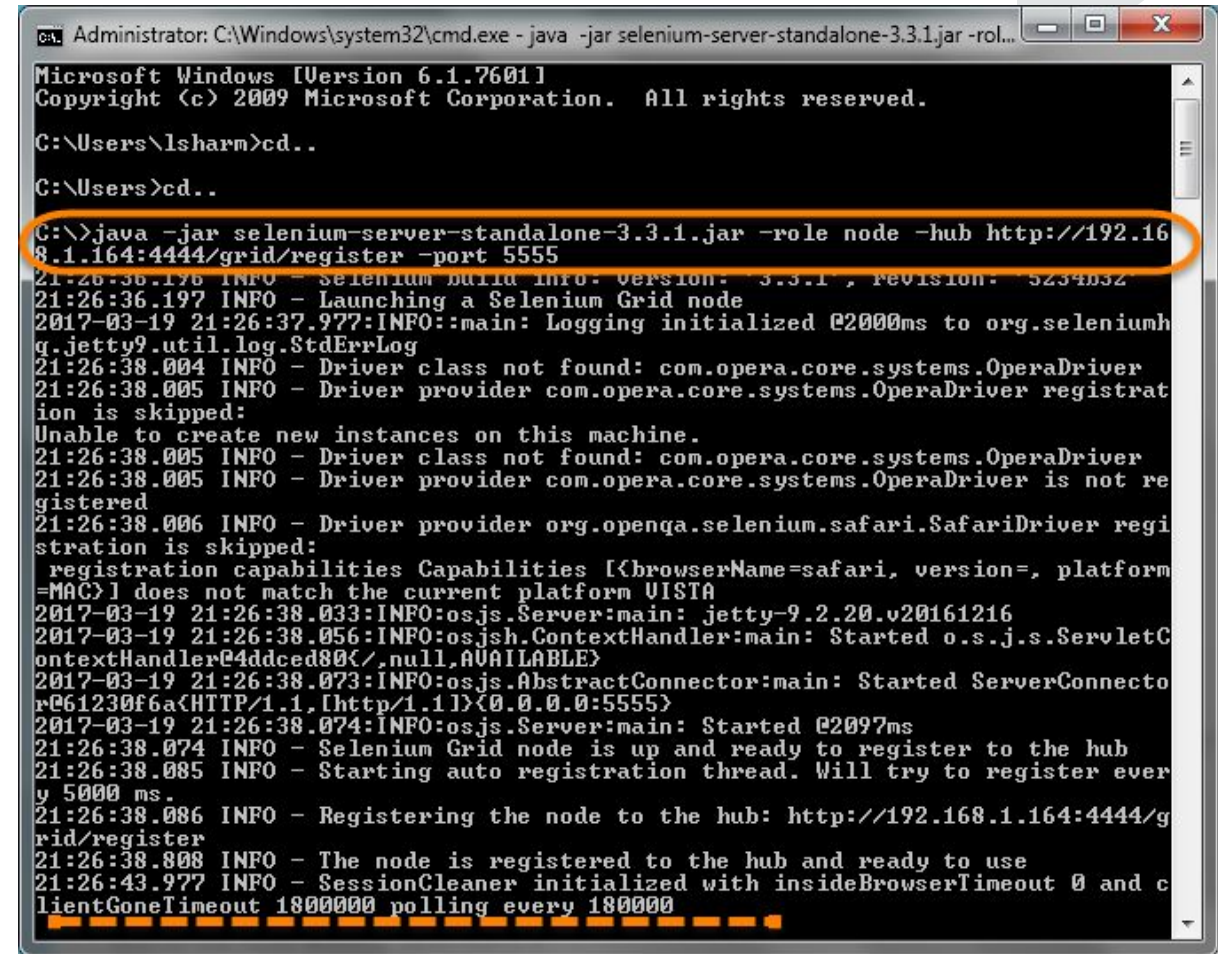
Ethernet adapter Local Area Connection 4:
```

# Selenium Grid-Node Setup

Step: 2. It is required to download the Selenium Server jar on the Node Machine as well. As *i am setting up the Node on the same machine, i do not need to download the Selenium Server jar again.*

- Open Command Prompt. If you are setting up Node on different machine, log on to that machine and open Command Prompt.
- To register Hub Machine with Node Machine,

```
java -jar selenium-server-standalone-3.3.1.jar -role node -hub http://192.168.1.164:4444/grid/register -port 5555
```



```
Administrator: C:\Windows\system32\cmd.exe - java -jar selenium-server-standalone-3.3.1.jar -rol...
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\lsharm>cd..
C:\Users>cd..
C:\>java -jar selenium-server-standalone-3.3.1.jar -role node -hub http://192.168.1.164:4444/grid/register -port 5555
21:26:36.196 INFO - Selenium build info: version: 3.3.1, revision: 5234032
21:26:36.197 INFO - Launching a Selenium Grid node
2017-03-19 21:26:37.977:INFO::main: Logging initialized @2000ms to org.seleniumhq.jetty9.util.log.StdErrLog
21:26:38.004 INFO - Driver class not found: com.opera.core.systems.OperaDriver
21:26:38.005 INFO - Driver provider com.opera.core.systems.OperaDriver registration is skipped:
Unable to create new instances on this machine.
21:26:38.005 INFO - Driver class not found: com.opera.core.systems.OperaDriver
21:26:38.005 INFO - Driver provider com.opera.core.systems.OperaDriver is not registered
21:26:38.006 INFO - Driver provider org.openqa.selenium.safari.SafariDriver registration is skipped:
registration capabilities Capabilities [{browserName=safari, version=, platform=MAC}] does not match the current platform VISTA
2017-03-19 21:26:38.033:INFO:osjs.Server:main: jetty-9.2.0.v20161216
2017-03-19 21:26:38.056:INFO:osjs.ContextHandler:main: Started o.s.j.s.ServletContextHandler@4ddced80[/,null,AVAILABLE]
2017-03-19 21:26:38.073:INFO:osjs.AbstractConnector:main: Started ServerConnector@61230f6a[HTTP/1.1,[http/1.1]<0.0.0.0:5555>]
2017-03-19 21:26:38.074:INFO:osjs.Server:main: Started @2097ms
21:26:38.074 INFO - Selenium Grid node is up and ready to register to the hub
21:26:38.085 INFO - Starting auto registration thread. Will try to register every 5000 ms.
21:26:38.086 INFO - Registering the node to the hub: http://192.168.1.164:4444/grid/register
21:26:38.808 INFO - The node is registered to the hub and ready to use
21:26:43.977 INFO - SessionCleaner initialized with insideBrowserTimeout 0 and clientGoneTimeout 1800000 polling every 180000
```

# Selenium Grid-Node Setup

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Step : 3 . After executing the command then return to the Hub and navigate the URL `http://localhost:4444` or `http://192.168.1.164:4444` and the hub will now display the node which is attached to it.



# Selenium Grid-Test Script

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```
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.remote.DesiredCapabilities;
import org.openqa.selenium.remote.RemoteWebDriver;

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

public class Grid_SetUp {
    public static WebDriver driver;

    public static void main(String[] args) throws MalformedURLException, InterruptedException{

        String URL = "https://www.facebook.com";
        String Node = "https://192.168.1.164:4444/wd/hub";
        DesiredCapabilities cap = DesiredCapabilities.chrome();

        driver = new RemoteWebDriver(new URL(Node), cap);

        driver.navigate().to(URL);
        Thread.sleep(5000);
        driver.quit();
    }
}
```