Jenkins Integration with Selenium

Table of content

Jenkins with selenium

Jenkins is an open-source automation server written in Java. Jenkins helps to automate the non-human part of the software development process, with continuous integration.

It works based on plugins, i.e., have to install respective plugins in order to communicate. For example, Maven, Git plugins have to install with configuration.

Instead of pulling the entire code for building and testing. You can just use Jenkins to automatically fetch the code from the repository, build and test it in the test environment and can send an email notification about the results so it will be easier to find the bug in that version of the commit, instead of going through the whole code to find the bug.

Advantages of Jenkins:

It is open-source, and it is user-friendly, easy to install, and does not require additional installations or components.

Easily Configurable. Jenkins can be easily modified and extended. It deploys code instantly, generates test reports. Jenkins can be configured according to the requirements for continuous integrations and continuous delivery.

Platform Independent. Jenkins is available for all platforms and different operating systems, whether OS X, Windows, or Linux.

Rich Plugin ecosystem. The extensive pool of plugins makes Jenkins flexible and allows building, deploying, and automating across various platforms.

Easy support. Because it is open-source and widely used, there is no shortage of support from large online communities of agile teams.

Developers write the tests to detect the errors of their code as soon as possible. So the developers don't waste time on large-scale error-ridden integrations.

Issues are detected and resolved almost right away, which keeps the software in a state where it can be released at any time safely.

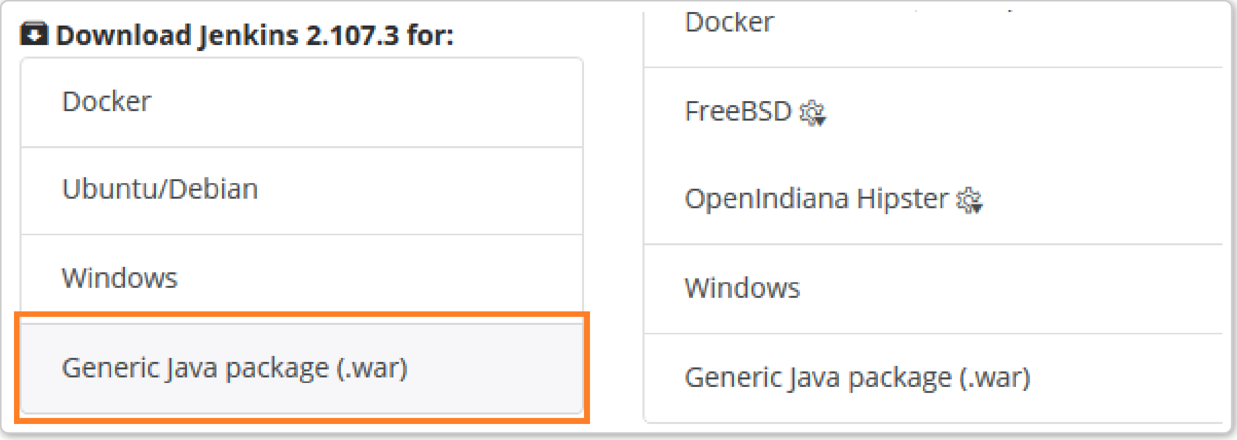
Most of the integration work is automated. Hence fewer integration issues. This saves both time and money over the lifespan of a project.

Maven with Selenium

Install Jenkins

1. Navigate to : https://jenkins.io/download/

2. Download the Generic war files, choose the war file from the stable release


Download Jenkins 2.107.3 for:
Docker
Ubuntu/Debian
Windows
Generic Java package (.war)
Docker
FreeBSD
OpenIndiana Hipster
Windows
Generic Java package (.war)

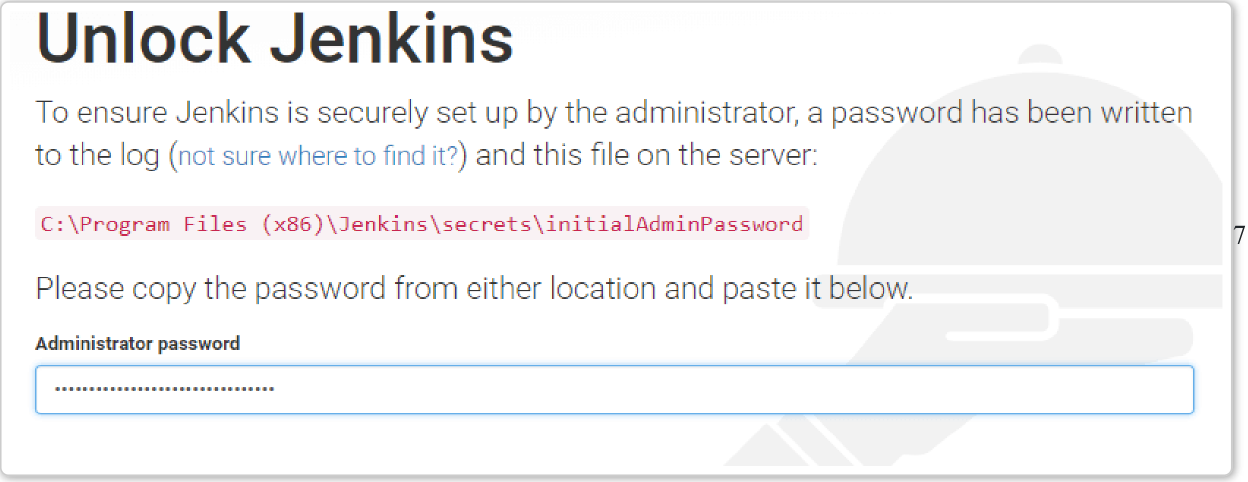
3. Go to the folder in terminal/CMD where you have stored the jenkins.war file and execute the below command.

```
java -jar jenkins.war
```

4. You would be able to success screen once we execute the command.

5. Navigate to the URL in your browser http://localhost:8080; sometimes, it may take up to 3 minutes to open the page, so have patience if you get no page/ error page.

6. Please navigate to the highlighted path in your browser, and copy the password.



Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

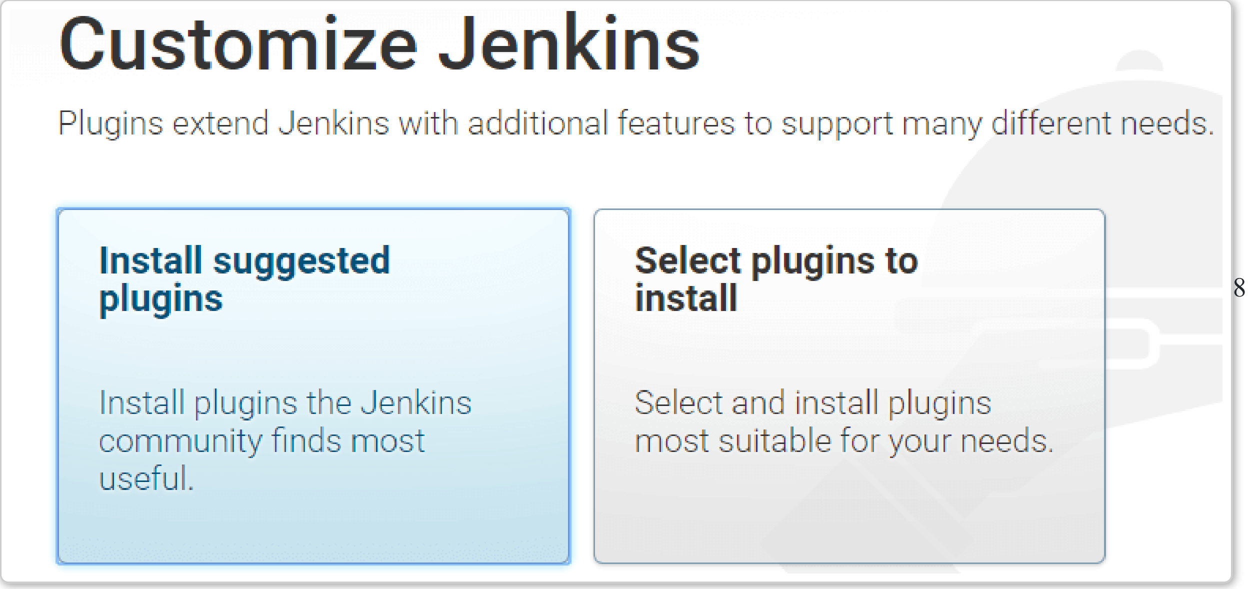
`C:\Program Files (x86)\Jenkins\secrets\initialAdminPassword`

Please copy the password from either location and paste it below.

Administrator password

································

7. Install / select plugins based on your need, you can install plugins after installation of Jenkins as well.



Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

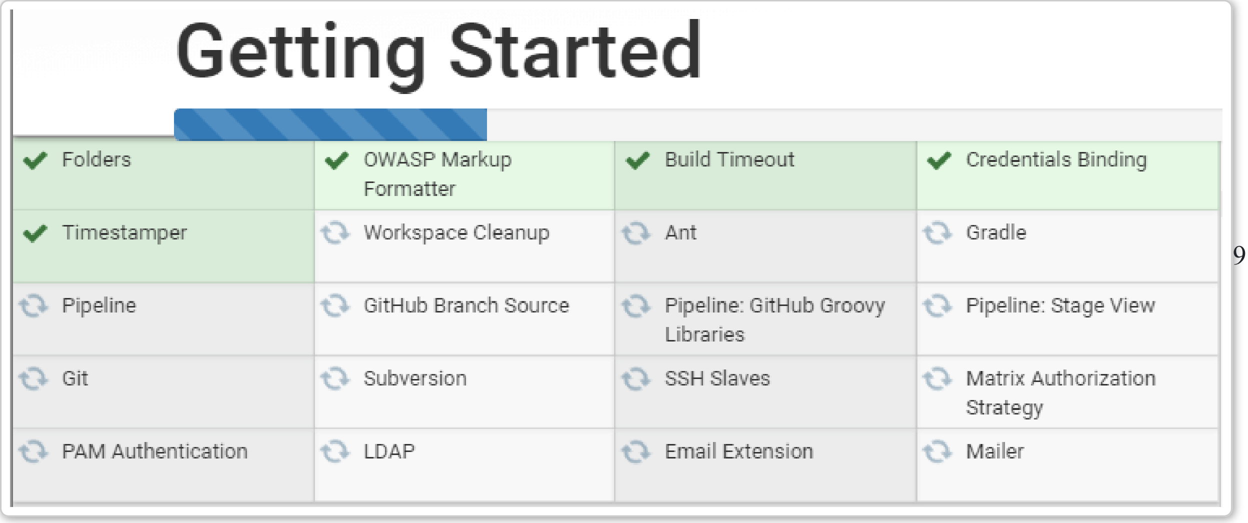
Install suggested plugins

Install plugins the Jenkins community finds most useful.

Select plugins to install

Select and install plugins most suitable for your needs.

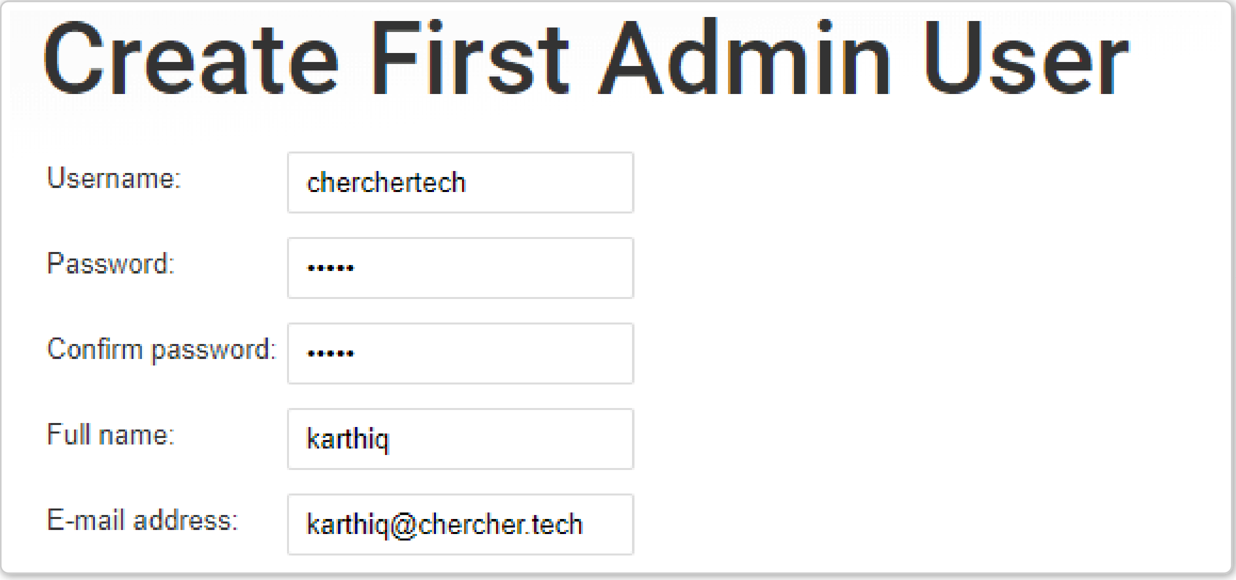
8. You may need to wait for 10-15 mins for the completion of the installation of plugins.



Getting Started

✓ Folders	✓ OWASP Markup Formatter	✓ Build Timeout	✓ Credentials Binding
✓ Timestamper	↻ Workspace Cleanup	↻ Ant	↻ Gradle
↻ Pipeline	↻ GitHub Branch Source	↻ Pipeline: GitHub Groovy Libraries	↻ Pipeline: Stage View
↻ Git	↻ Subversion	↻ SSH Slaves	↻ Matrix Authorization Strategy
↻ PAM Authentication	↻ LDAP	↻ Email Extension	↻ Mailer

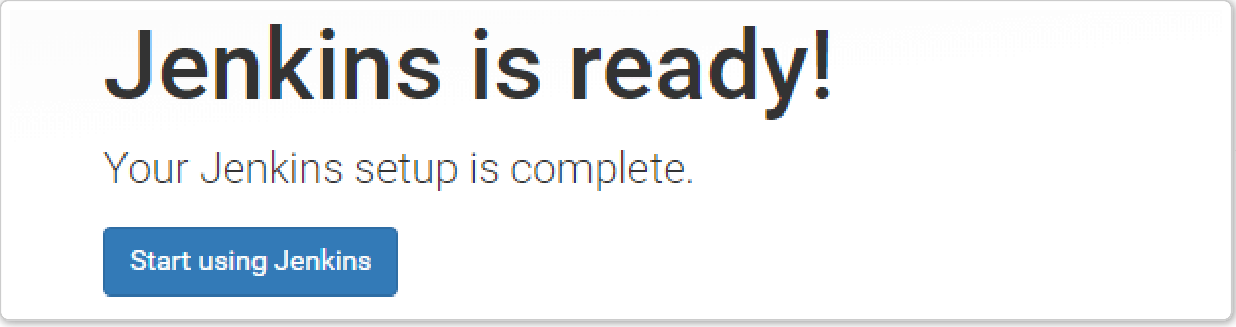
9. Fill the use details and continue



Create First Admin User

Username:	cherchertech
Password:	•••••
Confirm password:	•••••
Full name:	karthiq
E-mail address:	karthiq@chercher.tech

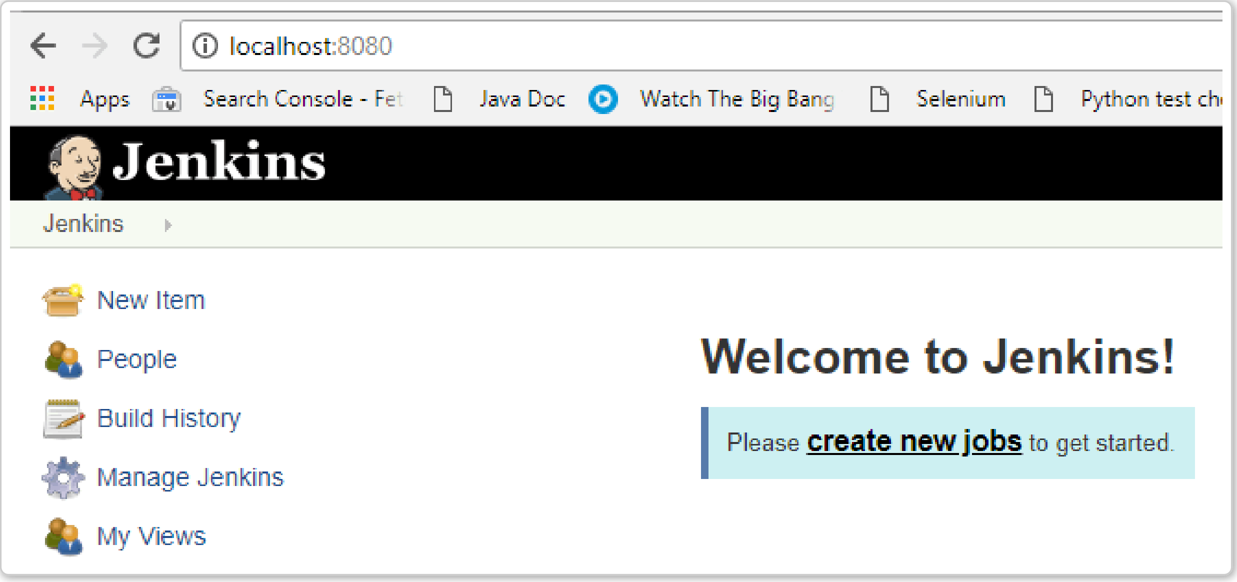
10. Click on start Jenkins button



Jenkins is ready!

Your Jenkins setup is complete.

11. If you reached the below page, then your installation is successful.



Welcome to Jenkins!

Please **create new jobs** to get started.

Single Inheritance in Selenium and java

Run Selenium with Batch file

Create a selenium sample test using TestNg as a unit testing framework and create testng.xml. Below is the same test file we have created :

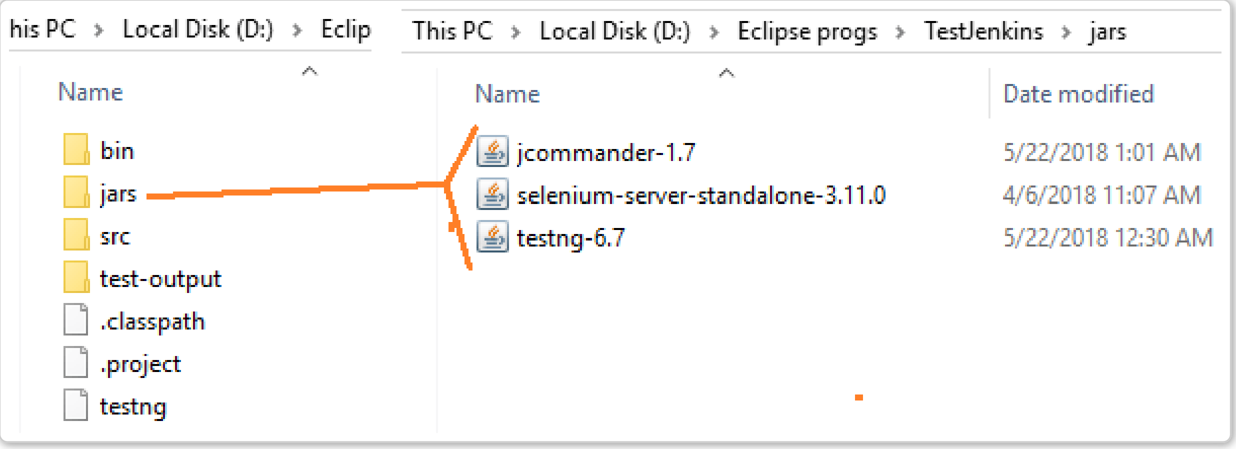
```
public class TestJenkins {
   @Test
   public void openGoogle() {

      System.out.println("Test  Started");
      System.setProperty("webdriver.chrome.driver", "D:PATHchromedriver.exe");

      System.out.println("open browser");
      WebDriver driver = new ChromeDriver();
      driver.manage().timeouts().implicitlyWait(30, TimeUnit.SECONDS);

      System.out.println("open google");
      driver.get("https://google.com");

      driver.quit();
      System.out.println("Test Ended");
   }
}
```

Once you crate the testng.xml file, place the below jars under "jars" folder:

testng

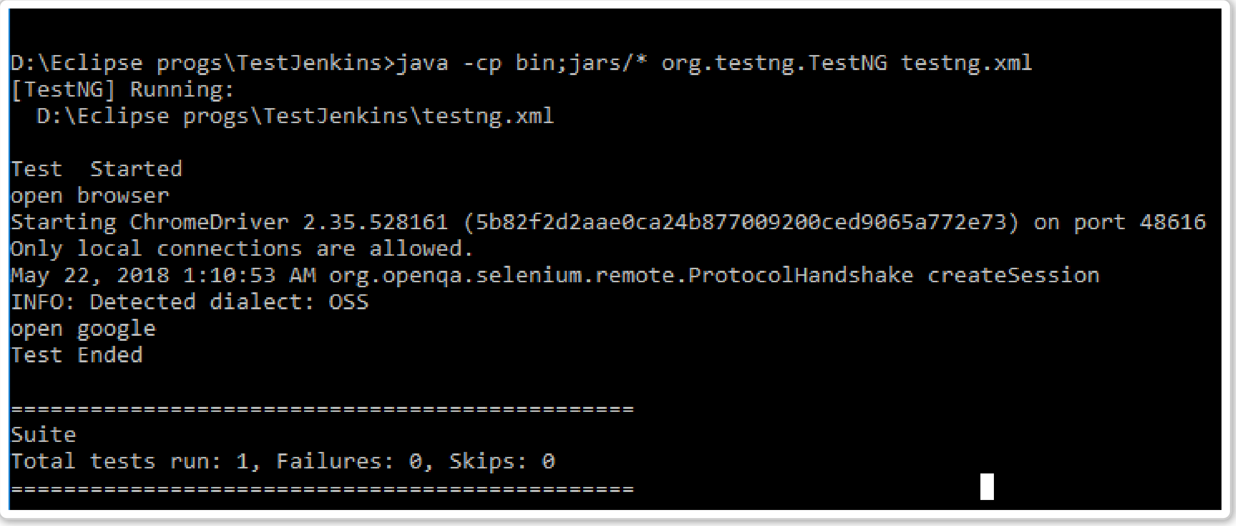
Jcommander

Selenium standalone server



Now execute the below command in the cmd/terminal to open run the test case; you must be inside the project folder with cmd, i.e., where you have the .classpath file.

```
java -cp Class_Files_Path; Jars_Path org.testng.TestNG testng.xml
java -cp bin;jars/* org.testng.TestNG testng.xml
```



```
D:\Eclipse progs\TestJenkins>java -cp bin;jars/* org.testng.TestNG testng.xml
[TestNG] Running:
  D:\Eclipse progs\TestJenkins\testng.xml

Test  Started
open browser
Starting ChromeDriver 2.35.528161 (5b82f2d2aae0ca24b877009200ced9065a772e73) on port 48616
Only local connections are allowed.
May 22, 2018 1:10:53 AM org.openqa.selenium.remote.ProtocolHandshake createSession
INFO: Detected dialect: OSS
open google
Test Ended

===============================================
Suite
Total tests run: 1, Failures: 0, Skips: 0
===============================================
```

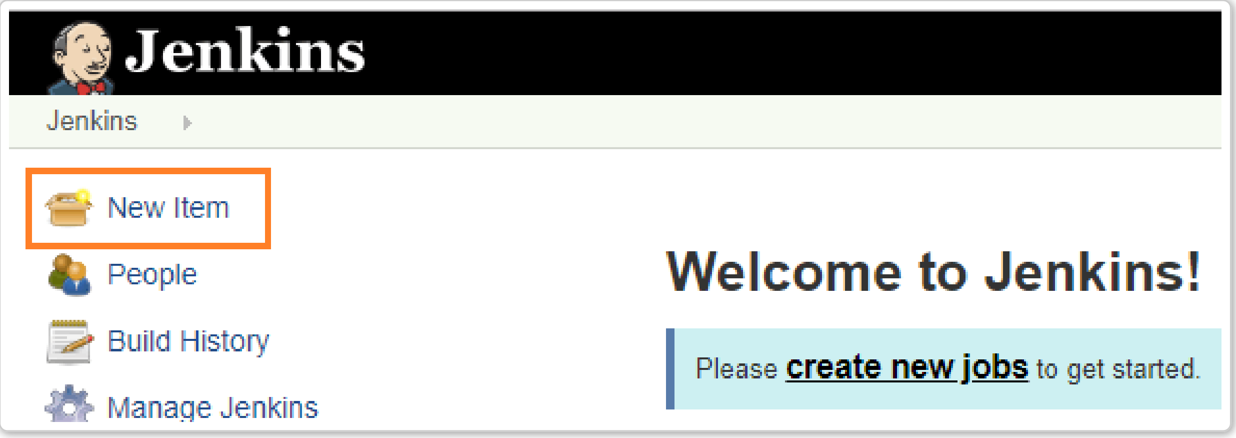
If you command-line execution is successful, then add the same line into the notepad and save the file as run.bat

Now try to run the bat file by double-clicking; it should perform the same operations as cmd execution.

TestNG Annotations with Selenium

Set Jenkins Job

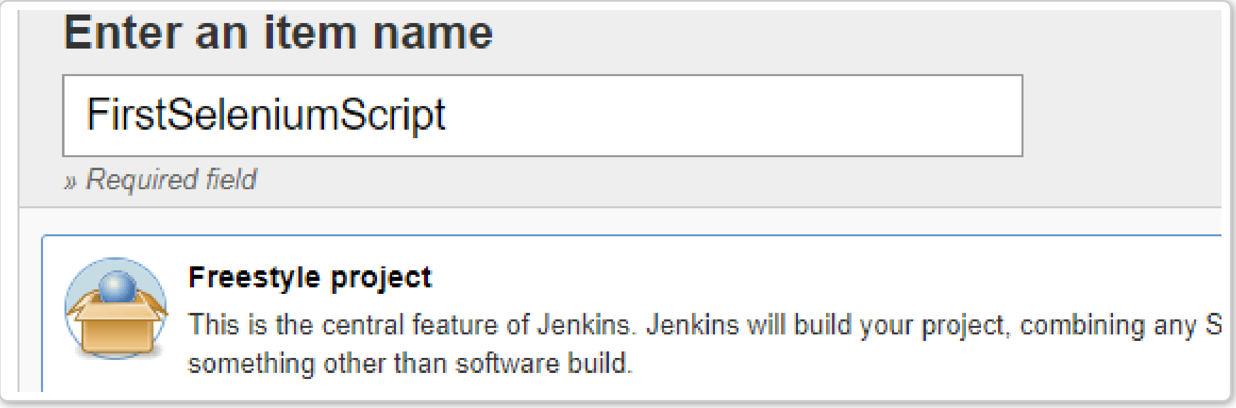
Open Jenkins and select 'New Item.'



Welcome to Jenkins!

Please **create new jobs** to get started.

Enter the Job Name and Select Free Style project and click ok button.



Enter an item name

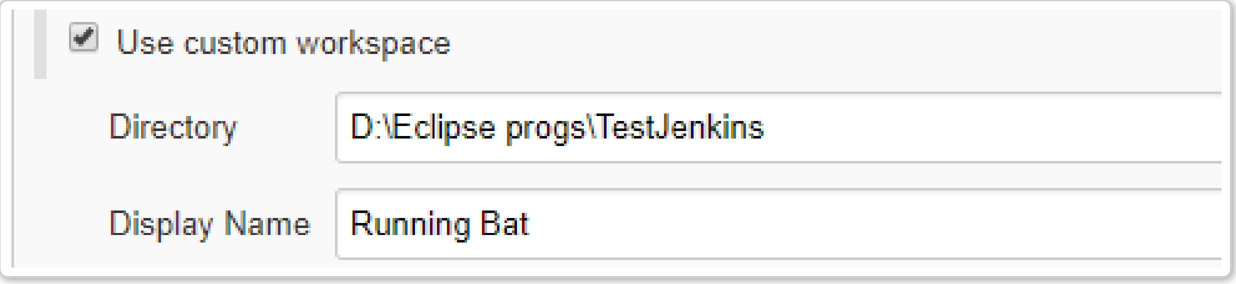
FirstSeleniumScript

» *Required field*

Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any S something other than software build.

Select Custom workspace under the General section and provide the project folder details.

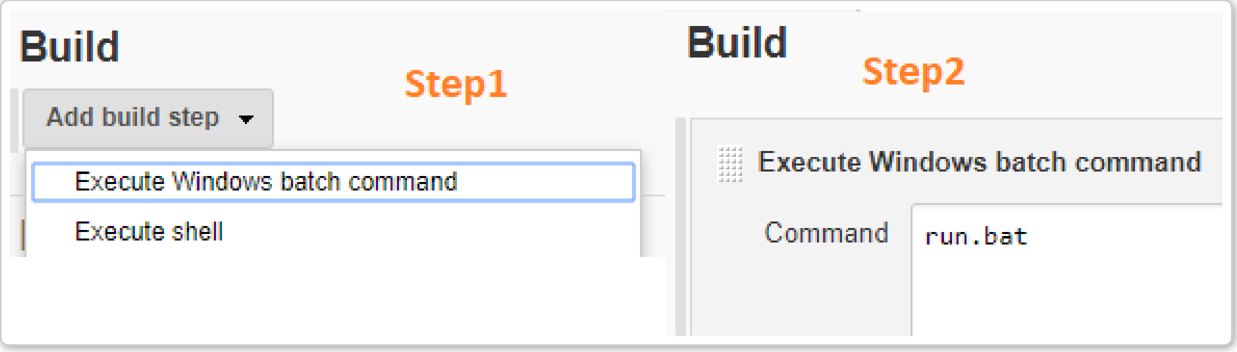


☑ Use custom workspace

Directory: D:\Eclipse progs\TestJenkins

Display Name: Running Bat

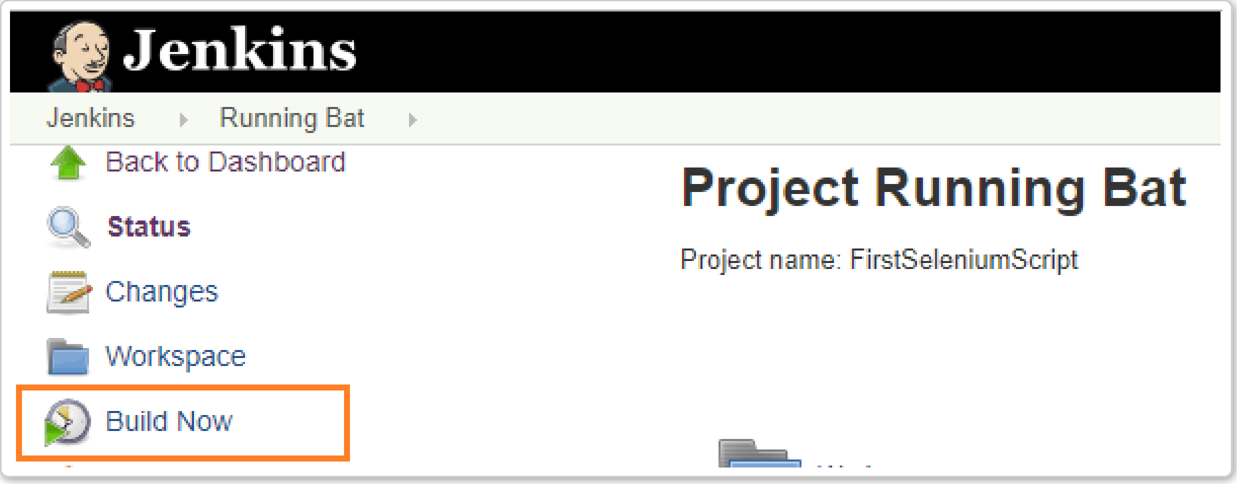
Under Build Section, choose Execute window batch command and provide our batch file name.



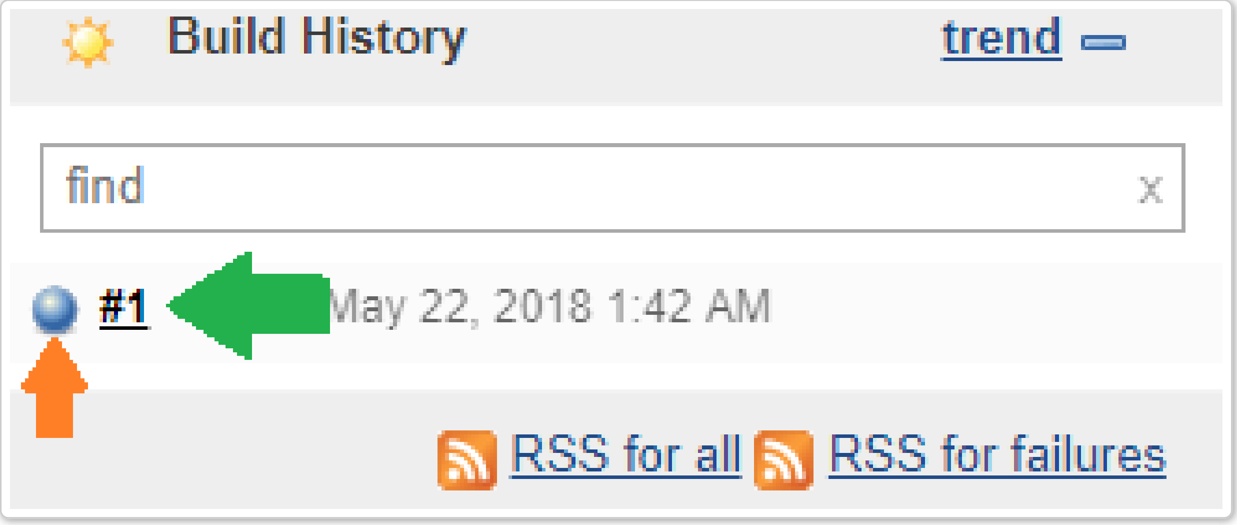
```
run.bat
```

Click the Save button, Jenkins now will open the home page.

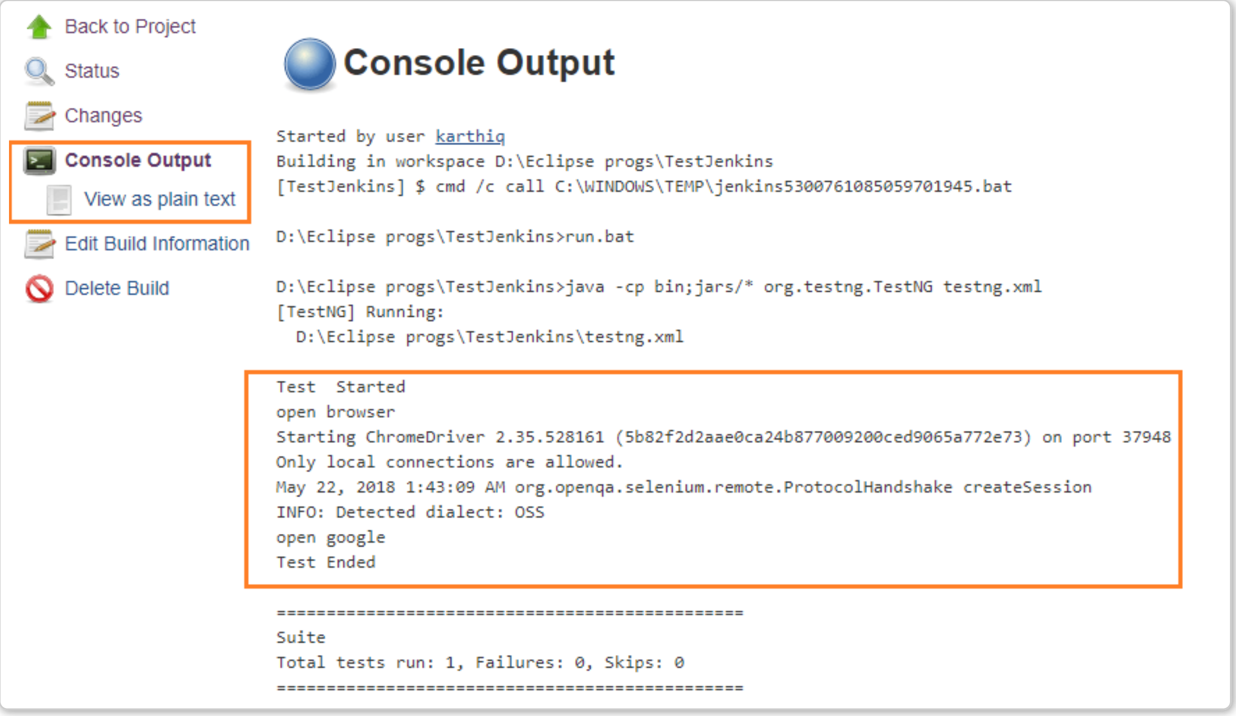
Click the Build Now link to run our project in Jenkins.



Once the Jobs starts Heartbeat starts, the orange sphere is the heartbeat, and the Green arrow is Build Name.



Now click the build number to see the details and select the Console Output option.



Console Output

```
Started by user karthiq
Building in workspace D:\Eclipse progs\TestJenkins
[TestJenkins] $ cmd /c call C:\WINDOWS\TEMP\jenkins5300761085059701945.bat

D:\Eclipse progs\TestJenkins>run.bat

D:\Eclipse progs\TestJenkins>java -cp bin;jars/* org.testng.TestNG testng.xml
[TestNG] Running:
  D:\Eclipse progs\TestJenkins\testng.xml

Test  Started
open browser
Starting ChromeDriver 2.35.528161 (5b82f2d2aae0ca24b877009200ced9065a772e73) on port 37948
Only local connections are allowed.
May 22, 2018 1:43:09 AM org.openqa.selenium.remote.ProtocolHandshake createSession
INFO: Detected dialect: OSS
open google
Test Ended

===============================================
Suite
Total tests run: 1, Failures: 0, Skips: 0
===============================================
```

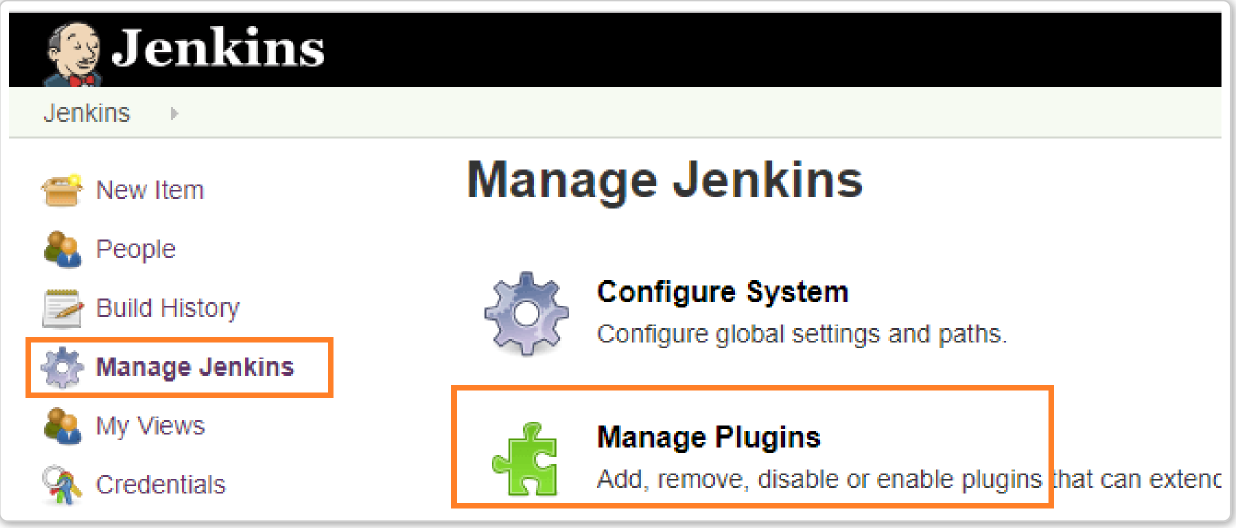
If you compare the above output, it will exactly match with the output that occurred when we ran with cmd.

Lets learn how to add some colorful results to Jenkins rather than console log summary.

Cucumber with Selenium

Jenkins Plugins

Jenkins provides all the standard operations, and if we want to have more options like reposting, something like that, then we should install the plugin for Jenkins.

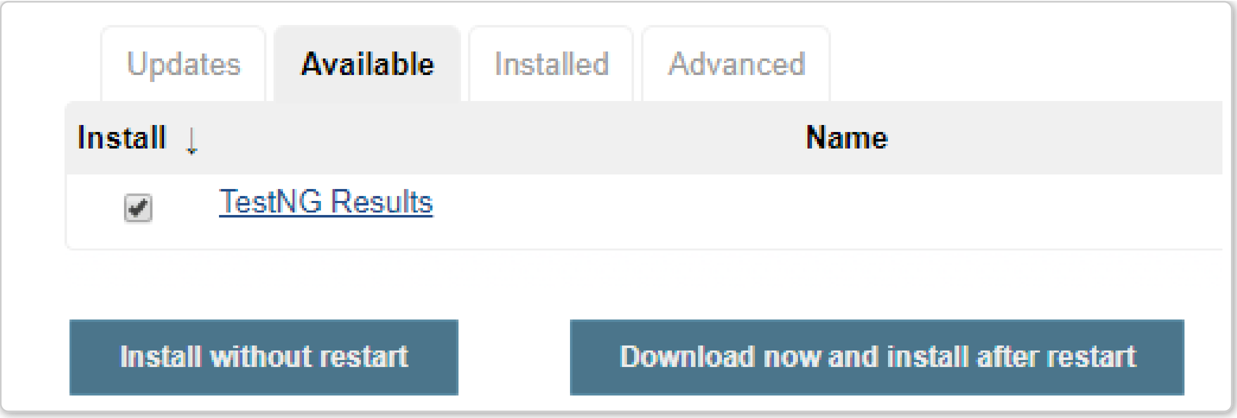


Manage Jenkins

Configure System
Configure global settings and paths.

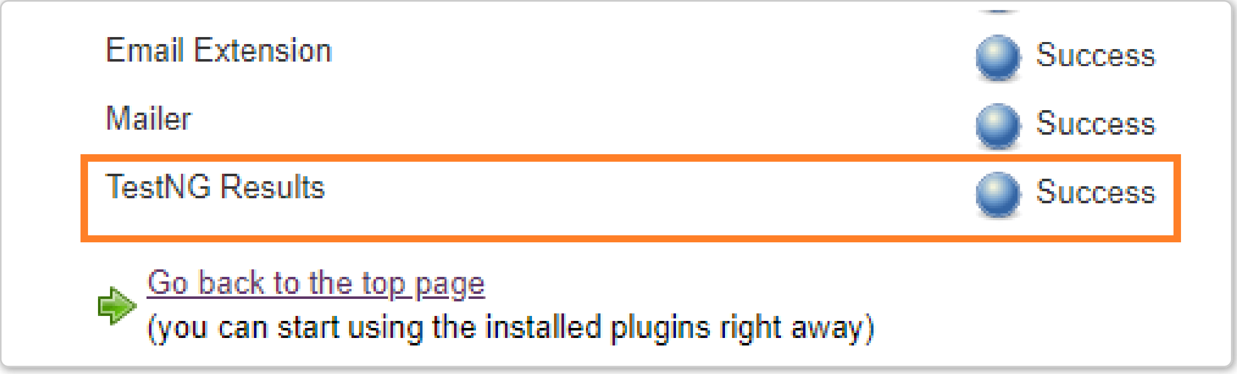
Manage Plugins
Add, remove, disable or enable plugins that can extenc

Go to Available tab and search for TestNG; you may get result for TestNG results, select it and install



Install ↓	Name
☑	TestNG Results

If your installation is successful, then you may see the success information like below.



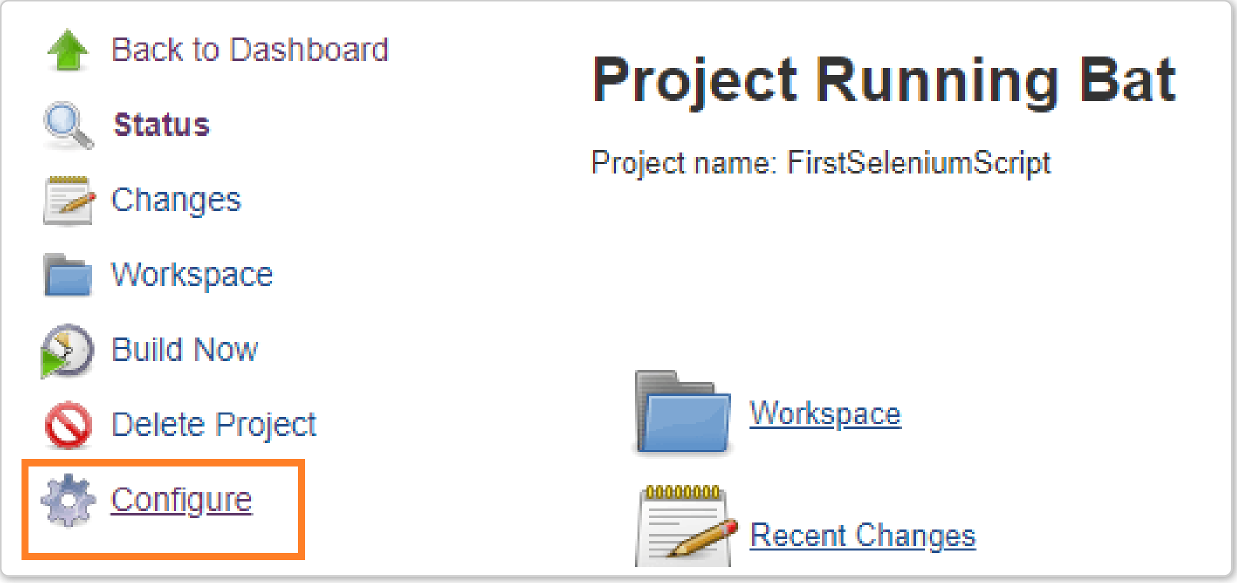
Email Extension	● Success
Mailer	● Success
TestNG Results	● Success

Go back to the top page
(you can start using the installed plugins right away)

Locators in Selenium

Generate Report in Jenkins

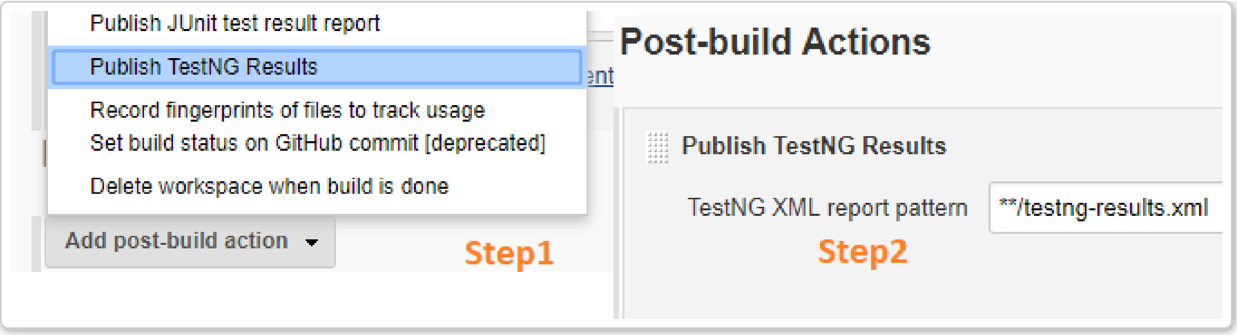
Once the TestNG plugin has installed the Choose to configure the Build.



Project Running Bat

Project name: FirstSeleniumScript

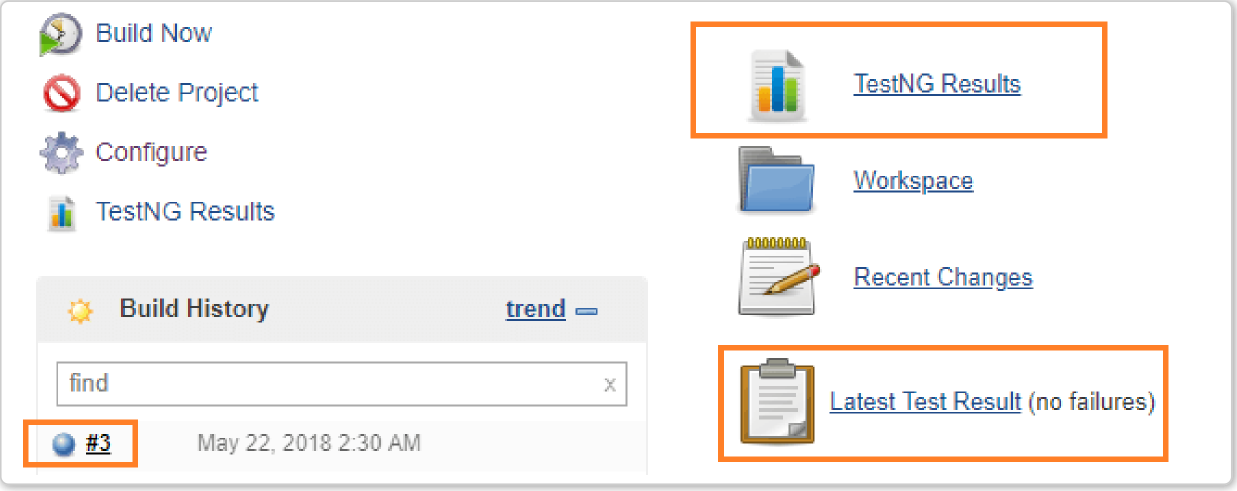
Go to Post Build option and select Publish TestNG results; it may populate default values of it. In the advanced section, you can make the build as unstable if a test fails.


Publish JUnit test result report
Publish TestNG Results
Record fingerprints of files to track usage
Set build status on GitHub commit [deprecated]
Delete workspace when build is done
Add post-build action
Step1
Post-build Actions
Publish TestNG Results
Step2

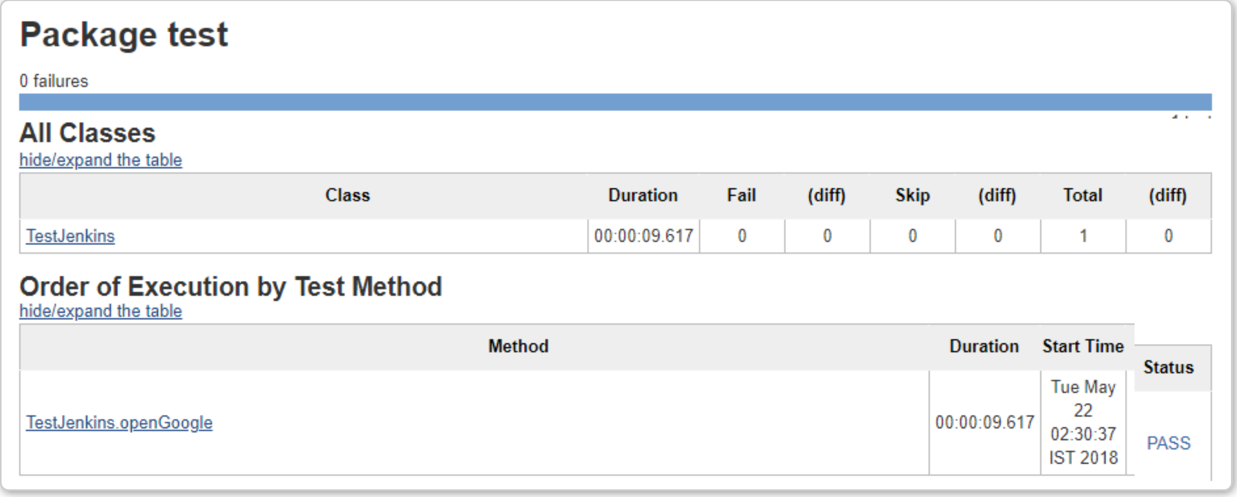
TestNG XML report pattern: **/testng-results.xml

Save the changes made so far.

Run the project again using Build Now Link, refresh the Page.



Click the TestNG Results and select the Build Number; now, it will navigate to the result page.



Package test

0 failures

All Classes

hide/expand the table

Class	Duration	Fail	(diff)	Skip	(diff)	Total	(diff)
TestJenkins	00:00:09.617	0	0	0	0	1	0

Order of Execution by Test Method

hide/expand the table

Method	Duration	Start Time	Status
TestJenkins.openGoogle	00:00:09.617	Tue May 22 02:30:37 IST 2018	PASS

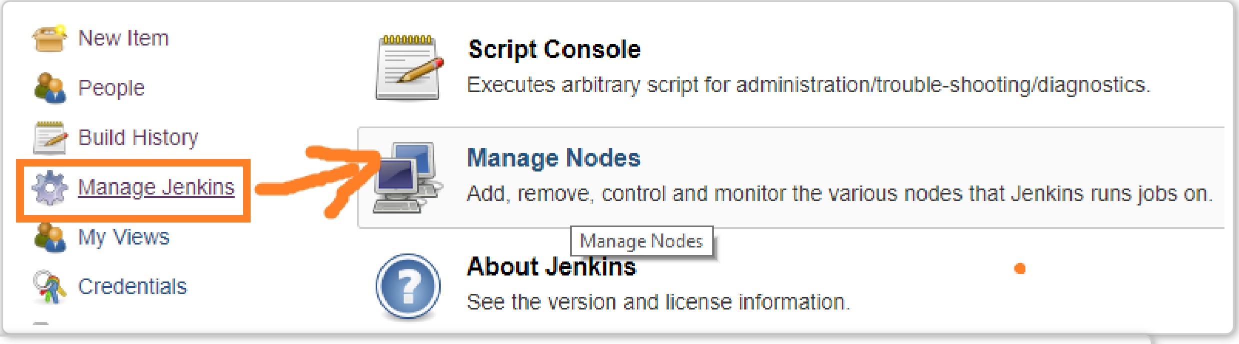
Slenium Grid

Master-Slave in Jenkins

So for you are working in Master, now lets try to set up the slave machine for this master so that we can run multiple jobs at the same time.

Steps to set up the Master for Slave in Jenkins :

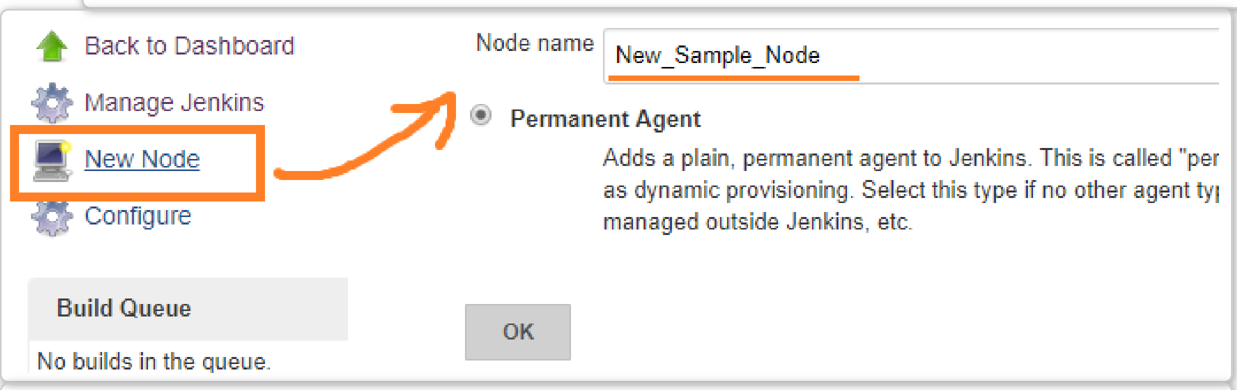
Click on the Manage Jenkins and new options will be showcased in Mid Pane, so choose Manage Nodes Option



Script Console
Executes arbitrary script for administration/trouble-shooting/diagnostics.

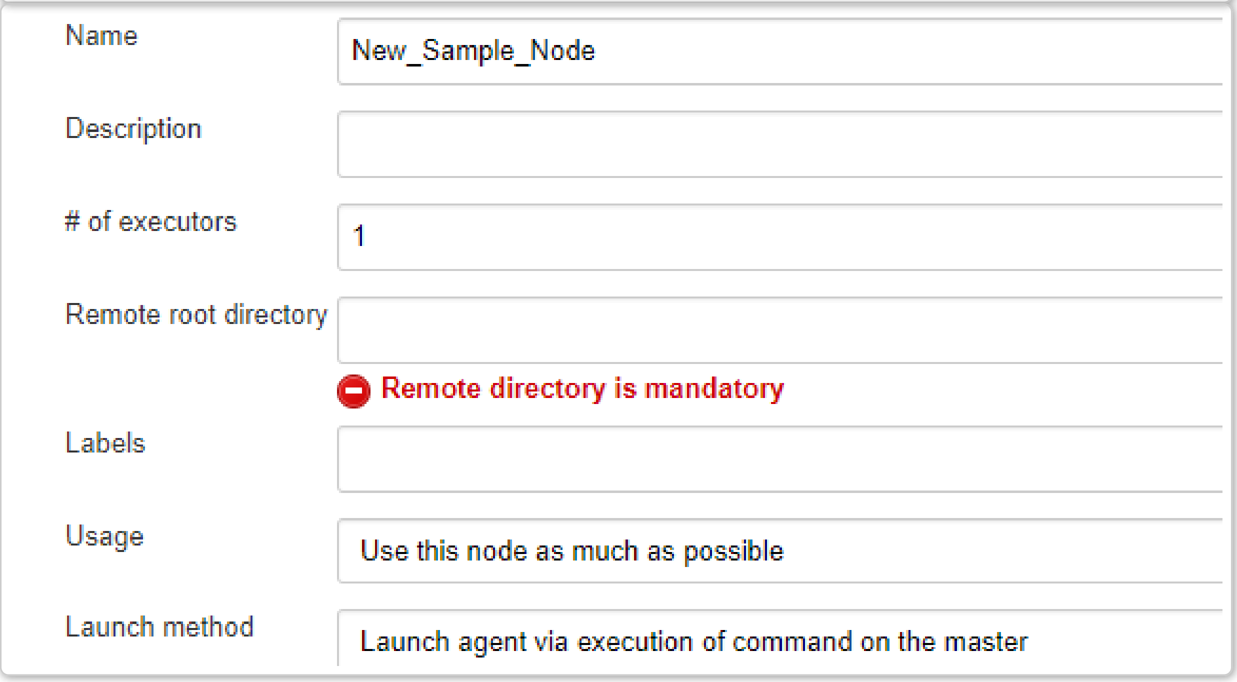
Manage Nodes
Add, remove, control and monitor the various nodes that Jenkins runs jobs on.

About Jenkins
See the version and license information.



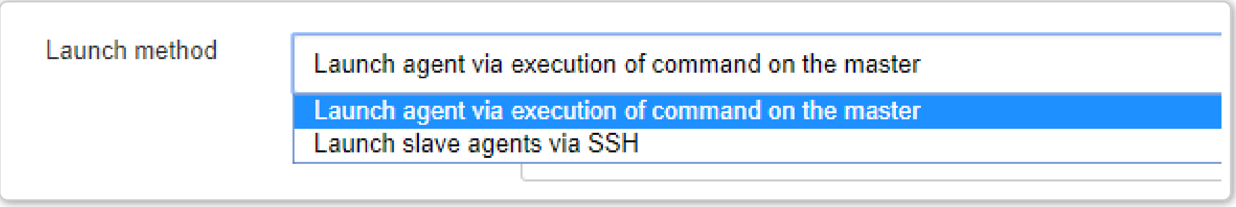
Node name: New_Sample_Node

○ **Permanent Agent**
Adds a plain, permanent agent to Jenkins. This is called "per
as dynamic provisioning. Select this type if no other agent ty
managed outside Jenkins, etc.



Name	New_Sample_Node
Description	
# of executors	1
Remote root directory	Remote directory is mandatory
Labels	
Usage	Use this node as much as possible
Launch method	Launch agent via execution of command on the master

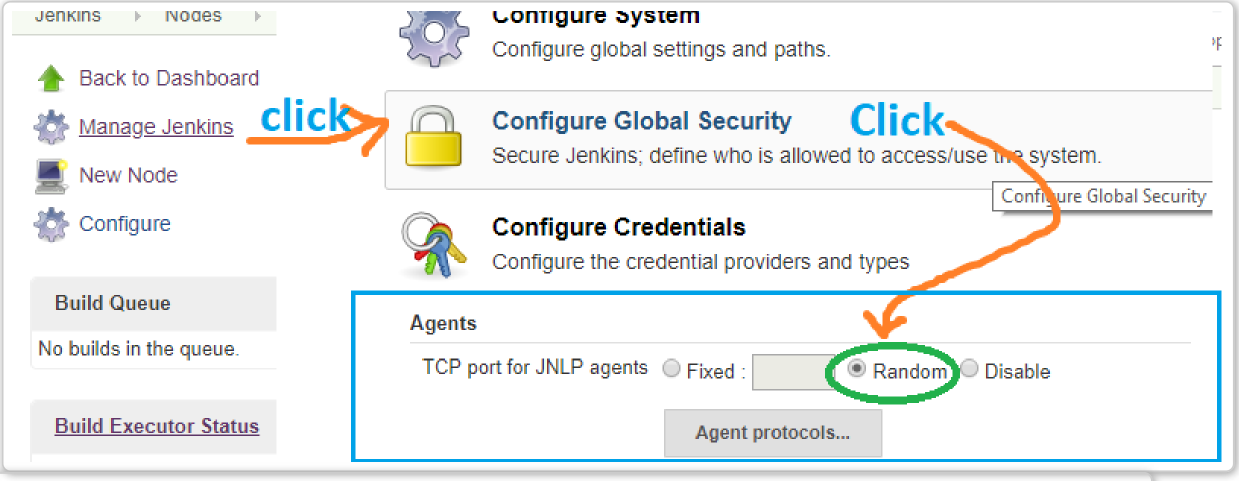
We have to set up the Method of invocation of the Node machine. When you are using it for the first time, you might not find the exact option. So first save the current configuration



Launch method: Launch agent via execution of command on the master

Launch agent via execution of command on the master
Launch slave agents via SSH

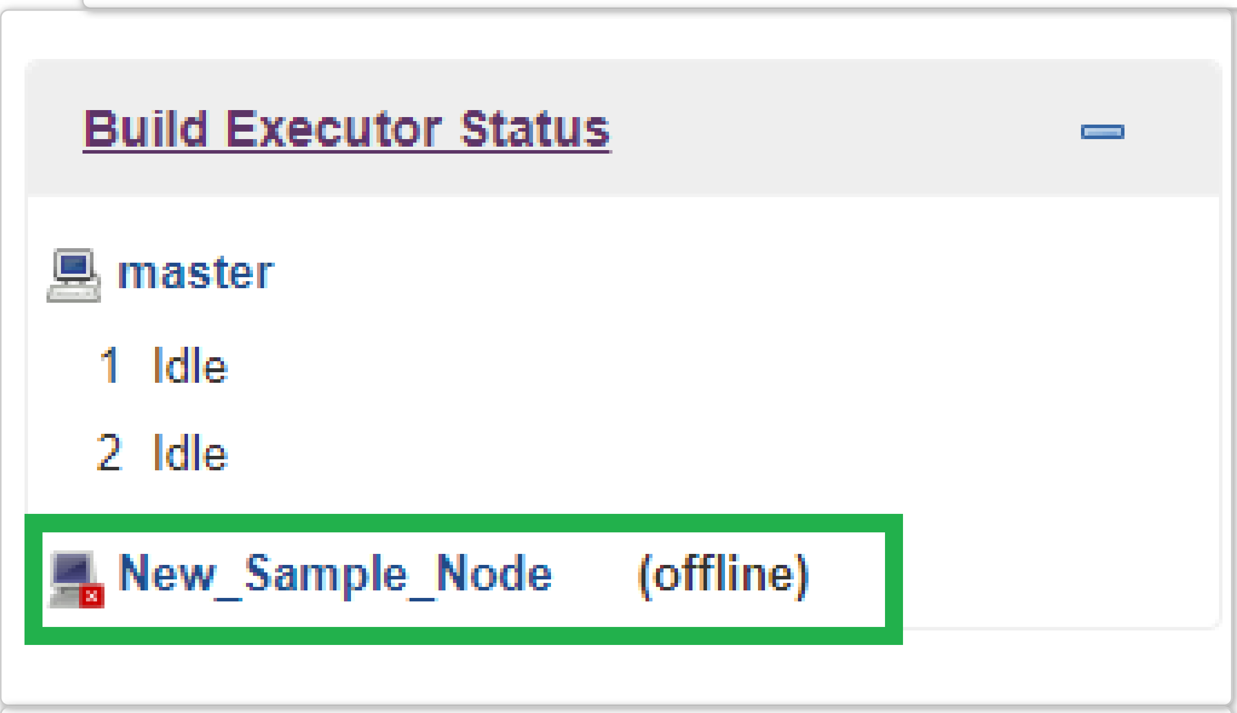
Click on Manage Jenkins >> Configure Global Security >> Select Random Optionunder Agents category



Jenkins
Nodes
Back to Dashboard
Manage Jenkins
click
New Node
Configure
Build Queue
No builds in the queue.
Build Executor Status
Configure System
Configure global settings and paths.
Configure Global Security
Click
Secure Jenkins; define who is allowed to access/use the system.
Configure Global Security
Configure Credentials
Configure the credential providers and types

Agents

TCP port for JNLP agents ○ Fixed : ● Random ○ Disable



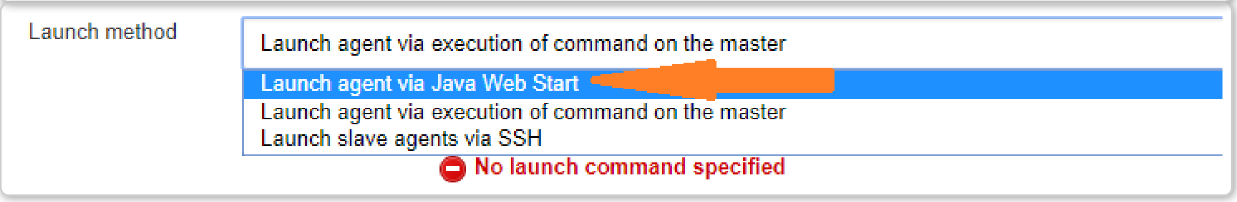
Build Executor Status

master

1 Idle

2 Idle

New_Sample_Node (offline)



Launch method: Launch agent via execution of command on the master

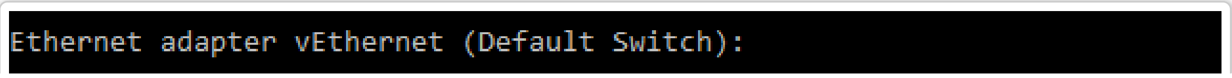
Launch agent via Java Web Start
Launch agent via execution of command on the master
Launch slave agents via SSH

No launch command specified

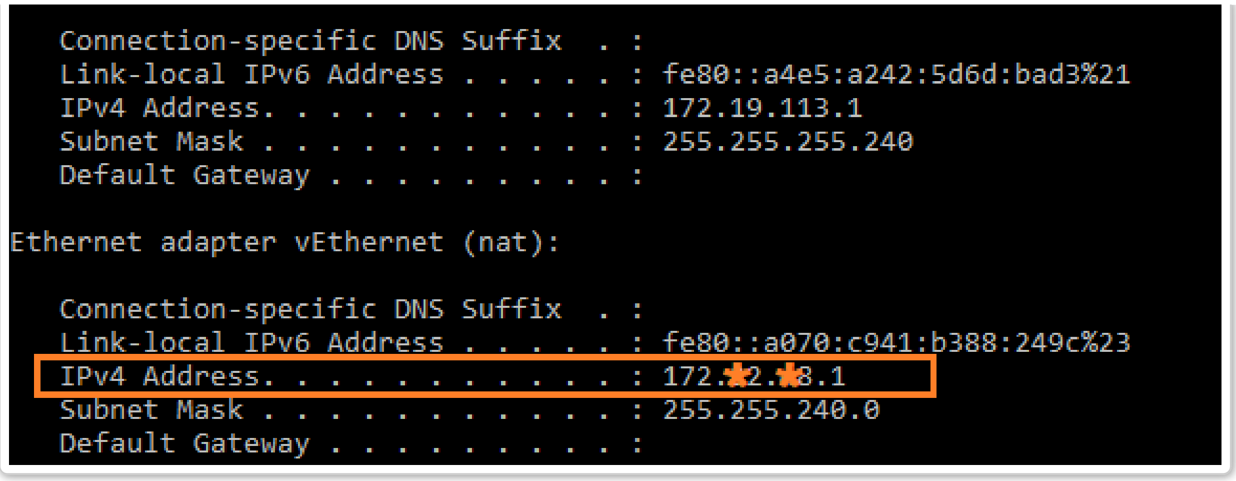
Steps to set up the Slave for Master in Jenkins :

Open the Node Machine (could be another physical machine or virtual machine)

[Optional] Now, you should have the IP address of the Master machine to configure the jenkins. You can get the IP address of the Computer by Typing ipconfig on the Command Prompt

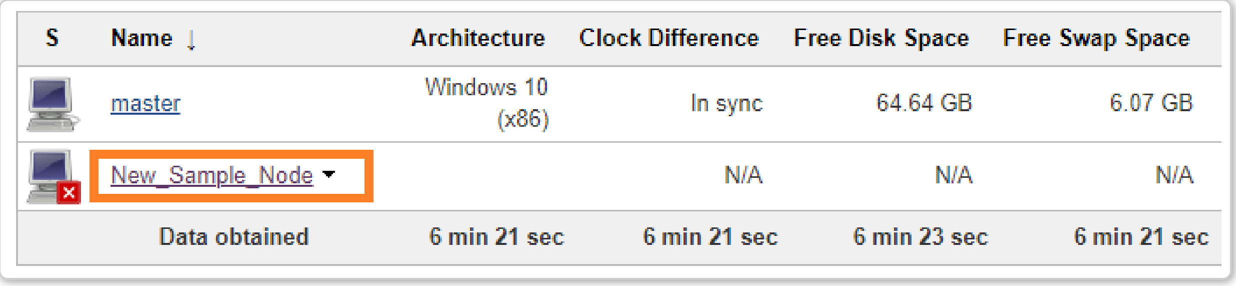


```
Ethernet adapter vEthernet (Default Switch):
```



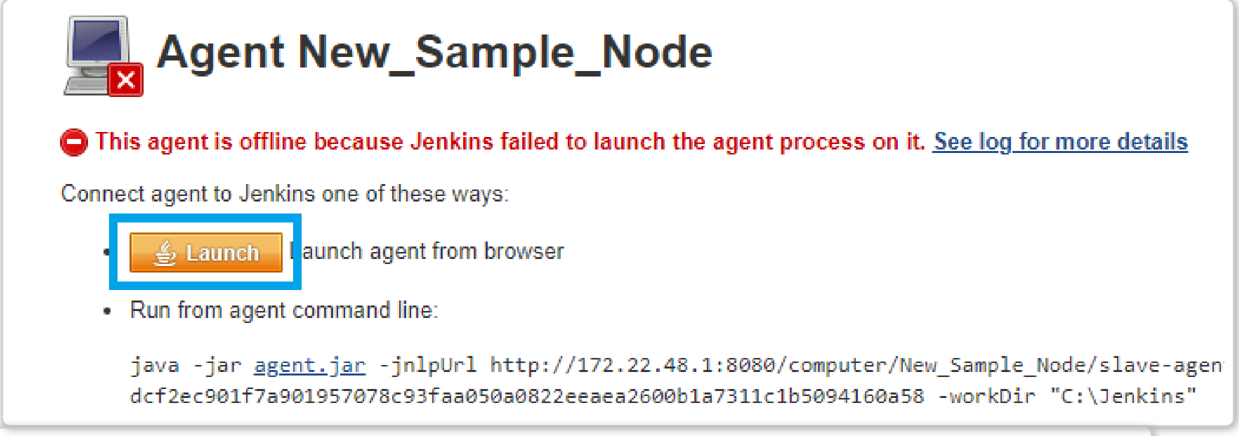
```
   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::a4e5:a242:5d6d:bad3%21
   IPv4 Address. . . . . . . . . . . : 172.19.113.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.240
   Default Gateway . . . . . . . . . :

Ethernet adapter vEthernet (nat):

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::a070:c941:b388:249c%23
   IPv4 Address. . . . . . . . . . . : 172.[redacted]2.[redacted]3.1
   Subnet Mask . . . . . . . . . . . : 255.255.240.0
   Default Gateway . . . . . . . . . :
```

Now click the Node that we have created sometime back



S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space
	master	Windows 10 (x86)	In sync	64.64 GB	6.07 GB
	New_Sample_Node		N/A	N/A	N/A
	Data obtained	6 min 21 sec	6 min 21 sec	6 min 23 sec	6 min 21 sec

Click on the Launch Button, Now a file called slave-agent will be downloaded



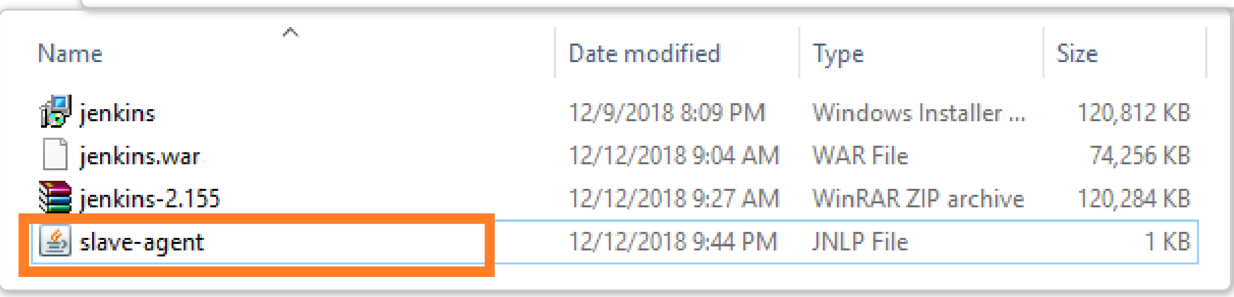
Agent New_Sample_Node

This agent is offline because Jenkins failed to launch the agent process on it. See log for more details

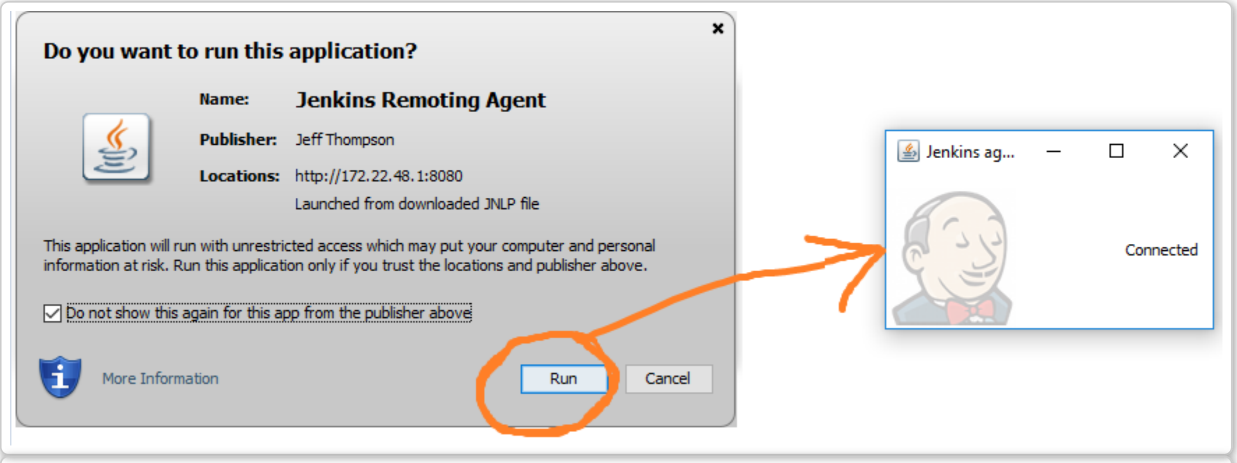
Connect agent to Jenkins one of these ways:

- Launch Launch agent from browser
- Run from agent command line:

```
java -jar agent.jar -jnlpUrl http://172.22.48.1:8080/computer/New_Sample_Node/slave-agen
dcf2ec901f7a901957078c93faa050a0822eeaea2600b1a7311c1b5094160a58 -workDir "C:\Jenkins"
```



Name	Date modified	Type	Size
jenkins	12/9/2018 8:09 PM	Windows Installer ...	120,812 KB
jenkins.war	12/12/2018 9:04 AM	WAR File	74,256 KB
jenkins-2.155	12/12/2018 9:27 AM	WinRAR ZIP archive	120,284 KB
slave-agent	12/12/2018 9:44 PM	JNLP File	1 KB



Do you want to run this application?

Name: Jenkins Remoting Agent

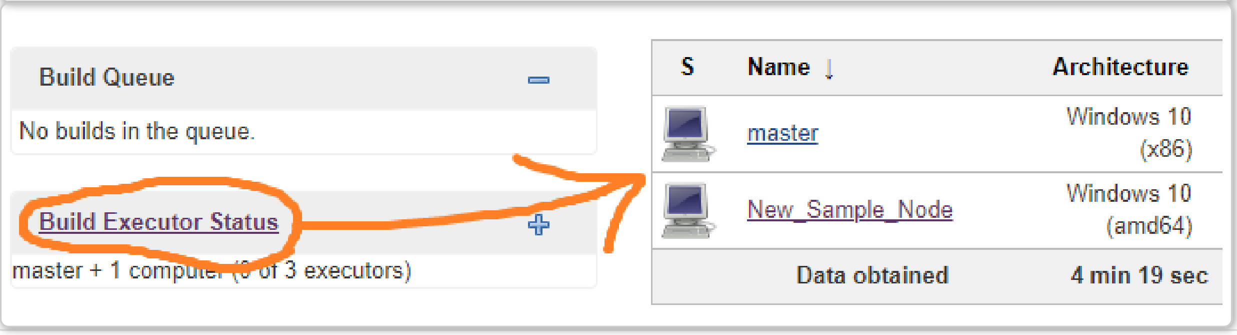
Publisher: Jeff Thompson

Locations: http://172.22.48.1:8080

Launched from downloaded JNLP file

This application will run with unrestricted access which may put your computer and personal information at risk. Run this application only if you trust the locations and publisher above.

☑ Do not show this again for this app from the publisher above



Build Queue

No builds in the queue.

Build Executor Status

master + 1 computer (0 of 3 executors)

S	Name ↓	Architecture
	master	Windows 10 (x86)
	New_Sample_Node	Windows 10 (amd64)
	Data obtained	4 min 19 sec

Recommended Readings

- Cucumber with Selenium | BDD
- Parameterize Cucumber BDD with selenium
- Tags & Hooks in Cucumber with Selenium | BDD
- Robot class in selenium
- GIT | BitBucket | SourceTree with Selenium
- SonarLint / SonarQube With Selenium
- Featured Page Object Model in Selenium | Feature Framework
- Page Object Model in Selenium | POM Framework