Jenkins is java-based application

Pre-req:

Java sdk

Jenkins installation

Jenkins master vs slave

Windows Slave configuration.

Jenkins plugins

Jenkins pipelines (build vs release)

Jenkins GUI vs Json

Jenkins email

Jenkins gut hub actions.

Jenkins Master installation in Ubuntu:

Ref : https://www.jenkins.io/doc/book/installing/linux/

Create a VM in ubuntu in Azure & make sure all ports are open(8080 & others.)

Login to Jenkin master server.

Install jdk 17 version by running below commands

Disable firewall → sudo ufw disable

sudo apt update

sudo apt install fontconfig openjdk-17-jre

type java –version to check.

```
root@antdemo:/home/gundradheeraj# java --version
openjdk 17.0.11 2024-04-16
OpenJDK Runtime Environment (build 17.0.11+9-Ubuntu-120.04.2)
OpenJDK 64-Bit Server VM (build 17.0.11+9-Ubuntu-120.04.2, mixed mode, sharing)
root@antdemo:/home/gundradheeraj# 
```

Install Jenkins now:

sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \

 https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key

echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]" \

 https://pkg.jenkins.io/debian-stable binary/ | sudo tee \

 /etc/apt/sources.list.d/jenkins.list > /dev/null

sudo apt-get update

sudo apt-get install Jenkins

Test if Jenkins are running.

http://jenkinip:8080

If its first time, it will ask you to enter admin password & it will tell to open a file which has admin password.

Then create a new user & login that user.

Setting up Slave windows Server.

1. Login to Jenkins → manage Jenkins → security & set port 50000

Dashboard   >   Manage Jenkins   >   Security

Agents

TCP port for inbound agents   ?

⦿ Fixed

50000

◯ Random

◯ Disable

Agent protocols ⌄

2. Create a windows VM in Azure & open all ports.
3. Disable the firewall.
4. Download & install java 17 jdk in c:\jenkins from https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html. Create a login in oracle.
5. Make c:\jenkins folder sharing.
6. Set up environment variable & add JAVA_HOME & path.

Environment Variables ✕

User variables for kumar

Variable	Value
ChocolateyLastPathUpdate	133631949580108147
JAVA_HOME	C:\java\jdk-17.0.10
Path	%USERPROFILE%\AppData\Local\Microsoft\WindowsApps;
TEMP	%USERPROFILE%\AppData\Local\Temp
TMP	%USERPROFILE%\AppData\Local\Temp

New...   Edit...   Delete

System variables

Variable	Value
ChocolateyInstall	C:\ProgramData\chocolatey
ComSpec	C:\Windows\system32\cmd.exe
JAVA_HOME	C:\java\jdk-17.0.10
NUMBER_OF_PROCESSORS	2
OS	Windows_NT
Path	C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;...

Edit environment variable

%SystemRoot%\system32
%SystemRoot%
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
C:\ProgramData\chocolatey\bin
%JAVA_HOME%\bin
C:\curl\curl-8.8.0_2-win64-mingw\curl-8.8.0_2-win64-mingw\bin

TO test it java is working, use cmd.

Note : Make sure java versions are same across.

```
C:\Users\kumar>java --version
java 17.0.10 2024-01-16 LTS
Java(TM) SE Runtime Environment (build 17.0.10+11-LTS-240)
Java HotSpot(TM) 64-Bit Server VM (build 17.0.10+11-LTS-240, mixed mode, sharing)
```

Install Curl in windows.

Login to Jenkins → Nodes → Add node

🖥 Nodes	Nodes	+ New Node

Name   ?

slavewindows

Number of executors   ?

2

Remote root directory   ?

C:\jenkins

Labels   ?

slavewindows

Label is important.

Usage   ?

Only build jobs with label expressions matching this node

Launch method   ?

Launch agent by connecting it to the controller

Availability   ?

Keep this agent online as much as possible

Then Click Save.

Login to Jenkins → Nodes → select slave node

Nodes

Clouds

Build Queue ⌄

No builds in the queue.

Build Executor Status ⌄

Built-In Node 0/2

slavewindows (🔴 offline)

Nodes

S	Name ↓	Architecture	Diffe
🖥️	**Built-In Node**	Linux (amd64)	
⊠	slavewindows	Windows Server 2016 (amd64)	
	Data obtained	**4 min 31 sec**	**4 mi**

⊠ Status
🗑️ Delete Agent
⚙️ Configure
🗄️ Build History
📈 Load Statistics
📋 Log

Build Executor Status 0/2 ⌄
⊠ slavewindows (🔴 offline)

Agent slavewindows

✏️ Add description   Mark this node temporarily offline

🔴 Connection was broken

Run from agent command line: (Unix) 📋

```
curl -sO http://20.96.176.65:8080/jnlpJars/agent.jar
java -jar agent.jar -url http://20.96.176.65:8080/ -secret
3a680de1f4c6a18f0d311f4d1ef5487adcd13bfe8d566348b07bf3c72a9b5607 -name slavewindows -workDir "C:\jenkins"
```

Run from agent command line: (Windows) 📋

```
curl.exe -sO http://20.96.176.65:8080/jnlpJars/agent.jar
java -jar agent.jar -url http://20.96.176.65:8080/ -secret
3a680de1f4c6a18f0d311f4d1ef5487adcd13bfe8d566348b07bf3c72a9b5607 -name slavewindows -workDir "C:\jenkins"
```

Run the agent command line : (windows) in slave node.

cd c:\jenkins

Run this

curl.exe -sO http://20.96.176.65:8080/jnlpJars/agent.jar

After agent.jar downloads, then run below command.

java -jar agent.jar -url http://20.96.176.65:8080/ -secret
3a680de1f4c6a18f0d311f4d1ef5487adcd13bfe8d566348b07bf3c72a9b5607 -name slavewindows
-workDir "C:\jenkins"

Now, you will see Jenkins slave server is working fine & online.

TO test Slave Node is working.

Go to Jenkins, new item →

New Item

Enter an item name

testslave

Select an item type

Freestyle project

Classic, general-purpose job type that checks out from up to
steps like archiving artifacts and sending email notifications.

Give the same label while you are creating/Adding Slave node.

☐ Execute concurrent builds if necessary ?

☑ Restrict where this project can be run ?

Label Expression ?

slavewindows

Advanced ∨

Select execute windows bash command.

Delete workspace before build starts

▽ Filter

Execute Windows batch command

Execute shell

Invoke Ant

Invoke Gradle script

Invoke top-level Maven targets

Run with timeout

Set build status to "pending" on GitHub commit

Add build step ⌃

Post-build Actions
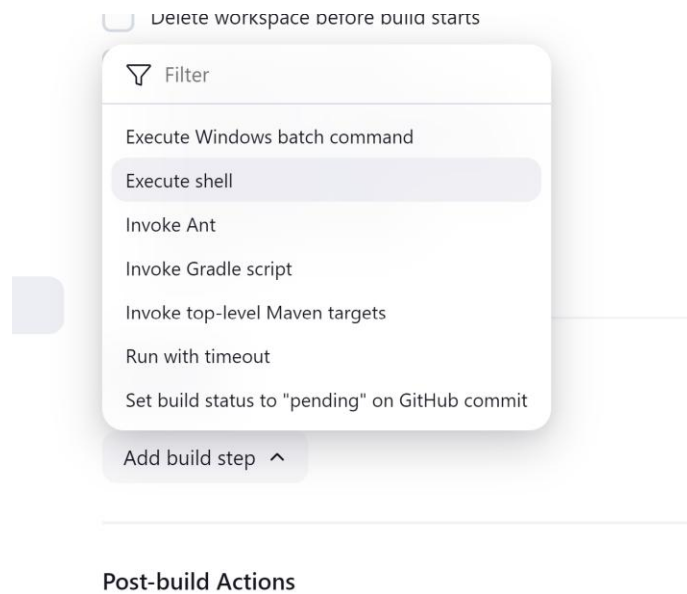
Type mkdir c:\kell and save it.

☰ **Execute Windows batch command** ⍰

Command

See the list of available environment variables

```
mkdir c:\kell
```

Dashboard 〉 testslave 〉

▤ **Status**

</> Changes

🗀 Workspace

▷ Build Now

⚙ Configure

🗑 Delete Project   Click Build Now.

> This PC > Windows (C:)

	Name
📌	📁 ashok
📌	📁 curl
📌	📁 dheeraj
📌	📁 java
📌	📁 jenkins
☑	📁 kell
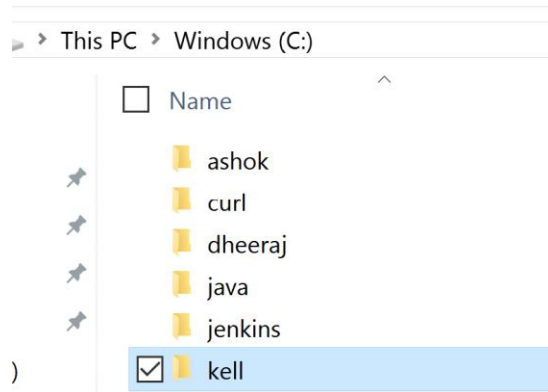
Installation of Plugins:

Dashboard > Manage Jenkins > Plugins

Plugins

🔍 jira

📥 Updates	②
🛍 **Available plugins**	
🧩 Installed plugins	
⚙ Advanced settings	

Install	Name ↓
☐	**Jira** 3.13 External Site/Tool Integrations Maven jira This plugin integrates Jenkins to Atlassian Jira.

🔍 gitlab

Install	Name ↓
☐	**GitLab** 1.8.1 Build Triggers This plugin allows GitLab to trigger Jenkins builds and display

Plugins

⬇ Updates	**2**	
🛍 Available plugins		
🧩 Installed plugins		
⚙ Advanced settings		
☰ **Download progress**		

Download progress

Preparation
- Checking internet connectivity
- Checking update center connectivity
- Success

Jersey 2 API   ⋯ Installing

GitLab   ⋯ Pending

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

→ ☐ Restart Jenkins when installation is complete and no jobs are running

Please wait while Jenkins is restarting ...

Your browser will reload automatically when Jenkins is ready.

Safe Restart
Builds on agents can usually continue.

Now you can see git lab.

☐ GitHub project

GitLab Connection

Pipelines:

1. Manually creating using GUI(declarative)
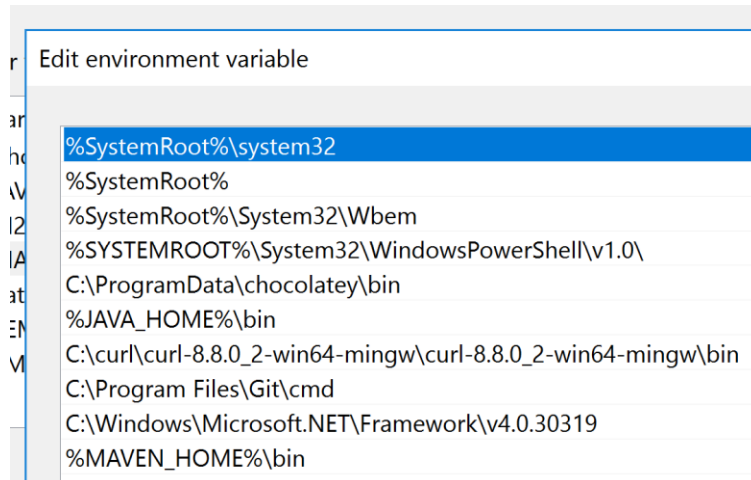2. Groove script.

Sample Project :

1. Install maven in the windows server.
2. Set proper env variables

JAVA_HOME	C:\java\jdk-17.0.10
M2_HOME	C:\maven
MAVEN_HOME	C:\maven
Path	%USERPROFILE%\AppData\Local\Micro

M2_HOME & MAVEN_HOME

Update the Path also.
Note update in system & user variables.

Edit environment variable

```
%SystemRoot%\system32
%SystemRoot%
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
C:\ProgramData\chocolatey\bin
%JAVA_HOME%\bin
C:\curl\curl-8.8.0_2-win64-mingw\curl-8.8.0_2-win64-mingw\bin
C:\Program Files\Git\cmd
C:\Windows\Microsoft.NET\Framework\v4.0.30319
%MAVEN_HOME%\bin
```

```
C:\Users\kumar>mvn --version
Apache Maven 3.9.8 (36645f6c9b5079805ea5009217e36f2cffd34256)
Maven home: C:\maven
Java version: 17.0.10, vendor: Oracle Corporation, runtime: C:\java\jdk-17.0.10
Default locale: en_US, platform encoding: Cp1252
OS name: "windows server 2016", version: "10.0", arch: "amd64", family: "windows"
```

Note : Add these Env variables in both System & User Level.

Login to Jenkins

Create a new item → select free style

Select that windows server with help of proper labels.

✓ Restrict where this project can be run ?

Label Expression ?

slaveserveranil

Label slaveserveranil matches 1 node. Permissions or other restrictions provided by plugins may further reduce that list.

Select source control → Git
URL is : https://github.com/cameronmcnz/rock-paper-scissors
No need to enter any password or credentials.

● Git ?

Repositories ?

Repository URL ?

https://github.com/cameronmcnz/rock-paper-scissors

Credentials ?

- none -

Branches to build ?

Branch Specifier (blank for 'any') ?

*/master

Add build step ⌃

Filter

Build a Visual Studio project or solution using MSBuild

Execute Windows batch command

Execute shell

Invoke Ant

Invoke Gradle script

Invoke top-level Maven targets

Select "Invoke top level maven targets" and in goal add "install"

Build Steps

≡ **Invoke top-level Maven targets** ?

Goals

install

Then Save & Apply. Run the Build Now

Console Output

Download   Copy

```
Started by user kumar
Running as SYSTEM
Building remotely on slaveserveranil in workspace c:\jenkins\workspace\maveninit
The recommended git tool is: NONE
No credentials specified
 > git rev-parse --resolve-git-dir c:\jenkins\workspace\maveninit\.git # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url https://github.com/cameronmcnz/rock-paper-scissors # timeout=10
Fetching upstream changes from https://github.com/cameronmcnz/rock-paper-scissors
 > git --version # timeout=10
 > git --version # 'git version 2.45.2.windows.1'
 > git fetch --tags --force --progress -- https://github.com/cameronmcnz/rock-paper-scissors
+refs/heads/*:refs/remotes/origin/* # timeout=10
```

Status
Changes
Console Output
Edit Build Information
Delete build '#5'
Timings
Git Build Data
Previous Build

```
[INFO] Running com.mcnz.rps.ScoreTest
[INFO] Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.001 s -- in com.mcnz.rps.ScoreTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 8, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO]
[INFO] --- jar:3.4.1:jar (default-jar) @ roshambo ---
[INFO]
[INFO] --- install:3.1.2:install (default-install) @ roshambo ---
[INFO] Installing c:\jenkins\workspace\maveninit\pom.xml to
C:\Users\kumar\.m2\repository\com\mcnz\rps\roshambo\1.0-SNAPSHOT\roshambo-1.0-SNAPSHOT.pom
[INFO] Installing c:\jenkins\workspace\maveninit\target\roshambo-1.0-SNAPSHOT.jar to
C:\Users\kumar\.m2\repository\com\mcnz\rps\roshambo\1.0-SNAPSHOT\roshambo-1.0-SNAPSHOT.jar
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  6.928 s
[INFO] Finished at: 2024-06-28T17:33:00Z
[INFO] ------------------------------------------------------------------------
Finished: SUCCESS
```

Create a Pipeline:

Login to Jenkins → manage Jenkins → tools

Maven installations

Maven installations ⌃   ✎ Edited

Add Maven

≡   **Maven**

Name

M3

MAVEN_HOME

C:\maven

⚠ C:\maven is not a directory on the Jenkins controller (but perhaps it exists on some agents)

☐ Install automatically ?

Save   Apply

Add M3 maven details. Un check "install automatically"
App & Save.

-------Now

Select new item → select pipeline -→ give any name
In pipeline , add below groovy script.
Note : In below script, I have added script should run only label server.

Pipeline

Definition

Pipeline script ⌄

Script ?

```
 1 ▾ pipeline {
 2 ▾     agent {
 3         label 'slaveserveranil'
 4     }
 5
 6 ▾     tools {
 7         // Install the Maven version configured as "M3" and add it to the path.
 8         maven "M3"
 9     }
10
11 ▾     stages {
12 ▾         stage('Build') {
13 ▾             steps {
14                 // Get some code from a GitHub repository
15                 git 'https://github.com/cameronmcnz/rock-paper-scissors'
16
17                 // Run Maven on a Unix agent.
18                 bat "mvn -Dmaven.test.failure.ignore=true clean package"
```

```
pipeline {
  agent {
  label 'slaveserveranil'
}

  tools {
    // Install the Maven version configured as "M3" and add it to the path.
    maven "M3"
  }

  stages {
    stage('Build') {
      steps {
        // Get some code from a GitHub repository
        git 'https://github.com/cameronmcnz/rock-paper-scissors'

        // Run Maven on a Unix agent.
        bat "mvn -Dmaven.test.failure.ignore=true clean package"

        // To run Maven on a Windows agent, use
        // bat "mvn -Dmaven.test.failure.ignore=true clean package"
      }

      post {
        // If Maven was able to run the tests, even if some of the test
        // failed, record the test results and archive the jar file.
```

```
    success {
        bat "echo hello its working"
    }
                }
            }
        }
    }
```

Click Build Now

pipelineSample > #4

✅ **Build #4 (28-Jun-2024, 6:01:12 pm)**

Output

d Information

uild '#4'

Started by user kumar

This run spent:

- 25 ms waiting;
- 16 sec build duration;
- 16 sec total from scheduled to completion.

Data

Overview

Console

git **Revision**: 385aa957fba8da6dfb2878e2ef953b5166ac0be0
Repository: https://github.com/cameronmcnz/rock-paper-scissors

- refs/remotes/origin/master

```
c:\jenkins\workspace\pipelineSample>echo hello its working
hello its working
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Jenkins script to Call Ansible

```
pipeline {
  agent { label 'linux' }
  environment {
   ANSIBLE_PRIVATE_KEY=credentials('mariadb-private-key')
  }
  stages {
    stage('Hello') {
      steps {
        sh 'ansible-galaxy collection install -r requirements.yml'
        sh 'ansible-playbook -i inventory/mariadb.hosts --private-key=$ANSIBLE_PRIVATE_KEY playbooks/mariadb.yml'
      }
    }
  }
}
```

Multi dependency trigger pipelines:

Build Triggers

☑ Build after other projects are built   ?

Projects to watch

pipelineSample

⦿ Trigger only if build is stable

◯ Trigger even if the build is unstable