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Experiment 6

Aim: To understand Jenkins Master-Slave Architecture and scale your Jenkins standalone implementation by implementing slave nodes.

Theory: Jenkins Distributed Architecture:

Jenkins uses a Master-Slave architecture tfo manage distributed builds. In this architecture, Master and Slave communicate through TCP/IP protocol.

Jenkins Master:

The main Jenkins server is the Master. The Master's job is to handle:

- Scheduling build jobs.
- Dispatching builds to the slaves for the actual execution.
- Monitor the slaves (possibly taking them online and offline as required).
- Recording and presenting the build results.
- A Master instance of Jenkins can also execute build jobs directly.

Jenkins Slave:

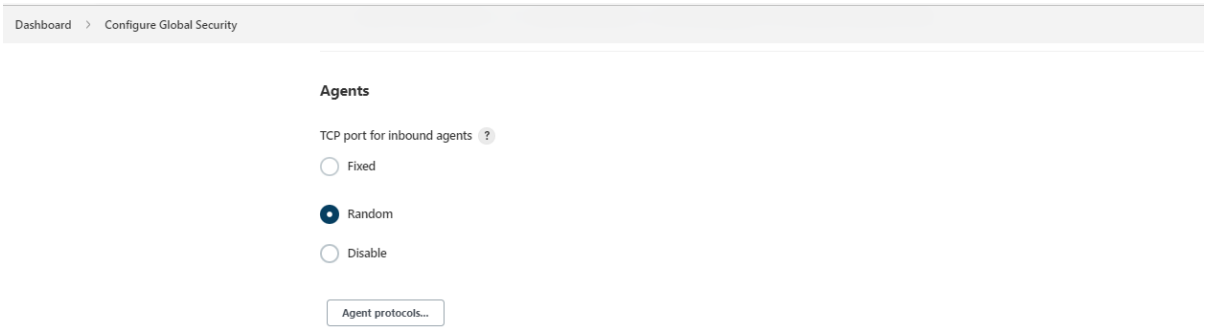
A Slave is a Java executable that runs on a remote machine. Following are the characteristics of Jenkins Slaves:

- It hears requests from the Jenkins Master instance.
- Slaves can run on a variety of operating systems.
- The job of a Slave is to do as they are told to, which involves executing build jobs dispatched by the Master.
- One can configure a project to always run on a particular Slave machine or a particular type of Slave machine, or simply let Jenkins pick the next available Slave.

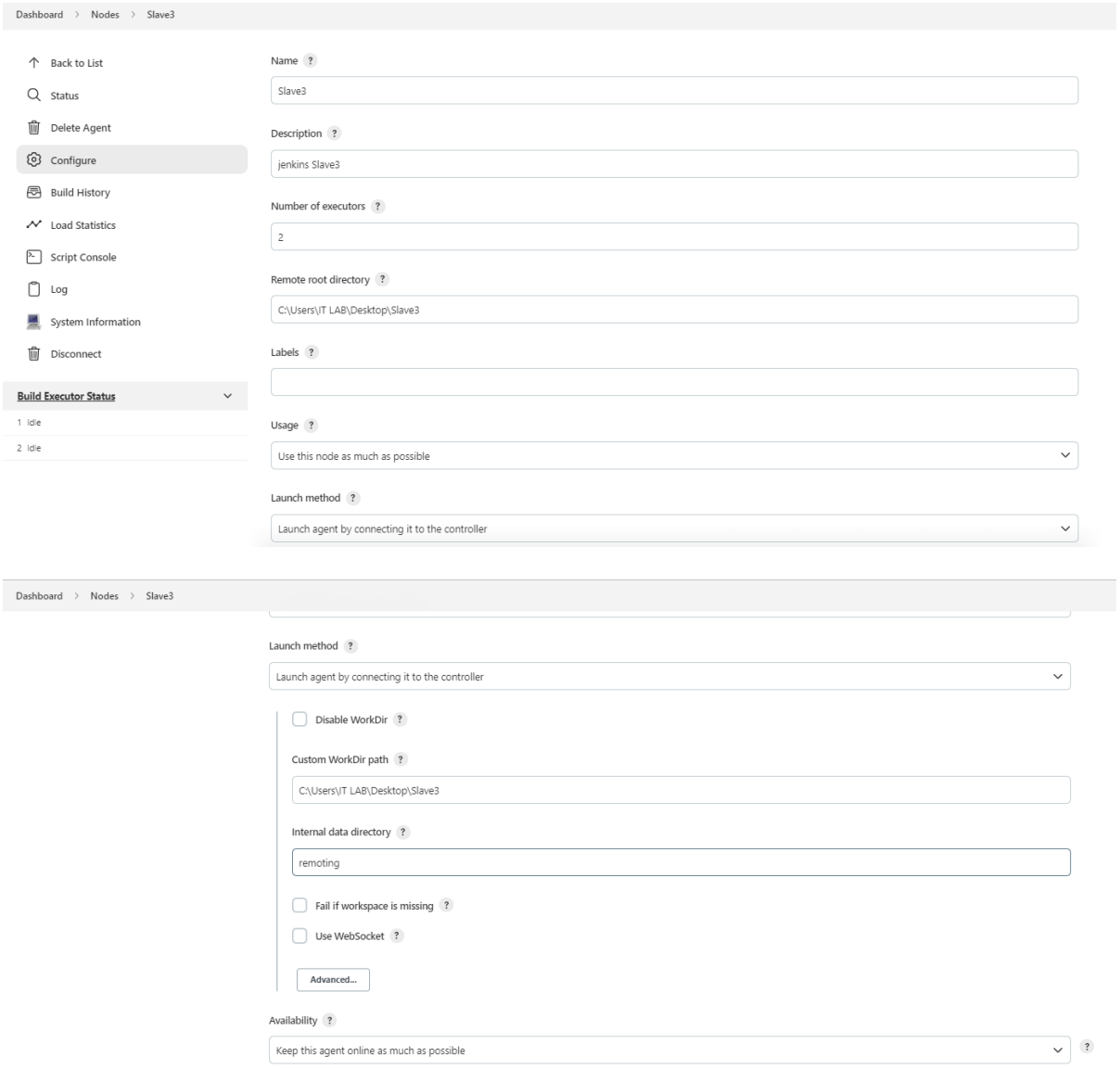
Below are the steps followed to implement the Jenkins Master-Slave architecture:

Output:

Step 1: Start Jenkins and go to Manage Plugins and click on Configure Global Security and Set Agents as Random.



Step 2: Create a Node and give the description and remote root directory for your node and click on Save



Step 3: In Node Properties, add the path of JAVA jdk

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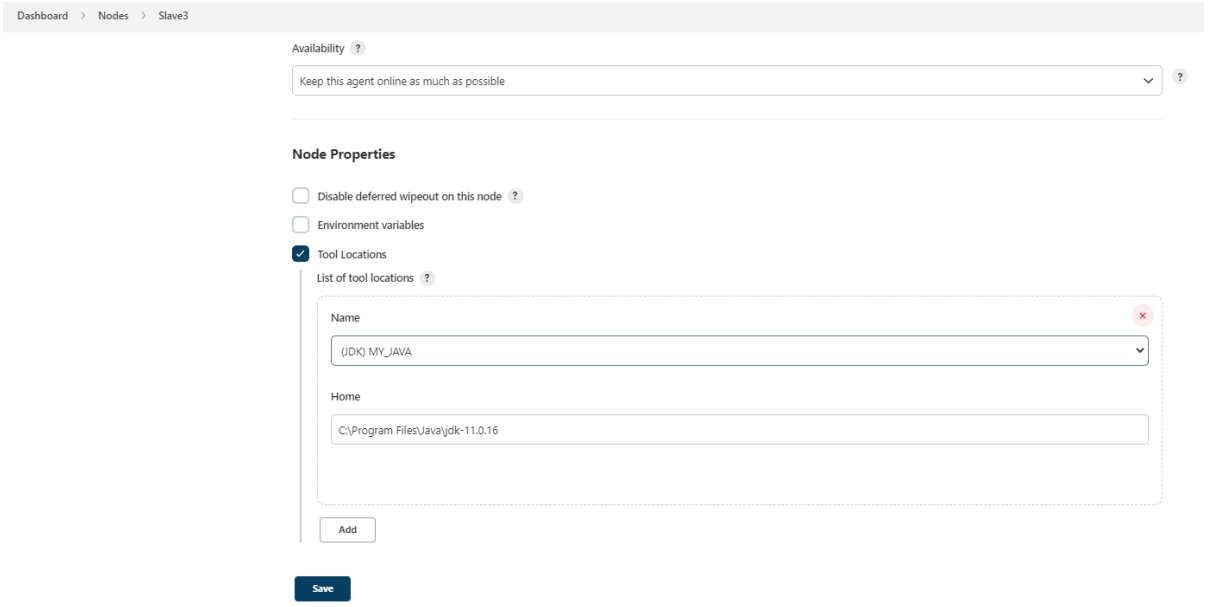
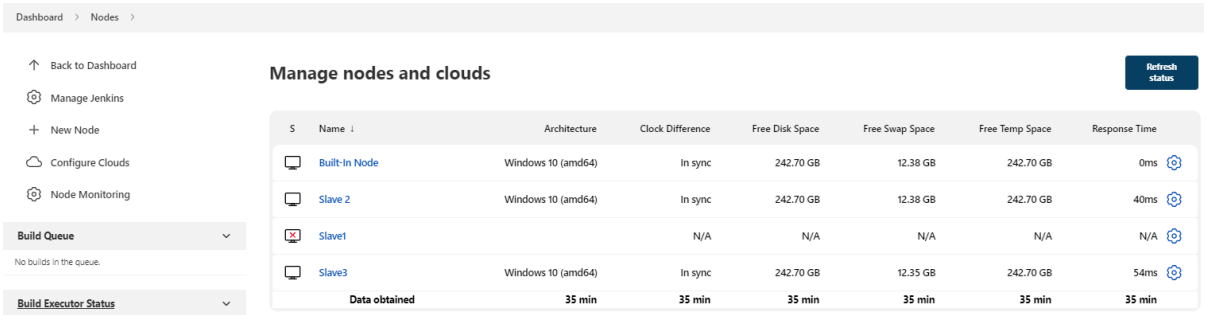


4. Connect the Slave

```
C:\>java -jar C:/agent2.jar -jnlpUrl http://localhost:8080/computer/Slave3/jenkins-agent.jnlp -workDir "C:\Users\IT LAB\Desktop\Slave3"
Sep 30, 2022 10:02:49 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using C:\Users\IT LAB\Desktop\Slave3\remoting as a remoting work directory
Sep 30, 2022 10:02:49 AM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to C:\Users\IT LAB\Desktop\Slave3\remoting
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main createEngine
INFO: Setting up agent: Slave3
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener <init>
INFO: Jenkins agent is running in headless mode.
Sep 30, 2022 10:02:49 AM hudson.remoting.Engine startEngine
INFO: Using Remoting version: 4.13.3
Sep 30, 2022 10:02:49 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using C:\Users\IT LAB\Desktop\Slave3\remoting as a remoting work directory
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Locating server among [http://localhost:8080/]
Sep 30, 2022 10:02:49 AM org.jenkinsci.remoting.engine.JnlpAgentEndpointResolver resolve
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Agent discovery successful
  Agent address: localhost
  Agent port:    54026
  Identity:      3f:19:d6:3e:e8:c1:6e:57:65:53:9c:14:73:ed:79:e9
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Handshaking
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connecting to localhost:54026
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Trying protocol: JNLP4-connect
Sep 30, 2022 10:02:49 AM org.jenkinsci.remoting.protocol.impl.BIONetworkLayer$Reader run
INFO: Waiting for ProtocolStack to start.
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Remote identity confirmed: 3f:19:d6:3e:e8:c1:6e:57:65:53:9c:14:73:ed:79:e9
Sep 30, 2022 10:02:49 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connected
```

Step 4: Go back to Nodes and now you can find your Slave3 is online



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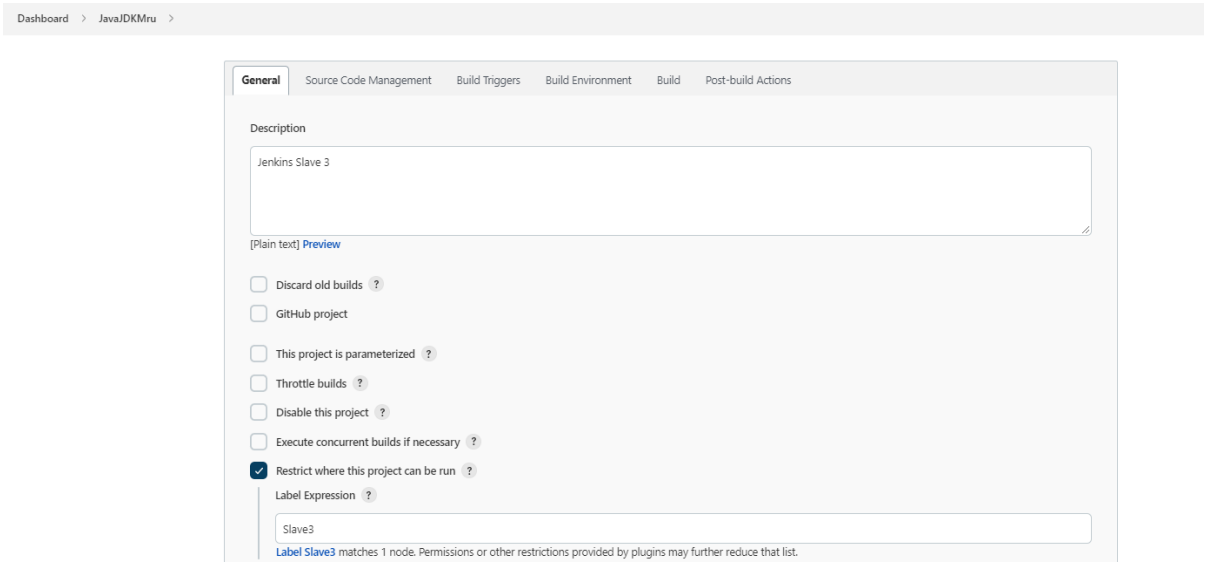
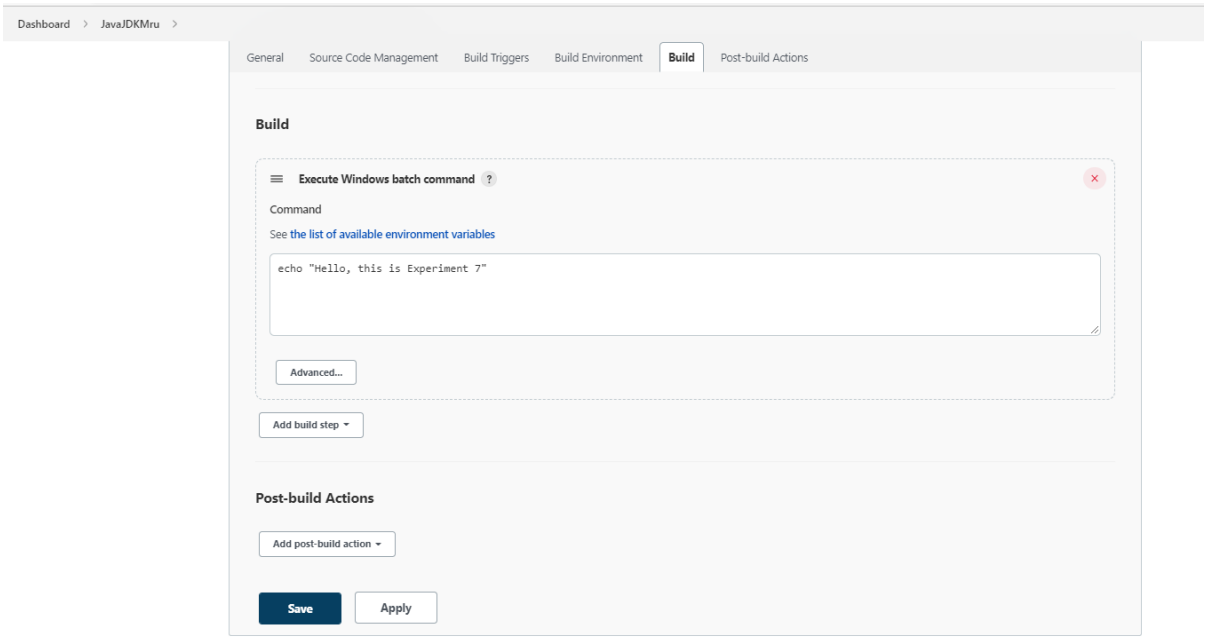
Step 5: Go to Dashboard and click on New item to create a new project





Step 6: Click on Build now and you will get the output as follows

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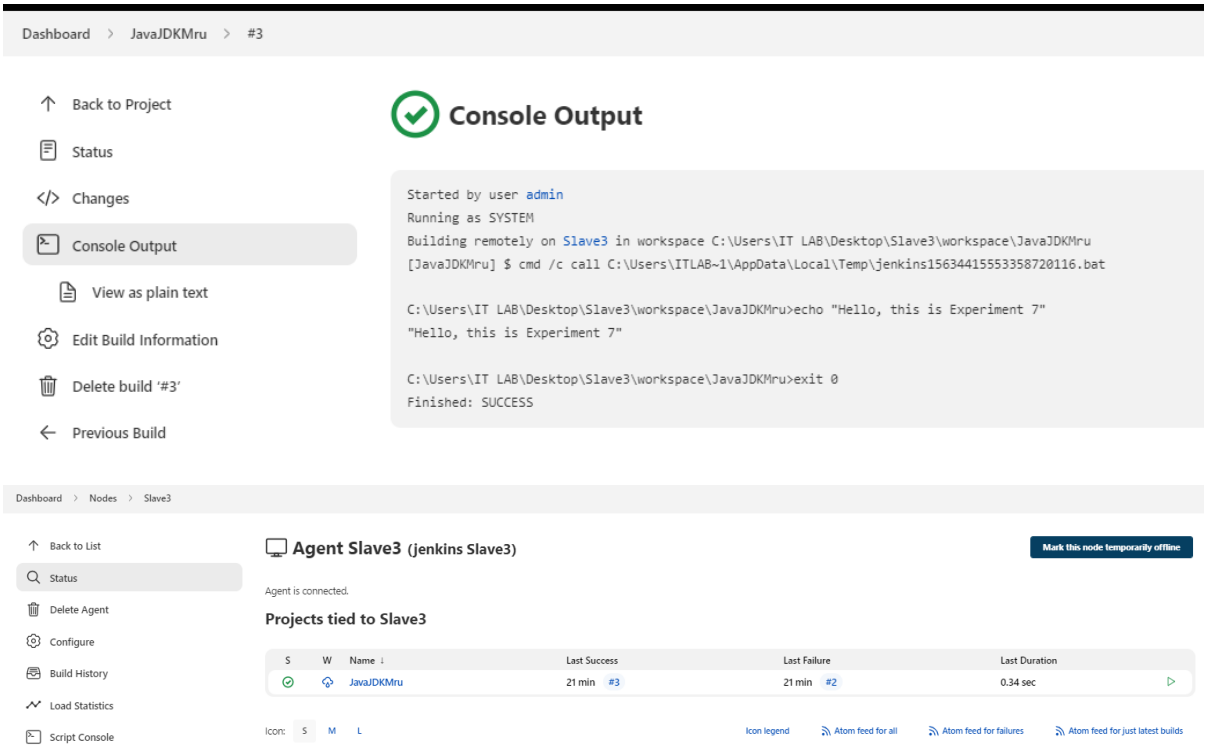

Conclusion:

From the above Experiment, we have Implemented the Master Slave architecture in Jenkins, which helped to understand the distributed architecture of Jenkins. In order to implement this experiment, two slave agents/nodes were created and tasks were built.Hence, with this experiment we have achieved the Lab Outcome Four (LO4).

POs Achieved: PO1, PO5, PO12