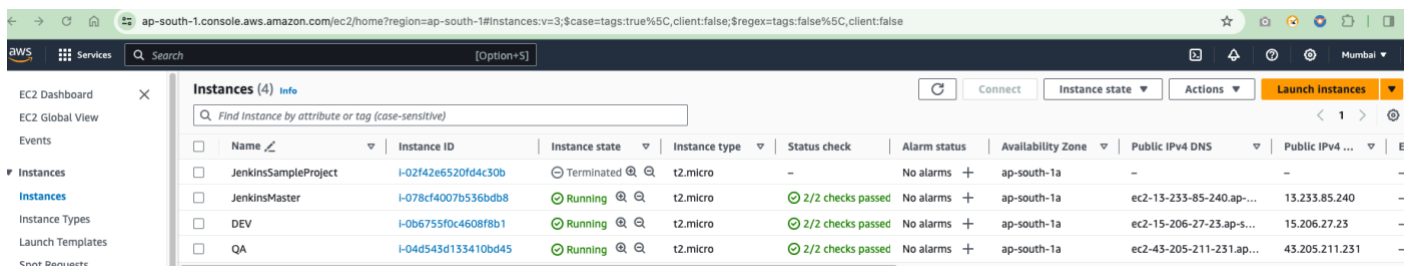# 💡Setting Up Jenkins on AWS EC2 with Master-Slave (Master-Agent) Architecture

As a part of the #LearningSeries, here's a detailed tutorial outlining the process of installing Jenkins on an AWS EC2 instance and setting up a resilient master-slave architecture to improve your QA and Dev workflows.

Master-Slave architecture: This is used for parallel executions. Master delegates the jobs to slaves(agents) based on the labels(ex. qa, dev, production etc..)

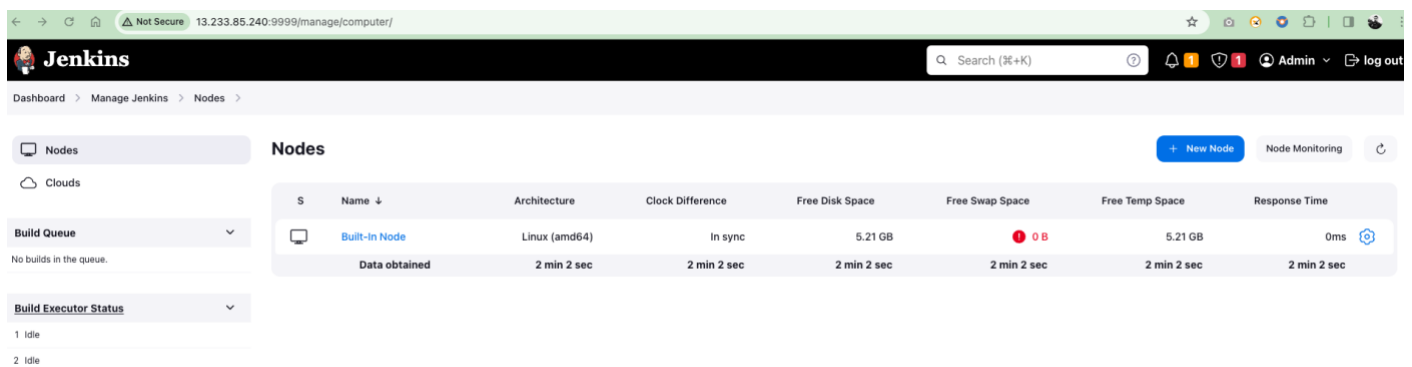**1** Create multiple EC2 instances as below and set up *Jenkins on Master instance*.

Refer below articles to create EC2 instance and setup Jenkins.

https://www.linkedin.com/posts/surajkhopkar_continuouslearning-automationwithjatin-awscloud-activity-7135000349144211457-0B_S?utm_source=share&utm_medium=member_desktop

https://www.linkedin.com/posts/surajkhopkar_continuouslearning-aws-ec2-activity-7136373221200719873-tP76?utm_source=share&utm_medium=member_desktop

2 Navigate to Jenkins URL (http://13.233.85.240:9999/ and login.

3 Navigate to Dashboard > Manage Jenkins > Nodes

4 Click on New Node. Assign Node name and make it as Permanent Agent. Click on Create.

Name ?

DEV

Description ?

Plain text Preview

Number of executors ?

1

Remote root directory ?

🚫 Remote directory is mandatory

Labels ?

Usage ?

Use this node as much as possible ⌄

Launch method ?

Launch agent by connecting it to the controller ⌄

- Enter Description.
- Number of executors: Number of parallel executions we need. As we are using t2 micro instance which is a free tier having only 1 core available, will keep it as low as possible, say 3.
- Remote directory keep it as empty.
- Enter label as say DEV. (We can have multiple labels)
- Under usage, select "Only build jobs with label expressions matching this node". This will allow to trigger build only when we pass the specific label.
- Under Launch method, select "Launch agent by connecting it to the controller"
- Select "Use WebSocket"WebSocket - Connection technique for two java based applications from different servers.
- Save the changes.

Nodes

+ New Node   Node Monitoring   ↻

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time	
🖥	Built-In Node	Linux (amd64)	In sync	5.21 GB	🚫 0 B	5.21 GB	0ms	⚙
☒	DEV		N/A	N/A	N/A	N/A	N/A	⚙
	Data obtained	9 ms	8 ms	6 ms	16 min	16 min	16 min	

5 Navigate to DEV

Run from agent command line: (Unix) 📋

```
curl -sO http://13.233.85.240:9999/jnlpJars/agent.jar
java -jar agent.jar -jnlpUrl http://13.233.85.240:9999/computer/DEV/jenkins-agent.jnlp -secret e892c2fcbb09fe1db9d3ddaaa7ebfb2c5451347fc584f5fe2ea750b9365f13f5 -workDir ""
```

Run from agent command line: (Windows) 📋

```
curl.exe -sO http://13.233.85.240:9999/jnlpJars/agent.jar
java -jar agent.jar -jnlpUrl http://13.233.85.240:9999/computer/DEV/jenkins-agent.jnlp -secret e892c2fcbb09fe1db9d3ddaaa7ebfb2c5451347fc584f5fe2ea750b9365f13f5 -workDir ""
```

Or run from agent command line, with the secret stored in a file: (Unix) 📋

```
echo e892c2fcbb09fe1db9d3ddaaa7ebfb2c5451347fc584f5fe2ea750b9365f13f5 > secret-file
curl -sO http://13.233.85.240:9999/jnlpJars/agent.jar
java -jar agent.jar -jnlpUrl http://13.233.85.240:9999/computer/DEV/jenkins-agent.jnlp -secret @secret-file -workDir ""
```

Or run from agent command line, with the secret stored in a file: (Windows) 📋

```
echo e892c2fcbb09fe1db9d3ddaaa7ebfb2c5451347fc584f5fe2ea750b9365f13f5 > secret-file
curl.exe -sO http://13.233.85.240:9999/jnlpJars/agent.jar
java -jar agent.jar -jnlpUrl http://13.233.85.240:9999/computer/DEV/jenkins-agent.jnlp -secret @secret-file -workDir ""
```

Note: PowerShell users must use curl.exe instead of curl because curl is a default PowerShell cmdlet alias for Invoke-WebRequest.

Projects tied to DEV

Node is added but it is still offline. We will have to execute above commands based on the OS.

6 Connect to slave instance(Dev) and execute below commands to connect DEV to Master.

sudo su

curl -sO http://13.233.85.240:9999/jnlpJars/agent.jar
java -jar agent.jar -jnlpUrl http://13.233.85.240:9999/computer/DEV/jenkins-agent.jnlp -secret
e892c2fcbb09fe1db9d3ddaaa7ebfb2c5451347fc584f5fe2ea750b9365f13f5 -workDir ""

```
ubuntu@ip-172-31-69:~$ sudo su
root@ip-172-31-38-69:/home/ubuntu# curl -sO http://13.233.85.240:9999/jnlpJars/agent.jar
root@ip-172-31-38-69:/home/ubuntu# ls
agent.jar
root@ip-172-31-38-69:/home/ubuntu# java -jar agent.jar -jnlpUrl http://13.233.85.240:9999/computer/DEV/jenkins-agent.jnlp -secret e892c2fcbb09fe1db9d3ddaaa7ebfb2c5451347fc584f5fe2ea750b9365f13f5 -workDir ""
Dec 02, 2023 3:25:47 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /remoting as a remoting work directory
Dec 02, 2023 3:25:47 PM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /remoting
Dec 02, 2023 3:25:47 PM hudson.remoting.jnlp.Main createEngine
INFO: Setting up agent: DEV
Dec 02, 2023 3:25:47 PM hudson.remoting.Engine startEngine
INFO: Using Remoting version: 3160.vd76b_9ddd10cc
Dec 02, 2023 3:25:47 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/ubuntu/remoting as a remoting work directory
Dec 02, 2023 3:25:48 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: WebSocket connection open
Dec 02, 2023 3:25:48 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connected
]
```

	Nodes		
	Clouds		

Nodes   **+ New Node**

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space
🖥	**Built-In Node**	Linux (amd64)	In sync	5.21 GB	❗ 0 B	5.21 GB
🖥	**DEV**	Linux (amd64)	4.2 sec ahead	N/A	N/A	N/A
	Data obtained	62 ms	0.22 sec	12 min	12 min	12 min

Build Queue ⌄

No builds in the queue.

Build Executor Status ⌄

🖥 **Built-In Node**
1 Idle
2 Idle

🖥 **DEV**
1 Idle
2 Idle
3 Idle

We can above, under DEV we have 3 executors added(maximum parallel executions possible). Built-in node is Master node.

Let's repeat Steps 4 and 5 for QA instance.

7 Create a sample freestyle project in Jenkins.

- Click on New Item -> Enter Project Name -> Click OK

- Under configuration, enable "Restrict where project can be run" and add label as DEV.

- Add basic build steps to execute and Save the changes.

*** When we click Build Now, Master will delegate the job to DEV(slave) as per the label passed and build will be executed.

Dashboard > SampleProject > #2 > Console Output

📄 Status

</> Changes

▣ Console Output

📄 View as plain text

✎ Edit Build Information

🗑 Delete build '#2'

← Previous Build

✓ **Console Output**

```
Started by user Admin
Running as SYSTEM
Building remotely on DEV in workspace /home/ubuntu/workspace/SampleProject
[SampleProject] $ /bin/sh -xe /tmp/jenkins256980424796425412.sh
+ pwd
/home/ubuntu/workspace/SampleProject
+ ls
+ echo this is sample project
this is sample project
Finished: SUCCESS
```

Do reach out to me in case of any Questions. Happy Learning. 🙂