

# Devops Jenkins Assignment

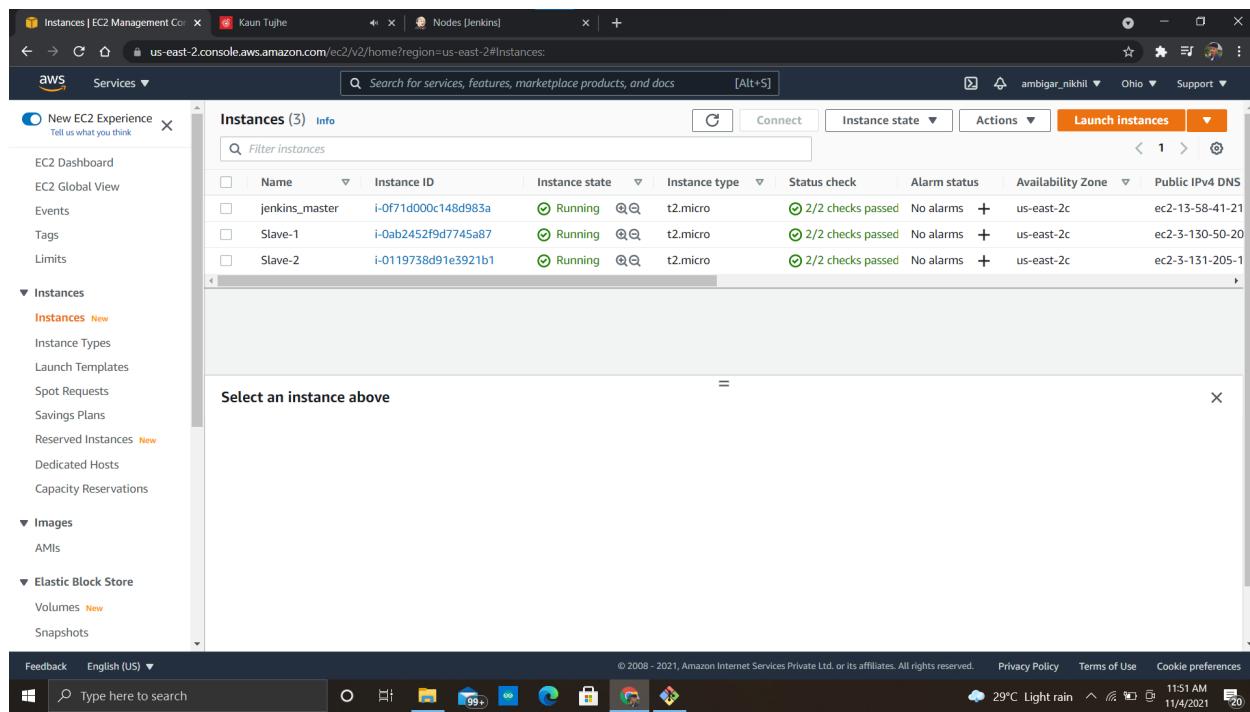
## Team - 03

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### Assignment-02: Jenkins Master Slave pipeline intellipaat.

Step-1: Firstly, we are creating three aws ec2 instances and naming them as jenkins\_master, slave-1, slave-2.



The screenshot shows the AWS EC2 Management Console interface. The left sidebar navigation includes 'Instances' (selected), 'New EC2 Experience', 'EC2 Dashboard', 'EC2 Global View', 'Events', 'Tags', 'Limits', 'Images', 'AMIs', and 'Elastic Block Store'. The main content area displays a table titled 'Instances (3) Info' with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IPv4 DNS. The table lists three instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
jenkins_master	i-0f71d000c148d983a	Running	t2.micro	2/2 checks passed	No alarms	us-east-2c	ec2-13-58-41-21
Slave-1	i-0ab2452f9d7745a87	Running	t2.micro	2/2 checks passed	No alarms	us-east-2c	ec2-3-130-50-20
Slave-2	i-0119738d91e5921b1	Running	t2.micro	2/2 checks passed	No alarms	us-east-2c	ec2-3-131-205-1

A modal dialog box at the bottom center says 'Select an instance above' with a close button 'X'.

## Step-2: Creating three elastic IP addresses and associating these elastic IP addresses to the ec2 instances.

Name	Allocated IPv4 add...	Type	Allocation ID	Reverse DNS record
jenkins_master	135.41.216	Public IP	eipalloc-016645518e513e695	-
Slave-1	3.130.50.206	Public IP	eipalloc-0f434da3b65ce35a6	-
Slave-2	3.131.205.11	Public IP	eipalloc-08c2235d2b63890ef	-

## Step-3: Install Jenkins on jenkins\_master ec2 instance.

Commands to install Jenkins on ubuntu ec2 instance.

```
sudo apt-get update -y
sudo apt-get install openjdk-8-jdk
wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key
| sudo apt-key add -
sudo sh -c 'echo deb https://pkg.jenkins.io/debian-stable
binary/ > \
/etc/apt/sources.list.d/jenkins.list'
sudo apt-get update
apt-get install jenkins
sudo service jenkins start
```

Welcome to Jenkins!

This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.

Start building your software project

Create a job →

Step-4: Creating two nodes. (one for ec2 slave-1 instance and the other for ec2 slave-2 instance.)

S	Name	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
1	master	Linux (amd64)	In sync	5.08 GB	0 B	5.08 GB	0ms
2	Slave-1		N/A	N/A	N/A	N/A	N/A
3	Slave-2		N/A	N/A	N/A	N/A	N/A

## Step-5:

Download agent.jar from Slave-1 node and using Filezilla, transfer that file to slave-1 ec2 instance.

The screenshot shows the Jenkins Agent Slave-1 configuration page. It includes instructions for connecting the agent via browser or command line, and a list of projects tied to the slave.

**Agent Slave-1**

Connect agent to Jenkins one of these ways:

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

```
java -jar agent.jar -jnlpUrl http://13.58.41.216:8080/computer/Slave-1/jenkins-agent.jnlp -secret 9bd56b5fba18722212012aed8d6bc5f567286e74b9210c8a83ebbc66bd57fe90 -workDir "/home/ubuntu/jenkins"
```

Run from agent command line, with the secret stored in a file:

```
echo 9bd56b5fba18722212012aed8d6bc5f567286e74b9210c8a83ebbc66bd57fe90 > secret-file
java -jar agent.jar -jnlpUrl http://13.58.41.216:8080/computer/Slave-1/jenkins-agent.jnlp -secret @secret-file -workDir "/home/ubuntu/jenkins"
```

**Projects tied to Slave-1**

None

The screenshot shows the FileZilla interface with two panes. The left pane shows the local site (C:\Users\Nikhil) and the right pane shows the remote site (/home/ubuntu). The file 'agent.jar' is selected in the remote site pane, indicating it is being transferred.

**FileZilla**

Host: sftp://ubuntu@3.130.50.206 - FileZilla

Local site: C:\Users\Nikhil

Remote site: /home/ubuntu

Filename	Filesize	Filetype	Last modified	Permiss...	Owner/Gr...
..					
atom		File folder	7/17/2021 11:4...		
.cache		File folder	1/1/2020 8:15...		
.conda		File folder	11/24/2020 12...		
.config		File folder	9/23/2021 5:36...		
docker		File folder	9/25/2021 10:4...		
eclipse		File folder	5/2/2020 4:45...		
.ipython_checkpoints		File folder	12/20/2020 11...		
.ipython		File folder	9/23/2020 11:2...		
jenkins		File folder	11/3/2021 12:1...		
jupyter		File folder	11/24/2020 12...		
kube		File folder	11/2/2021 1:05...		
.matplotlib		File folder	9/23/2020 11:2...		
.minikube		File folder	9/25/2021 1:28...		
p2		File folder	1/5/2021 10:07...		
14 files and 64 directories. Total size: 6,863,676 bytes					
7 files and 3 directories. Total size: 1,512,883 bytes					

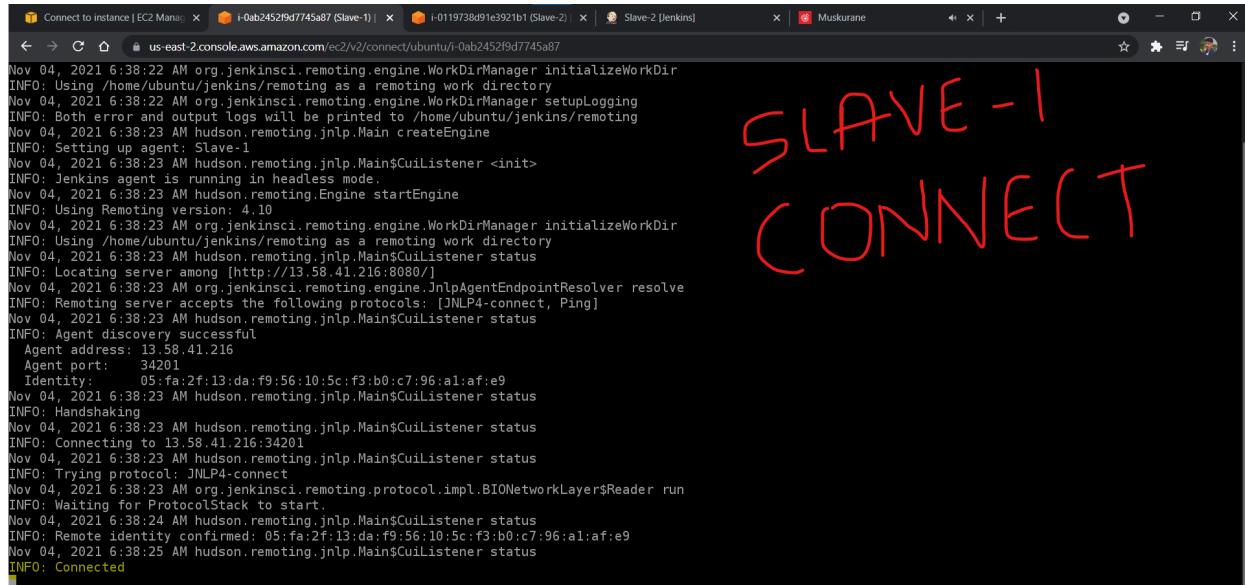
## Step-5:

Download agent.jar from Slave-2 node and using Filezilla, transfer that file to slave-2 ec2 instance.

The screenshot shows two windows side-by-side. The left window is a browser displaying the Jenkins Agent Slave-2 configuration page. It includes sections for 'Status' (with options like 'Delete Agent', 'Configure', 'Build History', 'Load Statistics', and 'Log'), 'Build Executor Status' (showing 'None'), and 'Projects tied to Slave-2' (also showing 'None'). The right window is a FileZilla interface showing a connection to 'slave-2' at 'sftp://ubuntu@3.131.205.11'. The local site is 'C:\Users\Nikhil' and the remote site is '/home/ubuntu'. The 'agent.jar' file is selected in the local site list, and its details are shown in the preview pane: 'Filename: agent.jar', 'Filesize: 1,507,326', 'Filetype: Executable', 'Last modified: 11/3/2021 12:11:11 PM', 'Permissions: -rw-rw-r--', 'Owner/Group: ubuntu'. The status bar at the bottom of the FileZilla window shows 'Queue: empty'.

## Step-6:

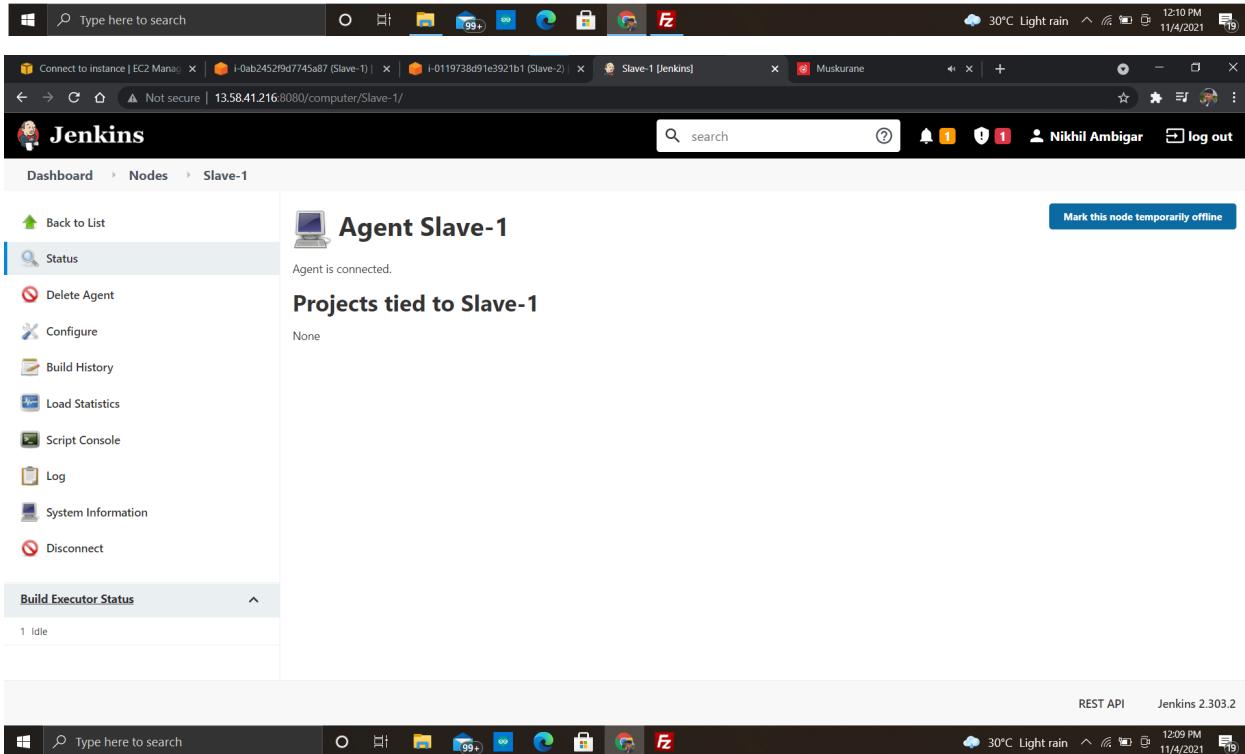
Run the command on the ec2 instances so that we can connect the nodes to the Jenkins.



```
Nov 04, 2021 6:38:22 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/ubuntu/jenkins/remoting as a remoting work directory
Nov 04, 2021 6:38:22 AM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /home/ubuntu/jenkins/remoting
Nov 04, 2021 6:38:23 AM hudson.remoting.jnlp.Main createEngine
INFO: Setting up agent: Slave-1
Nov 04, 2021 6:38:23 AM hudson.remoting.jnlp.Main$CuiListener <init>
INFO: Jenkins agent is running in headless mode.
Nov 04, 2021 6:38:23 AM hudson.remoting.Engine startEngine
INFO: Using Remoting version: 4.10
Nov 04, 2021 6:38:23 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/ubuntu/jenkins/remoting as a remoting work directory
Nov 04, 2021 6:38:23 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Locating server among [http://13.58.41.216:8080]
Nov 04, 2021 6:38:23 AM org.jenkinsci.remoting.engine.JnlpAgentEndpointResolver resolve
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Nov 04, 2021 6:38:23 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Agent discovery successful
  Agent address: 13.58.41.216
  Agent port: 34201
  Identity: 05:fa:2f:13:da:f9:56:10:5c:f3:b0:c7:96:a1:af:e9
Nov 04, 2021 6:38:23 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Handshaking
Nov 04, 2021 6:38:23 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connecting to 13.58.41.216:34201
Nov 04, 2021 6:38:23 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Trying protocol: JNLP4-connect
Nov 04, 2021 6:38:23 AM org.jenkinsci.remoting.protocol.impl.BIONetworkLayer$Reader run
INFO: Waiting for ProtocolStack to start.
Nov 04, 2021 6:38:24 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Remote identity confirmed: 05:fa:2f:13:da:f9:56:10:5c:f3:b0:c7:96:a1:af:e9
Nov 04, 2021 6:38:25 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connected
```

i-0ab2452f9d7745a87 (Slave-1)

Public IPs: 3.130.50.206 Private IPs: 172.31.36.172



Jenkins

Dashboard > Nodes > Slave-1

Agent Slave-1

Status

Projects tied to Slave-1

None

Build Executor Status

1 Idle

REST API Jenkins 2.303.2

```

Nov 04, 2021 6:39:54 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/ubuntu/jenkins/remoting as a remoting work directory
Nov 04, 2021 6:39:54 AM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /home/ubuntu/jenkins/remoting
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main createEngine
INFO: Setting up agent: Slave-2
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main$CuiListener <init>
INFO: Jenkins agent is running in headless mode.
Nov 04, 2021 6:39:55 AM hudson.remoting.Engine startEngine
INFO: Using Remoting version: 4.10
Nov 04, 2021 6:39:55 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/ubuntu/jenkins/remoting as a remoting work directory
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Locating server among [http://13.58.41.216:8080/]
Nov 04, 2021 6:39:55 AM org.jenkinsci.remoting.engine.JnlpAgentEndpointResolver resolve
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Agent discovery successful
  Agent address: 13.58.41.216
  Agent port: 34201
  Identity: 05:fa:2f:13:da:f9:56:10:5c:f3:b0:c7:96:a1:af:e9
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Handshaking
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connecting to 13.58.41.216:34201
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Trying protocol: JNLP4-connect
Nov 04, 2021 6:39:55 AM org.jenkinsci.remoting.protocol.impl.BIONetworkLayer$Reader run
INFO: Waiting for ProtocolStack to start.
Nov 04, 2021 6:39:55 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Remote identity confirmed: 05:fa:2f:13:da:f9:56:10:5c:f3:b0:c7:96:a1:af:e9
Nov 04, 2021 6:39:57 AM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connected

```

i-0119738d91e3921b1 (Slave-2)

Public IPs: 3.131.205.11 Private IPs: 172.31.35.96

Type here to search

Connect to instance | EC2 Manager | i-0ab2452f9d7745a87 (Slave-1) | i-0119738d91e3921b1 (Slave-2) | Slave-2 [Jenkins] | Pal

30°C Light rain 12:12 PM 11/4/2021

## Jenkins

Dashboard > Nodes > Slave-2

**Agent Slave-2**

Agent is connected.

**Projects tied to Slave-2**

None

**Build Executor Status**

1 Idle

REST API Jenkins 2.303.2

30°C Light rain 12:14 PM 11/4/2021

S	Name	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	master	Linux (amd64)	In sync	4.79 GB	0 B	4.79 GB	0ms
	Slave-1	Linux (amd64)	In sync	5.09 GB	0 B	5.09 GB	68ms
	Slave-2	Linux (amd64)	In sync	5.09 GB	0 B	5.09 GB	71ms

Data obtained 4 min 36 sec 4 min 36 sec

**Build Queue**  
No builds in the queue.

**Build Executor Status**

- master
  - 1 Idle
  - 2 Idle
- Slave-1
  - 1 Idle
- Slave-2
  - 1 Idle

## Step-7:

Install docker on Slave-1 and Slave-2 ec2 instances.

```

ubuntu@ip-172-31-36-172: ~
[11:04:00] [Nikhil Ambigar] [Windows Terminal]
$ ssh -i "jenkins.pem" ubuntu@ec2-3-130-50-206.us-east-2.compute.amazonaws.com
The authenticity of host 'ec2-3-130-50-206.us-east-2.compute.amazonaws.com (3.130.50.206)' can't be established.
ED25519 key fingerprint is SHA256:Y25jNVdHqMyZg6jCJ16FT65xyrw065VHF+Wh0QgAas.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-130-50-206.us-east-2.compute.amazonaws.com' (E
D25519) to the list of known hosts.
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.4.0-1045-aws x86_64)

 * Documentation: https://help.ubuntu.co
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

System information as of Thu Nov 4 06:50:35 UTC 2021

System Load: 0.0          Processes:           113
Usage of /: 33.6% of 7.69GB  Users Logged In: 1
Memory usage: 38%          IPv4 address for docker0: 172.17.0.1
Swap usage: 0%             IPv4 address for eth0: 172.31.36.172

* Ubuntu Pro delivers the most comprehensive open source security and
  compliance features.
  https://ubuntu.com/aws/pro

138 updates can be applied immediately.
72 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Last login: Thu Nov 4 06:37:42 2021 from 3.16.146.1
ubuntu@ip-172-31-36-172:~$ java -version
openjdk version "1.8.0_292"
OpenJDK 64-Bit Server VM (build 25.292-b10 mixed mode)
ubuntu@ip-172-31-36-172:~$ docker --version
Docker version 20.10.7, build 20.10.7-0ubuntu1~20.04.2
ubuntu@ip-172-31-36-172:~$
```

```

ubuntu@ip-172-31-35-96: ~
$ cd /opt/jenkins-pipeline/ec2-3-131-205-11.us-east-2.compute.amazonaws.com
$ ssh -o StrictHostKeyChecking=no ec2-3-131-205-11.us-east-2.compute.amazonaws.com (3.13.1.205.11)
Warning: Authentication failed for user 'ec2-3-131-205-11.us-east-2'@compute.amazonaws.com (3.13.1.205.11).
The authenticity of host 'ec2-3-131-205-11.us-east-2.compute.amazonaws.com (3.13.1.205.11)' can't be established.
ED25519 key fingerprint is SHA256:NfQvsHeTp/z6eyM4eD0u03tgqaxY/MaG864TNbOve.
This key is known to you.
Are you sure you want to connect? (yes/no/[fingerprint])? yes
warning: Permanently added 'ec2-3-131-205-11.us-east-2.compute.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.4.0-1045-aws x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

 System information as of Thu Nov  4 06:51:09 UTC 2021

System load: 0.0          Processes:           114
Usage of /:   33.6% of 7.69GB  Users logged in:        1
Memory usage:  1.1GB          IPv4 address for docker0: 172.17.0.1
Swap usage:   0%              IPv4 address for eth0: 172.31.35.96

* Ubuntu Pro delivers the most comprehensive open source security and
  compliance features.

https://ubuntu.com/aws/pro

138 updates can be applied immediately.
72 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Last login: Thu Nov  4 06:37:49 2021 from 3.16.146.0
ubuntu@ip-172-31-35-96:~$ java -version
openjdk version "1.8.0_292"
OpenJDK Runtime Environment (Build 1.8.0_292-b10-Ubuntu1-20.04-b10)
OpenJDK 64-Bit Server VM (Build 25-292-b10, mixed mode)
ubuntu@ip-172-31-35-96:~$ docker --version
Docker version 20.10.7, build 20.10.7-0ubuntu1-20.04.2
ubuntu@ip-172-31-35-96:~$ 

```

## Step 8:

Create two jobs (test for Slave-1 and prod for Slave-2)

In configure, we are setting source code management as git and passing our Github repo link, in build we are selecting execute shell and writing some commands to run.

All	CICD	+			
S	W	Name	Last Success	Last Failure	Last Duration
		Prod	1 min 55 sec - #4	15 min - #2	1.8 sec
		Test	2 min 6 sec - #4	29 min - #2	3.5 sec

Icon: S M L

Legend: Atom feed for all Atom feed for failures Atom feed for just latest builds

**Build Queue**  
No builds in the queue.

**Build Executor Status**

- master**
  - 1 idle
  - 2 idle
- Slave-1**
  - 1 idle

## Step 9: Build Test job.

The screenshot shows a web browser window with multiple tabs open. The active tab is 'Test [Jenkins]' at the URL [13.58.41.216:8080/job/Test/](http://13.58.41.216:8080/job/Test/). The page displays the Jenkins Test project dashboard. On the left, there's a sidebar with links like 'Back to Dashboard', 'Status', 'Changes', 'Workspace', 'Build Now', 'Configure', 'Delete Project', 'GitHub', and 'Rename'. Below this is a 'Build History' section with a search bar and a list of builds: #4 (Nov 4, 2021 7:42 AM), #3 (Nov 4, 2021 7:17 AM), #2 (Nov 4, 2021 7:15 AM), and #1 (Nov 4, 2021 7:01 AM). The main content area is titled 'Project Test' and includes sections for 'Workspace' (with a link to 'Recent Changes'), 'Downstream Projects' (listing 'Prod'), and 'Permalinks' (a bulleted list of recent builds). The top right of the dashboard has buttons for 'add description' and 'Disable Project'. The browser's address bar shows the URL. The bottom of the screen shows the Windows taskbar with various pinned icons and system status information.

The screenshot shows the Jenkins interface for a 'Test' job. The 'Console Output' tab is selected, displaying the build logs. The logs indicate a successful build process, starting with cloning from a GitHub repository and ending with a 'SUCCESS' status.

```

Started by user Nikhil Ambigar
Running as SYSTEM
Building remotely on Slave-1 in workspace /home/ubuntu/workspace/Test
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
Cloning repository https://github.com/hshar/devopsIQ.git
> git init /home/ubuntu/workspace/Test # timeout=10
Fetching upstream changes from https://github.com/hshar/devopsIQ.git
> git --version # timeout=10
> git --version # 'git version 2.25.1'
> git fetch --tags --force --progress -- https://github.com/hshar/devopsIQ.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git config remote.origin.url https://github.com/hshar/devopsIQ.git # timeout=10
> git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision cc26380b7f45bfcf31831fc4f4f6e438fd6e2ab2 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f cc26380b7f45bfcf31831fc4f4f6e438fd6e2ab2 # timeout=10
Commit message: "Set up CI with Azure Pipelines"
First time build. Skipping changelog.
Finished: SUCCESS

```

REST API Jenkins 2.303.2

## Step 10: Build prod job.

The screenshot shows the Jenkins interface for a 'Prod' job. The 'Build Now' button is highlighted. The 'Build History' section shows four builds: #3 (Nov 4, 2021 7:32 AM) which succeeded, and #2, #1, and #0 which failed. The 'Recent Changes' and 'Workspace' sections are also visible.

**Project Prod**

- Build Now
- Configure
- Delete Project
- GitHub
- Rename

**Permalinks**

- Last build (#2), 1 min 41 sec ago
- Last failed build (#2), 1 min 41 sec ago
- Last unsuccessful build (#2), 1 min 41 sec ago
- Last completed build (#2), 1 min 41 sec ago

**Build History**

#	Date
③ #3	Nov 4, 2021 7:32 AM
✖ #2	Nov 4, 2021 7:29 AM
✖ #1	Nov 4, 2021 7:28 AM

30°C Partly sunny 1:03 PM 11/4/2021

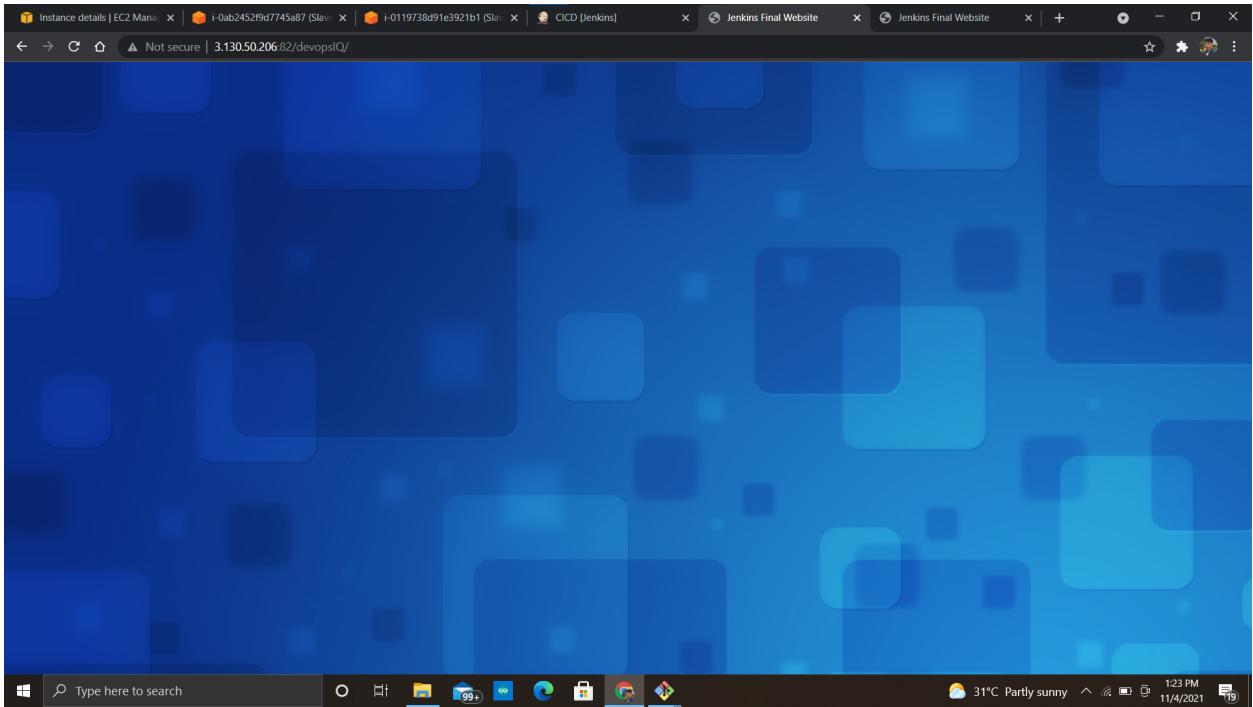
The screenshot shows the Jenkins interface for the 'Prod' project. On the left, a sidebar lists various project management options like Status, Changes, Workspace, and Build Now. The main area is titled 'Project Prod' and displays 'Upstream Projects' (Test) and 'Permalinks'. Below this, a 'Build History' section shows five builds: #4 (Nov 4, 2021 7:42 AM), #3 (Nov 4, 2021 7:32 AM), #2 (Nov 4, 2021 7:29 AM), and #1 (Nov 4, 2021 7:28 AM). The status of build #4 is 'Last build (#4), 9 min 17 sec ago'. At the bottom, a Windows taskbar shows the date as 11/4/2021.

## Step-11: Creating the pipeline

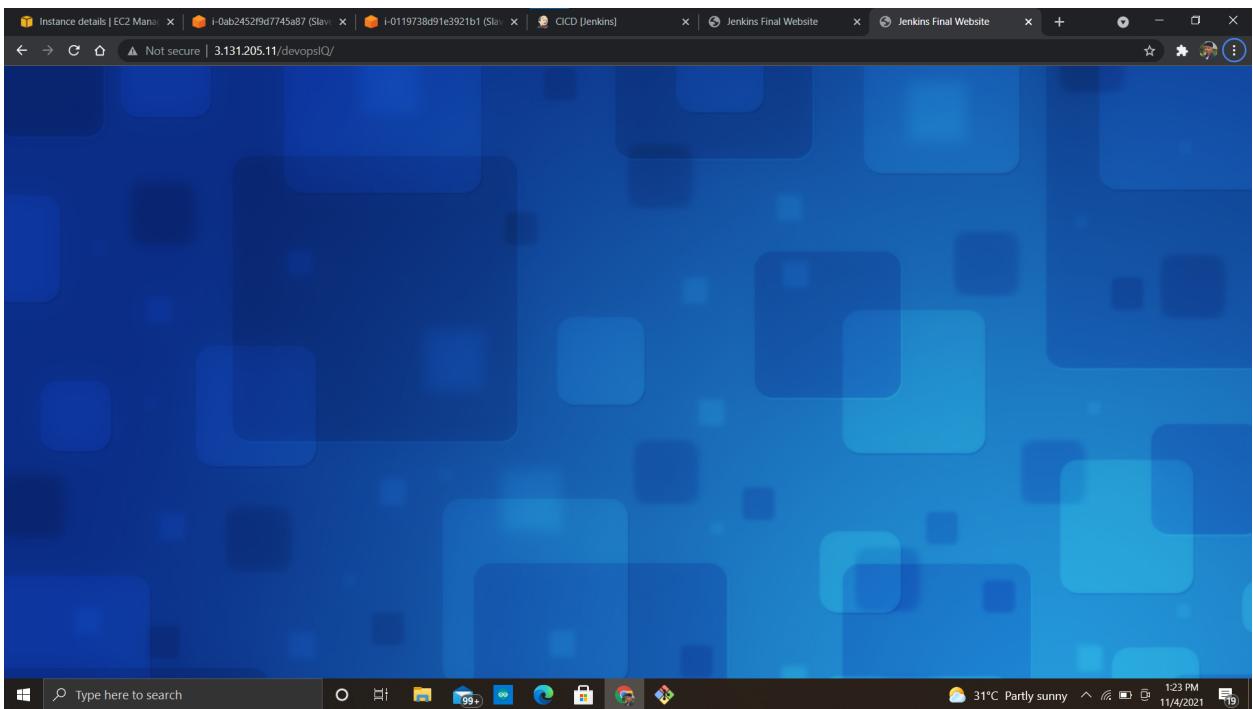
The screenshot shows the Jenkins interface for the 'CICD' pipeline. The main title is 'Build Pipeline: CICD'. Below it, there are two parallel pipeline runs: '#4 Test' and '#4 Prod'. Both runs show a single step: 'Nov 4, 2021 7:42:43 AM' with a duration of '3.5 sec' for the test run and '1.8 sec' for the prod run. The Jenkins logo is visible at the top right of the browser window.



Step-12: After successfully building our project we can see our website using slave-1 IP at port 82.



We can similarly, see our website using slave-2 IP at port 82.



Thank you!