

DevOps Project

>> Creating Html file

Index.html

simple app

```
<html>

<head>

</head>

<body>

    <p>Welcome to HTML web page created by Aravindu Bodadasari</p>

</body>

</html>
```

>> Creating Dockerfile without any extension file...

Dockerfile for index.html app with help of nginx server from Docker account

wikipedia.org/wiki/nginx



How to use this image

Hosting some simple static content

```
$ docker run --name some-nginx -v /some/content:/usr/share/nginx/html:ro -d nginx
```

Alternatively, a simple `Dockerfile` can be used to generate a new image that includes the necessary content (which is a much cleaner solution than the bind mount above):

```
FROM nginx
COPY static-html-directory /usr/share/nginx/html
```

FROM nginx

COPY Index.html /usr/share/nginx/html

>> Pushing the index file code to git hub and making local folder as git repository

Git is from my local machine

```
MINGW64:/c:/Users/Dell/OneDrive/Desktop/DevOps Project
Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git init
Reinitialized existing Git repository in C:/Users/Dell/OneDrive/Desktop/DevOps Project/.git/

Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ ls -la
./ ../ .git/ Dockerfile Index.html

Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git add .

Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git commit -m "initial commit"
[master (root-commit) 7483e7a] initial commit
2 files changed, 15 insertions(+)
create mode 100644 Dockerfile
create mode 100644 Index.html

Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git config --global user.mail "aravindb402@gmail.com"

Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git config --global user.name "aravindu"

Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git status
On branch master
nothing to commit, working tree clean

Dell@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$
```

>> Creating new remote repository from git hub

Create a new repository

A repository contains all project files, including the revision history. Already have a p
[Import a repository.](#)

Required fields are marked with an asterisk (*).

Owner *	Repository name *
 aravindubodadasari	/ devops_project
	✓ devops_project is available.

...or create a new repository on the command line

```
echo "# devops_project" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin https://github.com/aravindubodadasari/devops_project.git
git push -u origin main
```

>> Connecting remote repository from local repository

```
git remote add origin https://github.com/aravindubodadasari/devops_project.git
```

Setting up Token based authentication to my git URL and generating Token to git hub repository

The screenshot shows the GitHub Developer Settings page. On the left sidebar, 'Personal access tokens' is selected, with 'Tokens (classic)' highlighted. A red circle is drawn around this option. On the right, the 'Personal access tokens (classic)' section is visible. A dropdown menu is open, showing 'Generate new token (Beta)' and 'Generate new token (classic)'. The 'Generate new token (classic)' option is circled in red. Below this, the 'Note' section shows the token name 'devops_token' circled in red. The 'Expiration' section shows '30 days' selected, also circled in red. The 'Select scopes' section is circled in red, showing a list of scopes with checkboxes: 'repo' (checked), 'repo:status' (checked), 'repo_deployment' (checked), 'public_repo' (checked), 'repo:invite' (checked), 'security_events' (checked), 'workflow' (unchecked), 'write:packages' (checked), 'read:packages' (checked), 'delete:packages' (checked), 'admin:org' (checked), and 'write:org' (checked).

```
git remote add origin https://  
Token@github.com/aravindubodadasari/devops_project.git
```

token: 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

Personal access tokens (classic)

[Generate new token](#)[Revoke all](#)

Tokens you have generated that can be used to access the [GitHub API](#).

Make sure to copy your personal access token now. You won't be able to see it again!

✓ ghp_dDDZdqRwLGXBBTPcw7h9cGUfdKIH5d3x6FRQ

[Delete](#)

```
git remote add origin
```

```
https://ghp_dDDZdqRwLGXBBTPcw7h9cGUfdKIH5d3x6FRQ@github.com:aravindubodadasari/devops_project.git
```

git push -u origin HEAD – last commit which changes happen in repository

```
De1l@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git remote add origin https://ghp_dDDZdqRwLGXBBTPcw7h9cGUfdKIH5d3x6FRQ@github.com:aravindubodadasari/devops_project.git
De1l@DESKTOP-LU2880U MINGW64 ~/OneDrive/Desktop/DevOps Project (master)
$ git push -u origin HEAD
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 388 bytes | 388.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com:aravindubodadasari/devops_project.git
 * [new branch] HEAD -> master
branch 'master' set up to track 'origin/master'.
```

The screenshot shows the GitHub interface for a repository named 'devops_project' which is public. It has 1 branch and 0 tags. The commit history shows an initial commit by 'aravindubodadasari' containing 'Dockerfile' and 'Index.html'. A 'Code' dropdown menu is open, showing options to clone the repository via HTTPS, SSH, or GitHub CLI. The HTTPS URL is 'https://github.com:aravindubodadasari/devops_'. A blue banner at the bottom encourages adding a README file.

>> Creating EC2 instance from Git repository code to Jenkins

The screenshot shows the AWS Management Console Home page. The top navigation bar includes the AWS logo, 'Services', and a search bar. The main content area is titled 'Console Home'. A 'Recently visited' section is visible, showing a link to the 'EC2' service.

aws

Services

Search

EC2 > Instances > Launch an instance

Launch an instance

Info

Amazon EC2 allows you to create virtual machines, or instances, following the simple steps below.

Name and tags

Info

Name

jenkins-instance

OS – Amazon Linux selected with one CPU because application is small

▼ Application and OS Images (Amazon Machine Image)

Info

An AMI is a template that contains the software configuration (operating system, applications) required to launch your instance. Search or Browse for AMIs if you want below.

Search our full catalog including 1000s of application and OS images

Quick Start

Amazon Linux

aws

macOS

Mac

Ubuntu

ubuntu

Windows

Microsoft

Red Hat

Red Hat

Created Key pairs...

▼ Key pair (login)

Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the key pair before you launch the instance.

Key pair name - required

jenkins-keys

Jenkins Instance created

Instances (1/1)					Info	
Find Instance by attribute or tag (case-sensitive)						
<input checked="" type="checkbox"/>	Name	Instance ID	Instance state	Instance type		
<input checked="" type="checkbox"/>	jenkins-instance	i-05c7736ed1ab7501e	Running	t2.micro		

Added ports range in security group under inbound rules

EC2 > Security Groups > sg-0b86b69eeb27c771d - Launch-wizard-2 > Edit inbound rules

Edit inbound rules [info](#)

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules [info](#)

Security group rule ID	Type info	Protocol info	Port range info	Source info	Description - optional info
sg-01c016308d560c1ae	SSH	TCP	22	Custom	
				0.0.0.0/0	
-	All TCP	TCP	0 - 65535	Anyw...	
				0.0.0.0/0	

Launching EC2 instance browser-based

[EC2](#) > [Instances](#) > [i-05c7736ed1ab7501e](#) > [Connect to instance](#)

Connect to instance Info


Connect to your instance i-05c7736ed1ab7501e (jenkins-instance) using any of these options

EC2 Instance Connect

Session Manager

SSH client


EC2 serial console

Instance ID
 **i-05c7736ed1ab7501e** (jenkins-instance)

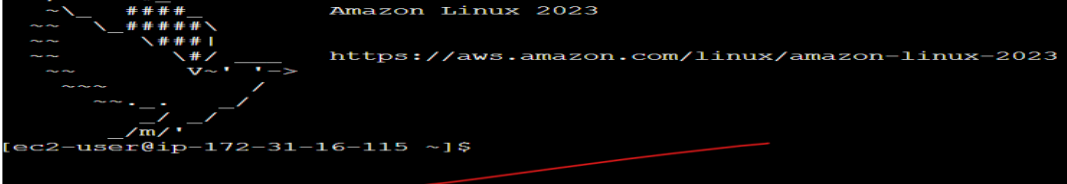
Connection Type

☒ **Connect using EC2 Instance Connect**
Connect using the EC2 Instance Connect browser-based client, with a public IPv4 address.

☐ **Connect using EC2 Instance Connect Endpoint**
Connect using the EC2 Instance Connect browser-based client, with a private IPv4 address and a VPC endpoint.

Public IP address
 **54.83.106.19**

User name



aws Services Search

Amazon Linux 2023

<https://aws.amazon.com/linux/amazon-linux-2023>

[ec2-user@ip-172-31-16-115 ~]\$

i-05c7736ed1ab7501e (jenkins-instance)

PublicIPs: 54.83.106.19 PrivateIPs: 172.31.16.115

>> Install required software in EC2.

Installing git

```
sudo yum -y update
```

```
sudo yum install git -y
```

Installed:

```
git-2.40.1-1.amzn2023.0.1.x86_64
perl-Error-1:0.17029-5.amzn2023.0.2.noarch
perl-TermReadKey-2.38-9.amzn2023.0.2.x86_64
```

Complete!

```
[ec2-user@ip-172-31-16-115 ~]$ git --version
git version 2.40.1
[ec2-user@ip-172-31-16-115 ~]$ █
```

>> pushing the remote repository URL into EC2 instance

```
[ec2-user@ip-172-31-16-115 ~]$ git clone https://github.com/aravindubodadasari/devops_project.git
Cloning into 'devops_project'...
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 4 (delta 0), reused 4 (delta 0), pack-reused 0
Receiving objects: 100% (4/4), done.
[ec2-user@ip-172-31-16-115 ~]$ ls
devops_project
[ec2-user@ip-172-31-16-115 ~]$ cd devops_project
[ec2-user@ip-172-31-16-115 devops_project]$ ls
Dockerfile  Index.html
```

>> Running and building of Docker image

Installing Docker software

```
sudo yum install docker
```

```
sudo service docker start
```

```
sudo docker info
```

Installed:

```
containerd-1.7.2-1.amzn2023.0.4.x86_64          docker-24.0.5-1.amzn2023.0.1.x86_64
iptables-nft-1.8.8-3.amzn2023.0.2.x86_64       libcgrouper-3.0-1.amzn2023.0.1.x86_64
libnftnl-1.0.1-19.amzn2023.0.2.x86_64          libnftnl-1.2.2-2.amzn2023.0.1.x86_64
runc-1.1.7-1.amzn2023.0.3.x86_64
```

Complete!

```
[ec2-user@ip-172-31-16-115 devops_project]$ sudo service docker start
Redirecting to /bin/systemctl start docker.service
[ec2-user@ip-172-31-16-115 devops_project]$ sudo docker info
```

Client:

```
Version:      24.0.5
Context:      default
Debug Mode:  false
Plugins:
  buildx: Docker Buildx (Docker Inc.)
    Version:  v0.0.0+unknown
    Path:     /usr/libexec/docker/cli-plugins/docker-buildx
```

Server:

```
Containers: 0
Running: 0
```

Building docker image

```
sudo docker build -t my-devops . -f Dockerfile
```

```
(ec2-user@ip-172-31-16-115 devops_project)$ sudo docker build -t my-devops . -f Dockerfile
[+] Building 5.4s (7/7) FINISHED                                docker:default
=> [internal] load build definition from Dockerfile              0.0s
=> => transferring dockerfile: 144B                             0.0s
=> [internal] load .dockerignore                                0.0s
=> => transferring context: 2B                                    0.0s
=> [internal] load metadata for docker.io/library/nginx:latest  0.4s
=> [internal] load build context                                0.0s
=> => transferring context: 209B                                  0.0s
=> [1/2] FROM docker.io/library/nginx@sha256:10d1f5b58f74683ad34eb29287e07dab1e90f10af243f151bb50aa5d4b4d62ee  4.7s
=> => resolve docker.io/library/nginx@sha256:10d1f5b58f74683ad34eb29287e07dab1e90f10af243f151bb50aa5d4b4d62ee  0.0s
```

Running the image in order to run the application container

```
sudo docker run -d -p 80:80 my-devops
```

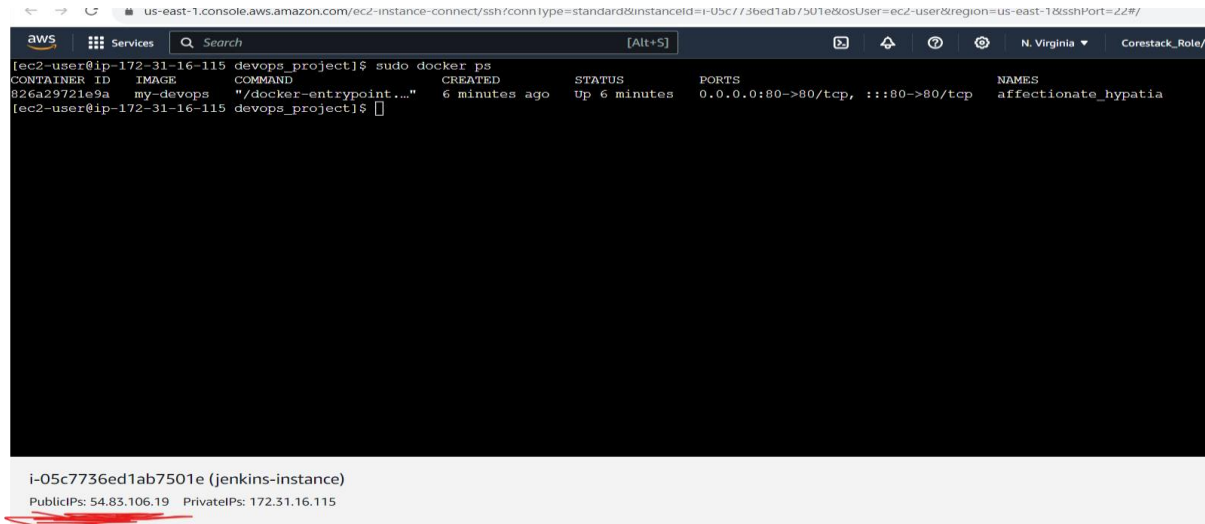
```
(ec2-user@ip-172-31-16-115 devops_project)$ sudo docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
my-devops latest 625ccd175b15 17 seconds ago 187MB
(ec2-user@ip-172-31-16-115 devops_project)$ sudo dokcer run -d -p 80:80 my-devops
sudo: dokcer: command not found
(ec2-user@ip-172-31-16-115 devops_project)$ sudo docker run -d -p 80:80 my-devops
826a29721e9a6710505dac5cef5d3a92ea3ff19b3c8c365d5d926f57ad69401a
(ec2-user@ip-172-31-16-115 devops_project)$ sudo docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
826a29721e9a my-devops "/docker-entrypoint..." 15 seconds ago Up 14 seconds 0.0.0.0:80->80/tcp, :::80->80/tcp affectionate_hypatia
(ec2-user@ip-172-31-16-115 devops_project)$
```

i-05c7736ed1ab7501e (jenkins-instance)

PublicIPs: 54.83.106.19 PrivateIPs: 172.31.16.115

Checking the Application container

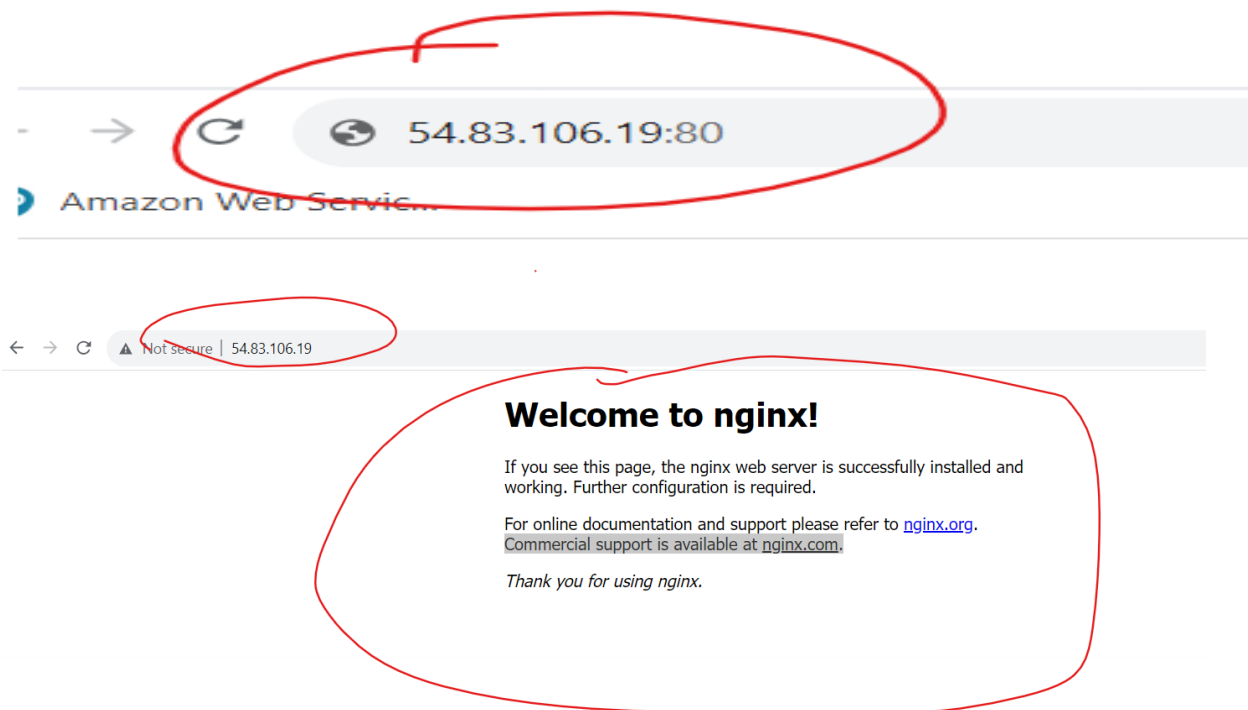
sudo docker ps



The screenshot shows the AWS Management Console interface. At the top, the breadcrumb navigation indicates the user is in the 'us-east-1' region, viewing the 'i-05c7736ed1ab7501e (jenkins-instance)' EC2 instance. Below the navigation bar, a terminal window displays the output of the 'sudo docker ps' command. The output is a table with columns: CONTAINER ID, IMAGE, COMMAND, CREATED, STATUS, PORTS, and NAMES. One container is listed: '826a29721e9a' with image 'my-devops', command '/docker-entrypoint...', created '6 minutes ago', status 'Up 6 minutes', ports '0.0.0.0:80->80/tcp, :::80->80/tcp', and name 'affectionate_hypatia'. Below the terminal, the instance details for 'i-05c7736ed1ab7501e (jenkins-instance)' are shown, including PublicIPs: 54.83.106.19 and PrivateIPs: 172.31.16.115.

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
826a29721e9a	my-devops	"/docker-entrypoint..."	6 minutes ago	Up 6 minutes	0.0.0.0:80->80/tcp, :::80->80/tcp	affectionate_hypatia

>> Now checking application is whether running or not on web page from EC2 instance public IP address though 80 port number ..



Got successfully launched nginx server

>> Running docker container using Jenkins

Installing java 11 on EC2 instance because Jenkins internal logic is written on Java technologies..

```
sudo yum install java-11
```

```
Complete!
[ec2-user@ip-172-31-16-115 ~]$ java --version
openjdk 11.0.21 2023-10-17 LTS
OpenJDK Runtime Environment Corretto-11.0.21.9.1 (build 11.0.21+9-LTS)
OpenJDK 64-Bit Server VM Corretto-11.0.21.9.1 (build 11.0.21+9-LTS, mixed mode)
[ec2-user@ip-172-31-16-115 ~]$
```

i-05c7736ed1ab7501e (jenkins-instance)

PublicIPs: 54.83.106.19 PrivateIPs: 172.31.16.115

download the latest Jenkins package

```
sudo wget -O /etc/yum.repos.d/jenkins.repo https://pkg.jenkins.io/redhat/jenkins.repo
```

```
sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.key
```

```
sudo yum install Jenkins
```

```
Installed:
jenkins-2.426.1-1.1.noarch

Complete!
[ec2-user@ip-172-31-16-115 ~]$ sudo service jenkins start
Redirecting to /bin/systemctl start jenkins.service

[ec2-user@ip-172-31-16-115 ~]$
```

```
[ec2-user@ip-172-31-16-115 ~]$ sudo systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/usr/lib/systemd/system/jenkins.service; disabled; preset: disabled)
   Active: active (running) since Fri 2023-11-24 12:51:08 UTC; 32min ago
     Main PID: 31032 (java)
       Tasks: 39 (limit: 1114)
      Memory: 376.0M
         CPU: 48.607s
    CGroup: /system.slice/jenkins.service
            └─31032 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/va
```

Downloading Java Jenkins war file

```
wget https://get.jenkins.io/war-stable/2.414.3/jenkins.war
```

```
java -jar Jenkins.war --httpPort=9090
```

```
[ec2-user@ip-172-31-16-115 ~]$ wget https://get.jenkins.io/war-stable/2.414.3/jenkins.war
--2023-11-24 13:36:09-- https://get.jenkins.io/war-stable/2.414.3/jenkins.war
Resolving get.jenkins.io (get.jenkins.io)... 20.7.178.24, 2603:1030:408:5::15a
Connecting to get.jenkins.io (get.jenkins.io)|20.7.178.24|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://ftp-nyc.osuosl.org/pub/jenkins/war-stable/2.414.3/jenkins.war [following]
--2023-11-24 13:36:09-- https://ftp-nyc.osuosl.org/pub/jenkins/war-stable/2.414.3/jenkins.war
Resolving ftp-nyc.osuosl.org (ftp-nyc.osuosl.org)... 64.50.233.100, 2600:3404:200:237::2
Connecting to ftp-nyc.osuosl.org (ftp-nyc.osuosl.org)|64.50.233.100|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 89542047 (85M) [application/x-java-archive]
Saving to: 'jenkins.war'

jenkins.war                                     100%[=====]

2023-11-24 13:36:10 (93.3 MB/s) - 'jenkins.war' saved [89542047/89542047]

[ec2-user@ip-172-31-16-115 ~]$ ls
devops_project  jenkins.war
[ec2-user@ip-172-31-16-115 ~]$
```

```
devops_project  jenkins.war
[ec2-user@ip-172-31-16-115 ~]$ java -jar jenkins.war
Running from: /home/ec2-user/jenkins.war
webroot: /home/ec2-user/.jenkins/war
2023-11-24 13:38:31.274+0000 [id=1] INFO winstone.Logger#logInternal: Beginning extraction from war file
2023-11-24 13:38:33.051+0000 [id=1] WARNING o.e.j.s.handler.ContextHandler#setContextPath: Empty contextPath
2023-11-24 13:38:33.223+0000 [id=1] INFO org.eclipse.jetty.server.Server#doStart: jetty-10.0.17 built: 2022
```

Providing user permissions

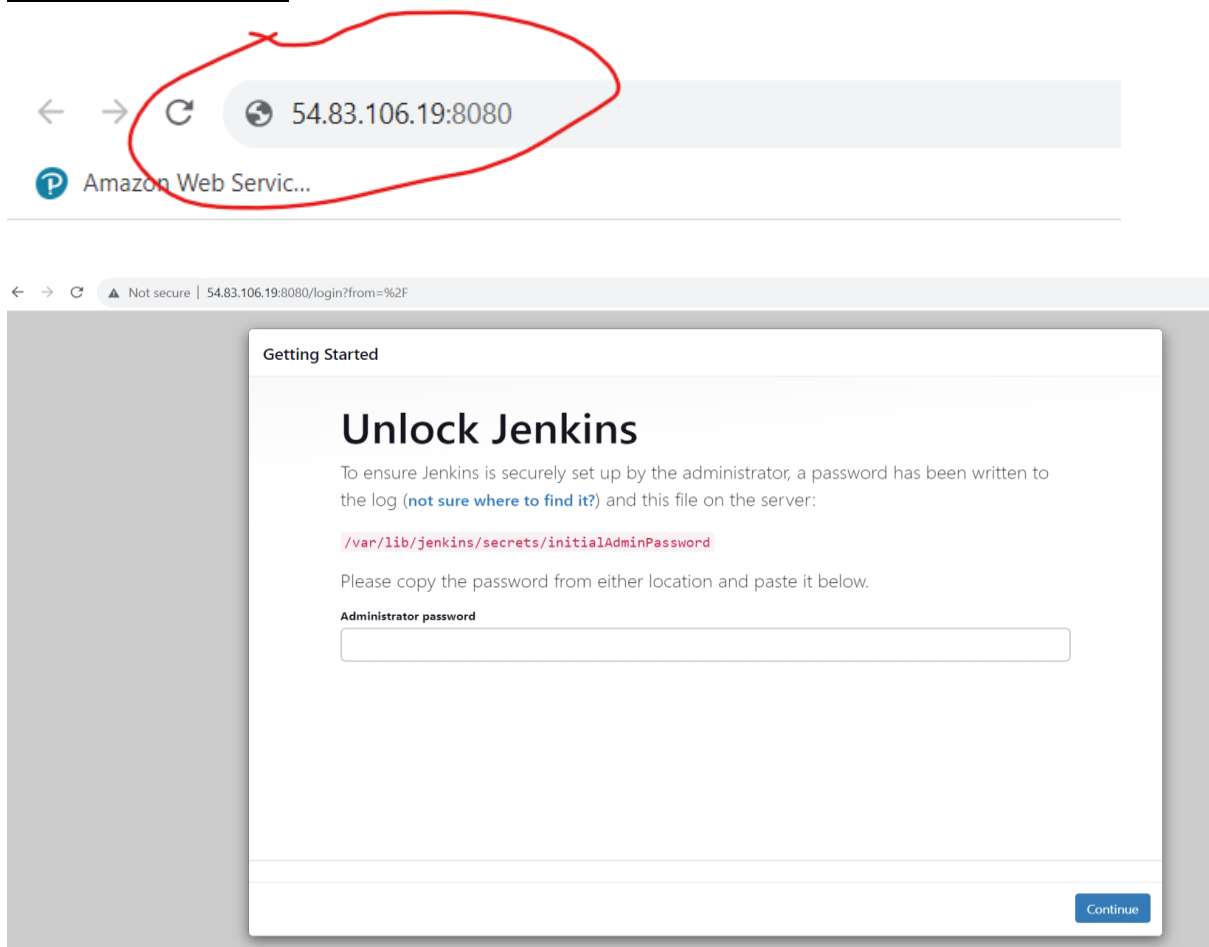
```
sudo usermod -a -G docker Jenkins
```

```
sudo usermod -a -G docker ec2-user
```

```
sudo chmod 777 /var/run/docker.sock
```

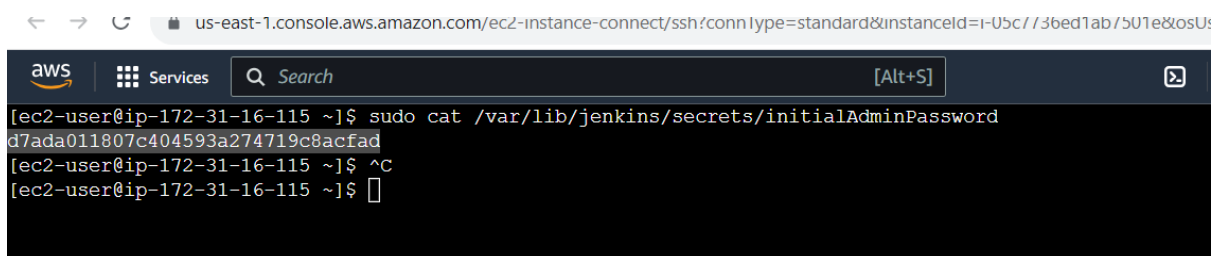
```
[ec2-user@ip-172-31-16-115 devops_project]$ sudo usermod -a -G docker jenkins
[ec2-user@ip-172-31-16-115 devops_project]$ sudo usermod -a -G docker ec2-user
[ec2-user@ip-172-31-16-115 devops_project]$ sudo chmod 777 /var/run/docker.sock
[ec2-user@ip-172-31-16-115 devops_project]$ sudo service jenkins restart
Redirecting to /bin/systemctl restart jenkins.service
[ec2-user@ip-172-31-16-115 devops_project]$
```

>> Connecting Jenkins server by EC2 instance ip address with Jenkins default port number 8080



Getting password from below path

`sudo cat /var/lib/jenkins/secrets/initialAdminPassword`



⚠ Not secure | 54.83.106.19:8080

Getting Started

Create First Admin User

Username

aravindu

Password

.....

Confirm password

.....

Full name

aravindu

E-mail address

aravindu4403@gmail.com

Jenkins 2.426.1

Skip and continue as admin

Save and Continue

Getting Started

Instance Configuration

Jenkins URL:

http://54.83.106.19:8080/

The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps.

The proposed default value shown is **not saved yet** and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.

← → ⌂ ⚠ Not secure | 54.83.106.19:8080 🔍 ⚙ 🔔 🔒 🔴 🔒 aravindu 🔒 log out

Jenkins

Dashboard >

+ New Item

👤 People

📅 Build History

⚙ Manage Jenkins

📌 My Views

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

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 +

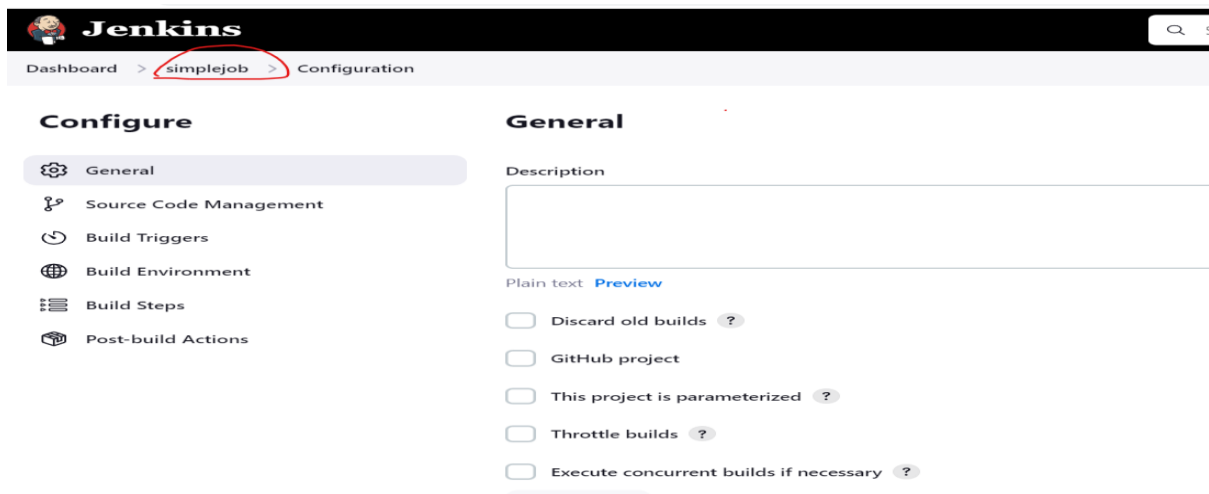
Set up a distributed build

Set up an agent 🗨

Configure a cloud ☁

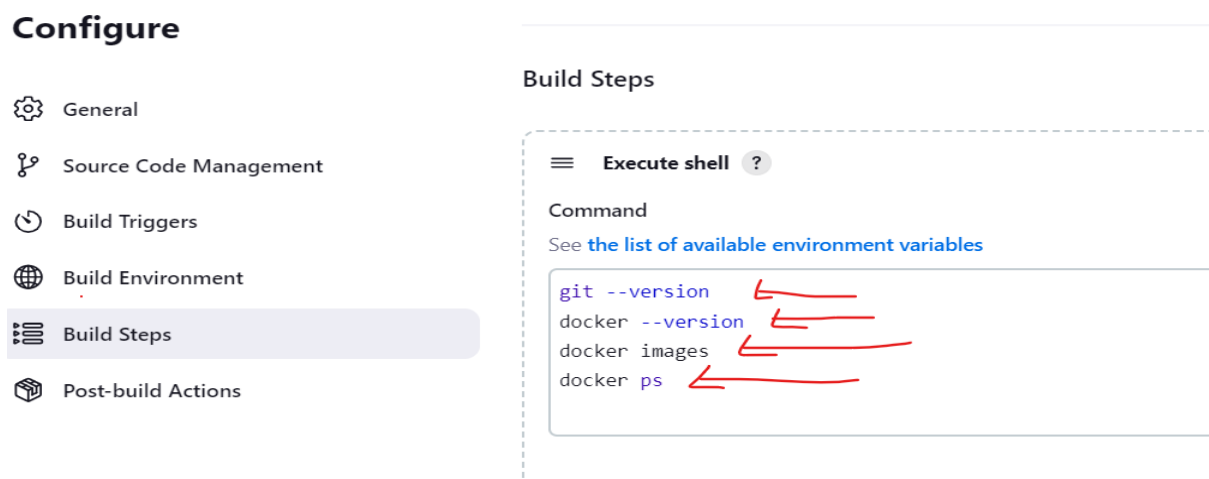
Learn more about distributed builds ⓘ

Build a Docker Jenkins Pipeline to Implement CI/CD Workflow

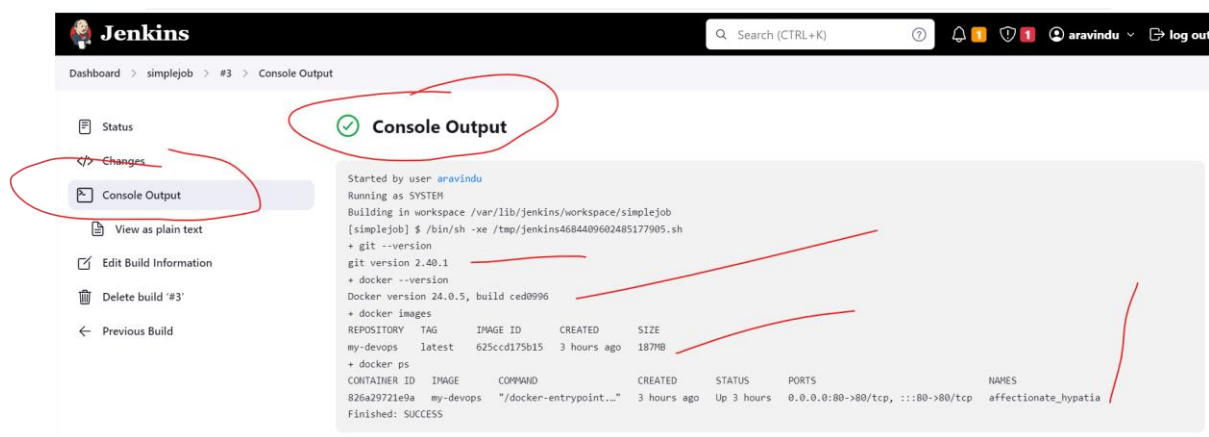


The screenshot shows the Jenkins Configuration page for a job named 'simplejob'. The 'General' tab is selected in the left sidebar. The main area displays the 'Description' field, which is empty, and a 'Plain text' preview. Below this, there are several checkboxes: 'Discard old builds', 'GitHub project', 'This project is parameterized', 'Throttle builds', and 'Execute concurrent builds if necessary'. All checkboxes are currently unchecked.

Building on execute shell



The screenshot shows the Jenkins Configuration page for 'simplejob', now with the 'Build Steps' tab selected. Under the 'Build Steps' section, there is a step named 'Execute shell'. The 'Command' field contains the following text: `git --version`, `docker --version`, `docker images`, and `docker ps`. Red arrows point to each of these commands. A link 'See the list of available environment variables' is visible above the command field.



The screenshot shows the Jenkins Console Output page for 'simplejob'. The 'Console Output' tab is selected in the left sidebar. The main area displays the build log, which shows the successful execution of the commands. The log includes the following text:
Started by user aravindu
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/simplejob
[simplejob] \$ /bin/sh -xe /tmp/jenkins4684409602485177905.sh
+ git --version
git version 2.40.1
+ docker --version
Docker version 24.0.5, build ced0996
+ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
my-devops latest 625ccd175b15 3 hours ago 187MB
+ docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
826a29721e9a my-devops "/docker-entrypoint..." 3 hours ago Up 3 hours 0.0.0.0:80->80/tcp, :::80->80/tcp affectionate_hypatia
Finished: SUCCESS

Job is gets successfully completed....

