

# Utrains : Jenkins Installation

In this part we will carry out the installation process using two methods:

- **Vagrant** : here we will use a bash script to configure a Jenkins server using **Centos 7 OS**.
- **AWS EC2** : here we will create an EC2 instance in AWS and then through a script, install Jenkins

Install Jenkins using Centos 7 (Vagrant) and AWS EC2 (Red Hat Enterprise)

We will describe the process using scripts for install Jenkins.

The different steps we will use to install Jenkins are the following:

- **Step 1** : clone the scripts for the quick installation in the **Utrains repository**
- **Step 2** : install Jenkins using a **Vagrant Box** and the **Centos 7 image**
- **Step 3** : create an **EC2** instance in AWS with the Red Hat Enterprise image
- **Step 4** : install Jenkins using our **EC2** instance created in step 2
- **Step 5** : configure the Jenkins web interface

## Getting Started

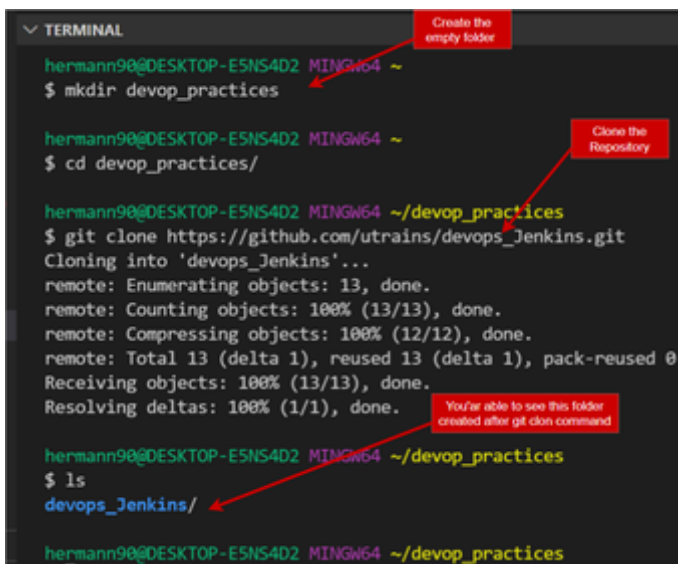
**Step 1** : Clone the script from the Utrains Repository to your local machine

here we will use the **git clone command** to clone the installation scripts the Utrains repository

1- open a terminal, create a working directory and enter this empty folder.

2- use git clone to clone the project that contains our Jenkins installation scripts

```
$ mkdir devop_practices
$ cd devop_practices
$ git clone https://github.com/utrains/devops_Jenkins.git
```



```
hermann90@DESKTOP-E5NS4D2 MINGW64 ~
$ mkdir devop_practices

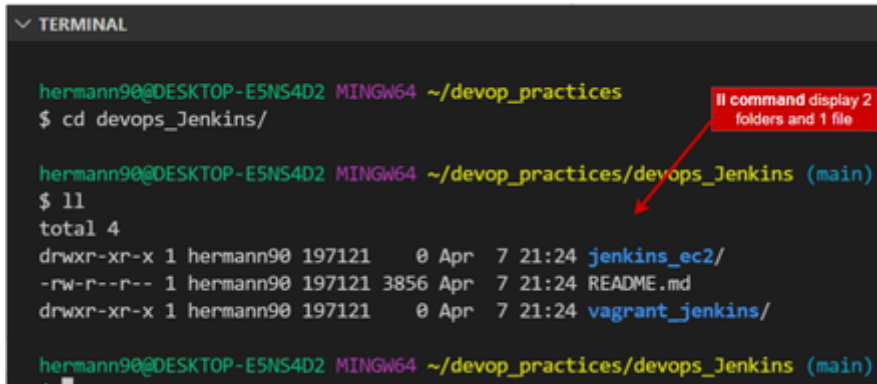
hermann90@DESKTOP-E5NS4D2 MINGW64 ~
$ cd devop_practices/

hermann90@DESKTOP-E5NS4D2 MINGW64 ~/devop_practices
$ git clone https://github.com/utrains/devops_Jenkins.git
Cloning into 'devops_Jenkins'...
remote: Enumerating objects: 13, done.
remote: Counting objects: 100% (13/13), done.
remote: Compressing objects: 100% (12/12), done.
remote: Total 13 (delta 1), reused 13 (delta 1), pack-reused 0
Receiving objects: 100% (13/13), done.
Resolving deltas: 100% (1/1), done.

hermann90@DESKTOP-E5NS4D2 MINGW64 ~/devop_practices
$ ls
devops_Jenkins/
```

enter the folder that is created after the **git clone command** then make **ls**. you can see **2 folders** (one is for install Jenkins using vagrant, another is for EC2), and one **README** file.

```
$ cd devops_Jenkins
$ ll
```



A terminal window titled 'TERMINAL' showing a user named hermann90 at a desktop named DESKTOP-E5NS4D2. The user is in a MINGW64 environment at the directory ~/devop\_practices. They execute the command 'cd devops\_Jenkins/'. The prompt changes to ~/devop\_practices/devops\_Jenkins (main). Then they execute 'll', which displays the following output:

```
total 4
drwxr-xr-x 1 hermann90 197121  0 Apr  7 21:24 jenkins_ec2/
-rw-r--r-- 1 hermann90 197121 3856 Apr  7 21:24 README.md
drwxr-xr-x 1 hermann90 197121  0 Apr  7 21:24 vagrant_jenkins/
```

Red annotations with arrows point to the 'll' command and the output, stating: 'll command display 2 folders and 1 file'.

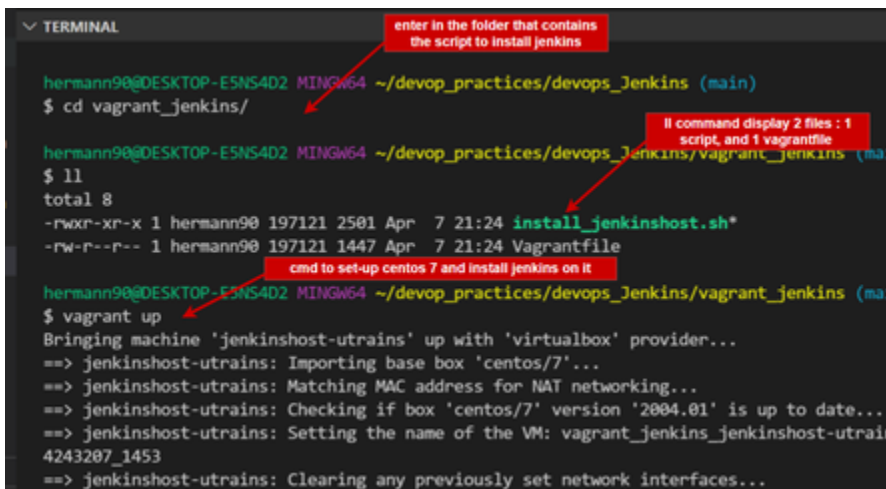
**Felicitation** : at this level, you already have the **scripts** available on your local machine for the fast installation of Jenkins.

## Step 2 : install Jenkins using a Vagrant Box and the Centos 7 image

After **step 1**, you have a **folder (devops\_jenkins)** that contains two **folders (jenkins\_ec2 and vagrant\_jenkins)**

- 1- you just have to enter the **vagrant\_jenkins** folder, make **ls** command to see that it contains 2 files (**vagrantfile** and **install\_jenkins.sh**)
- 2- then in this folder type the command **vagrant up** to install a **centos 7** server with Jenkins

```
cd vagrant_jenkins
vagrant up
```



A terminal window titled 'TERMINAL' showing the same user and environment. They execute 'cd vagrant\_jenkins/'. The prompt changes to ~/devop\_practices/devops\_Jenkins/vagrant\_jenkins (main). Then they execute 'll', which displays the following output:

```
total 8
-rwxr-xr-x 1 hermann90 197121 2501 Apr  7 21:24 install_jenkins.sh*
-rw-r--r-- 1 hermann90 197121 1447 Apr  7 21:24 Vagrantfile
```

Red annotations with arrows point to the 'cd vagrant\_jenkins/' command and the output, stating: 'enter in the folder that contains the script to install jenkins' and 'll command display 2 files : 1 script, and 1 vagrantfile'.

Then they execute 'vagrant up', which displays the following output:

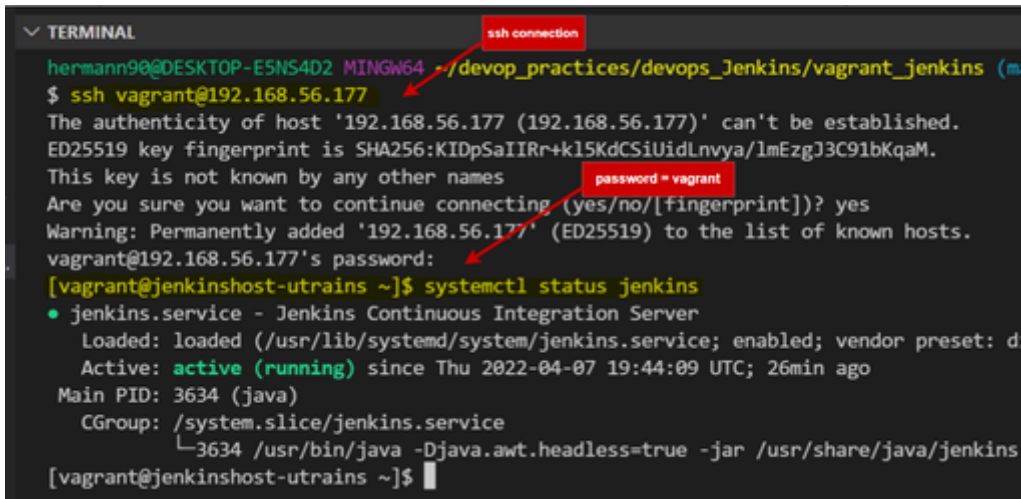
```
Bringing machine 'jenkinshost-utrains' up with 'virtualbox' provider...
==> jenkins-host-utrains: Importing base box 'centos/7'...
==> jenkins-host-utrains: Matching MAC address for NAT networking...
==> jenkins-host-utrains: Checking if box 'centos/7' version '2004.01' is up to date...
==> jenkins-host-utrains: Setting the name of the VM: vagrant_jenkins_jenkins-host-utrains
4243207_1453
==> jenkins-host-utrains: Clearing any previously set network interfaces...
```

Red annotations with arrows point to the 'vagrant up' command and the output, stating: 'cmd to set-up centos 7 and install jenkins on it'.

3- After sometimes, your **Jenkins server** is still being installed.

at the end of the previous command, we will connect via **ssh** on this server, then check if Jenkins is correctly installed with **systemctl** command

```
ssh vagrant@192.168.56.107
systemctl status jenkins
```



A terminal window titled 'TERMINAL' showing an SSH session. The user 'hermann90@DESKTOP-E5NS4D2' is in a 'MINGW64' environment. They run 'ssh vagrant@192.168.56.177'. The terminal shows the SSH connection process, including a warning about the host's authenticity and a prompt for the password 'vagrant'. After logging in as 'vagrant@jenkinshost-utrains', they run 'systemctl status jenkins'. The output shows that the 'jenkins.service' is loaded, enabled, and active (running) since Thursday, 2022-04-07 at 19:44:09 UTC, 26 minutes ago. The main PID is 3634 (java). The command group is '/system.slice/jenkins.service', and the command is '3634 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins...'.

Congratulations, you have just installed **Jenkins** on your **Centos 7** server using **vagrant** and a **script** written entirely by the Utrains team.

**Note :** We still have to configure the web interface of Jenkins (see step 5).

**Step 3 :** create an **EC2** instance in AWS with the Red Hat Enterprise image

for do this step2, just follow this link : [Create EC2 in AWS using Red Hat Enterprise image](#)

**Step 4 :** install Jenkins using our **EC2** instance created in [Step 2](#).

To install **Jenkins** on our **EC2** instance created in **AWS**, we will create a file in a directory of our **EC2** instance. In this file, we will put a shell script for the installation of Jenkins.

Finally, we will simply run this script on the remote server.

- connect you to the EC2 instance, using ssh command
- in the EC2, create a folder called **jenkins\_ec2**
- enter in this folder, using the **cd** command
- create the file called **install\_jenkins\_ec2.sh**, copy the **script** bellow and **paste** in this file, then **save and quit**
- give the execute privilege's on this file using **chmod** command
- run this script using sudo access. (**sudo ./install\_jenkins\_ec2.sh**)

```
$ ssh -i "C:\Users\hermann90\Downloads\jenkins_keys.pem" ec2-user@ec2-54-161-173-21.compute-1.amazonaws.com
$ mkdir jenkins_ec2
$ cd jenkins_ec2
$ vi install_jenkins_ec2.sh
## put the insert mode by cliquing in the i
```

✓ **ssh command explication:**

	ssh command parameters	explanation
1	"C:\Users\hermann90\Downloads\jenkins_keys.pem"	path where the download key is located when creating EC2
2	Jenkins_ec2	folder that we want to copy to our remote server
3	ec2-user@54.161.173.21	default user ( <b>ec2-user</b> ) of our remote server followed by the <b>public IP Address (54.161.173.21)</b> of our server
4	.compute-1.amazonaws.com	resolver host for aws

- script that you're paste in the `install_jenkins_ec2.sh` file

```
#!/bin/bash
#-----#
# @Autor : Utrains
# Description : This is the script that will take care of the
#               installation of Java,
#               Jenkins server and some utilities
# Date : 03/22/2022
#-----#
## Recover the ip address and update the server
IP=$(hostname -I | awk '{print $2}')
echo "START - install jenkins - "$IP
echo "====> [1]: updating ...."
sudo yum update -y

## Prerequisites tools(Wget, ...) for Jenkins
echo "====> [2]: install prerequisite tools for Jenkins"

sudo yum install -y yum-presto
# Although not needed for Jenkins, I like to use vim, so let's make
# sure it is installed:
sudo yum install -y vim

# The Jenkins setup makes use of wget, sshpass and gnupg2
sudo yum install -y wget
sudo yum install -y sshpass
sudo yum install -y gnupg2

# Let's make sure that we have the EPEL and IUS repositories installed.
# This will allow us to use newer binaries than are found in the
# standard CentOS repositories.
```

```

sudo wget -N http://dl.iuscommunity.org/pub/ius/stable/CentOS/7/x86_64
/ius-release-1.0-13.ius.centos7.noarch.rpm
sudo rpm -Uvh ius-release*.rpm

# gnupg2 openssl :
sudo yum install -y openssl

# Jenkins on CentOS requires Java, but it won't work with the default
(GCJ) version of Java. So, let's remove it:
sudo yum remove -y java

# install the OpenJDK version of Java 8:
sudo yum install -y java-1.8.0-openjdk-devel

# Let's now install Jenkins:
echo "=====> [3]: installing Jenkins ...."
sudo wget -O /etc/yum.repos.d/jenkins.repo http://pkg.jenkins-ci.org
/redhat-stable/jenkins.repo
sudo rpm --import https://pkg.jenkins.io/redhat/jenkins.io.key
sudo yum install -y jenkins

echo "=====> [4]: updating server after jenkins installation ...."
sudo yum update -y

echo "=====> [5]: Start Jenkins Daemon and Enable ...."
sudo systemctl start jenkins
sudo systemctl enable jenkins

echo "=====> [6]: Adjust Firewall ...."
sudo yum install -y firewallld
sudo firewall-cmd --permanent --zone=public --add-port=8080/tcp
sudo firewall-cmd --reload

echo "END - install jenkins"

```

- save and exit, give the execute right the execute the file

```

$ chmod +x install_jenkins_ec2.sh
$ sudo ./install_jenkins_ec2.sh

```

```
▼ TERMINAL
ssh command
$ ssh -i "C:\Users\hermann90\Downloads\jenkins_keys.pem" ec2-user@ec2-54-161-173-
s.com
Last login: Thu Apr  7 19:34:23 2022 from 102.115.149.194
[ec2-user@ip-172-31-82-14 ~]$ mkdir jenkins_ec2
[ec2-user@ip-172-31-82-14 ~]$ cd jenkins_ec2/
[ec2-user@ip-172-31-82-14 jenkins_ec2]$ vi install_jenkins_ec2.sh
[ec2-user@ip-172-31-82-14 jenkins_ec2]$ ls
install_jenkins_ec2.sh
[ec2-user@ip-172-31-82-14 jenkins_ec2]$ sudo chmod +x install_jenkins_ec2.sh
[ec2-user@ip-172-31-82-14 jenkins_ec2]$ ls
install_jenkins_ec2.sh
[ec2-user@ip-172-31-82-14 jenkins_ec2]$ sudo ./install_jenkins_ec2.sh
```

2- **install Jenkins script** : **execute** this script on the remote server

To execute the Jenkins installation script, you have to enter the folder (**cd** command) we just copied, then use the **bash** command for the installation.

After connecting to our EC2 server, we can see with the **systemctl** command that Jenkins has been installed.

```
▼ TERMINAL
PS D:\courses\utrails_DevOps_part\jenkins> ssh -i C:\Users\hermann90\Downloads\jenkins_keys.pem
ec2-user@ec2-54-161-173-21.compute-1.amazonaws.com
Last login: Fri Apr  1 09:35:04 2022 from 102.115.160.170
[ec2-user@ip-172-31-82-14 ~]$ systemctl status jenkins
jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/usr/lib/systemd/system/jenkins.service; enabled; vendor preset: disabled)
   Active: active (running) since Thu 2022-03-31 05:40:19 UTC; 1 day 11h ago
     Main PID: 69484 (java)
       Tasks: 35 (limit: 4821)
        Memory: 295.0M
      CGroup: /system.slice/jenkins.service
              └─69484 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --
```

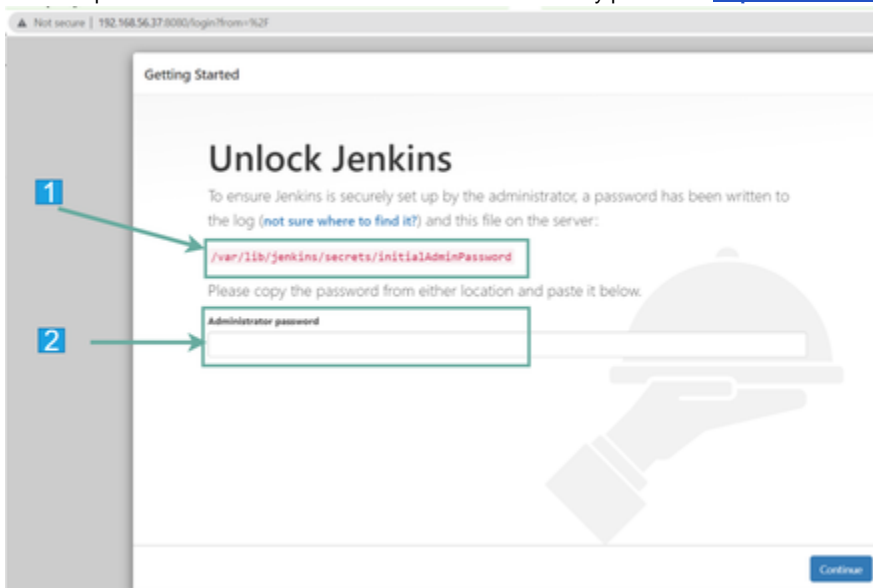
At this level, we have just installed Jenkins on two servers using two methods. We still have to configure the **Jenkins web interface** and create an Admin user.

### Step 5 : configure the Jenkins web interface

- if you enter the **IP address** (**192.168.56.37** for server install with **Vagrant** and **54.161.173.21** for server install with **AWS EC2**) of the server followed by port **8080**,

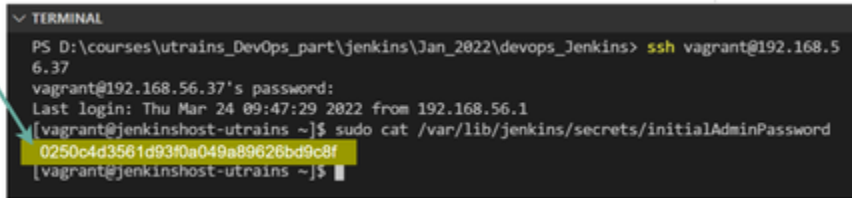
you will see the Jenkins web interface below :

- open the browser and enter the **IP address** followed by port 8080. <http://192.168.56.37:8080/> Or <http://54.161.173.21:8080/>



- in the terminal of your server, use the command **cat** to display the server password, then copy the code that appears to put in 2 on this window

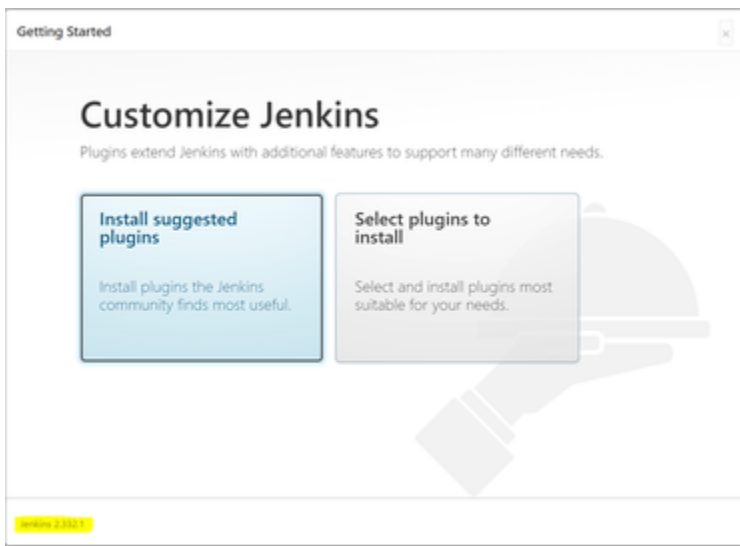
```
ssh vagrant@192.168.56.37
password: vagrant
cat /var/lib/jenkins/secrets/initialAdminPassword
```



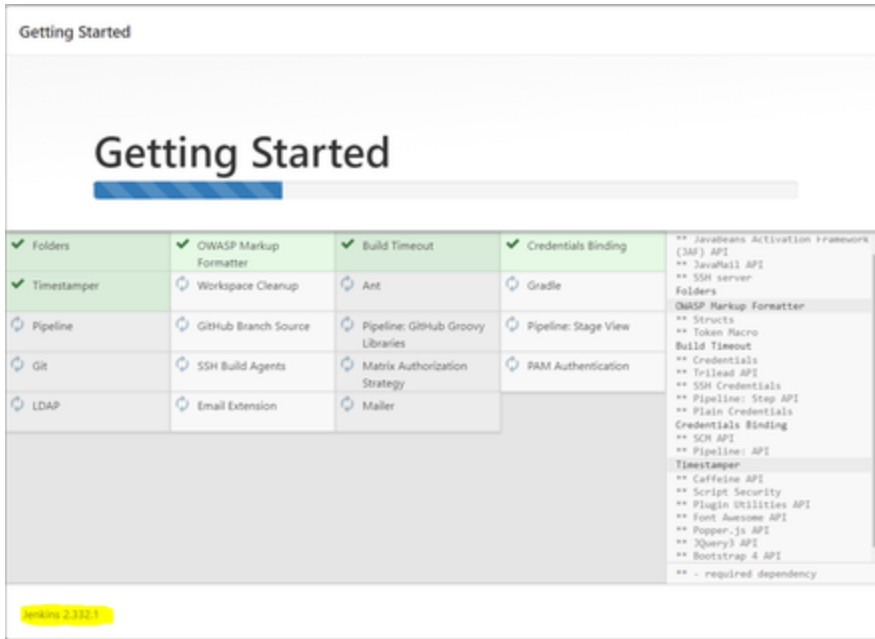
```
PS D:\courses\utrains_DevOps_part\jenkins\Jan_2022\devops_Jenkins> ssh vagrant@192.168.56.37
vagrant@192.168.56.37's password:
Last login: Thu Mar 24 09:47:29 2022 from 192.168.56.1
[vagrant@jenkinshost-utrains ~]$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword
0250c4d3561d93f0a049a89626bd9c8f
[vagrant@jenkinshost-utrains ~]$
```

copy the code that appears, then paste it in the web interface of Jenkins in 2. then click on continue to connect

- the installation of **Jenkins**, is almost finished. click on **install suggested plugins**, to install some plugins.



- plugins installation interfaces



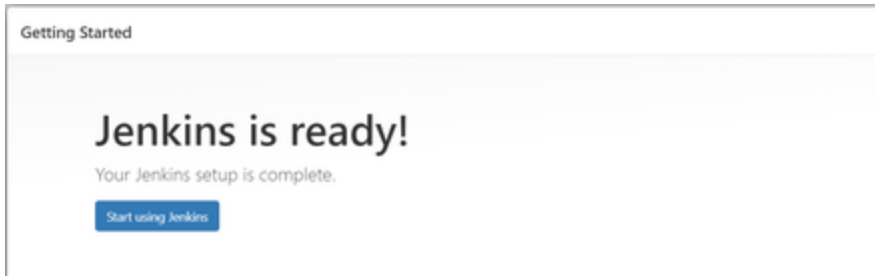
Once these plugins are installed, you have the Jenkins interface. we have the interface to **create a user**. fill this window with the following information :

- Username: **utrains-root**
- Password: **school1**
- Confirm password: **school1**
- Full name: **utrains jenkins user**
- E-mail address: **your\_email@gmail.com**

clique on **Save and Continue** button

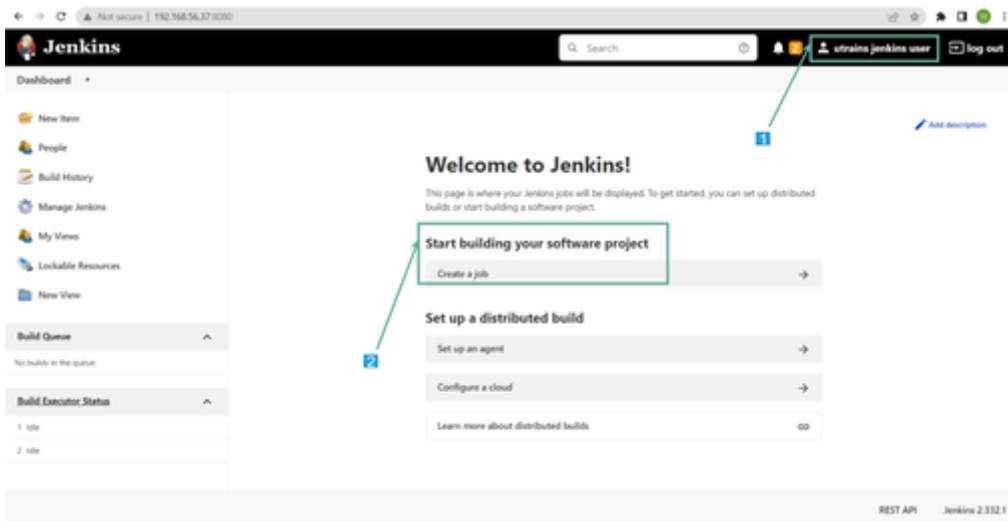
- To finish configuration, click on **Start using Jenkins**






The Jenkins dashboard can display.

- in 1, we see that our admin user is logged
- in 2, we have the tab to create the first job. We will dedicate an entire chapter to the creation of Jenkins jobs



## Releases

- **1.0** : build for Utrains Student

 Date : **01/04/2022**

 Participants : **hermann.chefouetmeka@utrails.org**

## Next steps

- ☒ **Begin Jobs creation**
- ☐ **Begin advanced Jenkins utilization like Pipeline for CI/CD, maven and GitHub integration, deploy ...**

 Link for similar document

-  [Create EC2 in AWS using Red Hat Enterprise image](#)