

# DevOps

## Jenkins

### 1 Install Jenkins

<https://www.jenkins.io/download/>

```
root@server:/home/nik# service jenkins status
jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2022-11-10 09:43:52 UTC; 15s ago
     Main PID: 4612 (java)
       Tasks: 44 (limit: 2131)
      Memory: 342.8M
         CPU: 25.982s
        CGroup: /system.slice/jenkins.service
                └─4612 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Nov 10 09:43:31 server jenkins[4612]: 5c947661add54b5299b8225ebd3af0ab
Nov 10 09:43:31 server jenkins[4612]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Nov 10 09:43:31 server jenkins[4612]: *****
Nov 10 09:43:31 server jenkins[4612]: *****
Nov 10 09:43:31 server jenkins[4612]: *****
Nov 10 09:43:52 server jenkins[4612]: 2022-11-10 09:43:52.587+0000 [id=28] INFO jenkins.InitReactorRunner$1#onAttained: Completed initialization
Nov 10 09:43:52 server jenkins[4612]: 2022-11-10 09:43:52.608+0000 [id=22] INFO hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running
Nov 10 09:43:52 server systemd[1]: Started Jenkins Continuous Integration Server.
Nov 10 09:43:53 server jenkins[4612]: 2022-11-10 09:43:53.224+0000 [id=44] INFO h.m.DownloadService$Downloadable#load: Obtained the updated data file f
Nov 10 09:43:53 server jenkins[4612]: 2022-11-10 09:43:53.225+0000 [id=44] INFO hudson.util.Retrier#start: Performed the action check updates server su
lines 1-20/20 (END)
```

<http://192.168.0.100:8080/>

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

Getting Started

## Getting Started

✓ Folders	✓ OWASP Markup Formatter	✓ Build Timeout	✓ Credentials Binding	== Instance Identity
✓ Timestamp	✓ Workspace Cleanup	✓ Ant	== Gradle	== Hina SSH API :: Common
⚙ Pipeline	⚙ GitHub Branch Source	⚙ Pipeline: GitHub Groovy Libraries	⚙ Pipeline: Stage View	== Hina SSH API :: Core
⚙ Git	⚙ SSH Build Agents	⚙ Matrix Authorization Strategy	⚙ PAM Authentication	== SSH-Agent
⚙ LDAP	⚙ Email Extension	⚙ Mailer		== OWASP Markup Formatter
				== Structs
				== Token Macro
				== Build Timeout
				== Credentials
				== Pipeline: API
				== SSH Credentials
				== Pipeline: Stop API
				== Plain Credentials
				== Credentials Binding
				== SSH API
				== Pipeline: API
				== Commons-lang3 v3.x Jenkins API
				== Timestamp
				== Carthage API
				== Script Security
				== Sonicon API
				== JAXWS
				== Snakeyaml API
				== Jackson 2 API
				== Common Text API
				== Plugin Utilities API
				== Popper.js 2 API
				== Bootstrap 5 API
				== jQuery API
				== ECharts API
				== Slicker UI API
				== Pipeline: Supporting APIs
				== JUnit API
				== JUnit
				== Matrix Project
				== Resource Discover
				== Workspace Cleanup
				== API
				== Apache HTTPComponents Client
				== d3.js API
				== Oracle Java SE Development Kit
				== Installer
				== Command Agent Launcher
				== Jenkins-Linux GUI Lib: ACE Editor
				== bundle
				== Pipeline: SSH Step
				== Pipeline: Groovy
				== Pipeline: Tasks and Processes
				== Pipeline: Job
				== Jenkins Activation API
				== - required dependency

## Create First Admin User

Имя пользователя

Пароль

Повторите пароль

Ф.И.О.

Адрес электронной почты

## 2 Install plugins.

/var/lib/jenkins

← → ↻ Не защищено | 192.168.0.100:8080/manage/

### Jenkins

Dashboard > Настроить Jenkins

+

 Создать Item

Пользователи

История сборок

Настроить Jenkins

My Views

Очередь сборки

Очередь сборки пуста

Состояние сборщиков

1 В ожидании  
2 В ожидании

Конфигурация системы  
Конфигурация глобальных настроек и путей.

Конфигурация глобальных инструментов  
Конфигурация инструментов, их расположение и автоматическая установка.

Управление плагинами  
Добавить, удалить, отключить или включить плагины, расширяющие функциональные возможности Jenkins.

Глобальные настройки безопасности  
Настройка безопасности Jenkins, конфигурация прав для доступа и использования системы.

Manage Credentials  
Configure credentials

Configure Credential Providers  
Configure the credential providers and types

## 3 Start first pipeline

Enter an item name

first\_project

> Required field



**Freestyle project**

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than building.



**Pipeline**

Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex builds.



**Multi-configuration project**

Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.



**Folder**

Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so items are in different folders.



**Multibranch Pipeline**

Creates a set of Pipeline projects according to detected branches in one SCM repository.



**Organization Folder**

Creates a set of multibranch project subfolders by scanning for repositories.

OK

## Configure

- ⚙️ General
- 🔑 Source Code Management
- 🕒 Build Triggers
- 🌐 Build Environment**
- ☰ Build Steps
- 📦 Post-build Actions

### Build Environment

- ☐ Delete workspace before build starts
- ☐ Use secret text(s) or file(s) ?
- ☐ Add timestamps to the Console Output
- ☐ Inspect build log for published build scans
- ☐ Terminate a build if it's stuck
- ☐ With Ant ?

### Build Steps

#### ☰ Execute shell ?

Command

See [the list of available environment variables](#)

```
echo "----- BEGINING-----"
sleep 2
echo "Live forever"
sleep 2
hostnamectl status
sleep 3
echo "-----FINISHING-----"
echo "Build number #"
echo "$BUILD_NUMBER"
```

Advanced...

Add build step ▾

### Post-build Actions

Add post-build action ▾

Save

Apply

← → ↻ Не защищено | 192.168.0.100:8080/job/first\_project/1/console

# Jenkins

Dashboard > first\_project > #1

- Status
- Changes
- Console Output
- View as plain text
- Edit Build Information
- Delete build '#1'
- Next Build

## Console Output

```
Started by user nik
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/first_project
[first_project] $ /bin/sh -xe /tmp/jenkins2927690277002929149.sh
+ echo ----- BEGINNING-----
----- BEGINNING-----
+ sleep 2
+ echo Live forever
Live forever
+ sleep 2
+ hostnamectl status
Static hostname: server
    Icon name: computer-vm
    Chassis: vm
    Machine ID: d83224ee04364b04940460ebb08e9f9d
    Boot ID: 85d7e43cb36d4da93b1fa2072efec24
    Virtualization: microsoft
    Operating System: Ubuntu 22.04.1 LTS
    Kernel: Linux 5.15.0-52-generic
    Architecture: x86_64
    Hardware Vendor: Microsoft Corporation
    Hardware Model: Virtual Machine
+ sleep 3
+ echo ----- FINISHING-----
----- FINISHING-----
+ echo Build number #
Build number #
+ echo 1
1
Finished: SUCCESS
```

**4 Builds will be saving during 5 days, but if build fail save the last on success**

← → ↻ Не защищено | 192.168.0.100:8080/me/my-views/view/all/job/first\_project/configure

Dashboard > nik > My Views > All > first\_project > Configuration

## Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

☒ Discard old builds ?

### Strategy

Log Rotation

**Days to keep builds**  
If not empty, build records are only kept up to this number of days

5

**Max # of builds to keep**  
If not empty, only this number of build records are kept

5

**Days to keep artifacts**  
If not empty, artifacts from builds older than this number of days will be deleted, but the logs, history, rep

1

**Max # of builds to keep with artifacts**  
If not empty, only this number of builds have their artifacts retained

1

☐ GitHub project

☐ This project is parameterized ?

☐ Throttle builds ?

☒ Execute concurrent builds if necessary ?

Advanced...

### Source Code Management

☒ None

☐ Git ?

## 5 New pipeline. Start pipeline with copy index.html using ssh to Centos 7 with apache server

echo "----- BEGINING-----"

echo "Copy my site"

COPY\_SITE=\$(sshpass -p asd scp -v -o StrictHostKeyChecking=no  
/var/lib//jenkins/.ssh/index.html root@192.168.0.106:/var/www/html)

echo \$COPY\_SITE

sleep 3

echo "-----FINISHING-----"

← → ↺ Не защищено | 192.168.0.100:8080/job/first\_project/20/console

Jenkins

Dashboard > first\_project > #20

Status

</> Changes

Console Output

View as plain text

Edit Build Information

Delete build '#20'

← Previous Build

✓ Console Output

Started by user nik  
Running as SYSTEM  
Building in workspace /var/lib/jenkins/workspace/first\_project  
[first\_project] \$ /bin/sh -xe /tmp/jenkins14872800170183590193.sh  
+ echo ----- BEGINING-----  
+ echo Copy my site  
Copy my site  
+ sshpass -p asd scp -v -o StrictHostKeyChecking=no /var/lib//jenkins/.ssh/index.html root@192.168.0.106:/var/www/html  
Executing: program /usr/bin/ssh host 192.168.0.106, user root, command scp -v -t /var/www/html  
OpenSSH\_8.9p1 Ubuntu-3, OpenSSL 3.0.2 15 Mar 2022  
debug1: Reading configuration data /etc/ssh/ssh\_config  
debug1: /etc/ssh/ssh\_config line 19: include /etc/ssh/ssh\_config.d/\*.conf matched no files  
debug1: /etc/ssh/ssh\_config line 21: Applying options for \*  
debug1: Connecting to 192.168.0.106 [192.168.0.106] port 22.  
debug1: Connection established.  
debug1: identity file /var/lib/jenkins/.ssh/id\_rsa type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_rsa-cert type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ecdsa type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ecdsa-cert type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ecdsa\_sk type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ecdsa\_sk-cert type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ed25519 type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ed25519-cert type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ed25519\_sk type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_ed25519\_sk-cert type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_xmss type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_xmss-cert type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_dsa type -1  
debug1: identity file /var/lib/jenkins/.ssh/id\_dsa-cert type -1  
debug1: Local version string SSH-2.0-OpenSSH\_8.9p1 Ubuntu-3  
debug1: Remote protocol version 2.0, remote software version OpenSSH\_7.4  
debug1: compat\_banner: match: OpenSSH\_7.4 pat OpenSSH\_7.4\* compat 0x04000006  
debug1: Authenticating to 192.168.0.106:22 as 'root'  
debug1: load\_hostkeys: fopen /var/lib/jenkins/.ssh/known\_hosts2: No such file or directory  
debug1: load\_hostkeys: fopen /etc/ssh/ssh\_known\_hosts: No such file or directory  
debug1: load\_hostkeys: fopen /etc/ssh/ssh\_known\_hosts2: No such file or directory  
debug1: SSH2\_MSG\_KEXINIT sent  
debug1: SSH2\_MSG\_KEXINIT received  
debug1: kex: algorithm: curve25519-sha256  
debug1: kex: host key algorithm: ssh-ed25519  
debug1: kex: server->client cipher: chacha20-poly1305@openssh.com MAC: <implicit> compression: none  
debug1: kex: client->server cipher: chacha20-poly1305@openssh.com MAC: <implicit> compression: none  
debug1: expecting SSH2\_MSG\_KEX\_ECDH\_REPLY  
debug1: SSH2\_MSG\_KEX\_ECDH\_REPLY received  
debug1: Server host key: ssh-ed25519 SHA256:GkAmJySh6x8uVvRG4WpCf8pQIjyl5K9gleJ3M  
debug1: load\_hostkeys: fopen /var/lib/jenkins/.ssh/known\_hosts2: No such file or directory  
debug1: load\_hostkeys: fopen /etc/ssh/ssh\_known\_hosts: No such file or directory  
debug1: load\_hostkeys: fopen /etc/ssh/ssh\_known\_hosts2: No such file or directory  
debug1: SSH2\_MSG\_SERVICE\_ACCEPT received  
debug1: kex\_input\_ext\_info: server-sig-algs=rsa-sha2-256,rsa-sha2-512  
debug1: SSH2\_MSG\_SERVICE\_ACCEPT received  
debug1: Authentications that can continue: publickey,gssapi-keyex,gssapi-with-mic,password  
debug1: Next authentication method: gssapi-with-mic  
debug1: No credentials were supplied, or the credentials were unavailable or inaccessible  
No Kerberos credentials available (default cache: FILE:/tmp/krb5cc\_113)  
  
debug1: No credentials were supplied, or the credentials were unavailable or inaccessible  
No Kerberos credentials available (default cache: FILE:/tmp/krb5cc\_113)  
  
debug1: Next authentication method: publickey  
debug1: Trying private key: /var/lib/jenkins/.ssh/id\_rsa  
debug1: Trying private key: /var/lib/jenkins/.ssh/id\_ecdsa  
debug1: Trying private key: /var/lib/jenkins/.ssh/id\_ecdsa\_sk  
debug1: Trying private key: /var/lib/jenkins/.ssh/id\_ed25519  
debug1: Trying private key: /var/lib/jenkins/.ssh/id\_ed25519\_sk  
debug1: Trying private key: /var/lib/jenkins/.ssh/id\_xmss  
debug1: Trying private key: /var/lib/jenkins/.ssh/id\_dsa  
debug1: Next authentication method: password  
Authenticated to 192.168.0.106 ([192.168.0.106]:22) using "password".  
debug1: channel 0: new [client-session]  
debug1: Requesting no-more-sessions@openssh.com  
debug1: Entering interactive session.  
debug1: pledge: filesystem  
debug1: client\_input\_global\_request: rtype hostkeys-0@openssh.com want\_reply 0  
debug1: client\_input\_hostkeys: searching /var/lib/jenkins/.ssh/known\_hosts for 192.168.0.106 / (none)  
debug1: client\_input\_hostkeys: searching /var/lib/jenkins/.ssh/known\_hosts2 for 192.168.0.106 / (none)  
debug1: client\_input\_hostkeys: hostkeys file /var/lib/jenkins/.ssh/known\_hosts2 does not exist  
debug1: Sending env LANG = "en\_US.UTF-8"  
debug1: channel 0: setting env LANG = "en\_US.UTF-8"  
debug1: Sending command: scp -v -t /var/www/html  
debug1: client\_input\_global\_request: rtype confirm: server used untrusted RSA signature algorithm ssh-rsa for key 0, disregarding  
debug1: update\_known\_hosts: known hosts file /var/lib/jenkins/.ssh/known\_hosts2 does not exist  
scp: debug1: fd 3: clearing O\_NONBLOCK  
Sending file modes: C0644 355 index.html  
scp: debug1: fd 4: clearing O\_NONBLOCK  
Sink: C0644 355 index.html  
debug1: client\_input\_channel\_req: channel 0 rtype exit-status reply 0  
debug1: channel 0: free: client-session, nchannels 1  
Transfer: sent 272, received 266 bytes, in 0.1 seconds  
Bytes per second: sent 19900.4, received 19630.1  
debug1: Exit status 0  
+ COPY\_SITE  
+ echo  
  
+ sleep 3  
+ echo -----FINISHING-----  
-----FINISHING-----  
Finished: SUCCESS

6 SSH in Jenkins

Available plugins Publish over SSH

←

→

↺

⚠ Не защищено

192.168.0.100:8080/manage/configure

Dashboard

>

Manage Jenkins

>

Configure System

>

☐ Test configuration by sending test e-mail

Publish over SSH

Jenkins SSH Key ?

Passphrase ?

🔒

Concealed

Path to key ?

/var/lib/jenkins/.ssh/rsa

Key ?

-----BEGIN OPENSSH PRIVATE KEY-----  
b3BlbnNzaC1rZXktdjEAAAABAG5vbmUAAAABbm9uZQAAAAAAAAABAAAABlAAAAAdzc2gtcn  
NhAAAAAwEAAQAAAEAw1Jf7pGWggnfpTZqBu9vqqiMPsQEUKqC6D32XdvLZdVoiCcabsx  
wsFNIOtmqlQgkNPIL7niq+/WC5SijCzwrqxlba4UADeXBnnzNP4G8ZhYoKxPQRbM6oxL6  
Xr5tBAXngRYAIXnaiBDIz+ng8lNqNzG6xB+KsluNiYoUpkd+ZXh6JJQkiWekr+w/PwkPVF  
XdQN6yZsvZV1jYUGiG+hPpRhA17S/4YJPSMZ9ucUtUmYr2bMyBQjGcvcATAj30kH14VXKG  
YG23nsh0wHQBpYD739Rr0ZBLx1eaEIoAu+JcG+3xZhaQcCJ7HdhFfuVd9QSPGUW5Qgww  
6tKgieC+KYUq8BCFMwUz6n3au/FXW+uHXZbAhJR4evt28a36MulKN0O5zKLXQrRwZ0y87  
dejYnmwUmfXVqGkxVbwXqFai0+a96rszYaC0D7vkW4uGnwwqZKhMUDsBmjz0g9t36lUpGp  
epNVjtXTTX52sewDryC6wJMvf3/pmP/6ny9wfqsNAAAFiAvvPvoFbz76AAAAAB3NzaC1yc2  
EAAAGBAMNSX+6Rl0lJ36U2agbvb6qojD7EBFCqgug99l3by2XVRaIgm7McL8TzT5qpU  
IJDTS5+54qvv1guUpYws8K6sZW2uFAA3lwZ58zT+BvGYWKCST0KwZuqMcS+i6+bQQF54EW  
AJV52ogQyM/p4PJTajcxusQfirJbYmKFKZHfmV4eiSUJlInpK/sPz8JD1RV3UdesmbL2V  
dY2FBohvoT6UYQNe0v+GCT0jGfbnFLVJmK9mzMgUlxnL3AEwl99JB9eFVyhmBtt57lMB0  
AaWA+9/Ua9GQSyMdXmhCKALviXBvt8WYyWkHAiex3YRX7rlXfUEjXfUIMMOrSolngvimF  
KvAQhTMFM+p92rvxV1vrh12WwISueHr7dvGt+jLiCjdDucyi1V0K0cGdMvO3Xo2J8JlJn1  
1ahpMVW8F6hWotPmveq7M2GgtA+75FuLhp8MKmSoTFA7AZo86lPbd+iFKRqXqTVY7V001+  
drHsA68gusCTL39/6Zj/+p8vcH6rDQAAAAMBAEAAAGAKFcZkZkKlX4hldEM7V9Ayq3eH  
kkiQKGce/mM8Fi81/Gd3MzytSKNPaWjuNtzo8gtz4r1A9hBRPSWoEfPyFlxZh8nOXFupk  
S0ahl/bFOV2IJF4iKpxjTRr/f39Nxiw12toCgKq9SUcVjCGMrtli7rN4YSVFJNY4PsKhV2  
KVeHv+5Pj8F3AFgDGAB7mYnF/D2VqKG0Z+2/MD6dwpGsGvdEzR8o/BIVu6CcH3qVpVmRgf  
ss5RChu6mifUAvgN095xn0EvoQC8qdO6kbNVlSiGfDQ61IRJmfa19SGZGIUK30GchCABNF  
UEe6FZNvtcXgxZ6+Q2Otr9CgsL5R4zlaVHPyvvnenHt1y/GKcbCa6rbJw1HBV4ShR0Di7r  
mPJ0xTUQmhs5crbDQRldE75nb5hlj6Ge+inJdC9OzS+QQ1n3vS8Hxt0IYknwl6eKDs4Y3y  
lsmpzMcaSChXD710+b7TY9kwjsMteK1nB4xcroihXhR+ImJwfHxzjJny6v5bGk3eBhAAAA  
wQCVOfLoYK/WxIxix21g7b2Z8UxwnCGEdjp4y7G0iKOPr2idAmzNCN9aqcE3oXjWyA/xxd  
GPv0p17EMfEN3VhG6gkjYvBPt2FcSiY2sNLev+p0hSeMjBB1mUu+aiZWjSgbZa4JJo/t66  
Lju4NBB933RhZtaA4ZyMPN8ZTmW2mFuUGGX45RxyKfLkKlX4BqmFlvOzdnaPe0pByRdoxJ  
aONzumZLN1jTk4L9j2MNRQ8FDyrG24UZx7P3/S8Vdf6JWd/OsAAADBANfU5/XgOxZ9N4bB  
lkitQsnvnZY8dEXGPyeYvJUsWg4pWb5vDIMUjcqWATRxf6GdtF1zVI6m3eXKB7OJJVSq8j  
yK3nkez+nLgMFDzYwPK/9FyT7NJaWbjOUTjmrBR8PU8ufvOvwYL+WrP1rNLsRHmGbFdo/V  
txYCpsE+b4tYkPXXgSnDAH3U3XdN4495cS5KDQoaMnkS9VG96UJ59+6iZ9tGCVoQMVYZcD  
TyMZxy4ROIAtwZIScWCO4jJAePmN0psQAAAMEA56xLaPKvjLTV3rKKWlrgNRBaGI+VL1YD  
zLIJyrt3jeyUTm7LbqmtPQDn2+C0QiQKO+u1D/uosPWvwInd3LeD1sBQKlel1IZy4HuQNm  
K9T1u//La9zYLGti6l0bTcbXJWUOmGcXAJ20e85clwy2X0gdmjeG47LQeutiWk6y9CNptD  
2zICIOBFau4PPWL3neb3E/AT4F2/T+1r4aOY9XuDPDEOu43+yllmNY6qx9tqYxl4GN2tMG  
D5MGJazEmYypIdAAAAC3Jvb3RAc2VydmVyaQIDBAUGBw==  
-----END OPENSSH PRIVATE KEY-----

Save

Apply

## SSH server

```
ssh-keygen -t rsa -C "jenkins" -m PEM -P "" -f /var/lib/jenkins/.ssh/id_rsa
```

```
ssh-copy-id -i /var/lib/jenkins/.ssh/id_rsa root@192.168.0.106
```

```
ssh -v root@192.168.0.106
```

```
chown jenkins /var/lib/jenkins/.ssh/id_rsa
```

## Success

← → ↺

⚠ Не защищено | 192.168.0.100:8080/manage/configure

Dashboard > Manage Jenkins > Configure System >

### Publish over SSH

Jenkins SSH Key ?

Passphrase ?

🔒

Concealed

Path to key ?

/var/lib/jenkins/.ssh/id\_rsa

Key ?

☐ Disable exec ?

SSH Servers

SSH Server

Name ?

apache

Hostname ?

192.168.0.106

Username ?

root

Remote Directory ?

/var/www/html

Advanced...

Success

Save

Apply



## 7 Pipeline with SSH in Jenkins

```
echo "Start build"
```

```
cat <<EOF > index.html
```

```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
<head>
```

```
<meta charset="UTF-8" />
```

```
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
```

```
<meta http-equiv="X-UA-Compatible" content="ie=edge" />
```

```
<title>Document</title>
```

```
<link rel="stylesheet" href="style.css" />
```

```
</head>
```

```
<body>
```


```
<h1>My new the best site</h1>
```

```
</body>
```


```
</html>
```


```
EOF
```


```
echo "Finish build"
```


 **Jenkins**


Dashboard > first\_project > #24


 Status


 Changes


 Console Output

 View as plain text

 Edit Build Information

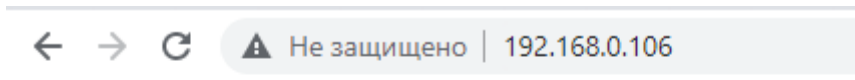
 Delete build '#24'

 Previous Build

 **Console Output**

Started by user [nik](#)  
Running as SYSTEM  
Building in workspace /var/lib/jenkins/workspace/first\_project  
[first\_project] \$ /bin/sh -xe /tmp/jenkins3081395391836948031.sh  
+ echo Start build  
Start build  
+ cat  
+ echo Finish build  
Finish build  
SSH: Connecting from host [server]  
SSH: Connecting with configuration [apache] ...  
SSH: EXEC: completed after 201 ms  
SSH: Disconnecting configuration [apache] ...  
SSH: Transferred 1 file(s)  
Finished: SUCCESS

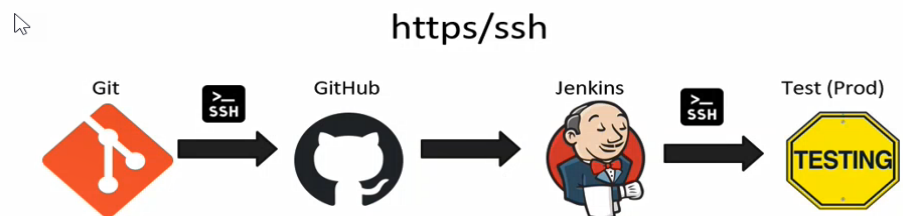
192.168.0.106 Apache server



# My new the best site

## 8 Gitlab, github version of pipeline

Simple CI/CD pipeline example



# create ssh-key

```
ssh-keygen -t rsa -C "jenkins" -m PEM -P "" -f /var/lib/jenkins/.ssh/id_rsa_git
```

# give rights Jenkins user to ssh-key

```
chown jenkins /var/lib/jenkins/.ssh/id_rsa_git.pub
```

```
chown jenkins /var/lib/jenkins/.ssh/id_rsa_git
```

# restart sshd

```
service sshd restart
```

```
git init
```

```
checkout -b main
```

```
git add . ( . = all ; or some file)
```

```
git commit -m "Init"
```

```
git remote add origin https://gitlab.com/epam-l-1/05-devops.git
```

```
git clone https://gitlab.com/epam-l-1/05-devops.git
```

8.1 Gitlab - HTTPS

<https://gitlab.com/epam-l-1/05-devops.git>

←

→

↻

⚠ Не защищено | 192.168.0.100:8080/job/first\_project/configure

Dashboard > first\_project > Configuration

Configure

⚙ General

🔑 Source Code Management

🕒 Build Triggers

🌐 Build Environment

☰ Build Steps

📦 Post-build Actions

☐ None

☒ Git ?

Repositories ?

Repository URL ?

https://gitlab.com/epam-l-1/05-devops.git

Credentials ?

@mykyta-lystopad/\*\*\*\*\* (gitlab)

- none -

@mykyta-lystopad/\*\*\*\*\* (gitlab)

jenkins (gitlab-ssh-key)

Advanced...

Add Repository

Branches to build ?

Branch Specifier (blank for 'any') ?

\*/main

Add Branch

Repository browser ?

(Auto)

Additional Behaviours

Add ▾

Dashboard > first\_project > Configuration

## Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

☐ None

☒ Git ?

☐ Repository ?

### Jenkins Credentials Provider: Jenkins

#### Add Credentials

Domain

Global credentials (unrestricted)

Kind

Username with password

Scope ?

Global (Jenkins, nodes, items, all child items, etc)

Username ?

@mykyta-lystopad

☐ Treat username as secret ?

Password ?

.....

ID ?


gitlab-https

Description ?

gitlab-https

**Add** Cancel

Password – Accesses token

 **Jenkins**

Dashboard > first\_project > #31

Status

</> Changes

Console Output


View as plain text

Edit Build Information

Delete build '#31'

Git Build Data

Previous Build

 **Console Output**

```
Started by user nik
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/first_project
The recommended git tool is: NONE
using credential gitlab
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/first_project/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://gitlab.com/epam-1-1/05-devops.git # timeout=10
Fetching upstream changes from https://gitlab.com/epam-1-1/05-devops.git
> git --version # timeout=10
> git --version # 'git version 2.34.1'
using GIT_ASKPASS to set credentials gitlab
> git fetch --tags --force --progress -- https://gitlab.com/epam-1-1/05-devops.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/main^{commit} # timeout=10
Checking out Revision e79aa0cac2951a9bf82502d9493d9452b68764dc (refs/remotes/origin/main)
> git config core.sparsecheckout # timeout=10
> git checkout -f e79aa0cac2951a9bf82502d9493d9452b68764dc # timeout=10
Commit message: "Update index.html"
> git rev-list --no-walk e79aa0cac2951a9bf82502d9493d9452b68764dc # timeout=10
[first_project] $ /bin/sh -xe /tmp/jenkins9284465591760393489.sh
SSH: Connecting from host [server]
SSH: Connecting with configuration [apache] ...
SSH: EXEC: completed after 200 ms
SSH: Disconnecting configuration [apache] ...
SSH: Transferred 2 file(s)
Finished: SUCCESS
```

## 8.2 Clone github without GIT Jenkins

Dashboard > first\_project > Configuration

### Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps**
- Post-build Actions

[Add Server](#)  
[Advanced...](#)

☐ Add timestamps to the Console Output  
☐ Inspect build log for published build scans  
☐ Terminate a build if it's stuck  
☐ With Ant [?](#)

### Build Steps

[Execute shell](#) [?](#)

Command


See [the list of available environment variables](#)

```
# show current folder
pwd
# delete all folders
rm -rf *
# delete all files
rm -f *
# clone repo using https link from github
git clone https://mykyta-lystopad:ghp_74DLFF5idP4xb0lsslyGC38U4PoRU42ib2E1@github.com/Mykyta-Lystopad/portfolio_frontend_developer.git
# cd to portfolio_frontend_developer/
cd /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/
# copy all from portfolio_frontend_developer/ to workspace dir
cp -r /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/* /var/lib/jenkins/workspace/first_project/
# delete portfolio_frontend_developer/ folder
rm -rf /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/
# remane main.html in index.html for apache reading
mv /var/lib/jenkins/workspace/first_project/main.html /var/lib/jenkins/workspace/first_project/index.html
```








[Advanced...](#)

[Add build step](#)

## 9 Add Jenkins-agent on local VM

 **Jenkins**


Dashboard >

- + New Item
-  People
-  Build History
-  Project Relationship
-  Check File Fingerprint
-  Manage Jenkins
-  My Views
-  CLI Commander


**Build Queue** [▼](#)

No builds in the queue.

**Build Executor Status** [▼](#)



 Built-In Node

- 1 Idle
- 2 Idle


 agent-1

- 1 Idle

**Build Queue**

S	W	Name	Last Success
		first_project	4 days 2 hr <a href="#">#46</a>

Icon: S M **L**





Dashboard > Nodes >

+ New Node

☁ Configure Clouds

⚙ Node Monitoring

#### Build Queue

No builds in the queue.

#### Build Executor Status

💻 Built-In Node

1 Idle

2 Idle

💻 agent-1

1 Idle

## Manage nodes and clouds

S	Name ↓	Architecture
💻	agent-1	Linux (amd64)
💻	Built-In Node	Linux (amd64)
Data obtained		5 min 57 sec



- Status
- Delete Agent
- Configure**
- Build History
- Load Statistics
- Script Console
- Log
- System Information
- Disconnect

## Build Executor Status

1 Idle

Name ?

agent-1

Description ?

this is my first agent

Number of executors ?

1

Remote root directory ?

/home/nik/jenkins-agent-1

Labels ?

linux docker agent-1 test-1 server

Usage ?

Use this node as much as possible

Launch method ?

Launch agents via SSH

Host ?

server

Credentials ?

nik/\*\*\*\*\* (agent-1)

+ Add

Host Key Verification Strategy ?

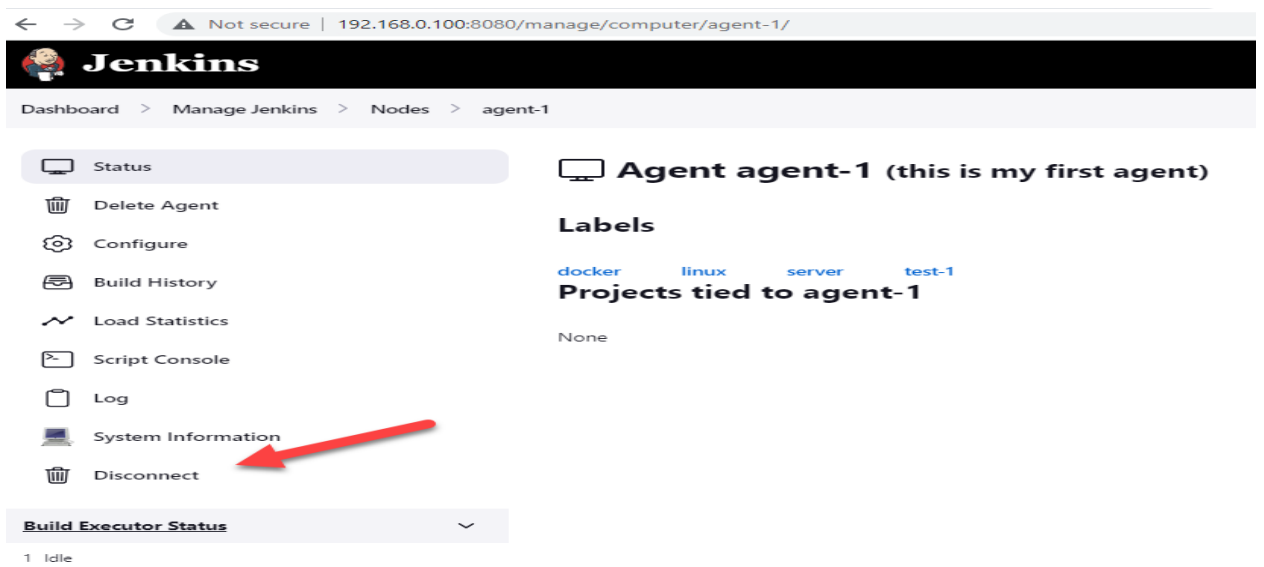
Known hosts file Verification Strategy



Advanced...

Save





← → ↻ ⚠ Not secure | 192.168.0.100:8080/manage/computer/agent-1/

# Jenkins

Dashboard > Manage Jenkins > Nodes > agent-1

- Status
- Delete Agent
- Configure
- Build History
- Load Statistics
- Script Console
- Log
- System Information
- Disconnect

**Build Executor Status** ▾

1 Idle

**Agent agent-1 (this is my first agent)**

**Labels**

docker linux server test-1

**Projects tied to agent-1**

None

```
ssh-keyscan -H <name of agent> >> /var/lib/jenkins/.ssh/known_hosts
```

if don't help:

```
mkdir -p /var/lib/jenkins/.ssh
```

```
chown -R jenkins:jenkins /var/lib/jenkins/.ssh
```

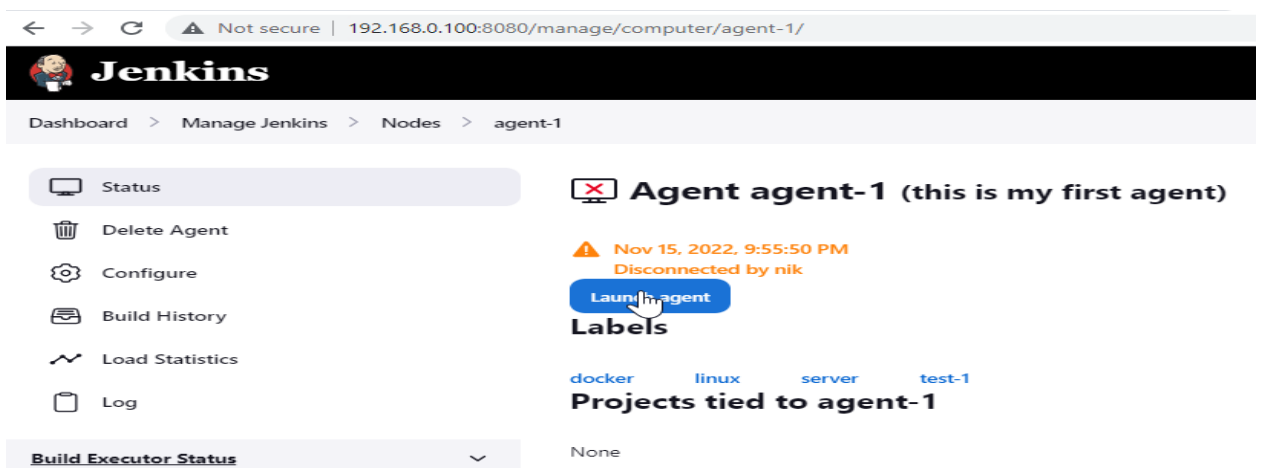
```
Cd /var/lib/jenkins/.ssh
```

```
ssh-keygen
```

# add to known\_hosts file all \*.pub key that we have on this VM

```
ssh-keyscan -H server >> /var/lib/jenkins/.ssh/known_hosts
```

server - hostname of VM



← → ↻ ⚠ Not secure | 192.168.0.100:8080/manage/computer/agent-1/

# Jenkins

Dashboard > Manage Jenkins > Nodes > agent-1

- Status
- Delete Agent
- Configure
- Build History
- Load Statistics
- Log

**Build Executor Status** ▾

**Agent agent-1 (this is my first agent)**

⚠ Nov 15, 2022, 9:55:50 PM  
Disconnected by nik

Launch agent

**Labels**

docker linux server test-1

**Projects tied to agent-1**

None



+ New Node

☁ Configure Clouds

⚙ Node Monitoring

## Build Queue

No builds in the queue.

## Build Executor Status

🖨 Built-In Node

1 Idle

2 Idle

🖨 agent-1

1 Idle

## Manage nodes and clouds

S	Name ↓
🖨	agent-1
🖨	Built-In Node
Data obtained	

```
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
PIPESTATUS=([0]="0")
PPID=1457
PS4='+ '
PWD=/home/nik
SHELL=/bin/bash
SHELLOPTS=braceexpand:hashall:interactive-comments
SHLVL=1
SSH_CLIENT='127.0.0.1 43206 22'
SSH_CONNECTION='127.0.0.1 43206 127.0.1.1 22'
TERM=dumb
UID=1000
USER=nik
XDG_RUNTIME_DIR=/run/user/1000
XDG_SESSION_CLASS=user
XDG_SESSION_ID=5
XDG_SESSION_TYPE=ttty
_='']'
Checking Java version in the PATH
openjdk version "11.0.17" 2022-10-18
OpenJDK Runtime Environment (build 11.0.17+8-post-Ubuntu-1ubuntu222.04)
OpenJDK 64-Bit Server VM (build 11.0.17+8-post-Ubuntu-1ubuntu222.04, mixed mode, sharing)
[11/15/22 21:56:02] [SSH] Checking java version of /home/nik/jenkins-agent-1/jdk/bin/java
Couldn't figure out the Java version of /home/nik/jenkins-agent-1/jdk/bin/java
bash: line 1: /home/nik/jenkins-agent-1/jdk/bin/java: No such file or directory

[11/15/22 21:56:02] [SSH] Checking java version of java
[11/15/22 21:56:02] [SSH] java -version returned 11.0.17.
[11/15/22 21:56:02] [SSH] Starting sftp client.
[11/15/22 21:56:02] [SSH] Copying latest remoting.jar...
Source agent hash is 778DAD42A65312A6187AE281A5F31129. Installed agent hash is 778DAD42A65312A6187AE281A5F31129
Verified agent jar. No update is necessary.
Expanded the channel window size to 4MB
[11/15/22 21:56:02] [SSH] Starting agent process: cd "/home/nik/jenkins-agent-1" && java -jar remoting.jar -workDir /
Nov 15, 2022 9:56:03 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/nik/jenkins-agent-1/remoting as a remoting work directory
Nov 15, 2022 9:56:03 PM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /home/nik/jenkins-agent-1/remoting
<---[JENKINS REMOTING CAPACITY]--->channel started
Remoting version: 3071.v7e9b_0dc08466
Launcher: SSHLauncher
Communication Protocol: Standard in/out
This is a Unix agent
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by jenkins.slaves.StandardOutputSwapper$ChannelSwapper to constructor java.io.File
WARNING: Please consider reporting this to the maintainers of jenkins.slaves.StandardOutputSwapper$ChannelSwapper
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
Evacuated stdout
Agent successfully connected and online
```

=== pipeline for jenkins agent

# show current folder

pwd

# delete all folders

rm -rf \*

# delete all files

rm -f \*

# clone repo using https link from github

git clone

[https://mykyta-lystopad:ghp\\_74DLff5idP4Xb0lssLyGCJ8U4PoRU42ib2El@github.com/Mykyta-Lystopad/portfolio\\_frontend\\_developer.git](https://mykyta-lystopad:ghp_74DLff5idP4Xb0lssLyGCJ8U4PoRU42ib2El@github.com/Mykyta-Lystopad/portfolio_frontend_developer.git)

# cd to portfolio\_frontend\_developer/

cd /home/nik/jenkins-agent-1/workspace/first\_project/portfolio\_frontend\_developer/

# copy all from portfolio\_frontend\_developer/ to workspace dir

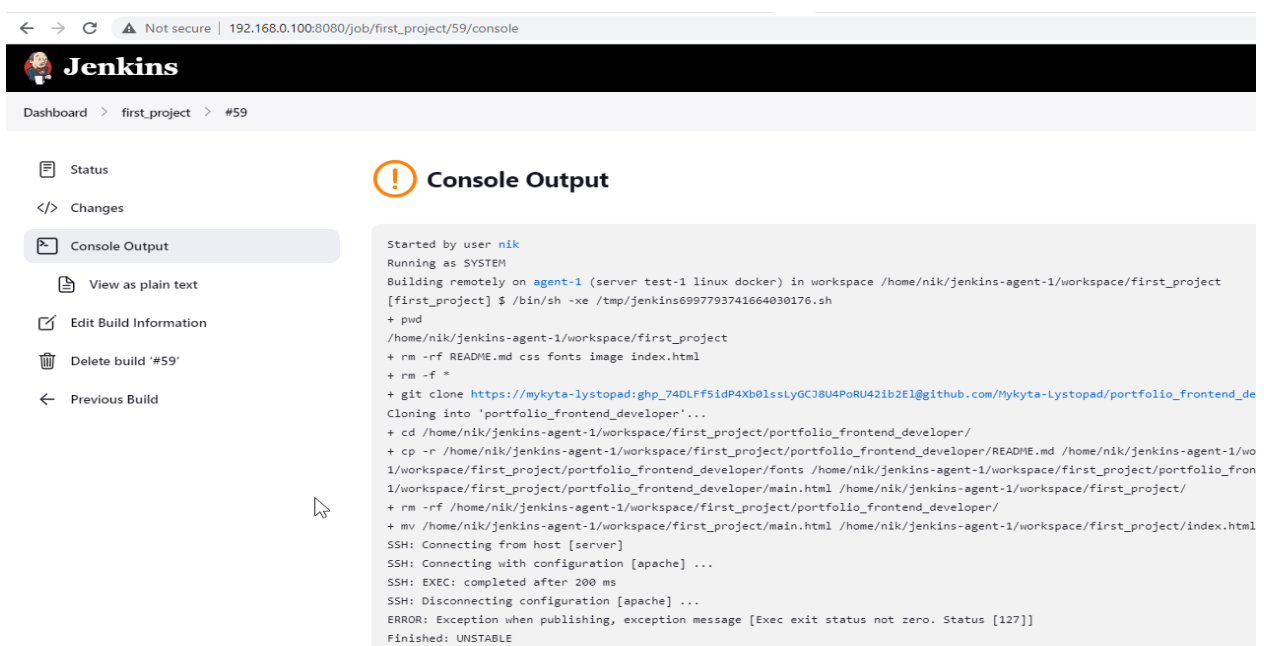
cp -r /home/nik/jenkins-agent-1/workspace/first\_project/portfolio\_frontend\_developer/\*  
/home/nik/jenkins-agent-1/workspace/first\_project/

# delete portfolio\_frontend\_developer/ folder

rm -rf /home/nik/jenkins-agent-1/workspace/first\_project/portfolio\_frontend\_developer/

# rename main.html in index.html for apache reading

mv /home/nik/jenkins-agent-1/workspace/first\_project/main.html  
/home/nik/jenkins-agent-1/workspace/first\_project/index.html



← → ↻ ⚠ Not secure | 192.168.0.100:8080/job/first\_project/59/console

## Jenkins

Dashboard > first\_project > #59

- Status
- </> Changes
- Console Output**
- View as plain text
- Edit Build Information
- Delete build '#59'
- ← Previous Build

### Console Output

```
Started by user nik
Running as SYSTEM
Building remotely on agent-1 (server test-1 linux docker) in workspace /home/nik/jenkins-agent-1/workspace/first_project
[first_project] $ /bin/sh -xe /tmp/jenkins6997793741664030176.sh
+ pwd
/home/nik/jenkins-agent-1/workspace/first_project
+ rm -rf README.md css fonts image index.html
+ rm -f *
+ git clone https://mykyta-lystopad:ghp_74DLff5idP4Xb0lssLyGCJ8U4PoRU42ib2El@github.com/Mykyta-Lystopad/portfolio_frontend_developer.git
Cloning into 'portfolio_frontend_developer'...
+ cd /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/
+ cp -r /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/README.md /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/
+ cp -r /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/fonts /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/
+ cp -r /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/main.html /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/
+ mv /home/nik/jenkins-agent-1/workspace/first_project/main.html /home/nik/jenkins-agent-1/workspace/first_project/index.html
SSH: Connecting from host [server]
SSH: Connecting with configuration [apache] ...
SSH: EXEC: completed after 200 ms
SSH: Disconnecting configuration [apache] ...
ERROR: Exception when publishing, exception message [Exec exit status not zero. Status [127]]
Finished: UNSTABLE
```

## Update Jenkins

```
cat /var/lib/jenkins/config.xml | grep '<version>'

sudo wget https://updates.jenkins-ci.org/latest/jenkins.war

cp /usr/share/java/jenkins.war /usr/share/java/jenkins.war_copy

cp /root/jenkins.war /usr/share/java/

sudo service jenkins restart

cat /var/lib/jenkins/config.xml | grep '<version>'
```

## Add Jenkins agent to remote VM

### On Master

```
nano /etc/ssh/sshd_config

Port 22

service sshd restart

# create ssh-key

ssh-keygen -t rsa -C "jenkins" -m PEM -P "" -f /var/lib/jenkins/.ssh/id_rsa_agent-2

# copy to client

ssh-copy-id -i /var/lib/jenkins/.ssh/id_rsa_agent-2 root@192.168.0.103
```

maybe:

# add to known\_hosts file all \*.pub key that we have on this VM

```
ssh-keyscan -H server >> /var/lib/jenkins/.ssh/known_hosts
```

server - hostname of VM

```
service sshd restart
```

```
drwxrwxrwx 2 jenkins root 4096 Nov 16 21:51 /
drwxr-xr-x 1 jenkins jenkins 4096 Nov 16 21:50 ../
-rw-r----- 1 jenkins jenkins 2455 Nov 10 21:45 id_rsa
-rw-r----- 1 jenkins jenkins 2459 Nov 16 20:20 id_rsa_agent-1
-rw-r--r-- 1 jenkins jenkins 561 Nov 16 20:20 id_rsa_agent-1.pub
-rw-r----- 1 jenkins jenkins 2455 Nov 16 20:01 id_rsa_agent-2
-rw-r--r-- 1 jenkins jenkins 561 Nov 16 20:01 id_rsa_agent-2.pub
-rw-r--r-- 1 jenkins jenkins 561 Nov 10 21:45 id_rsa.pub
-rw-r--r-- 1 jenkins jenkins 355 Nov 10 20:06 index.html
-rw-r--r-- 1 jenkins jenkins 6626 Nov 16 21:53 known_hosts
-rwxr-xr-x 1 jenkins jenkins 978 Nov 15 23:05 known_hosts_copy*
-rw-r----- 1 jenkins jenkins 2059 Nov 10 21:24 rsa
-rw-r--r-- 1 jenkins jenkins 565 Nov 10 14:39 rsa.ppk
-rw-r--r-- 1 jenkins jenkins 565 Nov 10 21:38 rsa.pub
root@server:/var/lib/jenkins/.ssh# ssh-keyscan -H server >> /var/lib/jenkins/.ssh/known_hosts
# server:22 SSH-2.0-OpenSSH_8.9p1 Ubuntu-3
# server:22 SSH-2.0-OpenSSH_8.9p1 Ubuntu-3
# server:22 SSH-2.0-OpenSSH_8.9p1 Ubuntu-3
# server:22 SSH-2.0-OpenSSH_8.9p1 Ubuntu-3
# server:22 SSH-2.0-OpenSSH_8.9p1 Ubuntu-3
```

## Remote agent VM

yum update

yum install -y java-11-openjdk-devel

# chose the version

alternatives --config java

java -version

# install maven

yum install maven -y

#Add a jenkins user with the home /var/lib/Jenkins

# Create an authorized\_keys file for the Jenkins user

useradd -d /var/lib/jenkins jenkins

mkdir -p /var/lib/jenkins/.ssh

cd /root/.ssh

cp authorized\_keys /var/lib/jenkins/.ssh/

chown -R jenkins /var/lib/jenkins/.ssh

chmod 600 /var/lib/jenkins/.ssh/authorized\_keys

chmod 700 /var/lib/jenkins/.ssh

```
[root@localhost .ssh]# pwd
/var/lib/jenkins/.ssh
[root@localhost .ssh]# cp /root/.ssh/authorized_keys /var/lib/jenkins/.ssh
cp: overwrite '/var/lib/jenkins/.ssh/authorized_keys'? yes
[root@localhost .ssh]# ll
total 12
-rw-----. 1 jenkins jenkins 1687 Nov 16 17:23 authorized_keys
-rw-----. 1 root     root     1126 Nov 16 17:22 authorized_keys_copy
-rw-rw-r--. 1 jenkins jenkins  806 Nov 16 17:07 known_hosts
[root@localhost .ssh]#
```



Status



Delete Agent



Configure



Build History



Load Statistics



Script Console



Log



System Information



Disconnect

## Build Executor Status



1 Idle

Name ?

remote-agent-2

Description ?

Number of executors ?

1

Remote root directory ?

/var/lib/jenkins/

Labels ?

linux

Usage ?

Use this node as much as possible

Launch method ?

Launch agents via SSH

Host ?

192.168.0.103

Credentials ?

jenkins (agent-2)

+ Add

Host Key Verification Strategy ?

Non verifying Verification Strategy



Advanced...

Save

# show current folder

pwd

# delete all folders

rm -rf \*

# delete all files

rm -f \*

# clone repo using https link from github

git clone

https://mykyta-lystopad:ghp\_74DLff5idP4Xb0lssLyGCJ8U4PoRU42ib2El@github.com/Mykyta-Lystopad/portfolio\_frontend\_developer.git

# cd to portfolio\_frontend\_developer/

cd /var/lib/jenkins/workspace/first\_project/portfolio\_frontend\_developer/

# copy all from portfolio\_frontend\_developer/ to workspace dir

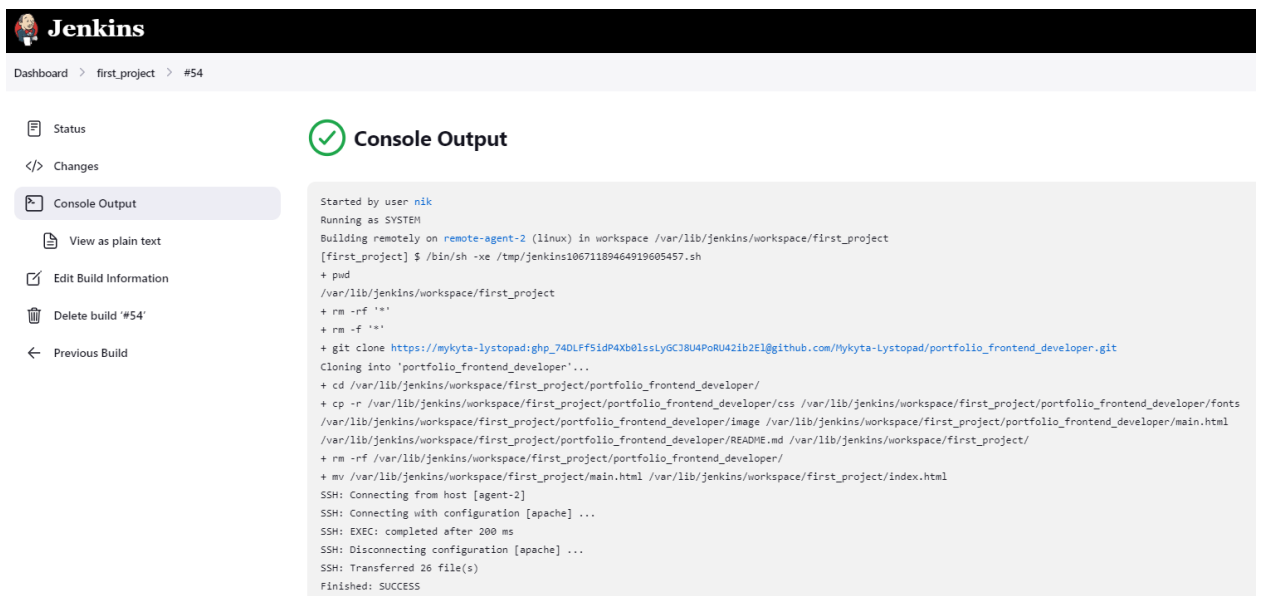
cp -r /var/lib/jenkins/workspace/first\_project/portfolio\_frontend\_developer/\*  
/var/lib/jenkins/workspace/first\_project/

# delete portfolio\_frontend\_developer/ folder

rm -rf /var/lib/jenkins/workspace/first\_project/portfolio\_frontend\_developer/

# rename main.html in index.html for apache reading

mv /var/lib/jenkins/workspace/first\_project/main.html  
/var/lib/jenkins/workspace/first\_project/index.html



The screenshot displays the Jenkins web interface. At the top, the Jenkins logo is visible. Below it, the breadcrumb navigation shows 'Dashboard > first\_project > #54'. On the left sidebar, the 'Console Output' tab is selected, with other options like 'Status', 'Changes', 'View as plain text', 'Edit Build Information', 'Delete build #54', and 'Previous Build'. The main area shows the 'Console Output' for build #54, which includes the following text:

```
Started by user nik
Running as SYSTEM
Building remotely on remote-agent-2 (linux) in workspace /var/lib/jenkins/workspace/first_project
[first_project] $ /bin/sh -xe /tmp/jenkins10671189464919605457.sh
+ pwd
/var/lib/jenkins/workspace/first_project
+ rm -rf '*'
+ rm -f '*'
+ git clone https://mykyta-lystopad:ghp_74DLff5idP4Xb0lssLyGCJ8U4PoRU42ib2El@github.com/Mykyta-Lystopad/portfolio_frontend_developer.git
Cloning into 'portfolio_frontend_developer'...
+ cd /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/
+ cp -r /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/css /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/fonts
/var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/image /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/main.html
/var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/README.md /var/lib/jenkins/workspace/first_project/
+ rm -rf /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/
+ mv /var/lib/jenkins/workspace/first_project/main.html /var/lib/jenkins/workspace/first_project/index.html
SSH: Connecting from host [agent-2]
SSH: Connecting with configuration [apache] ...
SSH: EXEC: completed after 200 ms
SSH: Disconnecting configuration [apache] ...
SSH: Transferred 26 file(s)
Finished: SUCCESS
```

