

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
✓ Timestamp	✓ Workspace Cleanup	✓ Ant	✓ Gradle
⚙ Pipeline	⚙ GitHub Branch Source	⚙ Pipeline: GitHub Groovy Libraries	⚙ Pipeline: Stage View
⚙ Git	⚙ SSH Build Agents	⚙ Matrix Authorization Strategy	⚙ PAM Authentication
⚙ LDAP	⚙ Email Extension	⚙ Mailer	

Instance Identity

== Hina SSHD API :: Common

== Hina SSHD API :: Core

== SSHD API

OWASP Markup Formatter

== Token Macro

Build Timeout

== Credentials

== Credentials

== SSH Credentials

== Pipeline: SSH API

== Plain Credentials

Credentials Binding

== SSH API

== Pipeline: API

== Commons-lang3 v3.x Jenkins API

Timestamp

== Cache API

== Script Security

== Sonicon API

== SASS

== Snakeyaml API

== Jackson 2 API

== Commons Text API

== Plugin Utilities API

== Font Awesome API

== Popper.js 2 API

== Bootstrap 5 API

== jQuery API

== ECharts API

== Pipeline: Supporting APIs

== JUnit API

== Matrix Project

== Resource Discover

Workspace Cleanup

API

== Apache HttpClient: Client

4.x API

== Oracle Java SE Development Kit

Installer

== Command Agent Launcher

== Jenkinsfile VCS 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

nik

Пароль

...

Повторите пароль

...

Ф.И.О.

Адрес электронной почты

2 Install plugins.

/var/lib/jenkins

Dashboard > Настроить Jenkins

Настройка Jenkins

Building on the built-in node can be a security issue. You should set up distributed builds. See [the documentation](#).

System Configuration

- 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.

Security

- 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

Left sidebar menu: Создать Item, Пользователи, История сборок, **Настроить Jenkins**, My Views, Очередь сборки, Состояние сборщиков.

3 Start first pipeline

Dashboard > All >

Create new item

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

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:GkAmn7ySh6x8uVvRG4WfCpF8pQIjyl5K9gleJ3M
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-----
b3BlbnNzaC1rZXktdjEAAAAAAAAABG5vbmUAAAAAEbm9uZQAAAAAAAAABAAABlWAAAAAdzc2gtcn
NhAAAAAwEAAQAAAYEAw1Jf7pGWggnfpTZqBu9vqqiMPsQEUKqC6D32XdvLZdVoiCcabsx
wsFNIOtmqlQgkNPIL7niq+/WC5SijCzwrqxlba4UADeXBnnzNP4G8ZhYoKxPQRbM6oxxL6
Xr5tBAXngRYAIXnaiBDIz+ng8lNqNzG6xB+KsluNiYoUpkd+ZXh6JJQkiWekr+w/PwkPVF
XdQN6yZsvZV1jYUGiG+hPpRhA17S/4YJPSMZ9ucUtUmYr2bMyBQjGcvcATAj30kH14VXKG
YG23nsh0wHQBpYD739Rr0ZBLx1eaEIoAu+JcG+3xZhaQcCJ7HdhFfuVd9QSPGUW5Qgww
6tKgieC+KYUq8BCFMwUz6n3au/FXW+uHXZbAhJR4evt28a36MulKN0O5zKLXQrRwZ0y87
dejYnmwUmfXVqGkxVbwXqFai0+a96rszYaC0D7vkW4uGnwwqZKhMUDsBmjzogs9t36lUpGp
epNVjtXTTX52sewDryC6wJMvf3/pmP/6ny9wfqsNAAAFiAvvPvoFbz76AAAAAB3NzaC1yc2
EAAAGBAMNSX+6RloIJ36U2agbvb6qojD7EBFCqgug99l3by2XVRaIlgNm7McLBTZTk5qpU
IJDT5S+54qvv1guUpYws8K6sZW2uFAA3lwZ58zT+BvGYWKCST0KwZuqMcS+i6+bQQF54EW
AJV52ogQyM/p4PJtAjcxusQfirJbYmKFKZHfmV4eiSUJlInpK/sPz8JD1RV3UDesmbL2V
dY2FBohvoT6UYQNe0v+GCT0jGfbnFLVJmK9mzMgUlxnL3AEwl99JB9eFVyhmBtt57lMBO
AaWA+9/Ua9GQSyMdXmhCKALviXBvt8WYyWkHAiex3YRX7rlXfUEjXfUIMMOrSolngvimF
KvAQhTMFM+p92rvxV1vrh12WwISueHr7dvGt+jLiCjdDucyi1V0K0cGdMvO3Xo2J8JJn1
1ahpMVW8F6hWotPmveq7M2GgtA+75FuLhp8MKmSoTFA7AZo86lPbd+iFKRqXqTVY7V001+
drHsA68gusCTL39/6Zj/+p8vcH6rDQAAAAMBAAEAAAGAKFcZkZkKlX4hldEM7V9Ayq3eH
kkiQKGce/mM8Fi81/Gd3MzytSKNPaWjuNtzo8gtz4r1A9hBRPSWoEfPyFlxZh8nOXFupk
S0ahl/bFOV2IJF4iKpxjTRr/f39Nxiw12toCgKq9SUcVjCGMrtli7rn4YSVFJNY4PsKhV2
KVeHv+5Pj8F3AFgDGAB7mYnF/D2VqKG0Z+2/MD6dwpGsGvdEzR8o/BIVu6CcH3qVpVmRgf
ss5RChu6mifUAvgN095xn0EvoQC8qdO6kbNVlSiGfDQ61IRJmfa19S2GKIUK30GchCABNF
UEe6FZNvtcXgxZ6+Q2Otr9CgsL5R4zlaVHPyvvnenHt1y/GKcbCa6rbJw1HBV4ShR0Di7r
mPJ0xTUQmhs5crbDQRldE75nb5hlj6Ge+inJdC9OzS+QQ1n3vS8Hxt0IYknwl6eKDs4Y3y
lsmpzMcaSChXD710+b7TY9kwjsMteK1nB4xcroihXhR+ImJwfHxzjJny6v5bGk3eBhAAAA
wQCVOfLoYK/WxIxix21g7b2Z8UxwnCGEdjp4y7G0iKOPr2idAmzNCN9aqcE3oXjWyA/xxd
GPv0p17EMfEN3VhG6gkYvBPt2FcSiY2sNLev+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>
```

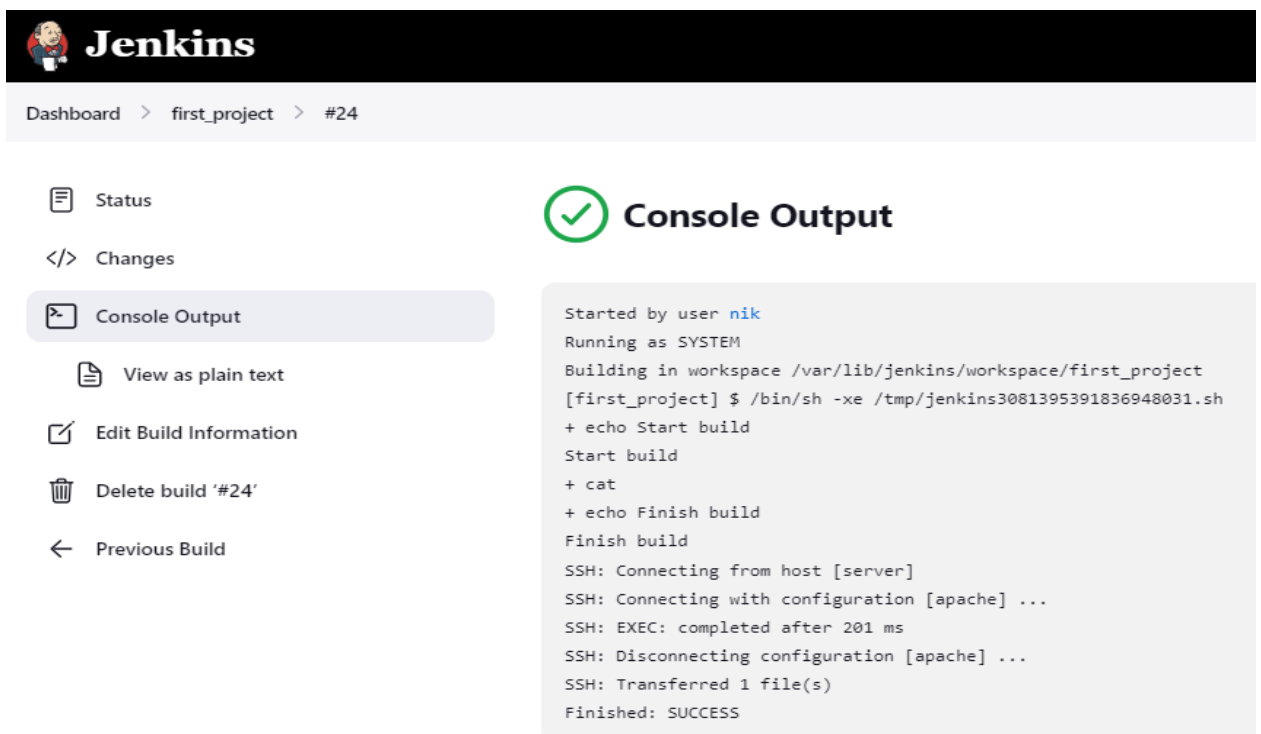
```
<h1>My new the best site</h1>
```

```
</body>
```

```
</html>
```

```
EOF
```

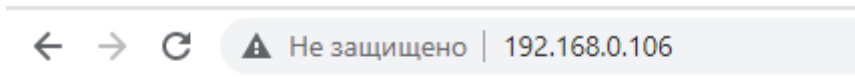
```
echo "Finish build"
```



The screenshot shows the Jenkins web interface. At the top, there's a black header with the Jenkins logo and name. Below it, a breadcrumb trail reads "Dashboard > first_project > #24". On the left sidebar, there are several menu items: "Status", "Changes", "Console Output" (which is highlighted), "View as plain text", "Edit Build Information", "Delete build '#24'", and "Previous Build". The main area on the right is titled "Console Output" with a green checkmark icon. It displays the following text:

```
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
```

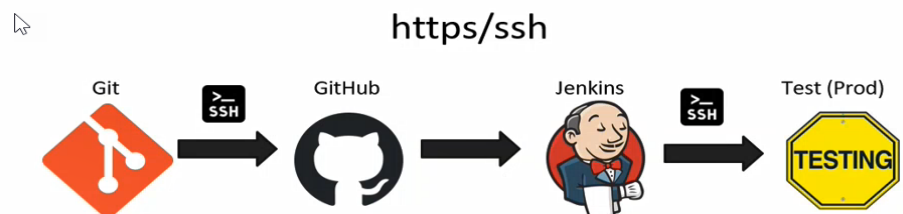

192.168.0.106 Apache server



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 ?

Credentials ?

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

- none -

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

jenkins (gitlab-ssh-key)

Advanced...

Add Repository

Branches to build ?

Branch Specifier (blank for 'any') ?

Add Branch

Repository browser ?

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

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_74DLFF5idP4Xb0lsslyGCJ8U4PorU421b2E1@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
```

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

All

+

S	W	Name ↓	Last Success
		first_project	4 days 2 hr #46

Icon: S M L

Build Queue

No builds in the queue.

Build Executor Status

Built-In Node

1 Idle


2 Idle

agent-1

1 Idle

← → ↻

⚠ Not secure | 192.168.0.100:8080/computer/

 **Jenkins**

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

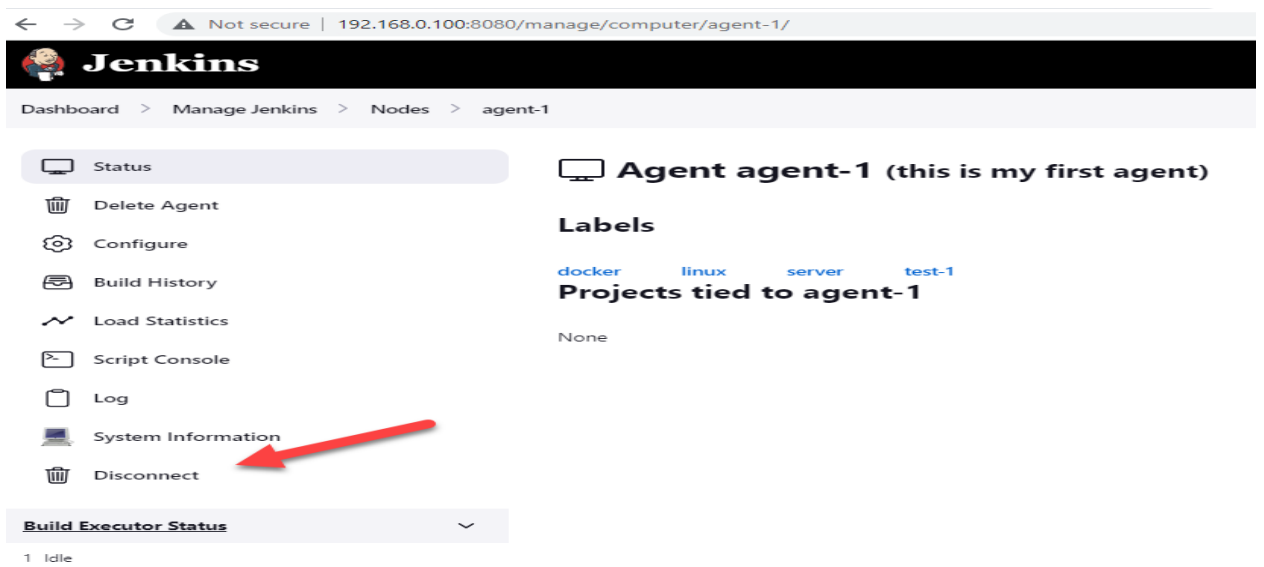
Host Key Verification Strategy ?

Known hosts file Verification Strategy



Advanced...

Save



```
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
```

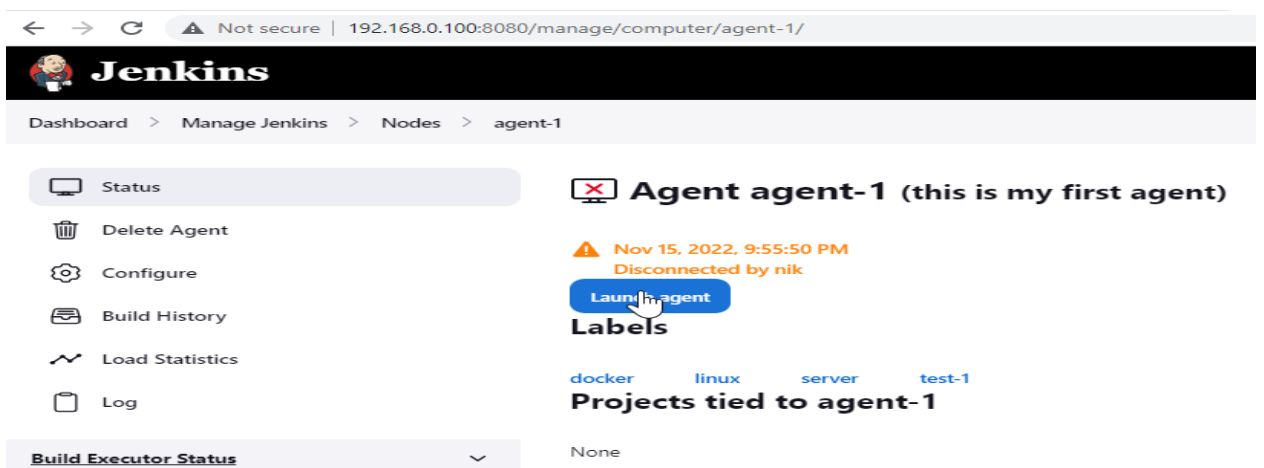
```
Cd /var/lib/jenkins/.ssh
```

```
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





+ 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

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

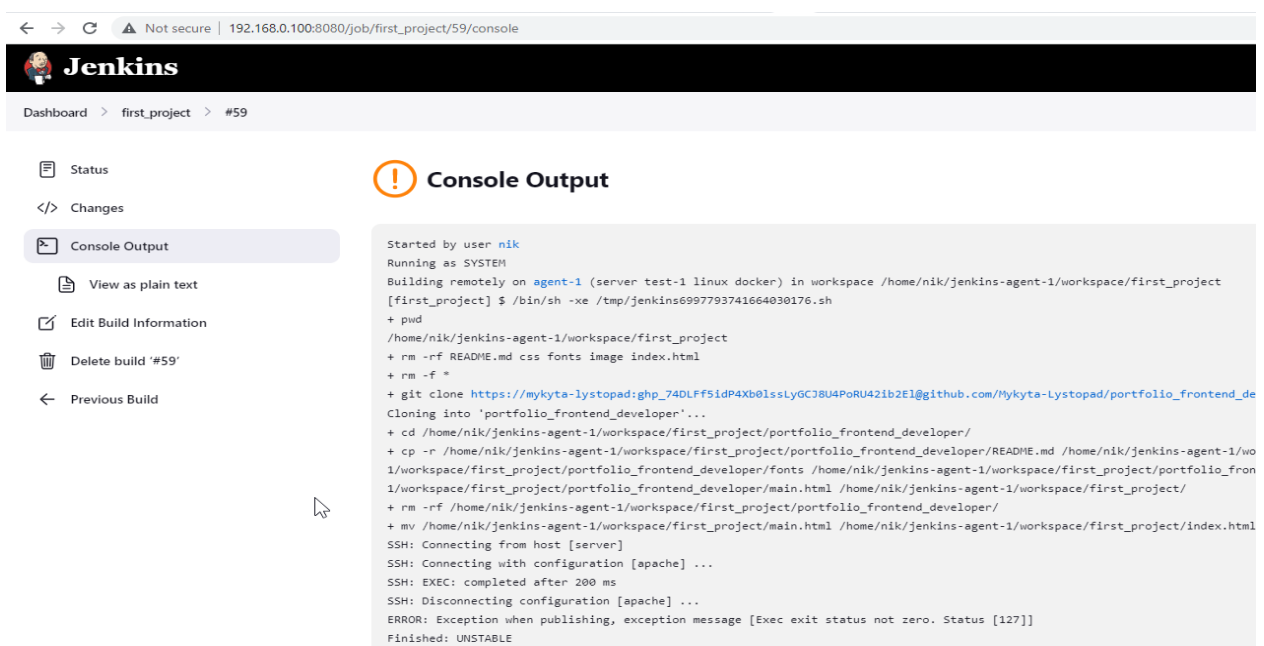
cp -r /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/*
/home/nik/jenkins-agent-1/workspace/first_project/

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/image /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/
+ cp -r /home/nik/jenkins-agent-1/workspace/first_project/portfolio_frontend_developer/index.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_74DLff5idP4Xb0IssLyGCJ8U4PoRU42ib2El@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

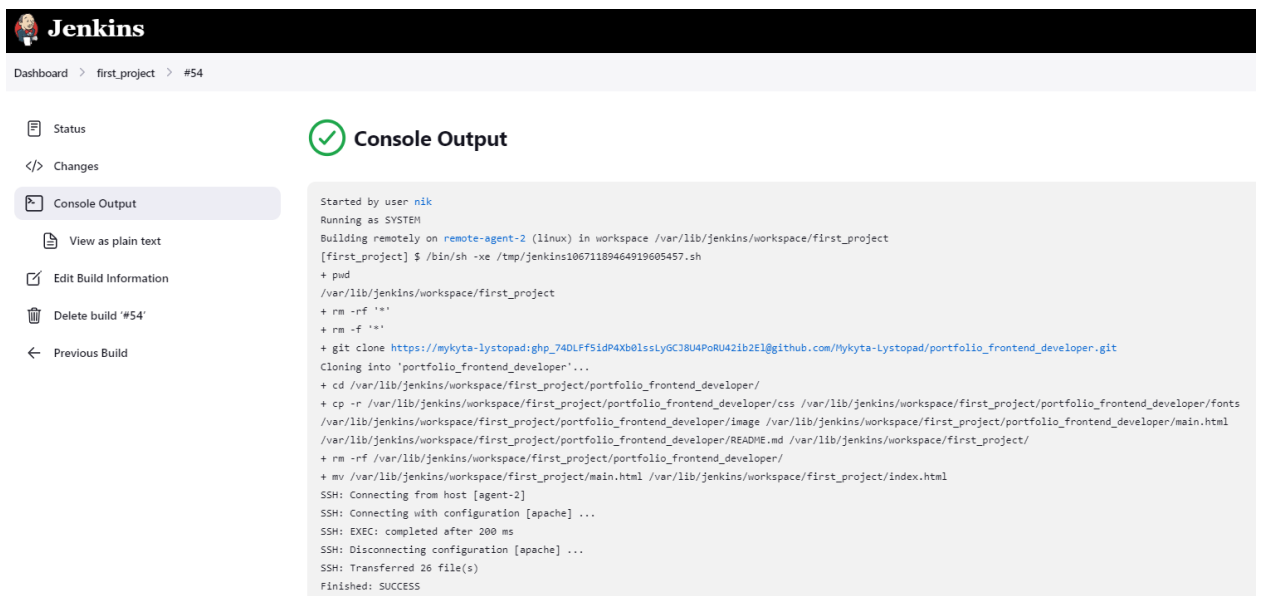
cp -r /var/lib/jenkins/workspace/first_project/portfolio_frontend_developer/*
/var/lib/jenkins/workspace/first_project/

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 shows the Jenkins web interface. At the top, there's a header with the Jenkins logo and the text "Jenkins". Below the header, there's a breadcrumb trail: "Dashboard > first_project > #54". On the left side, there's a sidebar with several links: "Status", "Changes", "Console Output" (which is highlighted), "View as plain text", "Edit Build Information", "Delete build '#54'", and "Previous Build". The main area on the right is titled "Console Output" and shows 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_74DLff5idP4Xb0IssLyGCJ8U4PoRU42ib2El@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
```

