Project to establish an efficient CI/CD pipeline containing three virtual machines where changes to the Ansible playbook hosted in private GitLab instance on second VM trigger automated deployments of Apache HTTP Server on the third VM, with integrated notifications for pipeline status and relevant information about users.

Candidate Name: Salma Salah
Assigned to: Eng. Amr

Step 1

Installing Jenkins on VM1 and GitLab on VM2

1) Installing Jenkins

VM1 JENKINS [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal Tue 06:41

salma@salma:~

File Edit View Search Terminal Help

```
    2  sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.key
    3  sudo yum upgrade
    4  sudo yum install fontconfig java-17-openjdk
    5  sudo yum install jenkins
    6  sudo systemctl daemon-reload
    7  sudo systemctl enable jenkins
    8  sudo systemctl start jenkins
    9  sudo systemctl status jenkins
   10  sudo systemctl start jenkins.service
   11  sudo systemctl enable jenkins.service
   12  sudo systemctl start jenkins.service
   13  sudo firewall-cmd --zone=public --add-port=8080/tcp --permanent
   14  sudo firewall-cmd --reload
   15  sudo firewall-cmd --zone=public --add-port=443/tcp --permanent
   16  sudo firewall-cmd --reload
   17  sudo firewall-cmd --zone=public --list-ports
   18  sudo yum remove jenkins
   19  sudo yum install jenkins
   20  sudo systemctl daemon-reload
   21  sudo systemctl enable jenkins.service
   22  sudo systemctl start jenkins.service
   23  sudo systemctl status jenkins
   24  -l
   25  history
[salma@salma ~]$ S
```

Right Ctrl

2)Configuring VM2 to have static IP Address

vm2 gitlab [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal Thu 23:19

salma@salma:/etc/sysconfig/network-scripts

File Edit View Search Terminal Help

```
TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO=static
IPADDR=192.168.1.35
NETMASK=255.255.255.0
GATEWAY=192.168.1.1
DEFROUTE="yes"
IPV4_FAILURE_FATAL="no"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
IPV6_DEFROUTE="yes"
IPV6_FAILURE_FATAL="no"
IPV6_ADDR_GEN_MODE="stable-privacy"
NAME="enp0s3"
UUID="b131b0e6-e4fa-4361-9b3c-0b3787c28df9"
DEVICE="enp0s3"
ONBOOT="yes"
~
~
~
~
~
~
-- INSERT --                                              5,20          All
```

salma@salma:/etc/sysconfig/networ...

Right Ctrl

3)Installing GitLab and getting root password to login with

VM1 JENKINS SERVER [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal Fri 05:58

salma@salma:~

File Edit View Search Terminal Help

```
   18  sudo vim ifcfg-enp0s3
   19  reboot
   20  ifconfig
   21  sudo yum update
   22  sudo yum install -y curl policycoreutils-python openssh-server perl
   23  sudo systemctl start sshd
   24  sudo systemctl enable sshd
   25  sudo systemctl status sshd
   26  sudo firewall-cmd --add-port=8080/tcp --permanent
   27  sudo firewall-cmd --add-port=80/tcp --permanent
   28  sudo firewall-cmd --add-port=443/tcp --permanent
   29  sudo firewall-cmd --list-ports
   30  sudo systemctl reload firewalld
   31  sudo firewall-cmd --list-ports
   32  sudo systemctl start postfix
   33  sudo systemctl enable postfix
   34  sudo systemctl status postfix
   35  curl -s https://packages.gitlab.com/install/repositories/gitlab/gitlab-ee/script
.sh | sudo bash
   36  curl -s https://packages.gitlab.com/install/repositories/gitlab/gitlab-ee/script
.rpm.sh | sudo bash
   37  sudo EXTERNAL_URL="http://192.168.1.22" yum install -y gitlab-ee
   38  sudo vim /etc/gitlab/gitlab.rb
   39  sudo gitlab-ctl reconfigure
   40  sudo cat /etc/gitlab/initial_root_password
   41  cd Disktop
```

salma@salma:~ *Untitled Documen... Something went wr...

Right Ctrl

VM1 JENKINS [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Thu 02:37

Dashboard [Jenkins]

Firefox View

localhost:8080 70%

Centos Wiki Documentation Forums

Jenkins Search (CTRL+K) salmasalah log out

Dashboard

New Item

People

Build History

Manage Jenkins

My Views

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

Add description

Welcome to Jenkins!

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

Start building your software project

Create a job

Set up a distributed build

Set up an agent

Configure a cloud

Learn more about distributed builds

Dashboard [Jenkins] — Mozilla Firefox

Right Ctrl

VM1 JENKINS SERVER [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal Fri 05:57

salma@salma:~

File Edit View Search Terminal Help

```
   12  route -n
   13  sudo cd /etc/sysconfig/network-scripts/
   14   cd /etc/sysconfig/network-scripts/
   15  ls
   16  cp ifcfg-enp0s3 ifcfg-backup
   17  sudo cp ifcfg-enp0s3 ifcfg-backup
   18  sudo vim ifcfg-enp0s3
   19  reboot
   20  ifconfig
   21  sudo yum update
   22  sudo yum install -y curl policycoreutils-python openssh-server perl
   23  sudo systemctl start sshd
   24  sudo systemctl enable sshd
   25  sudo systemctl status sshd
   26  sudo firewall-cmd --add-port=8080/tcp --permanent
   27  sudo firewall-cmd --add-port=80/tcp --permanent
   28  sudo firewall-cmd --add-port=443/tcp --permanent
   29  sudo firewall-cmd --list-ports
   30  sudo systemctl reload firewalld
   31  sudo firewall-cmd --list-ports
   32  sudo systemctl start postfix
   33  sudo systemctl enable postfix
   34  sudo systemctl status postfix
   35  curl -s https://packages.gitlab.com/install/repositories/gitlab/gitlab-ee/script
.sh | sudo bash
   36  curl -s https://packages.gitlab.com/install/repositories/gitlab/gitlab-ee/script
```

salma@salma:~ *Untitled Documen... Something went wr...

Right Ctrl

vm2 gitlab [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Thu 01:14

Projects · GitLab

192.168.1.27

Centos Wiki Documentation Forums

Your work / Projects

Search or go to...

Your work

Projects

Groups

Issues

Merge requests

To-Do List

Help Admin Area

Welcome to GitLab

Faster releases. Better code. Less pain.

Create a project

Projects are where you store your code, access issues, wiki and

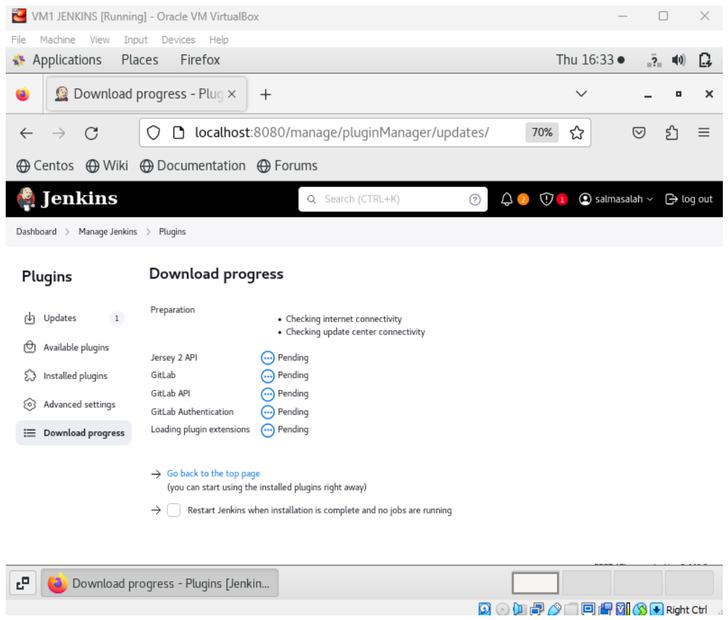
salma@salma:~ Projects · GitLab — Mozilla Firefox

Right Ctrl

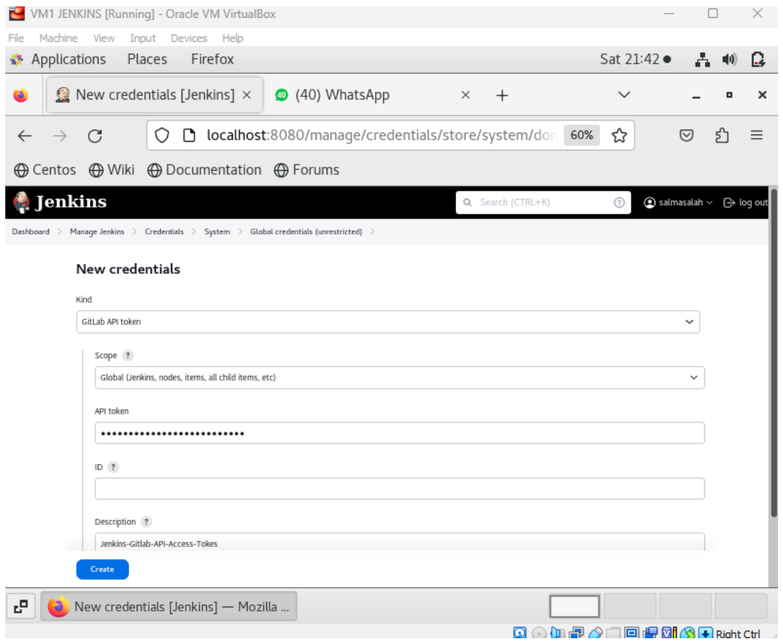
Step 2

Jenkins Integration With GetLab

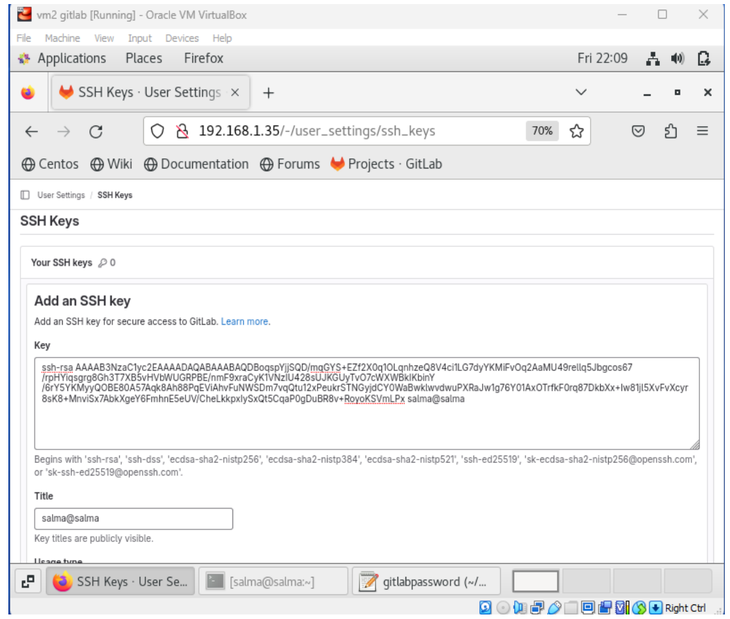
1)Installing Required Plugins



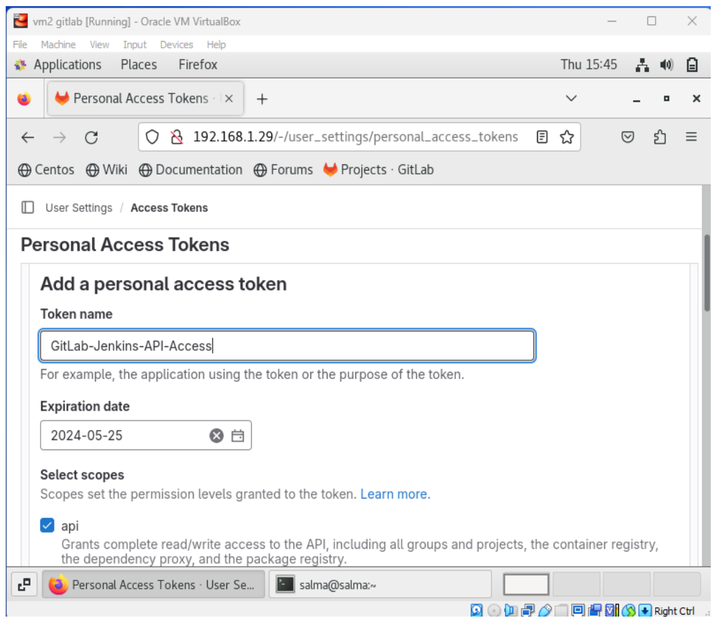
3) Adding token to jenkins



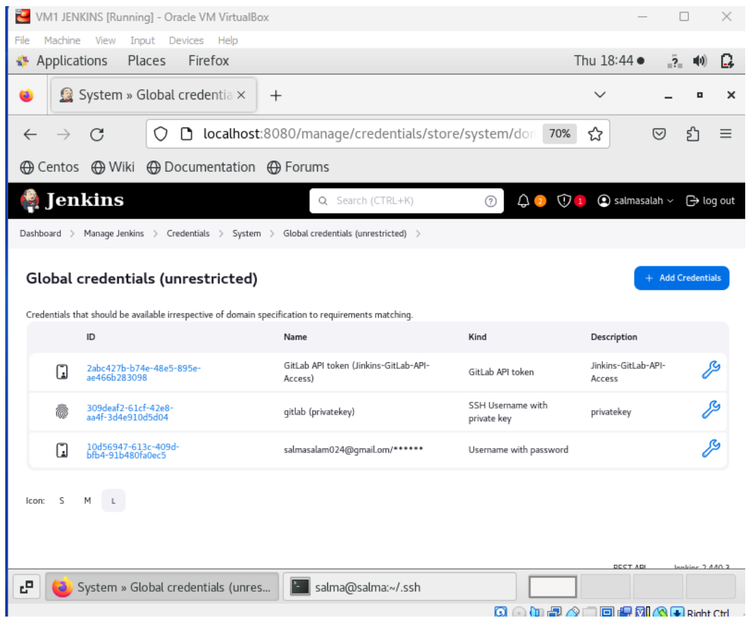
5) Adding key to Ansible



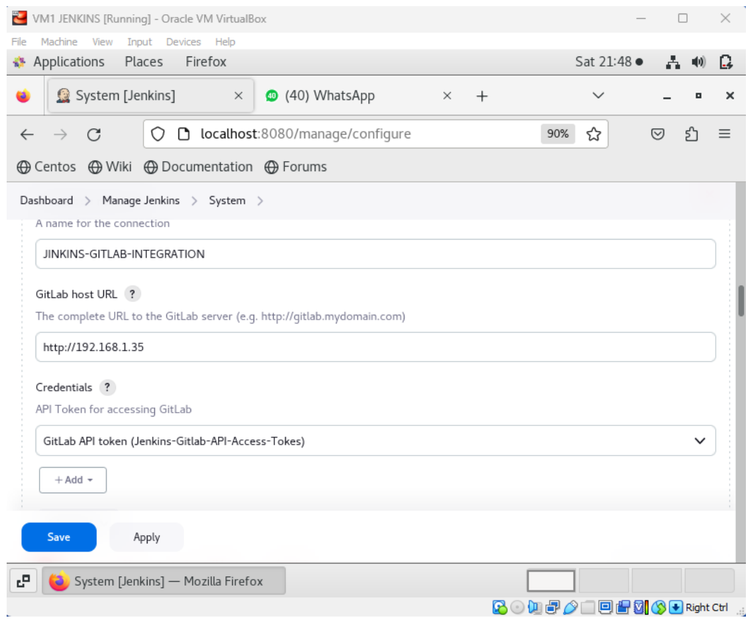
2)Creating API Token



4) Creating SSH key



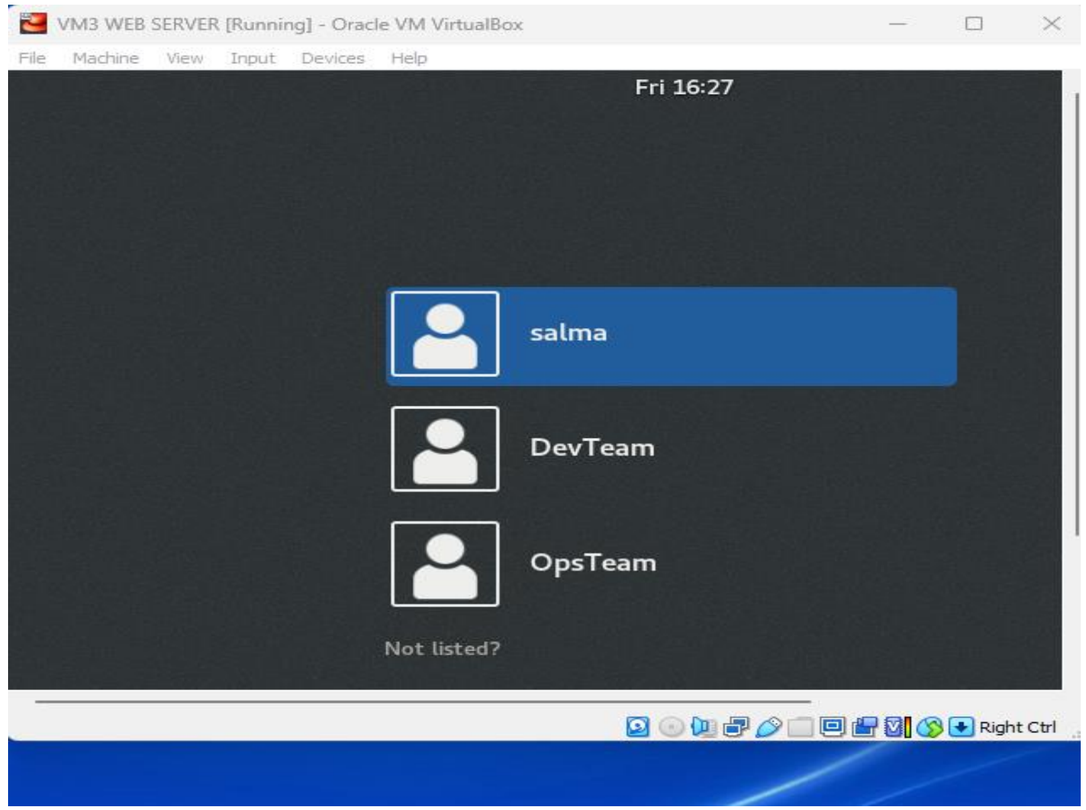
6) Testing Connection

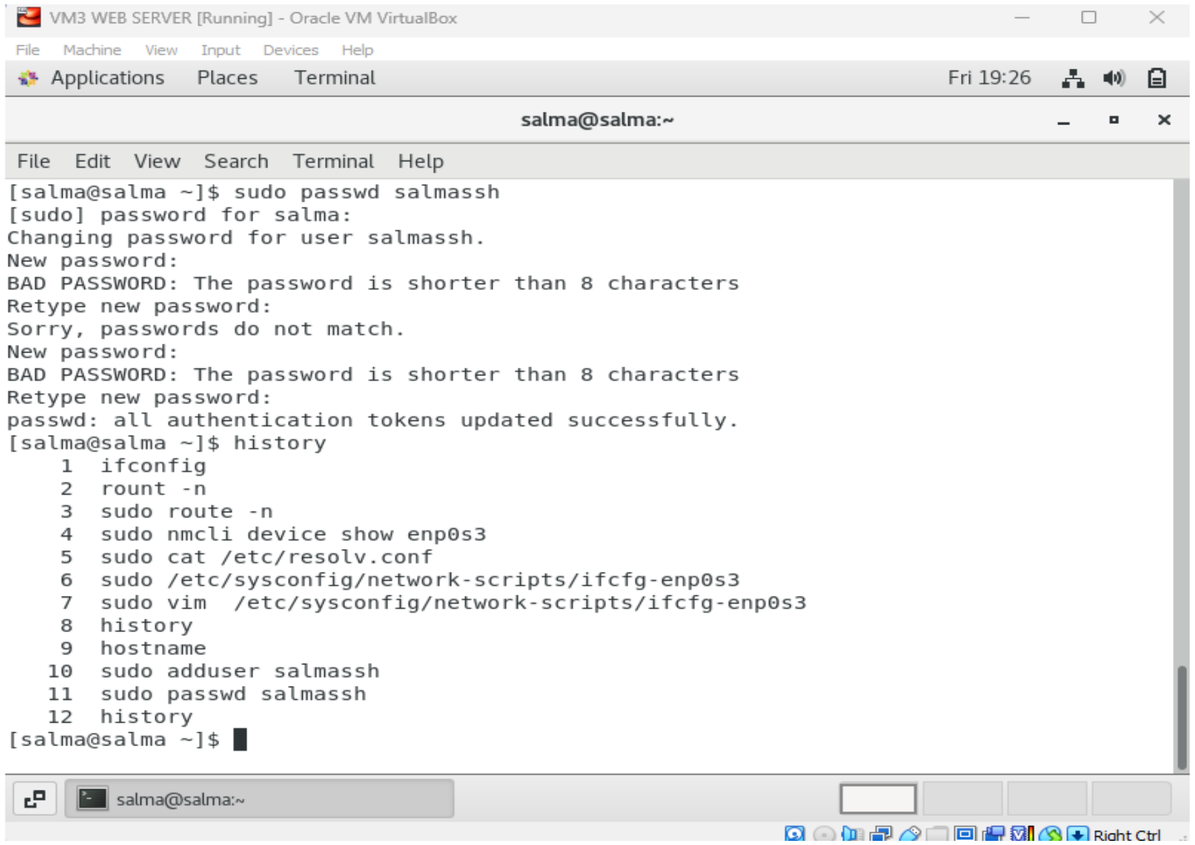


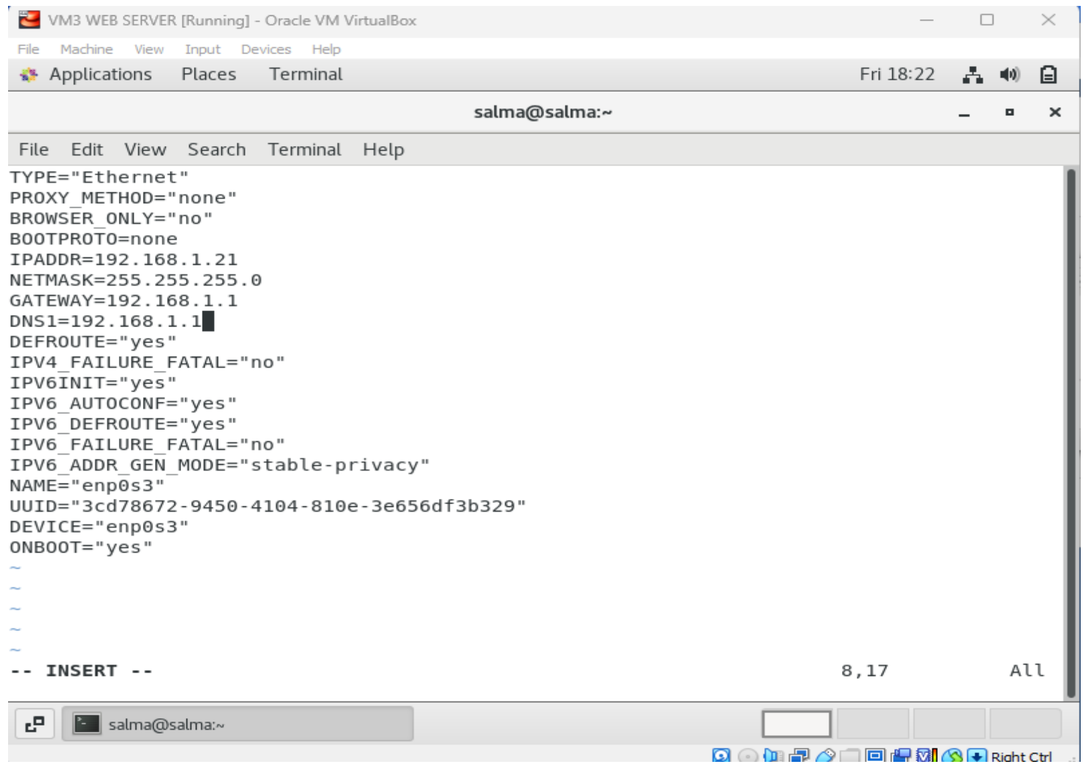
Step3

Configurations onVM3

1) Running bash script to create users DevTeam & OpsTeam
2)Making IP address STATIC to be used in Ansible Inventory
3)Making SSH user to to be used in Ansible Inventory







Step 4

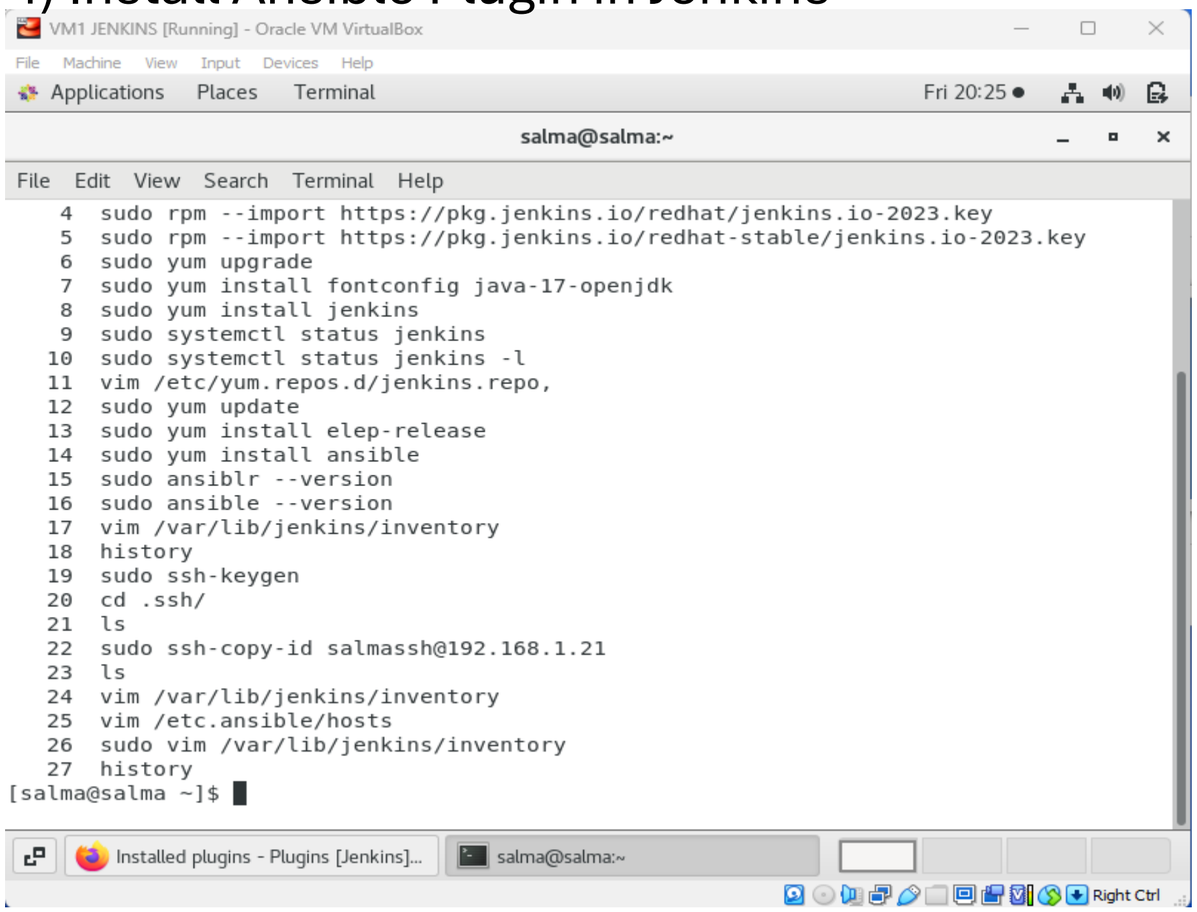
Ansible Installation and Integration with Jenkins

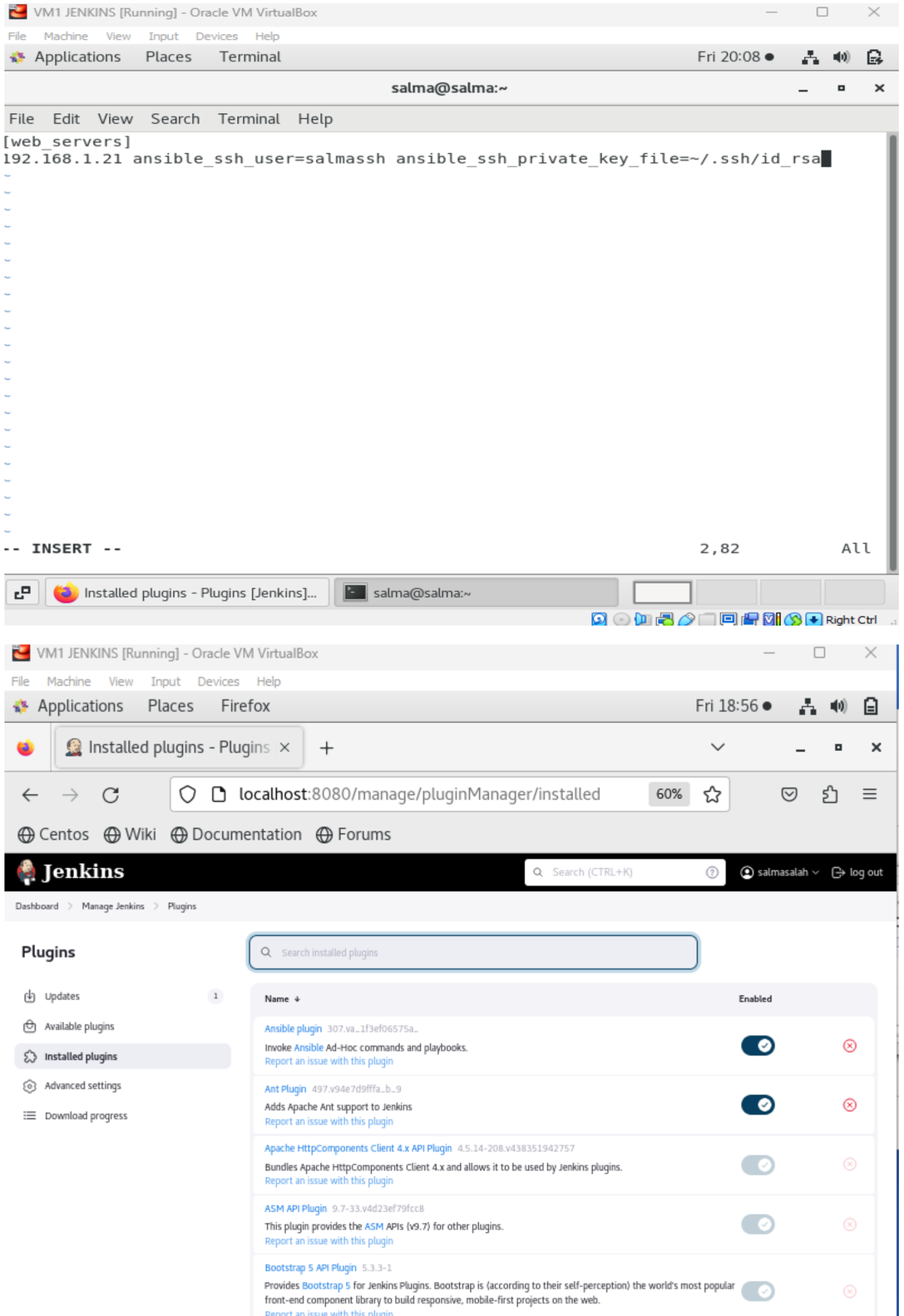
1)Install Ansible

2)Generate Public and private keys and copy the public to (VM3)

3) Configure Ansible Inventory and add IP Address of target machine (VM3) and ssh user name that was created on previous step and add path to private ssh key

4) Install Ansible Plugin in Jenkins

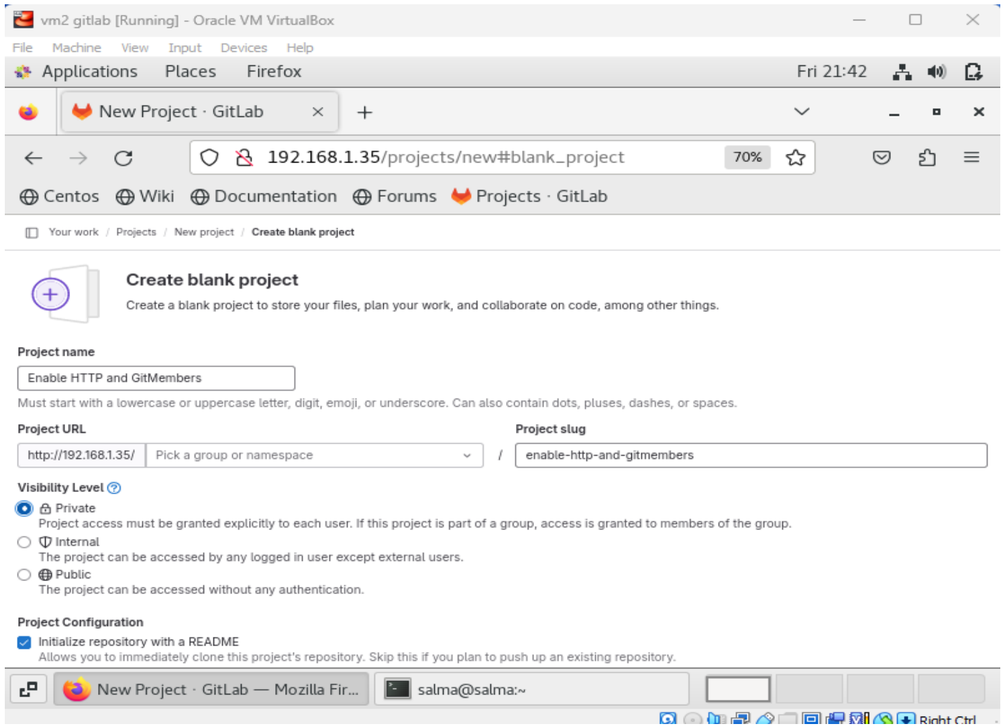


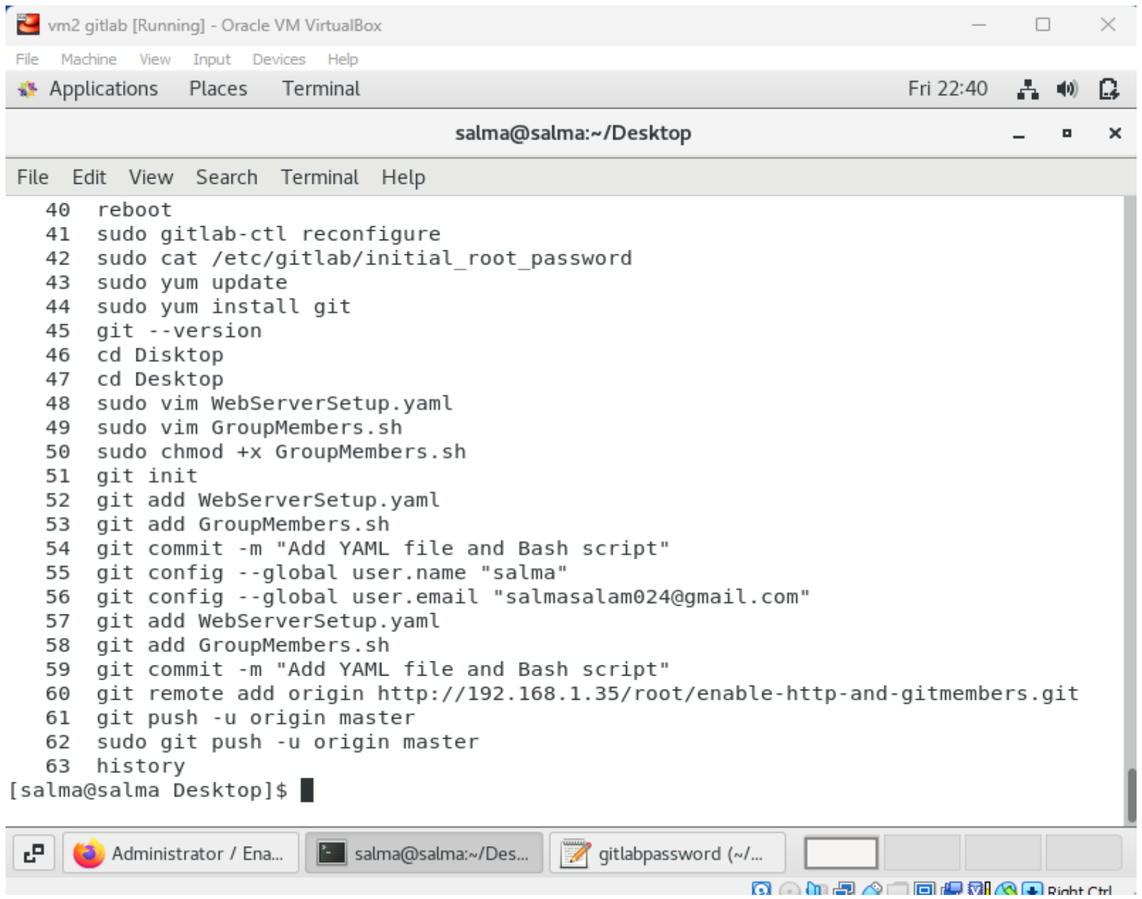


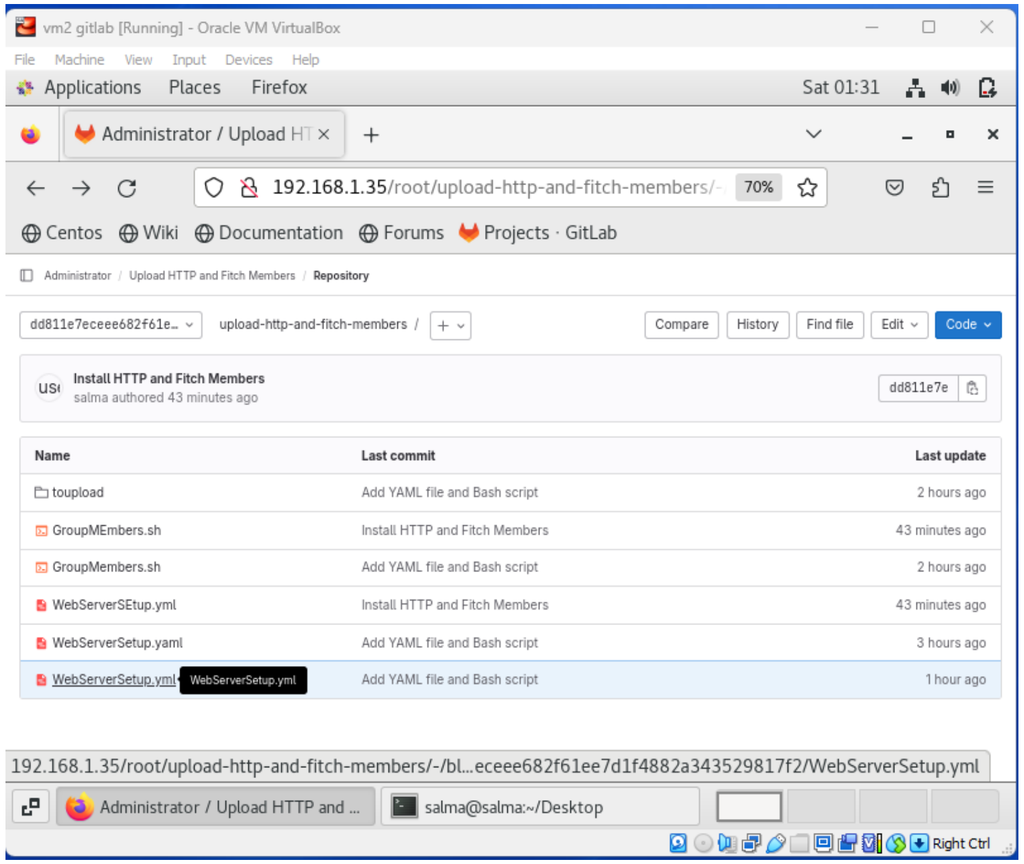
Step 5

Git Installation and push files into GitLab Repo

1)Install Git on VM2
2) Making a new repository
3) Push (WebSErver.yml) &(GetMEmbers.sh) into the Rebo



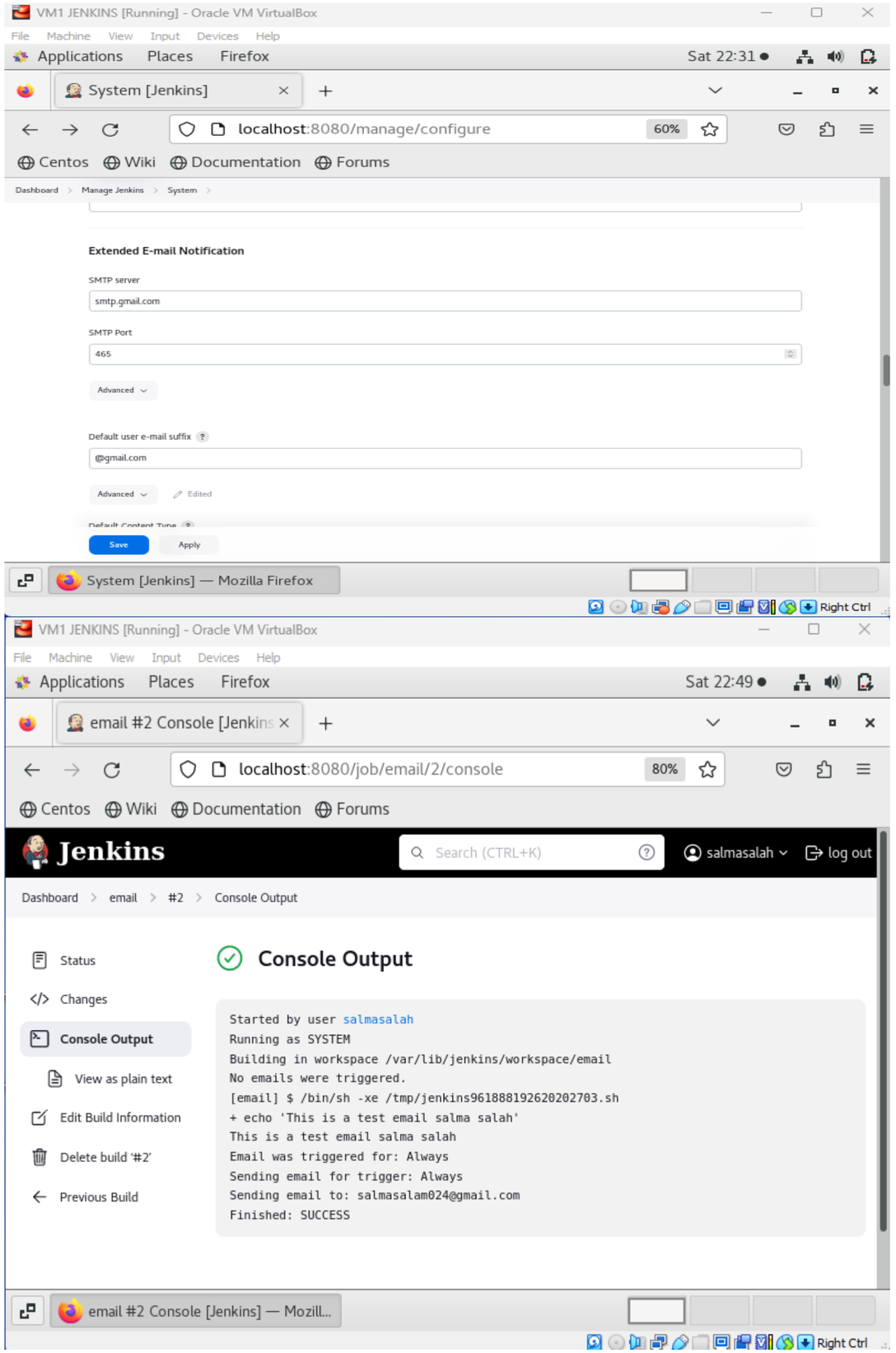


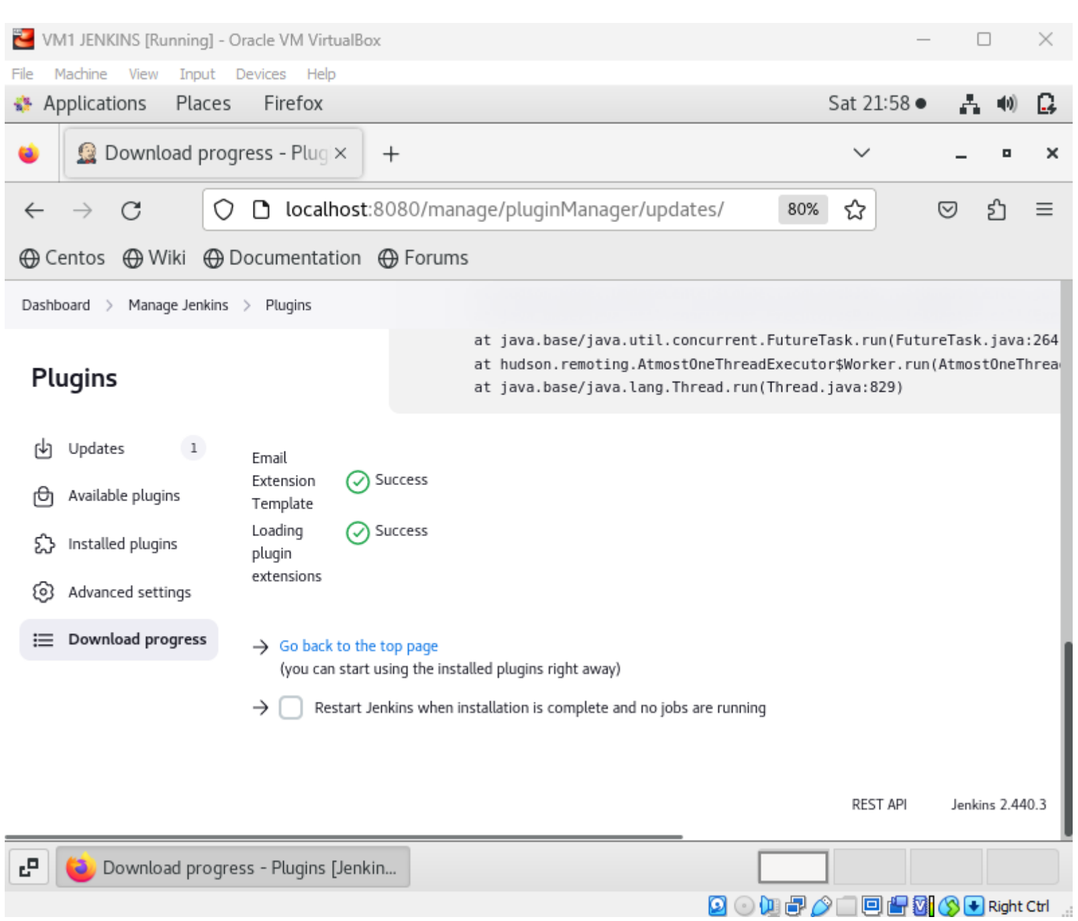


Step 6

Setting Up Email Notification in Jenkins

1) Install Email Extension Plugin
2) Configure Email Notification Settings
3) Create a project to test if email notification is working and it ‘s successful





Step 7

PipeLine Configuration

1)Create a new project
2) Add pipeline configurations and built triggers
3) Add Pipeline Script