SYSTEM ADMINISTRATION LAB

B. Tech. (COMPUTER ENGINEERING)
Semester -IV

Laboratory Manual

Department of Computer Engineering

R. C. Patel Institute of Technology, Shirpur

VISION & MISSION

Institute

Vision:
- To achieve excellence in engineering education with strong ethical values.

Mission:

To impart high quality Technical Education through:
- Innovative and Interactive learning process and high quality instructional programs.
- Fostering a scientific temper among students by means of a liaison with the Academia, Industries and Government.
- Preparing students from diverse backgrounds to have attitude for research and spirit of Professionalism.
- Inculcating in students a respect for fellow human beings and responsibility towards the society.

Computer Engineering Department

Vision:

- To provide prominent computer engineering education with socio-moral values.

Mission:

- To groom students to become professionally and ethically sound computer engineers to meet the growing needs of industry and society.

The Shirpur Education Society's

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CERTIFICATE

This is to certify that Mr. /Miss._____of B.Tech (Computer Engineering), Roll No._____ has performed practical work satisfactorily in the subject System Administration Lab, in the Department of Computer Engineering during the academic year 20 - 20 .

Date: / /20   *Subject In-charge*
Place: Shirpur

Principal   *Head of Department*

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Laboratory Report

Experiment No – 01A

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Installation of CentOS7 Linux Operating System without LVM.

Evaluation

1) Attendance [2]   ----------------

2) Lab Performance [2]   ----------------

3) Oral [1]   ----------------

Overall Marks [5]   ----------------

Subject Incharge

Experiment No.1A

TITLE: Installation of various Linux Flavors: CentOS (With & without LVM), Ubuntu

(With & Without LVM).

PREREQUISITE: Basic of Operating System

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

| Sr.No	Software Configuration	
1	Operating System	ISO Image of CentOS7 and Ubuntu
2	Software Platform	Virtual Box or VMWare Workstation

Theory:-
CentOS is a Linux distribution company similar to Redhat Enterprise Linux was released its first version on year 2004, Till now the versions released by CentOS are CentOS 3, 4, 5, 6, 7. CentOS 7 are the latest version which was released on year 2014. CentOS 7 comes with some additional features like included **systemd** which is replaced with init system, supports on Intel i3, i5, i7 Processors**.**

To start the installation process of CentOS 7 Server version / CentOS 7 Desktop version insert the installation bootable media in DVD-ROM/RW and keep the DVD-ROM as a first boot device to allow the system to boot from CentOS 7 bootable media OR if you are trying to install on Vmware Workstation then you can use ISO image.

Step 1: After boot the system from CentOS 7 media you will able to see the first screen in front of you which is shown below, Here you select **Install CentOS 7** (Highlighted in Blue color on the snapshot below)and press enter to go for further step. (**Note:** You can move the selection cursor by **UP** and **DOWN** key on Keyboard.)
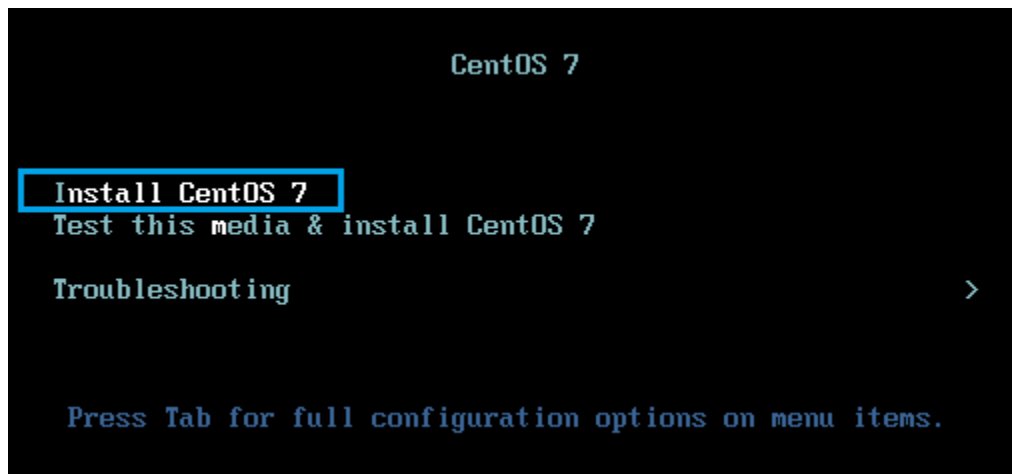
Step 2: On our next step just press **ENTER** to begin the installation process.
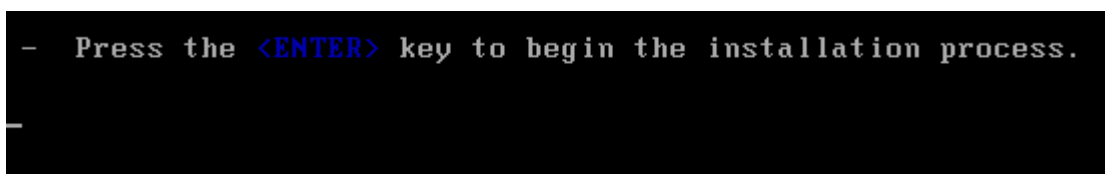
Step 3: Here select English (United States) then click on Continue.
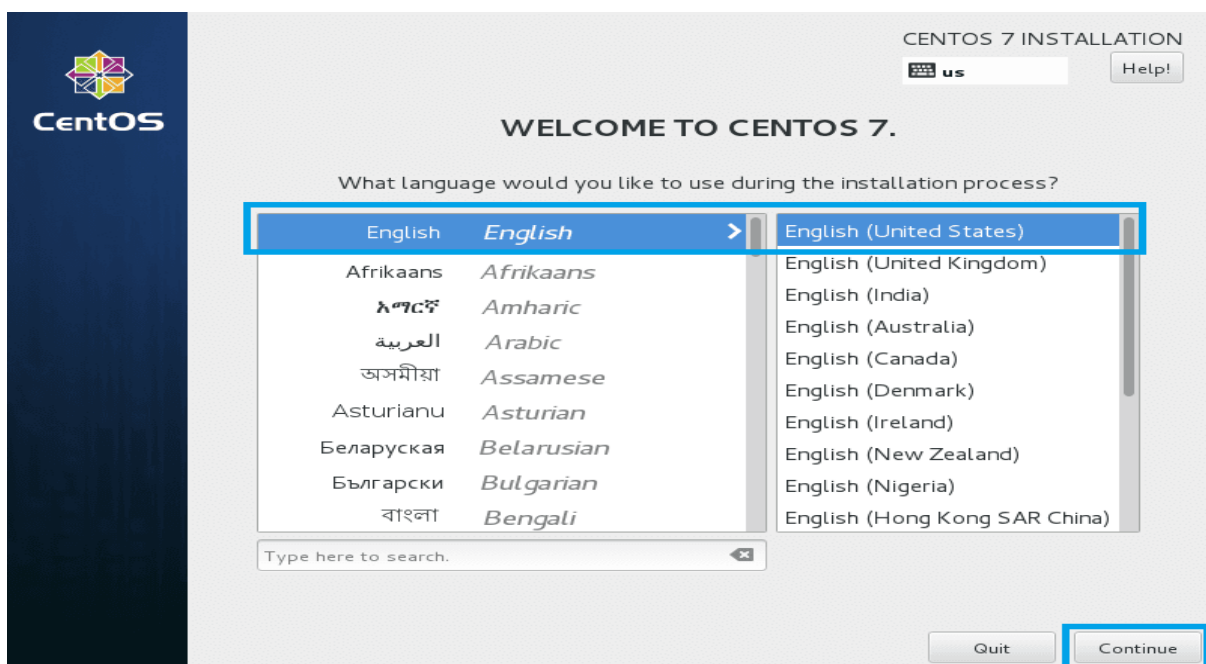
Step 4: Now we have to configure some main important settings that is:

- **Time Zone** – Select time Zone as per your Country. (eg: Asia/Calcutta)

- **Keyboard Language** – Select Language for Keyboard. (eg: English (US))

- **Language Support** – This is we have selected as English (United States) on our previous step.

- **Installation Source** – Select the Installation Source (eg: Installation DVD media or .iso Image)

- **Software Selection** – Here you have to select the software as per your scenario for eg: if you want to install with CentOS 7 Server features or just minimal Installation features, Just select as per your need.

- **Installation Destination :** Here we have to do some settings like :

  1. Select the Hard disk where you want to install the Operating System.

  2. You have to choose partition creation options i.e.

     - Automatically create partition: Here system will automatically create partition for you.

     - Manually create partition: Here you have to create partition manually as per your need.

- **Network & Hostname** : Enable the Network Settings to get the IP Address from DHCP Server or Manually configure the IP Configuration and give a Hostname to CentOS 7 Server.

Refer the below screenshots [Required Options are Highlighted in Blue Color].

Here below I have shown snapshots of all configurations as per our scenario, follow the snapshots below for your reference.

(**Note:** Below settings are selected as per our testing environment, you have to install the CentOS 7 Operating System as per you need and Scenario.)

1. Select Time Zone, Here I have selected **Region** as **Asia** and **City** as **Kolkata**, then set Date and Time, then click on **Done** to save the setting.

Note: You can Enable the Network Time by slide the button from OFF to ON if you have NTP Server.
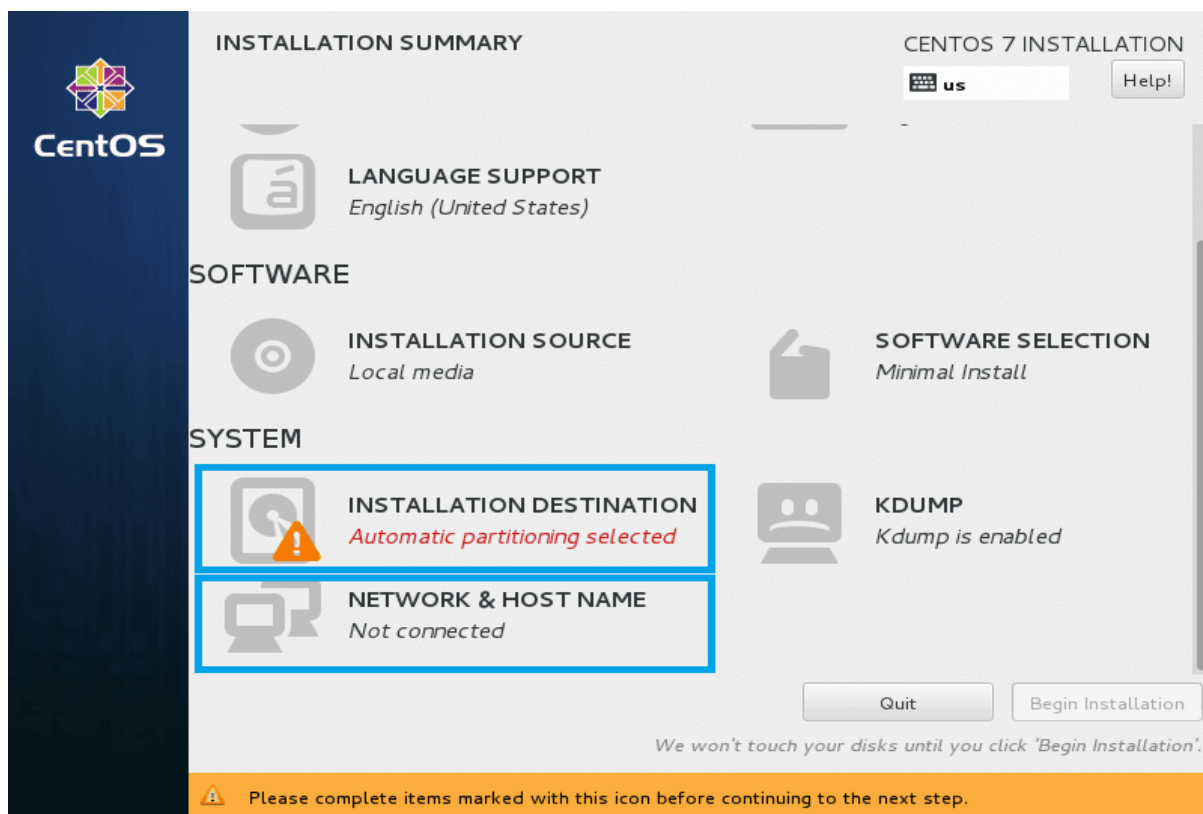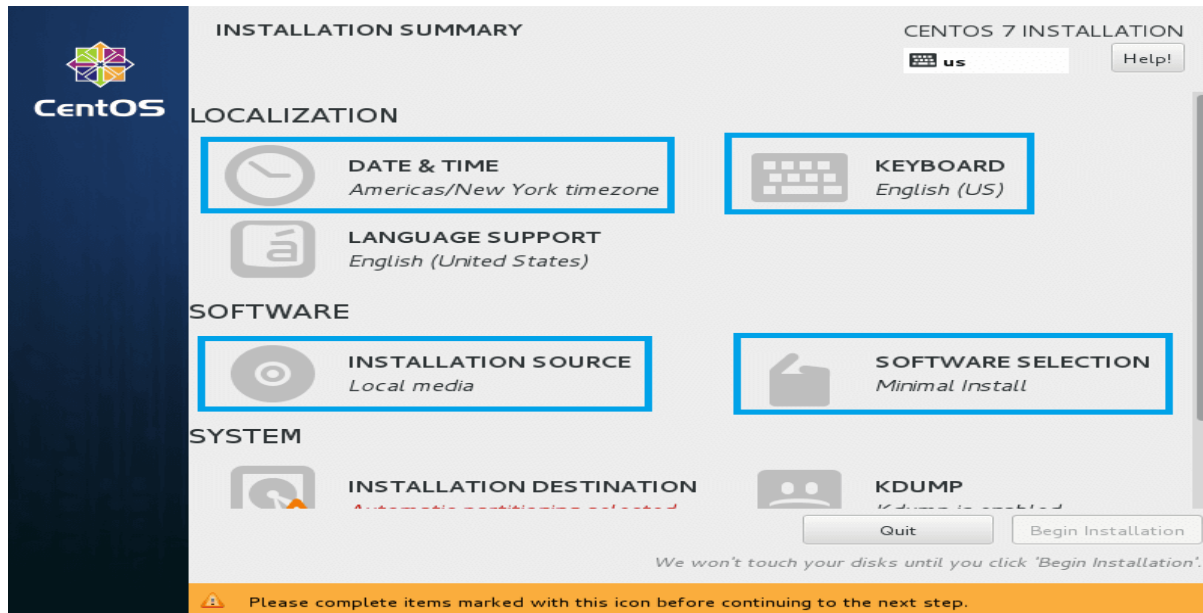
Select Keyboard Layout, here it's **English (US),** You can add more languages by click on + sign on lower portion of the window then click on **Done** to save the setting.

On our next step select Installation source i.e. CentOS 7 DVD media / iso Image then click on **Done**. Refer the Snapshot below.

Now we have to select the Installation environment as per our need and scenario. Here we have so many options i.e.

1. **Minimal Installation** : Install the Operating Basic Functionality.
2. **Infrastructure Server** : Server for operating Network Infrastructure Services.
3. **File and Print Server** : File, Print and Storage Server for your Network/Organisation.
4. **Basic Web Server** : Web Server for your Internet/Intranet Sites
5. **Server with GUI** : Install with all Server features with GUI (Graphical User Interface)
6. **Gnome Desktop** : Install with all Desktop Gnome Features and So on.

And then select required add-ons for selected environment on the right side of the window as shown on the snapshot below.

Here I am installing CentOS 7 using Gnome Desktop environment with required add-on.

Note: In this practicle I am installing CentOS 7 as per our testing environment but you have to install as per your need and Scenario.

After all required changes click on **Done** to save the settings, Refer the snapshot below.
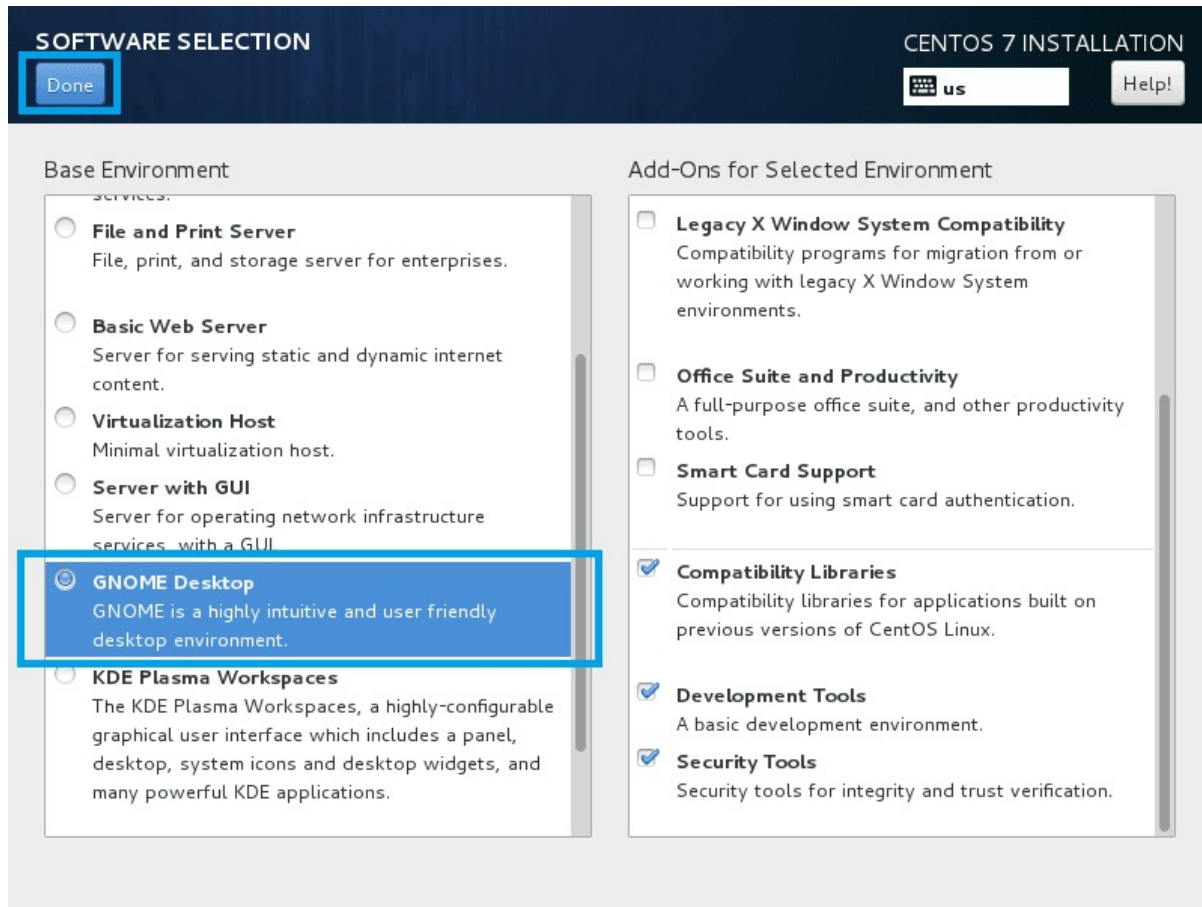
Now we have to select Local Harddisk where CentOS 7 is going to install.

Here in our Testing environment we installing CentOS 7 in Vmware Workstation so selecting the Vmware Virtual Harddisk of Size 20 GB. You have to select your harddisk if you are installing on your live server or somewhere else as per your scenario. Refer the snapshot below.

On our next part we have two options to create partition i.e.

- **Automatically configuring partitioning** : This will create partitions automatically
- **I will configure partitioning**: In this you have to create partitions manually as per your need.

Here I am selecting **Automatically configuring partitioning** to allow the system to create partition automatically. Refer the snapshot below.

After all required changes click on **Done** to save the settings.
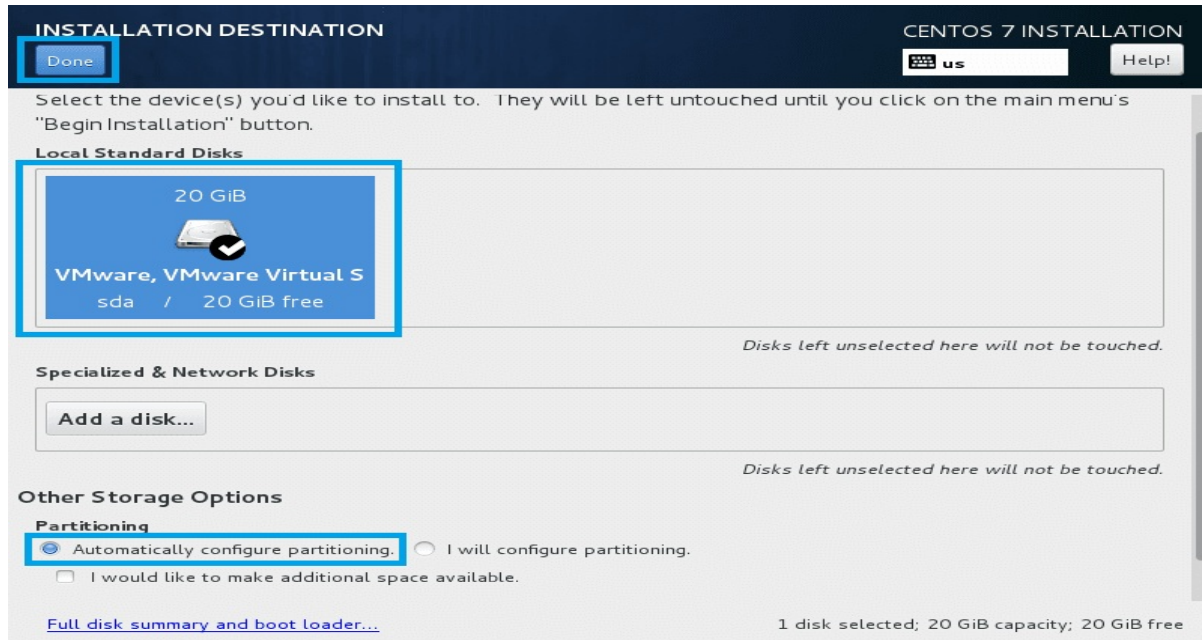
On next step of our installation enable the Ethernet Connection to get the IP Address by sliding the button from OFF to ON.

Then give a name to your server on Host name as highlighted on the snapshot below.
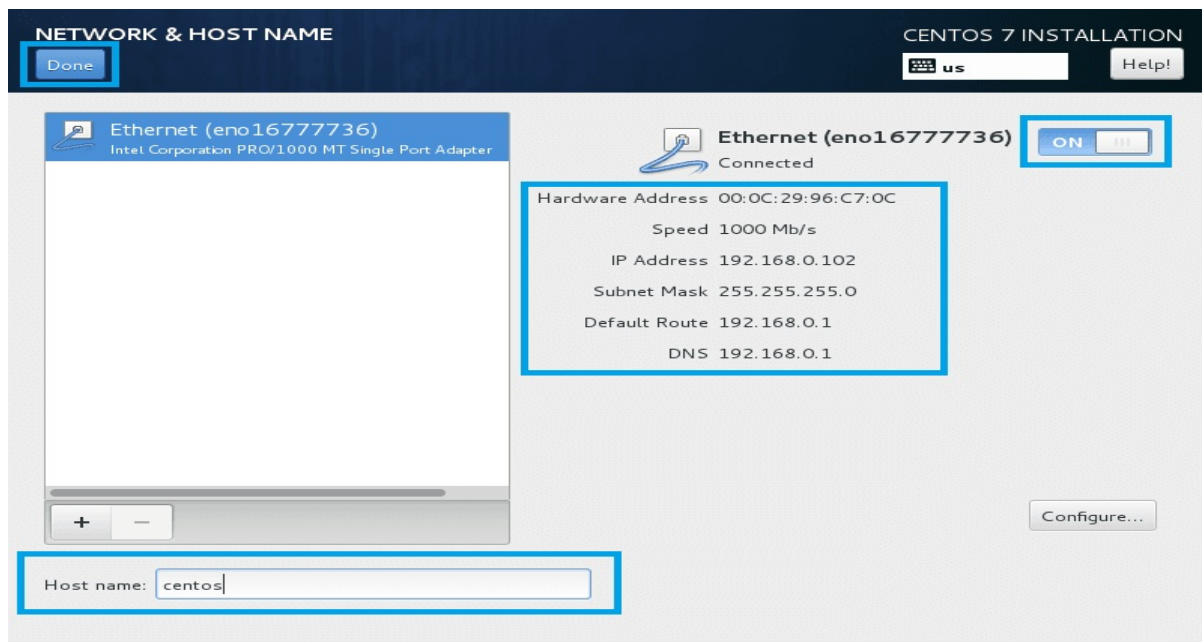
After complete configuration the configuration page would look like as shown on the snapshot below.

After complete configuration just click on **Begin Installation** button to start the Installation Process.
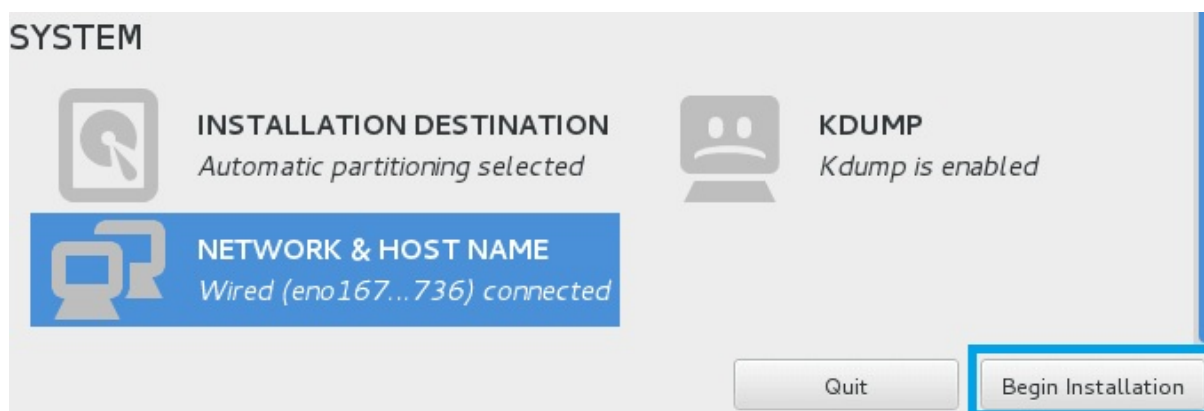
Now we have to set strong password for root (Administrator user account in linux) user and it is recommended to create a new user.
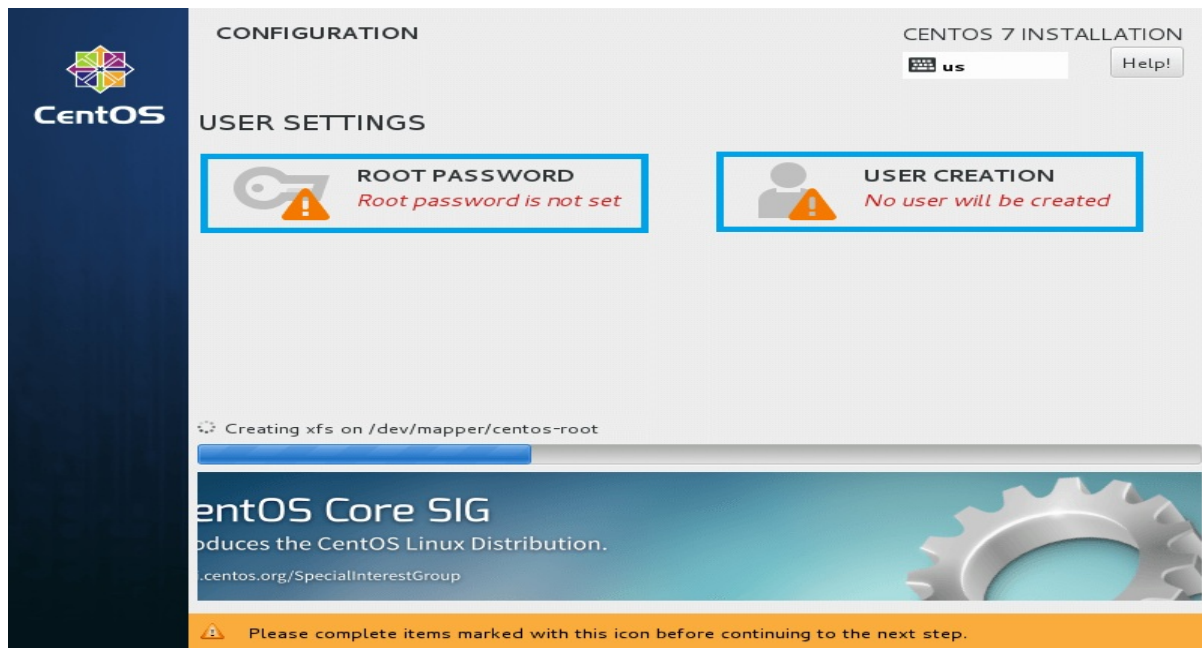
Follow the snapshot below to set password for root, then click on **Done** to save the setting.
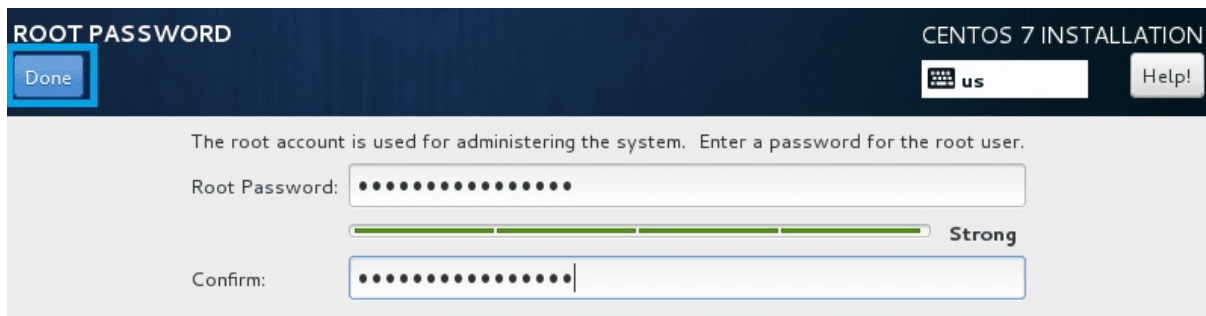
Follow the snapshot below to create a new user, then click on **Done** to save the setting.
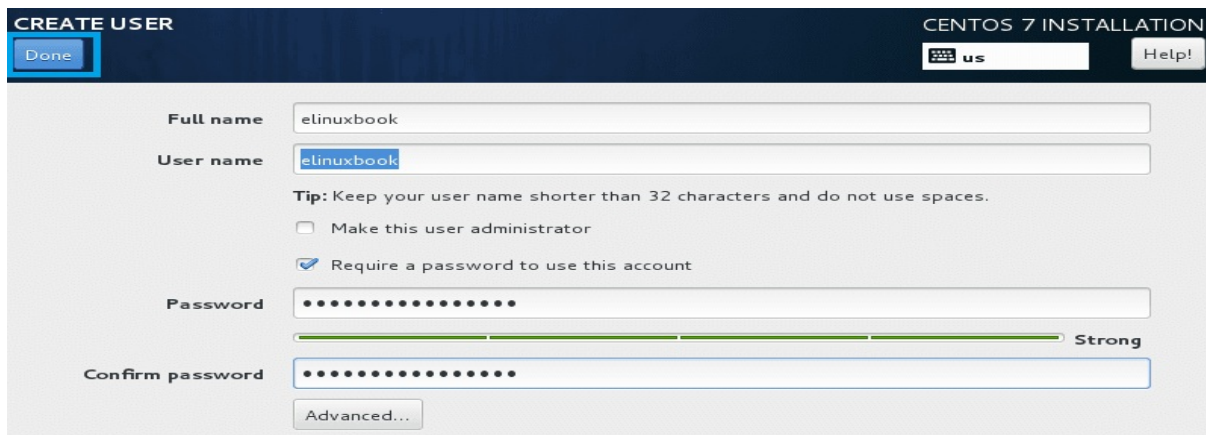
After configure the User Settings the windows would look like as shown on the snapshot below.
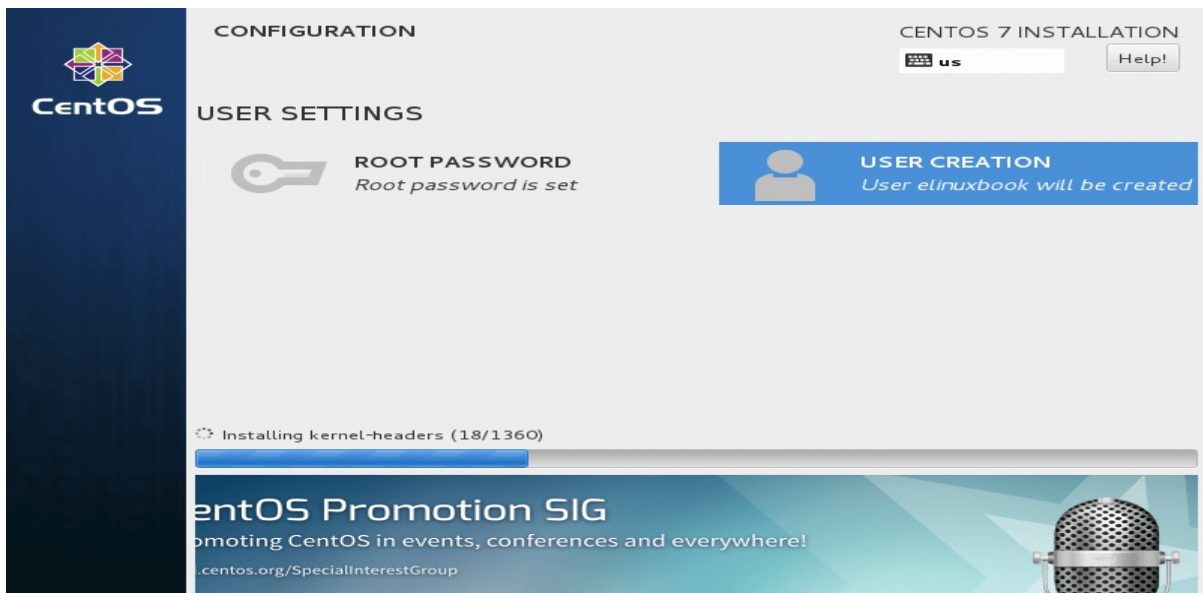
As shown on the snapshot below CentOS 7 Installation completed successfully, Just click on **Reboot** to login in to the operating system.
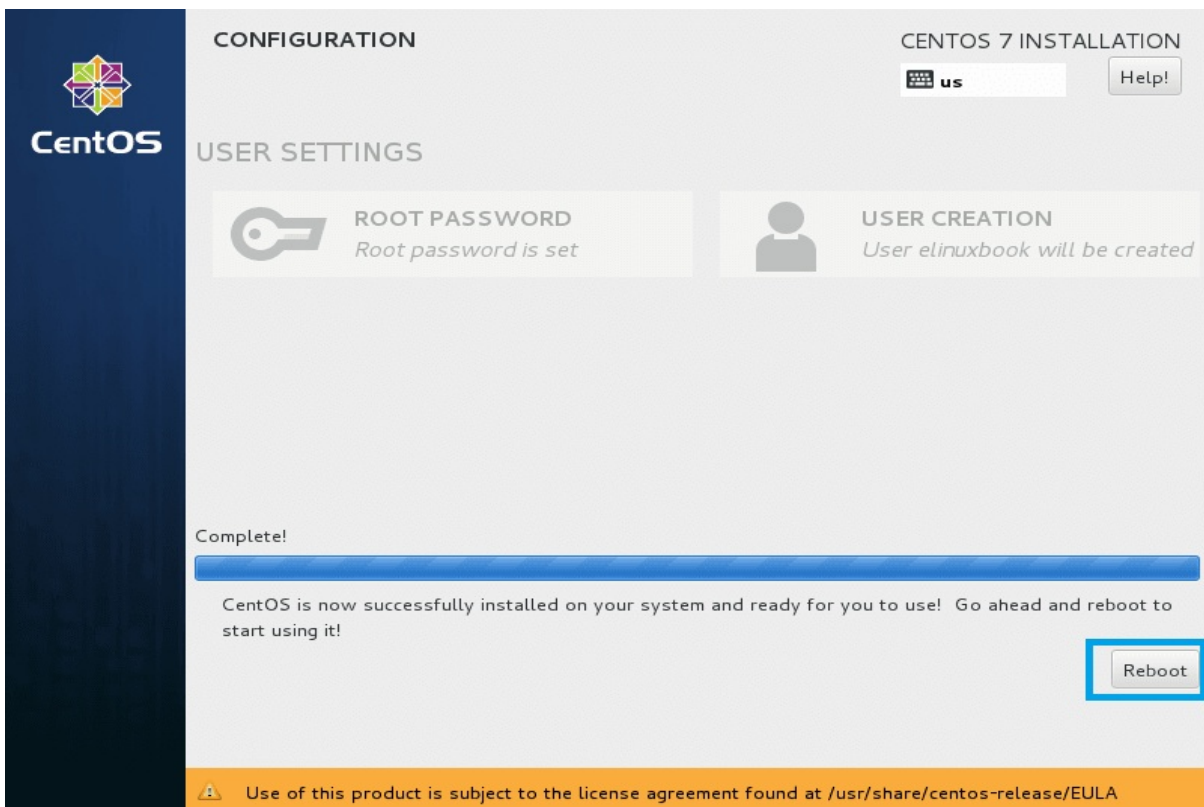
Now just select the GRUB and press ENTER to boot the operating system as shown on the snapshot below.
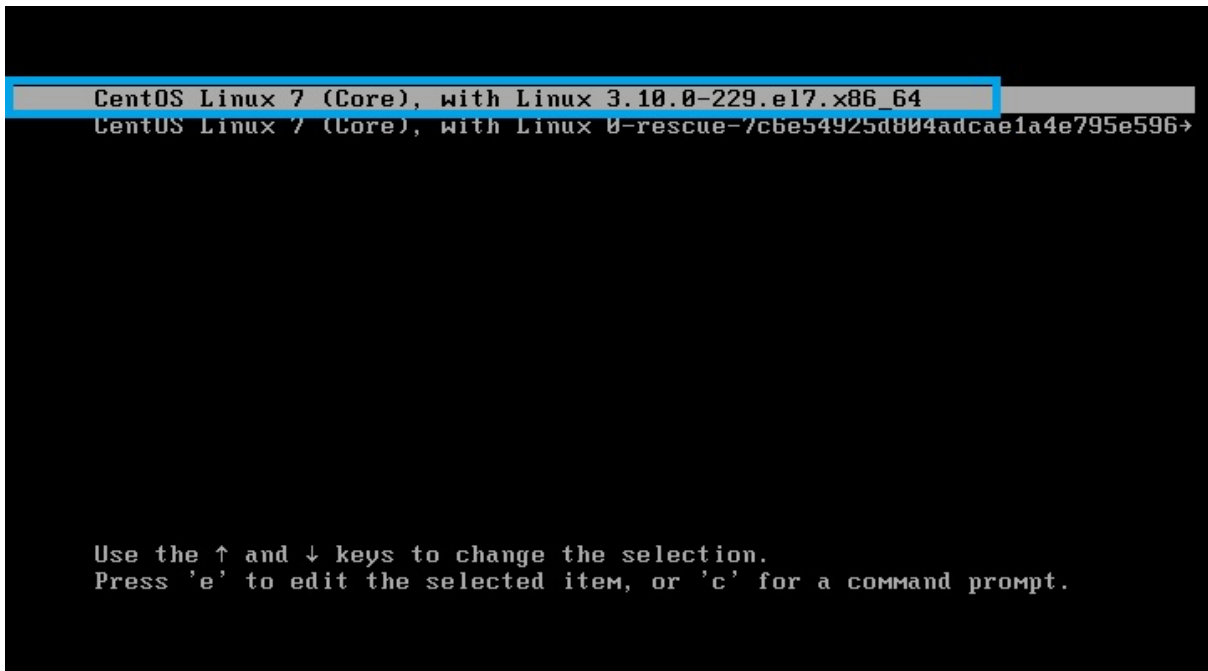
Enter the password for for user elinuxbook to login the operating system.
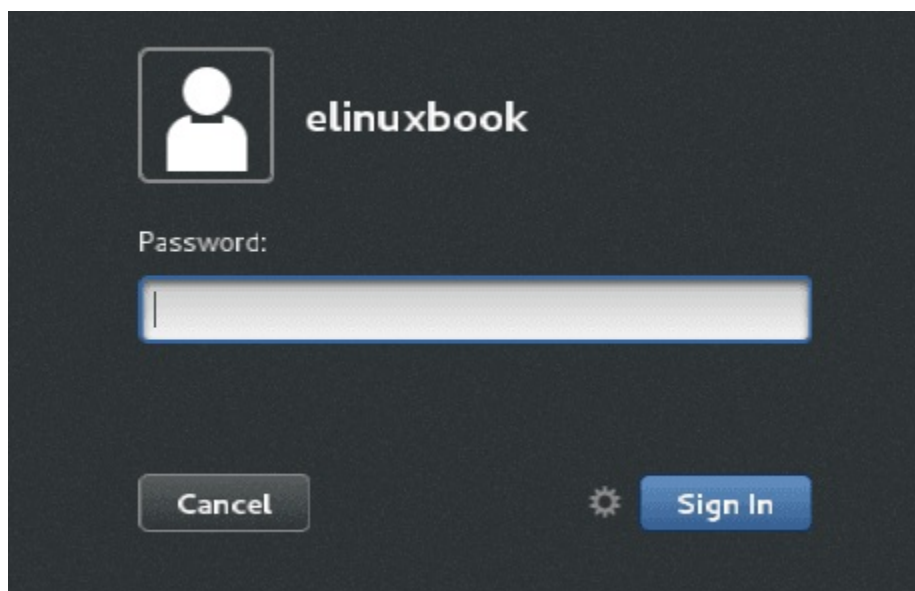
Here we got the Desktop of CentOS 7.

After first login the CentOS 7 operating system will prompt a Welcome Page where we have to do some normal settings like select preferred Language, Input Language. Then click on Start using CentOS Linux. Follow the snapshots below for reference.

Input Sources

Select input sources

English (US)

Previous   Next

Thank You

Your computer is ready to use.

You may change these options at any time in Settings.

Start using CentOS Linux
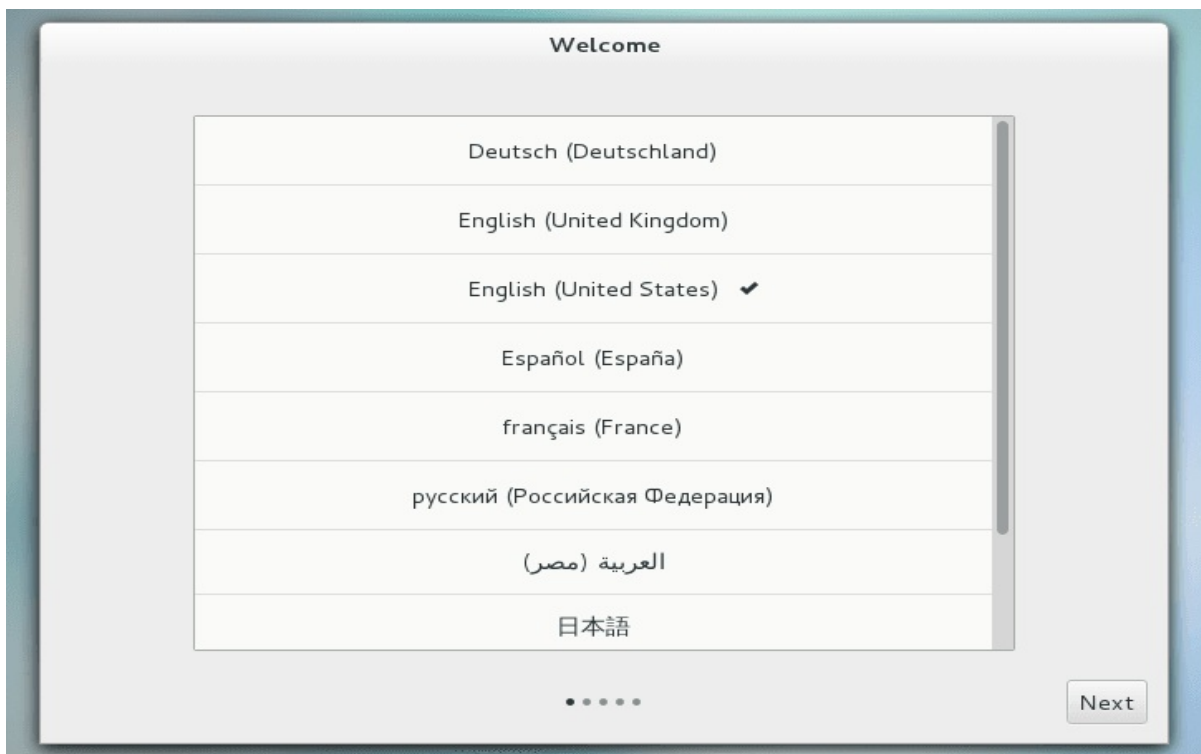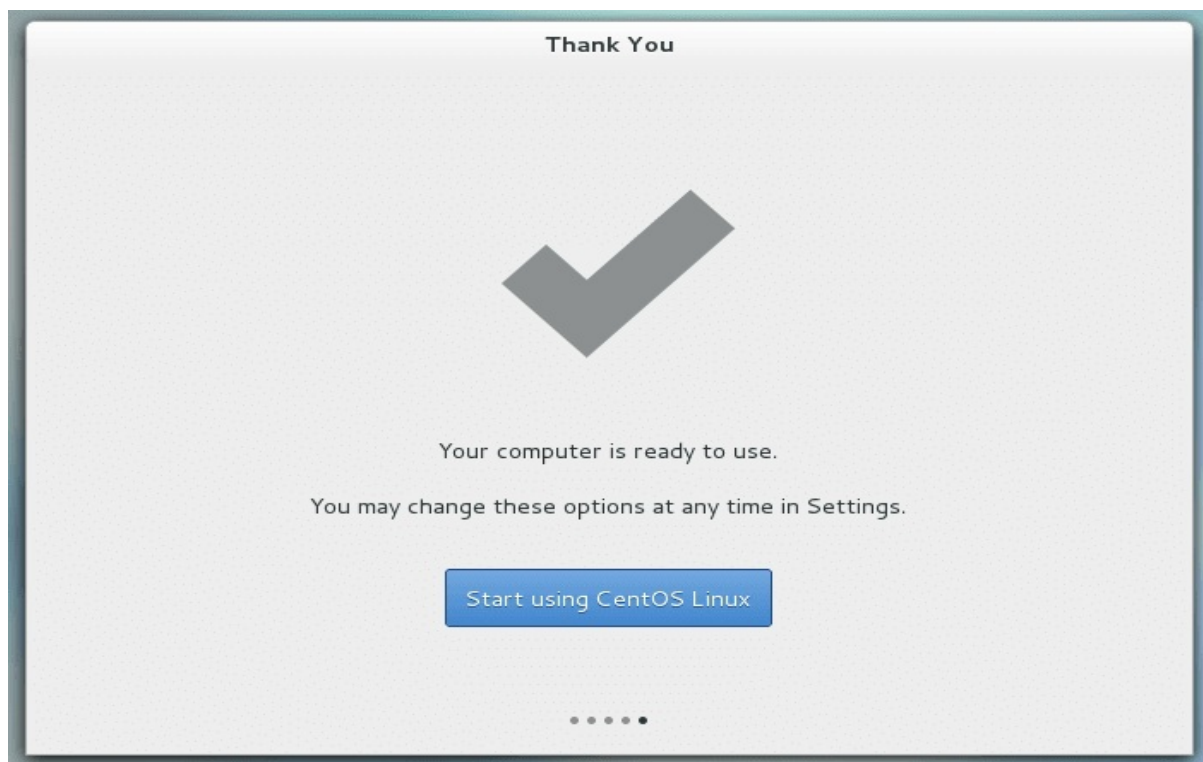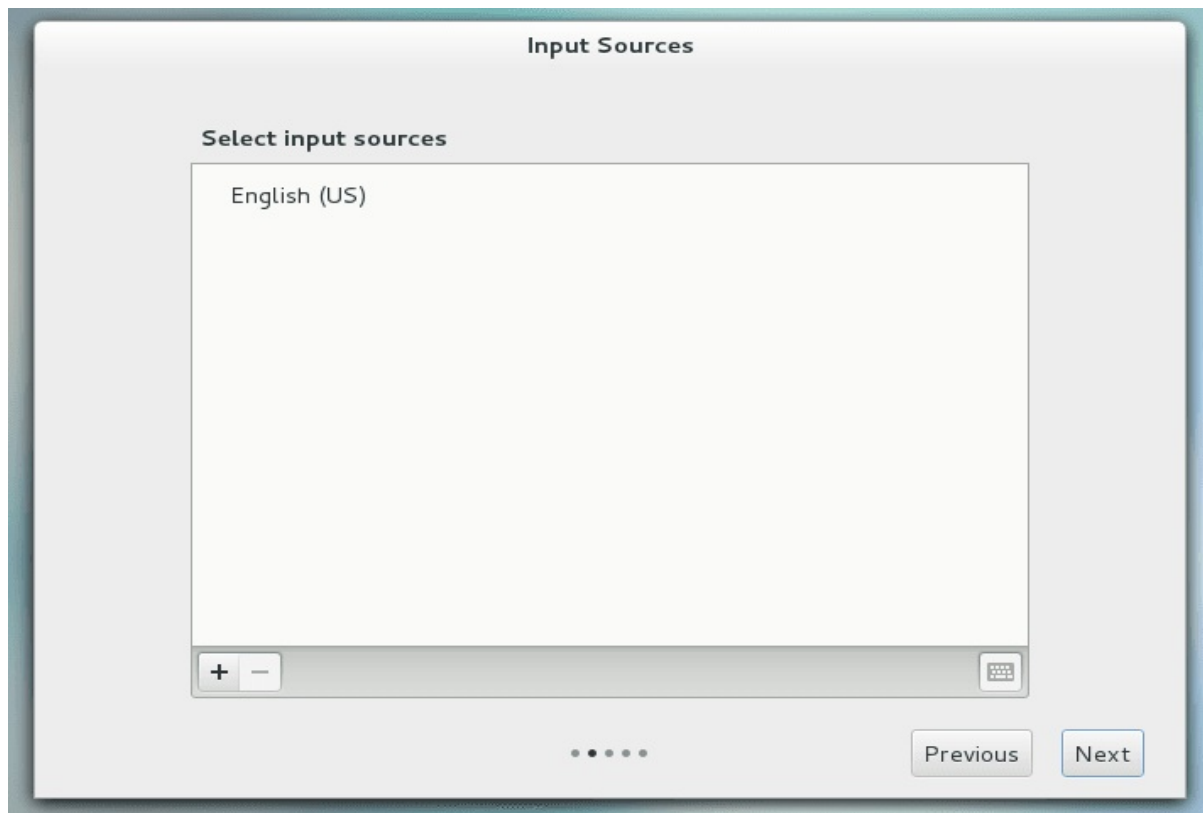
So this is how we can install CentOS7 Linux Operating System without LVM.

Laboratory Report

Experiment No – 01B

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Installation of CentOS7 Linux Operating System with LVM.

Evaluation

  1) Attendance [2]   ---------------

  2) Lab Performance [2]   ---------------

  3) Oral [1]   --------------

OverallMarks[5]   ---------------

Subject Incharge

Experiment No. 01B

TITLE: Installation of CentOS7 Linux Operating System with LVM.

PREREQUISITE: Basic Knowledge of Operating System

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr.No	Software Configuration	
1	Operating System	ISO image of CentOS7 or Ubuntu
2	Software Plateform	VirtualBox OR VMWare Workstation

Theory:-
Red Hat/CentOS Linux is a popular server operating system. Specially who work on mail server, web server, web proxy server, ftp server and file server are so familiar with the Red Hat/CentOS Linux.

If you want to work on mail server, web proxy server, ftp server, file server or any other application where disk space changes frequently, the standard partitioning is not recommended in this case because the standard partitioning is not able to manage disk partition dynamically.

On the other hand, LVM (Logical Volume Manager) provides opportunity to manage your partition dynamically. So, LVM partitioning is always recommended for Red Hat/CentOS Linux installation. But LVM partitioning is not as easy as the standard partitioning. You should have knowledge about the basic terms of the LVM partitioning.

LVM Components:-
The following three terms are the basic components of the LVM partitioning.
Physical Volume: The underlying physical storage unit of an LVM is a block device

such as a partition of a disk or the whole disk. To use the block device for an LVM logical volume, the device must be initialized as a physical volume (PV).

Volume Groups: Physical volumes (PV) are combined into volume groups (VG). This creates a pool of disk space out of which logical volumes can be allocated.

Logical Volume: In LVM, a volume group is divided up one or more logical volumes. The logical volume is used by file systems and applications.

Basic Architecture of LVM:-

In LVM technology, one or more disks or disk partitions are initialized as physical volumes (PV). These physical volumes are then combined into a volume group (VG) which works as a pool of disk space.

From volume groups, one or more logical volumes (LV) according to the system requirements can be created. This process is analogous to the way in which disks are divided into partitions.

A logical volume is used by the file systems and applications by mounting to a mount point. The following image shows an overview of the LVM architecture.
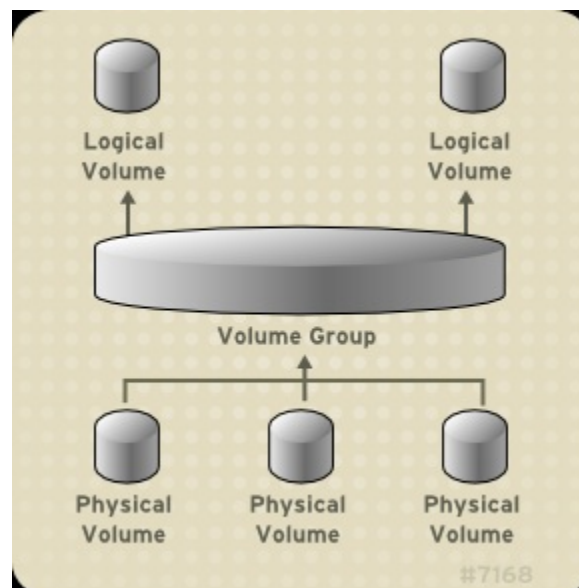
Now we will start CentOS 7.5 installation with LVM partitioning. CentOS 7.5 can be installed on your server machine if it has minimum 256MB RAM 2GB disk space and

64 bit CPU architecture because CentOS 7.5 does not support 32 bit CPU architecture. We will complete CentOS 7.5 installation with the following 8 steps.

Step 1: Downloading CentOS 7.5 ISO and Making Bootable Drive

Before going to start CentOS 7.5 installation, you have to collect CentOS 7.5 ISO file and then burn this ISO file to a bootable media. The following steps will show how to download CentOS 7.5 ISO file and how to burn ISO file to a bootable media.

> 1] Go to CentOS official site [centos.org] and click on GET CENTOS menu item and then click on DVD ISO button. Now choose your desired ISO file from this download page.

> 2] After downloading ISO file, burn the ISO image in a DVD or in a USB flash drive with your favorite burning software such as Nero[nero.com] or Power ISO [poweriso.com] and then start installation according to the below steps.

Step 2: Beginning Installation

After downloading and making bootable drive, we will now ready to start CentOS 7.5 installation. The following steps will show the initial procedures to start CentOS 7.5 installation.

- Press power button of your server machine and go to boot option menu according to your machine vender.

- Choose your boot media **CD/DVD ROM** if you use DVD or **USB Flash Drive** if you use Pen drive as your bootable media from boot menu.

- First window of CentOS 7.5 installation will appear.

- Press Enter key or just wait 60 seconds to go next window.

- It will now ask you to press Enter key to start installation. So, hit Enter key to begin installation.

- After checking a lot of system requirements, a graphical window will appear to choose language.
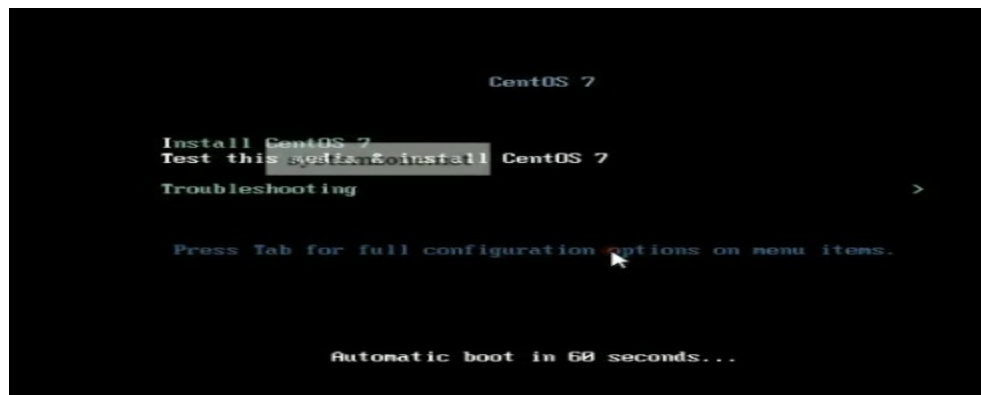
Step 3: Choosing Language

From this first graphical window, choose your operating system's language and then click on *Continue* button. If you wish to keep English as your server language, just click *Continue* button. Installation Summery window will now appear to setup Localization, Software and System.

Step 4: Localization Setup

In localization setup, there are three types of configuration. Among them, Keyboard and Language Support will be selected according to previous language setup. Now you need to setup Date & Time. To setup date and time, click on *Date & Time* icon.

Select your region from *Region* dropdown menu and select your city from *City* dropdown menu. You are also able to adjust your Region and City by clicking your city on the map. Your time and date will be adjusted by selecting Region and City but double check your changed date and time below the map and then click on *Done* button.
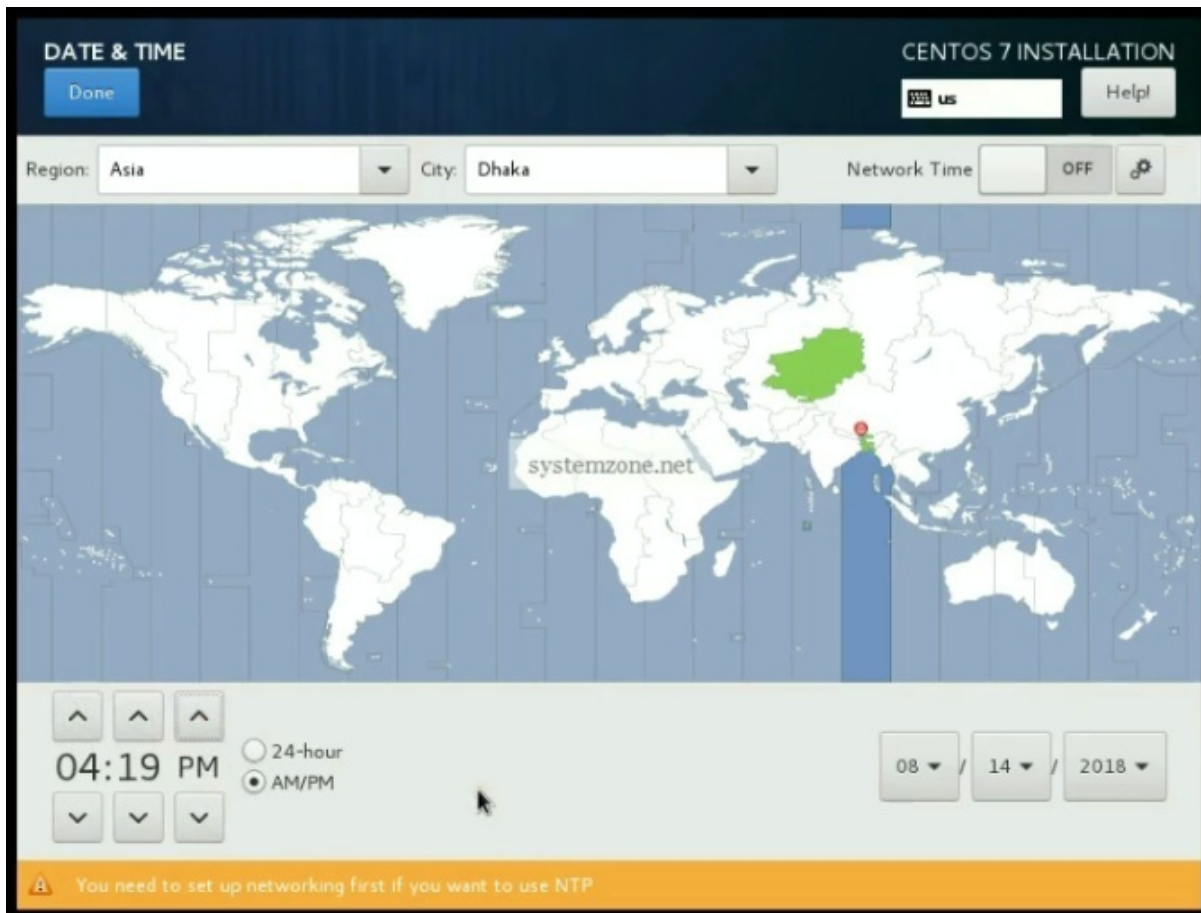
Step 5: Software Setup
In software setup, there are two options. These are:
Installation Source: Installation source will be automatically selected as Local Media. So, no need to change it.

Software Selection: Minimal Install will be selected in Software Selection option. As we want to install CentOS 7.5 Graphical User Interface (GUI), we will change Minimal Install now. Click on Software Selection icon and then click on GNOME Desktop from Base Environment panel. Optionally you can select Development Tools, System Administration Tools, GNOME Applications and Office Suite and Productivity options from Add-Ons for Selected Environment panel. Click on Done button after choosing your Base Environment and Add-On.
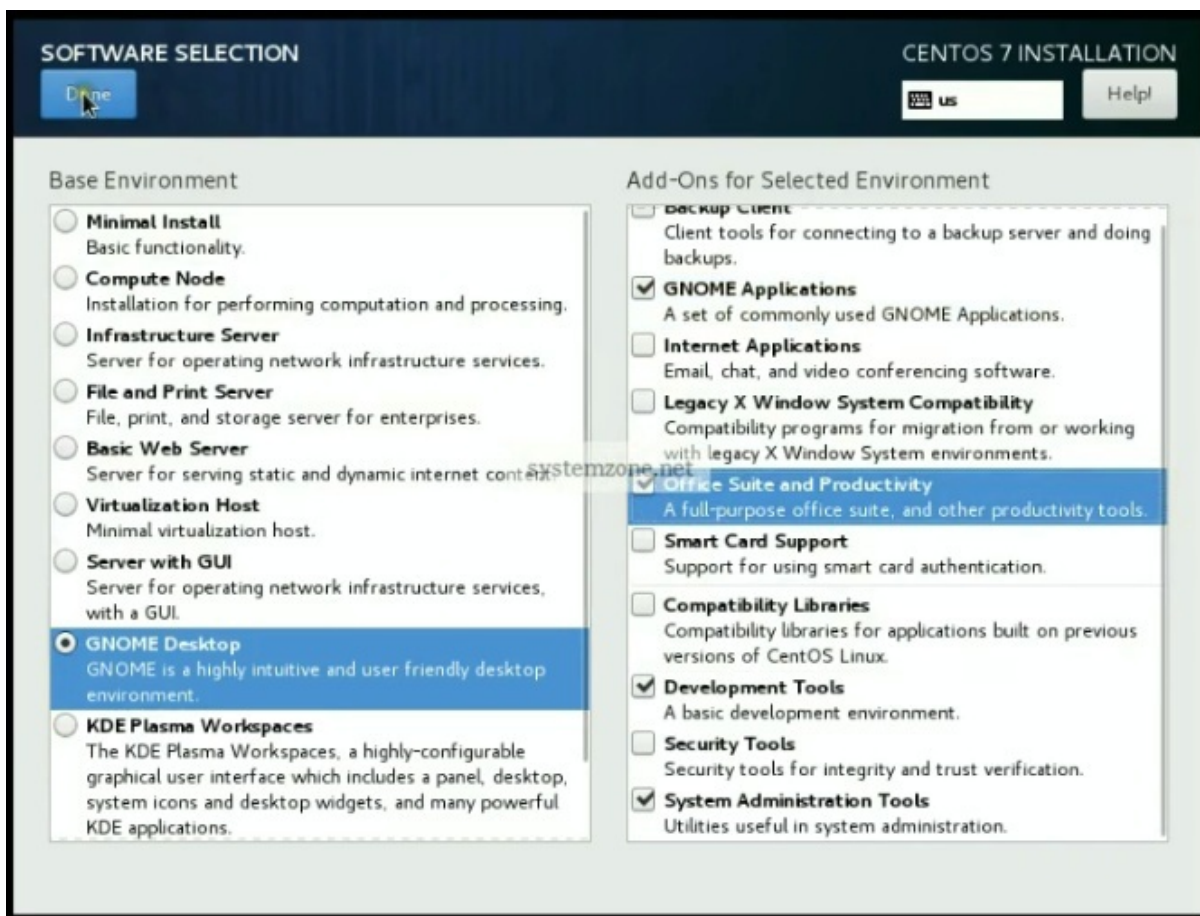
Step 6: System Setup

There are two options in System setup. These are **Installation Destination** and **Network & Hostname**. We will now configure *Installation Destination* according to the below steps.

1. Click on INSTALLATION DESTINATION icon. Installation Destination window will appear.

2. In Device Selection area click on disk icon which is shown within Local Standard Disks panel.

3. From Other Storage Options, click on *I will configure partitioning* radio button and then click on Done button.

4. Manual Partitioning window will appear now. Click on dropdown menu within *New* CentOS 7 Installation box and choose LVM option. By default LVM is selected because it is the recommended partitioning method.

5. Now click on PLUS SIGN (+) located below the *New CentOS 7 Installation* ADD A NEW MOUNT POINT pop up window will appear. Choose /boot option from Mount Point dropdown menu and type 500 in Desired Capacity input box. By default, MB will be the unit of capacity if you do not mention it. Click on Add Mount Point button now. The /boot partition will not be included into LVM because boot loader cannot read LVM partition. So, by default it will be kept into standard partition.

6. Similarly, click on PLUS SIGN again and choose swap from Mount Point dropdown menu and put desired capacity equal to your RAM size in Desired Capacity input box. For example, if your RAM size is 1GB, put capacity value 1GB. Click on Add Mount Point button. You will now find your SWAP partition is under LVM partition and a default Volume Group named centos has been created. If you wish you can modify by clicking Modify button.

7. Again click on PLUS SIGN and choose (/) root partition from *Mount Point* dropdown menu and put your desired root partition value in Desired Capacity input box. If you wish to assign 10GB for your root partition, put value as 10GB but it must be less than or equal to total disk space-(/boot+swap). If you wish to keep all available disk space, keep this field blank. Click on Add Mount Point button.

8. Click on Done button and then click on Accept Changes button in SUMMARY OF CHANGES window.

9. Now click on Begin Installation button. CentOS will start installation according to your desired configuration.
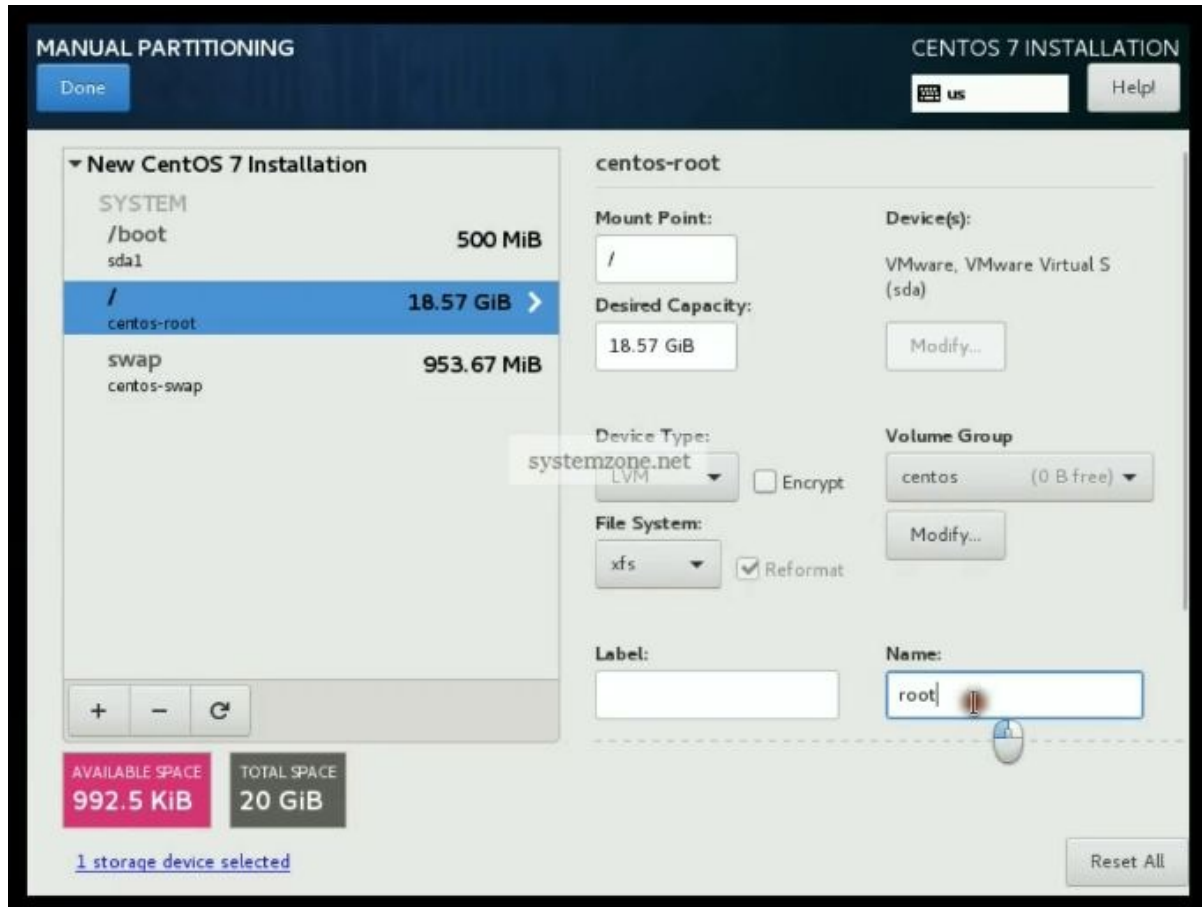
Step 7: Root Password and User Creation

While installing required services, you have to provide Root Password and optionally you can create another local user in this time. To provide root password, click on *Root Password* option from USER SETTINGS area.

Now provide root password in *Root Password* input box and confirm your password by typing again in *Confirm* input box and then click on *Done* button. If you wish to create a local user, click on USER CREATION option and provide necessary information.
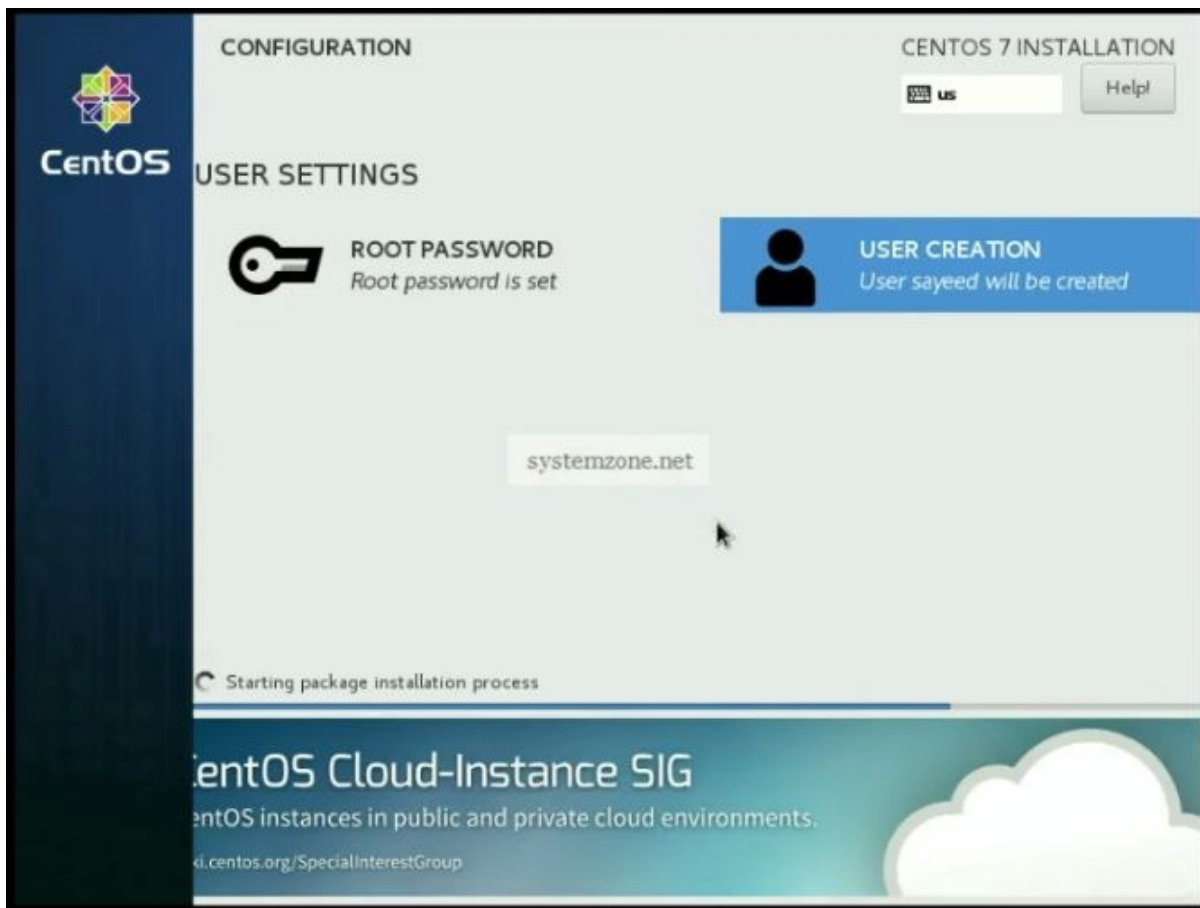
Step 8: Finalizing GNOME Desktop Configuration

After installing software packages, CentOS will show a complete message and ask you to reboot your system. Reboot your server by clicking Reboot button. After rebooting, CentOS will start Initial Setup. In Initial Setup page, it will ask to accept license agreement. So click on LICENSE INFORMATION and then click on *I accept the license agreement* checkbox and click Done button. We will not configure network and hostname at this time. So, click on FINISH CONFIGURTION button.

Now CentOS will ask to login to your system. You will find your local user is listed here if you provide information at the time of package installation. You can login with local user credential but we will now login with root (administrator) user. So, click on *Not listed link* and it will ask you to provide your known username. Put root in Username input box and click on Next button. Now it will ask you to provide password for root user. Put your root password that you provided at the time of package installation and click on Sign In button. You will now be logged in as root user.

Laboratory Report

Experiment No – 02

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Installation of SSH Server on CentOS7 Linux Operating System.

Evaluation

1) Attendance [2]   ---------------

2) Lab Performance [2]   ---------------

3) Oral [1]   --------------

Overall Marks [5]   ---------------

Subject In-charge

Experiment No.2

TITLE: Configuration of SSH Server on CentOS7 Linux Operating System.

PREREQUISITE: ISO Image of CentOS7 & Virtual Box or VMWare S/W.

HARDWARE CONFIGURATION / KIT:

Sr. No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr. No	Software Configuration	
1	Operating System	ISO Image of CentOS7
2	Software Platform	VMWare Workstation

THEORY:

Before starting the configuration of SSH server on CentOS7 we first configure YUM server. For rest of the practical we need YUM server so we first configure YUM server. YUM or Yellow-dog Update Modifier is a package manager that was developed by Duke University to improve the installations of RPMs (Red-hat Package Managers). Yum is an automatic updater & package installer/remover. Without having to manually update each one using RPM. Correct dependency calculation & fast operation.

Configuration of YUM Server (On Server Side) :-

Insert Linux DVD on DVD Drive

mount /dev/cdrom /mnt   To mount DVD on /mnt dir.

cd /mnt/Packages   Go to Packages directory.

ls   List the files & folders in Packages dir.

rpm –ivh vsftpd-3.0.2-9.el7.x86_64.rpm   Install vsftpd Package.

rpm –ivh createrepo-0.9.9-23.el7.noarch.rpm   Install createrepo Package.

mkdir /var/ftp/pub/centos7   Create Directory to store Packages.

cp –v * /var/ftp/pub/centos7   Copy all packages in centos7 directory.

cd   Go to home directory

createrepo –v /var/ftp/pub/centos7   To create Metadata

vim /etc/yum.repos.d/server.repo   To create repodata file.

After opening this file, add the following lines

[centos7]
name=centos7
baseurl=file:///var/ftp/pub/centos7
gpgcheck=0
enabled=1
ESC:wq

After adding this file run the following command,

firewall-cmd - -permanent - -add-service=ftp	To add ftp port on firewall.
firewall-cmd - -reload	To reload rules.
systemctl restart vsftpd	Restart the FTP service.
systemctl enable vsftpd	Enable the FTP service.
yum clean all	TO clean cache.
yum repolist	To check repository

On Client Side:-
Open the following file in vi editor,

vi /etc/yum.repos.d/server.repo

Add the following line.

[desktop]	Repo ID
name=centos7	Description
baseurl=ftp://192.168.0.100/pub/centos7	Package Path
gpgcheck=0	GPG Key Disable
enabled=1	To enable YUM
ESC:wq	Save & Exit

Here, **192.168.0.100** is a YUM server IP Address.
After that type the following line,

yum clean all
yum repolist

How to install/remove/update Packages via yum server:-

yum install vsftpd	To install packages
yum remove vsftpd	To uninstall packages
yum update vsftpd	To update packages
yum info vsftpd	To show Package info
yum search vsftpd	To search packages
yum list vsftpd	To show package install or not
yum history	To show history

Configuration of SSH Server:-

SSH (Secure Shell) is a program for logging into a remote machine and for executing commands on a remote machine. It is a replacement of Telnet protocol. This protocol provides secured encrypted communication between two untrusted hosts over the network. SSH is more secured as compared to Telnet Server. SSH encrypts the data while telnet sends data in plain text.

Important Options:-

ListenAddress 192.168.0.100	Listen on this IP
PermitRootLogin Yes/No	Root access enabled/disabled
LoginGraceTime 1m	Access Deny Time Set
MaxAuthTrie 1	Password Try Time
DenyUsers alex susan	To deny users
DenyGroup hr web	To deny groups

Important Note: - Above options are for security purpose

pkgname = openssh
Port no. = 22
Config file = /etc/ssh/sshd_config
Daemon/service name = sshd

Configuration of SSH Server:-
In linux ssh server is configured by default.

yum install openssh –y
vi /etc/ssh/sshd_config

Go to line number 19.

ListenAddress **192.168.0.100**

Uncomment this line & put your server IP address.

:wq

systemctl restart sshd
systemctl enable sshd

On Client Side:-

ssh root@192.168.0.100
        yes
password:rcpit@123
Login Successful……
------- Run any Command ----------
#mkdir /root/sa
#exit

How to deny IP Address?

#vi /etc/hosts.deny
Go to last line & type

sshd:192.168.0.2   (For single IP Address)
sshd:192.168.0.0/24   (For Complete Network)

:wq

Laboratory Report

Experiment No - 03

Batch-

Date of Experiment:_____   Date of Submission:_____

Title: Configuration of Telnet Server

 Evaluation

1) Attendance [2]   ---------------

2) Lab Performance [2]   ---------------

3) Oral [1]   ---------------

Overall Marks [5]   ---------------

                              Subject In-charge

Experiment No.3

TITLE: Configuration of Telnet Server on CentOS7 Linux Operating System.

PRE-REQUISITE: ISO Image of CentOS7 & Virtual Box or VMWare S/W.

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr.No	Software Configuration	
1	Operating System	ISO Image of CentOS7
2	Software Platform	VMWare Workstation

Theory: -

Telnet is a network protocol used on the Internet or local area networks to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection. We always recommend to use SSH because it communicates in encrypted way. Whereas telnet do not communicates in encrypted way. By default telnet server listens on port number 23/TCP. By default root is not able to login via telnet. Hence, use other system user.
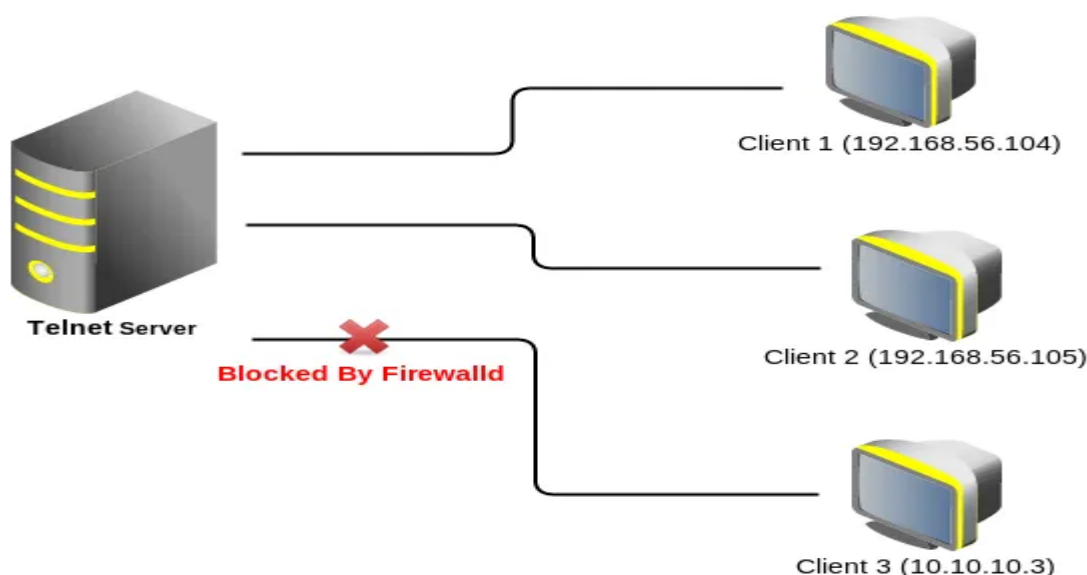
We can install telnet server from two commands; yum and rpm. To install telnet server from yum command use following:-

```
yum install telnet-server
```

yum command depends on repository. If system is connected with repository, above command will install the Telnet Sever. If system is not connected with any repository, above command will not work. Alternatively if we have RHEL installation disk (or local copy of Packages directory from RHEL installation disk), we can use rpm command to install the Telnet Server. Packages directory on RHEL installation media contents all RPMs. To install telnet server from rpm command use following:-

```
rpm –ivh telnet-server-[version number]
```

We can use shell's auto complete command feature to automatically populate the version number. To use auto complete command features type following command and press tab key.

```
rpm –ivh telnet-server-
```

Once telnet-server rpm is installed we can start the telnet service with following command.

```
systemctl start telnet.socket
```

To verify the status use following command,

```
systemctl status telnet.socket
```

Telnet service will be enabled only for this session. To enable it permanently use following command

```
systemctl enable telnet.socket
```

Laboratory Report

Experiment No - 04

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Configuration of FTP Server on CentOS7 Linux Operating System.

Evaluation

1) Attendance [2]   ----------------

2) LabPerformance [2]   ----------------

3) Oral [1]   ----------------

Overall Marks [5]   ----------------

Subject In-charge

Experiment No.4

TITLE: Configuration of FTP Server on CentOS7 Linux Operating System.

PREREQUISITE: ISO Image of CentOS7 and VMWare Software

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr.No	Software Configuration	
1	Operating System	ISO Image of CentOS7
2	Software Platform	VMWare WorkStation

THEORY:

FTP (**File Transfer Protocol**) is a traditional and widely used standard tool for transferring files between a server and clients over a network, especially where no authentication is necessary (permits anonymous users to connect to a server). We must understand that FTP is unsecure by default, because it transmits user credentials and data without encryption.

In this guide, we will describe the steps to install, configure and secure a FTP server (**VSFTPD** stands for "**Very Secure FTP Daemon**") in **CentOS/RHEL 7** and **Fedora** distributions.

Note that all the commands in this guide will be run as **root**, in case you are not operating the server with the **root** account, use the sudo command to gain root privileges.

Installing **vsftpd** server is straight forward, just run the following command in the terminal.

```
yum install vsftpd
```

After the installation completes, the service will be disabled at first, so we need to start it manually for the time being and enable it to start automatically from the next system boot as well:

```
systemctl start vsftpd
systemctl enable vsftpd
```

Next, in order to allow access to FTP services from external systems, we have to open port **21**, where the FTP daemons are listening as follows:

```
firewall-cmd --zone=public --permanent --add-port=21/tcp
firewall-cmd --zone=public --permanent --add-service=ftp
firewall-cmd -reload
```

Now we will move over to perform a few configurations to setup and secure our FTP server, let us start by making a backup of the original config file */etc/vsftpd/vsftpd.conf*:

```
cp /etc/vsftpd/vsftpd.conf /etc/vsftpd/vsftpd.conf.orig
```

Next, open the config file above and set the following options with these corresponding values:

```
anonymous_enable=NO          # disable anonymous login
local_enable=YES             # permit local logins
write_enable=YES     # enable FTP commands which change the filesystem
local_umask=022      # value of umask for file creation for local users
dirmessage_enable=YES # enable showing of messages when users first enter
a new directory
xferlog_enable=YES    # a log file will be maintained detailing uploads
and downloads
connect_from_port_20=YES   # use port 20 (ftp-data) on the server machine
for PORT style connections
xferlog_std_format=YES     # keep standard log file format
listen=NO                   # prevent vsftpd from running in standalone
mode
listen_ipv6=YES      # vsftpd will listen on an IPv6 socket instead of an
IPv4 one
pam_service_name=vsftpd    # name of the PAM service vsftpd will use
userlist_enable=YES        # enable vsftpd to load a list of usernames
tcp_wrappers=YES            # turn on tcp wrappers
```

Laboratory Report

Experiment No - 05

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Using command Upload and Download Files from FTP Server

Evaluation

1) Attendance [2]   ----------------

2) Lab Performance [2]   ----------------

3) Oral [1]   ---------------

Overall Marks [5]   ---------------

Subject In-charge

Experiment No.5

TITLE: Using Command Upload and Download Files from FTP Server.

PREREQUISITE: ISO Image of CentOS7 Linux Operating System

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr.No	Software Configuration	
1	Operating System	ISO Image of CentOS7
2	Software Platform	VMWare Workstation

THEORY:

To upload file on FTP server use put command from FTP prompt. First, navigate to the desired directory on the FTP server where to upload a file and use the following command. It will upload local system file **c:\files\file1.txt** to uploads directory on FTP server.
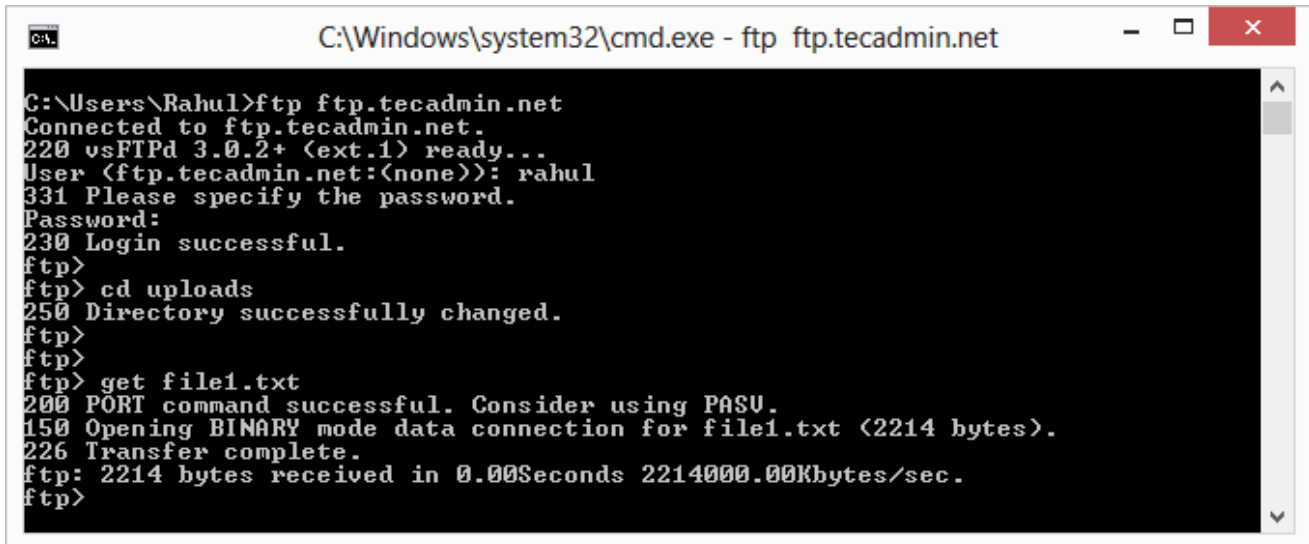
```
cd uploads
put c:\files\file1.txt
```

To download the file from FTP server, we use get command. Using that command we can download one time at a time. To download any file from FTP server First login to your FTP server, navigate to the directory and use the following command to download,

```
get file1.txt
```


To upload multiple files to FTP server use mput command. You can also specify wildcard characters to upload multiple files to the server at a time. First, navigate to the desired directory on the FTP server where to upload a file and use the following command. It will upload local system files with .txt extension in **c:files** directory to uploads directory on FTP server.

```
cd uploads
lcd c:\\files
put *.txt
```

To download multiple files from FTP server, we use mget command. Using that command we can download more than one file at a time. To download multiple files specify wildcard character for specifying directory name do download all files from the directory.

```
mget *.txt
```

Laboratory Report

Experiment No - 06

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Configuration of SAMBA Server using CentOS7 Linux Operating System

Evaluation

1) Attendance [2]   ----------------

2) Lab Performance [2]   ----------------

3) Oral [1]   ----------------

Overall Marks [5]   ----------------

Subject In-charge

Experiment No.6

TITLE: Configuration of SAMBA Server using CentOS7 Linux Operating System.

PREREQUISITE: ISO Image of CentOS7 Linux Operating System.

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr.No	Software Configuration	
1	Operating System	ISO Image of Linux OS
2	Software Platform	VMWare Workstation

THEORY :

Samba is a free and open-source re-implementation of the SMB/CIFS network file sharing protocol that allows end users to access files, printers, and other shared resources.

In this tutorial, we will show how to install Samba on CentOS 7 and configure it as a standalone server to provide file sharing across different operating systems over a network.

We'll create the following Samba shares and users.

Users:

- **sadmin** - An administrative user with read and write access to all shares.
- **josh** - A regular user with its own private file share.

Shares:

- **users** - This share will be accessible with read/write permissions by all users.
- **josh** - This share will be accessible with read/write permissions only by users josh and sadmin.

The file shares will be accessible from all devices on your network. Later in the tutorial, we will also provide detailed instructions on how to connect to the Samba server from Linux, Windows and macOS clients.

Samba is available from the standard CentOS repositories. To install it on your CentOS system run the following command:

yum install samba samba-client

Once the installation is completed, start the Samba services and enable them to start automatically on system boot:

```
systemctl start smb.service
systemctl start nmb.service

systemctl enable smb.service
systemctl enable nmb.service
```

The smbd service provides file sharing and printing services and listens on TCP ports 139 and 445. The nmbd service provides NetBIOS over IP naming services to clients and listens on UDP port 137.

For easier maintainability and flexibility instead of using the standard home directories (/home/user) all Samba directories and data will be located in the /samba directory.

Start by creating the /samba directory:

```
mkdir /samba

groupadd sambashare

chgrp sambashare /samba

sudo useradd -M -d /samba/josh -s /usr/sbin/nologin -G sambashare josh

mkdir /samba/josh

chown josh:sambashare /samba/josh
```

```
chmod 770 /samba/josh

sudo smbpasswd -a josh

New SMB password:
Retype new SMB password:
Added user josh.
```

Once the password is set, enable the Samba account by typing:

```
sudo smbpasswd -e josh
Enabled user josh
```

Open the Samba configuration file and append the sections:

```
sudo nano /etc/samba/smb.conf

[users]
    path = /samba/users
    browseable = yes
    read only = no
    force create mode = 0660
    force directory mode = 2770
    valid users = @sambashare @sadmin

[josh]
    path = /samba/josh
    browseable = no
    read only = no
    force create mode = 0660
    force directory mode = 2770
    valid users = josh @sadmin
```

Laboratory Report

Experiment No - 07

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Configuration of HTTP Server using CentOS7 Linux Operating System

Evaluation

1) Attendance [2]   ---------------

2) Lab Performance [2]   ---------------

3) Oral [1]   ---------------

Overall Marks [5]   ---------------

Subject In-charge

Experiment No.7

TITLE: Configuration of HTTP Server using CentOS7 Linux Operating System.

PREREQUISITE: ISO Image of CentOS7 Linux Operating System.

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr.No	Software Configuration	
1	Operating System	ISO Image of Linux OS
2	Software Platform	VMWare Workstation

THEORY :

Apache is a Linux application for running web servers. It is part of the LAMP stack – a package of applications that form the basis for most web technology. LAMP stands for Linux, Apache, MyPHP, and PHP.

This practical will show you **how to install and configure the Apache web server on CentOS 7.**

```
yum install httpd
```

The system should download and install the Apache software packages.

```
systemctl start httpd
```

```
systemctl enable httpd
```

```
systemctl status httpd
```

```
firewall-cmd --permanent --add-port=80/tcp
```

```
firewall-cmd --permanent --add-port=443/tcp
```

```
firewall-cmd --reload
```

Virtual hosts are different websites that you run from the same server. Each website needs its own configuration file.

Make sure these configuration files use the **.conf** extension, and save them in the **/etc/httpd/conf.d/** directory.

There are a couple of best practices to use when you're setting up different websites on the same server:

- Try to use the same naming convention for all your websites. For example:
  - **/etc/httpd/conf.d/MyWebsite.com.conf**
  - **/etc/httpd/conf.d/TestWebsite.com.conf**
- Use a different configuration file for each domain. The configuration file is called a **vhost**, for a virtual host. You can use as many as you need. Keeping them separate makes troubleshooting easier.

  1. To create a virtual host configuration file, enter the following into a terminal window:
- `vi /etc/httpd/conf.d/vhost.conf`
- This will launch the Vi text editor, and create a new **vhost.conf** file in the **/etc/httpd/conf.d** directory.

```
NameVirtualHost *:80

<VirtualHost *:80>

ServerAdmin webmaster@MyWebsite.com

ServerName MyWebsite.com

ServerAlias www.MyWebsite.com

DocumentRoot /var/www/html/MyWebsite.com/public_html/

ErrorLog /var/www/html/MyWebsite.com/logs/error.log
```

```
CustomLog /var/www/html/MyWebsite.com/logs/access.log
combined

</VirtualHost>
```

- Save the file and exit.

Laboratory Report

Experiment No - 06

Batch-

Date of Experiment: _____   Date of Submission: _____

Title: Configuration of SAMBA Server using CentOS7 Linux Operating System

Evaluation

1) Attendance [2]   ---------------

2) Lab Performance [2]   ---------------

3) Oral [1]   ---------------

Overall Marks [5]   ---------------

Subject In-charge

system Administration Lab

Experiment No.8

TITLE: Configuration of Proxy Server using CentOS7 Linux Operating System.

PREREQUISITE: ISO Image of CentOS7 Linux Operating System.

HARDWARE CONFIGURATION / KIT:

Sr.No	Hardware Configuration	
1	Processor	1.5GHz or more
2	RAM	4Gb Minimum
3	HDD	Minimum 30Gb free Space

SOFTWARE CONFIGURATION:

Sr.No	Software Configuration	
1	Operating System	ISO Image of Linux OS
2	Software Platform	VMWare Workstation

THEORY :

A proxy server is a server that acts as an intermediary for requests from clients seeking resources on the internet or an external network. Think of it as a go-between who makes requests on behalf of the client, ensuring that anyone outside of your network does not know the details of the requesting host.

Before we start, you should know that **Squid**, does not have any minimum requirements, but the amount of RAM usage may vary depending on the clients browsing the internet through the proxy server.

Squid is included in the base repository and thus the installation is simple and straightforward. Before installing it, however, make sure your packages are up to date by running.

```
# yum -y install squid
# systemctl start squid
# systemctl  enable squid
```

At this point, your Squid web proxy should already be running and you can verify the status of the service with.

If you wish to allow the IP address to access the web through your new proxy server, you will need to add a new **ACL** (**access control list**) line in the configuration file.

```
# vim /etc/squid/squid.conf
```

The line you should add is:

```
acl localnet src XX.XX.XX.XX
```

Where **XX.XX.XX.XX** is the actual client IP address you wish to add. The line should be added at the beginning of the file where the ACLs are defined. It is a good practice to add a comment next to ACL which will describe who uses this IP address.

It is important to note that if Squid is located outside your local network, you should add the public IP address of the client.

You will need to restart Squid so the new changes can take effect.

```
# systemctl  restart squid
```