

1. configure SMTP in localhost.

To configure an SMTP server in our localhost, we need to set up an SMTP server like Postfix, Sendmail, or Exim for Linux systems.

Here we setup postfix in our linux system.

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo apt install postfix
[sudo] password for sigmoid:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libllvm17t64 python3-netifaces
Use 'sudo apt autoremove' to remove them.
Suggested packages:
  postfix-cdb postfix-doc postfix-ldap postfix-lmdb postfix-mta-sts-resolver
  postfix-mysql postfix-pcre postfix-pgsql postfix-sqlite procmail sasl2-bin
  | dovecot-common
The following NEW packages will be installed:
  postfix
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 0 B/1,254 kB of archives.
After this operation, 4,195 kB of additional disk space will be used.
Preconfiguring packages ...
Selecting previously unselected package postfix.
(Reading database ... 199687 files and directories currently installed.)
Preparing to unpack .../postfix_3.8.6-1build2_amd64.deb ...
Unpacking postfix (3.8.6-1build2) ...
Setting up postfix (3.8.6-1build2) ...
info: Selecting GID from range 100 to 999 ...
info: Adding group `postfix' (GID 127) ...
info: Selecting UID from range 100 to 999 ...

info: Adding system user `postfix' (UID 125) ...
info: Adding new user `postfix' (UID 125) with group `postfix' ...
info: Not creating home directory `/var/spool/postfix'.
Creating /etc/postfix/dynamicmaps.cf
info: Selecting GID from range 100 to 999 ...
info: Adding group `postdrop' (GID 128) ...
```

setting myhostname: sigmoid-IdeaPad-3-15ITL6
 setting alias maps
 setting alias database
 mailname is not a fully qualified domain name. Not changing /etc/mailname.
 setting destinations: \$myhostname, sigmoid-IdeaPad-3-15ITL6, localhost.localdoma
 in, , localhost
 setting relayhost:
 setting mynetworks: 127.0.0.0/8 [::ffff:127.0.0.0]/104 [::1]/128
 setting mailbox_size_limit: 0
 setting recipient_delimiter: +
 setting inet_interfaces: all
 setting inet_protocols: all
 WARNING: /etc/aliases exists, but does not have a root alias.

Postfix (main.cf) is now set up with a default configuration. If you need to
 make changes, edit /etc/postfix/main.cf (and others) as needed. To view
 Postfix configuration values, see postconf(1).

After modifying main.cf, be sure to run 'systemctl reload postfix'.

Running newaliases

Created symlink /etc/systemd/system/multi-user.target.wants/postfix.service → /u
 sr/lib/systemd/system/postfix.service.

Processing triggers for ufw (0.36.2-6) ...

Processing triggers for man-db (2.12.0-4build2) ...

Processing triggers for rsyslog (8.2312.0-3ubuntu9) ...

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ dpkg -l | grep mailutil

ii	libmailutils9t64:amd64	1:3.17-1.1build3	amd64	GNU
	Mail abstraction library			
ii	mailutils	1:3.17-1.1build3	amd64	GNU mailutils
	utilities for handling mail			
ii	mailutils-common	1:3.17-1.1build3	all	common files for
	GNU mailutils			

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ sudo nano /etc/postfix/main.cf

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ sudo nano /etc/postfix/sasl_passwd

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ sudo chmod 600 /etc/postfix/sasl_passwd

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ sudo postmap /etc/postfix/sasl_passwd

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ sudo systemctl restart postfix

[sudo] password for sigmoid:

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ sudo systemctl enable postfix

Synchronizing state of postfix.service with SysV service script with

/usr/lib/systemd/systemd-sysv-install.

Executing: /usr/lib/systemd/systemd-sysv-install enable postfix

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sendmail pavv2301@gmail.com
sendmail: warning: /etc/postfix/main.cf, line 49: overriding earlier entry: relayhost=
sendmail: warning: /etc/postfix/main.cf, line 53: overriding earlier entry:
smtp_tls_security_level=may
postdrop: warning: /etc/postfix/main.cf, line 49: overriding earlier entry: relayhost=
postdrop: warning: /etc/postfix/main.cf, line 53: overriding earlier entry:
smtp_tls_security_level=may
subject: Assignment
completed Assignmentsigmoid@sigmoid-IdeaPad-3-15ITL6:~$ mailq
mailq: warning: /etc/postfix/main.cf, line 49: overriding earlier entry: relayhost=
mailq: warning: /etc/postfix/main.cf, line 53: overriding earlier entry:
smtp_tls_security_level=may
postqueue: warning: /etc/postfix/main.cf, line 49: overriding earlier entry: relayhost=
postqueue: warning: /etc/postfix/main.cf, line 53: overriding earlier entry:
smtp_tls_security_level=may
-Queue ID- --Size-- ----Arrival Time---- -Sender/Recipient-----
56E7C61669* 330 Sun Mar  2 15:40:16 sigmoid@sigmoid-IdeaPad-3-15ITL6
                                pavv2301@gmail.com

-- 0 Kbytes in 1 Request.
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$
```

2. Create a user in your localhost, which should not be able to execute the sudo command.

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo adduser pavani
info: Adding user `pavani' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `pavani' (1001) ...
info: Adding new user `pavani' (1001) with group `pavani (1001)' ...
info: Creating home directory `/home/pavani' ...
info: Copying files from `/etc/skel' ...
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: password updated successfully
Changing the user information for pavani
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
info: Adding new user `pavani' to supplemental / extra groups `users' ...
info: Adding user `pavani' to group `users' ...
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ groups pavani
pavani : pavani users
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo deluser pavani sudo
fatal: The user `pavani' is not a member of group `sudo'.
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ su - pavani
Password:
pavani@sigmoid-IdeaPad-3-15ITL6:~$ sudo ls -ltr
[sudo] password for pavani:
pavani is not in the sudoers file.
This incident has been reported to the administrator.
pavani@sigmoid-IdeaPad-3-15ITL6:~$ sudo pwd
[sudo] password for pavani:
pavani is not in the sudoers file.
This incident has been reported to the administrator.
pavani@sigmoid-IdeaPad-3-15ITL6:~$
```

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo adduser pavani
info: Adding user `pavani' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `pavani' (1001) ...
info: Adding new user `pavani' (1001) with group `pavani (1001)' ...
info: Creating home directory `/home/pavani' ...
info: Copying files from `/etc/skel' ...
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: password updated successfully
Changing the user information for pavani
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
info: Adding new user `pavani' to supplemental / extra groups `users' ...
info: Adding user `pavani' to group `users' ...
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ groups pavani
pavani : pavani users
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo deluser pavani sudo
fatal: The user `pavani' is not a member of group `sudo'.
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ su - pavani
Password:
pavani@sigmoid-IdeaPad-3-15ITL6:~$ sudo ls -ltr
[sudo] password for pavani:
pavani is not in the sudoers file.
This incident has been reported to the administrator.
pavani@sigmoid-IdeaPad-3-15ITL6:~$ sudo pwd
[sudo] password for pavani:
pavani is not in the sudoers file.
This incident has been reported to the administrator.
pavani@sigmoid-IdeaPad-3-15ITL6:~$ S
```

3. Configure your system in such a way that when a user type and executes a describe command from anywhere of the system it must list all the files and folders of the user's current directory.

Ex:- \$ describe

\$ content1 content2

Content3 content 4

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ nano ~/.bashrc
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ source /etc/bash.bashrc
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo nano /etc/bash.bashrc
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ describe
backup.tar  config      hello      myscripts  research.tar  semid        Templates
bashrc.org  Desktop    hello1     pavaniii   research.zip  semis        testfile
bin.bashrc  Documents  hi         Pictures    ressearch     showtime.sh  tmp
clerk       Downloads  khushi     Public      sem           showtime.txt  Videos
cnt         findpath   Music      research    semi          snap
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$
```

```
# if the command-not-found package is installed, use it
if [ -x /usr/lib/command-not-found -o -x /usr/share/command-not-found/command-not-found ]; then
    function command_not_found_handle {
        # check because c-n-f could've been removed in the meantime
        if [ -x /usr/lib/command-not-found ]; then
            /usr/lib/command-not-found -- "$1"
            return $?
        elif [ -x /usr/share/command-not-found/command-not-found ]; then
            /usr/share/command-not-found/command-not-found -- "$1"
            return $?
        else
            printf "%s: command not found\n" "$1" >&2
            return 127
        fi
    }
fi

alias describe='ls'
```

1. Users can put a compressed file at any path of the linux file system. The name of the file will be research and the extension will be of compression type, example for gzip type extension will be .gz. You have to find the file and check the compression type and uncompress it.

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ touch research
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ touch uncompress_research.sh
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ nano uncompress_research.sh
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ chmod +x uncompress_research.sh
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo ./uncompress_research.sh
Processing file: /home/sigmoid/research.zip
File is zip compressed (.zip). Extracting...
Archive: /home/sigmoid/research.zip
replace /home/sigmoid/research? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
  inflating: /home/sigmoid/research
Extraction completed for: /home/sigmoid/research.zip
All files processed.
```

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ cat uncompress_research.sh
#!/bin/bash
```

```
# Find all compressed files named "research.*" anywhere in the system and store them in an array
```

```
mapfile -t file_paths < <(find / -type f -name "research.*" 2>/dev/null)
```

```
# Check if any file is found
```

```
if [[ ${#file_paths[@]} -eq 0 ]]; then
```

```
    echo "No research compressed file found."
```

```
    exit 1
```

```
fi
```

```
# Loop through each found file
```

```
for file_path in "${file_paths[@]}"; do
```

```
    echo "Processing file: $file_path"
```

```
    # Detect file type using 'file' command
```

```
    file_type=$(file --mime-type -b "$file_path")
```

```
    # Extract based on file type
```

```
    case "$file_type" in
```

```
        application/gzip)
```

```
            echo "File is gzip compressed (.gz). Extracting..."
```

```
            gunzip "$file_path"
```

```
            ;;
```

```
        application/x-bzip2)
```

```
            echo "File is bzip2 compressed (.bz2). Extracting..."
```

```
            bunzip2 "$file_path"
```

```
            ;;
```

```

application/x-xz)
echo "File is xz compressed (.xz). Extracting..."
unxz "$file_path"
;;
application/x-tar)
echo "File is a tar archive (.tar). Extracting..."
tar -xf "$file_path" -C "$(dirname "$file_path")"
;;
application/zip)
echo "File is zip compressed (.zip). Extracting..."
unzip "$file_path" -d "$(dirname "$file_path")"
;;
application/x-7z-compressed)
echo "File is 7z compressed (.7z). Extracting..."
7z x "$file_path" -o"$(dirname "$file_path")"
;;
application/x-rar)
echo "File is rar compressed (.rar). Extracting..."
unrar x "$file_path" "$(dirname "$file_path")"
;;
*)
echo "Unknown file type: $file_type for file: $file_path"
;;
esac

echo "Extraction completed for: $file_path"
done

echo "All files processed."
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$

```

2. Configure your system in such a way that any user of your system creates a file then there should not be permission to do any activity in that file.

Note:- Don't use the chmod command.

1: Editing the /etc/profile File

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo nano /etc/profile
```

2: Modifying umask to 777


```

## /etc/profile: system-wide .profile file for the Bourne shell (sh(1))
# and Bourne compatible shells (bash(1), ksh(1), ash(1), ...).

if [ "${PS1-}" ]; then
  if [ "${BASH-}" ] && [ "$BASH" != "/bin/sh" ]; then
    # The file bash.bashrc already sets the default PS1.
    # PS1='\h:\w\$ '
    if [ -f /etc/bash.bashrc ]; then
      . /etc/bash.bashrc
    fi
  else
    if [ "$(id -u)" -eq 0 ]; then
      PS1='# '
    else
      PS1='$ '
    fi
  fi
fi

if [ -d /etc/profile.d ]; then
  for i in /etc/profile.d/*.sh; do
    if [ -r $i ]; then
      . $i
    fi
  done
  unset i
fi

umask 777

```

3: Applying the Configuration

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ source /etc/profile

4: Creating a New File

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ touch testfile

5: Checking the File Permissions

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ ls -ltr testfile
----- 1 sigmoid sigmoid 0 Mar 3 00:10 testfile

1. Create a service with the name showtime , after starting the service, every minute it should print the current time in a file in the user home directory.

Ex:-

sudo service showtime start -> It should start writing in file.

sudo service showtime stop -> It should stop writing in file.

sudo service showtime status -> It should show status.

1. Creating a Shell Script

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ nano /home/sigmoid/showtime.sh

Adding the content to the file:

```
GNU nano 7.2
#!/bin/bash

# Define the log file path in the user's home directory
log_file="/home/sigmoid/showtime.txt"

# Infinite loop to write the current time every minute
while true; do
    # Write current date and time to the log file
    echo "$(date)" >> "$log_file"
    # Sleep for 60 seconds
    sleep 60
done
```

2. Making the script executable:

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ chmod +x /home/sigmoid/showtime.sh

3. Creating a Systemd Service File:

sigmoid@sigmoid-IdeaPad-3-15ITL6:~\$ sudo nano /etc/systemd/system/showtime.service

Adding the content to the service file:

```
GNU nano 7.2 /etc/systemd/system/showtime.service *
[Unit] Description=Showtime Service - Logs current time every minute After=network.target

[Service]
ExecStart=/home/sigmoid/showtime.sh
Restart=always
User=sigmoid

[Install]
WantedBy=multi-user.target
```

4. Reloading systemd and Enable the Service

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo systemctl daemon-reload
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo systemctl enable showtime.service
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo systemctl start showtime.service
```

5. Verifying the Service Status

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo systemctl status showtime.service
```

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ sudo systemctl status showtime.service
● showtime.service - Showtime Service - Logs current time every minute
   Loaded: loaded (/etc/systemd/system/showtime.service; enabled; preset: enabled)
   Active: active (running) since Mon 2025-03-03 01:56:02 IST; 12s ago
     Main PID: 131090 (showtime.sh)
        Tasks: 2 (limit: 9203)
      Memory: 564.0K (peak: 928.0K)
         CPU: 6ms
       CGroup: /system.slice/showtime.service
               └─131090 /bin/bash /home/sigmoid/showtime.sh
                 └─131092 sleep 60

Mar 03 01:56:02 sigmoid-IdeaPad-3-15ITL6 systemd[1]: Started showtime.service - Showtime Service - Logs current time every minute.
```

6: Checking the Output in the Log File

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ cat /home/sigmoid/showtime.txt
```

```
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$ cat /home/sigmoid/showtime.txt
Mon Mar 3 01:56:02 AM IST 2025
Mon Mar 3 01:57:02 AM IST 2025
Mon Mar 3 01:58:02 AM IST 2025
Mon Mar 3 01:59:02 AM IST 2025
Mon Mar 3 02:00:02 AM IST 2025
Mon Mar 3 02:01:02 AM IST 2025
Mon Mar 3 02:02:02 AM IST 2025
Mon Mar 3 02:03:02 AM IST 2025
Mon Mar 3 02:10:06 AM IST 2025
Mon Mar 3 02:11:06 AM IST 2025
Mon Mar 3 02:12:06 AM IST 2025
Mon Mar 3 02:13:06 AM IST 2025
Mon Mar 3 02:14:06 AM IST 2025
Mon Mar 3 02:15:06 AM IST 2025
Mon Mar 3 02:16:06 AM IST 2025
Mon Mar 3 02:17:06 AM IST 2025
Mon Mar 3 02:18:06 AM IST 2025
Mon Mar 3 02:19:06 AM IST 2025
Mon Mar 3 02:20:06 AM IST 2025
Mon Mar 3 02:21:06 AM IST 2025
Mon Mar 3 02:22:06 AM IST 2025
Mon Mar 3 02:23:06 AM IST 2025
Mon Mar 3 02:24:06 AM IST 2025
Mon Mar 3 02:25:06 AM IST 2025
Mon Mar 3 02:26:06 AM IST 2025
Mon Mar 3 02:27:06 AM IST 2025
Mon Mar 3 02:28:06 AM IST 2025
Mon Mar 3 02:29:06 AM IST 2025
Mon Mar 3 02:30:06 AM IST 2025
Mon Mar 3 02:31:06 AM IST 2025
sigmoid@sigmoid-IdeaPad-3-15ITL6:~$
```