

# lab 10

## Lab10.1 : การจัดการ Process และ Service

### Part 1 (Remote Access ด้วย ssh)

1. ให้จับคู่กับเพื่อน สร้าง User และกำหนด Password สำหรับให้เพื่อน Login เข้ามาได้

ใช้คำสั่ง : `sudo adduser best`  
`sudo passwd best`  
`sudo apt update`  
`sudo apt install openssh-server`  
`sudo systemctl enable ssh`

2. ให้ใช้ ssh ทำการ Remote Access เข้าเครื่องเพื่อนโดยใช้ User/Password ที่เพื่อนสร้างให้

ใช้คำสั่ง : `ssh chat@192.168.93.129`

3. ให้ใช้ ssh ทำการ Remote Access เข้าเครื่องเพื่อนโดยใช้ User/Password ที่เพื่อนสร้างให้

```
chat@test:~$ ssh chat@192.168.93.129
chat@192.168.93.129's password:
Permission denied, please try again.
chat@192.168.93.129's password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-52-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Fri Feb  7 12:03:28 PM UTC 2025

System load:  0.42           Processes:            221
Usage of /:   43.4% of 9.75GB Users logged in:        1
Memory usage: 10%          IPv4 address for ens33: 192.168.93.129
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

131 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Fri Feb  7 11:49:42 2025 from 192.168.93.128
chat@best:~$
```

## Part 2 (Kill Shell Process ของเพื่อน)

### 1. ใช้คำสั่ง w เพื่อดูว่ามีใคร Login เข้ามาบ้าง และใช้ ps -eufa เพื่อมองหา Shell เพื่อน

```
valid_itt forever preferred_itt forever
chat@test:~$ w
12:13:53 up 1:29, 2 users, load average: 0.08, 0.03, 0.01
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT
chat      tty1    -             10:45    1.00s  0.19s  0.01s  w
best      -       192.168.93.129 12:13    1:28m  0.00s  0.30s  sshd: best [priv]
chat@test:~$ ps -eufa
USER      PID  %CPU  %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
best      1671  0.1   0.1   8652  5376 pts/0    Ss+  12:13   0:00 -bash
root      925   0.0   0.1   6976  4608 tty1     Ss   10:45   0:00 /bin/login -p --
chat      1382   0.0   0.1   8652  5376 tty1     S    10:45   0:00 \_ -bash USER=chat INVOCATION_ID=d72d8477b81547be8491856dcc423c90 TERM=linux CREDENTIALS_DIR
chat      1683   0.0   0.1  12316  5376 tty1     R+   12:14   0:00 \_ ps -eufa SHELL=/bin/bash CREDENTIALS_DIRECTORY=/run/credentials/getty@tty1.service ME
chat@test:~$
```

### 2. ใช้คำสั่ง kill ทำลาย Shell เพื่อน

ใช้คำสั่ง : **ps aux | grep bash**  
**sudo kill -9 1671**  
**ps aux | grep bash (ตรวจสอบอีกครั้ง)**

### 3. บันทึกคำสั่งและผลการทดลอง

```
chat@test:~$ ps aux | grep bash
chat      1382   0.0   0.1   8652  5376 tty1     S    10:45   0:00 -bash
best      1671   0.0   0.1   8652  5376 pts/0    Ss+  12:13   0:00 -bash
chat      1692   0.0   0.0   6544  2304 tty1     S+   12:16   0:00 grep bash
chat@test:~$ sudo kill -9 1671
[sudo] password for chat:
chat@test:~$ ps aux | grep bash
chat      1382   0.0   0.1   8652  5376 tty1     S    10:45   0:00 -bash
chat      1710   0.0   0.0   6544  2304 tty1     S+   12:18   0:00 grep bash
chat@test:~$ S_
```

## Part 3 (ปิด Service)

### 1. ใช้คำสั่ง systemctl หรือ service เพื่อดู Service sshd ว่าอยู่ในสถานะ active หรือ inactive

```
To show all installed unit files use 'systemctl list-unit-files'.
chat@test:~$ sudo systemctl status sshd
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: enabled)
   Active: active (running) since Fri 2025-02-07 10:45:00 UTC; 1h 36min ago
   TriggeredBy: ● ssh.socket
   Docs: man:sshd(8)
          man:sshd_config(5)
   Process: 878 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
   Main PID: 893 (sshd)
   Tasks: 1 (limit: 4556)
   Memory: 2.3M (peak: 19.8M)
   CPU: 46ms
   CGroup: /system.slice/ssh.service
           └─893 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Feb 07 10:44:59 test systemd[1]: Starting ssh.service - OpenBSD Secure Shell server...
Feb 07 10:45:00 test sshd[893]: Server listening on :: port 22.
Feb 07 10:45:00 test systemd[1]: Started ssh.service - OpenBSD Secure Shell server.
Feb 07 12:13:10 test sshd[1557]: Accepted password for best from 192.168.93.129 port 52524 ssh2
Feb 07 12:13:10 test sshd[1557]: pam_unix(sshd:session): session opened for user best(uid=1011) by best(uid=0)
chat@test:~$ ss
```

### 2. สั่งปิด Service sshd แล้วตรวจสอบสถานะข้างบนแน่ใจว่า inactive แล้ว

```
Feb 07 12:13:10 test sshd[1557]: pam_unix(sshd:session): session opened for user best(uid=1011) by best(uid=0)
chat@test:~$ sudo systemctl stop ssh
Stopping 'ssh.service', but its triggering units are still active:
ssh.socket
chat@test:~$ sudo systemctl status sshd
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: enabled)
   Active: inactive (dead) since Fri 2025-02-07 12:23:23 UTC; 22s ago
   Duration: 1h 38min 22.588s
   TriggeredBy: ● ssh.socket
   Docs: man:sshd(8)
          man:sshd_config(5)
   Process: 878 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
   Process: 893 ExecStart=/usr/sbin/sshd -D $SSH_OPTS (code=exited, status=0/SUCCESS)
   Main PID: 893 (code=exited, status=0/SUCCESS)
   CPU: 463ms

Feb 07 10:44:59 test systemd[1]: Starting ssh.service - OpenBSD Secure Shell server...
Feb 07 10:45:00 test sshd[893]: Server listening on :: port 22.
Feb 07 10:45:00 test systemd[1]: Started ssh.service - OpenBSD Secure Shell server.
Feb 07 12:13:10 test sshd[1557]: Accepted password for best from 192.168.93.129 port 52524 ssh2
Feb 07 12:13:10 test sshd[1557]: pam_unix(sshd:session): session opened for user best(uid=1011) by best(uid=0)
Feb 07 12:23:23 test systemd[1]: Stopping ssh.service - OpenBSD Secure Shell server...
Feb 07 12:23:23 test systemd[1]: ssh.service: Deactivated successfully.
Feb 07 12:23:23 test systemd[1]: Stopped ssh.service - OpenBSD Secure Shell server.
chat@test:~$ _
```

### 3. ให้เพื่อนลอง Remote Access เข้ามาอีกครั้ง

### 4. บันทึกคำสั่งและผลการทดลอง

```
best@test:~$ Connection to 192.168.93.128 closed.
best@best:~$ ssh best@192.168.93.128
best@192.168.93.128's password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-52-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Fri Feb  7 12:26:10 PM UTC 2025

System load:  0.08               Processes:    218
Usage of /:   48.7% of 9.75GB    Users logged in: 1
Memory usage: 6%                IPv4 address for ens33: 192.168.93.128
Swap usage:  0%

Expanded Security Maintenance for Applications is not enabled.

74 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Fri Feb  7 12:13:13 2025 from 192.168.93.129
best@test:~$ S
```

### 5. อย่าลืมลบหรือ Lock User ที่สร้างให้เพื่อน และอย่าลืมเปิด Service sshd คืนแบบเดิม

```
chat@test:~$ sudo userdel best
userdel: user best is currently used by process 1798
```

```
chat@test:~$ sudo systemctl start ssh
```

```
chat@test:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: enabled)
   Active: active (running) since Fri 2025-02-07 12:26:07 UTC; 5min ago
   TriggeredBy: ● ssh.socket
   Docs: man:sshd(8)
          man:sshd_config(5)
   Main PID: 1792 (sshd)
   Tasks: 1 (limit: 4556)
   Memory: 2.2M (peak: 18.7M)
   CPU: 200ms
   CGroup: /system.slice/ssh.service
           └─1792 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Feb 07 12:26:07 test systemd[1]: Starting ssh.service - OpenBSD Secure Shell server...
Feb 07 12:26:07 test sshd[1792]: Server listening on :: port 22.
Feb 07 12:26:07 test systemd[1]: Started ssh.service - OpenBSD Secure Shell server.
Feb 07 12:26:10 test sshd[1794]: Accepted password for best from 192.168.93.129 port 47302 ssh2
Feb 07 12:26:10 test sshd[1794]: pam_unix(sshd:session): session opened for user best(uid=1011) by best(uid=0)
chat@test:~$ S
```

## Lab10.2 : การจัดการ File System

### Part 1 (เพิ่ม HDD สร้าง Volume)

#### 1.เพิ่ม HDD ขนาด 35 GB จำนวน 3 ลูก

Virtual Machine Settings

Hardware Options	
Device	Summary
Memory	4 GB
Processors	2
Hard Disk (SCSI)	20 GB
Hard Disk 2 (SCSI)	35 GB
Hard Disk 3 (SCSI)	35 GB
Hard Disk 4 (SCSI)	35 GB
CD/DVD (SATA)	Using file C:\Users\Chatchaw...
Network Adapter	NAT
USB Controller	Present
Sound Card	Auto detect

#### 2. HDD#1 - กำหนด Partition แล้ว Format เป็น ext4 สำหรับ /home2

```
chat@test:~$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   20G  0 disk
├─sda1       8:1    0    1M  0 part
├─sda2       8:2    0   1.0G  0 part /boot
├─sda3       8:3    0  18.2G  0 part
└─ubuntu--vg-ubuntu--lv 252:0    0   10G  0 lvm  /
sdb          8:16   0   35G  0 disk
sdc          8:32   0   35G  0 disk
sdd          8:40   0   35G  0 disk
sr0         11:0    1   2.6G  0 rom

chat@test:~$ sudo fdisk /dev/sdb
[sudo] password for chat:

Welcome to fdisk (util-linux 2.39.3).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS (MBR) disklabel with disk identifier 0x689b6620.

Command (m for help): n
Partition type
  p   primary (0 primary, 0 extended, 4 free)
  e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-73400319, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-73400319, default 73400319):

Created a new partition 1 of type 'Linux' and of size 35 GiB.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

chat@test:~$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   20G  0 disk
├─sda1       8:1    0    1M  0 part
├─sda2       8:2    0   1.0G  0 part /boot
├─sda3       8:3    0  18.2G  0 part
└─ubuntu--vg-ubuntu--lv 252:0    0   10G  0 lvm  /
sdb          8:16   0   35G  0 disk
├─sdb1       8:17   0   35G  0 part
sdc          8:32   0   35G  0 disk
sdd          8:40   0   35G  0 disk
sr0         11:0    1   2.6G  0 rom

chat@test:~$ ss
```

```
chat@test:~$ sudo mkfs.ext4 /dev/sdb1
mke2fs 1.47.0 (5-Feb-2023)
Creating filesystem with 9174784 4k blocks and 2293760 inodes
Filesystem UUID: 786405b9-0ba1-4530-a5af-c13ec00bc902
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000, 7962624

Allocating group tables: done
Writing inode tables: done
Creating journal (65536 blocks): done
Writing superblocks and filesystem accounting information: done

chat@test:~$ df -h
Filesystem                Size      Used Avail Use% Mounted on
tmpfs                      387M    1.5M   386M    1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv 9.8G    4.8G    4.5G   52% /
tmpfs                      1.9G         0    1.9G    0% /dev/shm
tmpfs                      5.0M         0    5.0M    0% /run/lock
/dev/sda2                  1.8G    182M    1.5G   12% /boot
tmpfs                      387M    12K    387M    1% /run/user/1000

chat@test:~$
```

ใช้คำสั่ง : `sudo mkdir -p /home2`  
`sudo mount /dev/sdb1 /home2`  
`sudo nano /etc/fstab`

เพิ่ม `/dev/sdb1 /home2 ext4 defaults 0 2`

```
GNU nano 7.2 /etc/fstab *
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options> <dump> <pass>
# / was on /dev/ubuntu-vg/ubuntu-lv during curtin installation
/dev/disk/by-id/dm-uuid-LVM-c291xanrpglrFYtShkEdPcFEfhDwVsfqBuoPsnPIdJohWkvPMbeQVldkruQLia / ext4 defaults 0 1
# /boot was on /dev/sda2 during curtin installation
/dev/disk/by-uuid/300cfb4e-c346-4a57-ab7c-d38452567bb0 /boot ext4 defaults 0 1
/swap.img none swap sw 0 0
/dev/sdb1 /home2 ext4 defaults 0 2_
```

### 3. HDD#2 - จัดการแบบ HDD#1 แต่ใช้ Logical Volume Management (LVM) และใช้สำหรับ /home3

```
chat@test:~$ sudo fdisk /dev/sdc

Welcome to fdisk (util-linux 2.39.3).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS (MBR) disklabel with disk identifier 0x92987b4d.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-73400319, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-73400319, default 73400319):

Created a new partition 1 of type 'Linux' and of size 35 GiB.

Command (m for help): t
Selected partition 1
Hex code or alias (type L to list all): 8e
Changed type of partition 'Linux' to 'Linux LVM'.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

```
chat@test:~$ sudo pvcreate /dev/sdc1
Physical volume "/dev/sdc1" successfully created.
chat@test:~$ sudo vgcreate vg_home3 /dev/sdc1
Volume group "vg_home3" successfully created
chat@test:~$ sudo lvcreate -l 100%FREE -n lv_home3 vg_home3
Logical volume "lv_home3" created.
chat@test:~$ sudo mkfs.ext4 /dev/vg_home3/lv_home3
mke2fs 1.47.0 (5-Feb-2023)
Creating filesystem with 9174016 4k blocks and 2293760 inodes
Filesystem UUID: 6cd18915-116a-4257-88e2-175bb9e8c60c
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000, 7962624

Allocating group tables: done
Writing inode tables: done
Creating journal (65536 blocks): done
Writing superblocks and filesystem accounting information: done

chat@test:~$ sudo mkdir -p /home3
chat@test:~$ sudo mount /dev/vg_home3/lv_home3 /home3
mount: (hint) your fstab has been modified, but systemd still uses
the old version; use 'systemctl daemon-reload' to reload.
chat@test:~$ df -h
Filesystem                Size      Used Avail Use% Mounted on
tmpfs                      387M    1.5M   386M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv 9.8G    4.8G    4.5G  52% /
tmpfs                      1.9G     0    1.9G   0% /dev/shm
tmpfs                      5.0M     0    5.0M   0% /run/lock
/dev/sda2                  1.8G   182M    1.5G  12% /boot
tmpfs                      387M    12K   387M   1% /run/user/1000
/dev/mapper/vg_home3-lv_home3 35G    24K    33G   1% /home3
chat@test:~$
```

ใช้คำสั่ง : `sudo nano /etc/fstab`

เพิ่ม `/dev/vg_home3/lv-home3 /home3 ext4 defaults 0 2`

```
GNU nano 7.2 /etc/fstab *
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options> <dump> <pass>
# / was on /dev/ubuntu-vg/ubuntu-lv during curtin installation
/dev/disk/by-id/dm-uuid-LVM-c291xanrpglrFYtShkEdPcFEfhDwVsfqBuoPsnPIdJohWkvPMbeQVldkruQLia / ext4 defaults 0 1
# /boot was on /dev/sda2 during curtin installation
/dev/disk/by-uuid/300cfb4e-c346-4a57-ab7c-d38452567bb0 /boot ext4 defaults 0 1
/swap.img none swap sw 0 0
/dev/sdb1 /home2 ext4 defaults 0 2
/dev/vg_home3/lv_home3 /home3 ext4 defaults 0 2
```

#### 4.ทำไฟล์ Archive ของ /etc มาเก็บใน /home2 และของ /var มาเก็บใน /home3

ใช้คำสั่ง : `sudo tar -cvzf /home2/etc_backup.tar.gz /etc`  
`sudo tar -cvzf /home3/var_backup.tar.gz /var`

```
/var/lib/cloud/instances/iid-datasource-none/boot-finished
/var/lib/cloud/instances/iid-datasource-none/scripts/
/var/lib/cloud/instances/iid-datasource-none/handlers/
/var/lib/cloud/instances/iid-datasource-none/datasource
/var/lib/cloud/instances/iid-datasource-none/obj.pkl
/var/lib/cloud/instances/iid-datasource-none/vendor-data.txt.l
/var/lib/cloud/instances/iid-datasource-none/sem/
/var/lib/cloud/instances/iid-datasource-none/sem/config_mounts
/var/lib/cloud/instances/iid-datasource-none/sem/config_seed_random
/var/lib/cloud/instances/iid-datasource-none/sem/config_ssh_import_id
/var/lib/cloud/instances/iid-datasource-none/sem/consume_data
/var/lib/cloud/instances/iid-datasource-none/sem/configapt_configure
/var/lib/cloud/instances/iid-datasource-none/sem/config_byobu
/var/lib/cloud/instances/iid-datasource-none/sem/config_write_files
/var/lib/cloud/instances/iid-datasource-none/sem/config_scripts_user
/var/lib/cloud/instances/iid-datasource-none/sem/config_srub_deb.g
/var/lib/cloud/instances/iid-datasource-none/sem/config_set_passwords
/var/lib/cloud/instances/iid-datasource-none/sem/config_scripts_per_instance
/var/lib/cloud/instances/iid-datasource-none/sem/config_ssh
/var/lib/cloud/instances/iid-datasource-none/sem/config_install_hotplug
/var/lib/cloud/instances/iid-datasource-none/sem/config_reset_rmc
/var/lib/cloud/instances/iid-datasource-none/sem/config_keys_to_console
/var/lib/cloud/instances/iid-datasource-none/sem/config_users_groups
/var/lib/cloud/instances/iid-datasource-none/sem/config_write_files_deferred
/var/lib/cloud/instances/iid-datasource-none/sem/config_locale
/var/lib/cloud/instances/iid-datasource-none/sem/config_scripts_vendor
/var/lib/cloud/instances/iid-datasource-none/sem/config_ssh_authkey_fingerprints
/var/lib/cloud/instances/iid-datasource-none/sem/config_set_hostname
/var/lib/cloud/instances/iid-datasource-none/user-data.txt
/var/lib/cloud/instances/iid-datasource-none/vendor-data2.txt.l
/var/lib/cloud/instances/iid-datasource-none/user-data.txt.l
/var/lib/cloud/seed/
/var/lib/cloud/scripts/
/var/lib/cloud/scripts/per-instance/
/var/lib/cloud/scripts/per-boot/
/var/lib/cloud/scripts/per-once/
/var/lib/cloud/scripts/vendor/
/var/lib/cloud/handlers/
/var/lib/cloud/data/
/var/lib/cloud/data/instance-id
/var/lib/cloud/data/python-version
/var/lib/cloud/data/previous-datasource
/var/lib/cloud/data/status.json
/var/lib/cloud/data/result.json
/var/lib/cloud/data/previous-instance-id
/var/lib/cloud/instance
/var/lib/cloud/sem/
/var/lib/cloud/sem/config_scripts_per_instance_once
/var/mmap/
chat@test:~$
```

#### 5.สั่ง ls -la /home2 /home3 แล้วบันทึกผล และสั่ง df -hT แล้วบันทึกผล

```
chat@test:~$ ls -la /home2 /home3
ls: cannot access '/home2': No such file or directory
/home3:
total 104880
drwxr-xr-x  3 root root    4096 Feb  7 12:55 .
drwxr-xr-x 27 root root    4096 Feb  7 12:49 ..
drwx-----  2 root root   16384 Feb  7 12:48 lost+found
-rw-r--r--  1 root root 107372530 Feb  7 12:56 var_backup.tar.gz
chat@test:~$ df -hT
Filesystem                                Type      Size  Used Avail Use% Mounted on
tmpfs                                     tmpfs     387M  1.5M  386M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv        ext4      9.8G  4.8G  4.5G  52% /
tmpfs                                     tmpfs     1.9G   0    1.9G   0% /dev/shm
tmpfs                                     tmpfs     5.0M   0    5.0M   0% /run/lock
/dev/sda2                                 ext4      1.8G  182M  1.5G  12% /boot
tmpfs                                     tmpfs     387M  12K  387M   1% /run/user/1000
/dev/mapper/vg_home3-lv_home3             ext4       35G  103M   33G   1% /home3
chat@test:~$
```



## Part 2 (ขยาย Volume ที่มีอยู่)

### 1.นำ HDD#3 มาเพิ่มให้ /home3

```
/dev/mapper/vg_home3-lv_home3      ext4      35G  103M  33G  1% /home3
chat@test:~$ sudo fdisk /dev/sdd

Welcome to fdisk (util-linux 2.39.3).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS (MBR) disklabel with disk identifier 0x5bdbdaaf.

Command (m for help): n
Partition type
  p   primary (0 primary, 0 extended, 4 free)
  e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-73400319, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-73400319, default 73400319):

Created a new partition 1 of type 'Linux' and of size 35 GiB.

Command (m for help): t
Selected partition 1
Hex code or alias (type L to list all): 8e
Changed type of partition 'Linux' to 'Linux LVM'.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

chat@test:~$
```

```
chat@test:~$ sudo pvcreate /dev/sdd1
Physical volume "/dev/sdd1" successfully created.
chat@test:~$ sudo lvextend -l +100%FREE /dev/vg_home3/lv_home3
New size (8959 extents) matches existing size (8959 extents).
chat@test:~$ sudo resize2fs /dev/vg_home3/lv_home3
resize2fs 1.47.0 (5-Feb-2023)
open: No such file or directory while opening /dev/vg_home3/lv_home3
chat@test:~$ sudo resize2fs /dev/vg_home3/lv_home3
resize2fs 1.47.0 (5-Feb-2023)
The filesystem is already 9174016 (4k) blocks long. Nothing to do!

chat@test:~$ df -h /home3
Filesystem                Size      Used Avail Use% Mounted on
/dev/mapper/vg_home3-lv_home3  35G  103M   33G   1% /home3
chat@test:~$
```

### 2.Restore ไฟล์ Archive ออกมาใน /home3

ใช้คำสั่ง : **sudo tar -xvzf /home2/etc\_backup.tar.gz -C /home3**  
**sudo tar -xvzf /home3/var\_backup.tar.gz -C /home3**

```
etc/logrotate.d/ufw
etc/logrotate.d/cloud-init
etc/logrotate.d/bootlog
etc/logrotate.d/alternatives
etc/logrotate.d/rsyslog
etc/logrotate.d/ubuntu-pro-client
etc/logrotate.d/utmp
etc/logrotate.d/dpkg
etc/logrotate.d/apt
etc/logrotate.d/ntp
etc/logrotate.d/apport
etc/resolv.conf
etc/rc1.d/
etc/rc1.d/K01uuidd
etc/rc1.d/K01open-iscsi
etc/rc1.d/K01ufw
etc/rc1.d/K01open-vm-tools
etc/rc1.d/K01iscsid
etc/lvm/
etc/lvm/profile/
etc/lvm/profile/thin-generic.profile
etc/lvm/profile/vdo-small.profile
etc/lvm/profile/thin-performance.profile
etc/lvm/profile/metadata.profile.template.profile
etc/lvm/profile/lvmbusd.profile
etc/lvm/profile/command.profile.template.profile
etc/lvm/profile/cache-mq.profile
etc/lvm/profile/cache-smq.profile
etc/lvm/lvmlocal.conf
etc/lvm/archive/
etc/lvm/archive/vg_home3_00000-1410318057.vg
etc/lvm/lvm.conf
etc/lvm/backup/
etc/lvm/backup/ubuntu-vg
etc/lvm/backup/vg_home3
etc/libaudit.conf
etc/udev/
etc/udev/locost.conf
etc/udev/rules.d/
etc/udev/rules.d/ubuntu--vg-ubuntu--lv.rules
etc/udev/udev.conf
etc/udev/hwdb.d/
etc/UPower/
etc/UPower/UPower.conf
etc/services
etc/rsyslog.d/
etc/rsyslog.d/20-ufw.conf
etc/rsyslog.d/21-cloudinit.conf
etc/rsyslog.d/50-default.conf
chat@test:~$
```

```
var/lib/cloud/instances/iid-datasource-none/boot-finished
var/lib/cloud/instances/iid-datasource-none/scripts/
var/lib/cloud/instances/iid-datasource-none/handlers/
var/lib/cloud/instances/iid-datasource-none/datasource
var/lib/cloud/instances/iid-datasource-none/obj.pkl
var/lib/cloud/instances/iid-datasource-none/vendor-data.txt.1
var/lib/cloud/instances/iid-datasource-none/sem/
var/lib/cloud/instances/iid-datasource-none/sem/config_mounts
var/lib/cloud/instances/iid-datasource-none/sem/config_seed_random
var/lib/cloud/instances/iid-datasource-none/sem/config_ssh_import_id
var/lib/cloud/instances/iid-datasource-none/sem/consume_data
var/lib/cloud/instances/iid-datasource-none/sem/config_apt_configure
var/lib/cloud/instances/iid-datasource-none/sem/config_byobu
var/lib/cloud/instances/iid-datasource-none/sem/config_write_files
var/lib/cloud/instances/iid-datasource-none/sem/config_scripts_user
var/lib/cloud/instances/iid-datasource-none/sem/config_grub_dpkg
var/lib/cloud/instances/iid-datasource-none/sem/config_set_passwords
var/lib/cloud/instances/iid-datasource-none/sem/config_scripts_per_instance
var/lib/cloud/instances/iid-datasource-none/sem/config_ssh
var/lib/cloud/instances/iid-datasource-none/sem/config_install_hotplug
var/lib/cloud/instances/iid-datasource-none/sem/config_reset_rmc
var/lib/cloud/instances/iid-datasource-none/sem/config_keys_to_console
var/lib/cloud/instances/iid-datasource-none/sem/config_users_groups
var/lib/cloud/instances/iid-datasource-none/sem/config_write_files_deferred
var/lib/cloud/instances/iid-datasource-none/sem/config_locale
var/lib/cloud/instances/iid-datasource-none/sem/config_scripts_vendor
var/lib/cloud/instances/iid-datasource-none/sem/config_ssh_authkey_fingerprints
var/lib/cloud/instances/iid-datasource-none/sem/config_set_hostname
var/lib/cloud/instances/iid-datasource-none/user-data.txt
var/lib/cloud/instances/iid-datasource-none/vendor-data2.txt.1
var/lib/cloud/instances/iid-datasource-none/user-data.txt.1
var/lib/cloud/seed/
var/lib/cloud/scripts/
var/lib/cloud/scripts/per-instance/
var/lib/cloud/scripts/per-boot/
var/lib/cloud/scripts/per-once/
var/lib/cloud/scripts/vendor/
var/lib/cloud/handlers/
var/lib/cloud/data/
var/lib/cloud/data/instance-id
var/lib/cloud/data/python-version
var/lib/cloud/data/previous-datasource
var/lib/cloud/data/status.json
var/lib/cloud/data/result.json
var/lib/cloud/data/previous-instance-id
var/lib/cloud/instance
var/lib/cloud/sem/
var/lib/cloud/sem/config_scripts_per-once.once
var/snap/
chat@test:~$
```

### 3.สั่ง ls -la /home2 /home3 และ df -hT แล้วบันทึกผล

```
chat@test:~$ ls -la /home2 /home3
/home2:
total 592
drwxr-xr-x  2 root root   4096 Feb  7 13:21 .
drwxr-xr-x 28 root root   4096 Feb  7 13:21 ..
-rw-r--r--  1 root root 594696 Feb  7 13:21 etc_backup.tar.gz

/home3:
total 104892
drwxr-xr-x  5 root root   4096 Feb  7 13:25 .
drwxr-xr-x 28 root root   4096 Feb  7 13:21 ..
drwxr-xr-x 108 root root   4096 Feb  7 12:53 etc
drwx-----  2 root root 16384 Feb  7 12:48 lost+found
drwxr-xr-x 13 root root   4096 Jan 10 14:04 var
-rw-r--r--  1 root root 107372917 Feb  7 13:09 var_backup.tar.gz
chat@test:~$ df -hT
Filesystem                                Type      Size  Used Avail Use% Mounted on
tmpfs                                      tmpfs      387M  1.6M  386M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv        ext4       9.8G  4.8G  4.5G  52% /
tmpfs                                      tmpfs       1.9G   0  1.9G   0% /dev/shm
tmpfs                                      tmpfs       5.0M   0   5.0M   0% /run/lock
/dev/sda2                                 ext4       1.8G  182M  1.5G  12% /boot
tmpfs                                      tmpfs      387M  12K  387M   1% /run/user/1000
/dev/mapper/vg_home3-lv_home3            ext4       35G   683M  32G   3% /home3
chat@test:~$
```

## Part 3 (ติดตั้งแบบถาวร)

### 1. Restart Linux แล้วสั่ง ls -la /home2 /home3 และ df -hT แล้วบันทึกผล

```
System load:  1.04          Processes:      260
Usage of /:   48.8% of 9.75GB Users logged in:  0
Memory usage: 7%          IPv4 address for ens33: 192.168.93.128
Swap usage:   0%

* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
  just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

74 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Hello chat
chat@test:~$ ls -la /home2 /home3 df -hT
ls: option requires an argument -- 'T'
Try 'ls --help' for more information.
chat@test:~$ ls -la /home2 /home3
/home2:
total 24
drwxr-xr-x  3 root root   4096 Feb  7 12:39 .
drwxr-xr-x 28 root root   4096 Feb  7 13:21 ..
drwx-----  2 root root 16384 Feb  7 12:39 lost+found

/home3:
total 104892
drwxr-xr-x  5 root root   4096 Feb  7 13:25 .
drwxr-xr-x 28 root root   4096 Feb  7 13:21 ..
drwxr-xr-x 108 root root   4096 Feb  7 12:53 etc
drwx-----  2 root root 16384 Feb  7 12:48 lost+found
drwxr-xr-x 13 root root   4096 Jan 10 14:04 var
-rw-r--r--  1 root root 107372917 Feb  7 13:09 var_backup.tar.gz
chat@test:~$ df -hT
Filesystem                                Type      Size  Used Avail Use% Mounted on
tmpfs                                      tmpfs      387M  1.6M  386M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv        ext4       9.8G  4.8G  4.5G  52% /
tmpfs                                      tmpfs       1.9G   0  1.9G   0% /dev/shm
tmpfs                                      tmpfs       5.0M   0   5.0M   0% /run/lock
/dev/mapper/vg_home3-lv_home3            ext4       35G   683M  32G   3% /home3
/dev/sda2                                 ext4       1.8G  182M  1.5G  12% /boot
/dev/sdb1                                 ext4       35G   24K   33G   1% /home2
tmpfs                                      tmpfs      387M  12K  387M   1% /run/user/1000
chat@test:~$ _
```

### 2. Restart Linux แล้วสั่ง ls -la /home2 /home3 และ df -hT แล้วบันทึกผล ถ้าผลที่ได้เหมือน Part 2 ให้สรุปเพื่อจบการทดลอง แต่ถ้าผลที่ได้ไม่เหมือน Part 2 ให้แก้ปัญหาจนได้ผลการทดลองเหมือน Part 2 แล้วอธิบายวิธีแก้ไข แล้วสรุปผลเพื่อจบการทดลอง

ตอบ : ผลจากpart2และpart3ไม่แตกต่างกันมาก เพราะpartition /home2 และ home3 ถูกmount อัตโนมัติไว้ก่อนหน้านี้ เลยทำให้มีไฟล์อยู่ ถ้าไม่mount อัตโนมัติไว้ เมื่อ ls -la /home2 /home3 หรือ df -hT จะหาไม่เจอ