

LSAP HW2

1. 謎樣的硬碟

1. 下載完檔案之後掛載為 loop

```
for i in {1..4}; do  
    sudo losetup -fP disk${i}.img  
done
```

```
$ losetup -a  
# 輸出：  
# /dev/loop1: []: (/home/classuser/disk2.img)  
# /dev/loop2: []: (/home/classuser/disk3.img)  
# /dev/loop0: []: (/home/classuser/disk1.img)  
# /dev/loop3: []: (/home/classuser/disk4.img)
```

2. 檢查檔案資訊看看哪些是 raid 的成員

```
sudo mdadm --examine /dev/loop* | egrep 'loop|Array UUID|Device Role|State'
```

```
[classuser@vm01:~$ sudo mdadm --examine /dev/loop* | egrep 'loop|Array UUID|Device Role|State'
[[sudo] password for classuser:
mdadm: No md superblock detected on /dev/loop1.
mdadm: No md superblock detected on /dev/loop4.
mdadm: No md superblock detected on /dev/loop5.
mdadm: No md superblock detected on /dev/loop6.
mdadm: No md superblock detected on /dev/loop7.
mdadm: cannot open /dev/loop-control: Invalid argument
/dev/loop0:
    Array UUID : b908d87f:bfd47d06:8174af4e:b6522d58
    State : clean
    Device Role : Active device 0
    Array State : AAA ('A' == active, '.' == missing, 'R' == replacing)
/dev/loop2:
    Array UUID : b908d87f:bfd47d06:8174af4e:b6522d58
    State : clean
    Device Role : Active device 1
    Array State : AAA ('A' == active, '.' == missing, 'R' == replacing)
/dev/loop3:
    Array UUID : b908d87f:bfd47d06:8174af4e:b6522d58
    State : clean
    Device Role : Active device 2
    Array State : AAA ('A' == active, '.' == missing, 'R' == replacing)
```

可以看到 disk1, disk3, disk4 是 raid 的成員，然後 disk2 是壞掉的那個硬碟。

3. 確認完之後就把它們組成 raid

```
sudo mdadm --assemble /dev/md0 /dev/loop0 /dev/loop2 /dev/loop3
cat /proc/mdstat
```

結果：

```
mdadm: /dev/md0 has been started with 3 drives.
Personalities : [raid0] [raid1] [raid6] [raid5] [raid4] [raid10]
md0 : active raid5 loop0[0] loop3[3] loop2[1]
      405504 blocks super 1.2 level 5, 512k chunk, algorithm 2 [3/3] [UUU]

unused devices: <none>
```

4. 掛載 raid 然後查看裡面的內容

```
sudo mkdir -p /mnt/raid
sudo mount /dev/md0 /mnt/raid
ls /mnt/raid
```

```
classuser@vm01:~$ ls /mnt/raid
lost+found  treasure.txt
```

看到裡面有 treasure.txt 這個檔案接著把它複製出來。

```
classuser@vm01:~$ cat /mnt/raid/treasure.txt
Congradulations! You've found the treasure of this homework!
The secret code is {IL0V3L5AP_HAPPYHOLIDAY9/28}
Remember to write the secret code down in your report so that I know you found it :)
```

最後就得到了 secret code 是 `<IL0V3L5AP_HAPPYHOLIDAY9/28>`。

2. NFS auto mounting (autofs)

1. 建立目錄與資料夾

```
sudo mkdir -p /srv/nfsroot/shared/public
sudo mkdir -p /srv/nfsroot/shared/projects/group12
sudo mkdir -p /srv/nfsroot/shared/projects/HW2
sudo mkdir -p /srv/nfsroot/users/alice
sudo mkdir -p /srv/nfsroot/users/bob
sudo mkdir -p /srv/nfsroot/users/charlie
sudo mkdir -p /srv/nfsroot/services/webdata
sudo mkdir -p /srv/nfsroot/services/backups

echo "This is README" | sudo tee /srv/nfsroot/shared/public/README.txt
echo "Task for group12" | sudo tee /srv/nfsroot/shared/projects/group12/task.md
echo "To do for HW2" | sudo tee /srv/nfsroot/shared/projects/HW2/todo.txt
echo "Alice's note" | sudo tee /srv/nfsroot/users/alice/notes.txt
echo "Bob's plan" | sudo tee /srv/nfsroot/users/bob/plan.txt
echo "Charlie's secret" | sudo tee /srv/nfsroot/users/charlie/secret.txt
echo "<html>Hello</html>" | sudo tee /srv/nfsroot/services/webdata/index.html
echo "Backup on $(date)" | sudo tee /srv/nfsroot/services/backups/snapshot.txt
```

2. 設定權限

```
sudo chown -R nobody:nogroup /srv/nfsroot
sudo chmod -R 755 /srv/nfsroot
```

3. 設定 pseudo root 並 export

```
sudo nano /etc/exports
```

```
/srv/nfsroot 140.112.106.87(rw,fsid=0,insecure,no_subtree_check)
```

套用設定：

```
sudo exportfs -ra
sudo systemctl restart nfs-server
```

4. client 端建立 map

```
[classuser@vm01:~$ cat /etc/auto.master
/mnt/nfs    /etc/auto.nfs --timeout=60
/-         /etc/auto.direct
[classuser@vm01:~$ cat /etc/auto.nfs
public      -fstype=nfs4,rw,port=14956 140.112.106.87:/shared/public
projects/group12 -fstype=nfs4,rw,port=14956 140.112.106.87:/shared/projects/group12
projects/HW2 -fstype=nfs4,rw,port=14956 140.112.106.87:/shared/projects/HW2
alice       -fstype=nfs4,rw,port=14956 140.112.106.87:/users/alice
bob         -fstype=nfs4,rw,port=14956 140.112.106.87:/users/bob
charlie     -fstype=nfs4,rw,port=14956 140.112.106.87:/users/charlie
[classuser@vm01:~$ cat /etc/auto.direct
/webdata    -fstype=nfs4,port=14956 140.112.106.87:/services/webdata
/backups    -fstype=nfs4,port=14956 140.112.106.87:/services/backups
```

5. 啟用 autofs

```
sudo systemctl restart autofs
```

6. 驗證自動掛載生效

`public` 目錄在使用前是未掛載的，但 `ls /mnt/nfs/public` 之後再查看掛載狀態，結果顯示 `public` 已經被自動掛載。

```
[classuser@vm01:~$ mount | grep public ]
[ 1 classuser@vm01:~$ ls /mnt/nfs/public ]
README.txt
[classuser@vm01:~$ mount | grep public ]
140.112.106.87:/shared/public on /mnt/nfs/public type nfs4 (rw,relatime,vers=4.2
,rsz=262144,wsz=262144,namlen=255,hard,proto=tcp,port=14956,timeo=600,retran
s=2,sec=sys,clientaddr=10.0.2.15,local_lock=none,addr=140.112.106.87)
```