Báo Cáo Tuần 1: Hiểu về OS, LVM, File System và Secure SSH

Mục lục nội dung

Phần 1: Cài Đặt Hệ Điều Hành Ubuntu 22.04

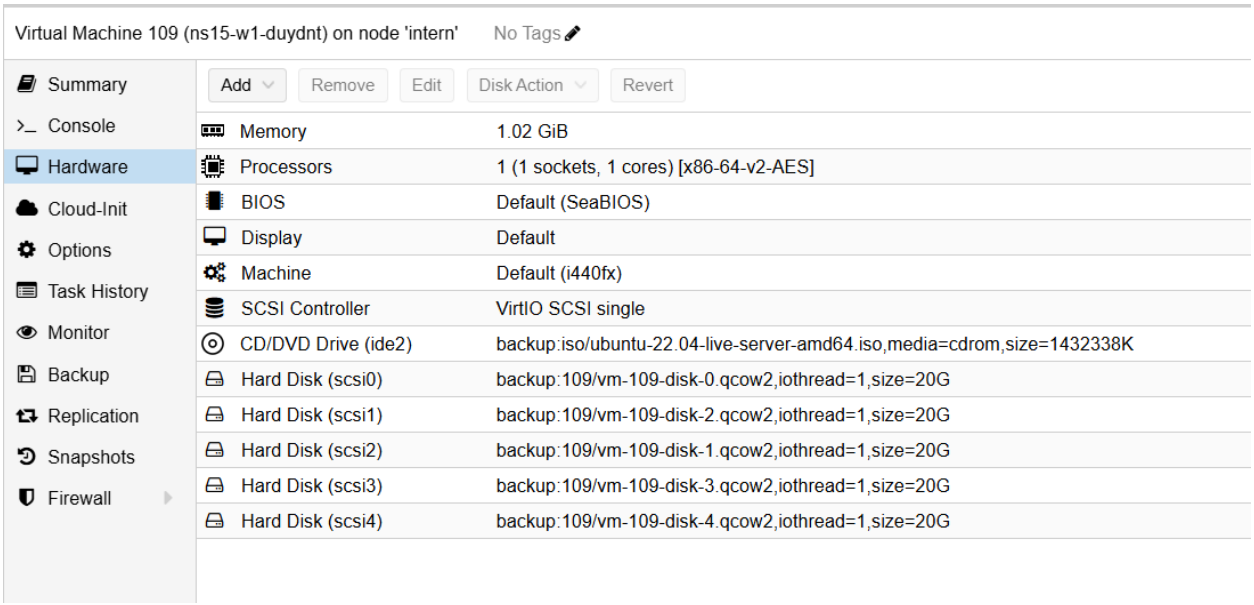
Yêu cầu:

- Partition: 1 phân vùng duy nhất /
- SWAP: không có
- File system: EXT4

Tiến hành:

1. Tạo mới 1 VM trên intern.vhost.vn với cấu hình:
    - CPU: 1 core
    - RAM: 1GB
    - Disk: 20GB SSD
    - Card mạng: vmbr1
2. Cài đặt Ubuntu 22.04.
3. Trong quá trình cài đặt:
    - Xóa toàn bộ phân vùng cũ.
    - Tạo 1 phân vùng duy nhất mount /

- File system: EXT4
- Không tạo SWAP.



Phần 2: Quản Lý Ổ Đĩa Bằng LVM

Yêu cầu: Thêm 3 ổ đĩa 20GB và gộp thành 1 Logical Volume 60GB mount vào /backup

Các bước thực hiện:

1. Kiểm tra các ổ đĩa mới:

lsblk

```
ubuntuserver login: tduy
Password:
Welcome to Ubuntu 22.04 LTS (GNU/Linux 5.15.0-25-generic x86_64)

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

  System information as of Tue Apr 15 04:58:42 AM UTC 2025

  System load: 0.83203125        Memory usage: 19%   Processes:       101
  Usage of /:  46.4% of 9.75GB   Swap usage:   0%    Users logged in: 0


0 updates can be applied immediately.

Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings


Last login: Tue Apr 15 04:54:59 UTC 2025 on tty1
tduy@ubuntuserver:~$ lsdlk
Command 'lsdlk' not found, did you mean:
  command 'lsblk' from deb util-linux (2.37.2-4ubuntu3)
Try: sudo apt install <deb name>
tduy@ubuntuserver:~$ lsblk
NAME                      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
loop0                       7:0    0 61.9M  1 loop /snap/core20/1405
loop1                       7:1    0 44.7M  1 loop /snap/snapd/15534
loop2                       7:2    0 79.9M  1 loop /snap/lxd/22923
sda                         8:0    0   20G  0 disk
├─sda1                      8:1    0    1M  0 part
└─sda2                      8:2    0 18.2G  0 part
  └─ubuntu--vg-ubuntu--lv 253:0    0   10G  0 lvm  /
sdb                         8:16   0   20G  0 disk
sdc                         8:32   0   20G  0 disk
sdd                         8:48   0   20G  0 disk
sr0                        11:0    1  1.4G  0 rom
```

2. Tạo Physical Volumes:

sudo pvcreate /dev/sdb /dev/sdc /dev/sdd

```
tduy@ubuntuserver:~$ sudo pvcreate /dev/sdb /dev/sdc /dev/sdd
[sudo] password for tduy:
  Physical volume "/dev/sdb" successfully created.
  Physical volume "/dev/sdc" successfully created.
  Physical volume "/dev/sdd" successfully created.
```

3. Tạo Volume Group:

sudo vgcreate backup_vg /dev/sdb /dev/sdc /dev/sdd

```
tduy@ubuntuserver:~$ sudo vgcreate backup_vg /dev/sdb /dev/sdc /dev/sdd
[sudo] password for tduy:
  Volume group "backup_vg" successfully created
```

4. Tạo Logical Volume:

sudo lvcreate -L 60G -n backup_v backup_vg

```
tduy@ubuntuserver:~$ sudo vgs
  VG        #PV #LV #SN Attr   VSize   VFree
  backup_vg   3   0   0 wz--n- <59.99g <59.99g
  ubuntu-vg   1   1   0 wz--n-  18.22g   8.22g
tduy@ubuntuserver:~$ sudo lvcreate -L 59.98G -n backup_v backup_vg
  Rounding up size to full physical extent 59.98 GiB
  Logical volume "backup_v" created.
```

5. Format LV với EXT4:

sudo mkfs.ext4 /dev/backup_vg/backup_v

```
tduy@ubuntuserver:~$ sudo mkfs.ext4 /dev/backup_vg/backup_v
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 15723520 4k blocks and 3932160 inodes
Filesystem UUID: c8365b40-8bf7-41c6-ba3d-f2f2429ad9cc
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424

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

6. Tạo thư mục mount:

sudo mkdir /backup

7. Mount vào /backup:

sudo mount /dev/backup_vg/backup_v /backup

```
tduy@ubuntuserver:~$ sudo mount /dev/backup_vg/backup_v /backup
mount: /backup: /dev/mapper/backup_vg-backup_v already mounted on /backup.
```

8. Thêm vào /etc/fstab

echo '/dev/backup_vg/backup_v /backup ext4 defaults 0 2' | sudo tee -a /etc/fstab

```
 GNU nano 6.2                                                    /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/sda2 during curtin installation
/dev/disk/by-uuid/609eb2f6-3fcf-4ecb-92d1-7b15304ec687 / ext4 defaults 0 1
/swap.img       none    swap    sw      0       0
UUID=17c1665f-eaf5-4663-b147-5943bc25ed31 /backup ext4 defaults 0 2
```

9. Kiểm tra:

df -hT

```
tduy@ubuntuserver:~$ df -hT
Filesystem                         Type   Size  Used Avail Use% Mounted on
tmpfs                              tmpfs  100M 1012K   99M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv ext4   9.8G  4.6G  4.7G  50% /
tmpfs                              tmpfs  496M     0  496M   0% /dev/shm
tmpfs                              tmpfs  5.0M     0  5.0M   0% /run/lock
tmpfs                              tmpfs  100M  4.0K  100M   1% /run/user/1000
/dev/mapper/backup_vg-backup_v     ext4    59G   24K   56G   1% /backup
tduy@ubuntuserver:~$ sudo mount -a
```

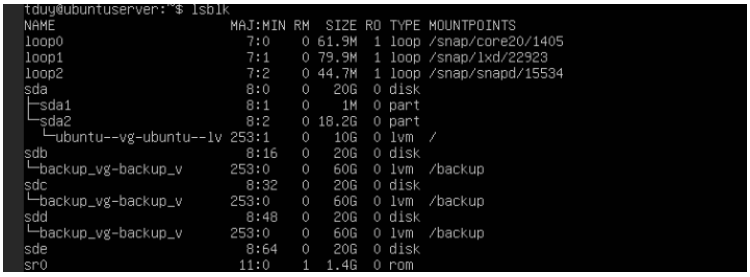
Phần 3: Mở Rộng LVM

Yêu cầu: Thêm 1 ổ đĩa 20GB và mở rộng /backup lên 80GB không reboot.

Các bước thực hiện:

1. Kiểm tra ổ đĩa mới:

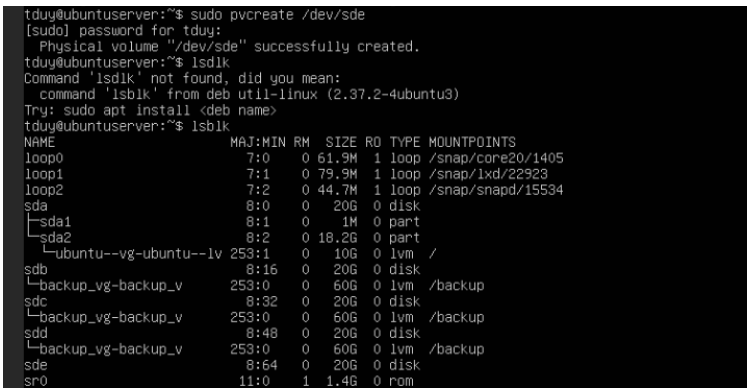
lsblk



2. Thêm vào Volume Group:

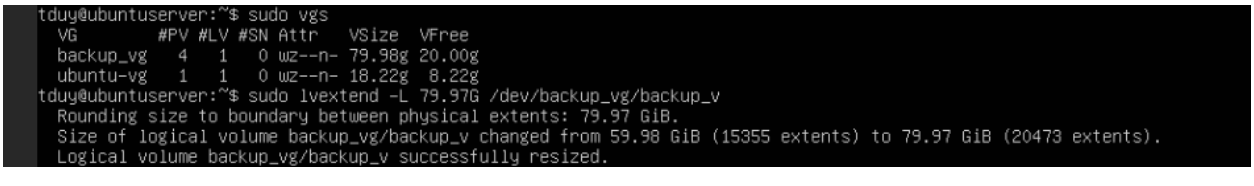
sudo pvcreate /dev/sde

sudo vgextend backup_vg /dev/sde



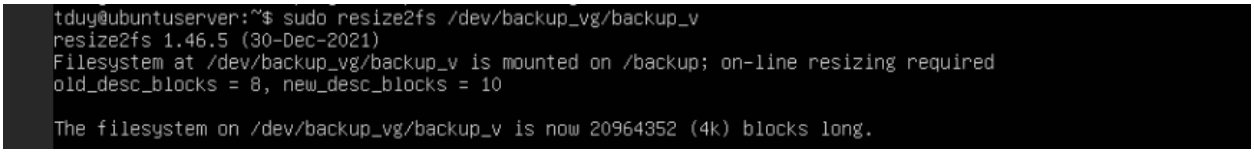
3. Mở rộng Logical Volume:

sudo lvextend -L 80G /dev/backup_vg/backup_v



4. Resize filesystem EXT4 (live resize):

sudo resize2fs /dev/backup_vg/backup_v



5. Kiểm tra:

df -hT

```
tduy@ubuntuserver:~$ df -hT /backup/
Filesystem                     Type  Size  Used Avail Use% Mounted on
/dev/mapper/backup_vg-backup_v ext4   79G   56M   75G   1% /backup
```

Phần 4: Cấu Hình Secure SSH

Yêu cầu:

- Chỉ cho phép SSH bằng public key
- Không cho phép login bằng password
- Đổi port SSH sang 2222
- Thêm SSH key mặc định của vHost

Các bước thực hiện:

1. Tạo thư mục SSH và thêm public key:

mkdir -p ~/.ssh

curl https://key.sysad.fun/pubkey_truongnxk >> /home/tduy/.ssh/authorized_keys

chmod 600 ~/.ssh/authorized_keys

chmod 700 ~/.ssh

```
tduy@ubuntuserver:~$ chmod 600 ~/.ssh/authorized_keys
tduy@ubuntuserver:~$ chmod 700 ~/.ssh
```

2. Cấu hình SSH:

sudo nano /etc/ssh/sshd_config

Thêm các dòng sau:

Port 2222

PermitRootLogin no

PasswordAuthentication no

PubkeyAuthentication yes

a) Cấu hình lại netplan để bật card mạng

```
 GNU nano 6.2                                  /etc/netplan/00-installer-config.yaml
# This is the network config written by 'subiquity'
network:
  version: 2
  ethernets:
   ens18:
    dhcp4: no
    addresses:
      - 192.168.1.123/24
    nameservers:
     addresses:
       - 8.8.8.8
    routes:
      - to: default
        via: 192.168.1.1
```

b) Cấu hình thành công ping được dns google

```
tduy@ubuntuserver:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether bc:24:11:99:d7:8c brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 192.168.1.123/24 brd 192.168.1.255 scope global ens18
       valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:fe99:d78c/64 scope link
       valid_lft forever preferred_lft forever
tduy@ubuntuserver:~$ ping -c 4 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=118 time=30.9 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=118 time=33.0 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=118 time=30.8 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=118 time=35.3 ms

--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 30.826/32.495/35.276/1.837 ms
```

c) Đúng SSH pucblickey mới truy cập vào được VM

```
 GNU nano 6.2                                  /home/tduy/.ssh/authorized_keys
#TruongNXK
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQCkIcnetyHgx2h79rQSm9/H1HjhXCJ6TqRAizhCOJG9AG7XqUodVrTGA1f5TRyQ3/LAxGMfEvgMnA2RklrxABSMBGqwcZGph3WdIcpoGLfixsDllh8pjq9BHvr
```

<u>Không cho phép login bằng password</u>

```
# Example of overriding settings on a per-user basis
#Match User anoncvs
#       X11Forwarding no
#       AllowTcpForwarding no
#       PermitTTY no
#       ForceCommand cvs server

#----Tat login bang mat khau
PasswordAuthentication no

^G Help      ^O Write Out   ^W Where Is   ^K Cut       ^T Execute   ^C Location   M-U Undo      M-A Set Mark   M-] To Bracket  M-Q Previous
```

<u>Đổi port SSH từ 22 thành 2222</u>

a) Đổi SSH từ port 22 sang 2222

```
# default value.

Include /etc/ssh/sshd_config.d/*.conf

Port 2222
```

3. Khởi động lại dịch vụ SSH và xem kết quả sau researt

sudo systemctl restart ssh

Chèn key SSH vào server sau khi đã cài đặt hoàn tất

```
tduy@ubuntuserver:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether bc:24:11:99:d7:8c brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 192.168.1.123/24 brd 192.168.1.255 scope global ens18
       valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:fe99:d78c/64 scope link
       valid_lft forever preferred_lft forever
tduy@ubuntuserver:~$ curl https://key.sysad.fun/pubkey_truongnxk>> /home/tduy/.ssh/authorized_keys
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   402  100   402    0     0   1191      0 --:--:-- --:--:-- --:--:--  1192
```

Kết quả trong authorized_keys

```
  GNU nano 6.2                                  /home/tduy/.ssh/authorized_keys
#TruongNXK
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQCkIcnetyHgx2h79rQSm9/H1HjhXCJ6TqRAizhCOJG9AG7XqUodVrTGA1f5TRyQ3/LAxGMfEvgMnA2RklrxABSMBGqwcZGph3WdIcpoGLfixsDl1h8pjq9BHvr>
```