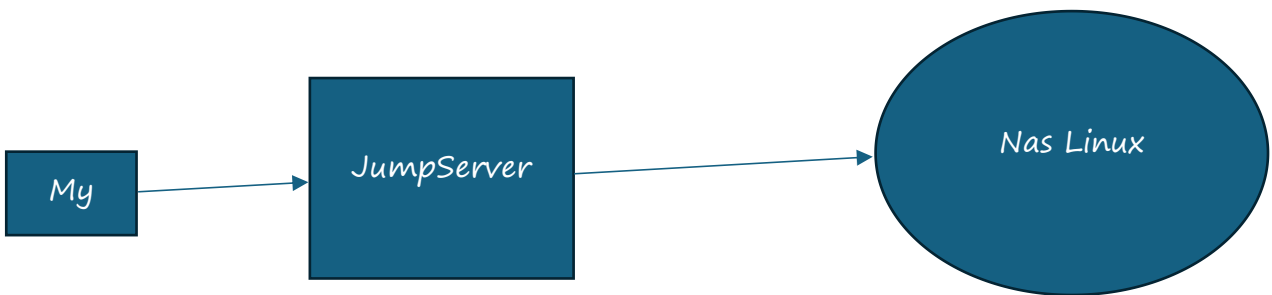


Klient = Konzumuje službu

Server = Poskytuje službu

JumpServer (Např. Phobos) :

Urobí sa 1 JumpServer ktorý má prístup do všetkých VLAN a na neho potom nastavujeme všetkých userov, zabezpečenie, atď. -> to sa robí preto aby sa to nemuselo nastavovať všade ale nastaví sa iba na 1 "dvere"



FileSystem v linuxu = úložná jednotka ktorá je naformátovaná tak, aby mohlo pracovať s metadátami (dáta o dátach) súborov a priečinkov a aj so samotnými súbormi a priečinkami

Listovanie FileSystemu = ls

ls / = listovanie všetkých súborov pod koreňom

ls -la / = ukáže lepšie napr. symlinky

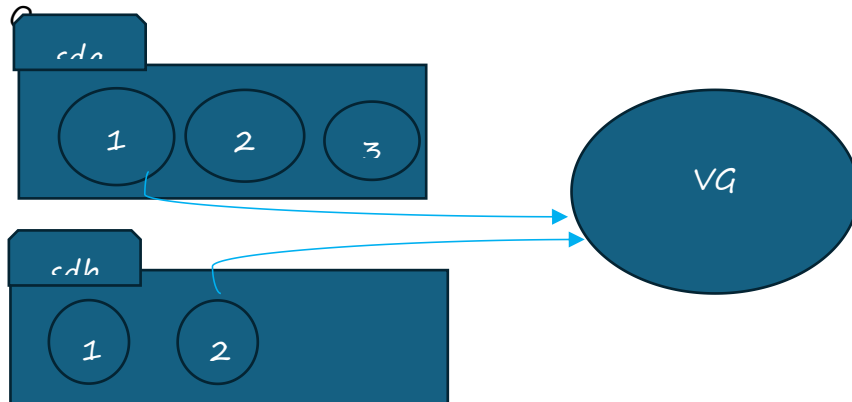
df -h = vylistuje všetky FileSystemy

df -h /tmp

mountpoint = pripájací bod

pvs = na zistenie LVMiek

VG (VolumeGroup) -> vieme pracovať iba s určitými miestami disku



*OS aj root je filesystem, to znamená pohľad OS to iste čo každý filesystem*

*Kedy si vytvorím LV a môj filesystem,*

*Jediné miesto čo ma obmedzuje je moja volume group, to ma obmedzuje veľkosť*

*Napr. vytvorí si VG čo má VSize 29gb, viem si tma vytvoriť LV napr. čo ma 6GB, to si viem pripojiť napr. na TMP alebo iný folder, a v tomto v rámci file systemu vytvorím väčší filesystem ako root*

## **PRAKTICKY**

*Ako root (sudo su)*

*fdisk -l*

*fdisk -l /dev/sdb*

```
Disk /dev/sdb: 1 GiB, 1073741824 bytes, 2097152 sectors
Disk model: Virtual disk
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/sdc: 1 GiB, 1073741824 bytes, 2097152 sectors
Disk model: Virtual disk
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

*Rozdelíme cez fdisk na 2 rovnake časti (partície)*

*fdisk /dev/sdb -> m (pyta prompt, daj m na help) -> n (nova partícia)*

```
Partition type
  p   primary (0 primary, 0 extended, 4 free)
  e   extended (container for logical partitions)
```

*Toto rozdelenie je na to, že :*

- Primary mozu byt len 4, ale este sa pridali extended aby mohli byt viac

Takto to ma byt (ked si nenapisal za prompt hodnotu tak to pouzilo default)

```
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 (2048-2097151, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-2097151, default 2097151): +
500M

Created a new partition 1 of type 'Linux' and of size 500 MiB.

Command (m for help): n
Partition type
  p   primary (1 primary, 0 extended, 3 free)
  e   extended (container for logical partitions)
Select (default p): p
Partition number (2-4, default 2): 2
First sector (1026048-2097151, default 1026048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (1026048-2097151, default 2097151)
: +500M

Created a new partition 2 of type 'Linux' and of size 500 MiB.

Command (m for help): p
Disk /dev/sdb: 1 GiB, 1073741824 bytes, 2097152 sectors
Disk model: Virtual disk
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x2d911039

Device      Boot    Start        End Sectors   Size Id Type
/dev/sdb1                2048  1026047  1024000   500M 83 Linux
/dev/sdb2          1026048  2050047  1024000   500M 83 Linux

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

Vytvorime PVS

```

root@server1a1:/home/student# pvs
  PV          VG          Fmt  Attr  PSize   PFree
  /dev/sda3   ubuntu-vg   lvm2 a--  <8.25g    0
root@server1a1:/home/student# pv
Command 'pv' not found, but can be installed with:
apt install pv
root@server1a1:/home/student# pvcreate /dev/sdb1 /dev/sdb2
  Physical volume "/dev/sdb1" successfully created.
  Physical volume "/dev/sdb2" successfully created.
root@server1a1:/home/student# pvs
  PV          VG          Fmt  Attr  PSize   PFree
  /dev/sda3   ubuntu-vg   lvm2 a--  <8.25g    0
  /dev/sdb1   lvm2     ---  500.00m 500.00m
  /dev/sdb2   lvm2     ---  500.00m 500.00m

```

*Vytvorime VG (Musí byt MINIMALNE 1 PhysicalVolume) -> size sa kus zmenší  
cuz metadáta*

```

root@server1a1:/home/student# vgcreate /dev/sdb1 vg01
/dev/sdb1: already exists in filesystem
Run `vgcreate --help' for more information.
root@server1a1:/home/student# vgcreate vg01 /dev/sdb1
Volume group "vg01" successfully created
root@server1a1:/home/student# vgs
  VG          #PV #LV #SN Attr   VSize   VFree
  ubuntu-vg    1  1  0 wz--n-  <8.25g    0
  vg01         1  0  0 wz--n- 496.00m 496.00m

```

*To že bolo VFree 0 to nevadi, lebo ešte LV môže mať väčší size*

```

root@server1a1:/home/student# vgs
  VG          #PV #LV #SN Attr   VSize   VFree
  ubuntu-vg    1  1  0 wz--n-  <8.25g    0
  vg01         1  0  0 wz--n- 496.00m 496.00m
root@server1a1:/home/student# vgextend ubuntu-vg /dev/sdb2
Volume group "ubuntu-vg" successfully extended
root@server1a1:/home/student# vgs
  VG          #PV #LV #SN Attr   VSize   VFree
  ubuntu-vg    2  1  0 wz--n-   8.73g 496.00m
  vg01         1  0  0 wz--n- 496.00m 496.00m

```

*Vieme aj removenúť*

```
root@server1a1:/home/student# vgs
VG          #PV #LV #SN Attr   VSize   VFree
ubuntu-vg   2   1   0 wz--n-   8.73g 496.00m
vg01        1   0   0 wz--n- 496.00m 496.00m
root@server1a1:/home/student# vgreduce ubuntu-vg /dev/sdb2
Removed "/dev/sdb2" from volume group "ubuntu-vg"
root@server1a1:/home/student# vgs
VG          #PV #LV #SN Attr   VSize   VFree
ubuntu-vg   1   1   0 wz--n-  <8.25g    0
vg01        1   0   0 wz--n- 496.00m 496.00m
```

*A zase pridame do spravneho, lebo ubuntu-vg nebolo spravne*

```
root@server1a1:/home/student# vgs
VG          #PV #LV #SN Attr   VSize   VFree
ubuntu-vg   1   1   0 wz--n-  <8.25g    0
vg01        1   0   0 wz--n- 496.00m 496.00m
root@server1a1:/home/student# vgextend vg01 /dev/sdb2
Volume group "vg01" successfully extended
root@server1a1:/home/student# vgs
VG          #PV #LV #SN Attr   VSize   VFree
ubuntu-vg   1   1   0 wz--n-  <8.25g    0
vg01        2   0   0 wz--n- 992.00m 992.00m
```

*Ideme si vytvoriť LV*

- *Musime definovať meno a veľkosť*



```

root@server1a1:/home/student# vgs
VG          #PV #LV #SN Attr   VSize   VFree
ubuntu-vg   1   1   0 wz--n-   <8.25g     0
vg01        2   0   0 wz--n-  992.00m  992.00m
root@server1a1:/home/student# lvcreate -n lv_app -L 300M vg01
Logical volume "lv_app" created.
root@server1a1:/home/student# vgs
VG          #PV #LV #SN Attr   VSize   VFree
ubuntu-vg   1   1   0 wz--n-   <8.25g     0
vg01        2   1   0 wz--n-  992.00m  692.00m
root@server1a1:/home/student# lvs
LV          VG          Attr   LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
ubuntu-lv   ubuntu-vg   -wi-ao----   <8.25g
lv_app      vg01        -wi-a----- 300.00m

```

## Vytvoríme si FS

```

root@server1a1:/home/student# mkfs
mkfs          mkfs.btrfs  mkfs.ext2    mkfs.ext4    mkfs.minix   mkfs.ntfs    mkfs.xfs
mkfs.bfs      mkfs.cramfs  mkfs.ext3    mkfs.fat     mkfs.msdos   mkfs.vfat
root@server1a1:/home/student# mkfs.ext4 /dev/vg01/lv_app
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 76800 4k blocks and 76800 inodes
Filesystem UUID: 1abe2ef9-6abc-4ae0-b83b-30d2efcfb175
Superblock backups stored on blocks:
    32768

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

```

*Ešte musíme filesystem pripojiť*

```

root@server1a1:/# mkdir DenisFS
root@server1a1:/# ll
total 84
drwxr-xr-x 21 root root 4096 Feb 10 11:35 ./
drwxr-xr-x 21 root root 4096 Feb 10 11:35 ../
lrwxrwxrwx 1 root root 7 Feb 17 2023 bin -> usr/bin/
drwxr-xr-x 4 root root 4096 Jan 29 06:22 boot/
-rw-r--r-- 1 root root 114 Sep 19 14:37 clean.sh
drwxr-xr-x 2 root root 4096 Feb 10 11:35 DenisFS/
drwxr-xr-x 20 root root 4180 Feb 10 11:31 dev/
drwxr-xr-x 97 root root 4096 Feb 8 06:54 etc/
drwxr-xr-x 7 root root 4096 Dec 16 10:14 home/
lrwxrwxrwx 1 root root 7 Feb 17 2023 lib -> usr/lib/
lrwxrwxrwx 1 root root 9 Feb 17 2023 lib32 -> usr/lib32/
lrwxrwxrwx 1 root root 9 Feb 17 2023 lib64 -> usr/lib64/
lrwxrwxrwx 1 root root 10 Feb 17 2023 libx32 -> usr/libx32/
drwx----- 2 root root 16384 Oct 1 2023 lost+found/
drwxr-xr-x 2 root root 4096 Feb 17 2023 media/
drwxr-xr-x 2 root root 4096 Feb 17 2023 mnt/
drwxr-xr-x 2 root root 4096 Feb 17 2023 opt/
dr-xr-xr-x 292 root root 0 Dec 12 10:40 proc/
drwx----- 6 root root 4096 Dec 16 10:29 root/
drwxr-xr-x 33 root root 1000 Feb 10 10:29 run/
lrwxrwxrwx 1 root root 8 Feb 17 2023 sbin -> usr/sbin/
drwxrws--- 2 root testers 4096 Dec 16 10:32 share/
drwxr-xr-x 6 root root 4096 Feb 17 2023 snap/
drwxr-xr-x 2 root root 4096 Feb 17 2023 srv/
dr-xr-xr-x 13 root root 0 Dec 12 10:40 sys/
drwxrwxrwt 14 root root 4096 Feb 10 09:01 tmp/
drwxr-xr-x 14 root root 4096 Feb 17 2023 usr/
drwxr-xr-x 13 root root 4096 Feb 17 2023 var/
root@server1a1:/# mount -t ext4 /dev/vg01/lv app /DenisFS/

```

```

root@server1a1:/# df -h

```

Filesystem	Size	Used	Avail	Use%	Mounted on
tmpfs	794M	1.3M	793M	1%	/run
/dev/mapper/ubuntu--vg-ubuntu--lv	8.1G	4.3G	3.4G	57%	/
tmpfs	3.9G	0	3.9G	0%	/dev/shm
tmpfs	5.0M	0	5.0M	0%	/run/lock
/dev/sda2	1.7G	242M	1.4G	15%	/boot
tmpfs	794M	4.0K	794M	1%	/run/user/1000
/dev/mapper/vg01-lv app	265M	24K	244M	1%	/DenisFS



KEĎ NIEČO NASTAVUJEŠ V LINUXE TAK SA VŠETKO VÄČŠINOU ZAPISUJE IBA DO RAMKY, PRETO TREBA ZMENY :

1. OVERIŤ ŽE ZAPISAL DO CONFIGU
2. ZAPISAŤ DO CONFIGU

Zmeny filesystemu urobíme :

```
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/ubuntu-vg/ubuntu-lv during curtin installation
/dev/disk/by-id/dm-uuid-LVM-AggdRWzPJrmIn64hzJpXxNfTA51R131rYiwZGQgBankmMXtLQ9dTegYkZlmoh0Pq / ext4 defaults 0 1
# /boot was on /dev/sda2 during curtin installation
/dev/disk/by-uuid/b13b3537-57d4-4a84-a23f-a349b3417afb /boot ext4 defaults 0 1
/dev/vg01/lv_app/DenisFS ext4 defaults 1 2
```