Ubuntu on ZFS root

[zfs, ubuntu]

- https://github.com/zfsonlinux/zfs/wiki/Ubuntu-16.10-Root-on-ZFS

Livecd

boot live cd and

```
sudo su
passwd ubuntu
apt-add-repository universe
apt update
apt install openssh-server
# connect from another PC via ssh
```

```
apt install --yes debootstrap gdisk zfs-initramfs
```

Disk

Reset disk and create GPT partition schema

```
DISK=/dev/disk/by-id/ata-HFS512G39MND-3510A_FJ64N5235113A4S13
sgdisk --clear $DISK
```

Prepare partitions

```
# Run this if you need legacy (BIOS) booting:
sgdisk -a1 -n2:34:2047  -t2:EF02 $DISK

# Run this for UEFI booting or raidz pool:
sgdisk     -n3:1M:+512M -t3:EF00 $DISK
parted $DISK set 3 bios_grub on # needed for embedding grub in this
partition

# and after run these:
sgdisk     -n9:-8M:0    -t9:BF07 $DISK
sgdisk     -n1:0:0      -t1:BF01 $DISK
```

Create pool or ...

```
zpool create -o ashift=12 \
      -O atime=off -O canmount=off -O compression=lz4 -O normalization=formD
\
      -O mountpoint=/ -R /mnt -f \
```

```
      rpool ${DISK}-part1
```

... import existing pool

```
zpool export rpool
zpool import -R /mnt rpool
```

create raidz pool

```
zpool create -O atime=off -O mountpoint=/ -R /mnt -O canmount=off -O
compression=lz4 -O normalization=formD -o ashift=12 \
  rpool raidz /dev/disk/by-id/ata-ST4000NM0035-1V4107_ZC10????-part1
```

System install

create filesystem dataset to act as container

```
zfs create -o canmount=off -o mountpoint=none rpool/ROOT
```

create filesystem for root

```
zfs create -o canmount=noauto -o mountpoint=/ rpool/ROOT/ubuntu
zfs mount rpool/ROOT/ubuntu
```

create other filesystems

```
zfs create -o setuid=off rpool/home

#zfs create -o canmount=off -o setuid=off  -o exec=off rpool/var
#zfs create -o com.sun:auto-snapshot=false -o exec=on  rpool/var/tmp


If this system will use NFS (locking):
# zfs create -o com.sun:auto-snapshot=false \
             -o mountpoint=/var/lib/nfs                rpool/var/nfs
```

deboostrap

```
DISTRO=xenial
debootstrap $DISTRO /mnt

zfs set devices=off rpool
mount --rbind /dev  /mnt/dev
mount --rbind /proc /mnt/proc
mount --rbind /sys  /mnt/sys
chroot /mnt /bin/bash --login
```

customization

```
echo 'LANG="en_US.UTF-8"' > /etc/default/locale
dpkg-reconfigure tzdata

dpkg-reconfigure keyboard-configuration

locale-gen it_IT.UTF-8
locale-gen en_US.UTF-8
update-locale LANG=it_IT.UTF-8 LC_MESSAGES=POSIX

DISTRO=xenial
cat > /etc/apt/sources.list <<EOF
deb http://archive.ubuntu.com/ubuntu $DISTRO main universe
#deb-src http://archive.ubuntu.com/ubuntu $DISTRO main universe

deb http://security.ubuntu.com/ubuntu $DISTRO-security main universe
#deb-src http://security.ubuntu.com/ubuntu $DISTRO-security main universe

deb http://archive.ubuntu.com/ubuntu $DISTRO-updates main universe
#deb-src http://archive.ubuntu.com/ubuntu $DISTRO-updates main universe
EOF

ln -s /proc/self/mounts /etc/mtab
apt update

apt install --yes --no-install-recommends linux-image-generic zfs-initramfs

cat > /etc/fstab <<EOF
rpool/ROOT/ubuntu / zfs defaults,noatime 0 0
EOF
```

GRUB

```
export DISK=/dev/disk/by-id/ata-HFS512G39MND-3510A_FJ64N5235113A4S13
```

UEFI

```
apt install dosfstools
mkdosfs -F 32 -n EFI ${DISK}-part3
mkdir /boot/efi
echo PARTUUID=$(blkid -s PARTUUID -o value ${DISK}-part3) /boot/efi vfat
defaults 0 1 >> /etc/fstab

mount /boot/efi
apt install --yes grub-efi-amd64
```

check

```
grub-probe /
```

```
---> zfs
```

if error occur upgrade grub to 2.02-beta3 from https://repo.morph027.de/grub/pool/main/g/grub2/

```
grub-install --target=x86_64-efi --efi-directory=/boot/efi \
      --bootloader-id=ubuntu --recheck --no-floppy
```

verify if “ls /boot/grub/*/zfs.mod”

If you are creating a mirror, repeat the grub-install command for each disk in the pool.

legacy MBR

```
apt install --yes grub-pc
```

```
grub-install ${DISK}
```

update grub

```
update-initramfs -c -k all
update-grub
```

exit

disable root password (re-enabled in phase two below)

```
passwd --delete root
```

```
zfs snapshot rpool/ROOT/ubuntu@install
exit

mount | grep -v zfs | tac | awk '/\/mnt/ {print $3}' | xargs -i{} umount -lf
{}
zpool export rpool
reboot
```

Complete system

create home filesystem

```
zfs create -o setuid=off rpool/home
```

add swap

```
zfs create -V 4G -b $(getconf PAGESIZE) -o compression=zle \
      -o logbias=throughput -o sync=always \
      -o primarycache=metadata -o secondarycache=none \
      -o com.sun:auto-snapshot=false rpool/swap
mkswap -f /dev/zvol/rpool/swap
echo /dev/zvol/rpool/swap none swap defaults 0 0 >> /etc/fstab
swapon -av
```

enable power button decomment in /etc/systemd/logind.conf

```
HandlePowerKey=poweroff
```

add user

```
useradd -m scipio
usermod -a -G adm,cdrom,dip,lpadmin,plugdev,sambashare,sudo scipio
passwd scipio
```

ubuntu standard

```
apt install --yes ubuntu-standard
```

ubuntu desktop

```
apt install --yes ubuntu-desktop
```

disable comression on logs

```
for file in /etc/logrotate.d/* ; do
    if grep -Eq "(^|[^#y])compress" "$file" ; then
        sed -i -r "s/(^|[^#y])(compress)/\1#\2/" "$file"
    fi
done
```

after reboot destroy ubuntu@install snapshot

```
zfs destroy rpool/ROOT/ubuntu@install
```

disable root password

```
sudo usermod -p '*' root
```