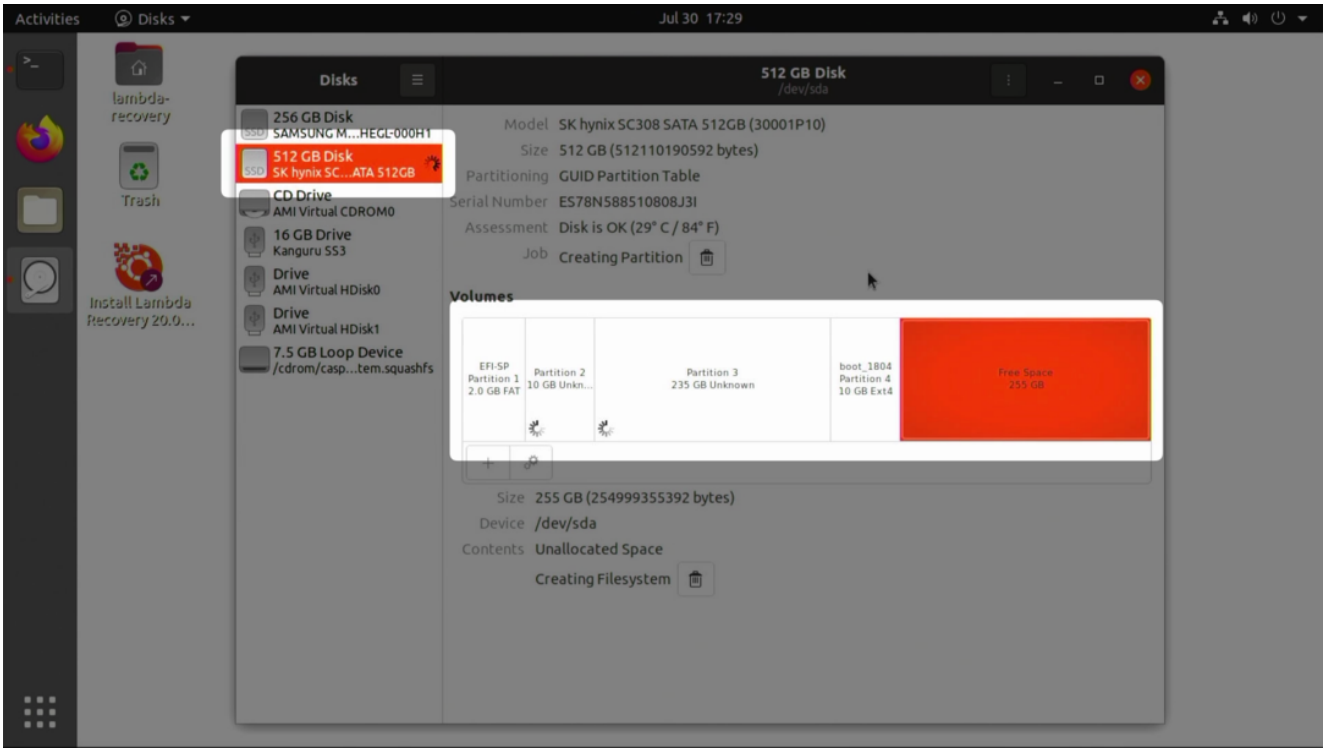
Dual Boot 20.04 and 18.04 with LUKS

1

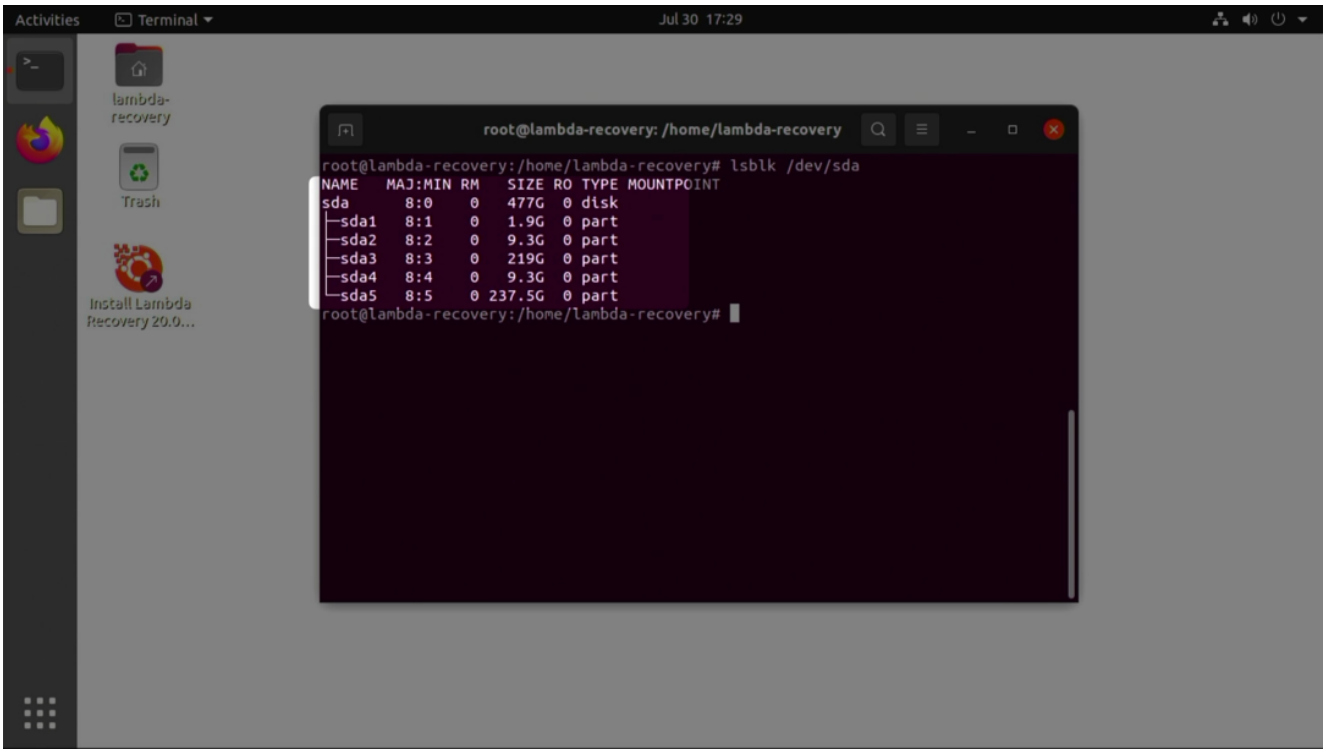


Format the SATA device and create 5 new partitions
Part1 will be the EFI boot partition
Part2 will be the 20.04 /boot partition
Part3 will be the 20.04 LUKS partition
Part4 will be the 18.04 /boot partition
Part5 will be the 18.04 LUKS partition

Partition 1 should be 2GB
The boot partitions should be big enough to hold all of the kernels that will ever be installed 10GB is very safe
The LUKS partitions should half of the total drive capacity each, less the 2GB used for EFI and the amount used for the boot partitions.

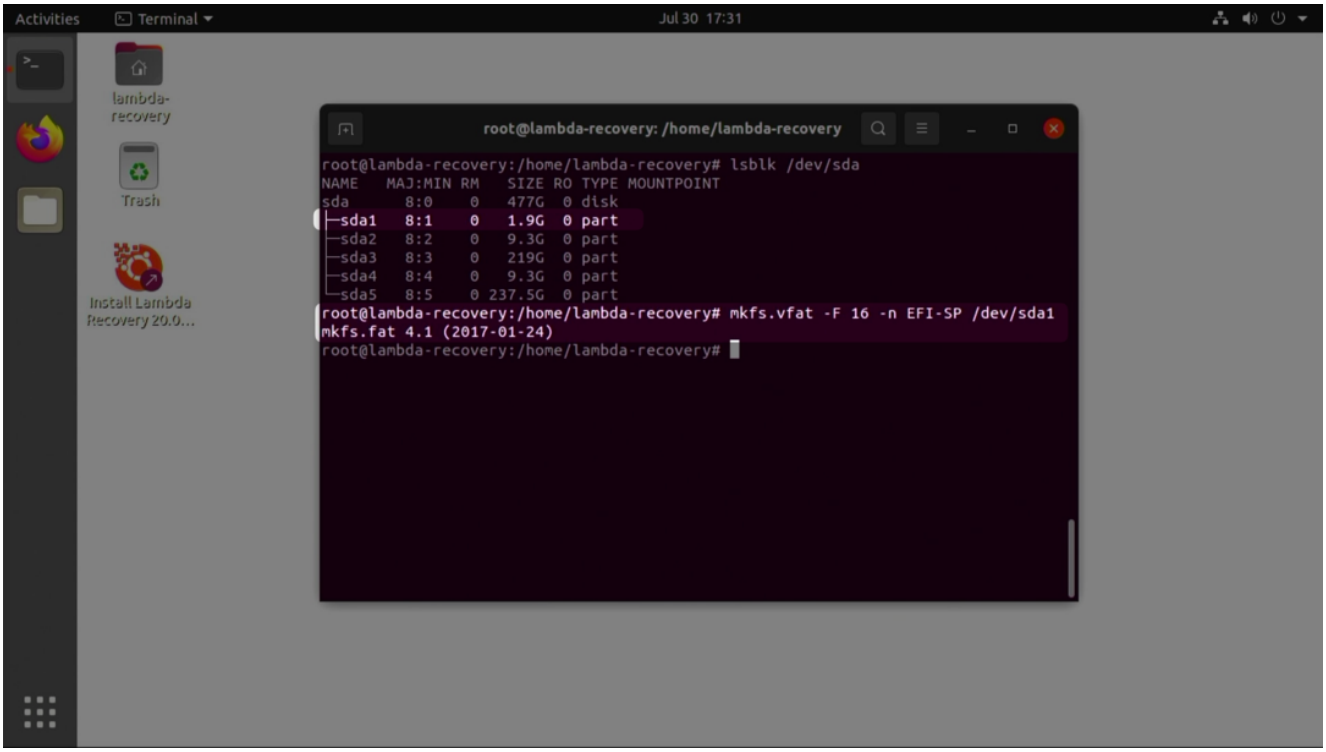
NOTE-- These will all be formatted later on.DO NOT select the encryption options. Use defaults for now

2



This guide assumes that the drive is labeled as SDA. This is what the output of `lsblk /dev/sda` should look like

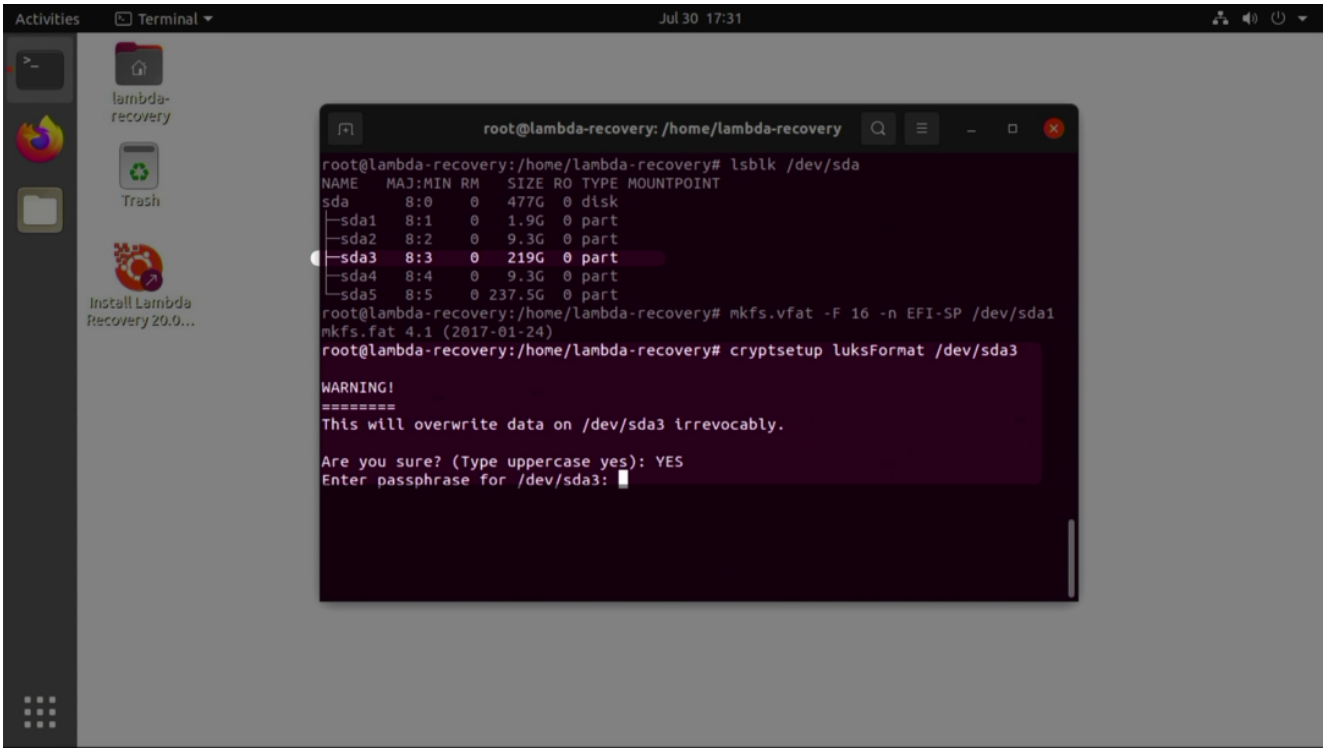
3



First we will setup /dev/sda1 for use as the EFI partition

```
mkfs.vfat -F 16 -n EFI-SP /dev/sda1
```

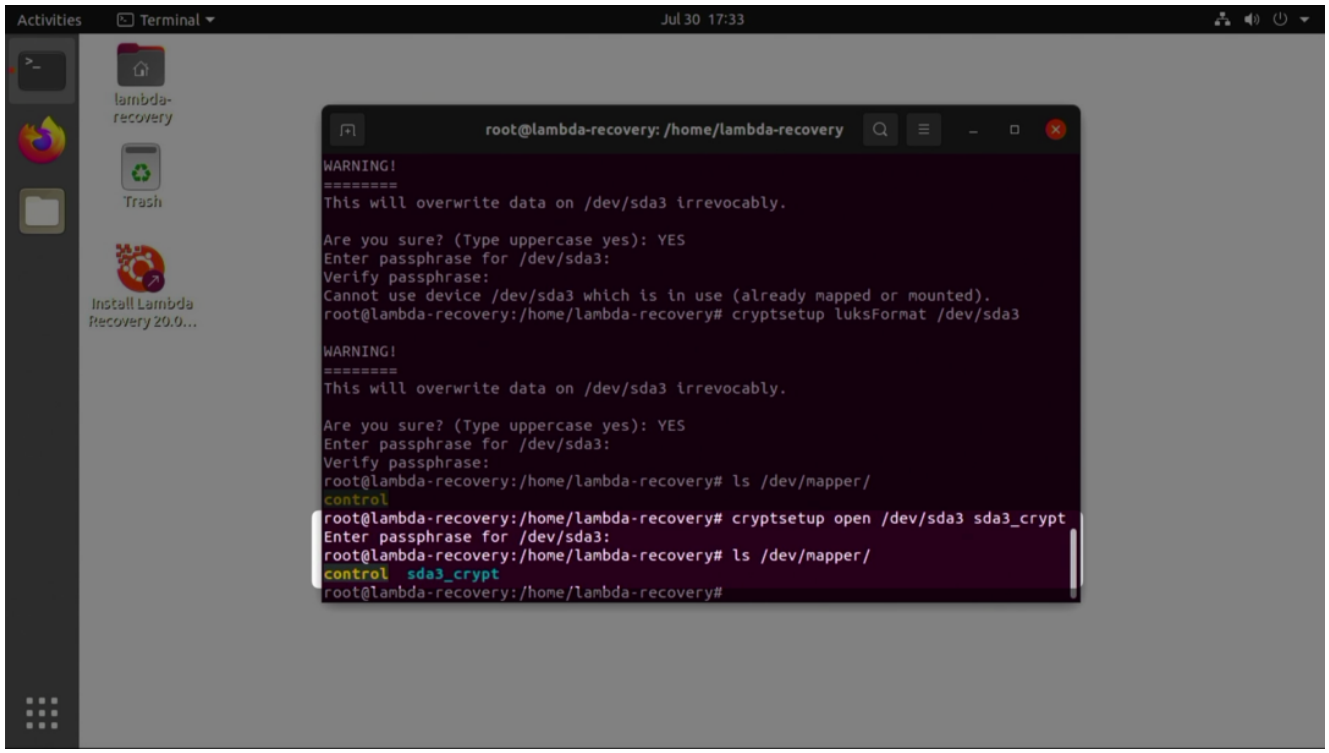
4



Now we will build the LUKS contianer for the 20.04 root partition

`cryptsetup luksFormat /dev/sda3`

5

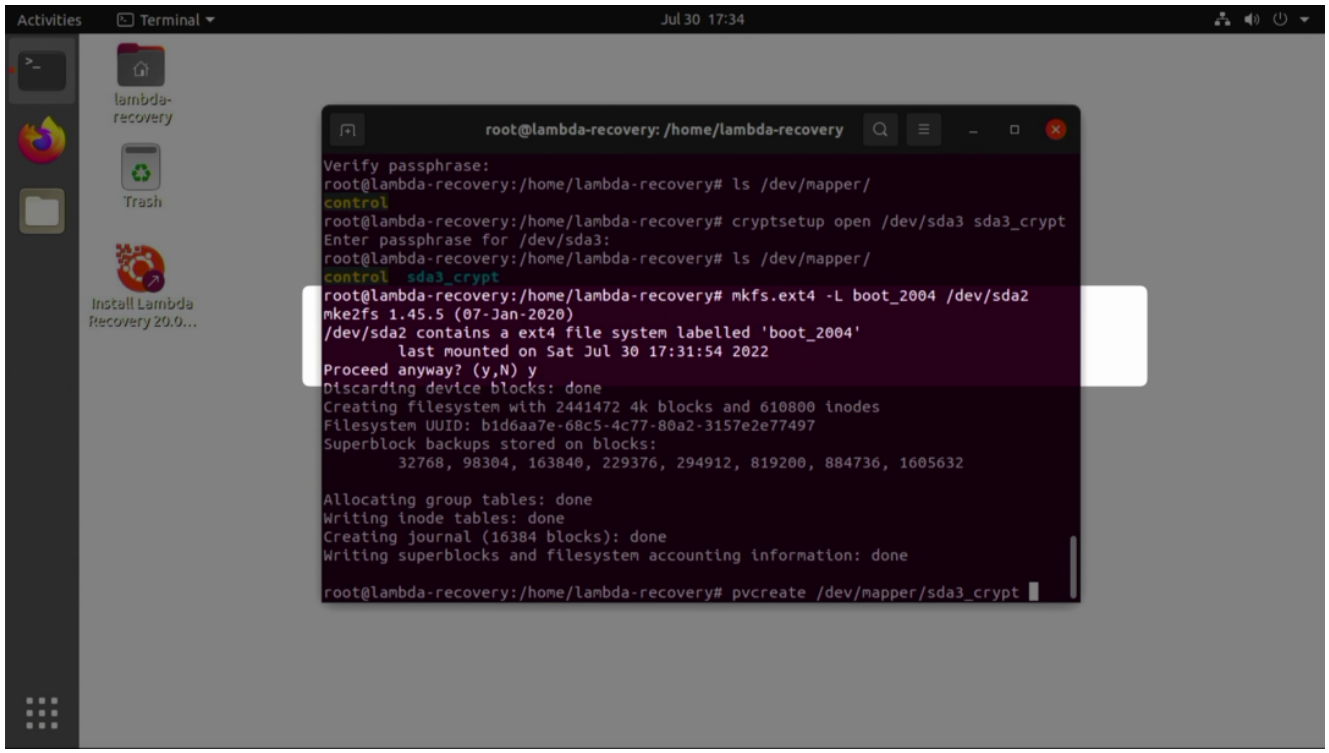


Now we will decrypt and map /dev/sda3 to sda3_crypt

`cryptsetup open /dev/sda3 sda3_crypt`

`ls /dev/mapper` shows that is is mapped

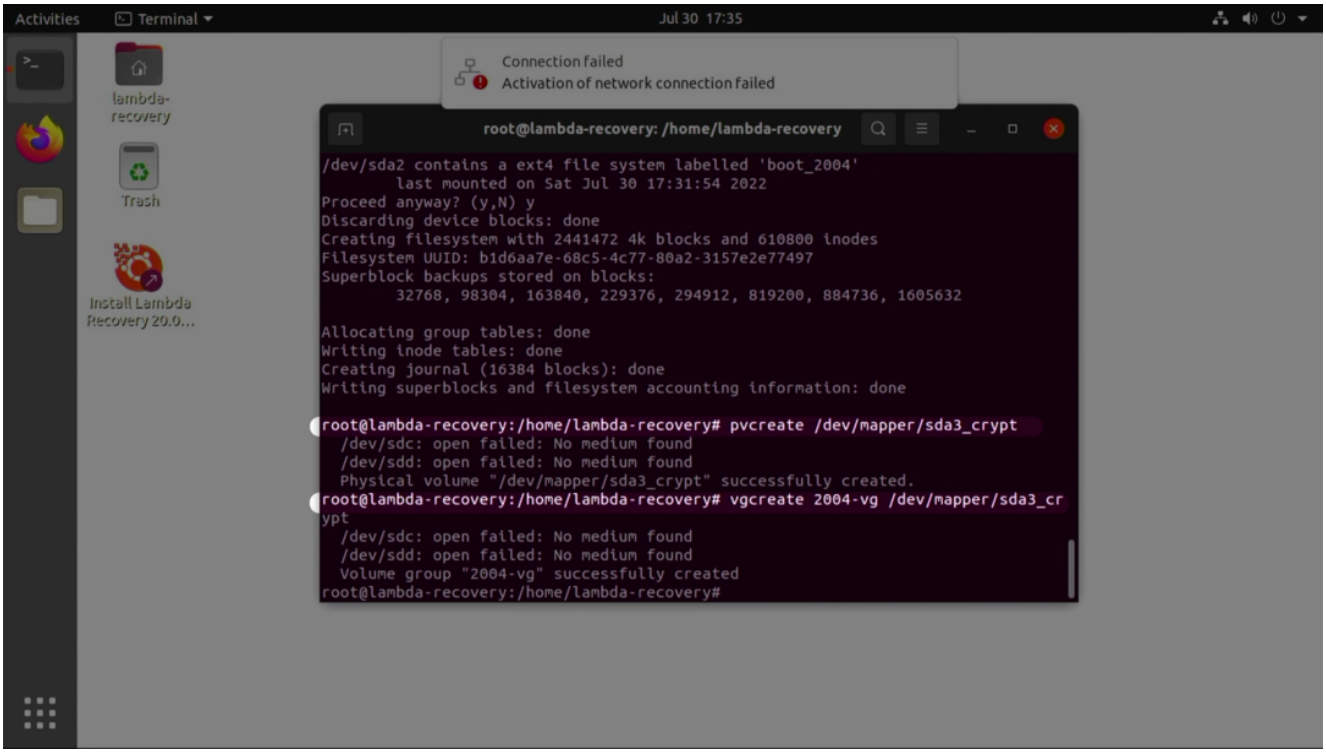
6



Format /dev/sda2 as ext4

```
mkfs.ext4 L boot_2004 /dev/sda2
```

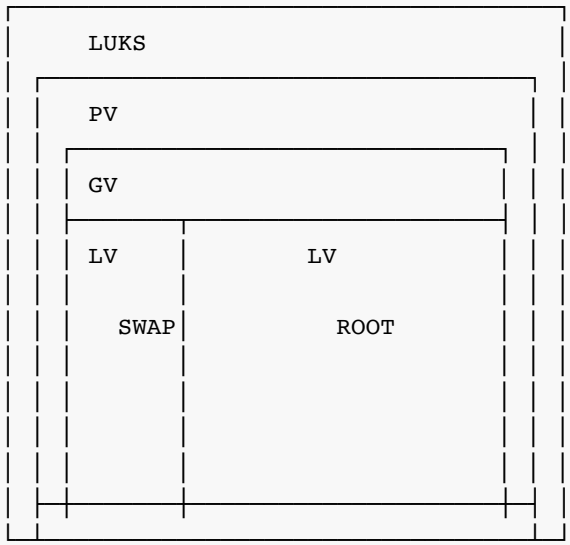
7



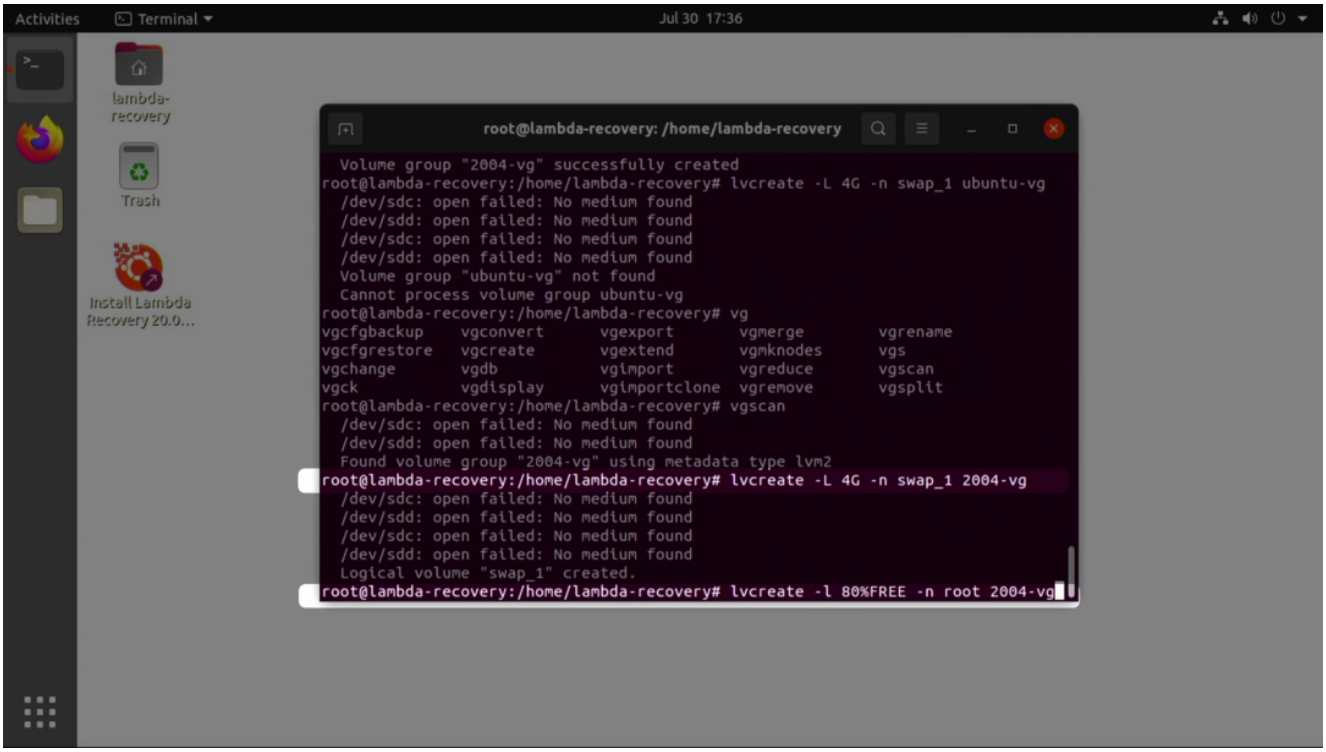
We will use LVM under the LUKS partition. This cleared up the major issues I was having in other testing and all of the documentation pointed to use LVM

```
pvcreate/dev/mapper/sda3_crypt
vgcreate 2004-vg /dev/mapper/sda3_crypt
lvcreate -L 4G -n swap_1 2004 vg
lvcreate -l 80%FREE -n root 2004-vg
```

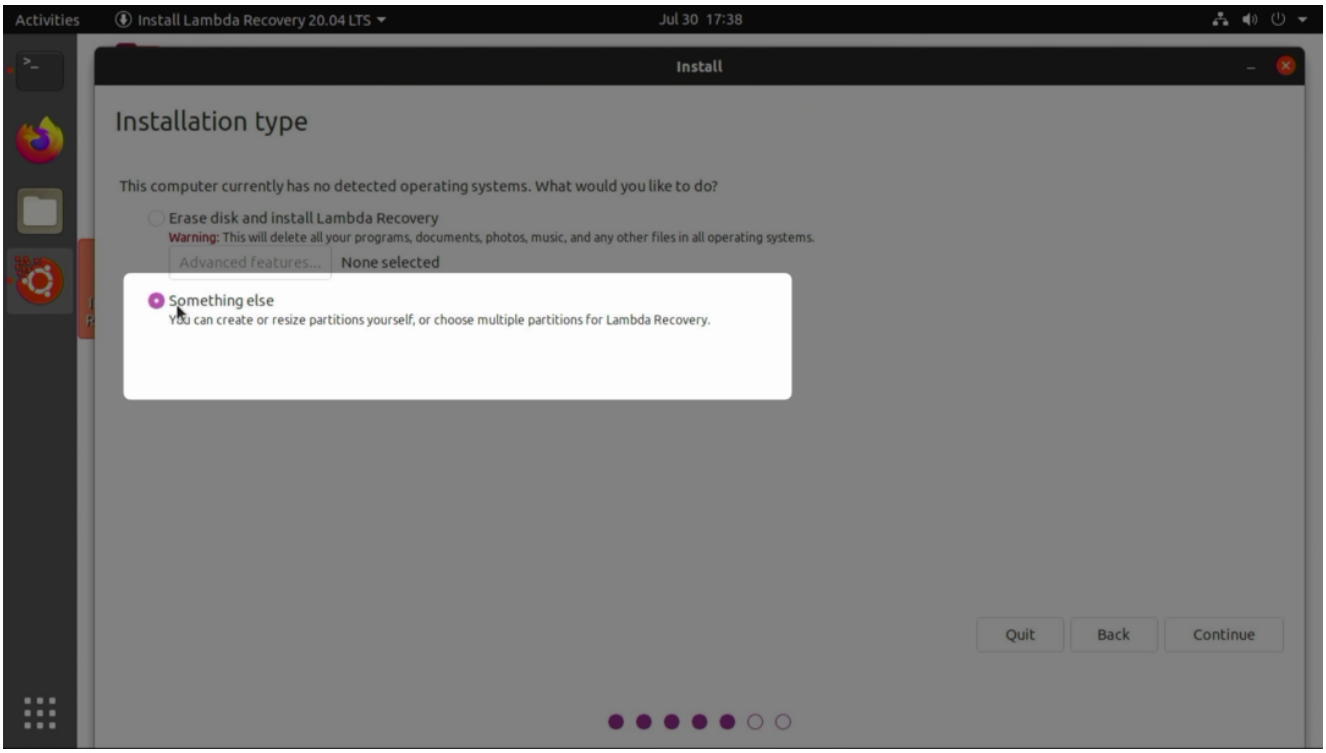
Block diagram of LUKS and LVM



8

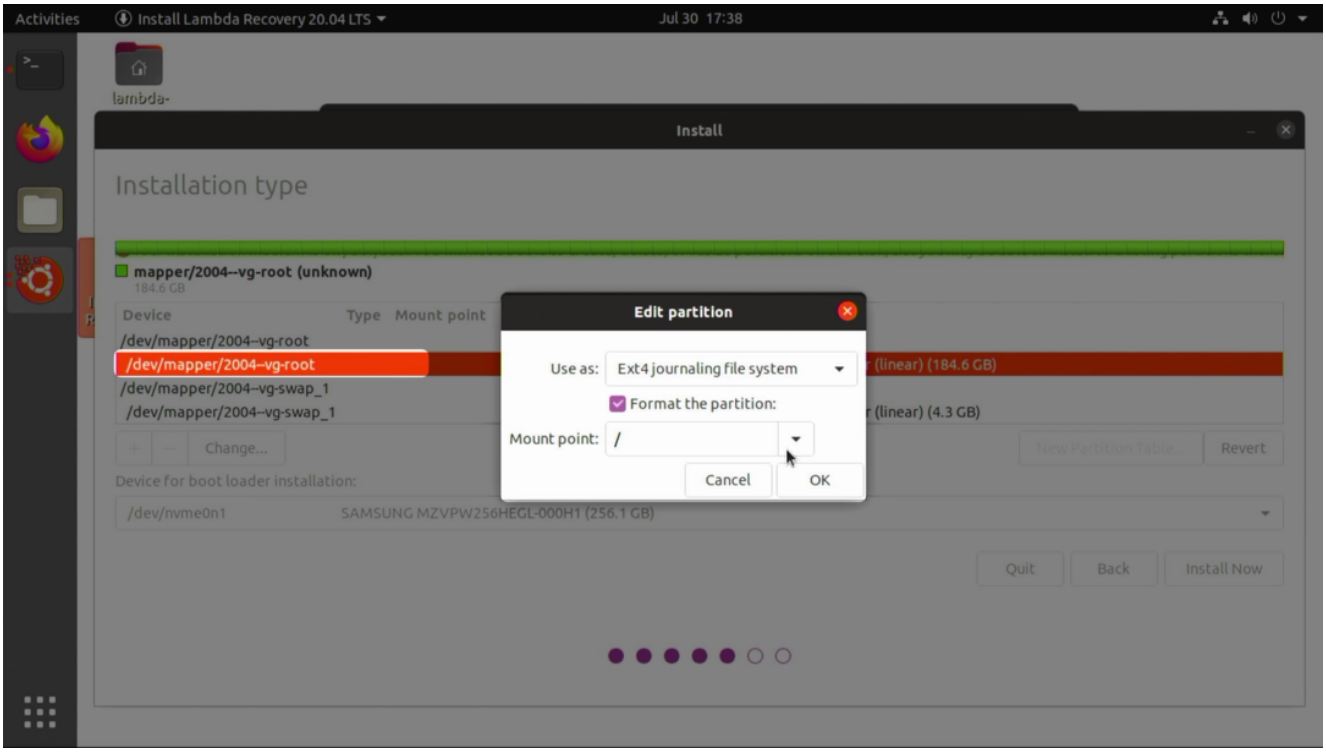


9



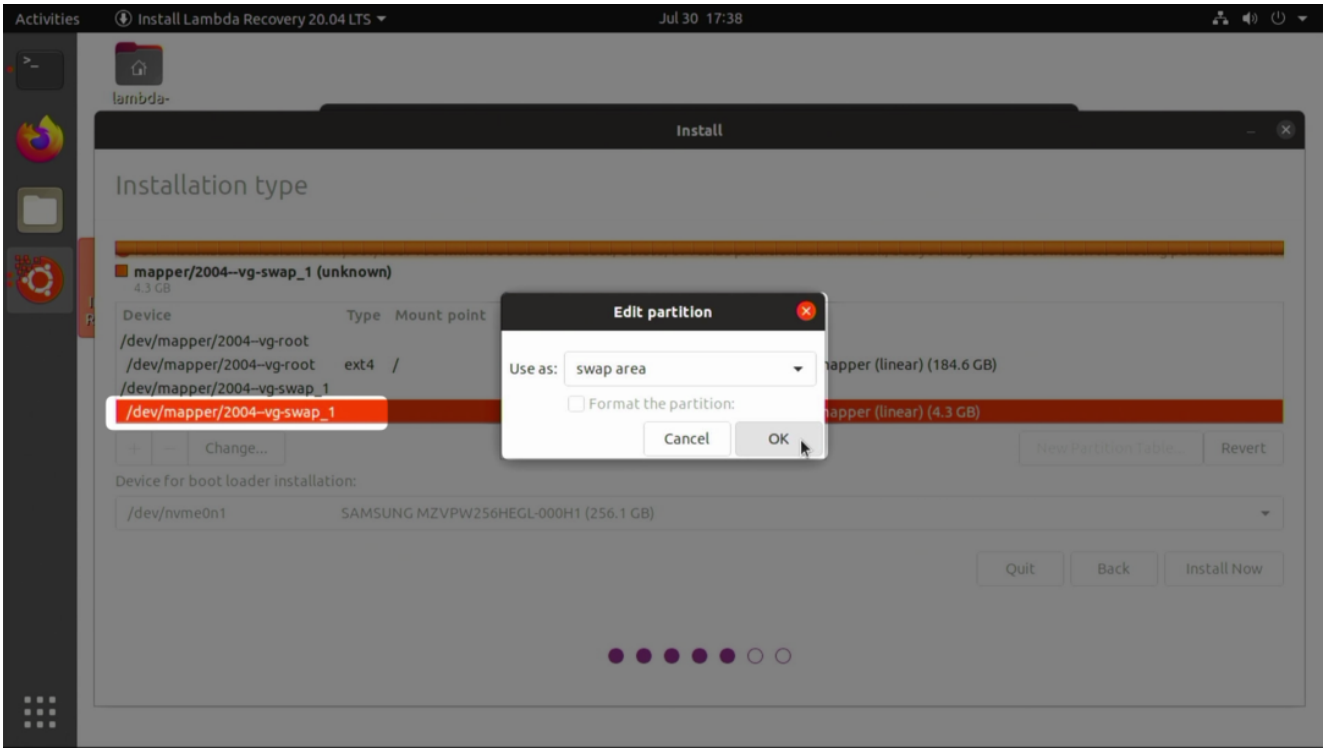
Launch the Installer and choose 'Something else' as the Installation type

10



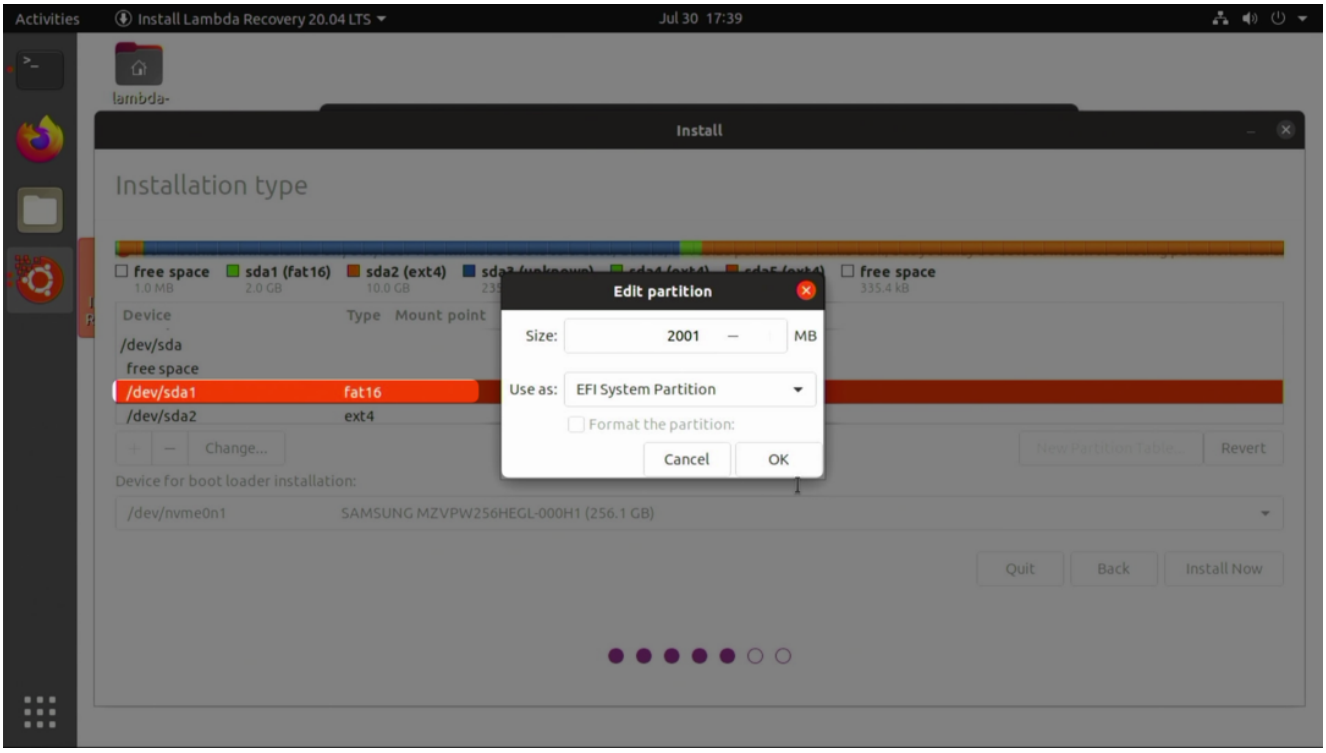
Select the child /dev/mapper/2004-vg-root and edit the partition as EXT4, format the partition, and set '/' as the mount point

11



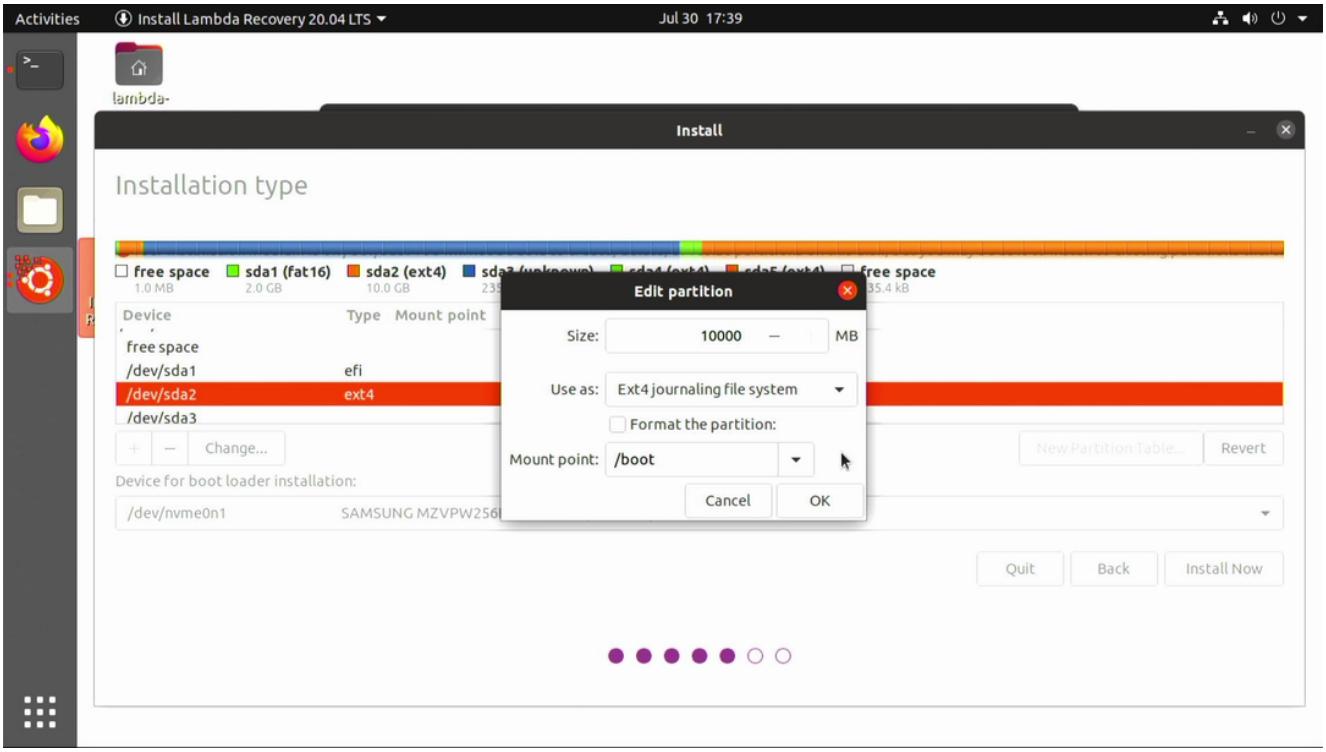
Select the child /dev/mapper/2004-vg-swap_1 and 'Use as: swap area'

12



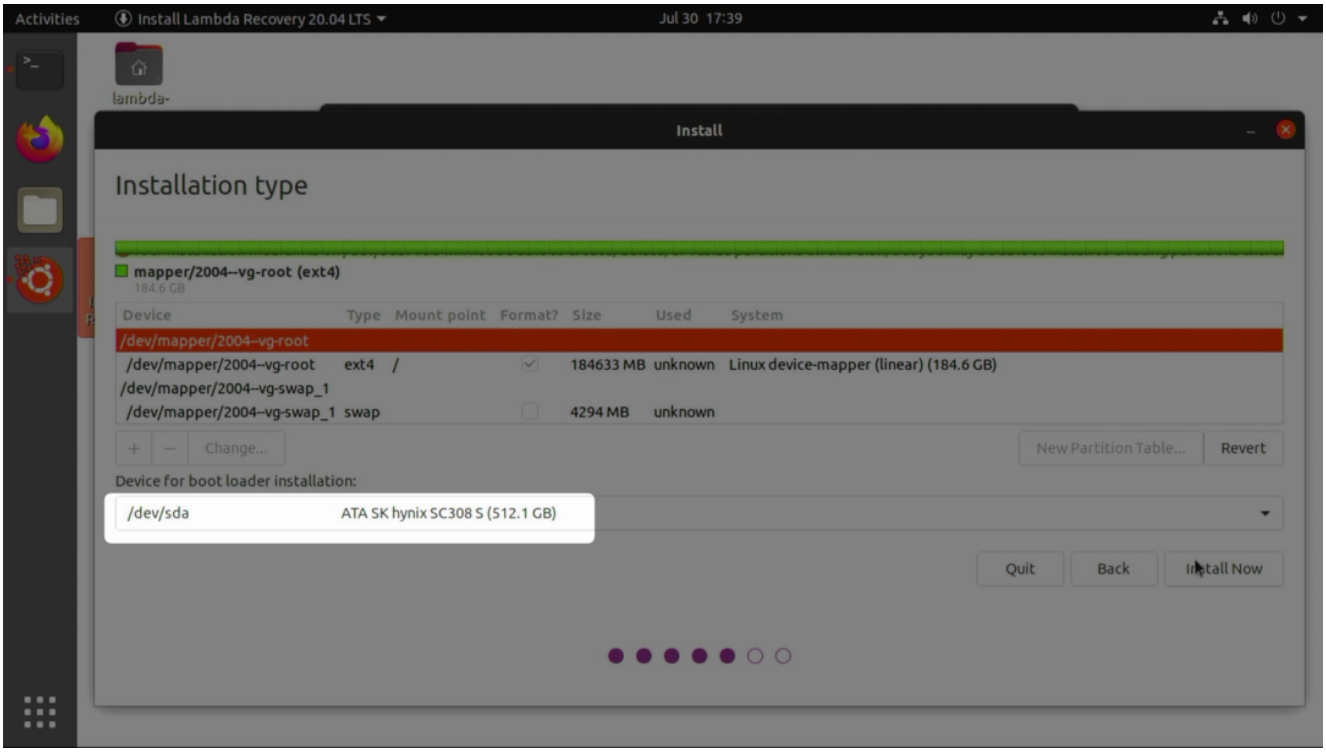
Select /dev/sda1 and 'Use as: EFI System Partition'

13



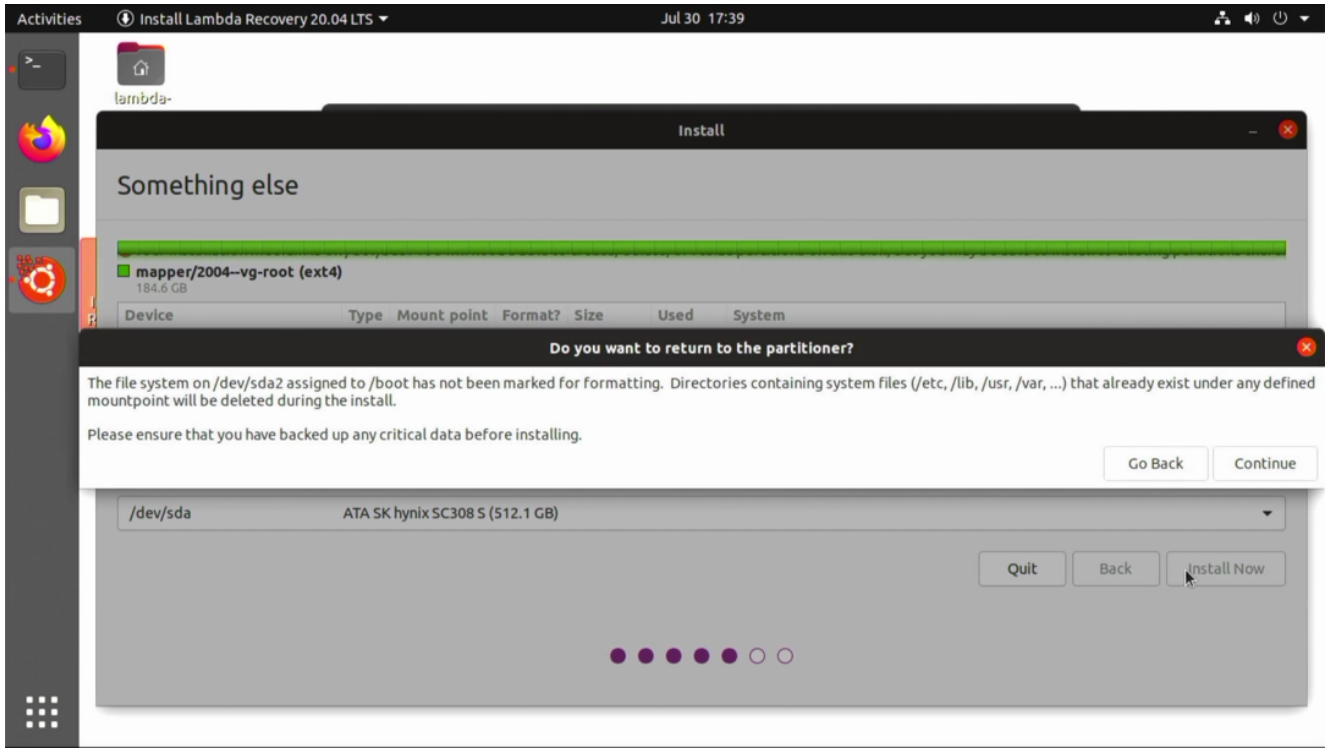
Select /dev/sda2 and Format as EXT4, format the partition and set mount point as '/boot'

14

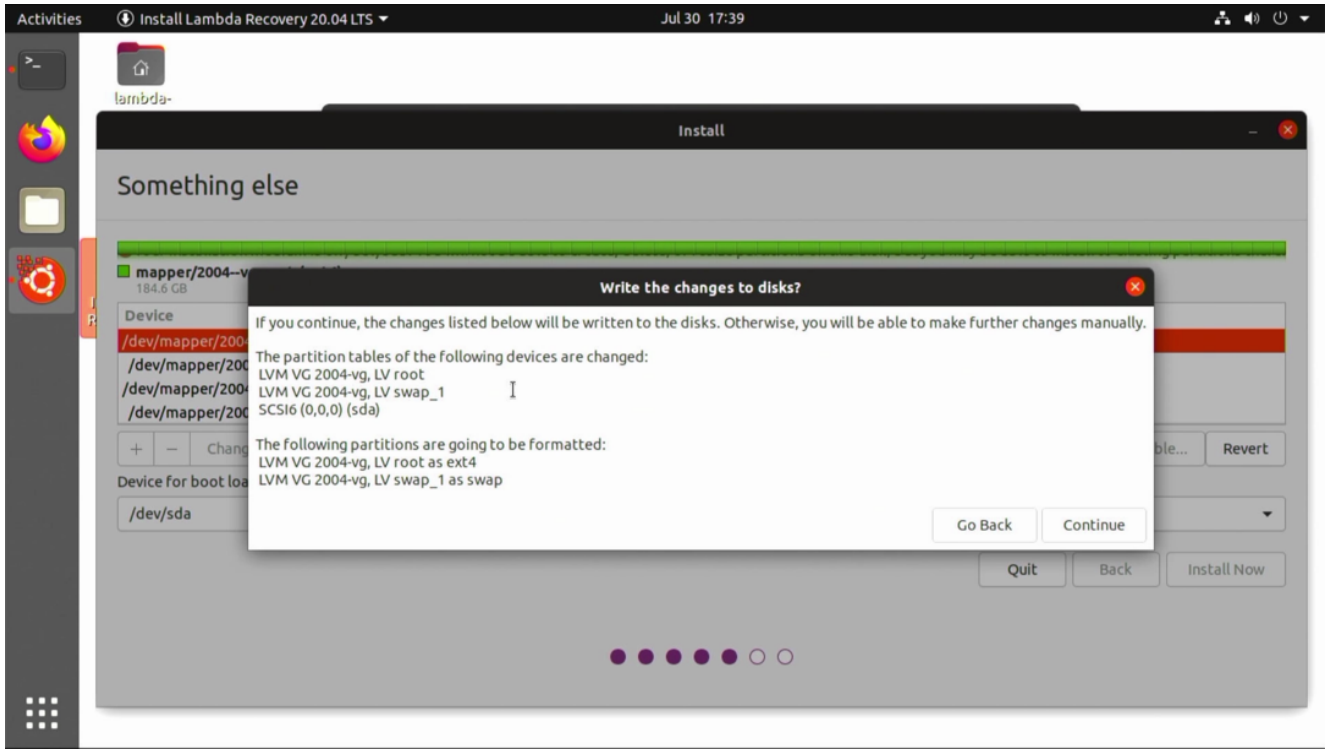


Select the root device-- /dev/sda as the bootloader installation device

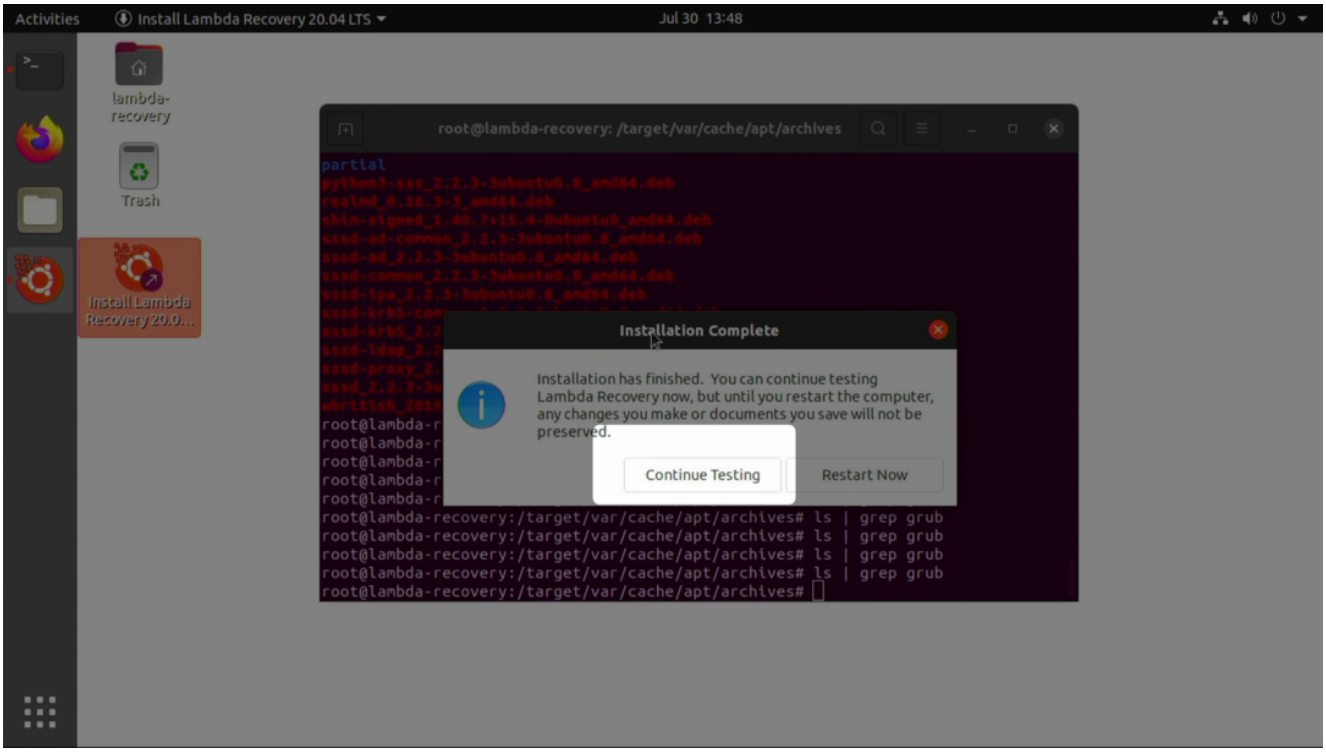
15


Activities
Install Lambda Recovery 20.04 LTS
Jul 30 17:39
lambda-
Install
Something else
mapper/2004--vg-root (ext4)
184.6 GB
Device
Type
Mount point
Format?
Size
Used
System
Do you want to return to the partitioner?
The file system on /dev/sda2 assigned to /boot has not been marked for formatting. Directories containing system files (/etc, /lib, /usr, /var, ...) that already exist under any defined mountpoint will be deleted during the install.
Please ensure that you have backed up any critical data before installing.
Go Back
Continue
/dev/sda
ATA SK hynix SC308 S (512.1 GB)
Quit
Back
Install Now

16

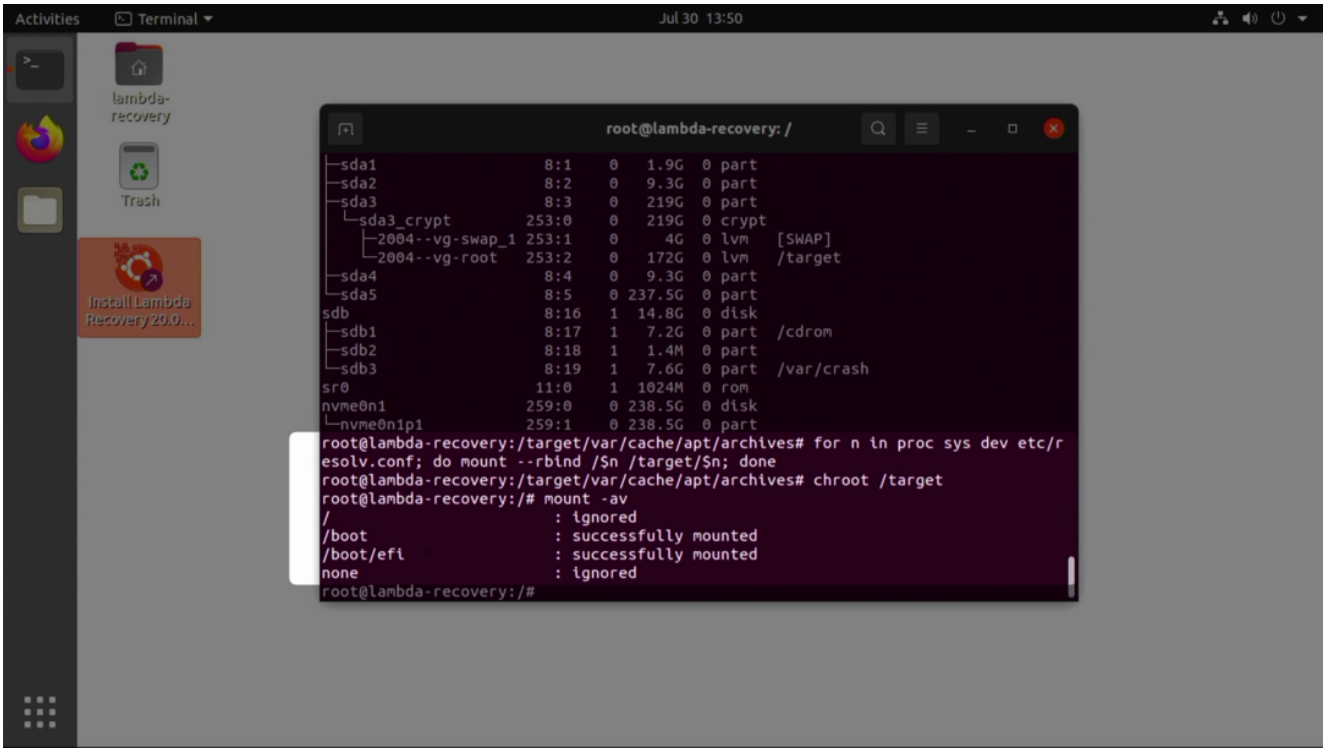

Activities
Install Lambda Recovery 20.04 LTS
Jul 30 17:39
lambda-
Install
Something else
184.6 GB
Device
Write the changes to disks?
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.
The partition tables of the following devices are changed:
LVM VG 2004-vg, LV root
LVM VG 2004-vg, LV swap_1
SCSI6 (0,0,0) (sda)
The following partitions are going to be formatted:
LVM VG 2004-vg, LV root as ext4
LVM VG 2004-vg, LV swap_1 as swap
Go Back
Continue
Revert
Device for boot loa
/dev/sda
Quit
Back
Install Now

17



After Installtion is complete, choose Continue Testing

18



We need to chroot into the new install so we have to mount the proc sys dev and etc/resolv devices onto the new

install before we reboot

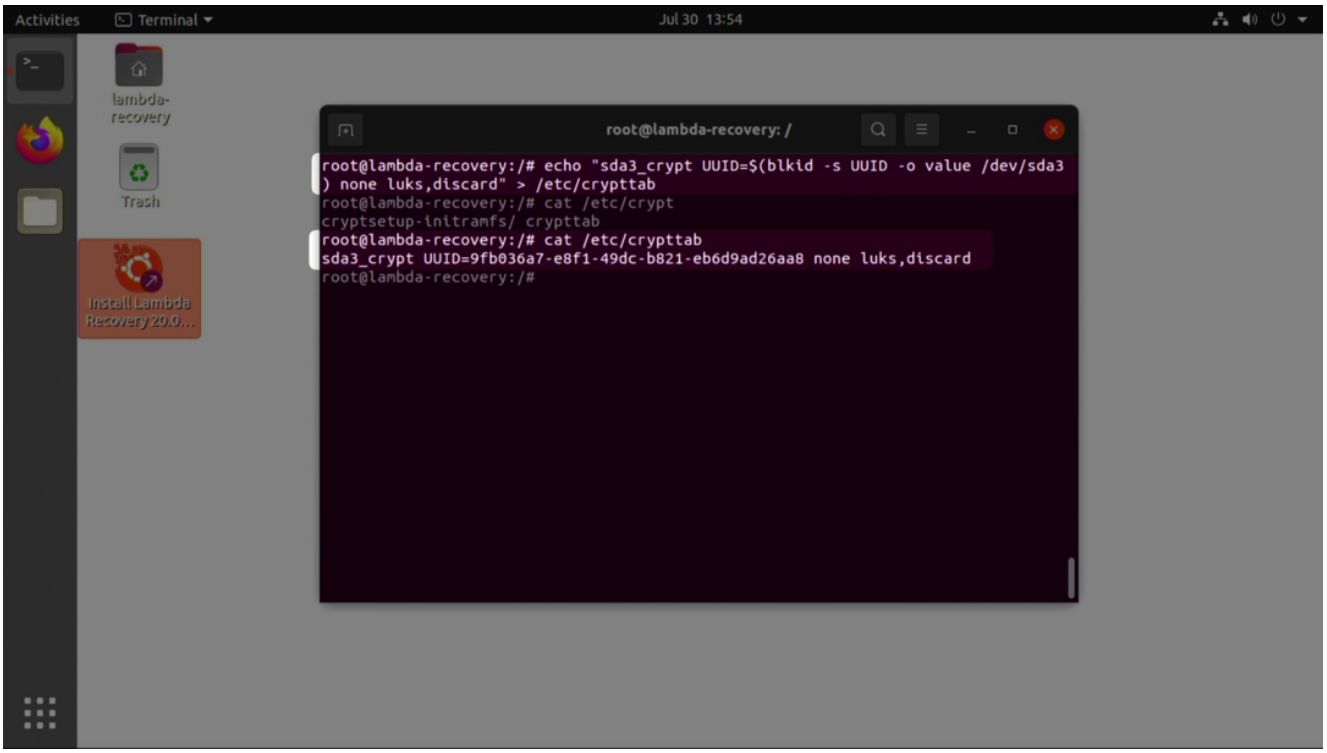
```
for n in proc sys dev etc/resolv.conf; do mount --rbind /$n /target/$n; done
chroot /target
mount -av
```

you should see:

```

/
/boot
/boot/efi
```

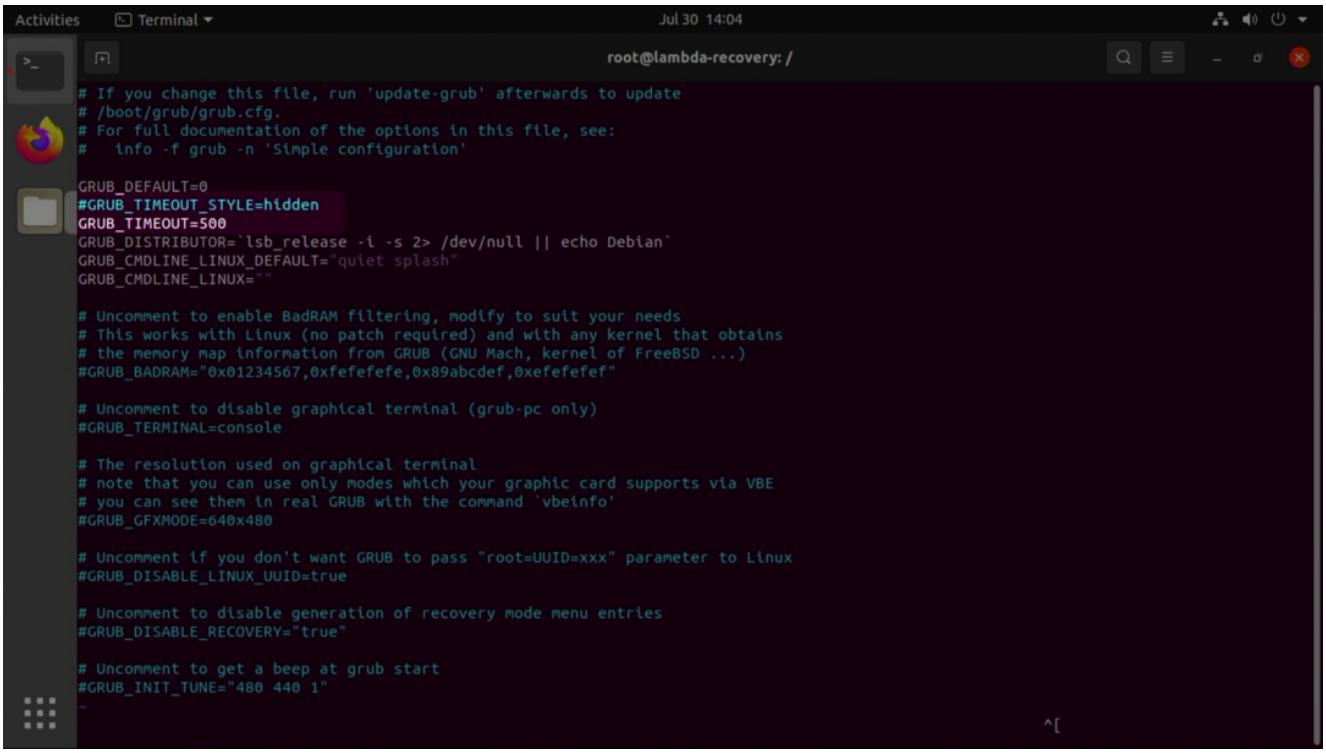
19



Create a crypttab file
sda3_crypt is the mapper lable for sda3, the UUID should be for /dev/sda3 and 'none luks,discard' options are added
This one-liner will set it up correctly, assuming again that the device is /dev/sda

```
echo "sda3_crypt UUID=$(blkid -s UUID -o value /dev/sda3) none luks,discard" > /etc/crypttab
```

20

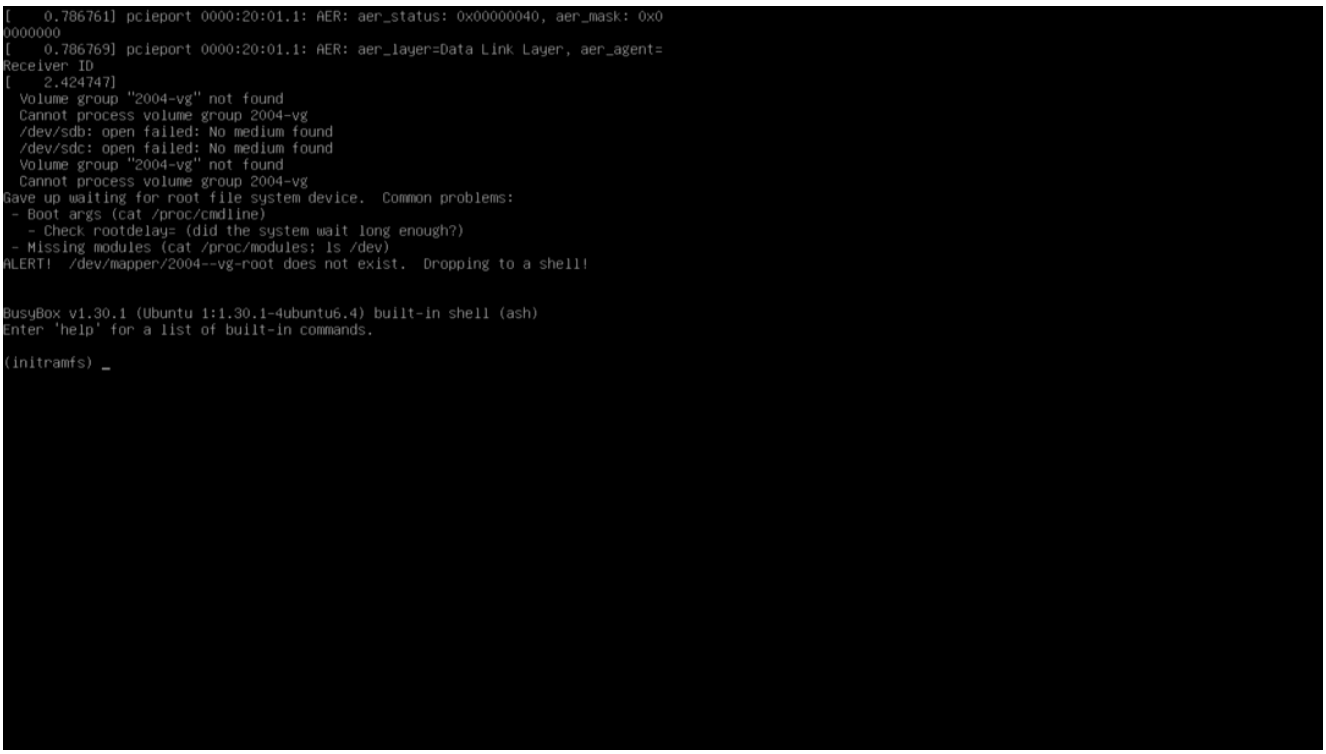


edit /etc/default/grub to show the grub menu and rebuild grub

I neglected to update-initramfs before I rebooted

DO NOT REBOOT until you have run `update-initramfs -u -k all` shown on slide 24

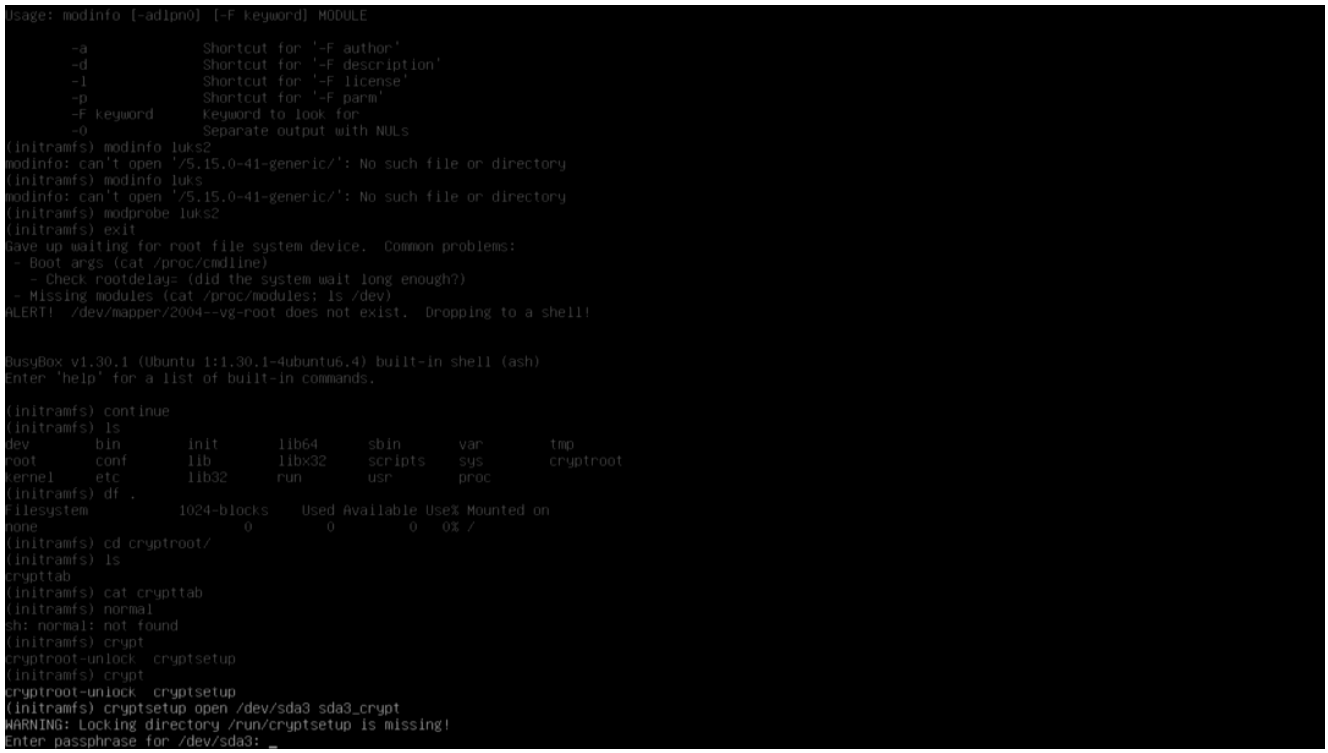
21



I inclued these and the next several slides to show you how to back out of the mistake I made, I thought it might

be helpful
You can see here that /dev/mapper doesn't have my LVM volume group because GRUB did not prompt to decrypt the partition

22



From the initramfs busybox environment
`cryptsetup open /dev/sda3 sda3_crypt`
this will map the the expected mapper location and boot can resume

23

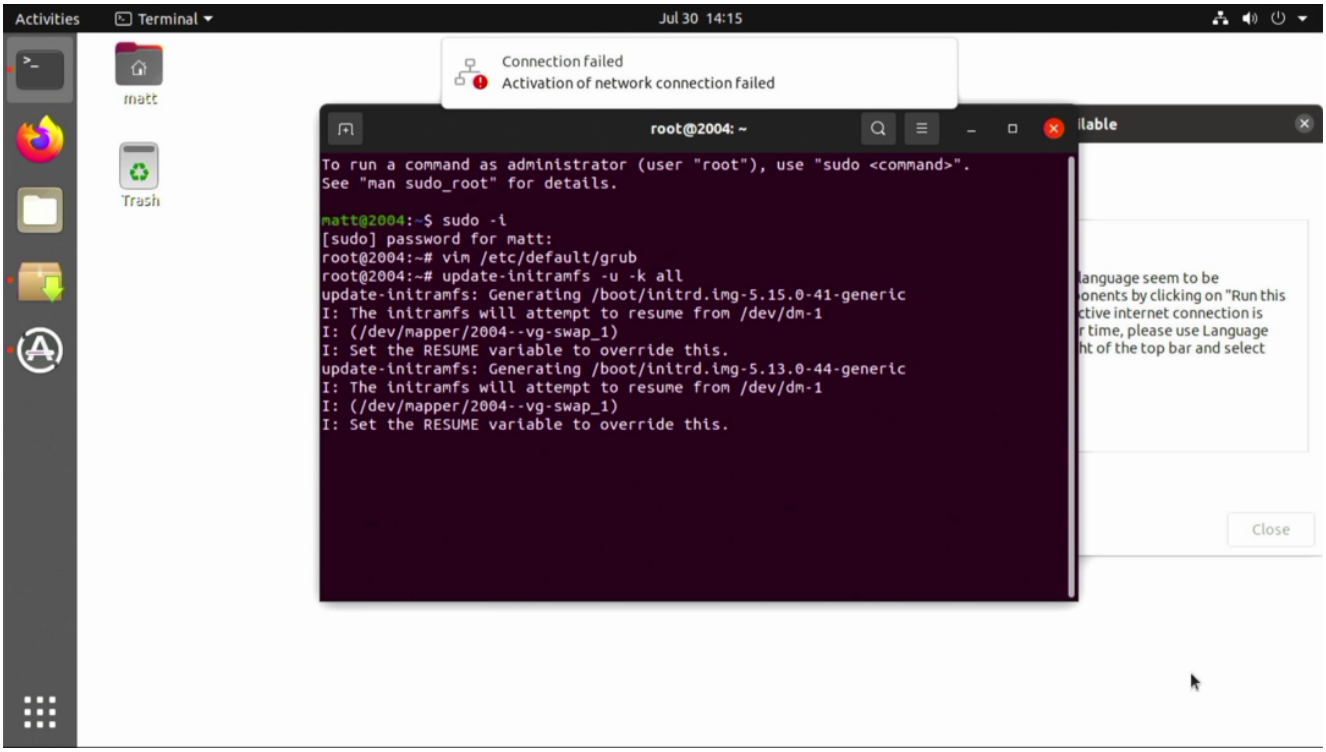
```
       -l             Shortcut for '-F license'
       -p             Shortcut for '-F parm'
       -F keyword     Keyword to look for
       -0             Separate output with NULs
(initramfs) modinfo luks2
modinfo: can't open '/5.15.0-41-generic/': No such file or directory
(initramfs) modinfo luks
modinfo: can't open '/5.15.0-41-generic/': No such file or directory
(initramfs) modprobe luks2
(initramfs) exit
Gave up waiting for root file system device.  Common problems:
 - Boot args (cat /proc/cmdline)
   - Check rootdelay= (did the system wait long enough?)
 - Missing modules (cat /proc/modules; ls /dev)
ALERT!  /dev/mapper/2004--vg-root does not exist.  Dropping to a shell!


BusyBox v1.30.1 (Ubuntu 1:1.30.1-4ubuntu6.4) built-in shell (ash)
Enter 'help' for a list of built-in commands.

(initramfs) continue
(initramfs) ls
dev        bin        init       lib64      sbin       var        tmp
root       conf       lib        libx32     scripts    sys        cryptroot
kernel     etc        lib32      run        usr        proc
(initramfs) df .
Filesystem           1024-blocks      Used Available Use% Mounted on
none                           0         0         0   0% /
(initramfs) cd cryptroot/
(initramfs) ls
crypttab
(initramfs) cat crypttab
(initramfs) normal
sh: normal: not found
(initramfs) crypt
cryptroot-unlock  cryptsetup
(initramfs) crypt
cryptroot-unlock  cryptsetup
(initramfs) cryptsetup open /dev/sda3 sda3_crypt
WARNING: Locking directory /run/cryptsetup is missing!
Enter passphrase for /dev/sda3:
(initramfs) continue
(initramfs) exit
/dev/mapper/2004--vg-root: clean, 277455/11272192 files, 5672301/45076480 blocks
```

`exit` to continue boot

24



This is what I should have done on slide 20

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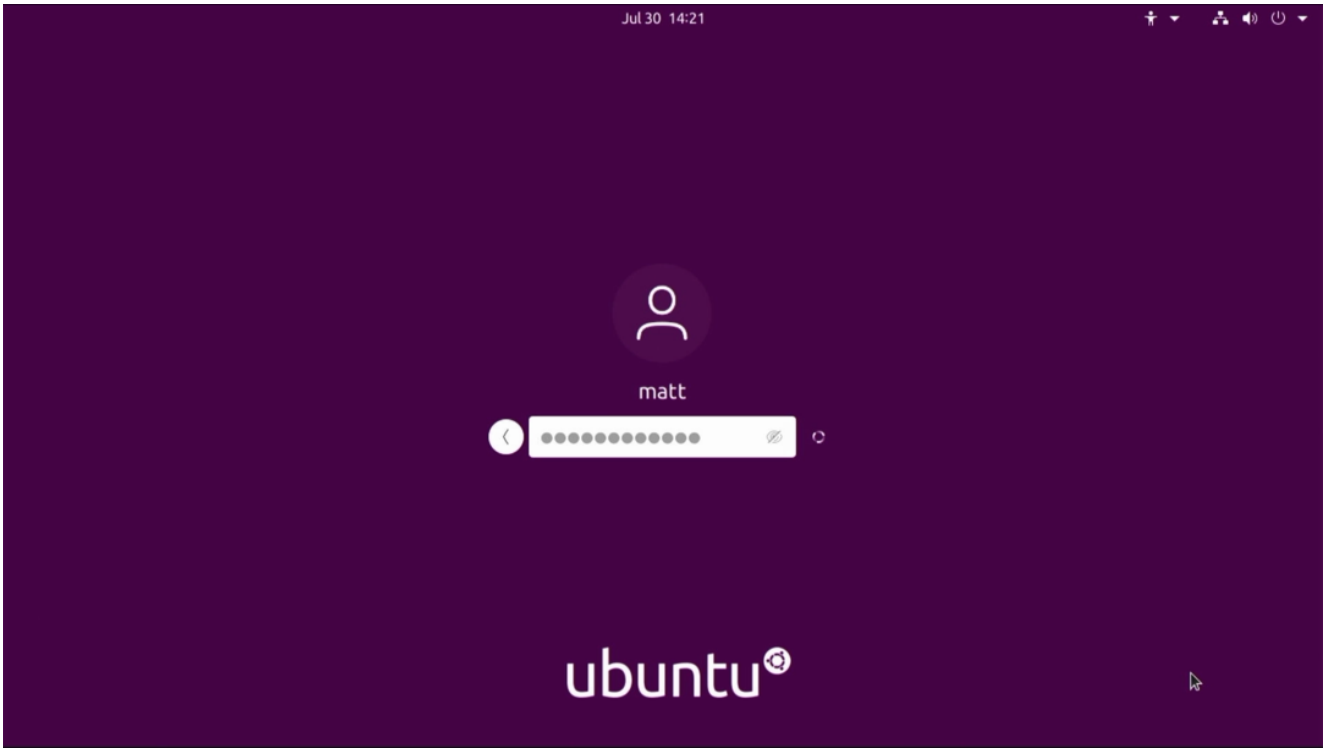
Reboot and you should be prompted to unlock sda3_crypt

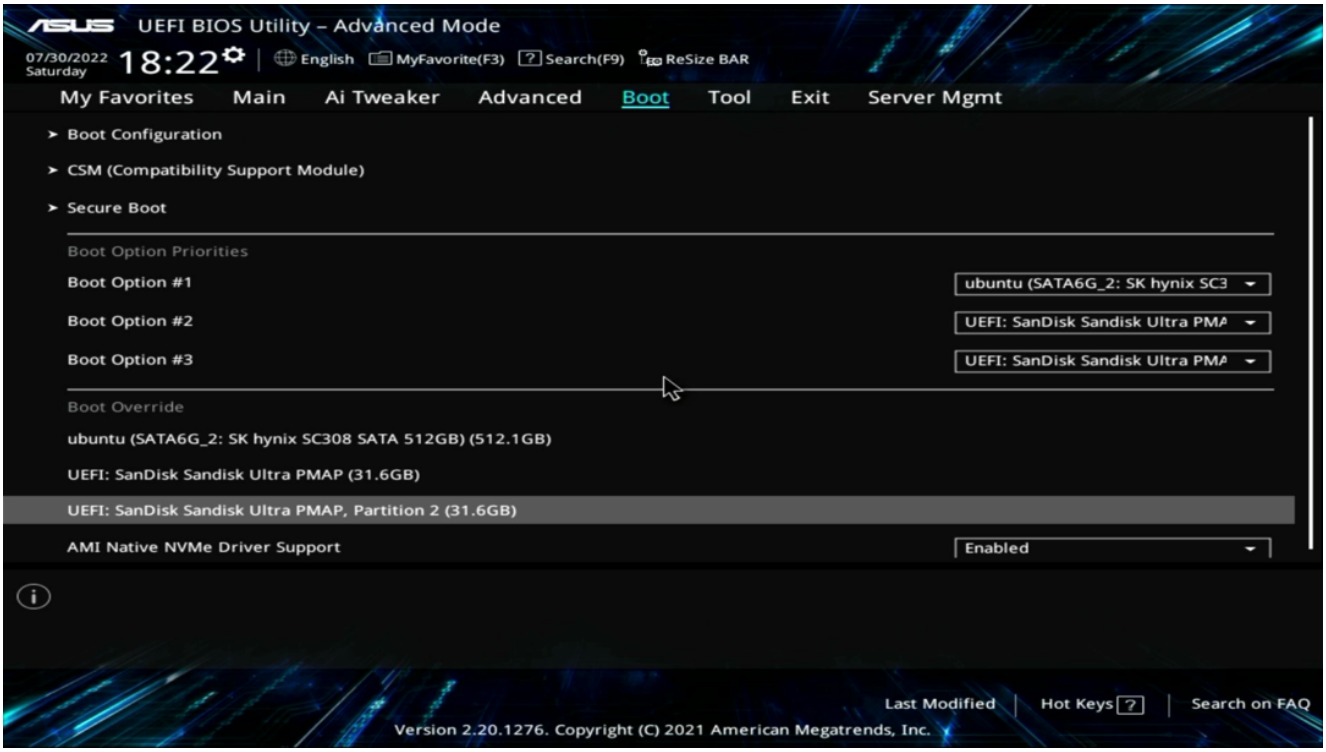
26



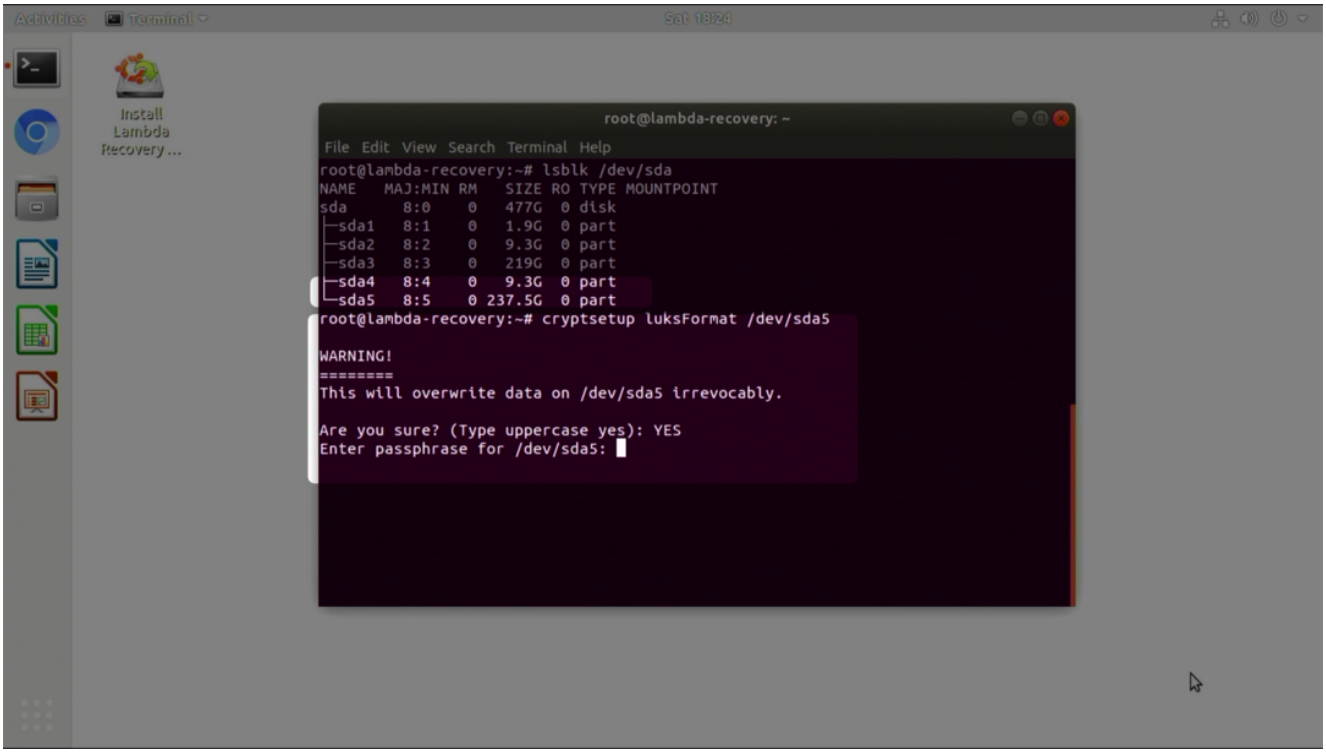
it works

27 reboot into the UEFI/BIOS and boot from the 18.04 Rescue

ISO



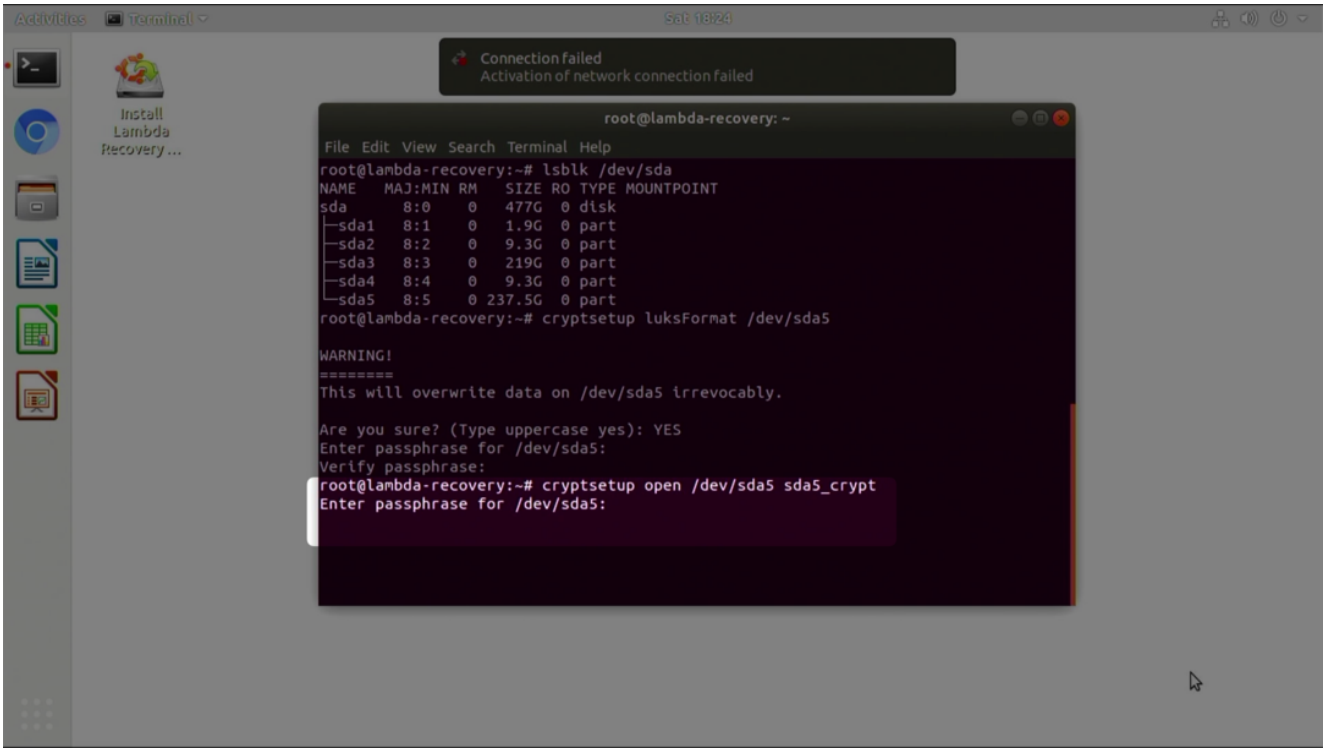
28



similar to what we did for 20.04, but this time we will be using /dev/sda4 for /boot and /dev/sda5 for the LUKS partition

```
cryptsetup luksFormat /dev/sda5
```

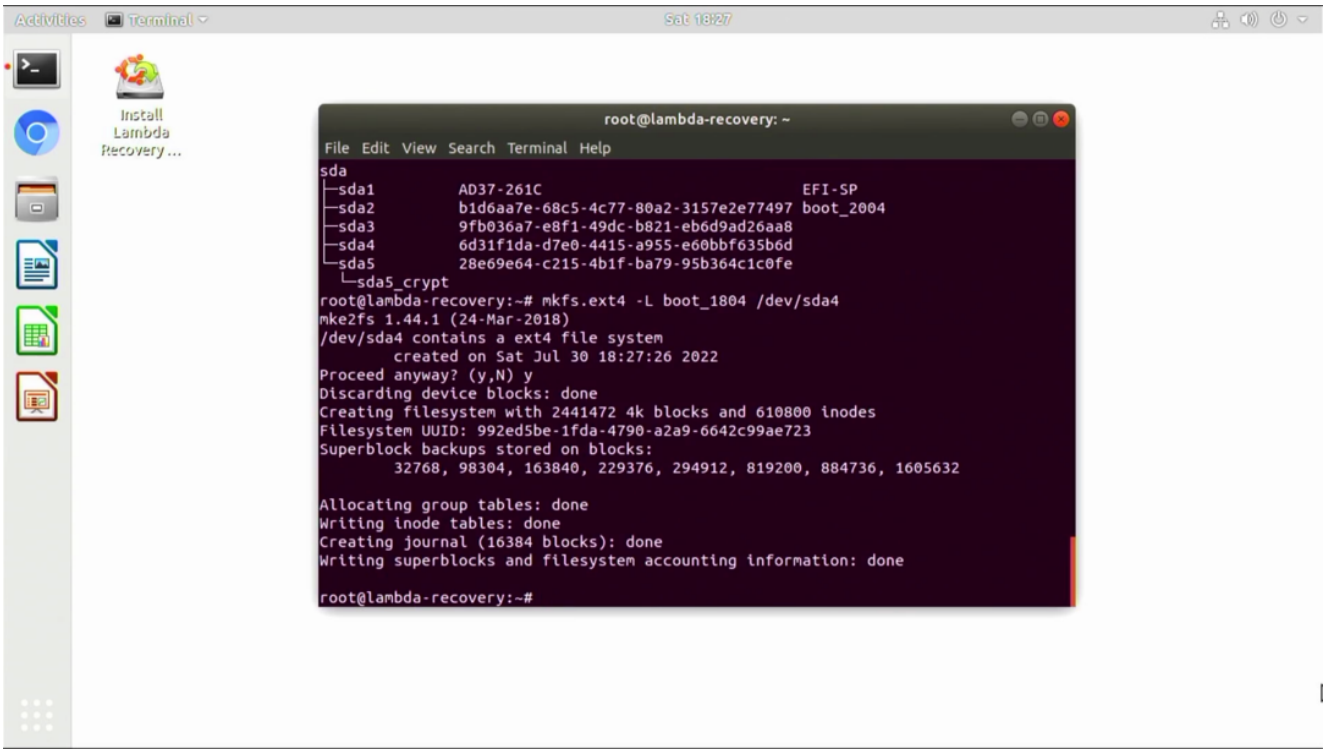
29



open and setup the device mapper to sda5_crypt

```
cryptsetup open /dev/sda5 sda5_crypt
```

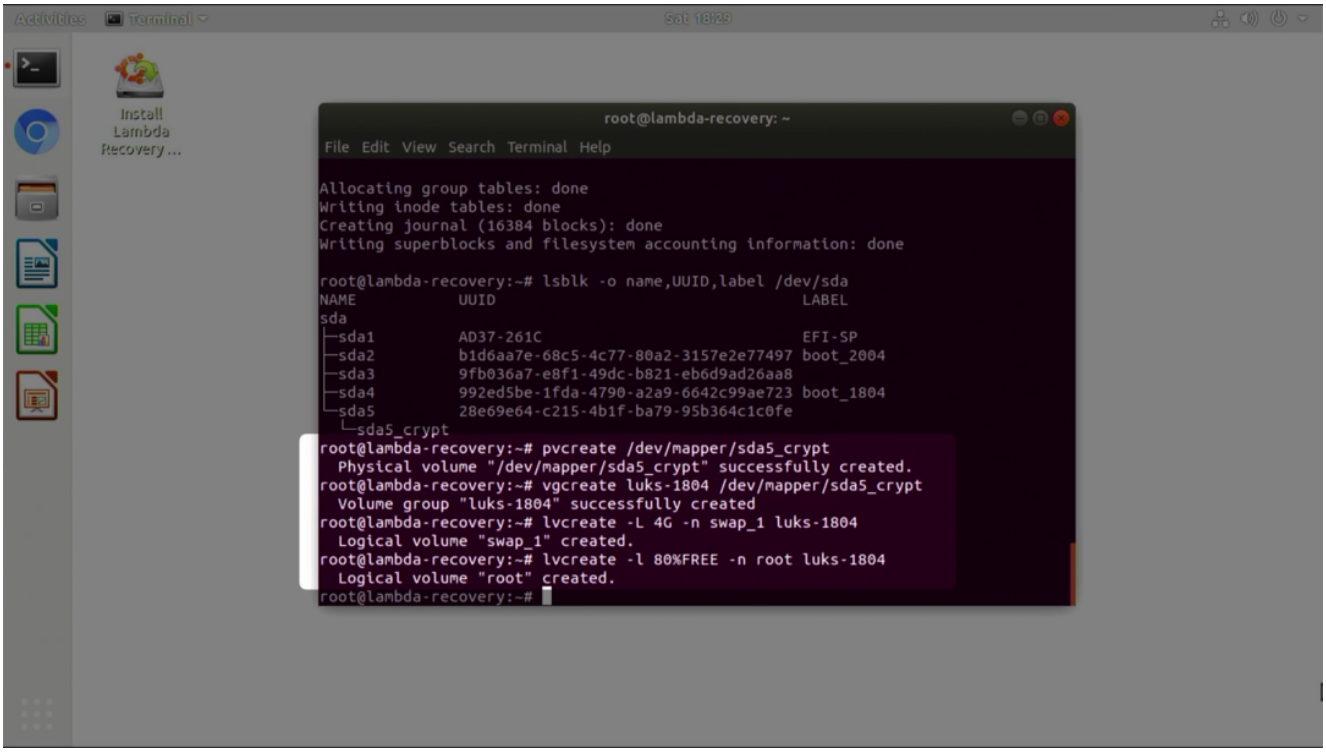
30



create an ext4 filesystem on /dev/sda4

```
mkfs.ext4 -L boot_1804 /dev/sda4
```

31



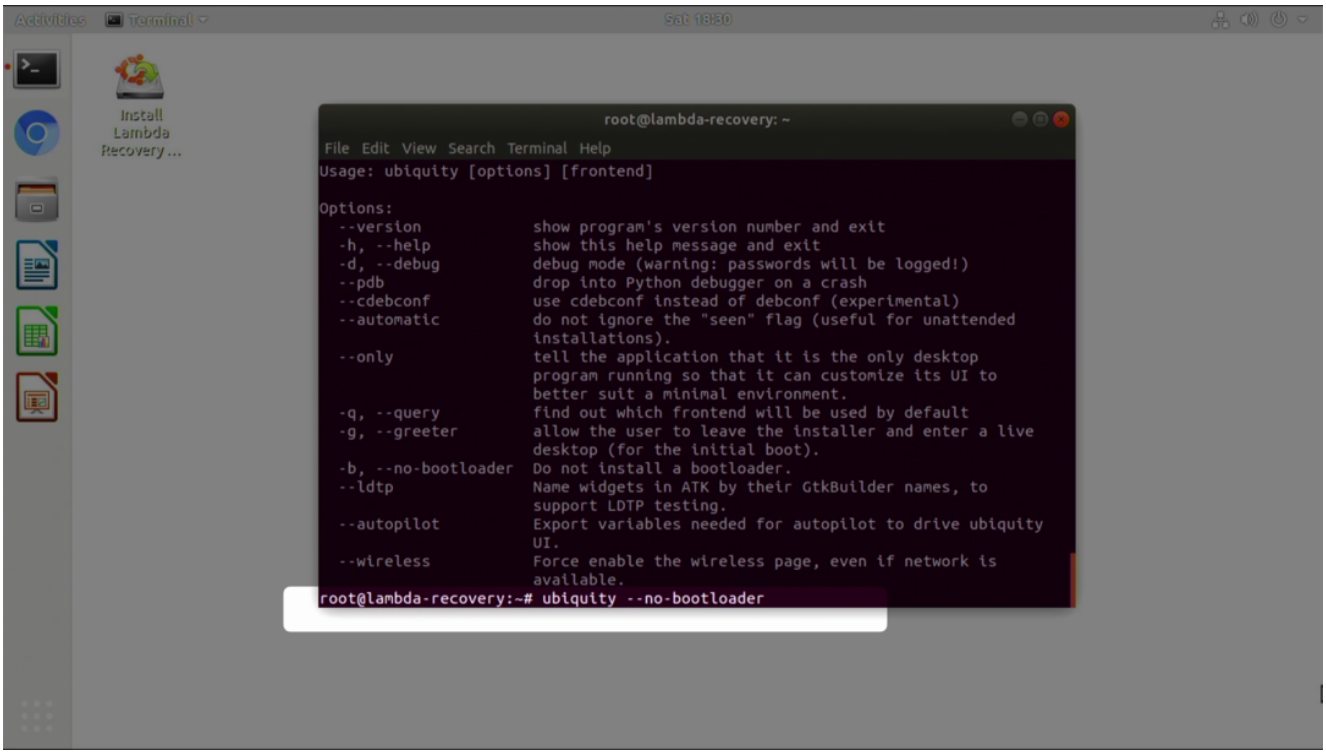
NOTE-- I messed up the LVM naming convention here. What I did works, but 100% of the documentation uses <>--vg like i did for 20.04. You may want to sub 1804-vg for luks-1804 in the following commands.

```
pvcreate/dev/mapper/sda5_crypt
vgcreate luks-1804 /dev/mapper/sda5_crypt
lvcreate -L 4G -n swap_1 luks-1804
lvcreate -l 80%FREE -n root luks-1804
```

CORRECTED

```
vgcreate 1804-vg /dev/mapper/sda5_crypt
lvcreate -L 4G -n swap_1 1804-vg
lvcreate -l 80%FREE -n root 1804-vg
```

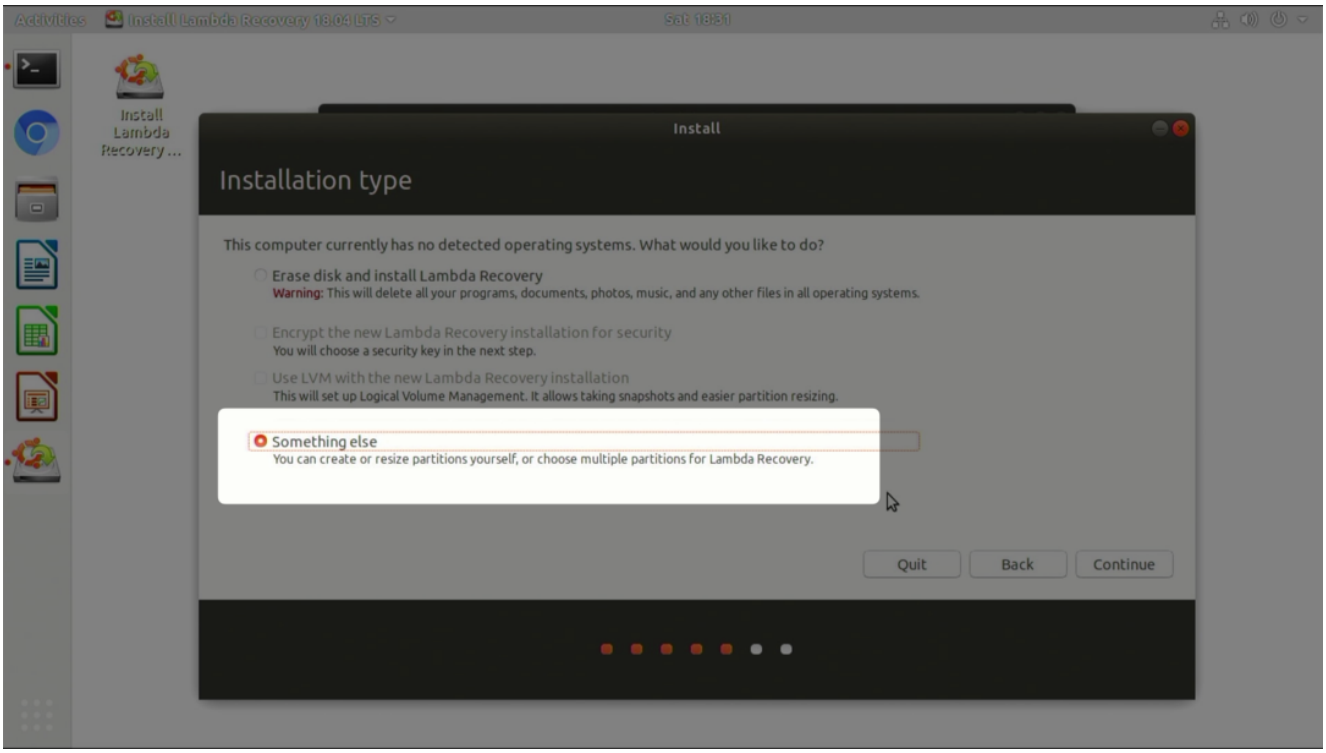
32



launch unquity without the installing a bootloader

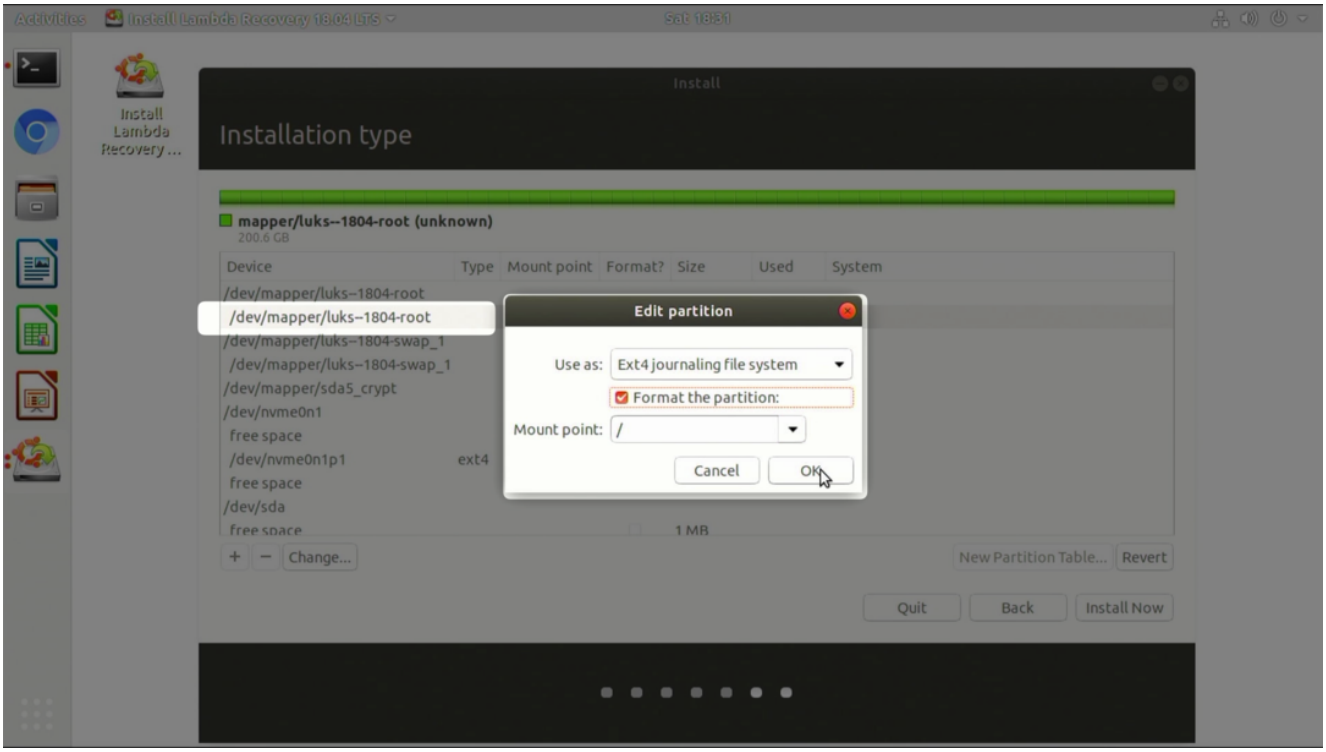
```
uquiquity -b
```

33



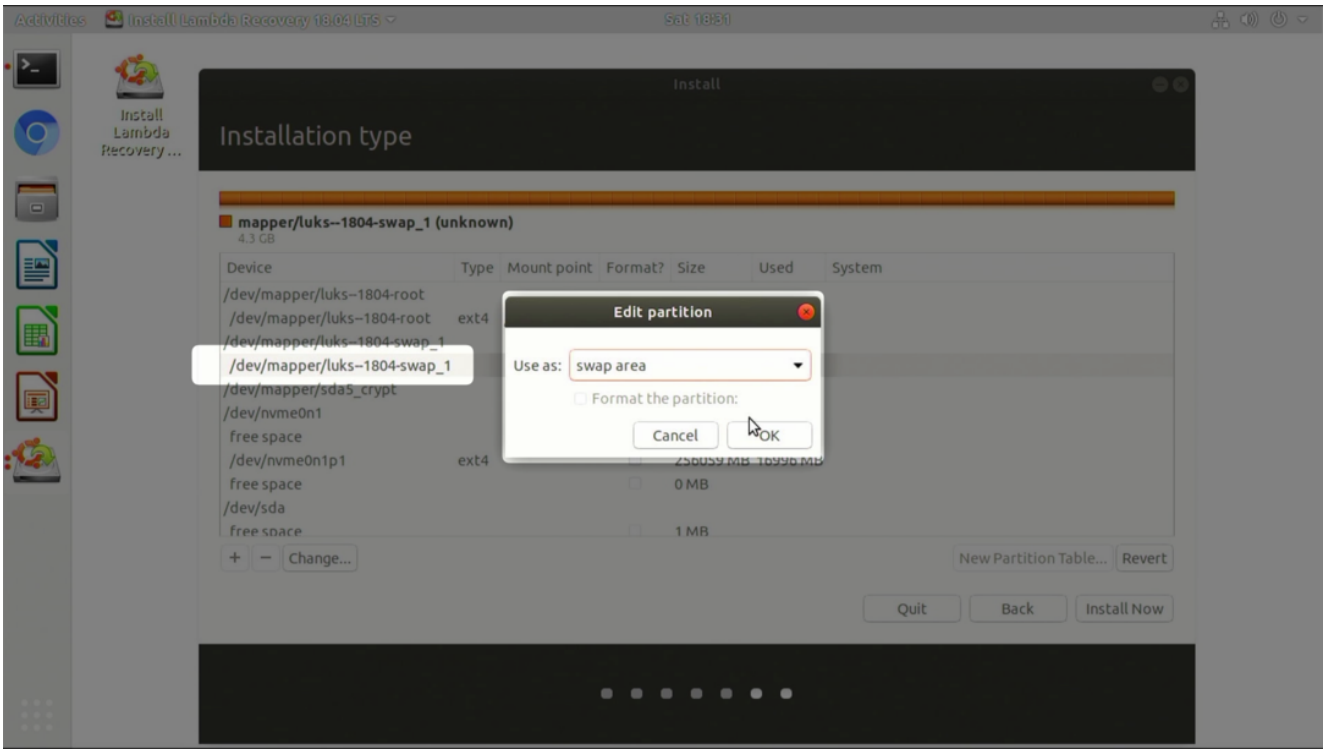
Installation type: Something else

34



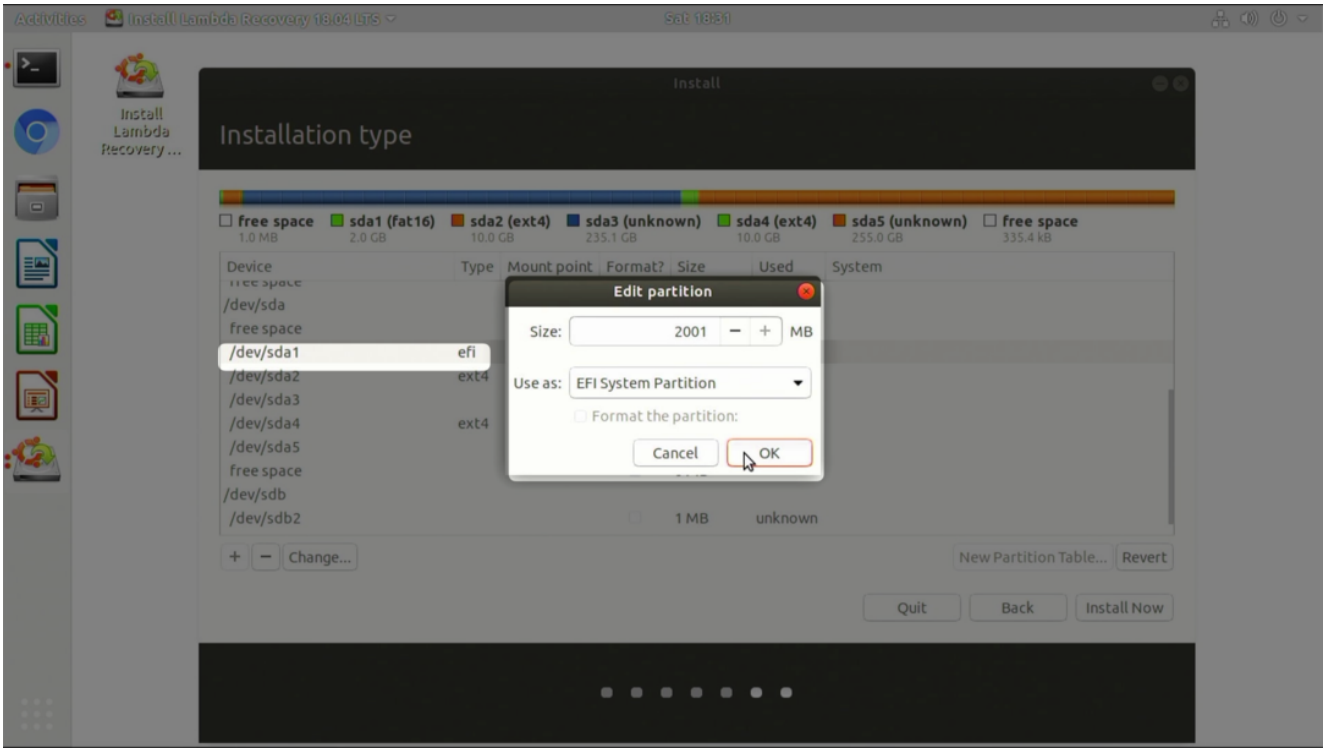
/dev/mapper/luks--1804-root as EXT4, format, Mount Point "/"

35



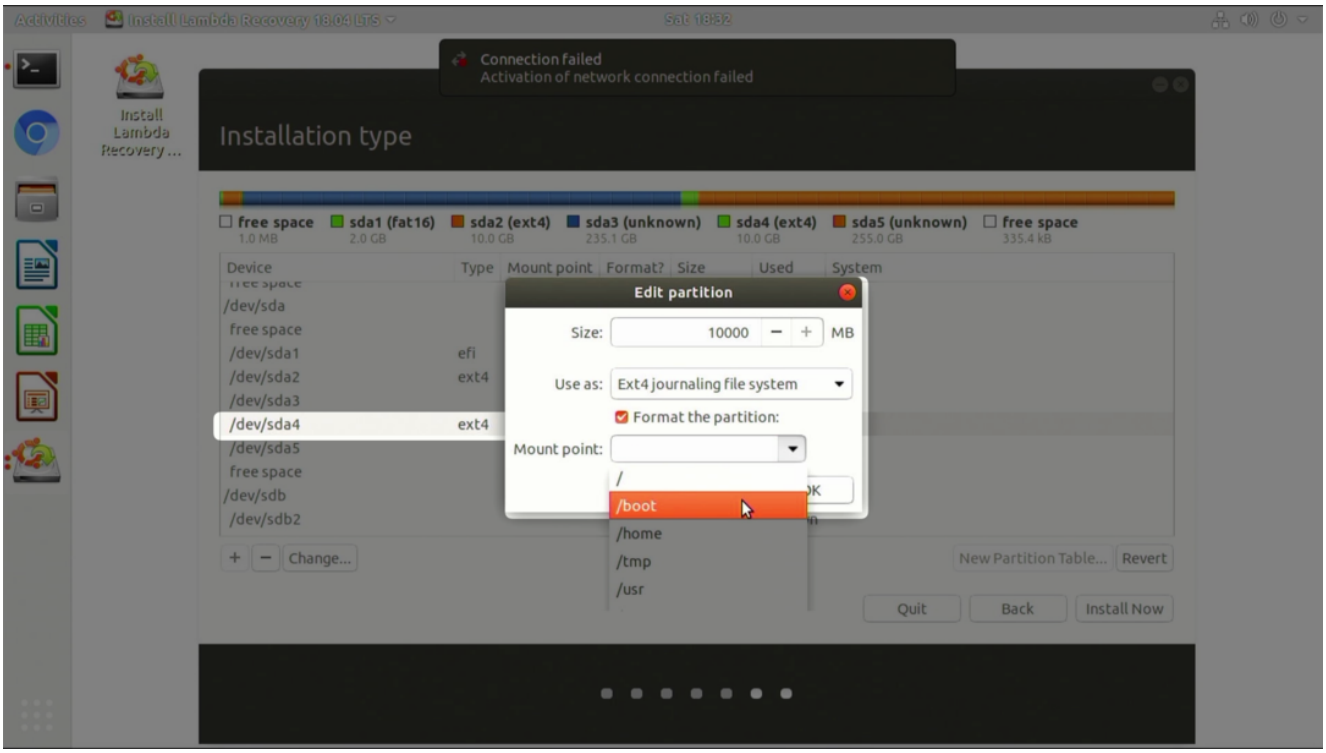
/dev/mapper/luks--1804-swap_1 as 'swap area'

36



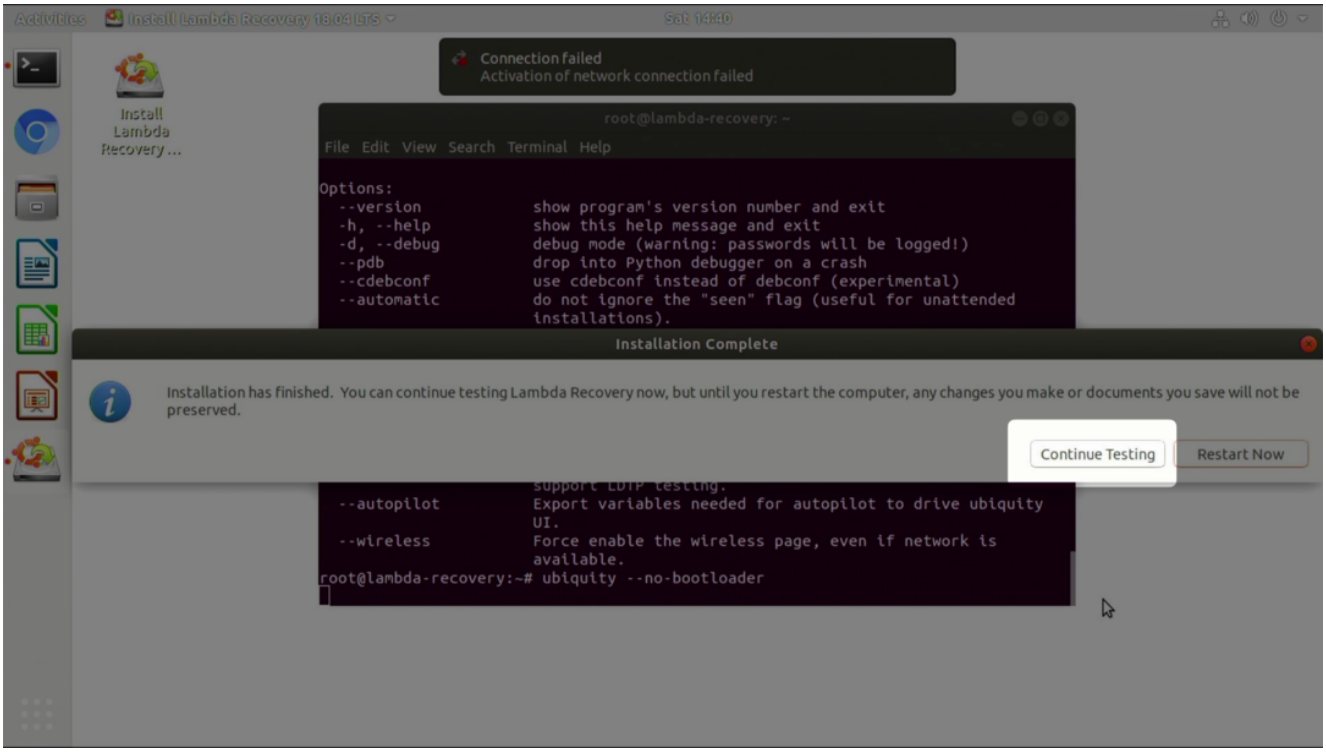
Check that /dev/sda is used as EFI System Partion. No change should be needed here

37



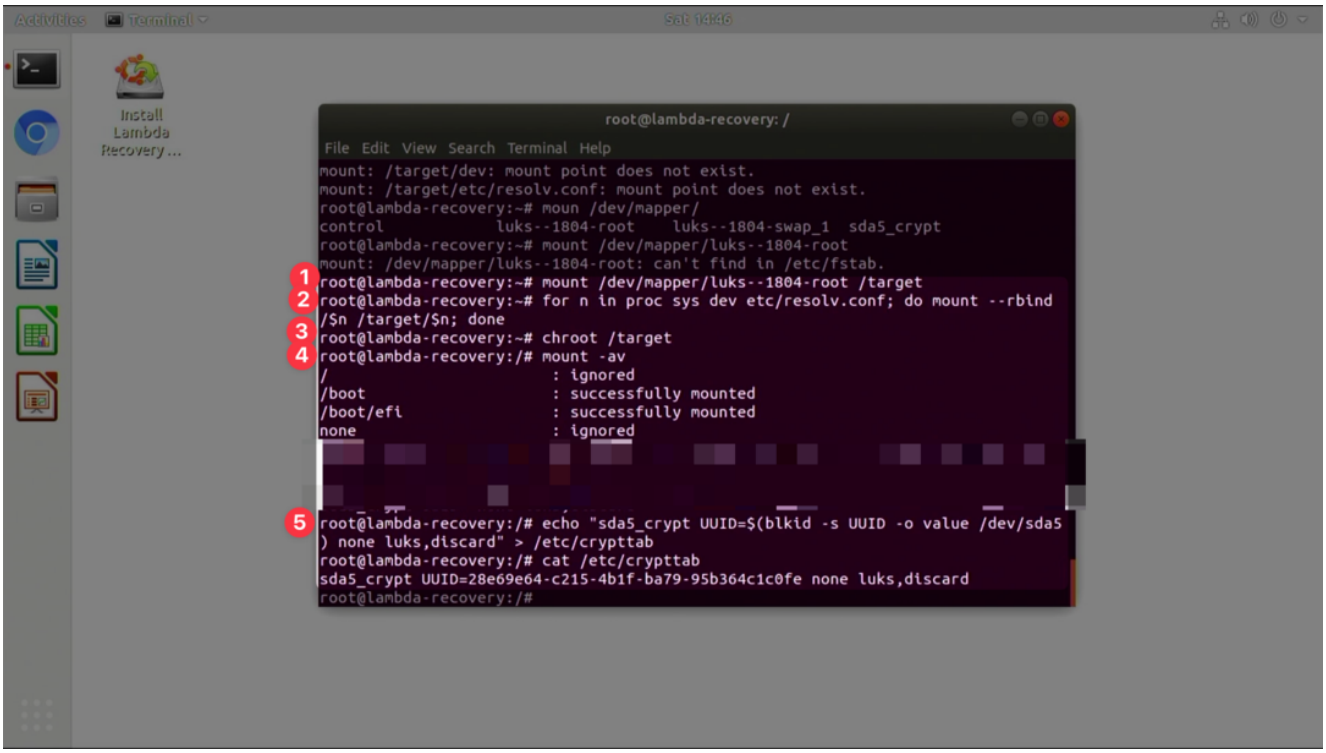
Edit /dev/sda for EXT4, format and mount to '/boot'

38



Install and continue testing upon completion

39



18.04 installer does not handle the LVM to /target mount as well as 20.04 so I ran

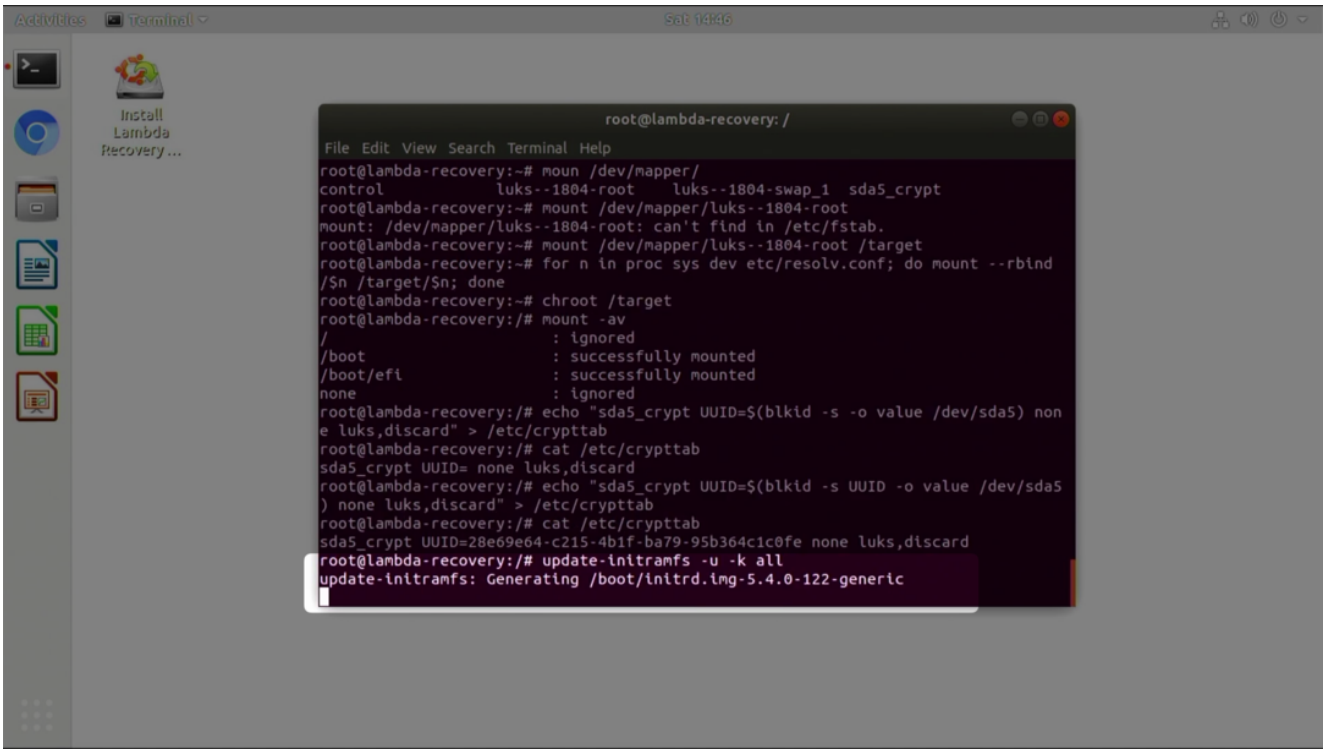
`mount /dev/mapper/luks--1804-root /target`

to mount it /target
then:

```
for n in proc sys dev etc/resolv.conf; do mount --rbind /$n /target/$n; done
chroot /target
mount -av
```

Then, very similar to for 20.04, just shifting from sda3 to sda5, setup /etc/crypttab
`echo "sda5_crypt UUID=$(blkid -s UUID -o value /dev/sda5) none luks,discard" > /etc/crypttab`

40



`update-initramfs -u -k all`

so that the initramfs will know about the crypttab

** we are relying on 20.04 GRUB so you do not need to update GRUB **

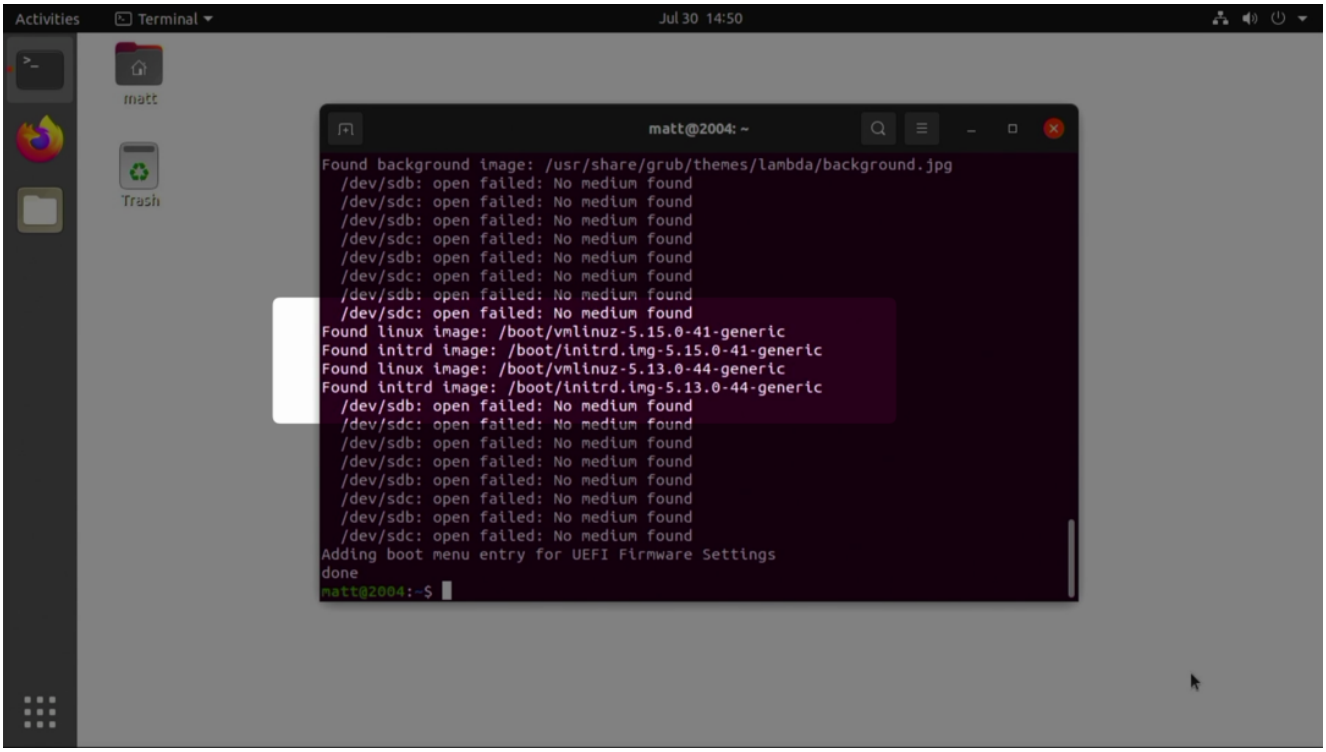
41

This is the GRUB menu for 20.04-- It doesn't know about 18.04 yet so we have one more cleanup task to perform.

Boot into 20.04

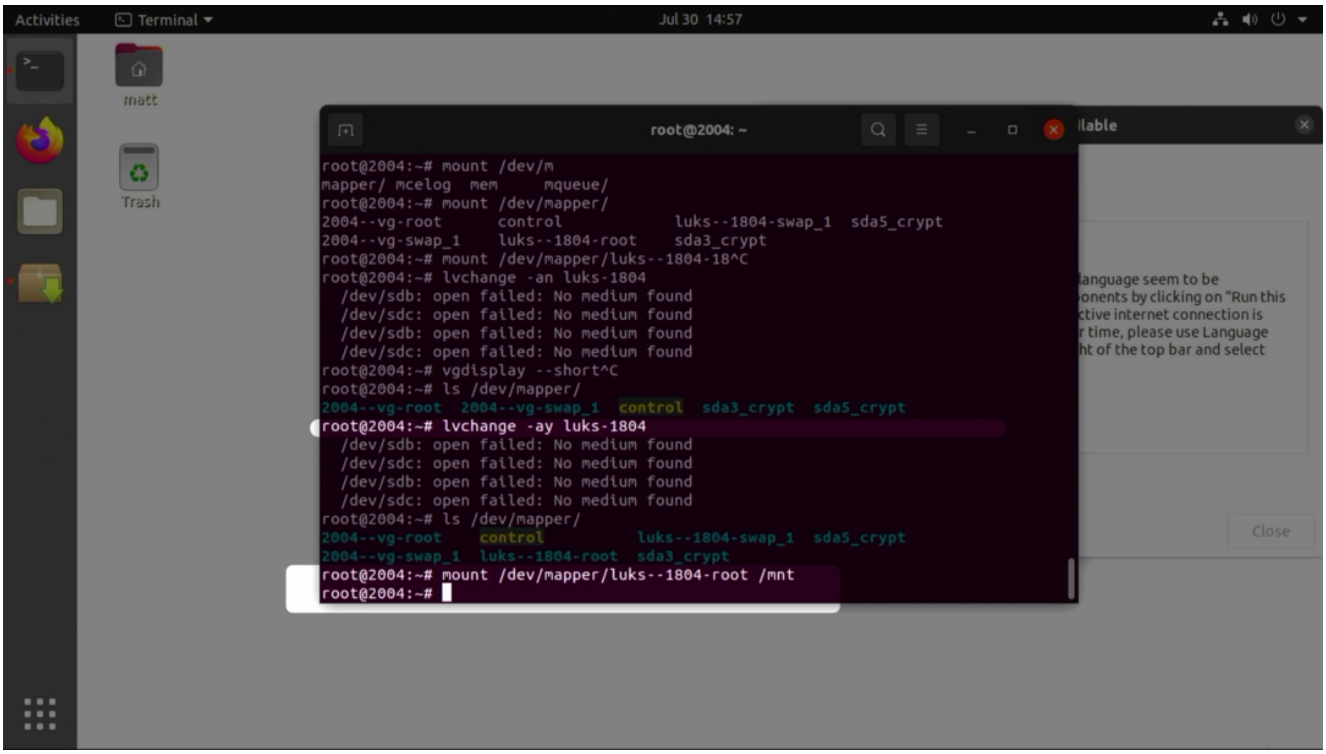
42

43



update-grub is not finding the initrd images for the 5.4 kernel. Rather than forcing it to, we are going to expose the 18.04 install and run again so it sees it as a seperate OS

44




```
** NOT SHOWN ON SLIDE **
decrypt /dev/sda5 and map to expected label of sda5_crypt
cryptsetup open /dev/sda5 sda5_crypt
```

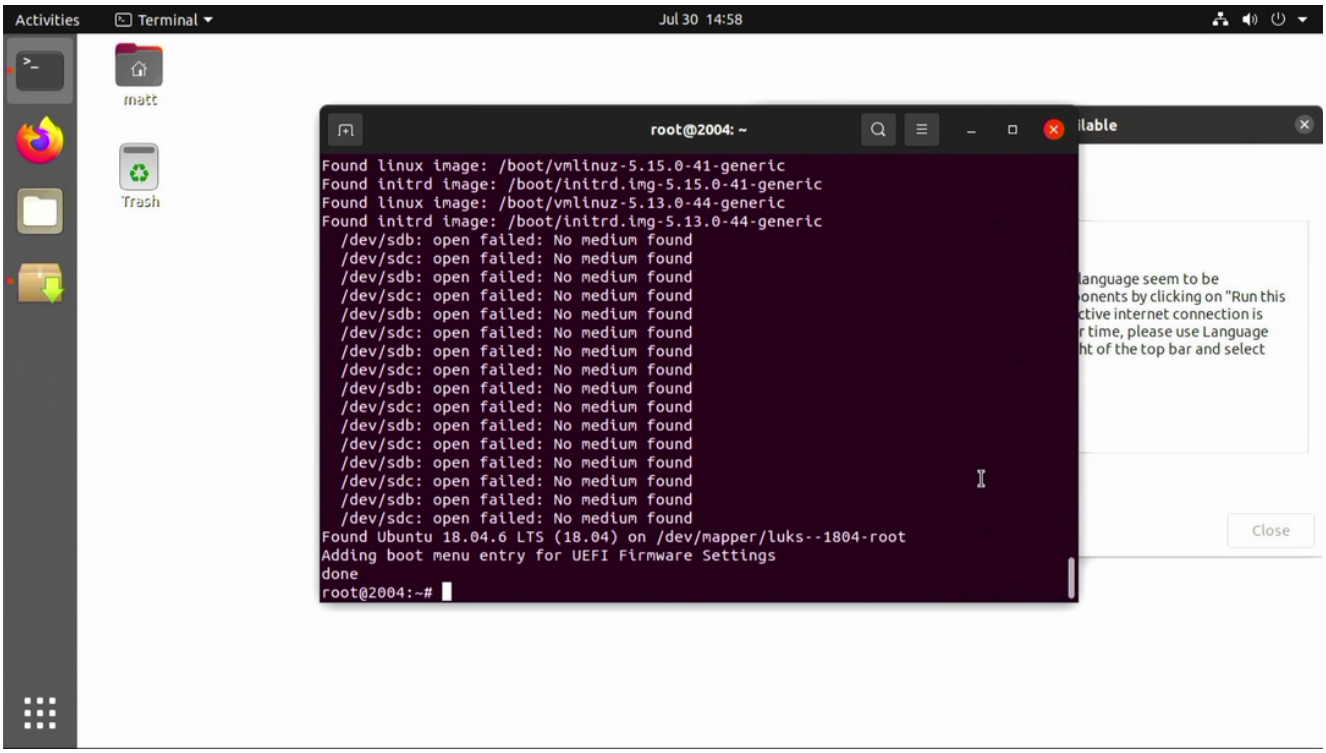
activate root lv

```
lvchange -ay luks-1804
```

mount the lv to /mnt

```
mount /dev/mapper/luks--1804-root /mnt
```

45



Run `update_grub` and it will find 18.04.6 and add a boot menu entry.

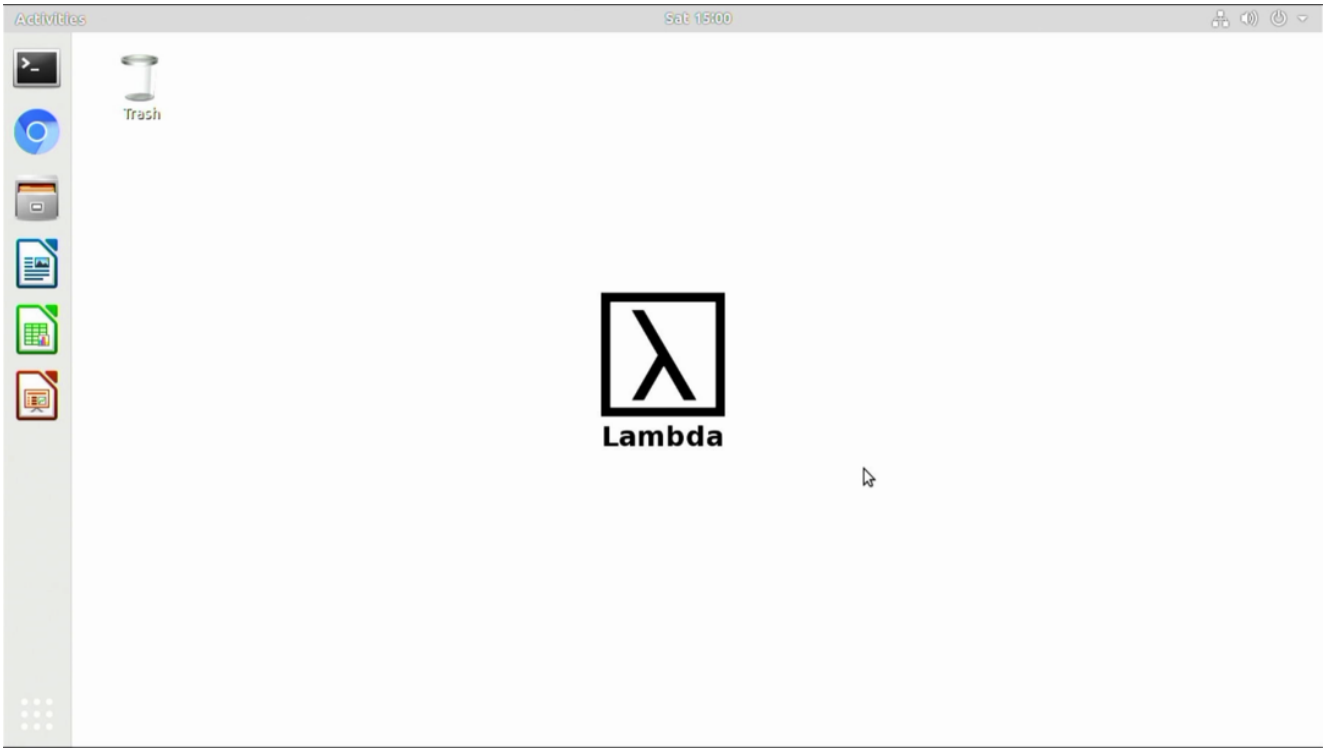
46

18.04 shows up now

47

Prompt to unlock sda5_crypt

48



booted into 18.04