



A guide to create Ubuntu ISO image creation with AMD eMMC driver

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Version History

Version	Date	Change
0.1	05-Nov-2018	Initial draft

1 *Kernel Source compilation*

1. Get the source code using git for the Ubuntu ISO
git://kernel.ubuntu.com/ubuntu/ubuntu-bionic.git
commit commit 22df1539aed949a48dadc5e555d5f82849b19ca0
2. Apply the patches required to enable features on Ubuntu kernel
Example to enable V1000 eMMC driver on Ubuntu kernel, merge the patches available in “patches/ubuntu-iso/” kernel to Ubuntu kernel. (some patches are specific to V1000 and some are specific to Snowy Owl. V1000 specific patches are named with suffix “v1000”)
3. Compile the kernel and copy “arch/x86/boot/bzImage” as vmlinuz- $\$KERNEL_VER$ ($KERNEL_VER = \text{`make kernelrelease`}$) and kernel modules
Commands to build kernel binaries
 - a. mkdir my-binaries
 - b. make
 - c. make modules_install INSTALL_MOD_STRIP=1 INSTALL_MOD_PATH=my-binaries
 - d. cp arch/x86/boot/bzImage my-binaries/vmlinuz- $\$KERNEL_VER$

2 *Preparing directories*

1. Download the ISO image from Ubuntu and extract the ISO image for modification
Example : With ubuntu-18.04.1-desktop-amd64.iso
Commands
 - a. mkdir mnt
 - b. sudo mount -o loop ubuntu-18.04.1-desktop-amd64.iso mnt
 - c. mkdir extract-cd-ubuntu18-desktop
 - d. sudo rsync --exclude=/install/filesystem.squashfs -a mnt/ extract-cd-ubuntu18-desktop
 - e. sudo unsquashfs mnt/casper/filesystem.squashfs
 - f. sudo mv squashfs-root edit-ubuntu18-desktop
 - g. sudo umount mnt
 - h. rm -rf mnt

3 *Copy new modules and kernel*

1. Remove the existing kernel image from ISO and replace new kernel image and copy new kernel modules

Example commands :
 - a. sudo rm -rf edit-ubuntu18-desktop/lib/modules/4.4.0-21-generic
 - b. sudo cp -r my-binaries/lib/modules/ $\$KERNEL_VER$ edit-ubuntu18-desktop/lib/modules/
 - c. sudo cp my-binaries/vmlinuz- $\$KERNEL_VER$ edit-ubuntu18-desktop/boot/

4 ***Build initrd for new kernel***

To use in the ISO image, build the initrd with the new kernel modules

Example commands:

- a. `sudo chroot edit-ubuntu18-desktop`
- b. `update-initramfs -k $KERNEL_VER -c`
- c. `exit`

5 ***Replace old initrd and Kernel in casper***

Example commands

- a. `sudo mv edit-ubuntu18-desktop/boot/vmlinuz-$KERNEL_VER extract-cd-ubuntu18-desktop/casper/vmlinuz.efi`

Or

- b. `sudo mv edit-ubuntu18-desktop/boot/vmlinuz-$KERNEL_VER extract-cd-ubuntu18-desktop/casper/vmlinuz`
 - a. `sudo mv edit-ubuntu18-desktop/boot/initrd.img-$KERNEL_VER extract-cd-ubuntu18-desktop/casper/initrd.img`

6 ***Prepare initrd.lz***

Example commands

```
cd extract-cd-ubuntu18-desktop/casper/  
Sudo mkdir lztempdir  
cd lztempdir  
sudo zcat ../initrd.img | sudo cpio -idmv  
sudo su  
find . | cpio --quiet --dereference -o -H newc | lzma -7 > ../initrd.lz  
exit  
cd ../  
sudo rm -rf lztempdir initrd.img
```

7 ***Regenerate squashfs***

Example commands

```
sudo rm -rf filesystem.squashfs  
cd ../../  
sudo mksquashfs edit-ubuntu18-desktop/ extract-cd-ubuntu18-  
desktop/casper/filesystem.squashfs -comp xz -e edit/boot
```

8 *ISO Image creation*

Update file size and md5 before generation iso image

Example commands

```
sudo su
printf $(du -sx --block-size=1 edit-ubuntu18-desktop | cut -f1) > extract-cd-ubuntu18-
desktop/casper/filesystem.size
exit
cd extract-cd-ubuntu18-desktop/
sudo rm md5sum.txt
find -type f -print0 | sudo xargs -0 md5sum | grep -v isolinux/boot.cat | sudo tee md5sum.txt
```

Now generate iso image

Example command

```
sudo mkisofs -o ../ubuntu-18.04.1.iso -D -r -J -l -b isolinux/isolinux.bin -c
isolinux/boot.cat -no-emul-boot -boot-info-table .
```

9 *References*

1. <https://help.ubuntu.com/community/LiveCDCustomization>