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-$KERNEL_VER
   (KERNEL_VER = `make kernelrelease`) and kernel modules
   Commands to build kernel binaries
   a. `mkdir my-binaries`
   b. `make`
   c. `make modules_install  INSTALL_MOD_STRIP=1   INSTALL_MOD_PATH=my-binaries`
   d. `cp arch/x86/boot/bzImage  my-binaries/vmlinuz-$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 imange 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 commnds

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 commnds

```
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 commnds

```
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 genearate 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*