***Flash Raspberry Pi SD image***

*1. Download the Raspberry-pi- os (Raspberry Pi OS with desktop) from below weblink*

*For 32-bit :-*

*https://www.raspberrypi.com/software/operating-systems/#raspberry-pios-32-bit*

*2. Extract the downloaded image file using below command. This command is applicable only if your downloaded file has extension (img.xz) in Linux*

*• $unxz filename.img.xz*

*Example:*

*root@rama-Inspiron-3501:/home/rama/Downloads# unxz 2023-05-03-raspios-bullseye-armhf.img.xz*

*root@rama-Inspiron-3501:/home/rama/Downloads# ls 2023-05-03-raspios-bullseye-armhf.img*

*3. Above command generates Raspberry pi Image file. Flash this Image file to micro sd card using the below tools By using the below weblink choose the respective OS*

*https://www.balena.io/etcher/*

*4. After flashing Image on SD card, Insert the SD c ard into Raspberry Pi. Connect Keyboard, mouse and HDMI display. Power up on board*

***32 bit Rapsberry Pi-3 kernel compilation***

*1. git clone --depth=1 https://github.com/raspberrypi/linux*

*2. cd linux*

*3. KERNEL=kernel7*

*4. make ARCH=arm CROSS\_COMPILE=arm-linux-gnueabihf- bcm2709\_defconfig*

*5. make ARCH=arm CROSS\_COMPILE=arm-linux-gnueabihf- menuconfig*

*6. make ARCH=arm CROSS\_COMPILE=arm-linux-gnueabihf- zImage modules dtbs*

***Kernel Installation on Raspberry pi- 32 bit***

*• mkdir -p /mnt*

*• mkdir -p /mnt/fat32*

*• mkdir -p /mnt/ext4*

*• sudo mount /dev/sdb1 /mnt/fat32 // boot partition*

*• sudo mount /dev/sdb2 /mnt/ext4 // root FS*

*sudo env PATH=$PATH make ARCH=arm CROSS\_COMPILE=arm-linux-gnueabihf- INSTALL\_MOD\_PATH=/mnt/ext4 modules\_install*

*KERNEL=kernel7*

*• sudo cp /mnt/fat32/$KERNEL.img /mnt/fat32/$KERNEL-backup.img*

*• sudo cp arch/arm/boot/zImage /mnt/fat32/$KERNEL.img*

*• sudo cp arch/arm/boot/dts/\*.dtb /mnt/fat32/*

*• sudo cp arch/arm/boot/dts/overlays/\*.dtb\* /mnt/fat32/overlays/*

*• sudo cp arch/arm/boot/dts/overlays/README /mnt/fat32/overlays/*

*• sudo umount /mnt/fat32*

*• sudo umount /mnt/ext4*

***64 bit Rapsberry Pi-4 kernel compilation***

*Tool chain:*

*sudo apt install crossbuild-essential-arm64*

*1. Download Kernel source code for RP board*

*git clone --depth=1* ***-b rpi-6.5.y*** *https://github.com/raspberrypi/linux.git*

*2. cd linux*

*3. KERNEL=kernel8*

*4. make ARCH=arm64 CROSS\_COMPILE=aarch64-linux-gnu- bcm2711\_defconfig*

*5. make ARCH=arm64 CROSS\_COMPILE=aarch64-linux-gnu- menuconfig*

*6. make ARCH=arm64 CROSS\_COMPILE=aarch64-linux-gnu- Image modules dtbs*

***Kernel Installation on Raspberry pi- 64 bit***

*• mkdir -p /mnt/fat32*

*• mkdir -p /mnt/ext4*

*• sudo mount /dev/sdb1 /mnt/fat32 // boot partition*

*• sudo mount /dev/sdb2 /mnt/ext4 // root FS*

*sudo env PATH=$PATH make ARCH=arm64 CROSS\_COMPILE=aarch64-linux-gnu- INSTALL\_MOD\_PATH=/mnt/ext4 modules\_install*

*KERNEL=kernel8*

*sudo cp /mnt/fat32/$KERNEL.img /mnt/fat32/$KERNEL-backup.img*

*sudo cp arch/arm64/boot/Image /mnt/fat32/$KERNEL.img*

*sudo cp arch/arm64/boot/dts/broadcom/\*.dtb /mnt/fat32/*

*sudo cp arch/arm64/boot/dts/overlays/\*.dtb\* /mnt/fat32/overlays/*

*sudo cp arch/arm64/boot/dts/overlays/README /mnt/fat32/overlays/*

*sudo umount /mnt/fat32*

*sudo umount /mnt/ext4*

RX Path: 128 \* sizeof(struct buffer\_desc)

virt = dma\_alloc\_coherent(...,phy); 0xA0000000

rphy + sizeof(bd) \* NUM\_128;

0x2000

Status

....

Next

SKBuffer

Status

....

Next:

0xA000040

Status

....

Next: 0xA000060

SKBuffer

Status

....

Next

SKBuffer

Status

....

Next : 0xA00020

SKBuffer

Phys