RASPBERRY PI DOCUMENT

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Cross Compilation and Booting of Linux kernel for Raspberry Pi3 – Manual Compilation

1.Download Linux kernel source code from raspberry pi git:-

$.mkdir -p /home/myuser/rpi
$.cd /home/myuser/rpi
$.git clone git://github.com/raspberrypi/linux.git --depth=1
This will download the default HEAD branch from the remote repository:-
$.cd linux
$.git branch (* rpi-4.9.y)

Downloading toolchain:-

$.cd /home/myuser/rpi
$.git clone https://github.com/raspberrypi/tools --depth 1
$.cd tools
$.git branch (* master)

Export toolchain path:-

$.export PATH=$PATH:/home/myuser/rpi/tools/arm-bcm2708/arm-bcm2708-linux-gnueabi/bin

Configuring Linux Kernel:-

$.cd linux

default configuration file for RPi3 is arch/arm/configs/bcm2709_defconfig

$.make ARCH=arm CROSS_COMPILE=arm-bcm2708-linux-gnueabi- bcm2709_defconfig

Above command will do the default configuration of kernel for compilation for RPi
Now, we will compile the kernel to create kernel binary using below command,

$.make ARCH=arm CROSS_COMPILE=arm-bcm2708-linux-gnueabi- zImage modules dtbs

This command will create, kernel zImage at arch/arm/boot/zImage

$.file arch/arm/boot/zImage
arch/arm/boot/zImage: Linux kernel ARM boot executable zImage (little-endian)

Now, we have to copy this image into first partition of the SD card by using standard name as "kernel7.img" as,

$.sudo cp -r arch/arm/boot/zImage /media/myuser/raspberrypi/kernel7.img

Assuming that first partition of sdcard is mounted at /media/myuser/raspberrypi/ (you can check same using df -h command).Now, put unmount this SD card and put to RPi and power ON RPi,You can check now the booted kernel is what we manually compiled as,

$.root@raspberrypi3:~# cat /proc/version

Linux version 4.9.45-v7+ (myuser@myhost) (gcc version 4.7.1 20120402 (prerelease) (crosstool-NG 1.15.2)) #1 SMP Mon Aug 28 19:52:58 IST 2017.