Porting of U-boot on Raspberry-pi3

1.Steps To Partitioning SD card

STEP 1: Insert a SD card in to the card reader and connect it to the PC ,after detecting the SD card, from the following command we can see SD card partition.

```
$sudo fdisk -l
```

Note:- it will show something like below location.

/dev/sdc

STEP 2: For creating partitions execute the below command

```
sudo fdisk (location of SDcard)
```

STEP 3: Execute the below character to list out all the partition's

```
p
```

STEP 4: Execute the below character to delete the partition

```
d
```

STEP 5: Execute the below character sequentially to create new partitions

i) To create a new partition

```
n
```

ii) Partition it would be in primary

```
p
```

iii) No. Of Partitions

```
1
```

iv) For default starting value of primary partition

```
[enter]
```

v) For default size of the primary partition

```
[enter]
```

STEP 6: Execute the below character to activate / boot the primary partition

```
a
```

i) To activate the which partition

```
1
```

STEP 7: Execute the below character to changing the partition type to FAT32

```
t
```

i) Select the partition number

```
1
```

ii) For creating FAT32 file system

```
c
```

STEP 8: Execute the below character to write all information in to the new partition

```
w
```

2.Steps To building U-boot image for Rpi-3

Prerequeset:

Cross Compililer : arm-linux-gnueabi-

GCC : GCC Version should be greter than gcc 6.0
Ubuntu : Ubuntu 14.04 or more

STEP 1: Install cross compiler and export environment variables:
Run below command to get a ARM based linaro cross compiler.

```
$ sudo apt-get install gcc-arm-linux-gnueabi
```

STEP 2: Download the U-Boot source from the below link

Get the source code by cloning the U-Boot git repository :

```
$   git clone --depth 1 --branch v2017.11 git://git.denx.de/u-boot.git v2017.11
```

or download the tar file :

```
$   wget ftp://ftp.denx.de/pub/u-boot/u-boot-2017.11.tar.bz2
```

STEP 3: Compile U-Boot
Go to the folder using below command.

```
$ cd V2018.11

$   sudo make -C v2017.11/ CROSS_COMPILE=aarch64-linux-gnu- rpi_3_defconfig
$   sudo make -C v2017.11/ CROSS_COMPILE=aarch64-linux-gnu-
```

After downloading the U-Boot source. it will create a folder, name as **V2018.11**. After executing all above steps do ' **ls**' command, you can see below images in your folder
u-boot.bin,u-boot.lds,u-boot.map,u-boot.srec

Filename	Description
System.map	The symbol map
u-boot	U-Boot in ELF binary format
u-boot.bin	U-Boot raw binary image that can be written to the boot storage device
u-boot.srec	U-Boot image in Motorola's S-Record format

Steps to copying u-boot ino sd card

STEP 1: Use below link to download **bootcode.bin** and **start.elf** according to rpi supported images and copy in to your sdcard.

```
https://github.com/raspberrypi/firmware/tree/master/boot
```

STEP 2: Insert the SD card into card reader and connect the USB of card reader to CPU.

STEP 3: You will see a window on monitor, after connecting USB to the CPU

STEP 4: Copy the below images into SDcard location using below commands from command line. u-boot.bin, bootcode.bin, start.elf,and config.txt

STEP 5: Give following commands.

```
$ mount
```

By putting above command we will get sd card location on which bootable partition is mounted.

```
$ cp u-boot.bin (location of SDcard)
```

then follow below commands replacing with your sdcard location.

```
# cp bootcode.bin media/abc/FCF1-DD00/
# cp start.elf /media/abc/FCF1-DD00/
# vim /media/abc/FCF1-DD00/config.txt
```

write config.txt as below:

```
# Serial console output!
enable_uart=1

# 64bit-mode
arm_control=0x200

# Use U-Boot
kernel=u-boot.bin

dtparam=i2c_arm=on
dtparam=spi=on
```

Interfacing with minicom

Connections of RPI:-

1. Insert the SD card containing card reader into RPI board memory card slot.
2. Connect the RPI Tx and Rx pins to RS-232 serial converter.
3. Connect the RS-232 USB to CPU.

RPI GPIO pin number	**USB-to-TTL pins**	**Description**
8	Tx	Rx
10	Rx	Tx
6	GND	GND

Steps to use minicom to check the output:-

STEP 1: To open the minicom first install minicom using below command

```
$ sudo apt-get install minicom
```

STEP 2: put command dmesg,so that you will get exat address of connectiong device(USB-to-TTL)

```
$ dmesg
```

STEP 3: Use below command to open the minicom to see the output.

```
$ sudo minicom  -s
```

STEP 4: you will get a configuration menu after opening the minicom.

STEP 5: set **Serial port setup** as below

Serial Device	/dev/ttyUSB0
Bps/Par/Bits	115200 8N1
Hardware Flow Control	No
Software Flow Control	No

STEP 6: Give supply to Rpi3 board, **U-boot>** prompt should be come on minicom screen.