

Copying HPS Executables/Binaries to the microSD Card you use with your DE1-SoC Board

Method #1: Using an Ethernet connection of the board to your router

The easiest method to copy executables (such as the “my_first_hps” executable of the first example from lec07) to the **/home/root** directory of your micro SD Card that has the bootable Linux, is to connect the DE1-SoC board with an Ethernet cable to your home router or switch, and then to transfer using “scp” command the executable over the Internet to the board – as described in the lec07 document of my class. You should be able to do that at home; I did that in my office; it works.

Method #2: Using a USB memory stick/driver

Copy the binary “de1_soc” to a USB memory stick.

Insert the USB stick to J8 USB port of the DE1-SoC board (notice the messages in your Putty terminal).

In your Putty terminal do the following to get an idea of what kind of partitions you have:

>fdisk -l

This is what I got when I did that:

```
root@socfpga:/dev# fdisk -l
```

```
Disk /dev/mmcblk0: 16.0 GB, 16005464064 bytes
4 heads, 16 sectors/track, 488448 cylinders, total 31260672 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0xd68e23ba
```

Device	Boot	Start	End	Blocks	Id	System
/dev/mmcblk0p1		2121728	3799447	838860	b	W95 FAT32
/dev/mmcblk0p2		14336	2111487	1048576	83	Linux
/dev/mmcblk0p3		2048	4095	1024	a2	Unknown

Partition table entries are not in disk order

```
Disk /dev/sda: 31.0 GB, 31042043904 bytes
65 heads, 1 sectors/track, 932753 cylinders, total 60628992 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x9893c713
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1		8064	60628991	30310464	c	W95 FAT32 (LBA)

```
root@socfpga:/dev#
```

Mount the USB:

>mount /dev/sda1 /mnt/

If all is ok, and if you do an “ls” to that location, you should see the files on the memory stick, like so for instance:

```
root@socfpga:~# ls /mnt
System Volume Information  de1_soc2021
root@socfpga:~# pwd
/home/root
root@socfpga:~#
```

In this example, I have on the memory stick just the binary “de1_soc2021”, which I’ll copy to the current /home/root location, from where we execute the binaries for HPS+FPGA systems:

```
root@socfpga:~# cp /mnt/de1_soc2021 .
```

At this time, you can execute the binary “de1_soc2021”!

Unmount the USB drive:

```
>umount /dev/sda1
```

You can now remove the USB drive from the DE1-SoC board.

When you are done using the board, do not forget to first shut down the Linux first, before powering off the board from the red-button! Like so:

```
>shutdown -h now
```

Method #3: Accessing directly the microSD card on your laptop

If the previous methods do not work (because you do not have an Ethernet port available, etc.), then, we need a method to copy the executable from our laptop/PC to the micro SD Card directly. I assume you have a direct card reader port on your laptop or you have a USB card reader (I have a USB based card reader that you can borrow from me).

To be able to see the Linux partition from the micro SD Card, one can use different methods; most of which would require one to install some software first. Googling will point you to several such tools. I tried a few, and the one that worked for me is this software:

<https://sourceforge.net/projects/ext2fsd/files/Ext2fsd/0.53/> (note it is version 0.53)

So, download and install it on your laptop.

Then, plug in the microSD Card into your card reader on your laptop.

Using the Ext2 Volume Manager (right click and Run as Administrator) that you just installed, you should be able to browse the EXT3 Linux partition of your micro SD Card, and be able to access (read/write) files.

Read basic steps of this method are explained with some figures here:

<https://www.howtogeek.com/112888/3-ways-to-access-your-linux-partitions-from-windows/>
<https://techjourney.net/access-read-write-linux-ext2-ext3-ext4-hfs-reiserfs-filesystem-partitions-in-windows/>

Basically, after you start Ext2 as administrator:

- Select the Volume EXT3 for your microSD card (in the upper half of the Ext2 GUI)
- Tools --> Service Management and start the Ext2Fsd service
- When the main app window opens, look for the drive you just attached (it will have an EXT2 or EXT3 file system); that is the microSD card.
- Right-click the newly attached drive listing in the window.
- Select Change Drive Letter.
- In the resulting window, click the Add button.
- Select the drive letter you want associated with the drive.
- Select the mount option you want to use.

- Click the OK button.
- Click the Done button.
- Open an Windows Explorer to access your Linux files.