Kernel parameter
With serial console.

console=ttyO2,115200n8 mem=450M

With frame buffer console.

mem=450M

How to bring up the panda board in 3.10-SS

Connect the micro-SD card in the card reader and connect the card reader to a linux PC.

Create two partitions

-- Prepare U-Boot
-- Flash the U-Boot from linaro to the SD card.

```
$ export URL=http://releases.linaro.org/13.06/ubuntu/panda/panda-raring_developer_20130623-376.img.gz
$ curl $URL | gunzip | sudo dd bs=64k of=/dev/sdd
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  189M  100  189M    0     0   351k      0  0:09:10  0:09:10 --:--:--  320k
112+32544 records in
112+32544 records out
1073741824 bytes (1.1 GB) copied, 550.892 s, 1.9 MB/s
$ sudo sync
```

Prepare boot.scr

Create a file named boot.txt with the following contents (Basically containing the necessary bootargs. The boot.scr from linaro boots the uImage and root filesytem from the SD MMC card)

usb reset

```
setenv ipaddr 10.2.2.42
setenv serverip 10.2.22.1
setenv dtbpath "arm/panda/omap4-panda-a4.dtb"     <<---- NOTE, If you are using PandaBoard A4
setenv dtbpath "arm/panda/omap4-panda-es.dtb"     <<---- NOTE, If you are using PandaBoard ES

(B series)
setenv dtbpath "arm/panda/omap4-panda.dtb"        <<---- NOTE, If you are using other

PandaBoards
setenv dtbaddr 0x815f0000
setenv initrd_high "0xffffffff"
setenv fdt_high "0xffffffff"
setenv bootargs 'console=tty0 console=ttyO2,115200n8 mem=456M@0x80000000 mem=512M@0xA0000000 root=/dev/nfs rw nfsroot=10.2.22.1:/tftpboot/arm/panda ip=10.2.2.42 rootdelay=30'
setenv bootcmd 'tftp 0x80200000 arm/panda/uImage; tftp ${dtbaddr} ${dtbpath};bootm 0x80200000 - ${dtbaddr}'
boot
```

```
mkimage -A arm -O linux -T script -C none -a 0 -e 0 -n "Panda SD Boot" -d boot.txt boot
```

Create a file boot.scr from boot.txt

$ sysopy boot.scr to the boot partition of the SD card.

```
$ sudo cp boot.scr /media/boot/
```

Attach the micro-SD card to the target board and reset the target.

Q.How to bring up the panda board in 3.10-SS using rootfs on SD card

Connect the micro-SD card in the card reader and connect the card reader to a linux PC.

Creating Partitions on the SD card

Create 2 partitions on SD card:
Use fdisk to create partitions:

```
$ sudo fdisk /dev/sdb
```

Create a new partition, partition 1:

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-30679039, default 2048):
Using default value 2048
Last sector, +sectors or +sizeK,M,G (2048-30679039, default 30679039): +8M
```

Set the first partition as W95 FAT32 (LBA) using the t command and entering the Hex code c.

```
Command (m for help): t
Selected partition 1
Hex code (type L to list codes): c
```

Set the bootable flag on the first partition using the a command.

```
Command (m for help): a
Partition number (1-4): 1
```

Create a second primary partiion using the n command. This partition will be a linux partition for storing the root filesystem. It will fill the rest of the SD card.

```
Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4, default 2): 2
First sector (18432-30679039, default 18432):
Using default value 18432
Last sector, +sectors or +sizeK,M,G (18432-30679039, default 30679039):
Using default value 30679039
```

Verify that the partition table is correct by using the p command. It should look similar to the following:

```
Command (m for help): p

Disk /dev/sdb: 15.7 GB, 15707668480 bytes
64 heads, 32 sectors/track, 14980 cylinders, total 30679040 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: 0x6eaae8f8
```

```
   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1   *        2048       18431        8192    c  W95 FAT32 (LBA)
/dev/sdb2           18432    30679039    15330304   83  Linux
```

This step will destroy all data on the SD Card - Write the partition table to the card using the w command.

```
Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: If you have created or modified any DOS 6.x
partitions, please see the fdisk manual page for additional
information.
Syncing disks.
```

Format the first partition of the SD card with a FAT filesystem using the mkfs.vfat tool.

```
$ sudo /sbin/mkfs.vfat -n boot /dev/sdb1
```

Format the second partition using an ext4 filesystem using the mkfs.ext4 tool.

```
$ sudo /sbin/mkfs.ext4 -L rootfs /dev/sdb2
```

Once you have a properly partitioned SD card, you can then populate it with the boot files. The partitions are usually automounted under /media, but if not, you can use the mount command to mount the partition to an arbitrary location.

```
   $ sudo mount /dev/sdb1 /media/boot
   $ sudo mount /dev/sdb2 /media/rootfs
```

Creating boot.scr for setting the bootargs

Create the following boot.txt file:

```
setenv dtbaddr 0x815f0000
setenv fdt_high "0xffffffff"
setenv initrd_high "0xffffffff"
setenv dtbfile "omap4-panda-a4.dtb"
setenv bootargs "console=tty0 console=ttyO2,115200n8 mem=456M@0x80000000 mem=512M@0xA0000000 root=/dev/mmcblk0p2 ip=10.2.2.42 rw rootwait"
setenv bootcmd "mmc rescan;fatload mmc 0:1 0x80200000 uImage;fatload mmc 0:1 ${dtbaddr} ${dtbfile};bootm 0x80200000 - ${dtbaddr}"
boot
```

Create a file boot.scr from boot.txt

```
$ mkimage -A arm -O linux -T script -C none -a 0 -e 0 -n "Panda SD Boot" -d boot.txt boot.scr
```

Flash the u-boot.img, MLO, boot.scr uImage and dtb file in the first partition.

```
cp -r boot.scr MLO u-boot.img omap4-panda-a4.dtb uImage /media/boot
```

Copy the rootfs in the second partition:

```
cp -r /tftpboot/arm/panda/* /media/rootfs
```

How to Build U-boot Image

checkout uboot source from linaro

```
# git clone git://git.linaro.org/boot/u-boot-linaro-stable.git
```

for PandaBoard ES B3, use uboot source from svt

```
# git clone https://github.com/svtronics/u-boot-pandaboard-ES-RevB3.git
```

The source which was used to build uboot for BDK TE release had the following commit id

```
commit 921ce9c32de5561c27e000b11218de74437d462e
Author: Alexander Graf <agraf@suse.de>
Date:   Thu Mar 21 18:19:39 2013 +0100

    Exynos5: Fix errata 773022 and 774769 on Exynos5250
```

for PandaBoard ES B3, use the following commit id

```
commit 0f459411f79975ce0f16ce11590b36feb0c2e864
Author: svtronics <svtronics.com>
Date:   Fri Sep 27 15:10:35 2013 +0530

    Adding support for Elpida RAM for pandaboard-ES Rev B3
```

For this particular source, value of " CONFIG_SYS_MAXARGS" in include/configs/omap4_common.h file was changed from "32" to "64", as help command on uboot command was not working properly.

Build uboot

```
# cd u-boot-linaro-stable/  or cd u-boot-pandaboard-ES-RevB3/ (for PandaBoard ES B3)
# export CROSS_COMPILE=arm-linux-gnueabihf-
# make omap4_panda_config
# make
```

Copy u-boot.img and MLO to boot partition

How to Build the kernel Image

To Build the kernel, clone the repository: 43.4.54.59:export/git/linux-3.10.y-BRANCH_SS.git.

Since, we are building it through armhfs, we export the following parameters :

```
export ARCH=arm
export CROSS_COMPILE=arm-linux-gnueabihf- or USCEL armhf (majorly required)
```

Use the setup script :

```
# setup-panda-smp
```

Build the kernel as :

```
# make uImage LOADADDR=0x80008000
```

Build the DTB as:

```
# make dtbs
```

Copy the uImage and omap4-panda.dtb for PandaBoard A4 or omap4-panda-es.dtb for PandaBoard ES or omap4-panda.dtb for other PandaBoards? to tftp folder and boot the target.

NOTE, Please use appropriate DTB file depending on your PandaBoard revision

Build the kernel modules as:

```
# make modules
```

Install the kernel module at Respective location

```
# make modules_install INSTALL_MOD_PATH=<User_created_Directory>
```