DreamPlug - Change OS From Ubuntu to Debian

V 0.3
June 17,2011

I. Document History

Version	Date	Author	Description
V0.1	May 7, 2011	Globalscale	First Draft
V0.2	May 19, 2011	Globalscale	Upgrade the filesystem making procedure
V0.3	June 17, 2011	Globalscale	Add steps of partitions re-creating on internal uSD card

II. Obligation and Responsibility

We recommend that only experienced Linux programmers should undertake this project, and done at their own risk, as any changes from the original factory settings will invalidate the warranty.

III. Introduction

DreamPlug is a powerful, low-cost development platform, which is based on Marvell high-performance, highly integrated controller 88F6281. The DreamPlug internal micro SD card for boot-up has two partitions- one is a DOS file system(fat16) where the kernel image is stored, the other partition is Linux file system(ext3) with a root file system. The default file system of DreamPlug is Ubuntu 9.04. This document provides the procedure to set up a new file system-Debian5.0 for the DreamPlug to take the place of the pre-installed Ubuntu 9.04.

IV. Prerequisites

The prerequisites for set-up a Debian file system on DreamPlug are mentioned below:

1. Linux Host with GParted installed.
2. Globalscale External JTAG Board for access to the DreamPlug console.
3. 2GB or above USB storage disk, used for another boot-up device.
4. The kernel image and Debian file system for DreamPlug. For the latest Debian file system and kernel image, please go to the following websites. Here a Debian file system named dreamplug_debian_v0.2.tar.gz is used.
   http://www.globalscaletechnologies.com/t-downloads.aspx
   http://code.google.com/p/dreamplug/downloads/list

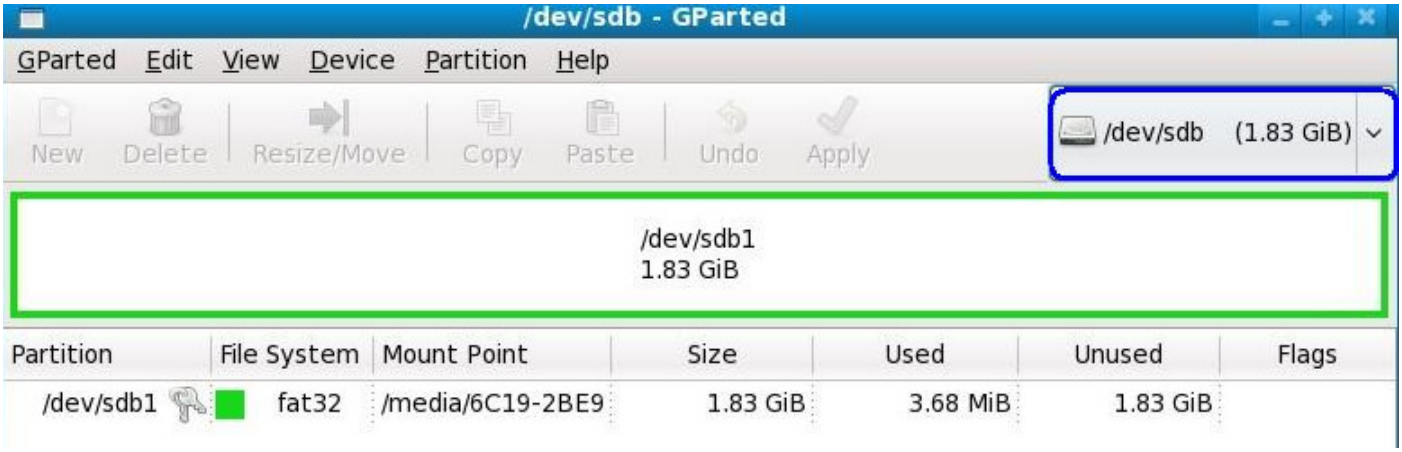
V. Procedure

1. Use GParted to create an ext3 file system in the USB stick

1.1 Connect the USB storage disk to the Linux Host and launch the GParted Partition Editor. If the GParted is not installed, please issue the following command in your Host (assumed the network is connected) for auto-installation.

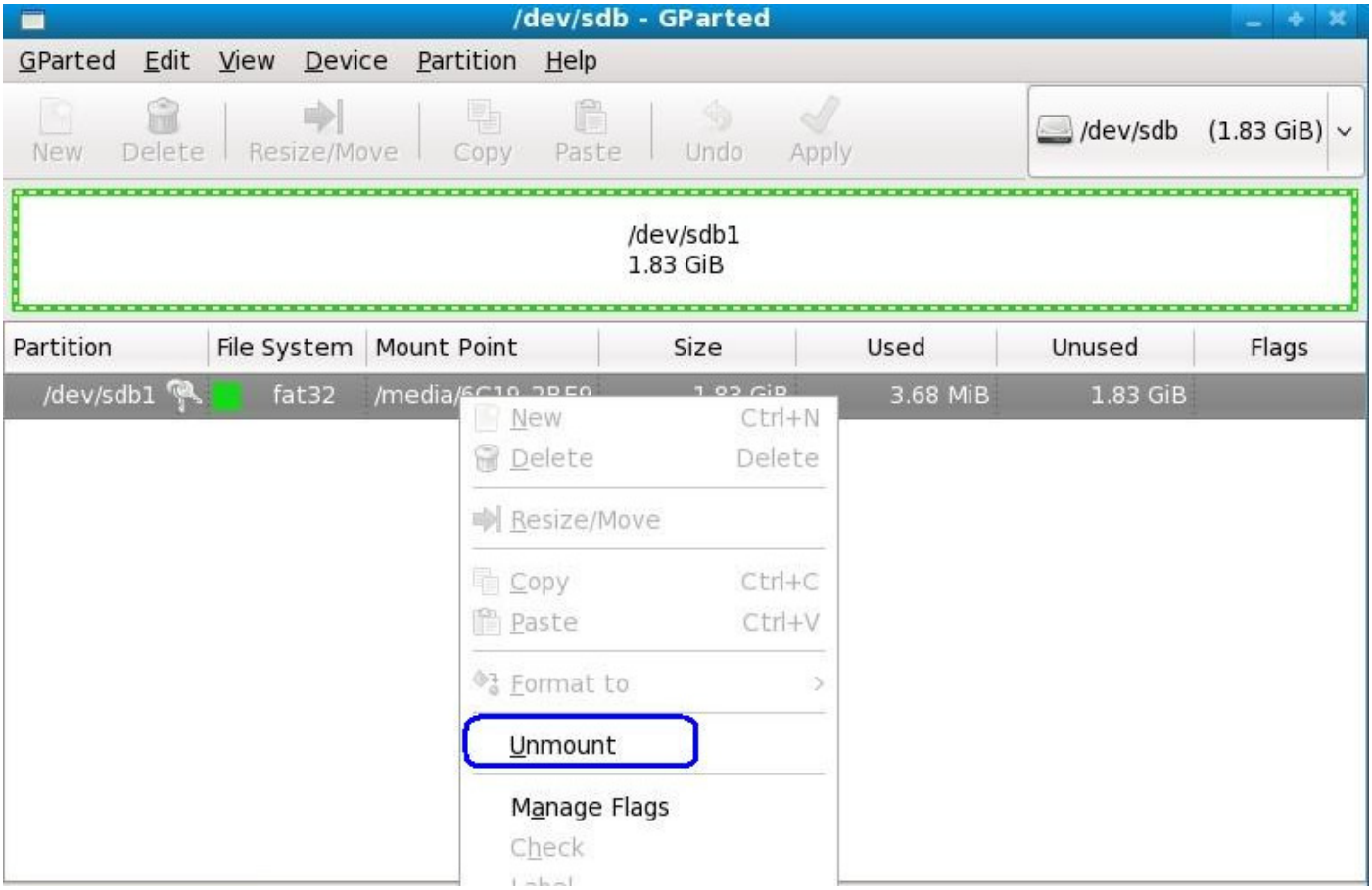
#yum -y install gparted

1.2 Select the USB stick in GParted. Make sure which device is the USB stick.

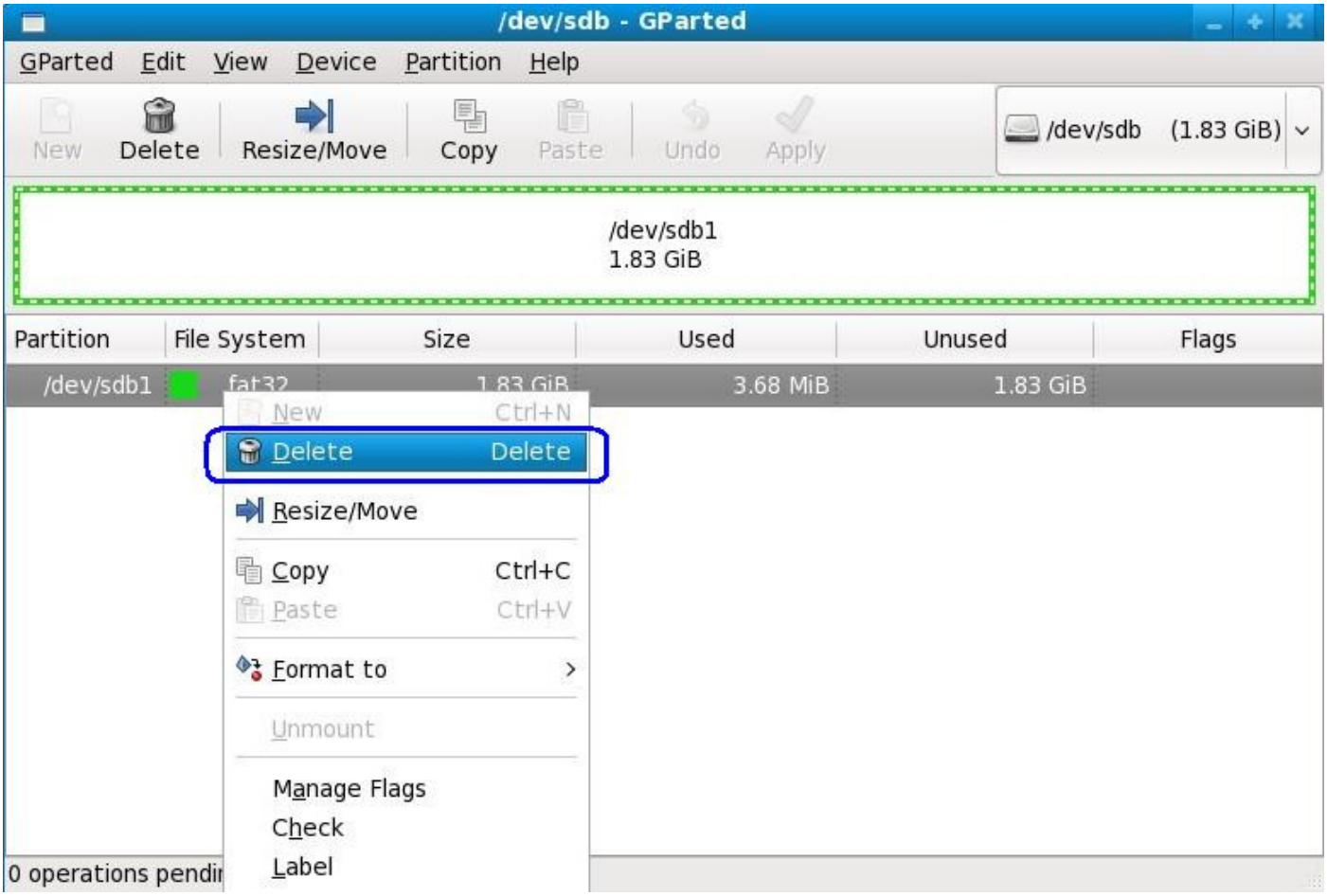


Here let's assume the USB stick is detected as /dev/sdb by the Host.

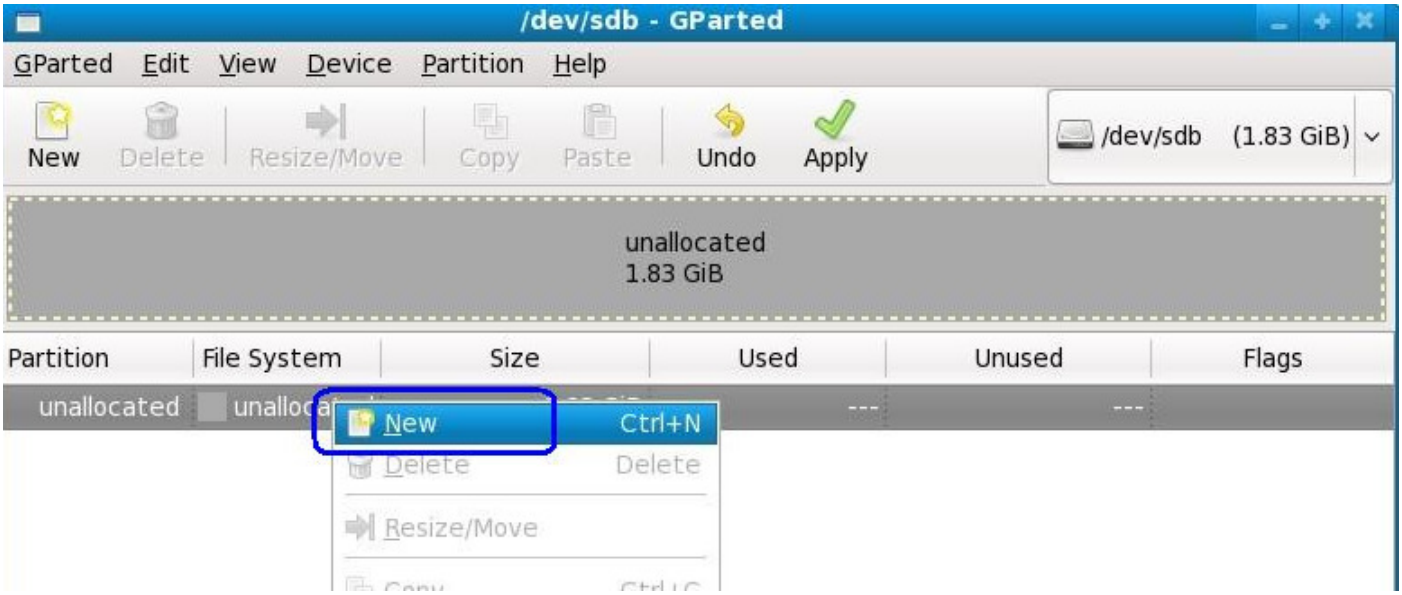
1.3 Unmount all partitions in the USB stick



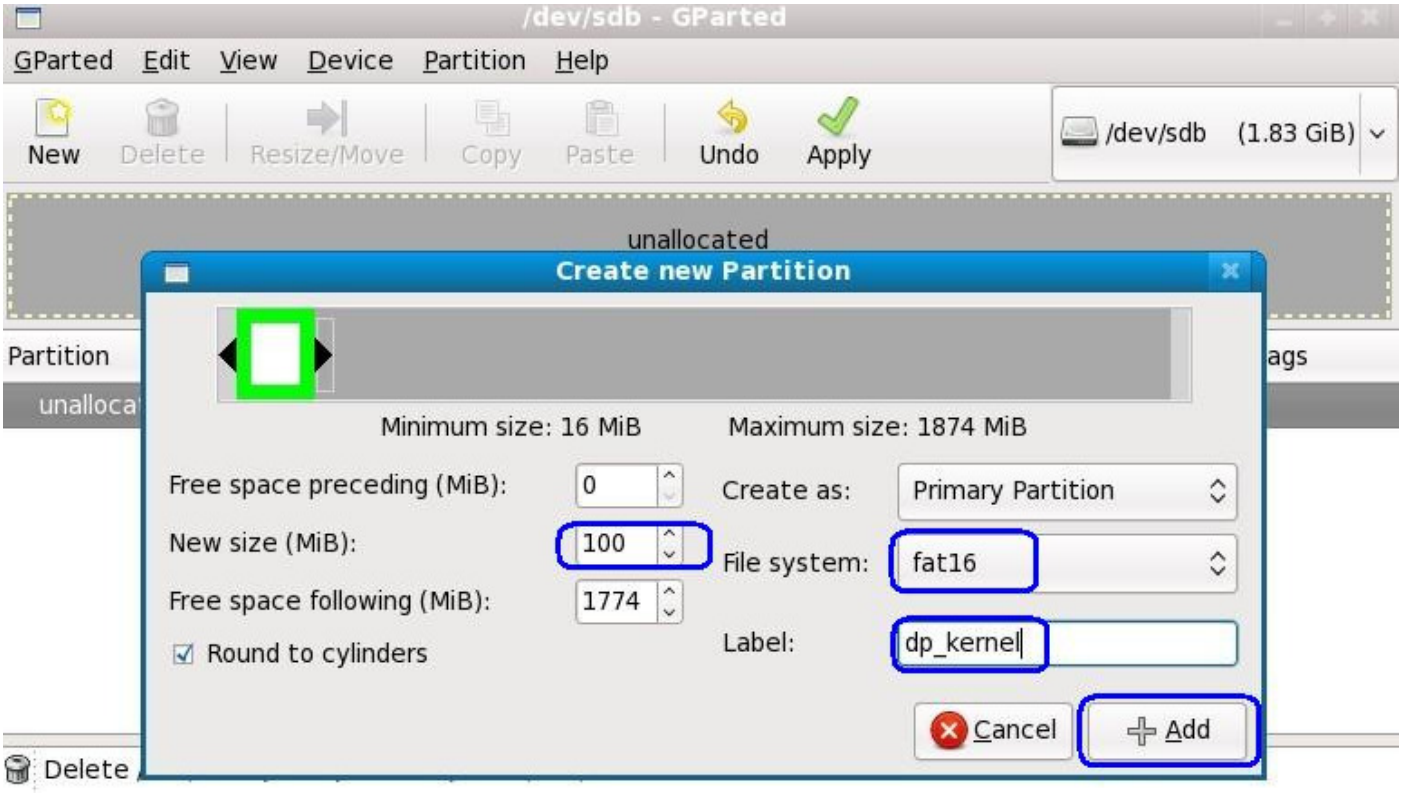
1.4 Delete all partitions in the USB stick. Note: that when this behavior is applied, all data in the USB stick will be lost.



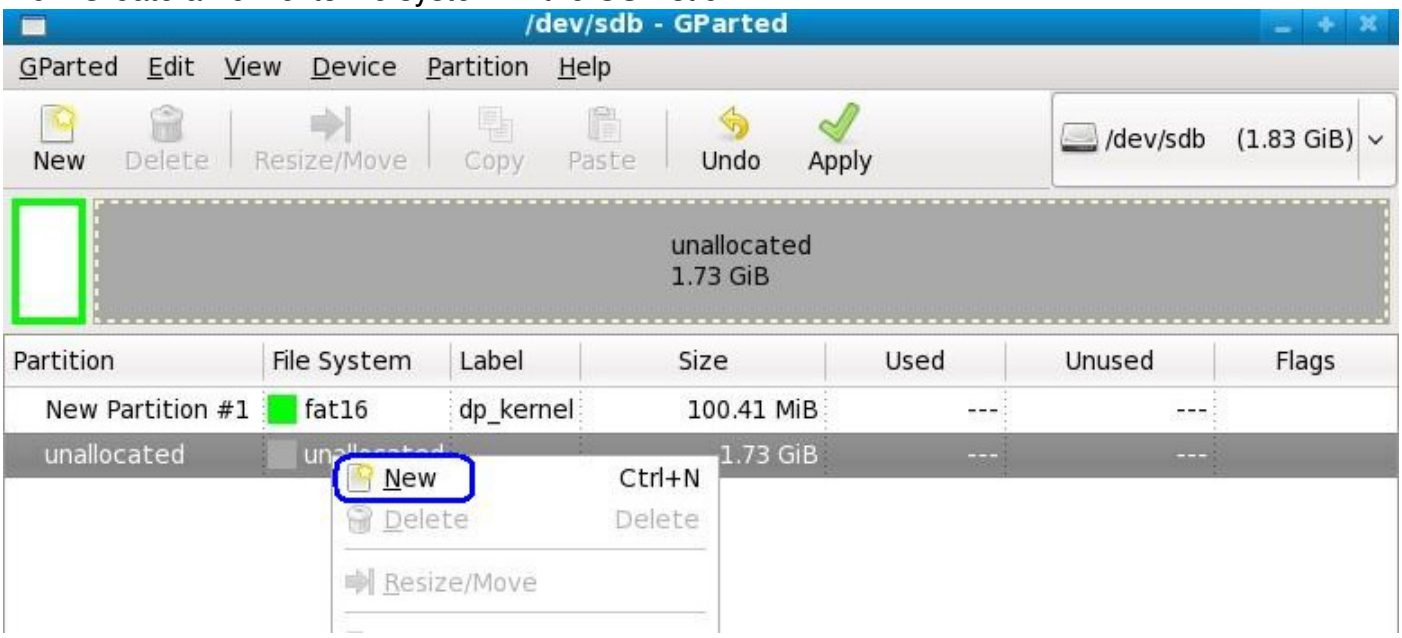
1.5 Create a new fat16 file system in the USB stick.



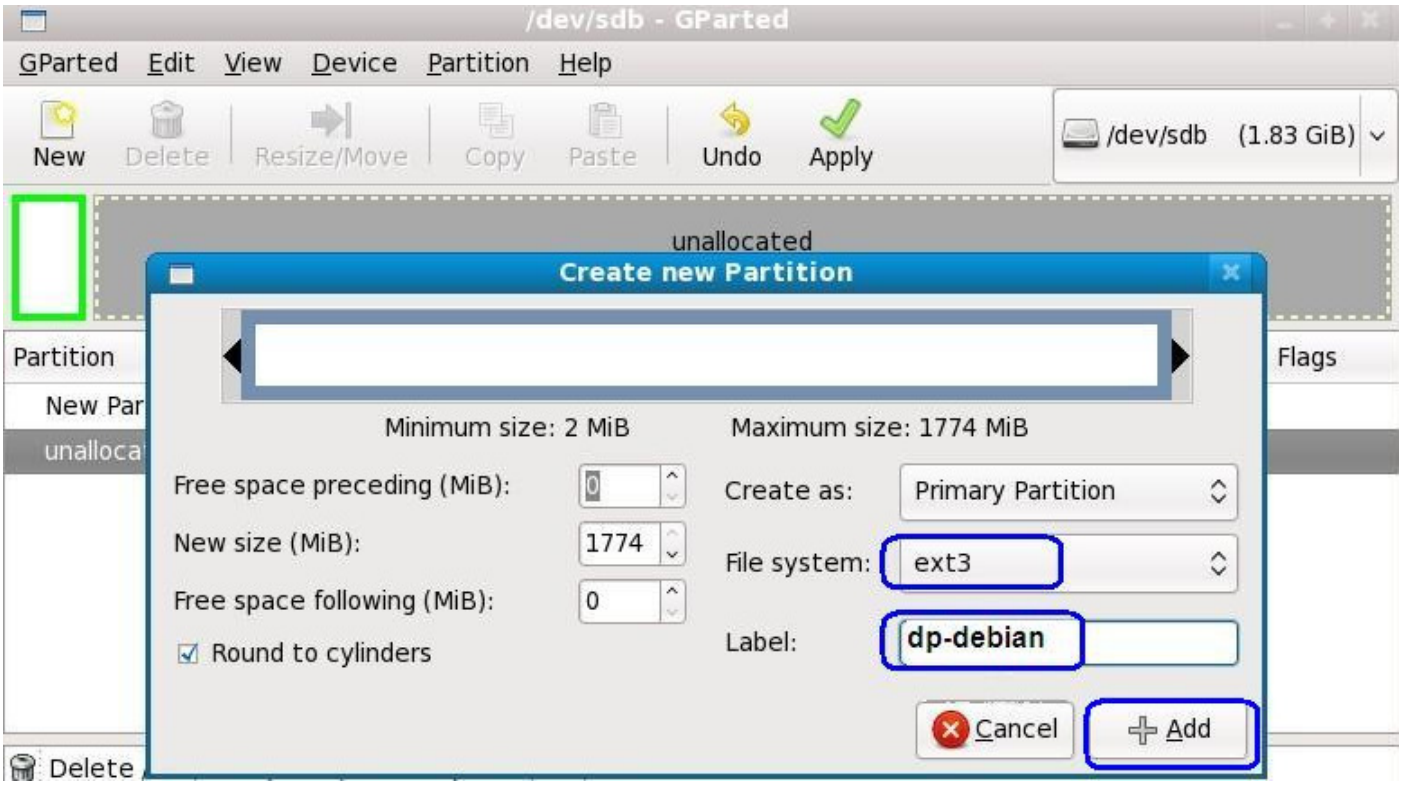
Enter the size “100” in the New size field. Select “fat16” in the File system field and enter a label name (e.g. “dp-kernel”) in the Label field, then click ”Add”:



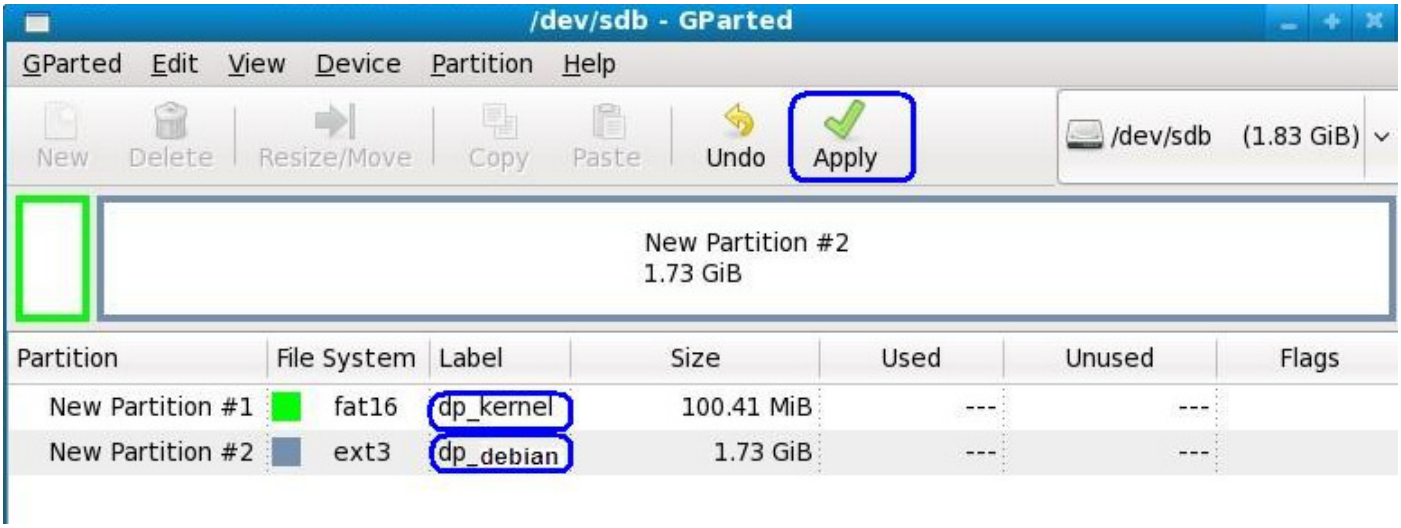
1.6 Create a new ext3 file system in the USB stick.



Select “ext3” in the File system field and enter a label name (e.g. “dp-debian”) in the Label field, then click ”Add”:



1.7 Click the  to apply the operation:



When the above steps are correctly performed, the USB stick is ready to be used for Debian file system.

2 Untar and copy uImage and dreamplug_debian_v0.2.tar.gz to this newly prepared USB stick.

2.1 Plug the USB stick to the Host and execute the following command as root user in the Host Terminal.
The example here shows the uImage(kernel image) and dreamplug_debian_v0.2.tar.gz have been downloaded to /home folder in the Host, and the two partitions /dev/sda1 and /dev/sda2 in

this newly prepared USB stick are mounted to /media/usb0 and /media/usb1in Host respectively.

```
#cd /home
#cp uImage /media/usb0
# tar xzvf dreamplug_debian_v0.2.tar.gz -C /media/usb1
  …
  ….
#cp uImage /media/usb1/home
#cp dreamplug_debian_v0.2.tar.gz /media/usb1/home
    …(we will use the kernel image and file system later)
#sync
#umount /media/usb0
#umount /media/usb1
```

Now, the USB stick is ready for a boot-up device of DreamPlug.

3 Boot-up the DreamPlug from the Debian USB stick.

3.1 Connect one end of the External JTAG Box to the DreamPlug via 4-pin UART cable, the other end to Windows PC via USB cable.

Insert the USB stick with Debian file system to the Dreamplug, then launch a terminal program such as Putty or Tera Term in Host and access to the system console of DreamPlug.

Regarding the driver and setup of “Globalscale External JTAG Board” for Windows PC, please refer to the following website:

http://plugcomputer.org/plugwiki/index.php/Serial_terminal
http://www.ftdichip.com/Drivers/VCP.htm

3.2 Power on the DreamPlug. You will see the boot-up messages on the console, then stop the auto boot by pressing any key.

3.3 Change the UBoot parameters to boot from the USB stick.

In the UBoot prompt, type the following commands to set the UBoot variables:

```
Marvell>>setenv x_bootcmd_kernel fatload usb 2 0x6400000 uImage
Marvell>>setenv x_bootargs_root root=/dev/sdc2 rootdelay=10
Marvell>>saveenv
```

```
Hit any key to stop autoboot:  0
Marvell>> printenv
bootcmd=setenv ethact egiga0; ${x_bootcmd_ethernet}; setenv ethact egiga1; ${x_bootcmd_etherne
bootdelay=3
baudrate=115200
x_bootcmd_ethernet=ping 192.168.2.1
x_bootcmd_usb=usb start
x_bootargs=console=ttyS0,115200
ethaddr=02:50:43:f5:34:ff
eth1addr=02:50:43:0f:ff:0a
filesize=296350
x_bootargs_root=root=/dev/sda2 rootdelay=10
bootargs=console=ttyS0,115200 root=/dev/sda2 rootdelay=10
ethact=egiga0
x_bootcmd_kernel=fatload usb 0 0x6400000 uImage
stdin=serial
stdout=serial
stderr=serial

Environment size: 598/4092 bytes
Marvell>> setenv x_bootcmd_kernel fatload usb 2 0x6400000 uImage
Marvell>> setenv x_bootargs_root root=/dev/sdc2 rootdelay=10
Marvell>> saveenv
Saving Environment to SPI Flash...
Erasing SPI flash...Writing to SPI flash...done
Marvell>> reset
```

Note: you may enter “printenv” to make sure the setting environment is correct before saving it.

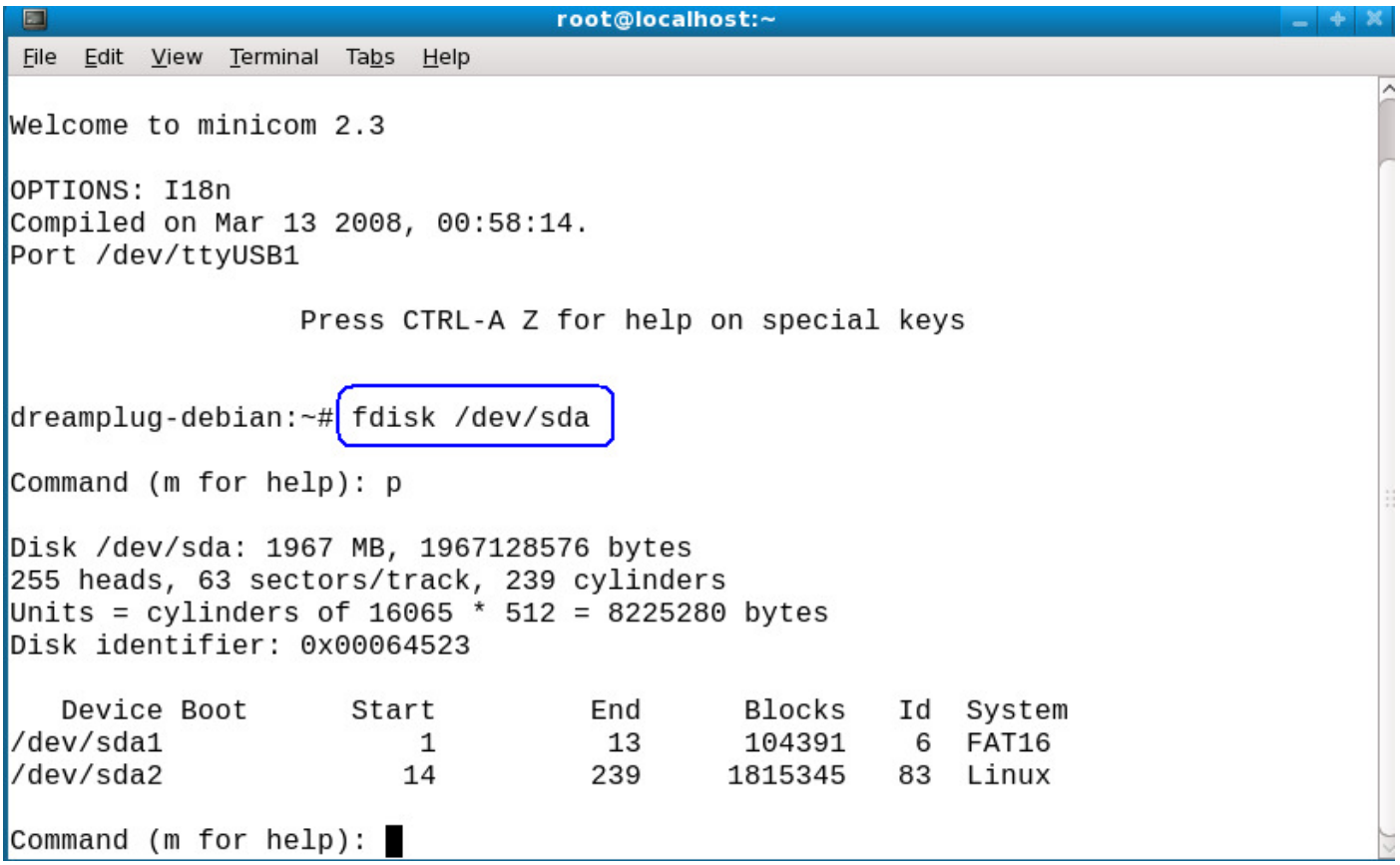
Usually, the external USB stick is always recognized as /dev/sdc* , while the internal boot uSD card is /dev/sda*.

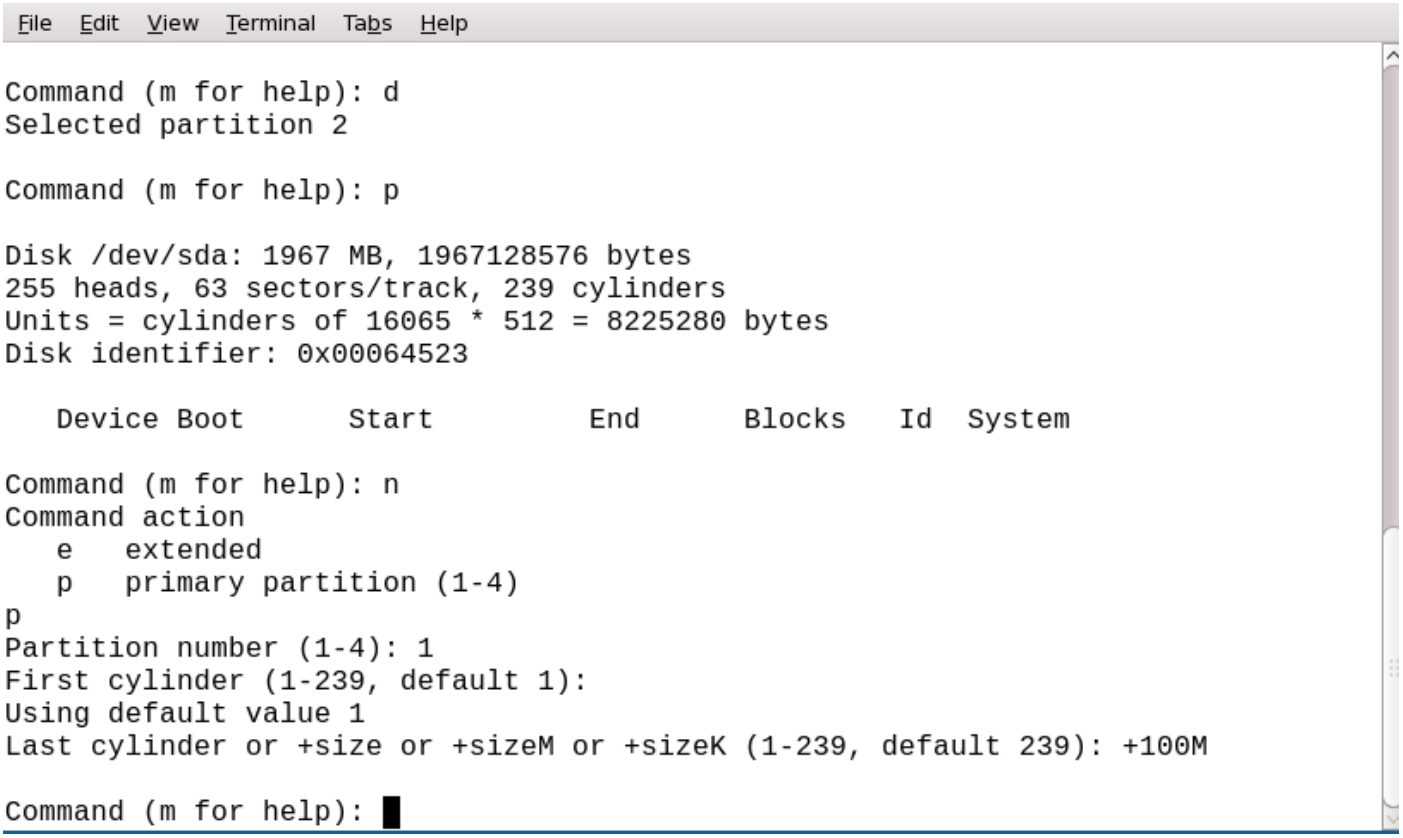
3.4 Reset the DreamPlug, and it should boot up from the external USB stick with Debian system. Login to the DreamPlug as “root” user with password “nosoup4u”.

4 Transplant the Debian file system and kernel image to the internal uSD card.

4.1 Re-create new and fresh file systems in the internal uSD. This step is to fix the cylinders mix up issue in the internal uSD of some DreamPlugs.

Lauch ‘fdisk’ command in DreamPlug console to delete and create two new partitions, the 1st partition is 100M fat16 formatted for kernel image, the 2nd partition is ext3 formatted with remaining free space.
#fdisk /dev/sda


root@localhost:~
File Edit View Terminal Tabs Help
Welcome to minicom 2.3
OPTIONS: I18n
Compiled on Mar 13 2008, 00:58:14.
Port /dev/ttyUSB1
Press CTRL-A Z for help on special keys
dreamplug-debian:~# fdisk /dev/sda
Command (m for help): p
Disk /dev/sda: 1967 MB, 1967128576 bytes
255 heads, 63 sectors/track, 239 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x00064523
Device Boot Start End Blocks Id System
/dev/sda1 1 13 104391 6 FAT16
/dev/sda2 14 239 1815345 83 Linux
Command (m for help):

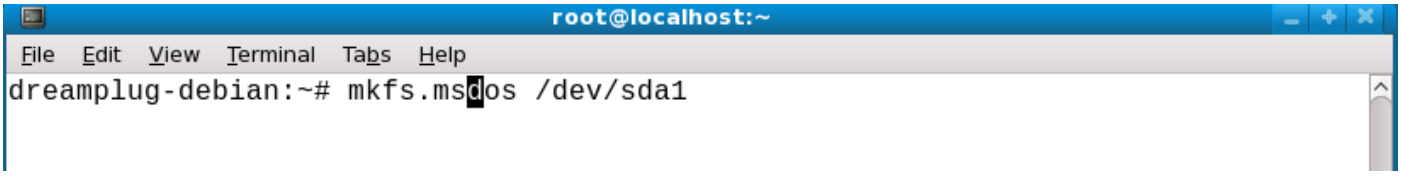

File Edit View Terminal Tabs Help
Command (m for help): d
Selected partition 2
Command (m for help): p
Disk /dev/sda: 1967 MB, 1967128576 bytes
255 heads, 63 sectors/track, 239 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x00064523
Device Boot Start End Blocks Id System
Command (m for help): n
Command action
e extended
p primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-239, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-239, default 239): +100M
Command (m for help):

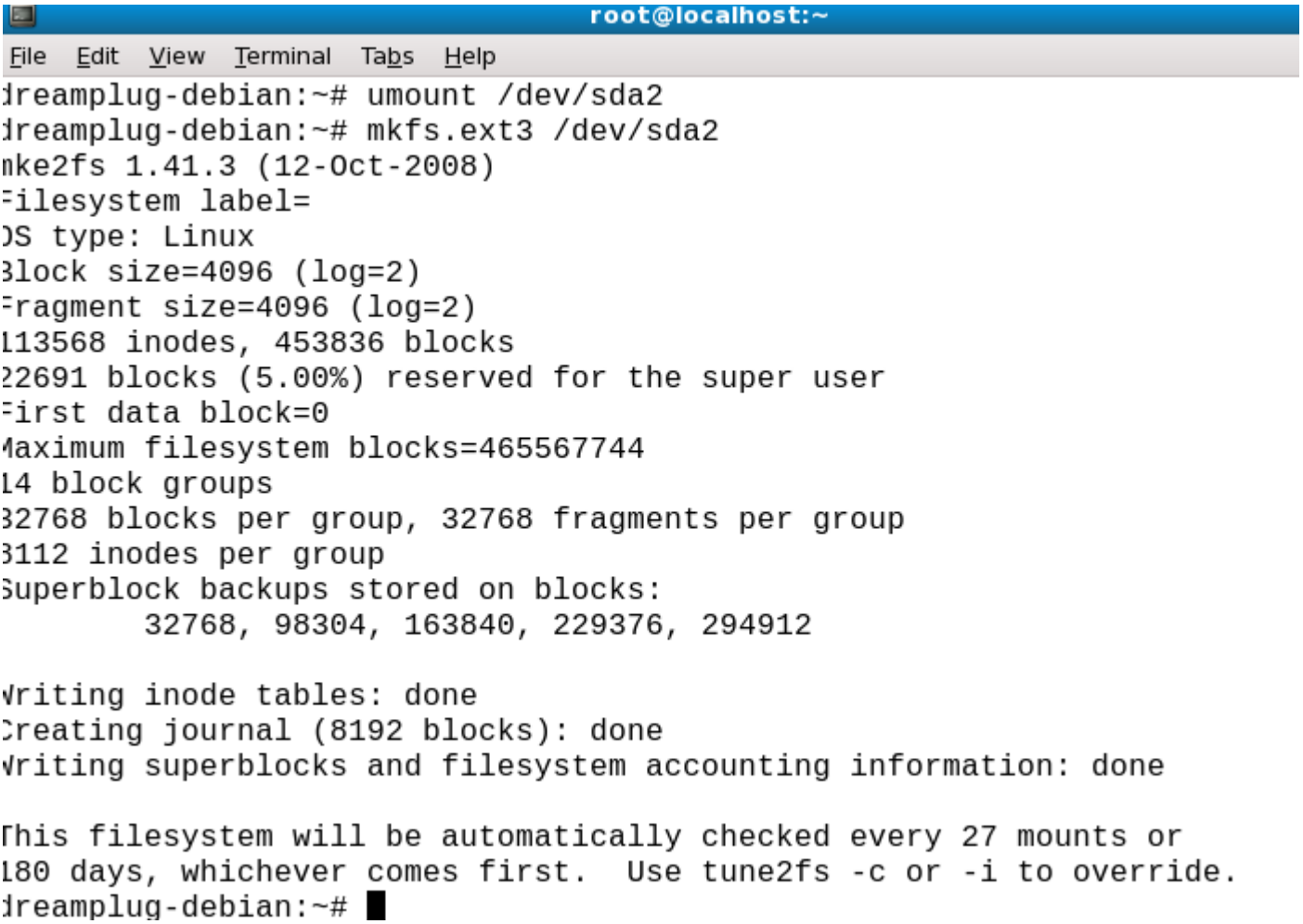
```
Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resourc.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.
dreamplug-debian:~# 
```

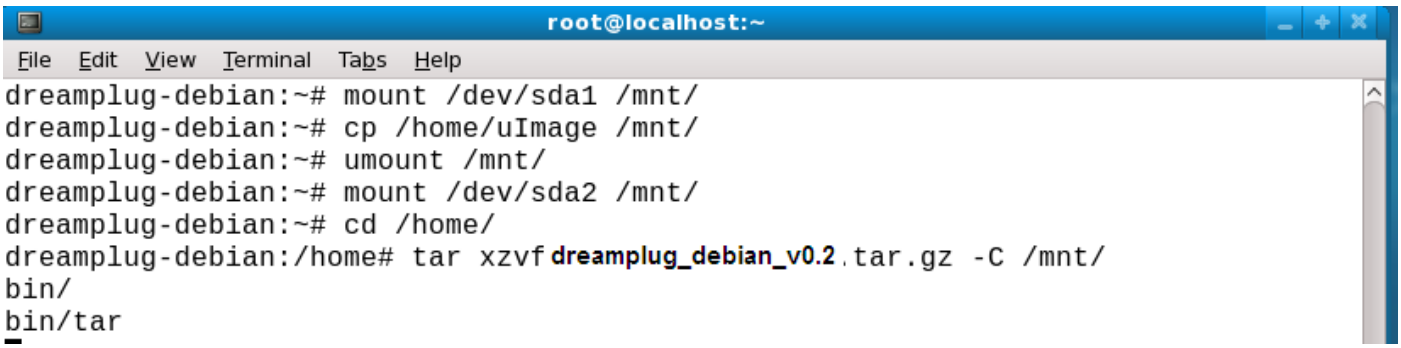
4.2 Make fresh file system on the newly re-created partitions by executing following commands:
#mkfs.msdos /dev/sda1
#mkfs.ext3 /dev/sda2
(Note: unmount these partitions if they are mounted)





4.3 Copy the kernel image and untar the Debian file system tar file to the internal uSD.
#cd /home
#mount /dev/sda1 /mnt
#cp uImage /mnt

#umount /mnt
#mount /dev/sda2 /mnt
#tar xzvf dreamplug_debian_v0.2.tar.gz –C /mnt
….
#sync



When above steps are properly executed, the Debian file system and kernel image are populated to the internal uSD, then this uSD is good to use as a boot device.

5 Change the UBoot parameters in order to boot the DreamPlug from the internal uSD, steps are as follows:

5.1 Reboot the Dreamplug and stop the auto boot in the DreamPlug console, type the following commands under the UBoot prompt:

Marvell>>setenv x_bootcmd_kernel fatload usb 0 0x6400000 uImage
Marvell>>setenv x_bootargs_root root=/dev/sda2 rootdelay=10
Marvell>>saveenv
Marvell>>reset

Remove the external USB stick and reset the DreamPlug. Now the DreamPlug should boot up with a fresh Debian file system in the internal uSD.