

Upgrade Kernel and Root Filesystem on DreamPlug v9

Quick Start Guide

v0.1

February 21, 2012

We recommend that only experienced Linux programmers can undertake this task, and done at their own risk, as any changes from the default settings will invalidate the warranty.

● Introduction

The DreamPlug is a powerful, low-cost development platform, which features Marvell high-performance, highly integrated controller 88F6281. The DreamPlug utilizes an internal micro SD card as a boot-up device. In default, this system micro SD card has two partitions- one is a DOS file system (fat16) where the kernel image is populated, the other partition is Linux file system (ext3) with a root file system.

This quick start guide provides you with steps to update DreamPlug v9 with the latest firmware like kernel and root file system.

● Prerequisites

The prerequisites for upgrade DreamPlug to the latest firmware 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. Get the latest firmware for DreamPlug v9 from Globalscale Technologies website.

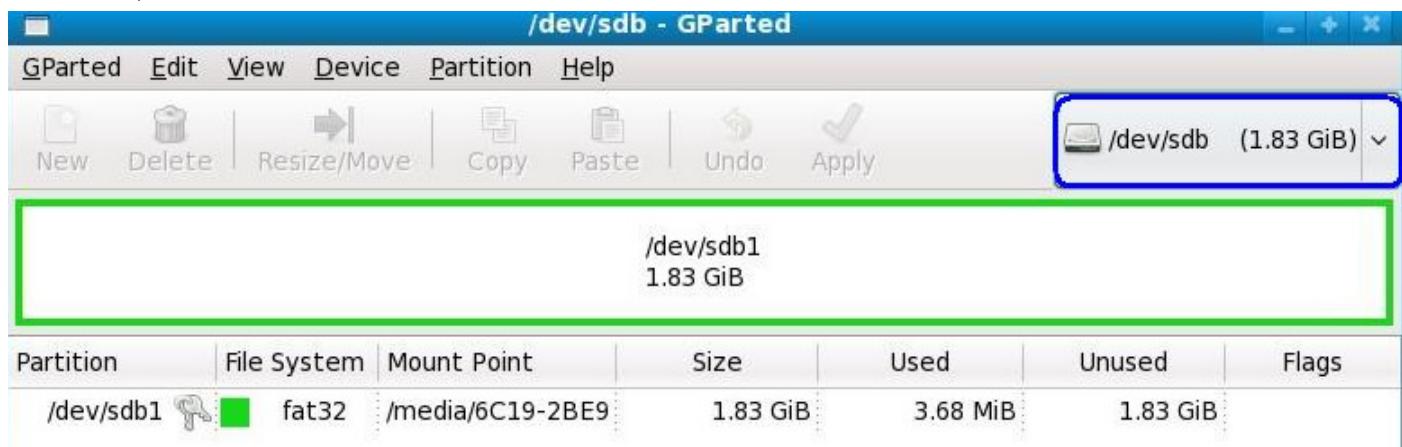
<http://www.globalscaletechnologies.com/t-downloads.aspx>

<http://code.google.com/p/dreamplug/downloads/list>

● Steps

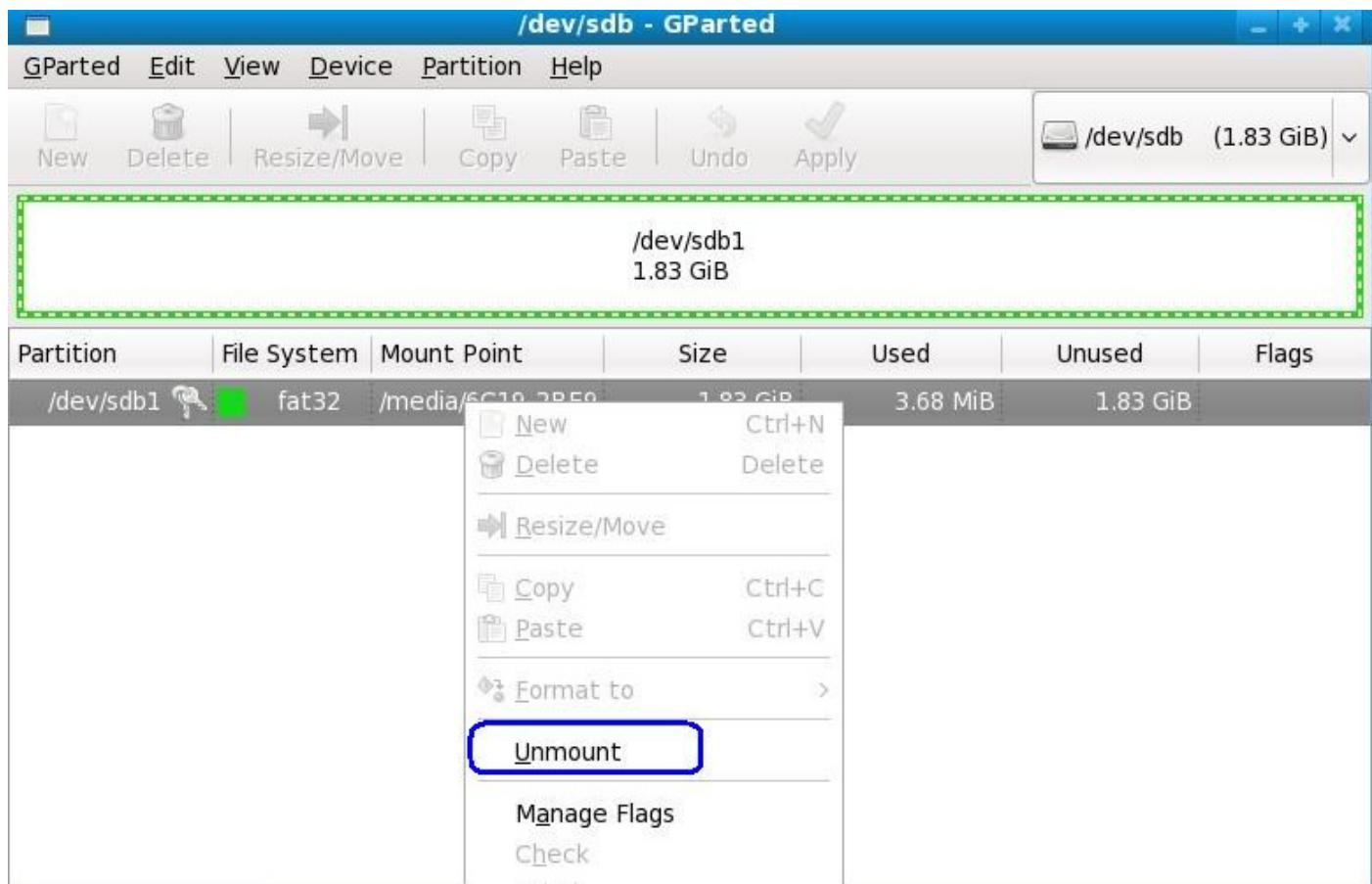
1. Prepare a USB flash stick for a 2nd boot device
 - a) Connect the USB storage disk to the Linux Host and launch the GParted Partition Editor. If the GParted is not installed, please issue the following command in your Host(assuming the internet is connected) for auto-installation.
`#yum -y install gparted`

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

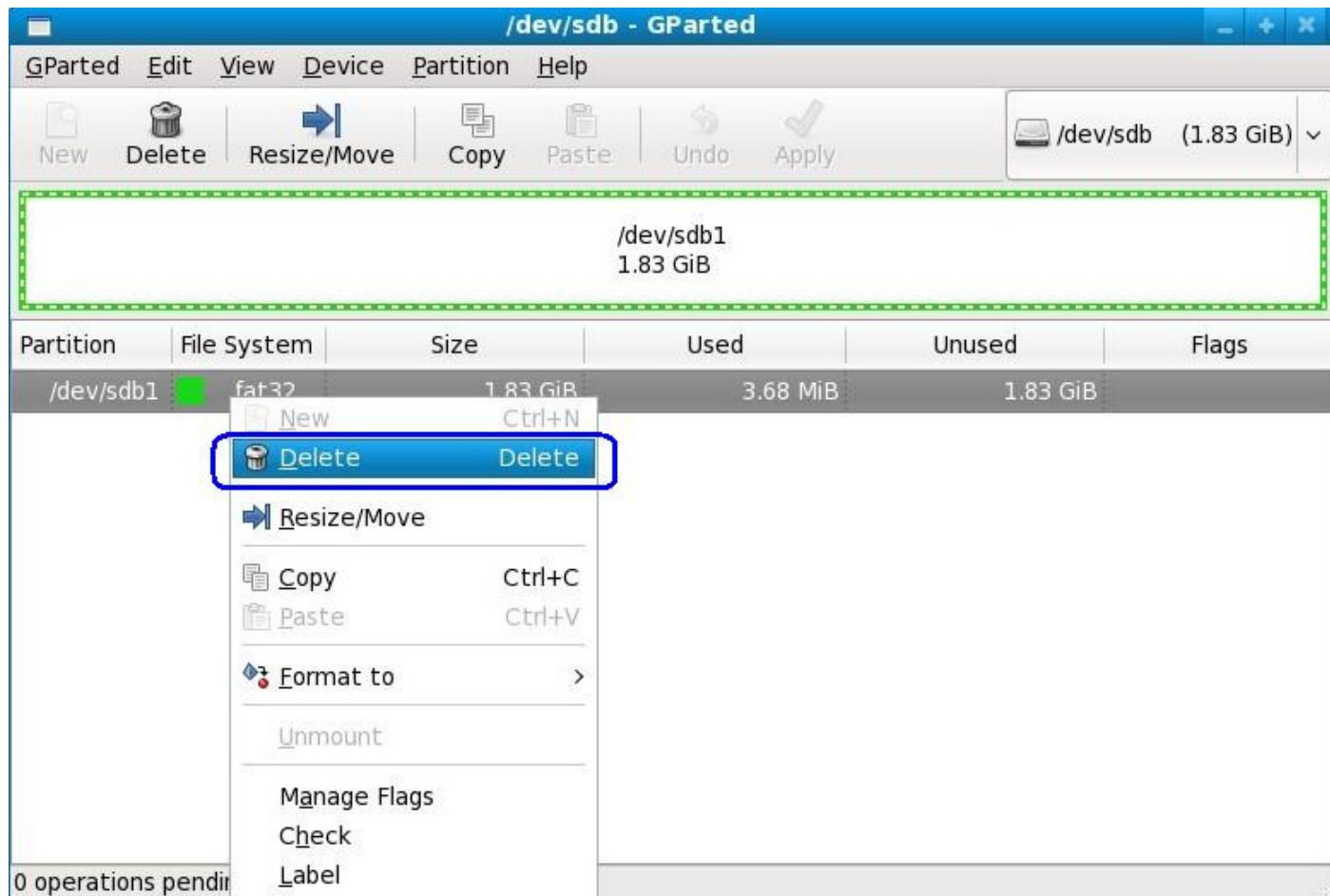


Here let's assume the USB stick is detected as /dev/sdb by the Host.

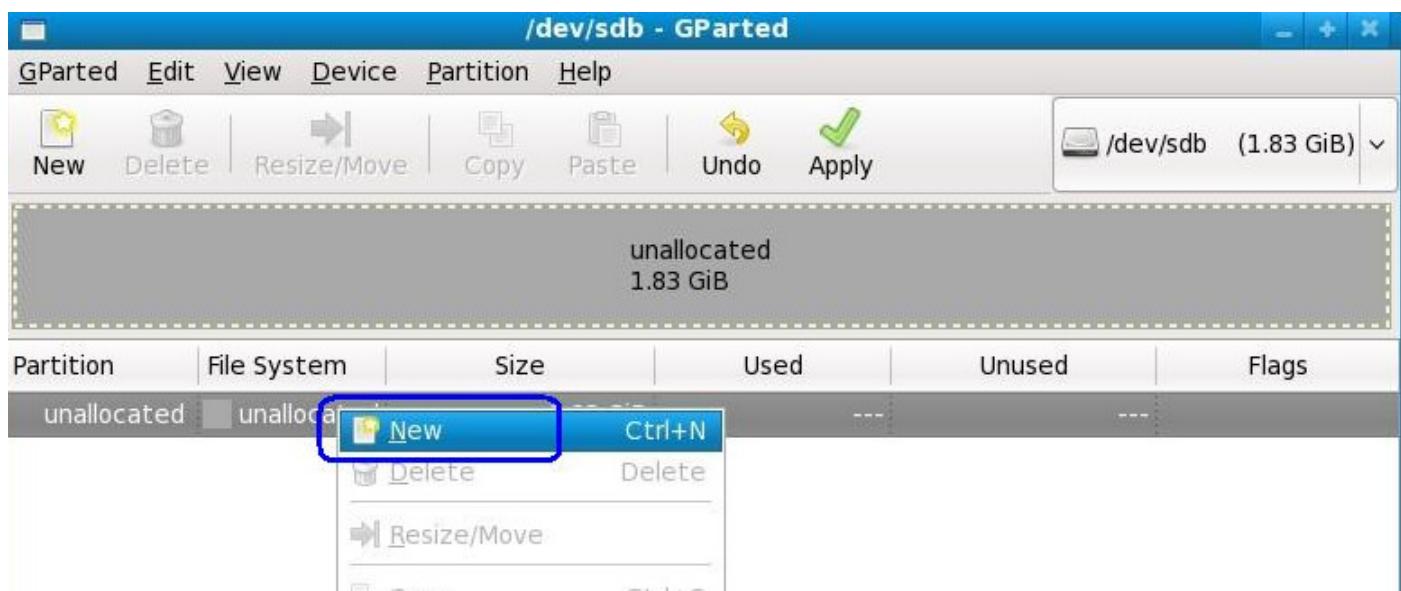
c) Unmount all partitions in the USB stick



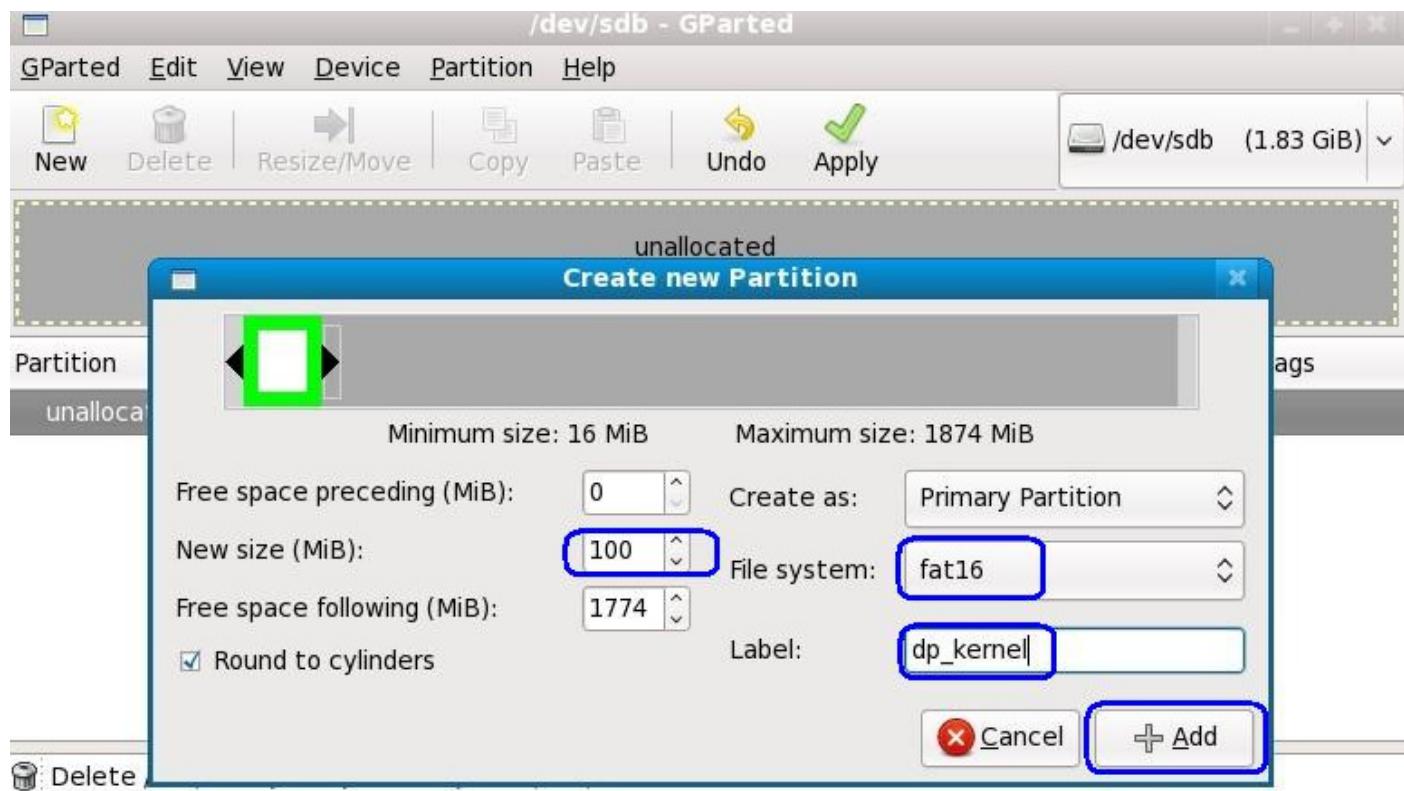
- d) Delete all partitions in the USB stick, Noted that when this behavior is applied, all data in the USB stick will be lost.



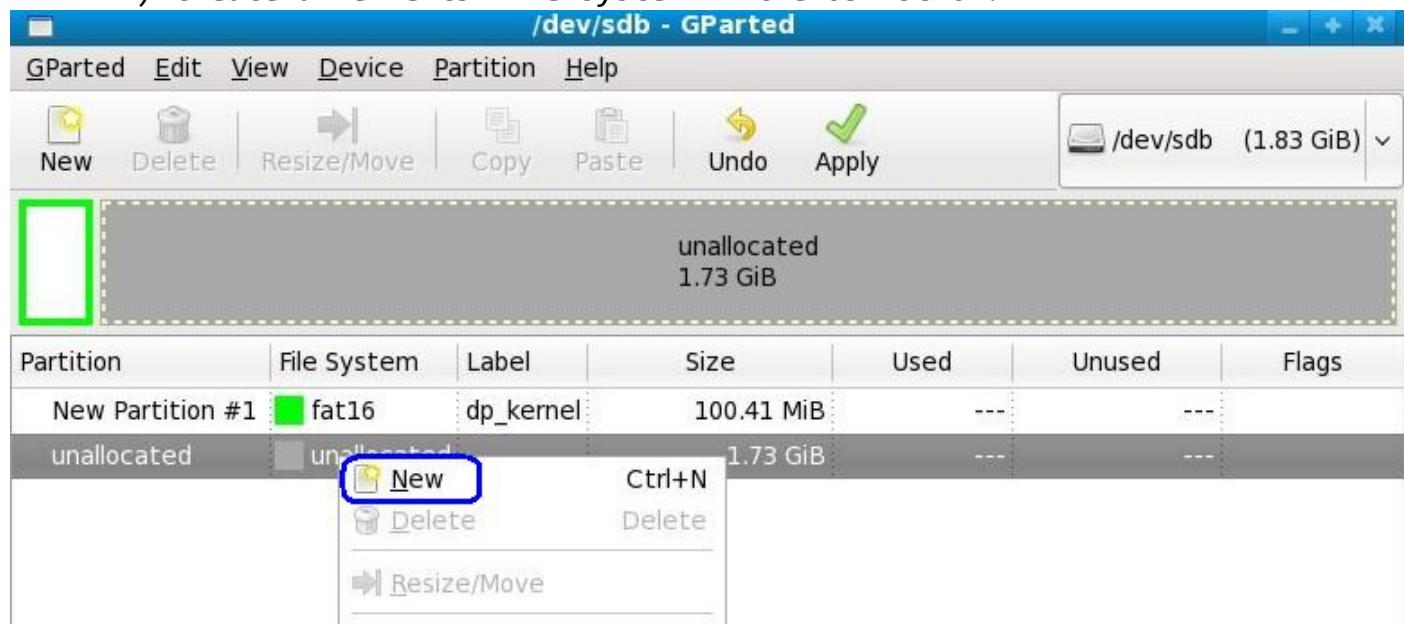
- e) Create a new fat16 file system in the USB stick.



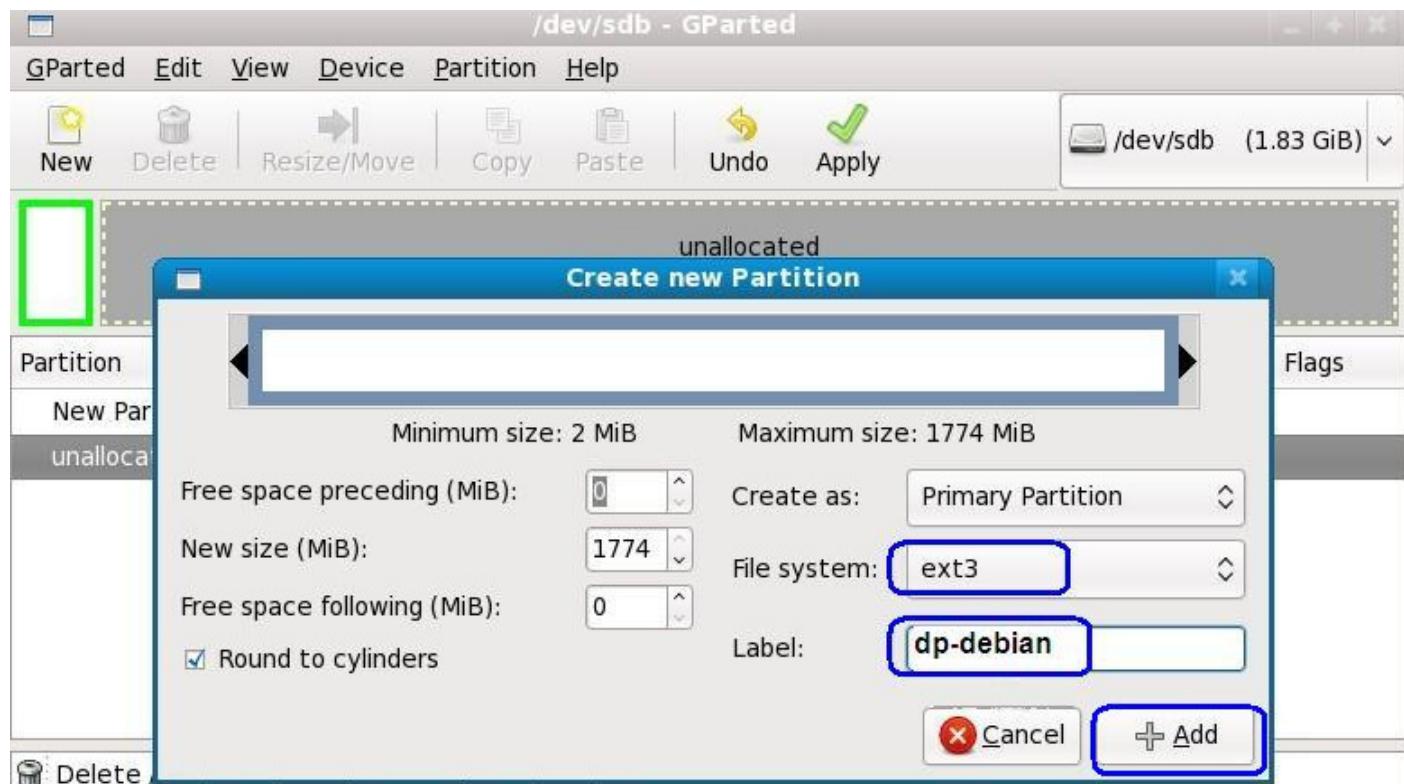
Enter the size “100” in the New size field. Select “fat16” in the File system field and enter a label name (e.g. “dp-kernel”) in the Label field, then click “Add”:



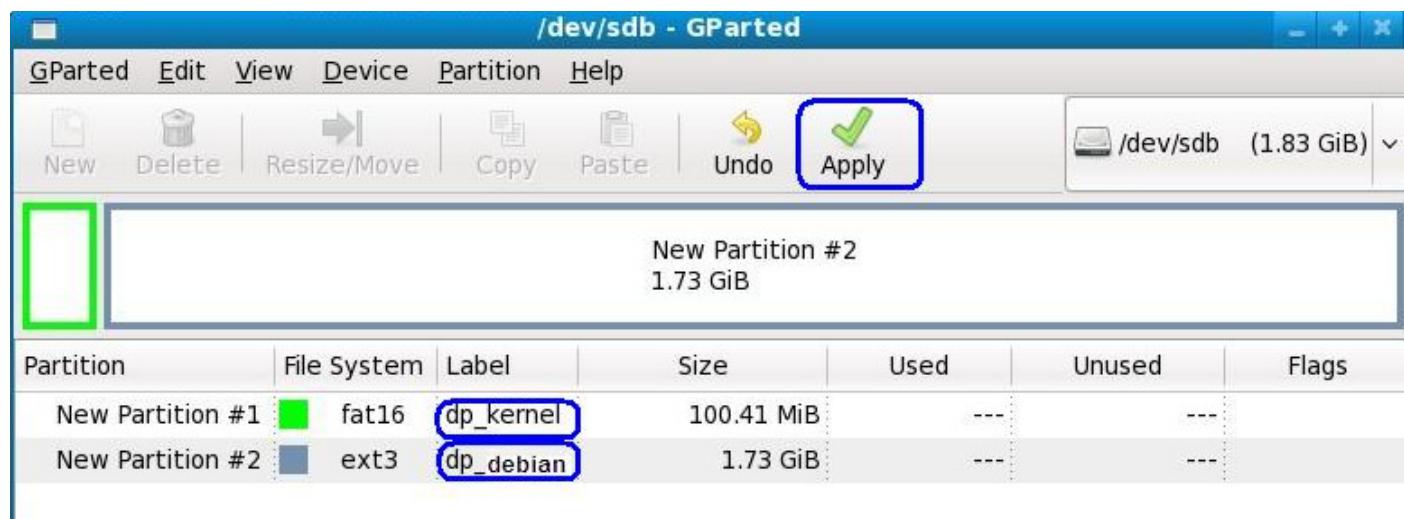
f) Create a new ext3 file system in the USB stick.



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



g) 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. Transfer kernel image and root file system to this newly prepared USB stick.

a) 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 v9r18787.tar.bz2 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 xjvf v9r18787.tar.bz2 -C /media/usb1
...
...
#cp uImage /media/usb1/home
#cp v9r18787.tar.bz2 /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.

- a) 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>

- b) Power on the DreamPlug you will see the boot-up messages on the console then stop the auto boot by pressing any key.

- c) Change the UBoot parameters to boot from the USB stick.

In the UBoot prompt, type the following command 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_etherne};
bootdelay=3
baudrate=115200
x_bootcmd_etherne=ping 192.168.2.1
x_bootcmd_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*.

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

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

- a) 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.

Launch ‘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 resource
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.
dreamplug-debian:~#
```

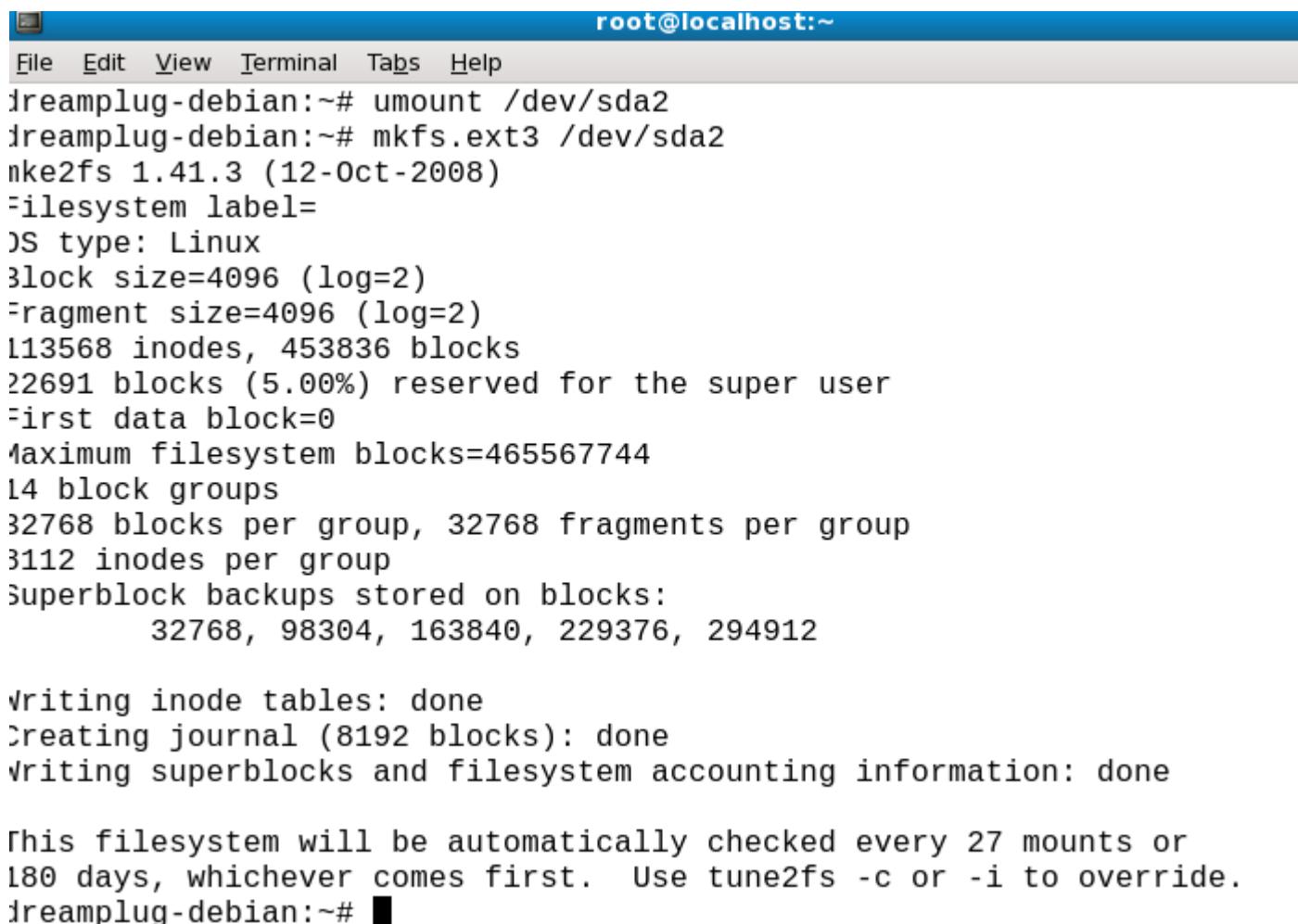
- b) Make fresh file system on the newly re-created partitions by executing following commands:

```
#mkfs.msdos /dev/sda1
#mkfs.ext3 /dev/sda2
```

(Note: unmount these partitions if they are mounted)



```
root@localhost:~
File Edit View Terminal Tabs Help
dreamplug-debian:~# mkfs.msdos /dev/sda1
```



```
root@localhost:~
File Edit View Terminal Tabs Help
dreamplug-debian:~# umount /dev/sda2
dreamplug-debian:~# mkfs.ext3 /dev/sda2
  mke2fs 1.41.3 (12-Oct-2008)
  - filesystem label=
  - OS type: Linux
  - block size=4096 (log=2)
  - fragment size=4096 (log=2)
  - 113568 inodes, 453836 blocks
  - 22691 blocks (5.00%) reserved for the super user
  - first data block=0
  - maximum filesystem blocks=465567744
  - 14 block groups
  - 32768 blocks per group, 32768 fragments per group
  - 3112 inodes per group
  - Superblock backups stored on blocks:
    - 32768, 98304, 163840, 229376, 294912

  Writing inode tables: done
  Creating journal (8192 blocks): done
  Writing superblocks and filesystem accounting information: done

  This filesystem will be automatically checked every 27 mounts or
  180 days, whichever comes first.  Use tune2fs -c or -i to override.
dreamplug-debian:~#
```

- c) Copy the kernel image and extract the root file system tar file to the internal uSD.

```
#cd /home
```

```
#mount /dev/sda1 /mnt
#cp uImage /mnt
#umount /mnt
#mount /dev/sda2 /mnt
#tar xjvf v9r18787.tar.bz2 -C /mnt
...
#sync
```



```
root@localhost:~
File Edit View Terminal Tabs Help
dreamplug-debian:~# mount /dev/sda1 /mnt/
dreamplug-debian:~# cp /home/uImage /mnt/
dreamplug-debian:~# umount /mnt/
dreamplug-debian:~# mount /dev/sda2 /mnt/
dreamplug-debian:~# cd /home/
dreamplug-debian:/home# tar xjvf v9r18787.tar.bz2 -C /mnt
bin/
bin/tar
```

When above steps are properly executed, the root 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:

- 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
```

```
x_bootcmd_kernel=fatload usb 2 0x6400000 uImage
x_bootargs_root=root=/dev/sdc2 rootdelay=10
stdin=serial
stdout=serial
stderr=serial
```

```
Environment size: 598/4092 bytes
Marvell>> setenv x_bootcmd_kernel fatload usb 0 0x6400000 uImage
Marvell>> setenv x_bootargs_root root=/dev/sda2 rootdelay=10
Marvell>> saveenv
Saving Environment to SPI Flash...
Erasing SPI flash...Writing to SPI flash...done
Marvell>> █
```

Remove the external USB stick and reset the DreamPlug. Now the DreamPlug should boot up with the latest firmware in the internal uSD.

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