Upgrade Kernel and Root-File system on DreamPlug v10

Quick Start Guide

-Aug 28, 2012

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

contents

- **Introduction**

The DreamPlug is a powerful, low-cost development platform, which features Marvell high-performance, highly integrated controller 88F6281. The DreamPlug utilizes an internal 4GB micro SD card as a boot-up device. Defaultly, this system micro SD card has three partitions- the 1st partition is Linux file system (ext2) where the kernel image is populated, the 2nd partition is Linux file system (ext3) with a root file system, and the last partition is a fat32 file system with default manufacturing images (kernel and root-file system).

```
Device Boot       Start        End      Blocks   Id  System
/dev/sda1             1         13      104391   83  Linux
/dev/sda2            14        395     3068415   83  Linux
/dev/sda3           396        474      634567+   b  W95 FAT32
```

This quick start guide provides you with steps to update DreamPlug v10 with the latest kernel and root-file system.

- **Prerequisites**

The prerequisites for upgrade DreamPlug to the latest firmware are mentioned below:
1.   Linux PC with GParted installed.
2.   Globalscale External JTAGbox for access to the DreamPlug console.
3.   4GB or above USB storage disk, used for another boot-up device.
4.   Get the latest firmware for DreamPlug v10 from Globalscale Technologies website.

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

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

| kernel image	uImage_dreamplug_v10_Aug-28-2012
root-file system	rootfs_dreamplug_v10_Aug-28-20128.tgz

- **Steps**

1.   Prepare a USB flash stick for a 2nd boot device

a)   Connect the USB storage disk to the Linux PC and launch the GParted Partition Editor. If the GParted is not installed, please execute the following command in your Linux PC (Assuming the internet is connected) for auto-installation.
#yum -y install gparted
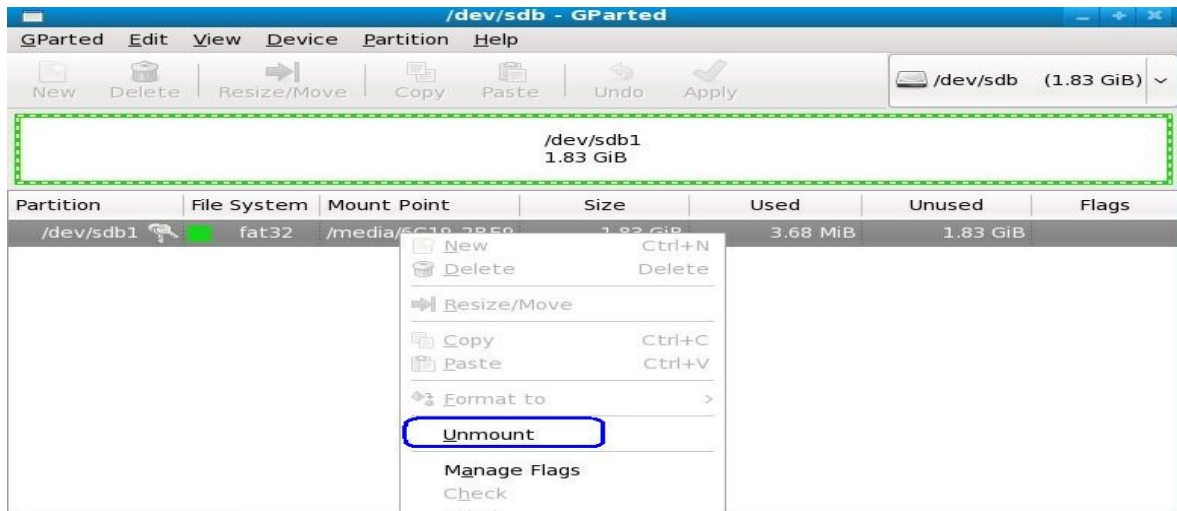Waiting for a minute, the software gparted will install success.

b)   Then input the below command to run the gparted.
#gparted

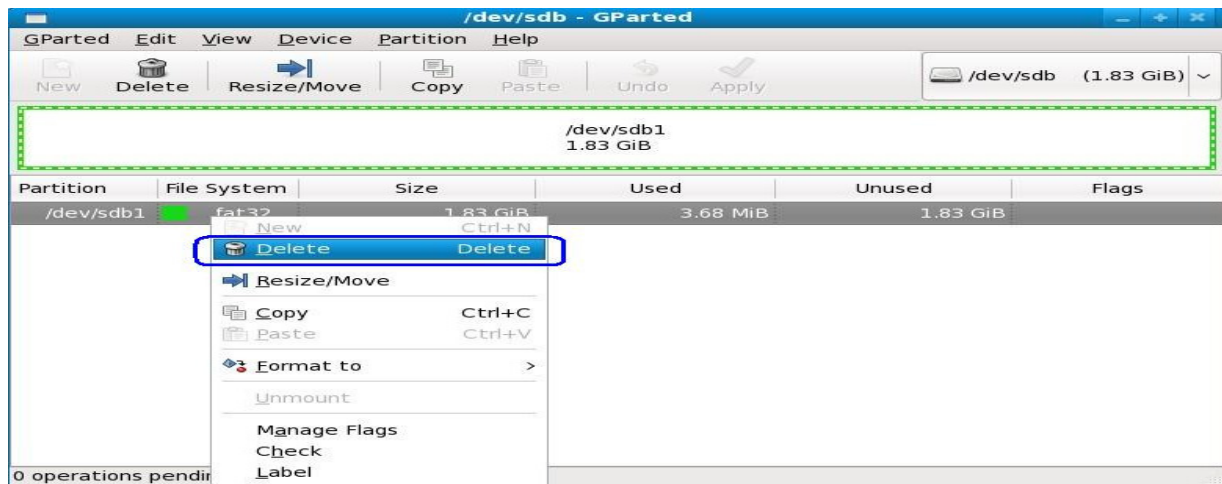c)   Select the USB stick in GParted. Make sure which device is the USB stick.
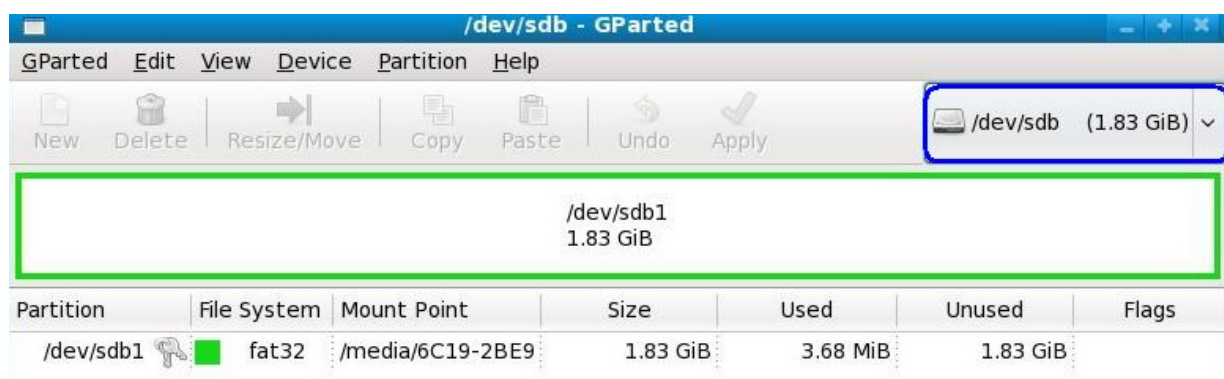
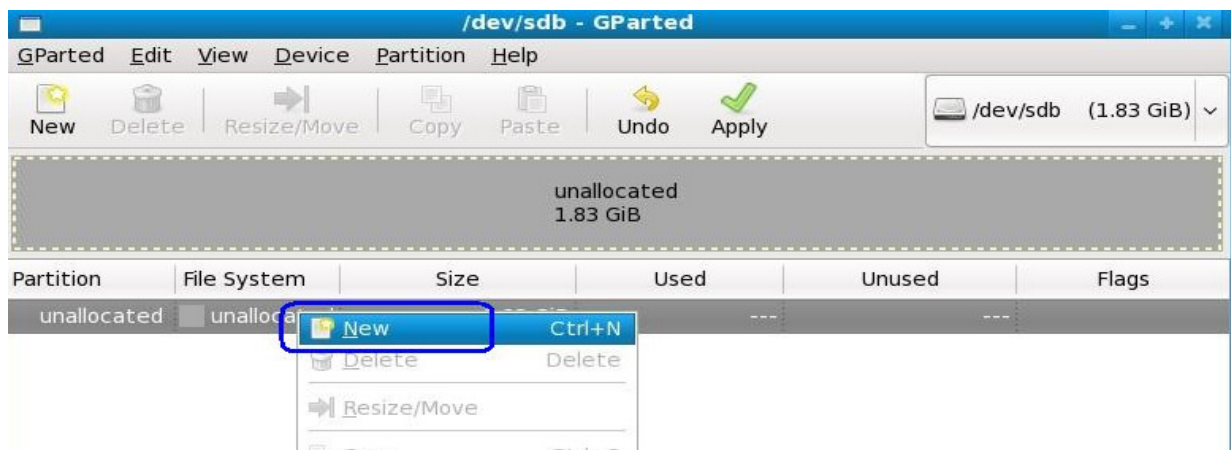Here let's assume the USB stick is detected as /dev/sdb by the Host Linux PC.

d) Unmount all partitions in the USB stick

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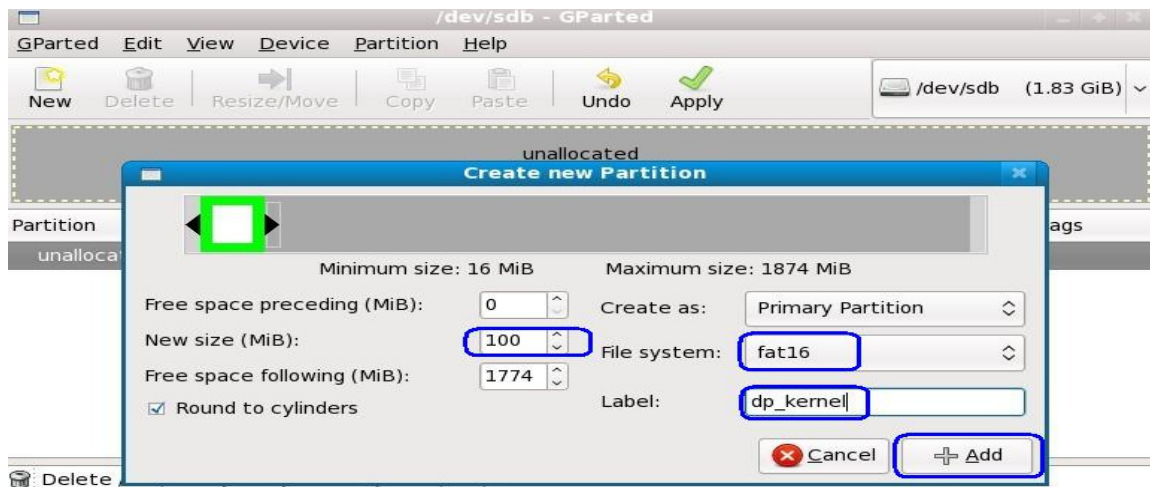

f) Create a new fat16 file system in the USB stick.

f-1) Right-click mouse then select "New".
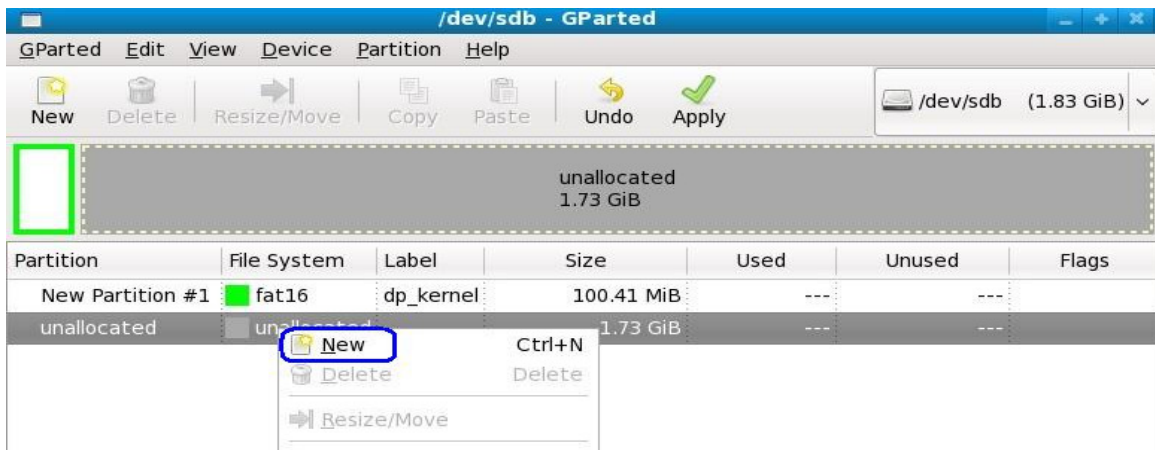
f-2) Enter the size "100" in the New size field. Select "fat16" in the File system field and enter a label name (e.g. "dp-kernel") in the Label field, then click "Add".
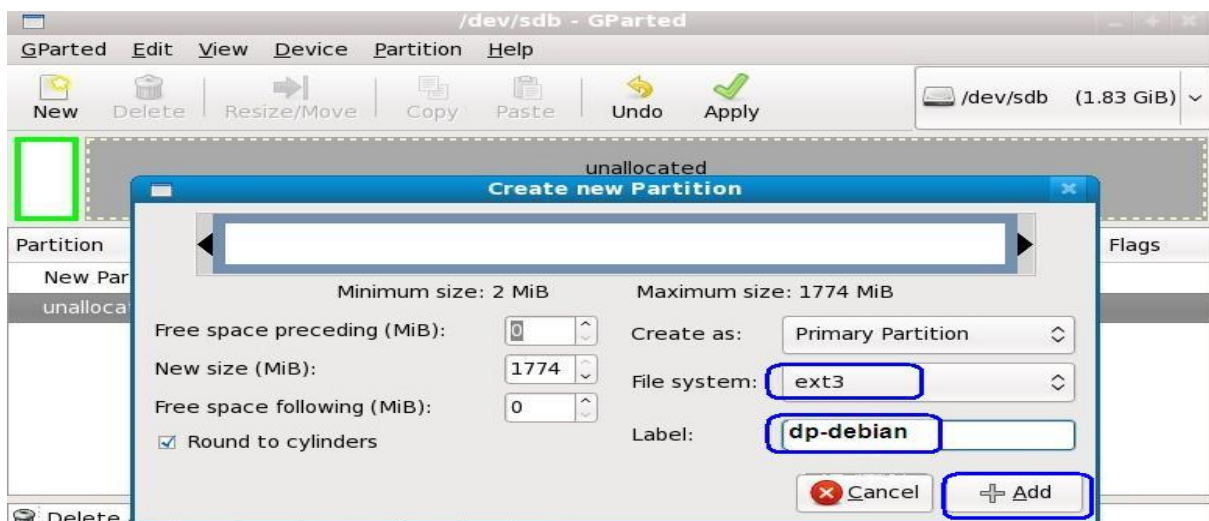

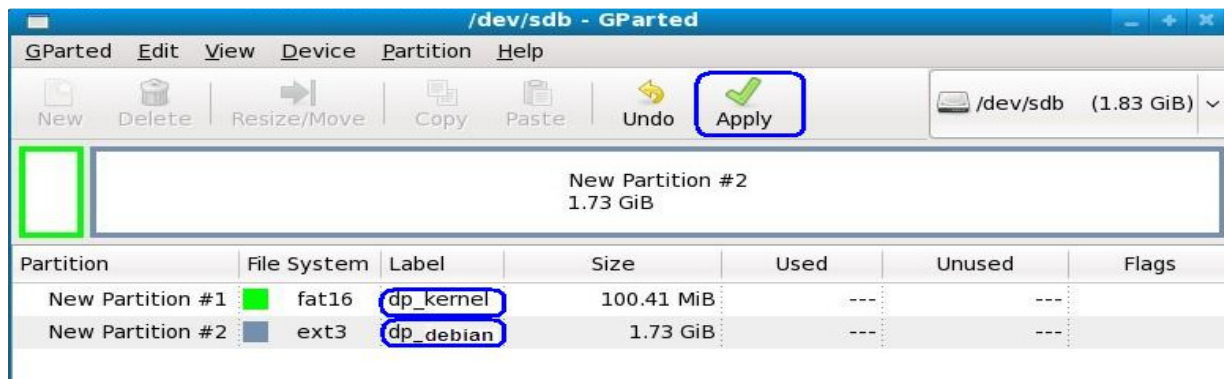g) Create a new ext3 file system in the USB stick.

g-1) Right-click mouse then select "New".

g-2) Select "ext3" in the File system field and enter a label name (e.g. "dp-debian") in the Label field, then click "Add".

h)   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 Linux PC Host.
b)   Assuring that the dreamplug v10 kernel image "uImage_dreamplug_v10_Aug-28-2012" and root file system "rootfs_dreamplug_v10_Aug-28-20128.tgz"have been downloaded to /home/ folder in the Linux PC host.
c)   Execute the following command as root user in the Terminal.

```
#cd /home
#mkdir -p /media/usb0
#mkdir -p /media/usb1
#mount -t vfat /dev/sdb1 /media/usb0
#mount -t ext3 /dev/sdb2 /media/usb1

#cp uImage_dreamplug_v10_Aug-28-2012 /media/usb0/uImage
#tar -xzf rootfs_dreamplug_v10_Aug-28-20128.tgz -C /media/usb1
…
#cp uImage_dreamplug_v10_Aug-28-2012 /media/usb1/home/uImage
#cp rootfs_dreamplug_v10_Aug-28-20128.tgz /media/usb1/home
…
#sync
#umount /media/usb0
#umount /media/usb1
```

We will use the kernel image and file system for the next step of make uSD that boot-up the system throw it. Now, Unplug the USB stick. Be 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. And insert the USB stick with Debian file system and kernel to the Dreamplug then launch a terminal program such as Putty in Windows PC Host and access to the system console of DreamPlug.
Note: Regarding the driver and setup of "Globalscale External JTAG Board" for Windows PC, Please refer to the following website for setup of Guru JTAG box

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 environment variables.

Marvell>>setenv x_bootcmd_kernel fatload usb 2 0x6400000 uimage

Marvell>>setenv bootargs 'console=ttyS0,115200 root=/dev/sdc2 rootdelay=10'

Marvell>>saveenv

Marvell>>reset

```
Hit any key to stop autoboot:  0
Marvell>> setenv x_bootcmd_kernel fatload usb 2 0x6400000 uimage
Marvell>> setenv bootargs 'console=ttyS0,115200 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 the password "nosoup4u".

```
Debian GNU/Linux 6.0 dreamplug-debian ttyS0

dreamplug-debian login: root
Password:
```

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.
Use this command to see the uSD partitions.
#fdisk –l

```
   Device Boot      Start         End      Blocks   Id  System
/dev/sda1    *          1          13      104391   83  Linux
/dev/sda2              14         395     3068415   83  Linux
/dev/sda3             396         474      634567+   b  W95 FAT32
```

Please be noted that the 3rd partition in uSD is specially used for system backup and restore, please do not destroy this partition in any case.

b) Copy the kernel image and extract the root-file system tar file to the internal uSD.（Default show: /dev/sda1,/dev/sda2,/dev/sda3.
#mount

```
root@dreamplug-debian:/home# mount
tmpfs on /lib/init/rw type tmpfs (rw,nosuid,mode=0755)
proc on /proc type proc (rw,noexec,nosuid,nodev)
sysfs on /sys type sysfs (rw,noexec,nosuid,nodev)
udev on /dev type tmpfs (rw,mode=0755)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
devpts on /dev/pts type devpts (rw,noexec,nosuid,gid=5,mode=620)
rootfs on / type rootfs (rw)
/dev/sda1 on /media/usb1 type ext2 (rw,noexec,nodev,sync,noatime,nodiratime,errors=con
/dev/sda2 on /media/usb2 type ext3 (rw,noexec,nodev,sync,noatime,nodiratime,errors=con
/dev/sdc1 on /media/usb3 type vfat (rw,noexec,nodev,sync,noatime,nodiratime,fmask=0022
8859-1,shortname=mixed,errors=remount-ro)
/dev/sda3 on /media/usb4 type vfat (rw,noexec,nodev,sync,noatime,nodiratime,fmask=0022
8859-1,shortname=mixed,errors=remount-ro)
tmpfs on /var/cache/apt type tmpfs (rw,noexec,nosuid)
```

You can see the uSD partition of /dev/sda1 and /dev/sda2 were mounted respectively to the /media/usb1 and /media/usb2.Then execute the follow commands.

    #cd /home

    #cp uImage /media/usb1

    #tar xzvf rootfs_dreamplug_v10_Aug-28-20128.tgz –C /media/usb2

    …

    This process takes about 2 hours, please wait.

    …

    #sync

```
./lib/libnss_nisplus-2.11.2.so
./lib/libpamc.so.0
./lib/libext2fs.so.2.4
./lib/libcap.so.2.19
./lib/libselinux.so.1
root@dreamplug-debian:/home#
root@dreamplug-debian:/home#
root@dreamplug-debian:/home# sync
root@dreamplug-debian:/home#
```

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 and boot-up the DreamPlug from the internal uSD

    a) Remove the external USB stick.

    b) Reboot the Dreamplug and stop the auto boot in the DreamPlug console, type the following commands under the uboot prompt that to change the environment variables in order to boot-up from uSD.

Marvell>>setenv x_bootcmd_kernel ext2load usb 0 0x6400000 uImage

Marvell>>setenv bootargs 'console=ttyS0,115200 root=/dev/sda2 rootdelay=10'

Marvell>>saveenv

Marvell>>reset

```
Hit any key to stop autoboot:  0
Marvell>> setenv x_bootcmd_kernel ext2load usb 0 0x6400000 uImage
Marvell>> setenv bootargs 'console=ttyS0,115200 root=/dev/sda2 rootdelay=10'
Marvell>> saveenv
Saving Environment to SPI Flash...
Erasing SPI flash...Writing to SPI flash...done
Marvell>> reset
resetting ...
```

. Now the DreamPlug should boot up with the latest firmware in the internal uSD.

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