How-to make an Emmabuntüs refurbishing key

This tutorial supports the demonstration videos made by [Blabla Linux](#).
Please read the tips and advice at the end of this document before you start.

This tutorial applies to all Debian distribution and derivatives.

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1 – Refurbishing key principle

The Emmabuntüs refurbishing key allows you to recondition all kinds of computer by directly cloning a system pre-configured by Emmabuntüs

Basic principle: the [MultiSystem](#) [Fr] software is used to launch a [Clonezilla](#) disk image that will let you select through a list of "clone image" stored on the USB key, to transfer it directly on the target machine. This cloning operation takes about 5 minutes, and thus allows the mass reconditioning of numerous machine in a minimum of time. This operation is handled by two scripts which organize the partitioning of the target disk, and provide Clonezilla with the procedure to follow.

This refurbishing method is shared by the [Emmabuntüs collective](#), thanks to them !

2 – The requested software for Debian

On Emmabuntüs, everything is already installed, MultiSystem integrated by default, you have nothing more to do, and you can jump to chapter 3 😊
On Debian, you will need the Multisystem software as well as the Geany text editor.

2.1 – MultiSystem installation on Debian/DFiso

In order to install MultiSystem on Debian, you need to follow the process described on the MultiSystem site:

- Install software-properties and wget:

```
sudo apt update && sudo apt install software-properties-common wget
```

- Add the MultiSystem repository:

```
sudo apt-add-repository 'deb http://liveusb.info/multisystem/depot all main'
```

- Ajdd the repository authentication key:

```
wget -q -O - http://liveusb.info/multisystem/depot/multisystem.asc | sudo apt-key add -
```

- Reload the list of available packages and install multisystem:

```
sudo apt update && sudo apt install multisystem
```

- Add the user into the "adm" group:

```
sudo adduser $USER adm
```

2.2 - Geany installation

Geany is used by Multisystem to edit the GRUB menu. Geany is present in the Debian Buster repositories. To install it you have to open a terminal window and simply type :

```
sudo apt update && sudo apt install geany
```

3 – Hardware needed for the refurbishing key

To generate your refurbishing key, you'll need a USB key with some specific properties:

- a capacity of 16 GB minimum
- a good quality (Kingston Data Traveler, Transcend JetFlash 750…)
- of type USB3, if possible, to take advantage of an optimal speed during the I/O transfers.

4 – Files needed for the refurbishing key

Several files are mandatory to create your refurbishing key. They are all provided by Emmabuntüs, in order to make your job easier.

Files needed:
- a Clonezilla ISO image, 32bits or 64bits, depending on your needs
- one or several clone image(s) of Emmabuntüs and/or DFiso that need to be extracted
- two scripts to partition the target disk and launch the transfer of the clone (clone.sh and parted.sh)
- one file to modify the GRUB menu of MultiSystem

You can find all these files in this space :
http://usb-remploi.emmabuntus.org

4.1 – How to choose my version: 32bits or 64bits ? UEFI?

The decision depends on the use you wish to make of this key : if you desire to recondition 32bits or 64bits machines. But how to make the difference ? To make a long story short:

- If your computer has a sticker saying "coreDuo", "core2duo", or is dated after 2003, you can pick a 64bits clone.
- If your computer proudly displays "Pentium IV M" or is dated before 2003, take a 32bits clone , with a i686 version of Clonezilla.

As far as UEFI, the BIOS successor, is concerned, the 64bits version was designed to automatically handle UEFI. In case of doubts, take a clone of each architecture, and the script will only list the compatible clone

Find here after, a summary table of the various compatible versions:

Computer types	Computer examples	Clone	Clonezilla
32bits before 2003	Pentium3, Pentium4	32bits	i686
64bits with RAM < 1G	Pentium4 HT, Dual-Core	32bits	i686/amd64
64bits with RAM 1-3G	Dual-Core, Core2	32bits/64bits	i686/amd64
64bits with RAM > 3G	Core i3, i5, i7, i9	64bits	i686/amd64
64bits with UEFI	Recent computers starting with Windows 8	64bits UEFI	amd64
64bits UEFI +SecureBOOT	Recent computers starting with Windows 8	Not avaialble	-

If possible, we suggest you disable UEFI, and use a non-UEFI clone, see the CSM (Compatibility Support Module).

5 – The making of the refurbishing key

Here a brief description of the process, described later in details :

- plug your USB key in
- prepare the key : partition it with two partitions, one vFat to host Multisystem and another Ext4 one to receive all the files needed for the cloning operation
- copy the files
- launch MultiSystem, initialize the key with the GRUB install
- handling of the Clonezilla image by Multisystem
- Multisystem Grub menu modification
- remove the USB key, which is now ready for its refurbishing job
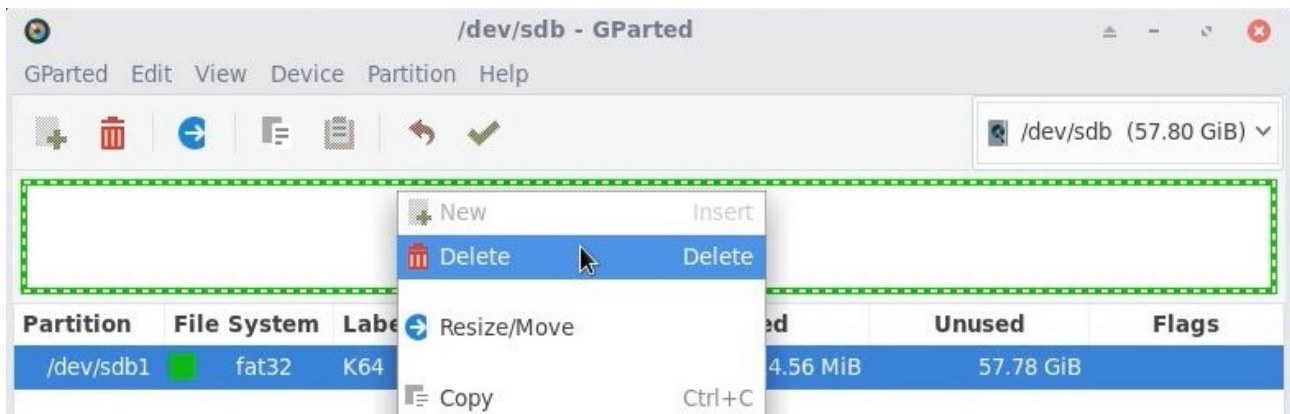
5.1 – Preparing the USB key

In order to prepare the refurbishing key, we use the "GParted" software, but it is also possible to use the Gnome disk utility. Start by plugging the USQB key in your computer, and then open GParted (your password is required):
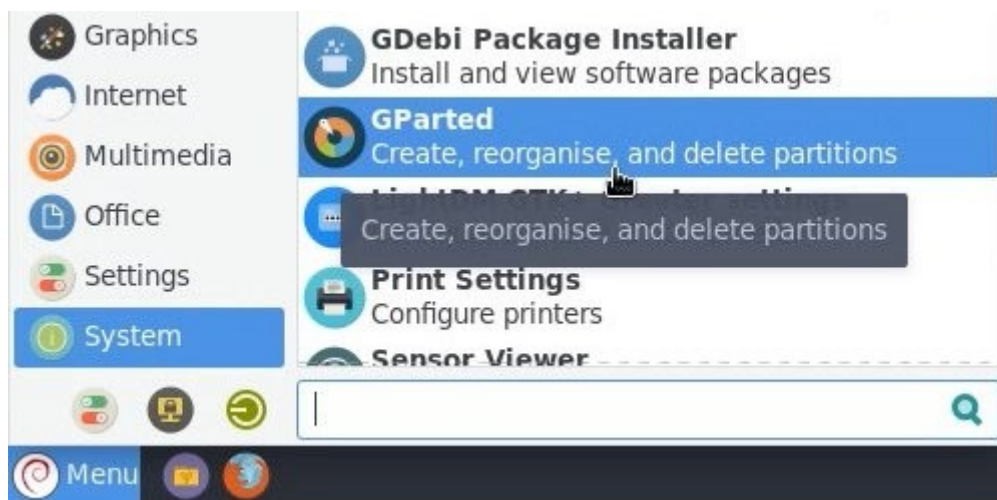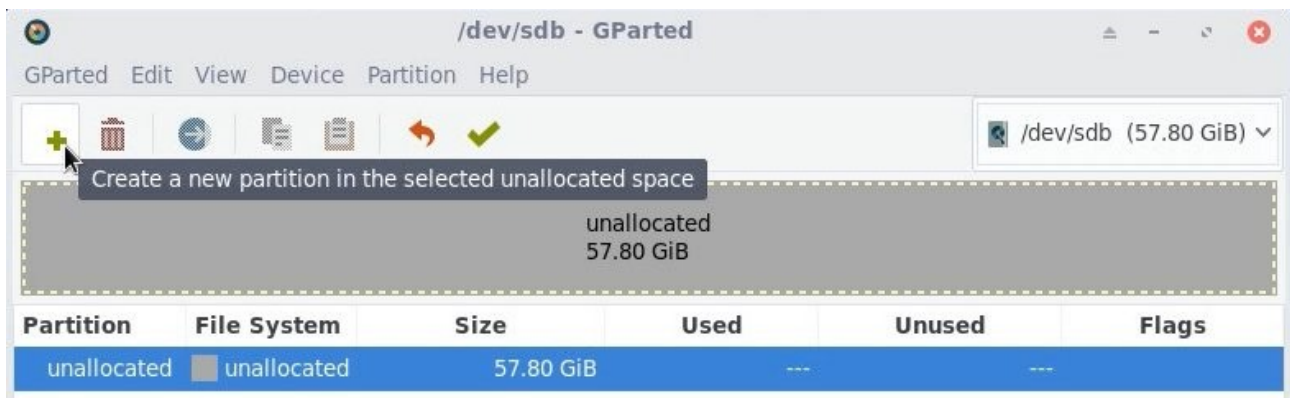

Select your USB key, within the list of available devices:
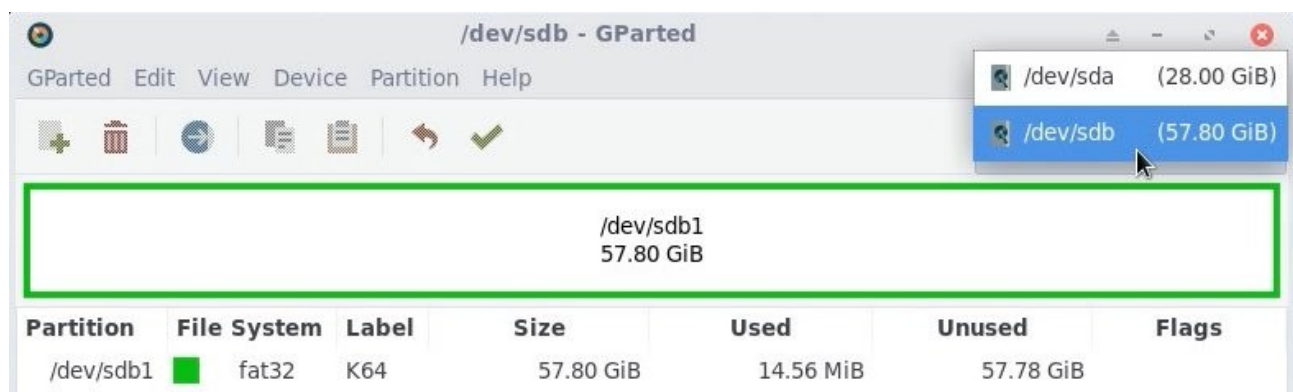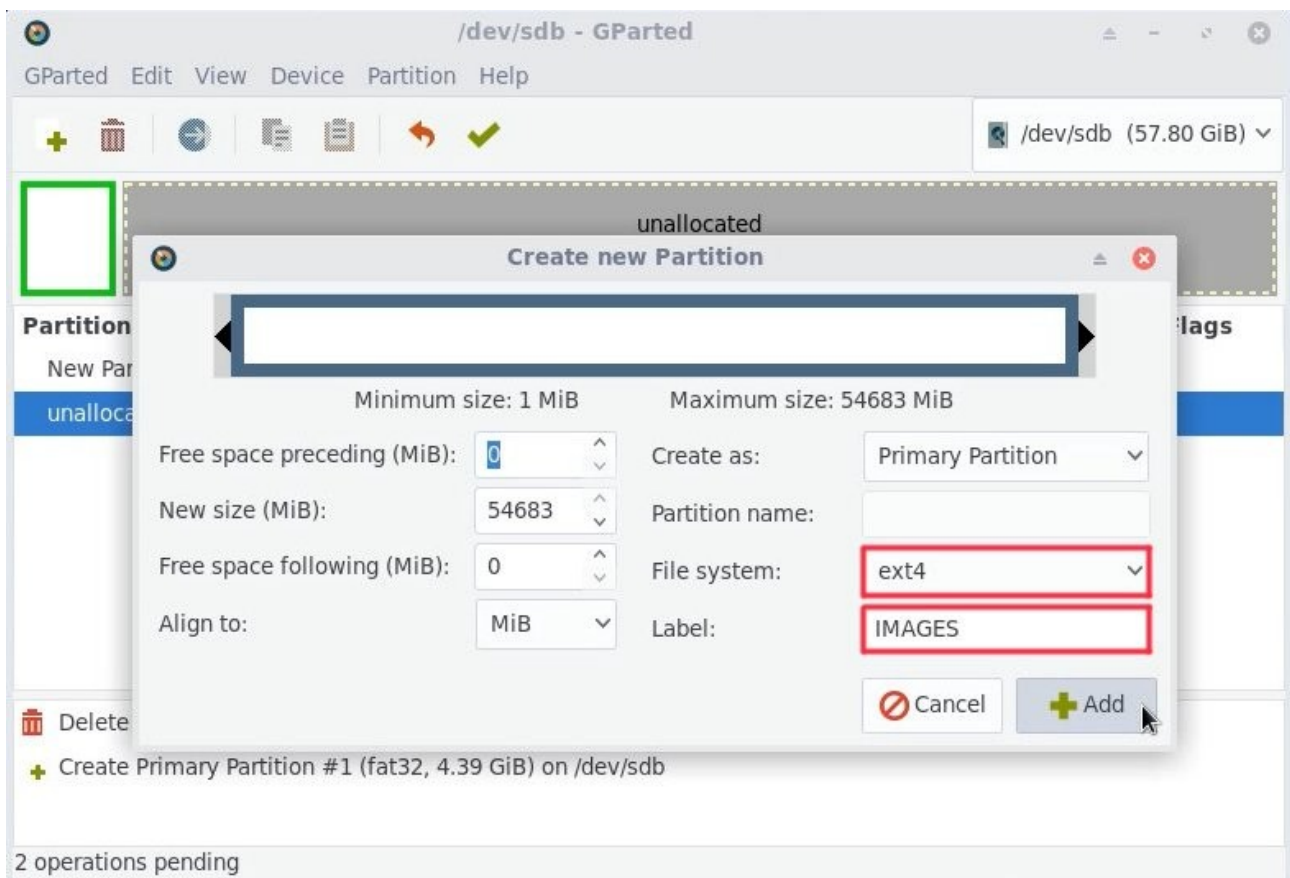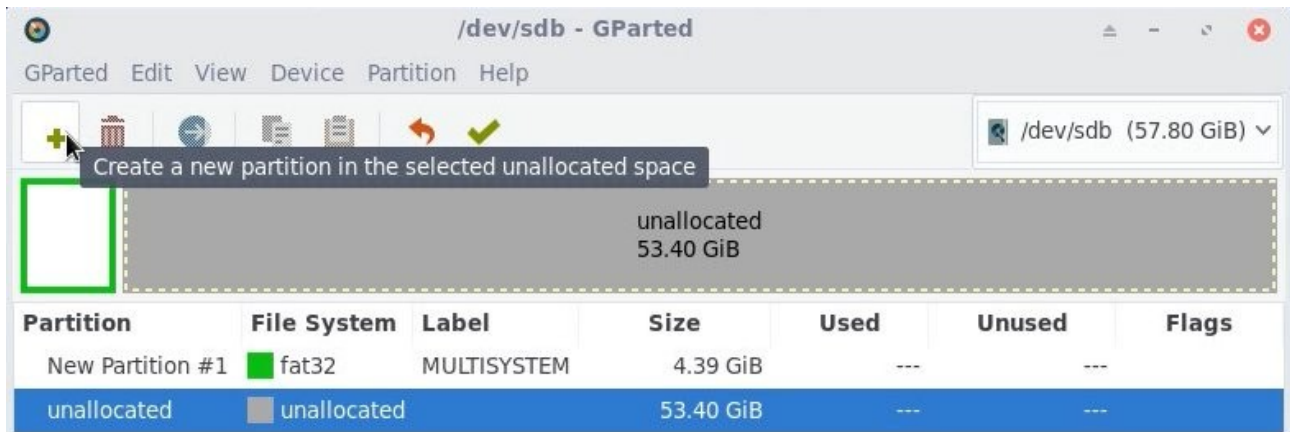

If necessary, delete the existing partition:

Create a vFat partition of 4,500 MB to host Multisystem (it is possible to define a partition of a smaller size, see the tips at the end of this documents):
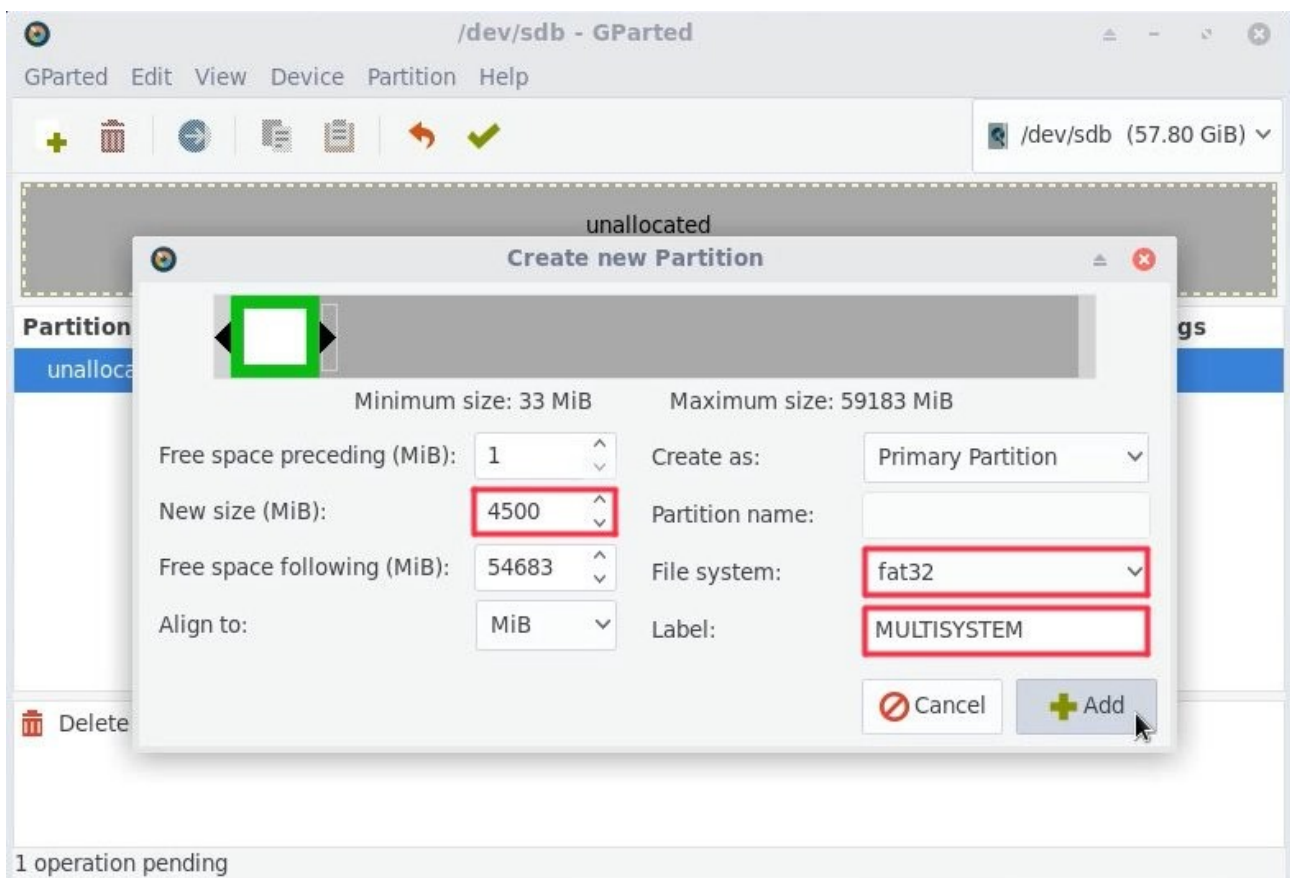
Create a second ext4 partition using the remaining available free space to host the clones and the scripts.
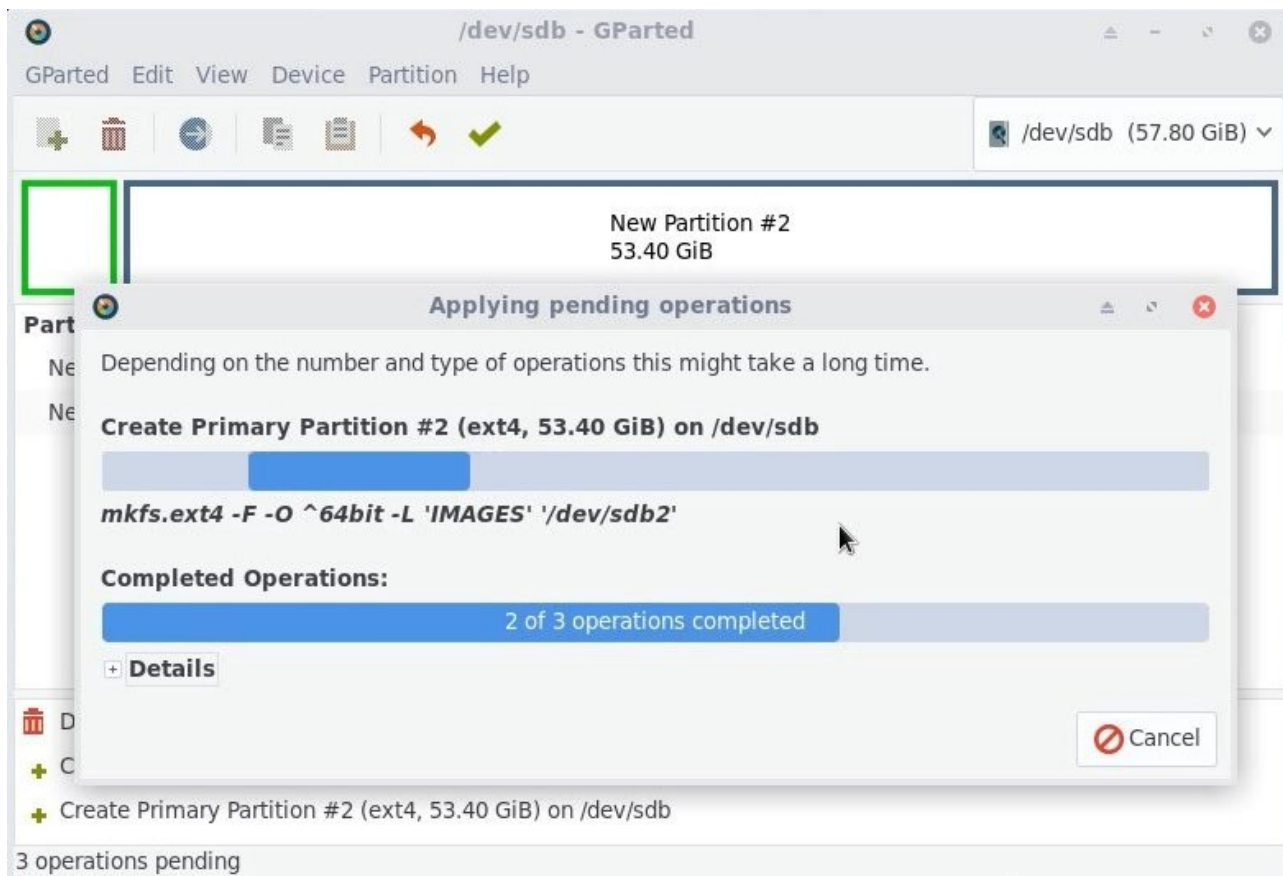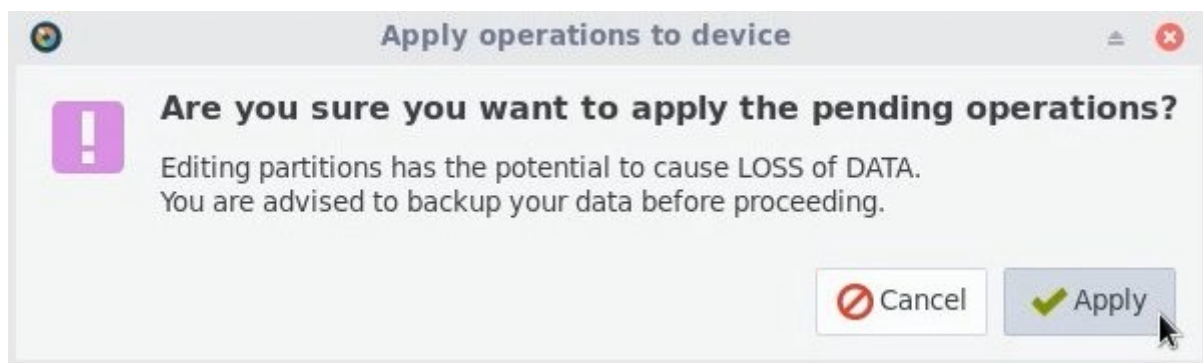
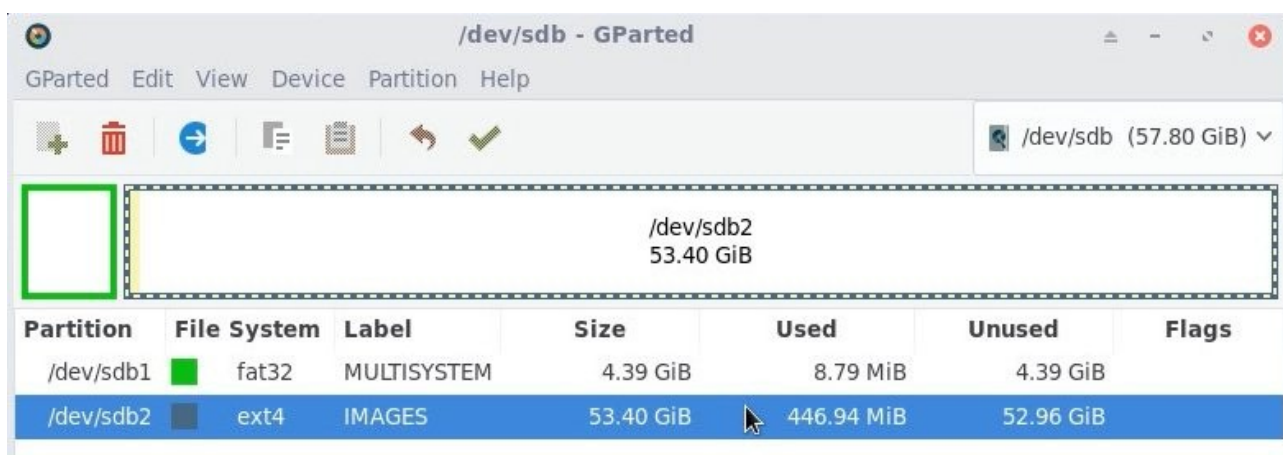**WARNING**: you must call this partition "IMAGES" so that it could be identified by the scripts on the key:

Then apply previously defined operations:

Apply operations to device

Are you sure you want to apply the pending operations?

Editing partitions has the potential to cause LOSS of DATA.
You are advised to backup your data before proceeding.

[Cancel]   [Apply]

/dev/sdb - GParted

GParted   Edit   View   Device   Partition   Help

/dev/sdb (57.80 GiB)

New Partition #2
53.40 GiB

Applying pending operations

Depending on the number and type of operations this might take a long time.

Create Primary Partition #2 (ext4, 53.40 GiB) on /dev/sdb

mkfs.ext4 -F -O ^64bit -L 'IMAGES' '/dev/sdb2'

Completed Operations:

2 of 3 operations completed

[+] **Details**

[Cancel]

+ Create Primary Partition #2 (ext4, 53.40 GiB) on /dev/sdb

3 operations pending

Once all operations are completed, the partitioning of your key should look like this:

/dev/sdb - GParted

GParted   Edit   View   Device   Partition   Help

/dev/sdb (57.80 GiB)

/dev/sdb2
53.40 GiB

Partition	File System	Label	Size	Used	Unused	Flags
/dev/sdb1	fat32	MULTISYSTEM	4.39 GiB	8.79 MiB	4.39 GiB	
/dev/sdb2	ext4	IMAGES	53.40 GiB	446.94 MiB	52.96 GiB	

5.2 – Copy of the clones and scripts

Once your key if formatted with these two partitions, one must copy all the needed files:

- the cloning script: clone.sh
- the partitioning guide : parted.sh
- the clone image(s) to be used

Beforehand, you should extract from the archive(s) the image(s) you plan to transfer. Simply use the the Thunar file manager with the option "Extract here" of the contextual menu obtained by a right-click on the relevant archive.
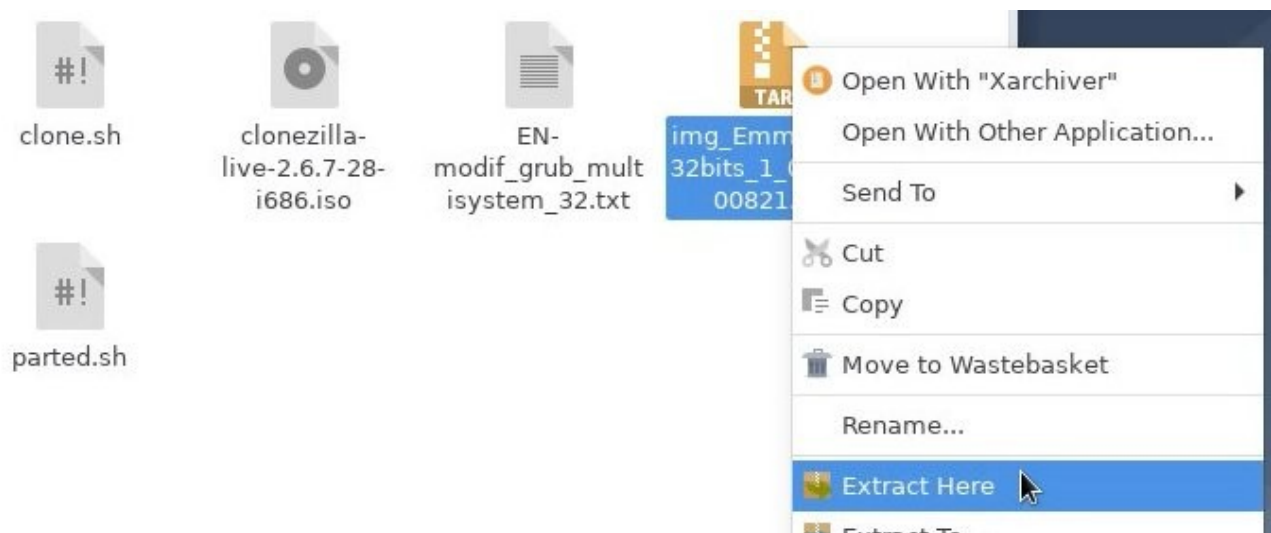
Extraction is proceeding ...
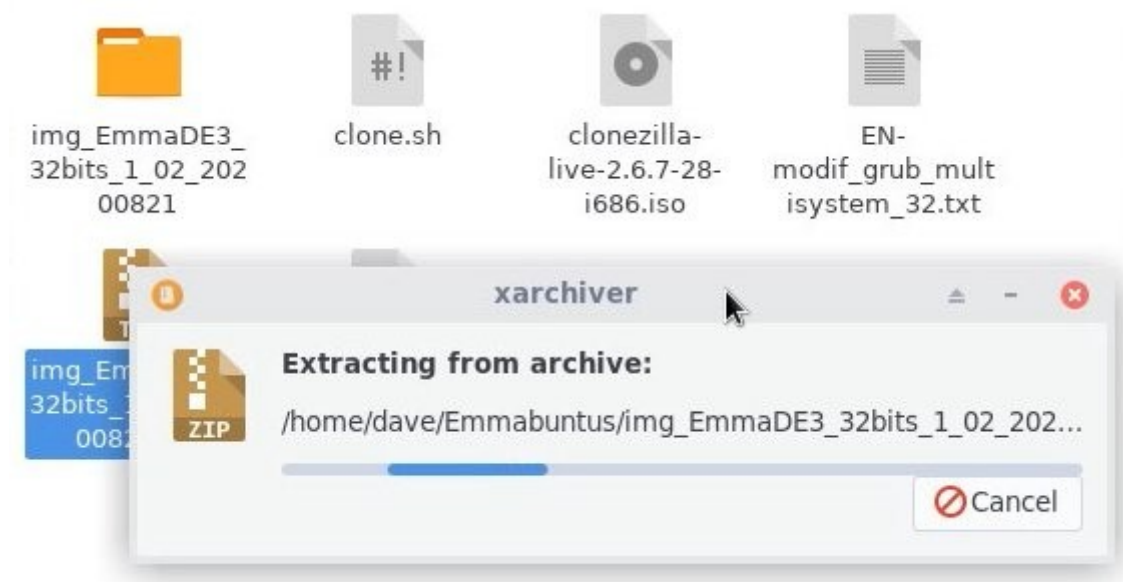
Once your Image extracted, the folder is ready to be copied inside the "IMAGES" partition:

In order to copy files and folder, you need the admin rights, because the second partition is of type ext4 and is mounted by default in write mode only. So, to make it simple, you launch Thunar in "root" mode and you copy-paste the relevant objects.

Open the Thunar program in ""root" mode:
`sudo thunar`

Then navigate to the folder containing the downloaded files you need:
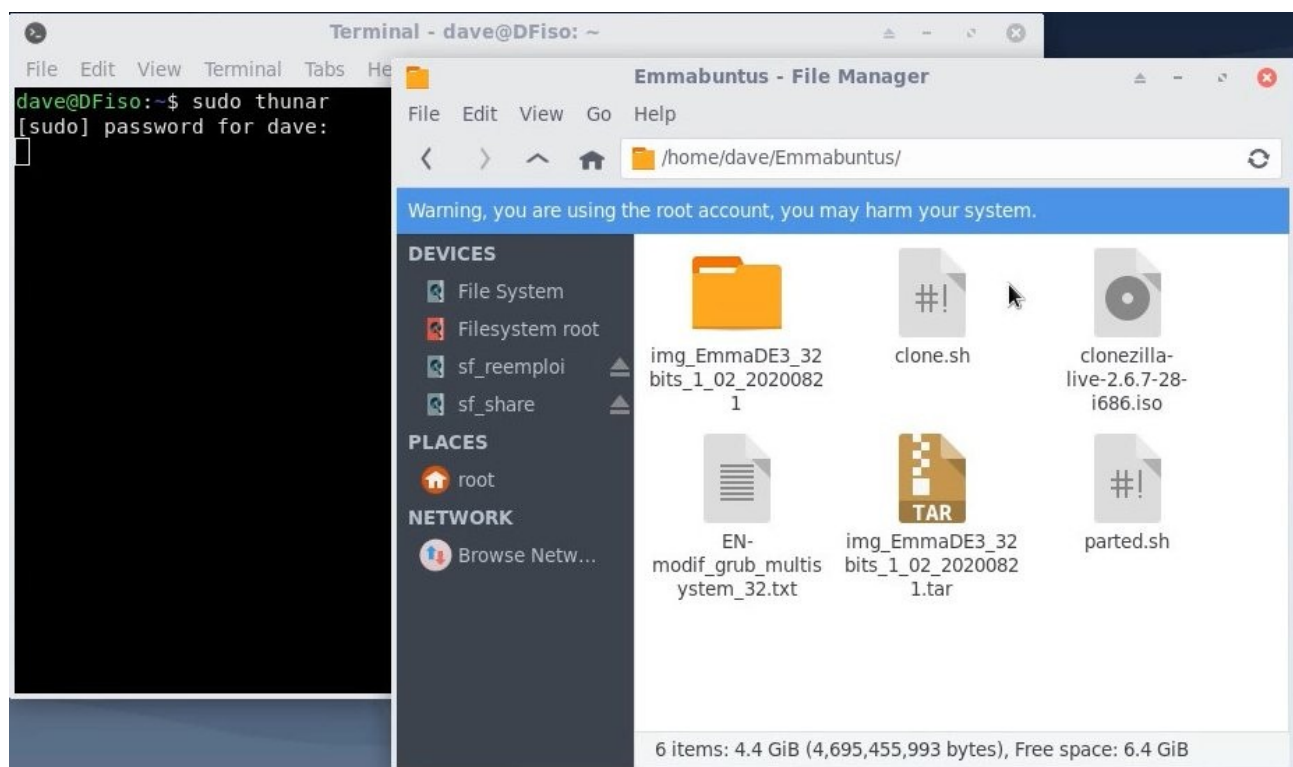
Now, open the "IMAGES" partition with a right-click on the bookmark located in the Thunar left pane and take the option "Open in New Window".
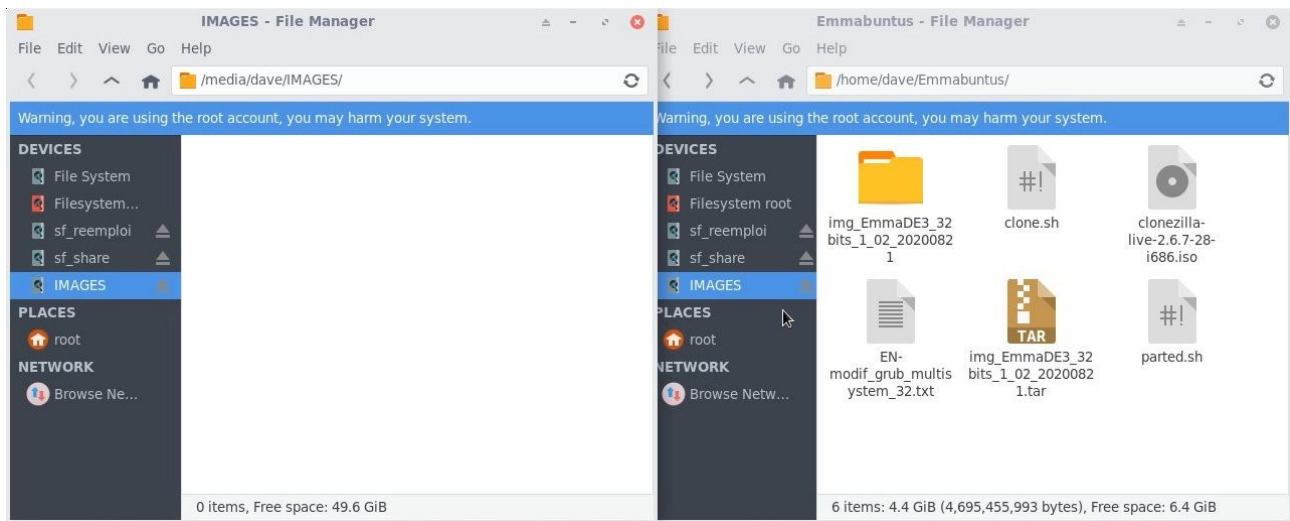
We start by copying the scripts (clone.sh and parted.sh) by using the drag-and-drop method, and then we make them executable with a right-click > Properties > Permissions > "Allow this file to run as program":
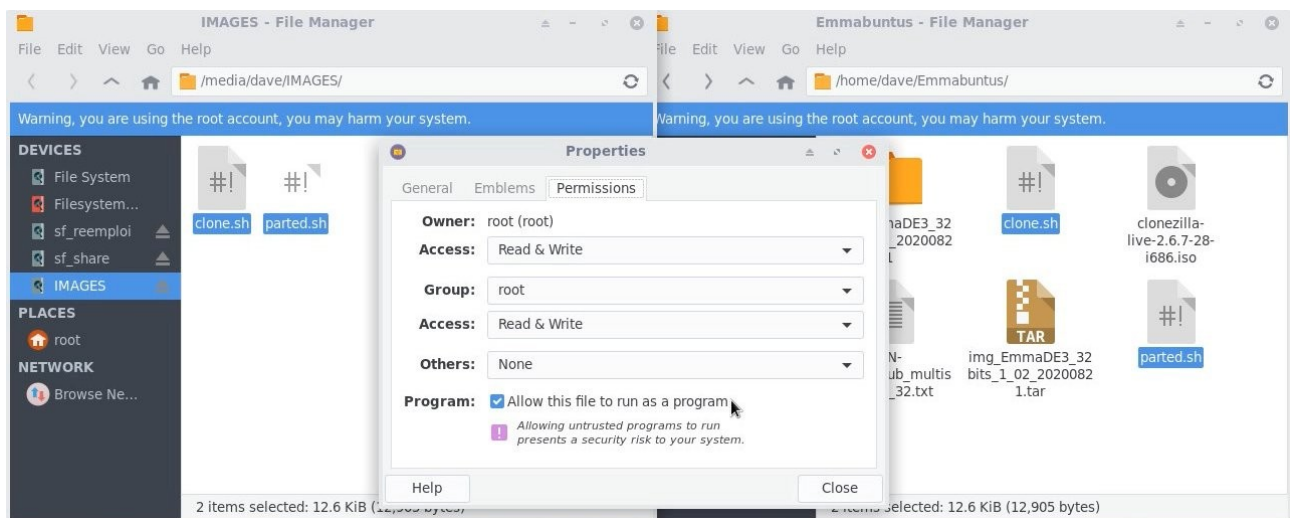
Then we copy the folder(s) containing the clone(s):
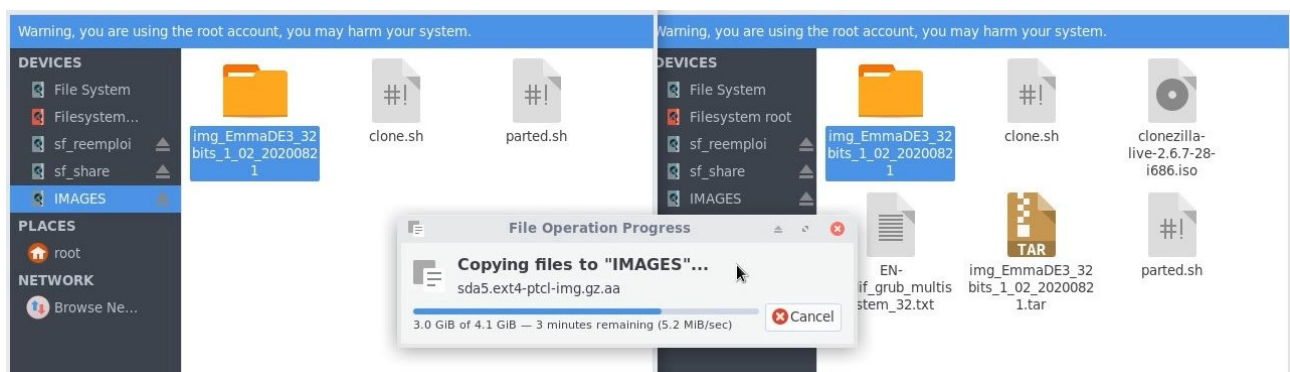
And that's it, all the files are in place for a 32bits mode reconditioning.
Please note that you can add other clones like the Emmabuntüs 64bits UEFI, or
the (classic or UEFI) DFiso 64bits provided by Emmabuntüs.

Now we are going to use Multisystem, which is already installed, to drop the
Clonezilla image in the vFat partition.

5.3 – Key initialization with MultiSystem

In order for the key to launch Clonezilla and select the clone image to install,
we need first to initialize this key.

From the Whisker application menu, category "Accessories":
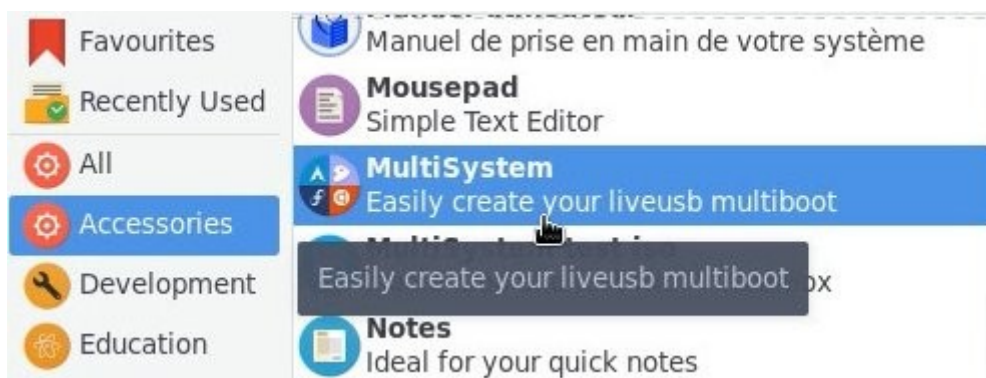
Multisystem starts and will detect your USB key. Select it, and launch the
initialization by clicking on "Confirm". MultiSystem will then install the GRUB
loader on the key.
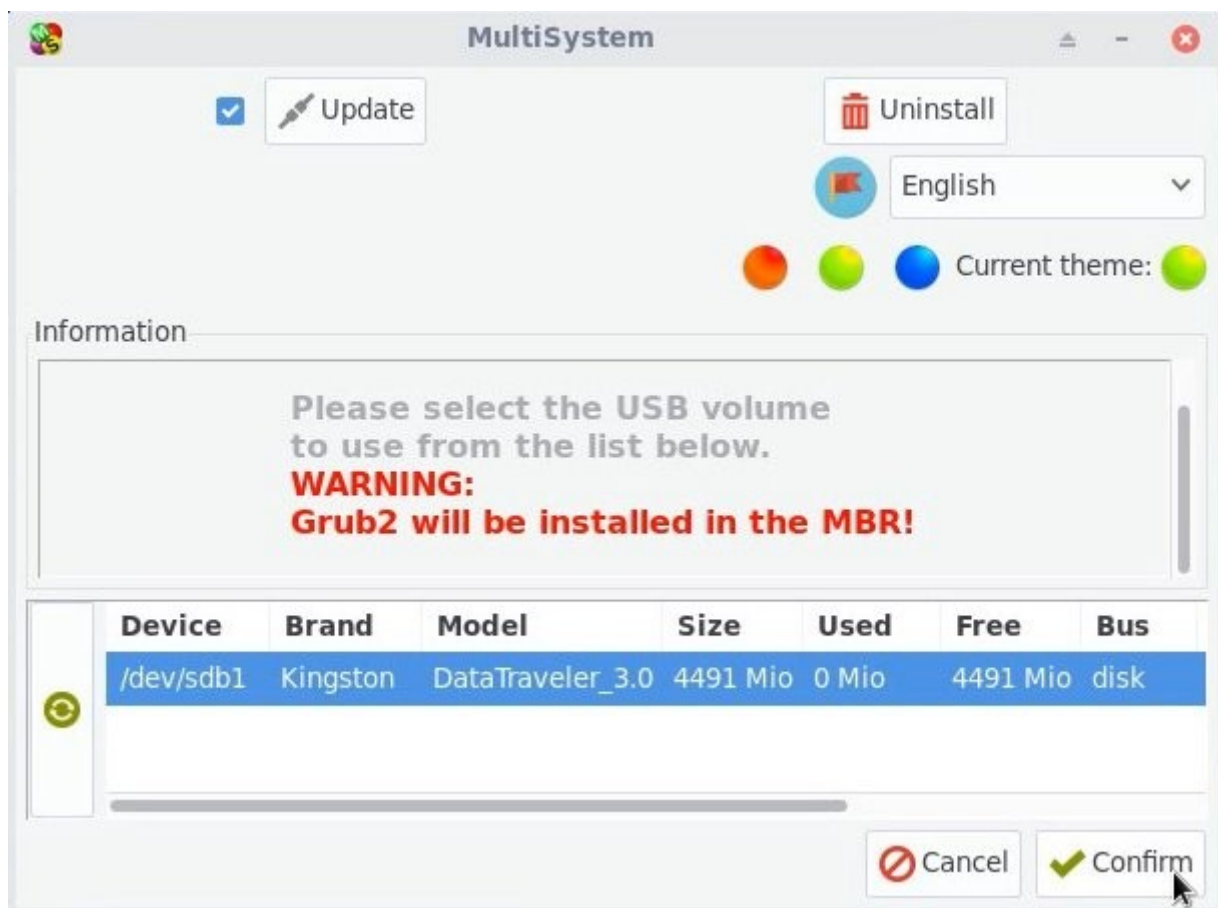
Confirmation requested:

MultiSystem installs GRUB on the selected key ...

Once this operation is complete, MultiSystem displays on its main window some information relative to the USB key:
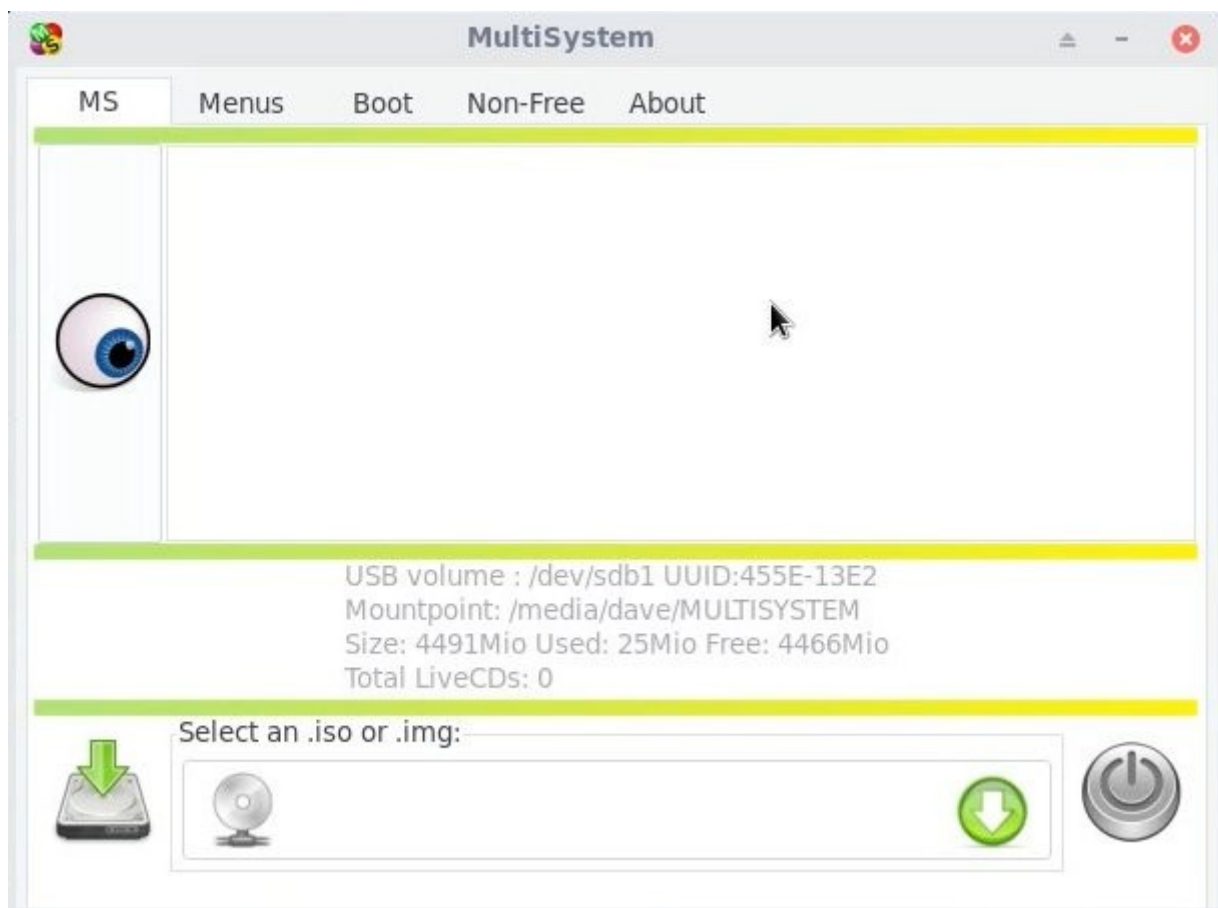
5.4 – Handling of the Clonezilla ISO ?

Once GRUB installed, we need to add the Clonezilla ISO image fitting your wishes (32bits or 64bits). To achieve this, and since the drag and drop does not function between Xfce and MultiSystem, you need to use the cut-and-paste functionality of the Thunar contextual menu.

Open Thunar, select the Clonezilla image you want to integrate on the key, then right-click > Copy.
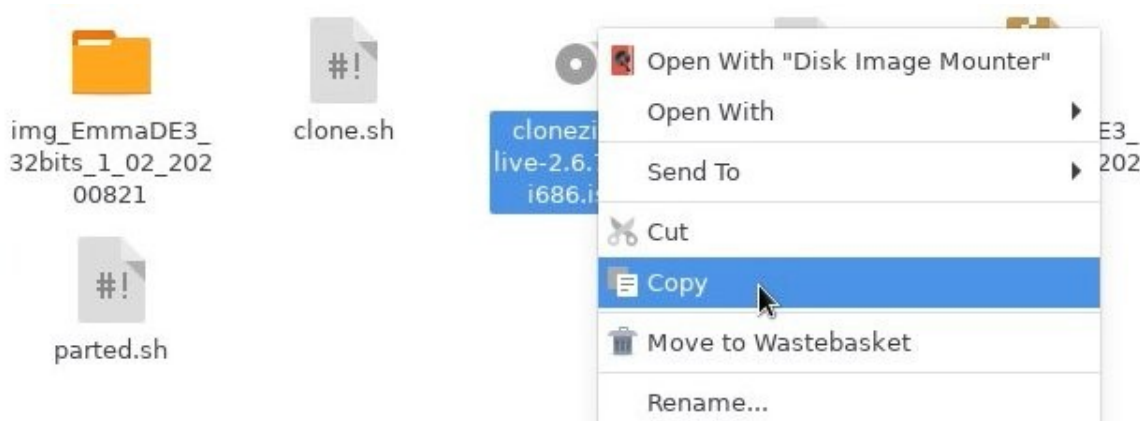
Then move your cursor in the Add frame of MultiSystem, and use the "Ctrl+v" key shortcut to paste on it the ISO image:
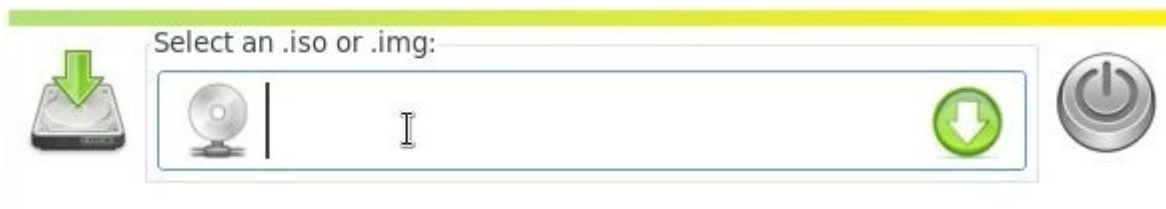
The admin password is requested, then the ISO image is added within the vFat partition, and an entry is created in the MultiSystem Grub menu:

5.5 - Modification of the MultiSystem GRUB menu

To be able to launch our own refurbishing process, we need to modify the
MultiSystem grub menu, in order to use the scripts installed on the ext4
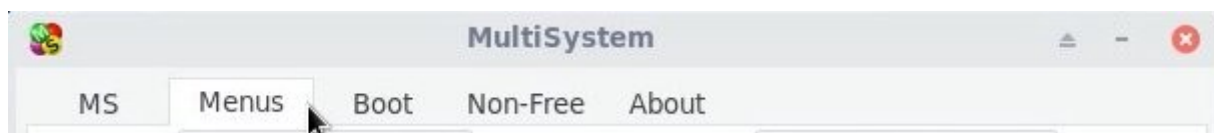partition.
The text segment to be added resides in the file
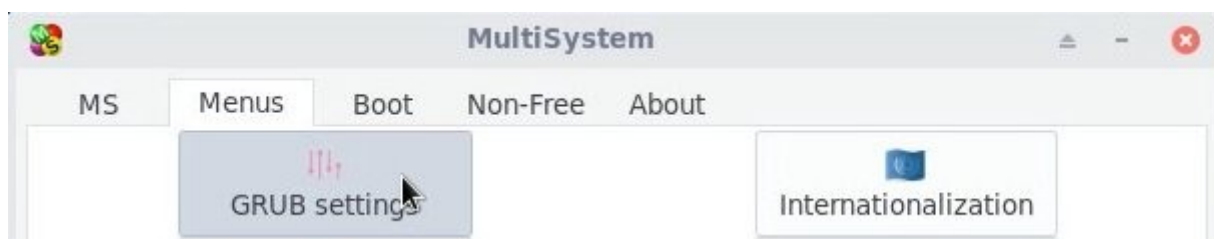 " EN-modif_grub_multisystem_(32/64).txt"
where you have to adapt "32" or "64" to your own configuration.
To modify the menu, we utilize the MultiSystem configuration interface.

Select the "Menus" tab:

then click on the "GRUB settings" button:

and then the "grub.cfg" item:

MultiSystem opens the GRUB menu within Geany (that you installed at the
beginning of this tutorial). You need to add the text included in the file
 "EN- modif_grub_multisystem_(32/64).txt"
(according to the Clonezilla version used) after the already existing entry, like
this :

The original grub.cfg file:

The text to add must be placed before the line "#MULTISYSTEM_STOP" (which, in this example, is at the line 74 of the original grub.cfg)

Copy the paragraph from the file provided by Emmabuntüs:

Then paste it between the line "MULTISYSTEM_MENU_FIN|28...." and the line "#MULTISYSTEM_STOP":

Here after the resulting grub.cfg file, with its new entry:

```
61  #
62  #
63  #Ne supprimez pas ce marqueur! / Do not remove this marker!
64  #MULTISYSTEM_START
65  #MULTISYSTEM_MENU_DEBUT|16-09-2020-14:05:04-851167517|clonezilla-live-2.6.7-28-i686.iso|multisystem-clonezilla|277Mio|
66  menuentry "clonezilla-live-2.6.7-28-i686.iso" {
67  search --set -f "/clonezilla-live-2.6.7-28-i686.iso"
68  loopback loop "/clonezilla-live-2.6.7-28-i686.iso"
69  linux (loop)/live/vmlinuz findiso=/clonezilla-live-2.6.7-28-i686.iso toram=filesystem.squashfs boot=live union=overlay username=user config
70  initrd (loop)/live/initrd.img
71  }
72  #MULTISYSTEM_MENU_FIN|16-09-2020-14:05:04-851167517|clonezilla-live-2.6.7-28-i686.iso|multisystem-clonezilla|277Mio|
73  #MULTISYSTEM_MENU_DEBUT|23-08-2020-12:25:24-893097238|clonezilla-live-2.6.7-28-i686.iso|multisystem-clonezilla-emmabuntus-en|277Mio|
74  menuentry "Emmabuntüs refurbishing key (Automatic install by cloning)." {
75  search --set -f "/clonezilla-live-2.6.7-28-i686.iso"
76  loopback loop "/clonezilla-live-2.6.7-28-i686.iso"
77  linux (loop)/live/vmlinuz findiso=/clonezilla-live-2.6.7-28-i686.iso toram=filesystem.squashfs boot=live union=overlay username=user config
78  initrd (loop)/live/initrd.img
79  }
80  #MULTISYSTEM_MENU_FIN|23-08-2020-12:25:24-893097238|clonezilla-live-2.6.7-28-i686.iso|multisystem-clonezilla-emmabuntus-en|277Mio|
81  #MULTISYSTEM_STOP
```

Save your file, and close Geany. MultiSystem execute a GRUB update on the USB key, and your password is required:

Now it's time to close MultiSystem, to eject your refurbishing key, and to start reconditioning all the computers passing nearby … 😊

Thanks to Emmabuntüs ! 😀

6 – Tips and advice

The handling of the UEFI or BIOS boot order is different for each computer model : the procedures are normalized, but it happens that sometimes one way of doing functions better than another one … So find here after a small list of tips and advice that you can take into account if you face some issues during your tests.

- The UEFI handling is managed automatically by the refurbishing scripts. However it is better to deactivate the UEFI feature on the computer to be refurbished, in order to increase the compatibility level between hardware and software.

- If you use computers equipped with the SECUREBOOT feature, we suggest to disable this option, when possible.

- This tutorial recommend the use of a 16 GB USB key, in order to add at least one "clone image". However you can perfectly use 32 or64 GB USB key to be able to add all the images compatible with your architecture, and let the end users pick the version of their choice

- In the chapter 5.1, we recommend a partition of 4,500 MB for Multisystem to be able to add another distribution next to Clonezilla. As a matter of fact, another distribution of the type live-CD, would let you test the hardware configuration, before you launch the cloning process
  If you do not intend to use this capability, you can reduce the vFat partition down to 1 GB.