

How to populate the SD card with dd command

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1 Introduction

STMicroelectronics delivers also a script running on **Linux** host PC to populate **ONLY** the microSD card device. This script is located here : build-<DISTRO>-<MACHINE>/tmp-glibc/deploy/images/<MACHINE>/scripts/

This script as [STM32CubeProgrammer](#) tool is using *Flashlayout.tsv* file in input parameter

This script creates a raw file <FlashLayoutName>.raw and a txt file <FlashLayoutName>.how_to_update.txt

Then you can use this raw file to populate your microSD card inserted on your HOST PC

2 Usage

PC \$> cd build-<DISTRO>-<MACHINE>/tmp-glibc/deploy/images/<MACHINE>/scripts

PC \$> ./create_sdcard_from_flashlayout.sh ../flashlayout_<built-image>/<FlashLayout file>

Example :

```
PC $> cd build-openstlinuxweston-stm32mp1/tmp-glibc/deploy/images/stm32mp1/scripts/
PC $> ./create_sdcard_from_flashlayout.sh ../flashlayout_st-image-weston/FlashLayout_sdcard_stm32mp1
Create Raw empty image: ../flashlayout_st-image-weston/./flashlayout_st-image-weston_FlashLayout_sdcard_stm32mp1
Create partition table:
[CREATED] part 1:  fsbl1 [partition size 256.0 KiB]
[CREATED] part 2:  fsbl2 [partition size 256.0 KiB]
[CREATED] part 3:  ssbl [partition size 2.5 MiB]
[CREATED] part 4:  bootfs [partition size 64.0 MiB]
[CREATED] part 5:  vendorfs [partition size 16.0 MiB]
[CREATED] part 6:  rootfs [partition size 750.4 MiB]
[CREATED] part 7:  userfs [partition size 702.5 MiB]
```

```
Partition table from ../flashlayout_st-image-weston/./flashlayout_st-image-weston_FlashLayout_sdcard_stm32mp1
Disk ../flashlayout_st-image-weston/./flashlayout_st-image-weston_FlashLayout_sdcard_stm32mp1
Logical sector size: 512 bytes
Disk identifier (GUID): 8E3FE74B-3B58-4617-B71B-5EC498875478
Partition table holds up to 128 entries
First usable sector is 34, last usable sector is 3145694
Partitions will be aligned on 2-sector boundaries
Total free space is 0 sectors (0 bytes)
```

Number	Start (sector)	End (sector)	Size	Code	Name
1	34	545	256.0 KiB	8300	fsbl1

```

2          546          1057    256.0 KiB    8300  fsbl2
3          1058          6177    2.5 MiB     8300  ssbl
4           6178         137249   64.0 MiB    8300  bootfs
5         137250         170017   16.0 MiB    8300  vendorfs
6         170018         1706881  750.4 MiB   8300  rootfs
7        1706882         3145694  702.5 MiB   8300  userfs

```

Populate raw image with image content:

```

[ FILLED ] part 1:  fsbl1, image: tf-a-stm32mp157c-ev1-trusted.stm32
[ FILLED ] part 2:  fsbl2, image: tf-a-stm32mp157c-ev1-trusted.stm32
[ FILLED ] part 3:  ssbl, image: u-boot-stm32mp157c-ev1-trusted.stm32
[ FILLED ] part 4:  bootfs, image: st-image-bootfs-openstlinux-weston-stm32mp1.ext4
[ FILLED ] part 5:  vendorfs, image: st-image-vendorfs-openstlinux-weston-stm32mp1.ext4
[ FILLED ] part 6:  rootfs, image: st-image-weston-openstlinux-weston-stm32mp1.ext4
[ FILLED ] part 7:  userfs, image: st-image-userfs-openstlinux-weston-stm32mp1.ext4

```

```

#####
#####

```

RAW IMAGE generated: ../flashlayout_st-image-weston/./flashlayout_st-image-weston_FlashLa

WARNING: before to use the command dd, please amount all the partitions associated to SDCARD.

```
sudo umount `lsblk --list | grep mmcblk0 | grep part | gawk '{ print $7 }' | tr '\n' `
```

To put this raw image on sdcard:

```
sudo dd if=../flashlayout_st-image-weston/./flashlayout_st-image-weston_FlashLayout_s
```

(mmcblk0 can be replaced by:

sdX if it's a device dedicated to receive the raw image
(where X can be a, b, c, d, e)

```

#####
#####

```

3 Populate the microSD card inserted on your linux host PC with the created raw file

You need first to retrieve the volume name of your drive (USB Key or MMC card)

To connect a USB device to the virtual machine manually, select VM > Removable Devices > Device Name > Connect (Disconnect from host)

More explanations for this specific case [here](#)

Insert your drive then use the following command :

- In this example, the volume name is **sdd** (microSD card is inserted with USB key)

```

PC $> cat /proc/partitions
major minor #blocks name
8          0  488386584 sda
8          1   999424 sda1
8          2         1 sda2
8          5  487384064 sda5

```

```

11      0      1048575 sr0
252     0      487382016 dm-0
252     1      19996672 dm-1
252     2      8335360 dm-2
252     3      459046912 dm-3
8       48      1921024 sdd

```

- In this example, the volume name is **mmcblk0** (microSD card is inserted directly with microSD card adapter)

```

PC $> cat /proc/partitions
major minor #blocks name

8       0      488386584 sda
8       1          999424 sda1
8       2              1 sda2
8       5      487384064 sda5
11      0          1048575 sr0
252     0      487382016 dm-0
252     1      19996672 dm-1
252     2      8335360 dm-2
252     3      459046912 dm-3
8       48      1921024 mmcblk0

```



mmcblk0 can be replaced by: sdX if it's a device dedicated to receive the raw image (where X can be a, b, c, d, e)

- Before using the command dd, please umount all the partitions associated to microSD card.

```
PC $> sudo umount `lsblk --list | grep mmcblk0 | grep part | gawk '{ print $7 }' | tr '\n' ' '`
```

- Populate microSD card with dd command:

```
PC $> cd build-openstlinuxweston-stm32mp1/tmp-glibc/deploy/images/stm32mp1/scripts/
```

```
PC $> sudo dd if=../flashlayout_st-image-weston_FlashLayout_sdcard_stm32mp157c-ev1-trusted.raw of=/dev/mmcblk0 bs=8M conv=fdatsync
```

The dd command takes few minutes (depending mainly of your rootfs size)

4 Update manually some partitions with dd command

Once you have populated your microSD card with the raw file, it is possible to update manually some partitions as explained in txt file.

Example :

```

PC $> cat flashlayout_st-image-weston_FlashLayout_sdcard_stm32mp157c-ev1-trusted.how_to_up
This file describes how to update manually the partition of SDCARD:
1. SDCARD schema of partition
2. How to populate each partition
3. How to update the kernel/devicetree

```

1. SDCARD schema of partition:

```
=====
=          fsbl1  =          fsbl2  =          ssbl   =          bootfs  =          vendorfs =          rootfs  =          userfs
=          =          =          =          =          =          =          =
= mmcblk0p1 = mmcblk0p2 = mmcblk0p3 = mmcblk0p4 = mmcblk0p5 = mmcblk0p6 = mmcblk0p7
= ( 1 )     = ( 2 )     = ( 3 )     = ( 4 )     = ( 5 )     = ( 6 )     = ( 7 )
=          =          =          =          =          =          =
=====
```

- (1):
Device: /dev/mmcblk0p1
Label: fsbl1
Image: tf-a-stm32mp157c-ev1-trusted.stm32
- (2):
Device: /dev/mmcblk0p2
Label: fsbl2
Image: tf-a-stm32mp157c-ev1-trusted.stm32
- (3):
Device: /dev/mmcblk0p3
Label: ssbl
Image: u-boot-stm32mp157c-ev1-trusted.stm32
- (4):
Device: /dev/mmcblk0p4
Label: bootfs
Image: st-image-bootfs-openstlinux-weston-stm32mp1.ext4
- (5):
Device: /dev/mmcblk0p5
Label: vendorfs
Image: st-image-vendorfs-openstlinux-weston-stm32mp1.ext4
- (6):
Device: /dev/mmcblk0p6
Label: rootfs
Image: st-image-weston-openstlinux-weston-stm32mp1.ext4
- (7):
Device: /dev/mmcblk0p7
Label: userfs
Image: st-image-userfs-openstlinux-weston-stm32mp1.ext4

2. How to populate each partition

- Populate partition fsbl1 (/dev/mmcblk0p1)
dd if=tf-a-stm32mp157c-ev1-trusted.stm32 of=/dev/mmcblk0p1 bs=1M conv=fdatasync
- Populate partition fsbl2 (/dev/mmcblk0p2)
dd if=tf-a-stm32mp157c-ev1-trusted.stm32 of=/dev/mmcblk0p2 bs=1M conv=fdatasync
- Populate partition ssbl (/dev/mmcblk0p3)
dd if=u-boot-stm32mp157c-ev1-trusted.stm32 of=/dev/mmcblk0p3 bs=1M conv=fdatasync
- Populate partition bootfs (/dev/mmcblk0p4)
dd if=st-image-bootfs-openstlinux-weston-stm32mp1.ext4 of=/dev/mmcblk0p4 bs=1M conv=fd
- Populate partition vendorfs (/dev/mmcblk0p5)
dd if=st-image-vendorfs-openstlinux-weston-stm32mp1.ext4 of=/dev/mmcblk0p5 bs=1M conv=
- Populate partition rootfs (/dev/mmcblk0p6)
dd if=st-image-weston-openstlinux-weston-stm32mp1.ext4 of=/dev/mmcblk0p6 bs=1M conv=fd
- Populate partition userfs (/dev/mmcblk0p7)
dd if=st-image-userfs-openstlinux-weston-stm32mp1.ext4 of=/dev/mmcblk0p7 bs=1M conv=fd

3. How to update the kernel/devicetree

The kernel and devicetree are present on "bootfs" partition.

```
To change kernel and devicetree, you can copy the file on this partition:  
- plug SDCARD on your PC  
- copy kernel uImage on SDCARD  
  sudo cp uImage /media/$USER/bootfs/  
- copy devicetree uImage on SDCARD  
  sudo cp stm32mp1*.dtb /media/$USER/bootfs/  
- umount partitions of SDCARD  
  sudo umount /media/$USER/bootfs/  
  (dont't forget to umount the other partitions of SDCARD:  
  sudo umount `lsblk --list | grep mmcblk0 | grep part | gawk '{ print $7 }' | tr '\n' '  
  )
```