



## How to populate the SD card with dd command

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## 1 Introduction

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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 is also located in the Starter Package/<VERSION>/ images/stm32mp1/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_stm32mp157c-ev1-trusted.tsv
```

```
Create Raw empty image: ../flashlayout_st-image-weston/./flashlayout_st-image-
weston_FlashLayout_sdcard_stm32mp157c-ev1-trusted.raw of 1536MB
```

```
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_stm32mp157c-ev1-trusted.raw
```

```
Disk ../flashlayout_st-image-weston/./flashlayout_st-image-
```

```
weston_FlashLayout_sdcard_stm32mp157c-ev1-trusted.raw: 3145728 sectors, 1.5 GiB
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_FlashLayout_sdcard_stm32mp157c-ev1-trusted.raw
```

```
WARNING: before to use the command dd, please umount 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 sdcad:  
sudo dd if=./flashlayout_st-image-weston/./flashlayout_st-image-  
weston_FlashLayout_sdcad_stm32mp157c-ev1-trusted.raw of=/dev/mmcblk0 bs=8M conv=fdatasync
```

```
(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=fdatasync status=progress
```

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_update.txt
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=fdatasync
- Populate partition vendorfs (/dev/mmcblk0p5)  
dd if=st-image-vendorfs-openstlinux-weston-stm32mp1.ext4 of=/dev/mmcblk0p5 bs=1M conv=fdatasync
- Populate partition rootfs (/dev/mmcblk0p6)  
dd if=st-image-weston-openstlinux-weston-stm32mp1.ext4 of=/dev/mmcblk0p6 bs=1M conv=fdatasync
- Populate partition userfs (/dev/mmcblk0p7)  
dd if=st-image-userfs-openstlinux-weston-stm32mp1.ext4 of=/dev/mmcblk0p7 bs=1M conv=fdatasync

## 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' ' '
- )

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MultimediaCard