

# Image installation and backup

## Image installation and backup

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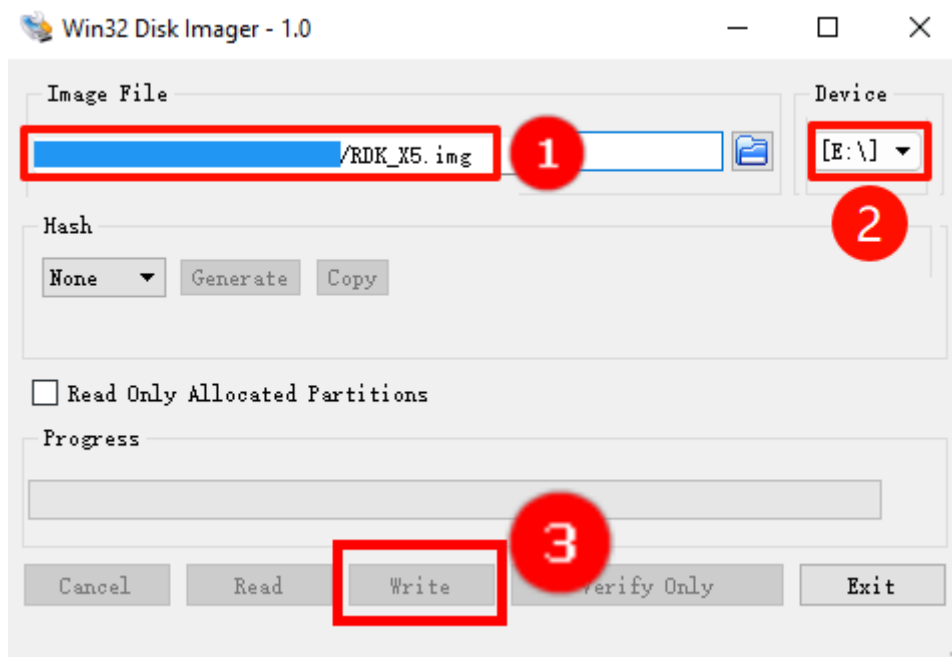
**Note:** The TF card of the RDK X5 robot has been burned with the image at the factory. You can directly insert the TF card into the robot for use. Generally, you do not need to burn the image system according to this tutorial!!!

## 6.1. Burn the SD card image

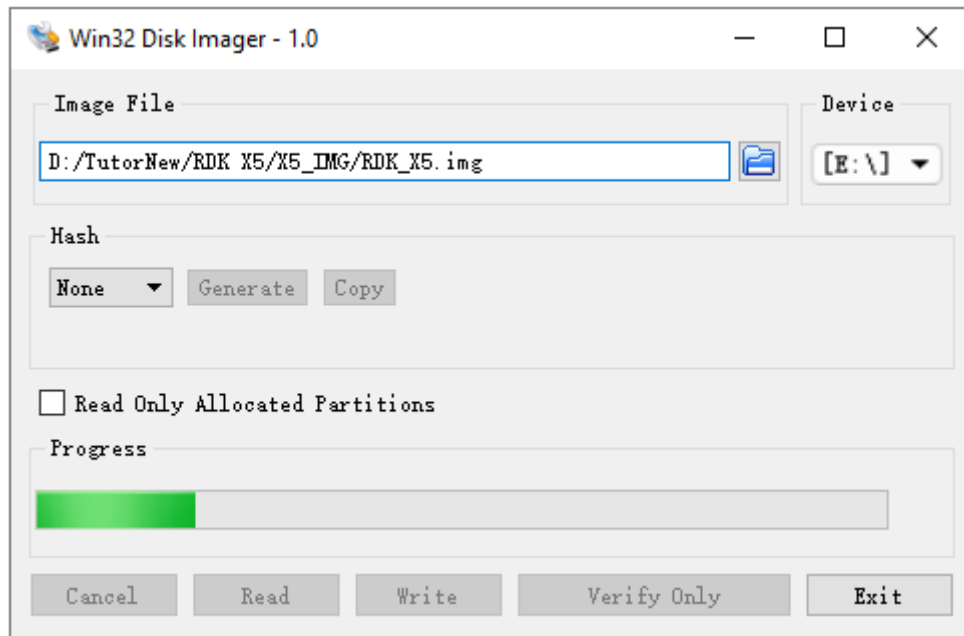
Preparation: Windows 10/11 system computer, card reader, TF card (64G or larger recommended), factory image compressed package file.

Steps:

1. Unzip the downloaded system compressed file to get the img image file;
2. Insert the TF card into the card reader, and then insert the card reader into the computer USB port;
3. Format the SD card to exfat format disk;
4. Start the image burning software, here use the Win32DiskImager tool;
5. Confirm the SD card device number and select the system image to be burned;



5. Wait for the image writing to complete;



6. The progress bar will show the current burning progress. After the burning is completed, you can exit the software.

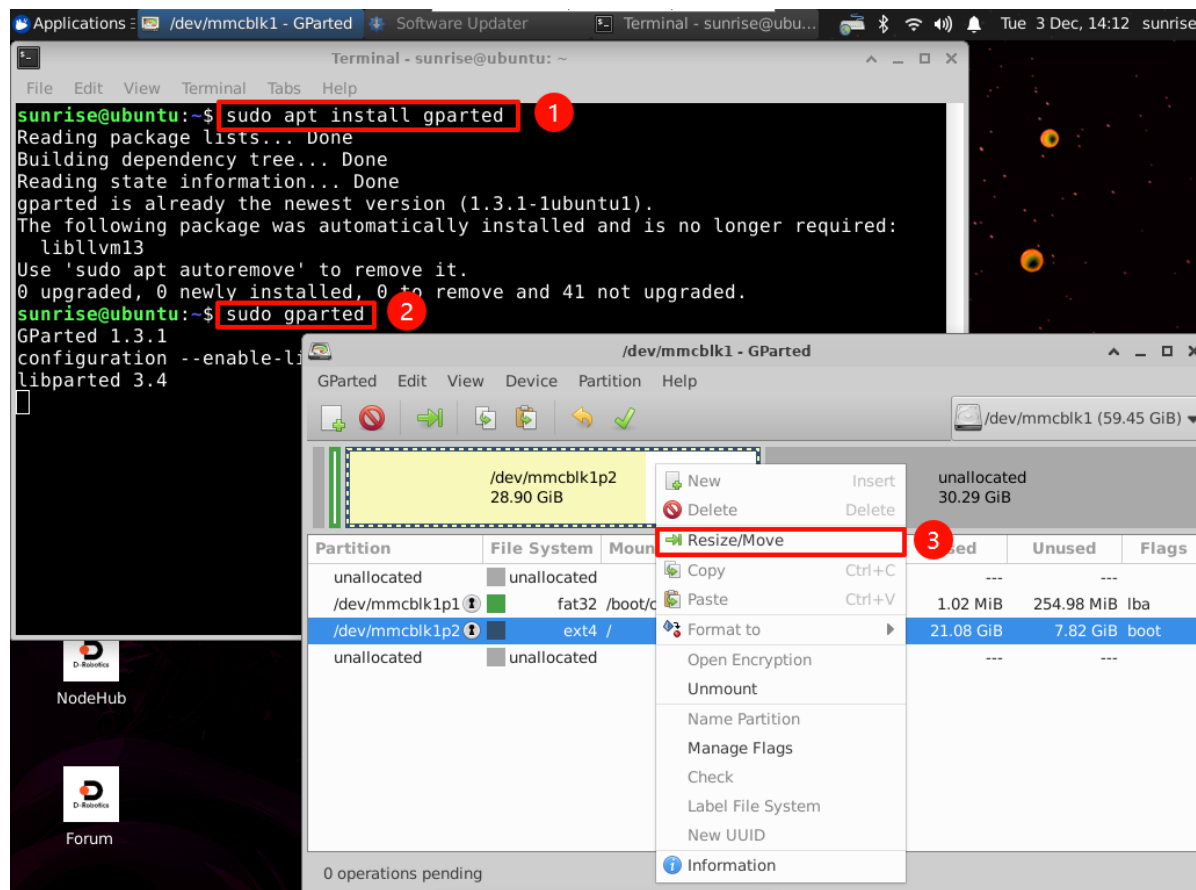
7. Eject the disk

## 6.2 Disk expansion

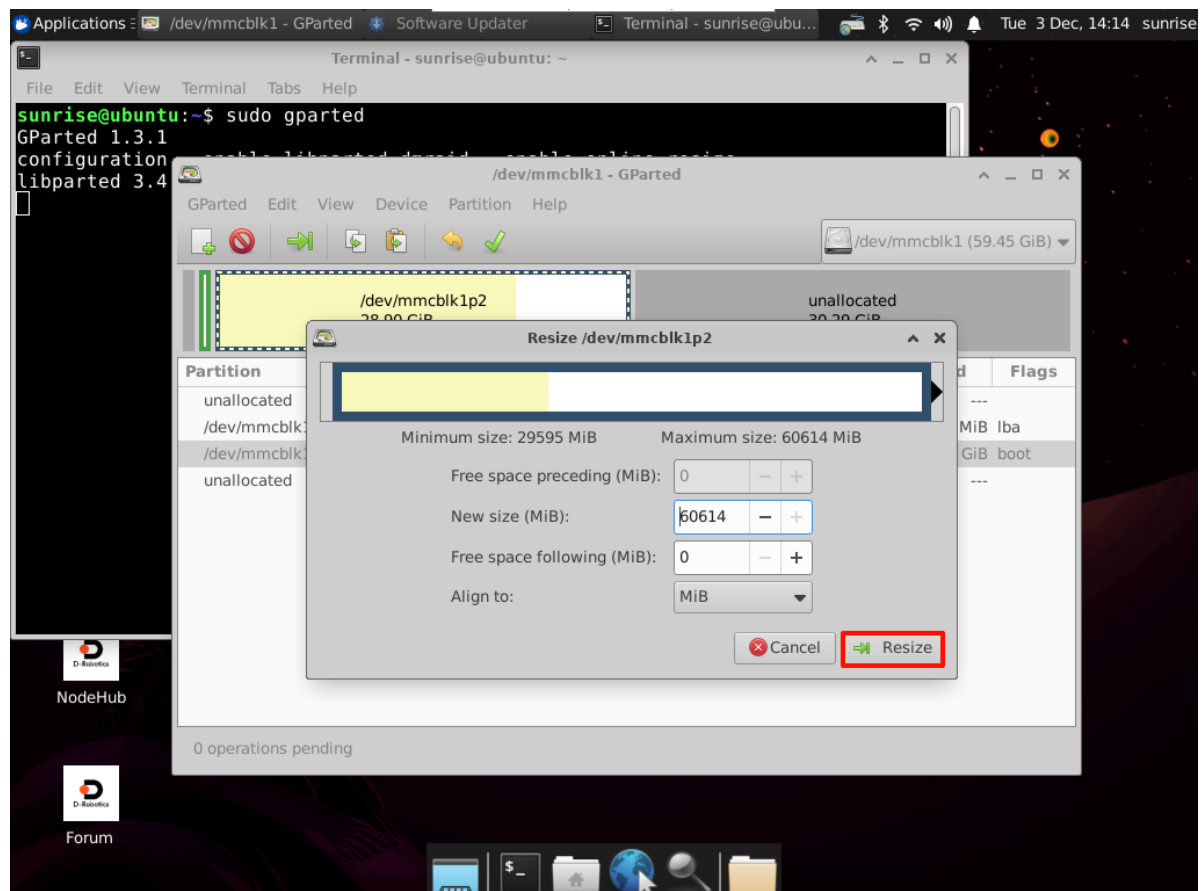
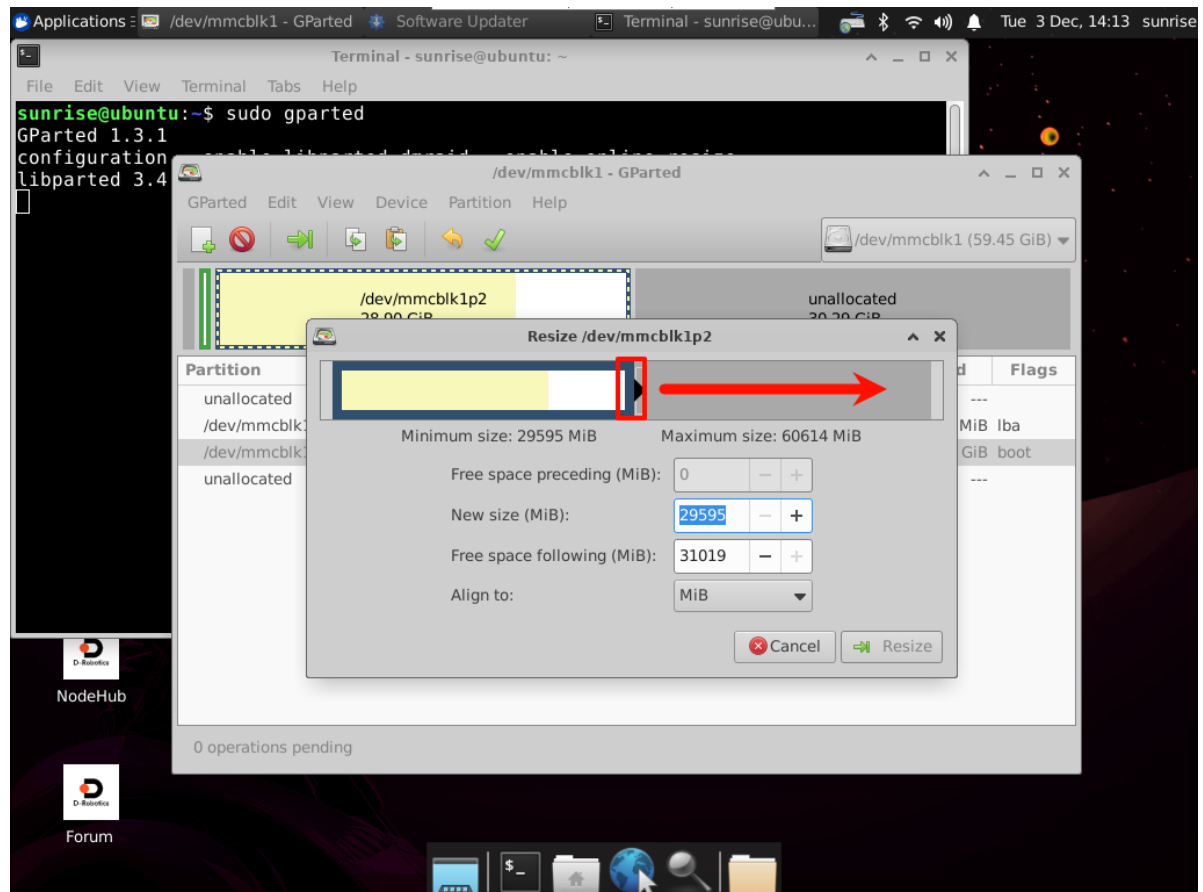
Insert the SD card into the RDK X5 motherboard slot and wait for the system to start.

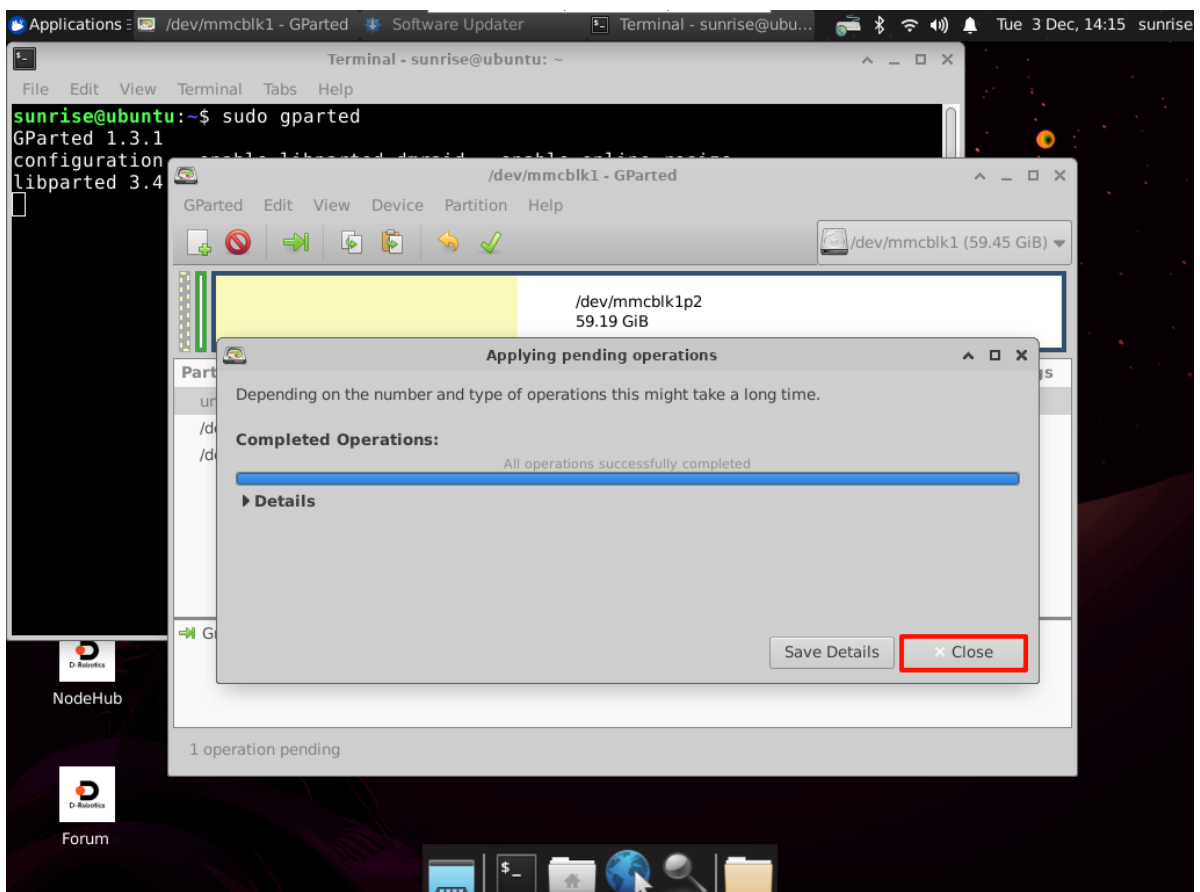
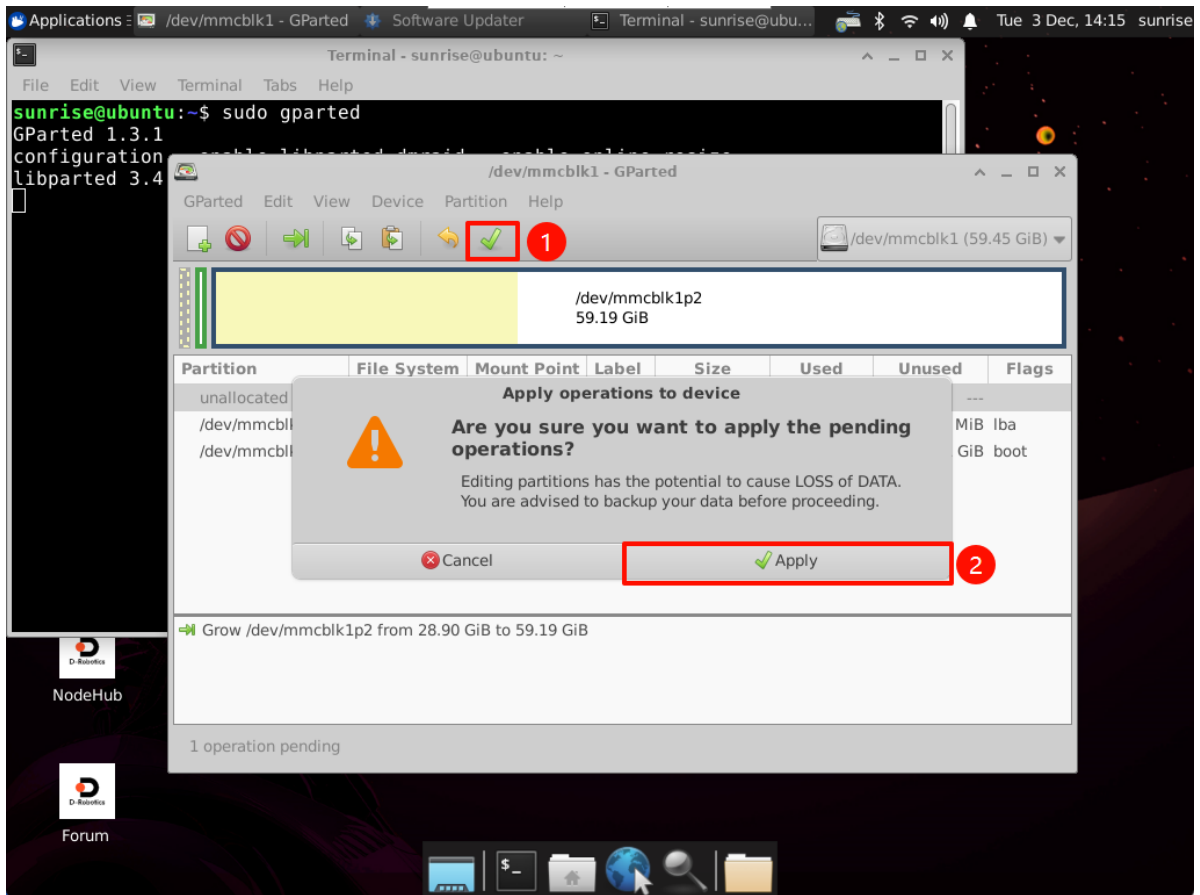
Install and run the GParted software on the system:

```
sudo apt install gparted #Install
sudo gparted #Run
```



Drag the slider to change the disk space capacity:





After completing all operations, close the software!

## 6.3, backup SD card image

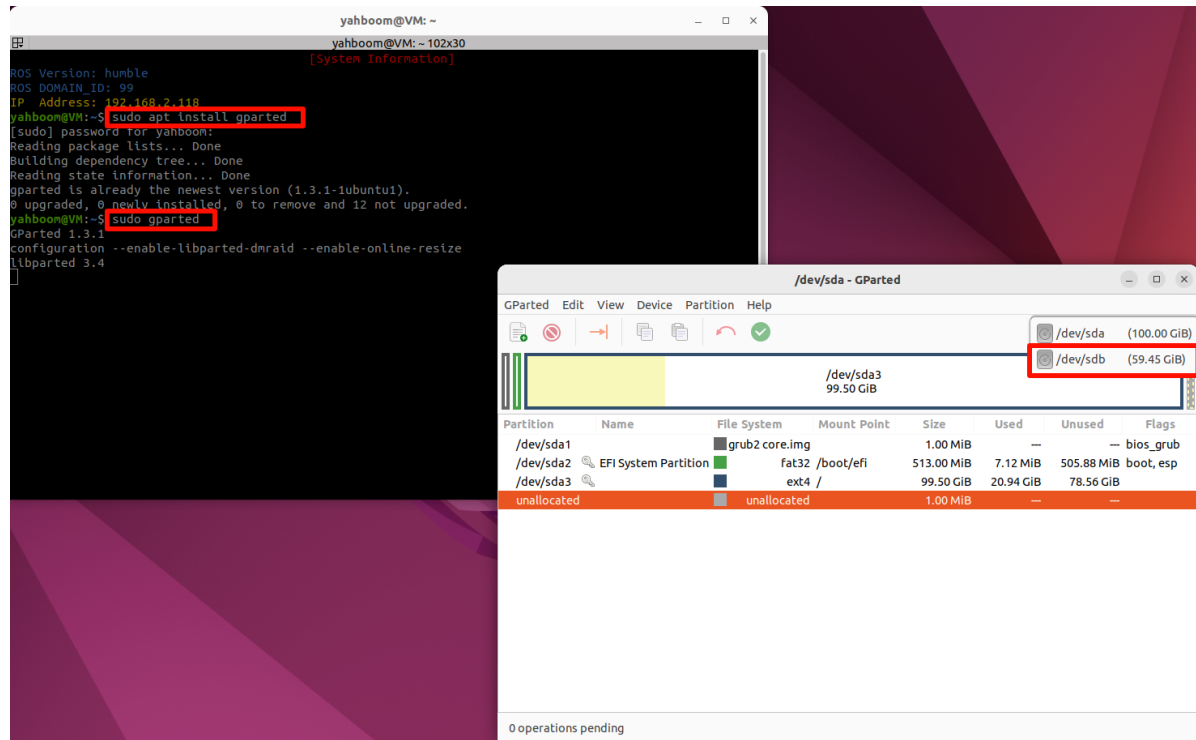
## 6.2.1 Compress disk space

Before backing up the image, use gparted software to compress the disk space of the SD card to reduce the image size.

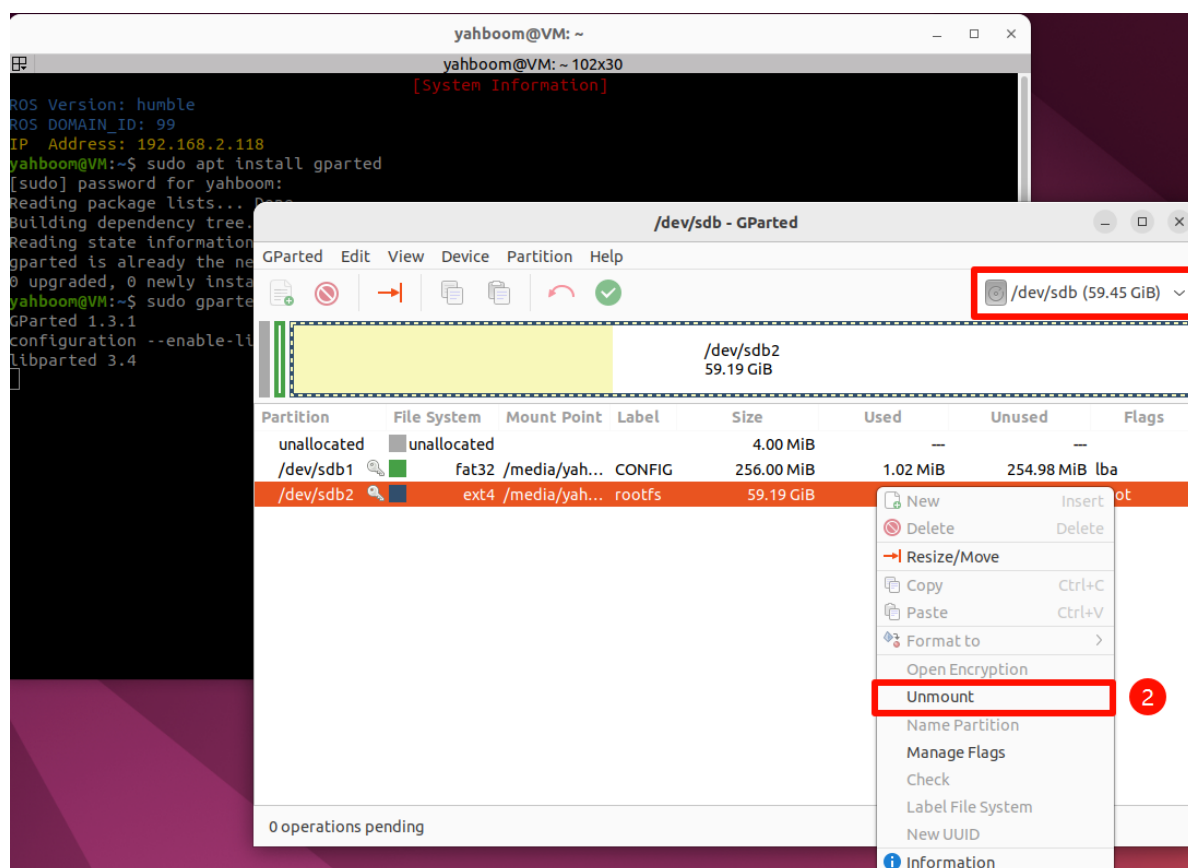
Install and start gparted software in the virtual machine:

```
sudo apt install gparted #Install
sudo gparted #Run
```

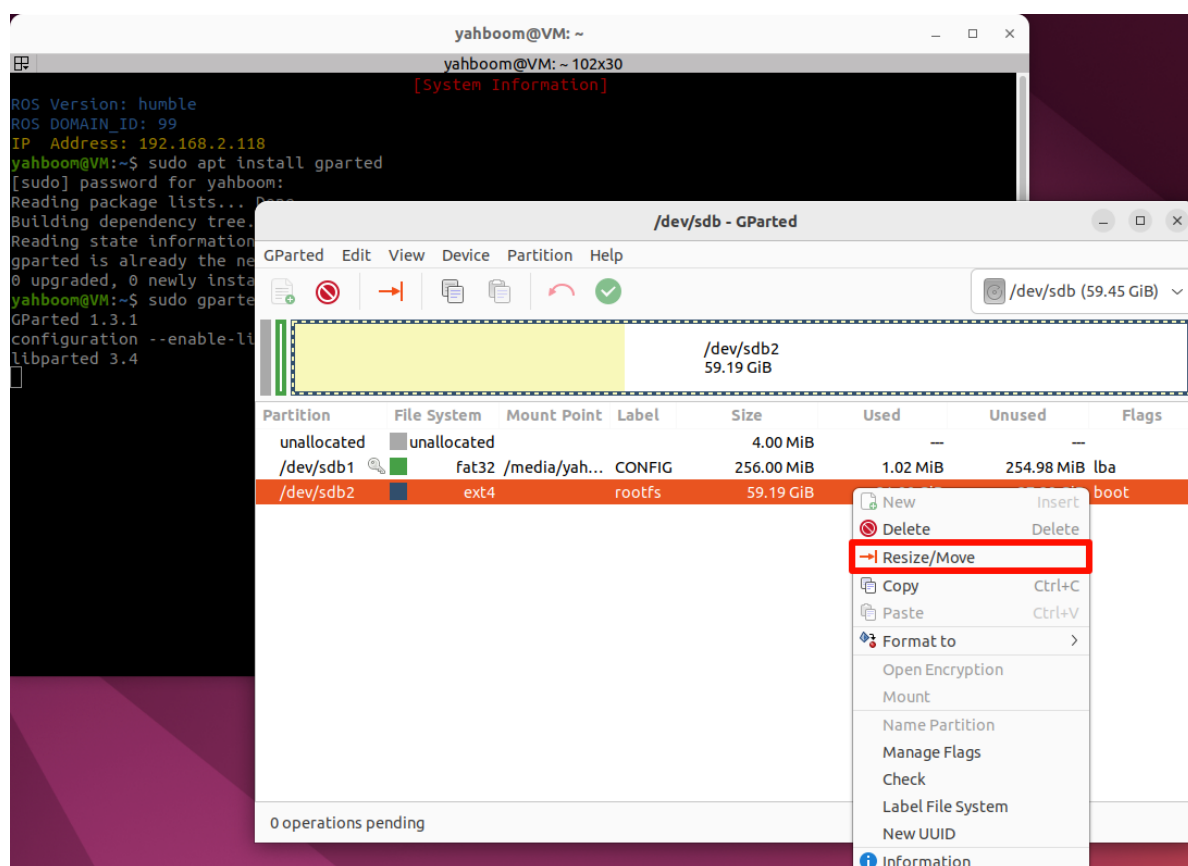
Insert the SD card into the running computer through the card reader and connect it to the virtual machine. In the opened gparted software, select the SD card in the upper right corner:



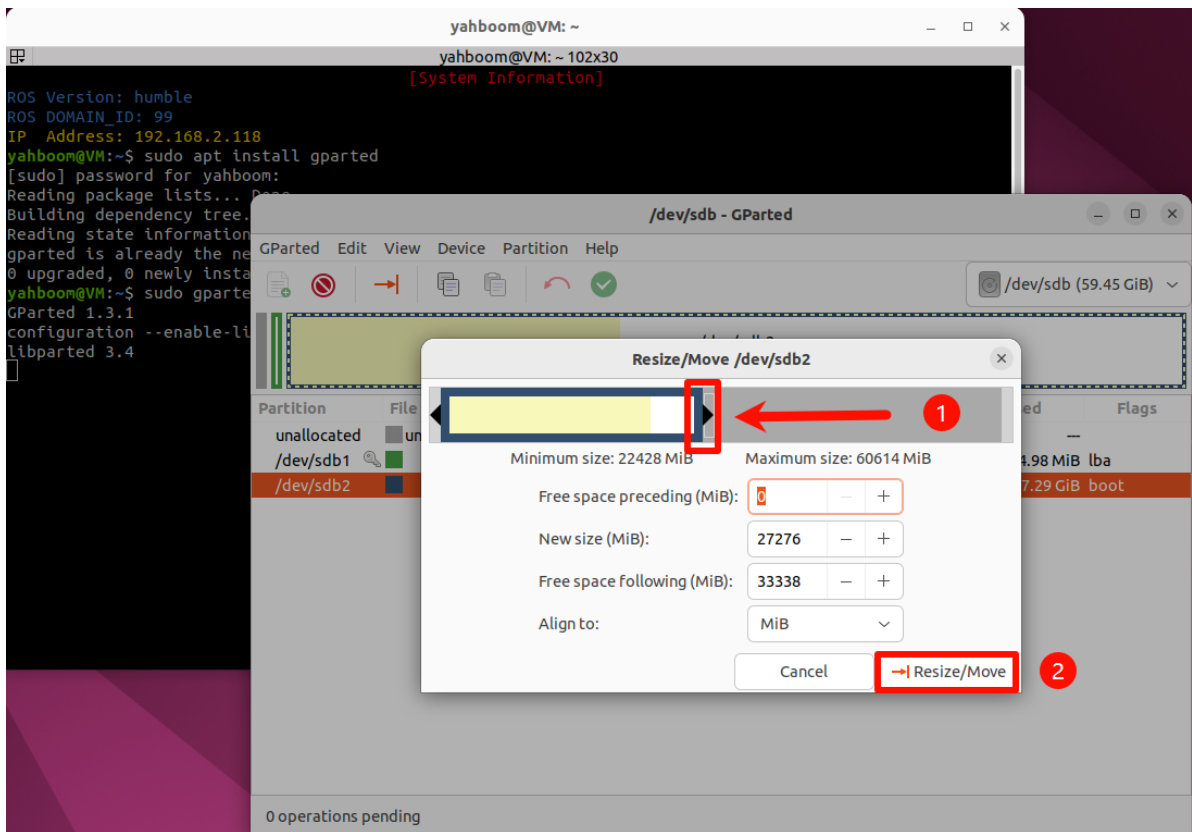
Then right-click and select to uninstall the SD card mount:



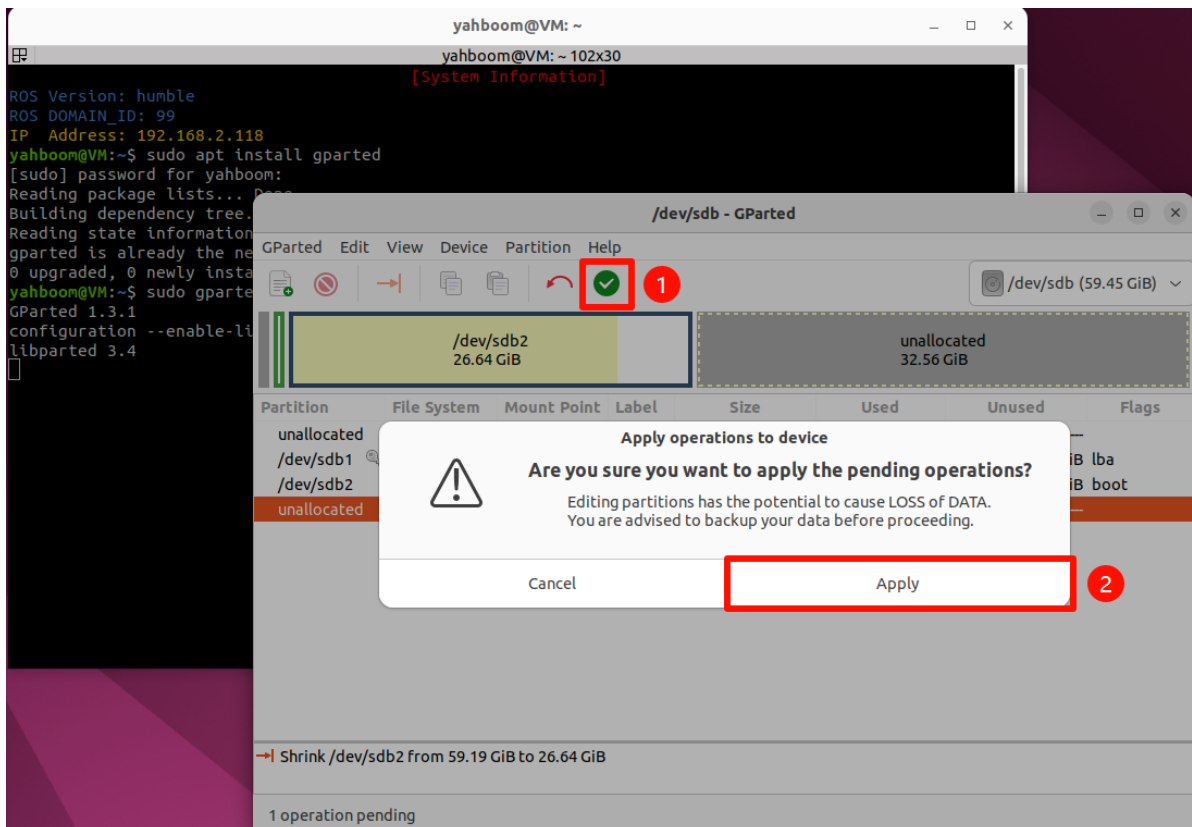
Continue to right-click and select the "Resize/Moves" option to reset the space size of the SD card:

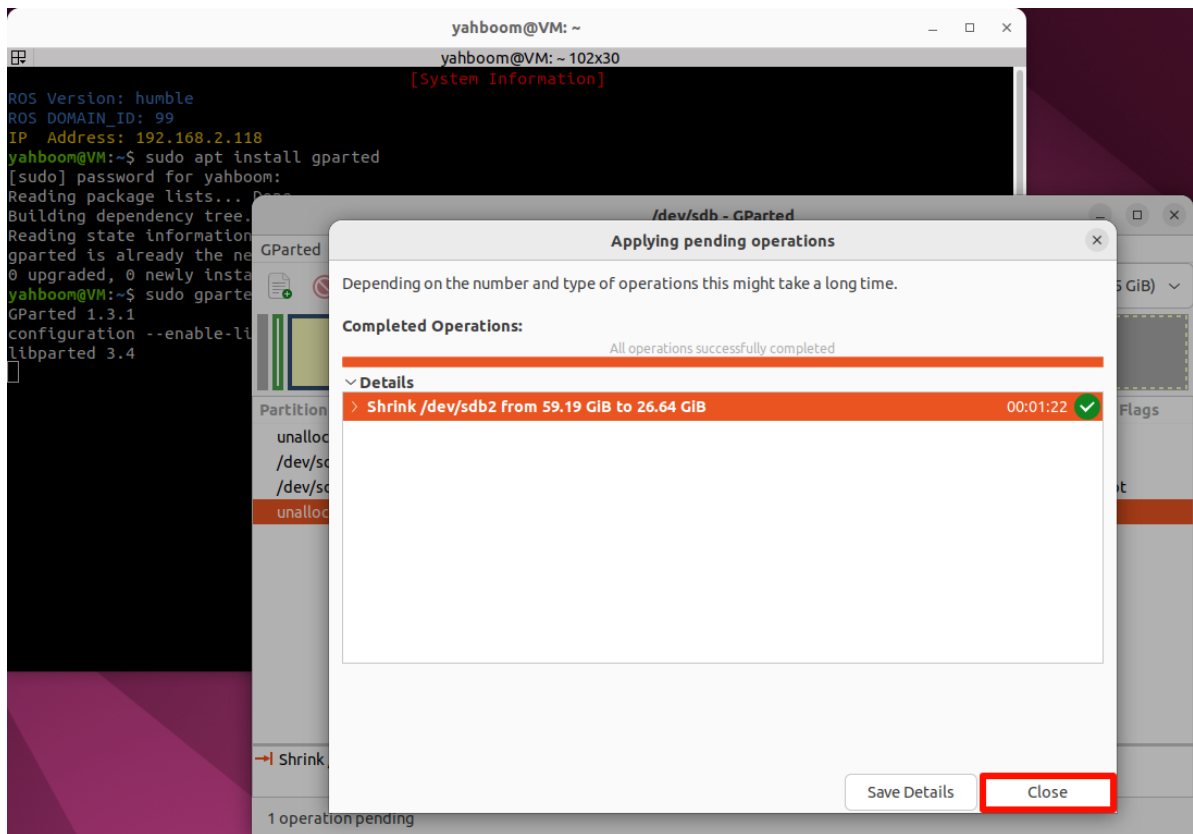


Drag the right side of the space division bar to compress the space. The yellow one is the occupied partition and the white one is the free partition. Be careful to keep a little white free partition to prevent the image from failing to start.



After confirmation, click the execute button in the software to start the compression operation.





After the compression is completed, you can close the gparted software.

## 6.2.2 View disk information

Open the terminal and use the script to view the current disk status:

```
./parted_info.sh /dev/sdb
```

### parted\_info.sh script content

```
#!/bin/bash
date
echo $1
sudo parted $1 <<EOF
unit s
print free
quit
EOF
```



```
yahboom@VM: ~
Building dependency tree... Done
Reading state information... Done
gparted is already the newest version (1.3.1-1ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 12 not upgraded.
yahboom@VM:~$ sudo gparted
GParted 1.3.1
configuration --enable-libparted-dmraid --enable-online-resize
libparted 3.4
yahboom@VM:~$ ./parted_info.sh /dev/sdb
Tue Dec 3 06:15:32 PM CST 2024
/dev/sdb
GNU Parted 3.4
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) unit s
(parted) print free
Model: SD Card Reader (scsi)
Disk /dev/sdb: 124669952s
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start      End          Size         Type         File system  Flags
  1      8192s      532479s      524288s      primary      fat32         lba
  2      532480s    56393727s    55861248s    primary      ext4          boot
                   56393728s    124669951s    68276224s                    Free Space

(parted) quit
yahboom@VM:~$
```

/dev/sdb in the figure is the disk number of the SD card, record this data in the figure: 56393728

```
yahboom@VM: ~
Building dependency tree... Done
Reading state information... Done
gparted is already the newest version (1.3.1-1ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 12 not upgraded.
yahboom@VM:~$ sudo gparted
GParted 1.3.1
configuration --enable-libparted-dmraid --enable-online-resize
libparted 3.4
yahboom@VM:~$ ./parted_info.sh /dev/sdb
Tue Dec 3 06:15:32 PM CST 2024
/dev/sdb
GNU Parted 3.4
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) unit s
(parted) print free
Model: SD Card Reader (scsi)
Disk /dev/sdb: 124669952s
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start      End          Size         Type         File system  Flags
  1      8192s      532479s      524288s      primary      fat32         lba
  2      532480s    56393727s    55861248s    primary      ext4          boot
                   56393728s    124669951s    68276224s                    Free Space

(parted) quit
yahboom@VM:~$
```

## 6.2.3 Start disk backup

Use the dd command to back up the SD card to the img file. Enter the following in the terminal:

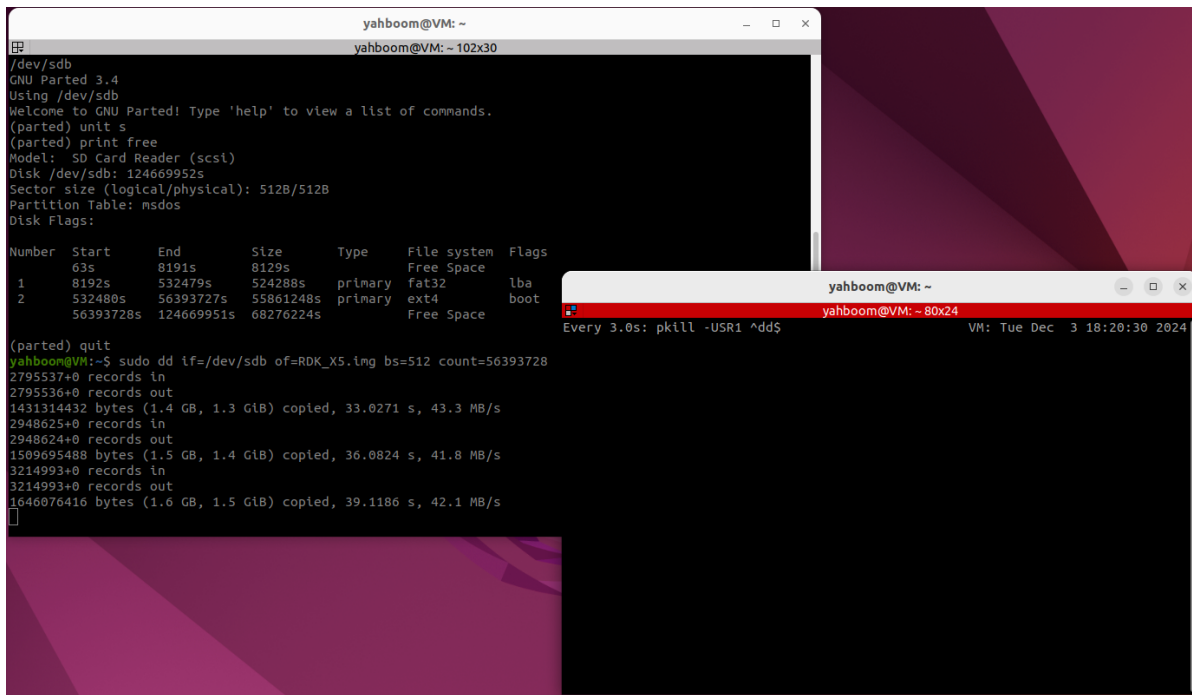
```
sudo dd if=/dev/sdb of=RDK_X5.img bs=512 count=56393728
```

where if=/dev/sdb is the disk device number queried in the first step, of=RDK\_X5.img is the name of the backup, bs=512 indicates the block size,

count=56393728 indicates the backup size, and this data is obtained from the above steps.

At this time, there is no prompt information in the terminal. Reopen a terminal and run the following command to check the progress.

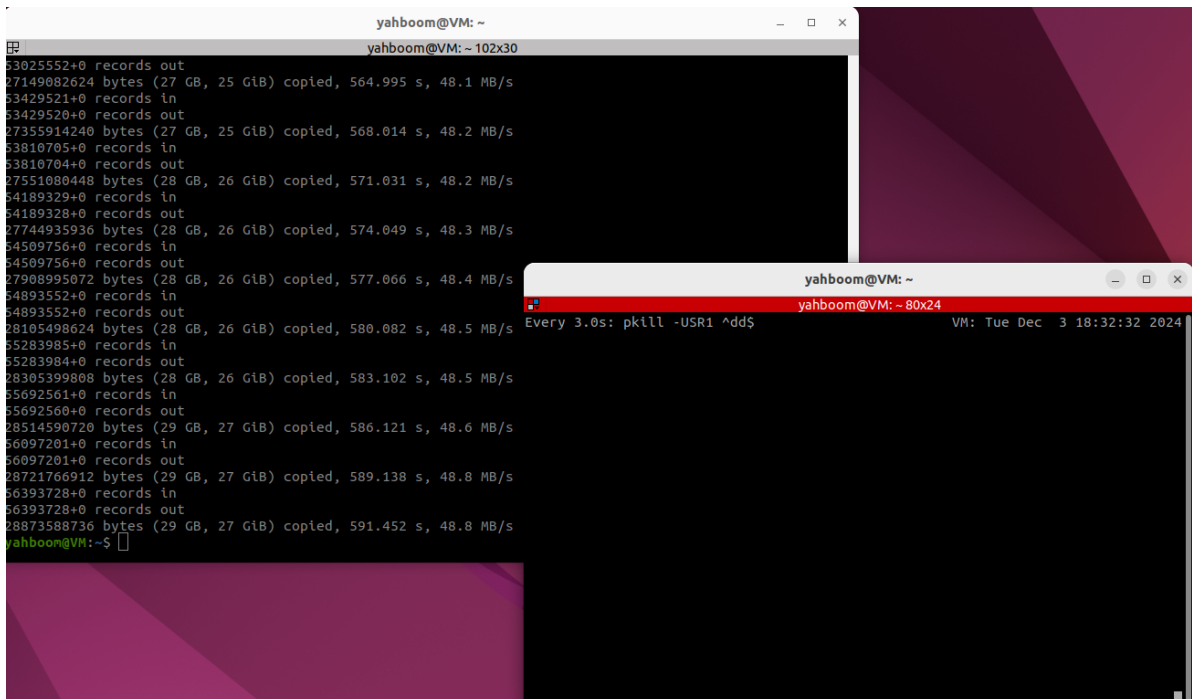
```
sudo watch -n 3 pkill -USR1 ^dd$
```



The screenshot shows a terminal window with the following content:

```
yahboom@VM: ~  
yahboom@VM: ~ 102x30  
/dev/sdb  
GNU Parted 3.4  
Using /dev/sdb  
Welcome to GNU Parted! Type 'help' to view a list of commands.  
(parted) unit s  
(parted) print free  
Model: SD Card Reader (scsi)  
Disk /dev/sdb: 124669952s  
Sector size (logical/physical): 512B/512B  
Partition Table: msdos  
Disk Flags:  
  
Number  Start      End          Size         Type      File system  Flags  
1       63s        8191s        8129s        primary   Free Space    lba  
2       8192s      532479s      524288s      primary   fat32         boot  
3       532480s    56393727s    55861248s    primary   ext4            
4       56393728s  124669951s  68276224s    primary   Free Space      
  
(parted) quit  
yahboom@VM:~$ sudo dd if=/dev/sdb of=RDK_X5.img bs=512 count=56393728  
2795537+0 records in  
2795536+0 records out  
1431314432 bytes (1.4 GB, 1.3 GiB) copied, 33.0271 s, 43.3 MB/s  
2948624+0 records in  
2948624+0 records out  
1509695488 bytes (1.5 GB, 1.4 GiB) copied, 36.0824 s, 41.8 MB/s  
3214993+0 records in  
3214993+0 records out  
1646076416 bytes (1.6 GB, 1.5 GiB) copied, 39.1186 s, 42.1 MB/s  
^C
```

Wait for the backup to complete!



The screenshot shows a terminal window with the following content:

```
yahboom@VM: ~  
yahboom@VM: ~ 102x30  
53025552+0 records out  
27149082624 bytes (27 GB, 25 GiB) copied, 564.995 s, 48.1 MB/s  
53429521+0 records in  
53429520+0 records out  
27355914240 bytes (27 GB, 25 GiB) copied, 568.014 s, 48.2 MB/s  
53810705+0 records in  
53810704+0 records out  
27551080448 bytes (28 GB, 26 GiB) copied, 571.031 s, 48.2 MB/s  
54189329+0 records in  
54189328+0 records out  
27744935936 bytes (28 GB, 26 GiB) copied, 574.049 s, 48.3 MB/s  
54509756+0 records in  
54509756+0 records out  
27908995072 bytes (28 GB, 26 GiB) copied, 577.066 s, 48.4 MB/s  
54893552+0 records in  
54893552+0 records out  
28105498624 bytes (28 GB, 26 GiB) copied, 580.082 s, 48.5 MB/s  
55283985+0 records in  
55283984+0 records out  
28305399808 bytes (28 GB, 26 GiB) copied, 583.102 s, 48.5 MB/s  
55692561+0 records in  
55692560+0 records out  
28514590720 bytes (29 GB, 27 GiB) copied, 586.121 s, 48.6 MB/s  
56097201+0 records in  
56097201+0 records out  
28721766912 bytes (29 GB, 27 GiB) copied, 589.138 s, 48.8 MB/s  
56393728+0 records in  
56393728+0 records out  
28873588736 bytes (29 GB, 27 GiB) copied, 591.452 s, 48.8 MB/s  
yahboom@VM:~$
```

The above is the image burning and backup process!