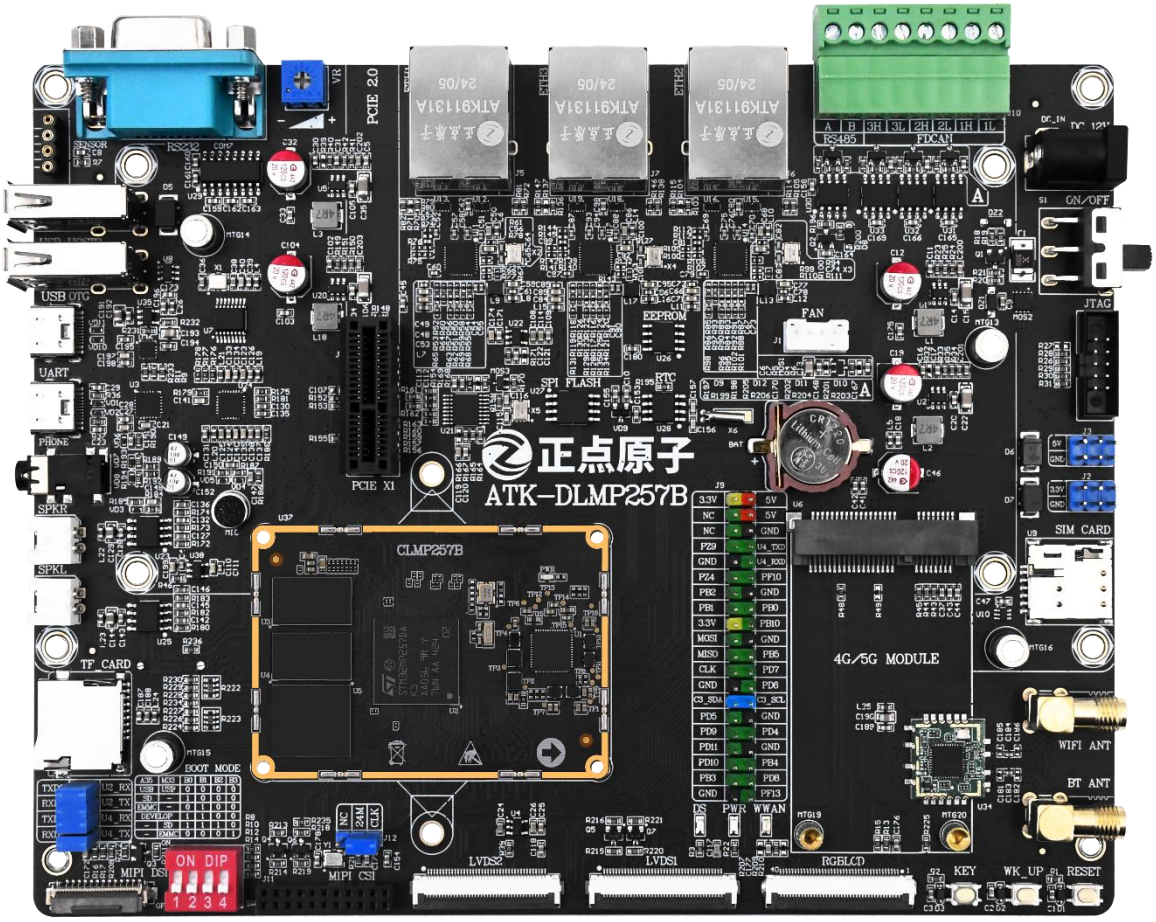
ATK-DLMP257B

Porting Debian Reference Manual

V1.0



ALIENTEK

1. Shopping：

TMALL：https://zhengdianyuanzi.tmall.com

TAOBAO：https://openedv.taobao.com

2. Download

Address：http://www.openedv.com/docs/index.html

3. FAE

Website ：www.alientek.com

Forum ：http://www.openedv.com/forum.php

Videos ：www.yuanzige.com

Fax ：+86 - 20 - 36773971

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Disclaimer

The product specifications and instructions mentioned in this document are for reference only and subject to update without prior notice; Unless otherwise agreed, this document is intended as a product guide only, and none of the representations made herein constitutes a warranty of any kind.

In order to get the latest version of product information, please regularly visit the download center or contact the customer service of Taobao ALIENTEK flagship store. Thank you for your tolerance and support.

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Introduction

The documentation describes how to port the Debian filesystem from Linaro, a nonprofit open-source software engineering company, to run on the ATK-DLMP257 development board. The process is quite simple. ATK-DLMP257 runs this lightweight system fairly smoothly. The documentation is not very technical, but mainly shows you how to get the Debian filesystem up and running on our ALIENTEK ATK-DLMP257 development board! There are also some tutorials on the Internet that teach you how to make Debian filesystems. After all, our own may not be as good as Linaro's.

The main purpose of this document is to show you how to quickly get the Debian filesystem up and running on the ATK-DLMP257 board, and to configure some common software.

System: Debian filesystem by Linaro
Hardware platform: Dot Atom ATK-DLMP257 development board
Skills Required:
1. Proficiency in Ubuntu file manipulation commands
2. Burn system: Can make STM32CubeProgrammer burn system

Chapter 1. Porting the Debian filesystem

1.1 Obtaining a Debian filesystem

We got the Debian filesystem directly from the Linaro website (Linaro makes an excellent filesystem). Just download the latest Debian filesystem image from their website. The download address is posted below.

https://releases.linaro.org/debian/images/alip-armhf/

Copy it to the browser, open it, and select the nearest image to come down.

In the image below, click latest.

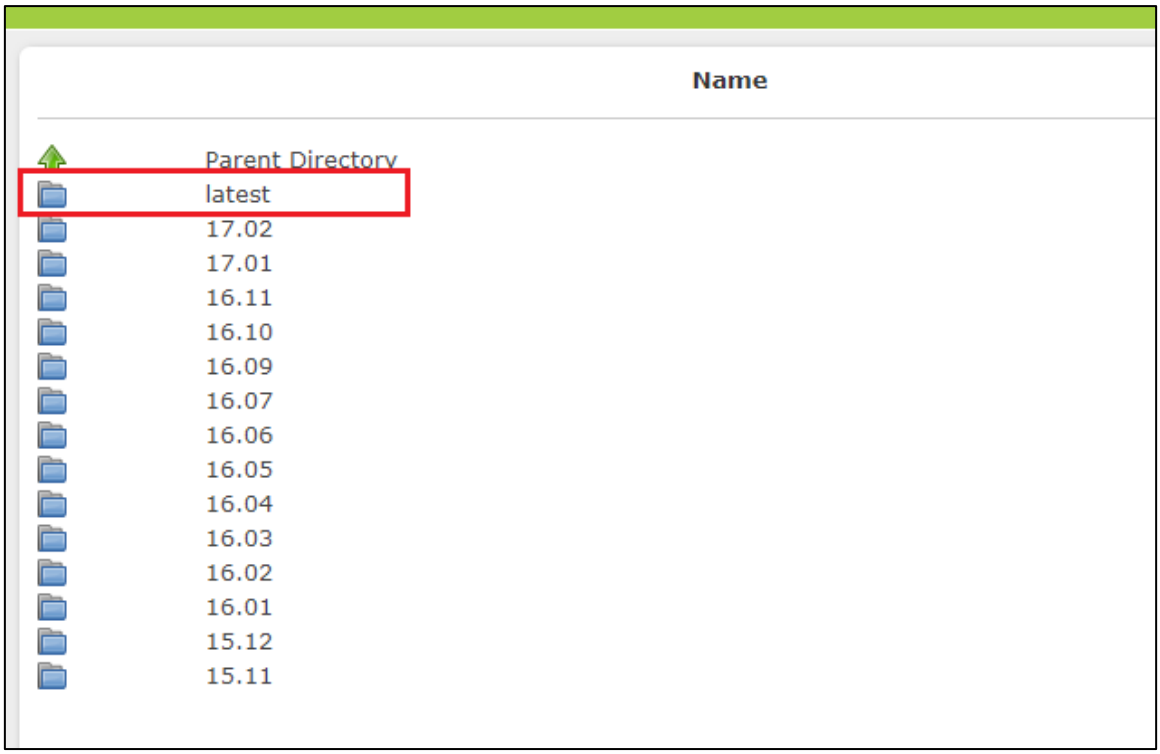

Figure 1 Download the latest Debian system

Since the Debian filesystem is up to 500 megabytes in size, the unzipped size will be even larger. Therefore, mounting this Debian filesystem using network NFS is strongly not recommended. NFS mounts are good for scenarios such as simple debugging, but for running a Debian filesystem, burning it to an actual device will provide better performance. It is recommended to burn it to an SD card and boot it for faster burning speed and better performance.

1.2 Copy the Debian filesystem to an SD card

According to the chapter 2.4 Burning the system to TF card (micro SD card) in the "[ALIENTEK] ATK-DLMP257 Quick Experience Manual V0.1.pdf", first use STM32CubeProgrammer to burn the factory system to an SD card with a capacity of at least 4GB. Doing so ensures proper use of touch and audio features. Do not use self-ported kernels, device trees, and uboot to prevent problems with audio and touch. Next, download the linaro-jessie-alip-20161117-32.tar.gz file to your Ubuntu directory. For example, you can upload it to your personal directory /home/alientek/debian.

The ALIENTEK has a linaro-jence-alip-alientek tar.gz image file ready for the video and audio playback tests in section 2.2. You can unzip the archive yourself and use the image file.

```
alientek@ubuntu:~/debian$ ls
linaro-jessie-alip-20161117-32.tar.gz
```

Figure 2 Transfer the compressed package to Ubuntu

Use tar to unzip it, and remember to use sudo for non-root users. Wait a moment, it will decompress. Once unzipped, you will get a binary folder.

```
alientek@ubuntu:~/debian$ ls
linaro-jessie-alip-20161117-32.tar.gz
alientek@ubuntu:~/debian$ sudo tar zxf linaro-jessie-alip-20161117-32.tar.gz
[sudo] password for alientek:
alientek@ubuntu:~/debian$ ls
binary  linaro-jessie-alip-20161117-32.tar.gz
alientek@ubuntu:~/debian$
```

Figure 3 Unzip the archive

Using the card reader, insert the made SD card system boot card into Ubuntu. You can see that the SD card has two partitions as shown below. Note that VMware should be set to compatible B3.0 mode.

Figure 4 Display the SD card partition

Use df command to view the directory of these two partitions mount, please confirm according to personal specific, generally automatically mount under /media/ + username +/boot or rootfs path.

df

/media/alientek/boot (boot partition, zImage and device tree)

/media/alientek/rootfs (filesystem partition for the root filesystem)

```
alientek@ubuntu:/media/alientek$ df
Filesystem     1K-blocks     Used Available Use% Mounted on
udev             1944040        0   1944040   0% /dev
tmpfs             396956     1880    395076   1% /run
/dev/sda5      514417952 17411980 470801556   4% /
tmpfs            1984764        0   1984764   0% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
tmpfs            1984764        0   1984764   0% /sys/fs/cgroup
/dev/loop1         65536    65536         0 100% /snap/core20/2182
/dev/loop2         93952    93952         0 100% /snap/gtk-common-themes/1535
/dev/loop4           128      128         0 100% /snap/bare/5
/dev/loop0         64896    64896         0 100% /snap/core20/1828
/dev/loop3        354688   354688         0 100% /snap/gnome-3-38-2004/119
/dev/loop7         51072    51072         0 100% /snap/snapd/18357
/dev/loop11       358144   358144         0 100% /snap/gnome-3-38-2004/143
/dev/loop10        13312    13312         0 100% /snap/snap-store/1113
/dev/loop5         76032    76032         0 100% /snap/core22/1122
/dev/loop8        516352   516352         0 100% /snap/gnome-42-2204/172
/dev/loop6         47104    47104         0 100% /snap/snap-store/638
/dev/loop9         40064    40064         0 100% /snap/snapd/21184
/dev/sda1         523248        4    523244   1% /boot/efi
tmpfs             396952       40    396912   1% /run/user/1000
/dev/sdc2       29329916  3317584  24497096  12% /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7
/dev/sdc1         510984    33420    477564   7% /media/alientek/1A21-3A9A
```

Figure 5 Use the df directory to see where the two partitions are mounted

First, we use the command to delete the factory root file system first, and modify the red part to the specific file system path of the individual.

ls /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7/

```
sudo rm -rf /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7/*
```

The * symbol means wildcard all, which in this case means delete all files in that path.

```
alientek@ubuntu:/media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7$ pwd
/media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7
alientek@ubuntu:/media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7$ ls
bin   dev  home  lost+found  mnt  proc  sbin  sys  unit_tests  var
boot  etc  lib   media       opt  run   srv   tmp  usr
alientek@ubuntu:/media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7$
```

Figure 6 Check the factory root filesystem

```
alientek@ubuntu:~/debian$ sudo rm -rf /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7/*
[sudo] password for alientek:
alientek@ubuntu:~/debian$ sync
```

Figure 7 Removing the factory root filesystem

We use the cd command to enter the binary directory, and then use the mv command to move everything under the binary directory to /media/alientek/rootfs/! (Note that only mv commands can be used, not cp! Using the cp command may cause the display to fail)

In the following instructions, the red part is confirmed according to the personal specific path! Moving filesystems takes time, so wait. You'll need to run sync after you move it over, which prevents the data from being fully written to the device! Finally, run the ls command to view the filesystem contents.

```
cd binary
ls
sudo mv * /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7/
sync
ls /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7/
```

```
alientek@ubuntu:~/debian$ cd binary/
alientek@ubuntu:~/debian/binary$ ls
bin  boot  dev  etc  home  lib  md5sum.txt  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
alientek@ubuntu:~/debian/binary$ sudo mv * /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7/
alientek@ubuntu:~/debian/binary$ ls /media/alientek/79255bfd-4d9c-4bb3-9be8-33fe67dde1a7/
bin  boot  dev  etc  home  lib  md5sum.txt  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
alientek@ubuntu:~/debian/binary$
```

Figure 8 After the movement is completed, the sync instruction is executed to synchronize and the ls instruction is used to view

After you exit your SD card as shown below, just pull out the card reader!

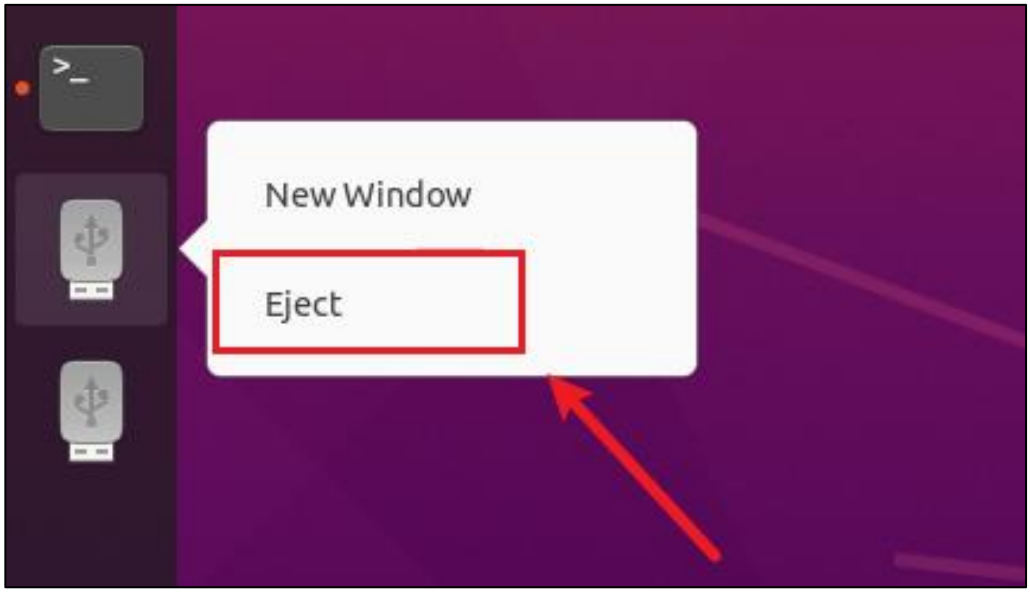

Figure 9 Uninstall the SD card system boot card

(Note: If you need to directly replace the root filesystem under eMMC, the same is true, please delete the filesystem under eMMC first, and move all the contents under binary to it.)

1.3 Starting the Debian filesystem

In Section 1.2, we have copied the Debian file system to the SD card system card, and we have inserted the SD card into the SD slot of the ATK-DLMP257B development board. The dial switch is set to 1000, and then power on to boot the system from the SD card! The system startup information can also be viewed in the serial port terminal, as shown in the following figure.

```
[  OK  ] Started Wait for Plymouth Boot Screen to Quit.
[  OK  ] Started Terminate Plymouth Boot Screen.
[  OK  ] Started Serial Getty on ttySTM0.
[  OK  ] Started Getty on tty1.
[  OK  ] Reached target Login Prompts.
[  OK  ] Reached target Multi-User System.
[  OK  ] Reached target Graphical Interface.
         Starting Update UTMP about System Runlevel Changes...
[  OK  ] Started Update UTMP about System Runlevel Changes.

Debian GNU/Linux 8 linaro-alip ttySTM0

linaro-alip login: root (automatic login)

Linux linaro-alip 6.6.48 #1 SMP PREEMPT Fri Dec 27 18:26:28 CST 2024 aarch64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
```

Figure 10 A screenshot of part of the boot process of Debian system

After waiting for tens of seconds, the startup is slow, and the Debian desktop has been successfully loaded. If you are prompted to fail to set up the network, click "ok".

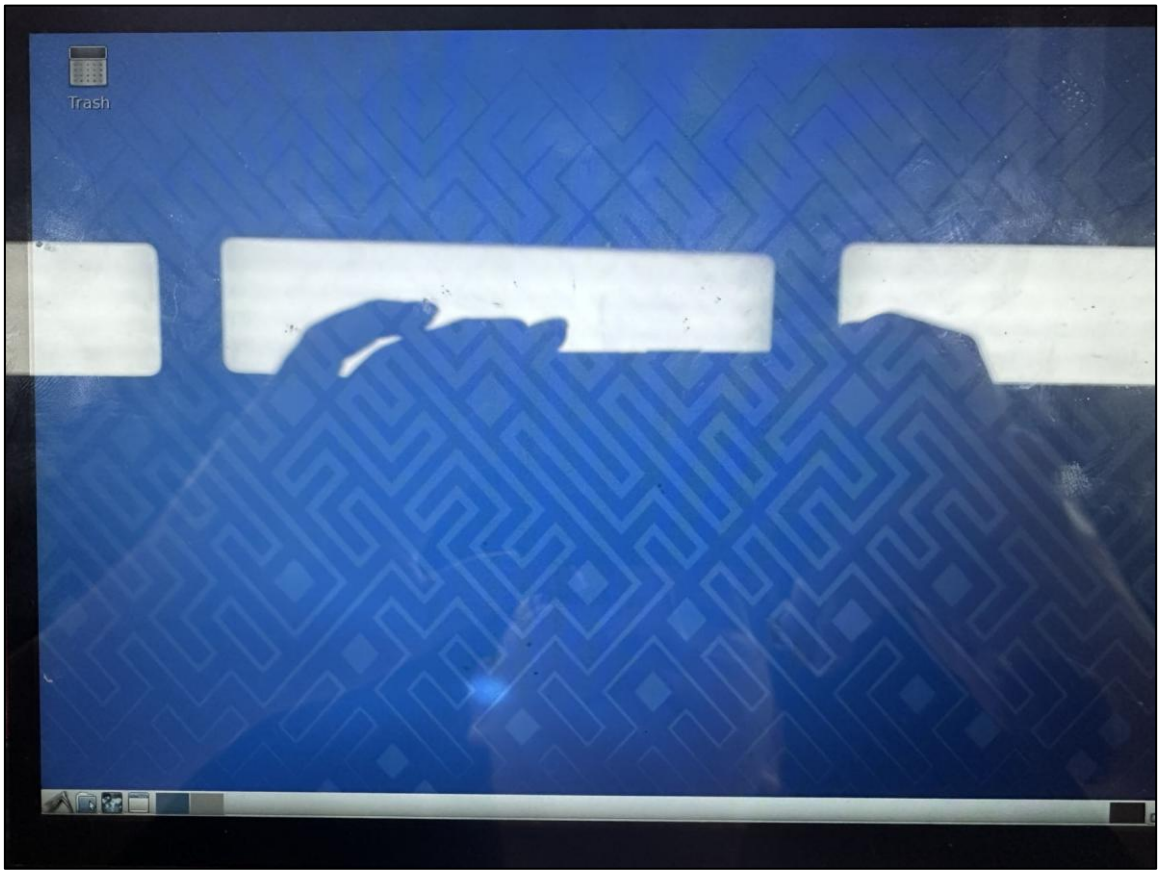

Figure 11 Desktop started successfully

The login information printed by the serial port terminal is as follows. For ssh transfer, the password is linaro and the username is linaro.

```
[  OK  ] Reached target Login Prompts.
[  OK  ] Reached target Multi-User System.
[  OK  ] Reached target Graphical Interface.
[   24.707264] FAT-fs (mmcblk0p1): Volume was not properly unmounted. Some data may be corrupt. Please rur
         Starting Update UTMP about System Runlevel Changes...
[  OK  ] Started Update UTMP about System Runlevel Changes.

Debian GNU/Linux 8 linaro-alip ttyLP0

linaro-alip login: root (automatic login)

Linux linaro-alip 6.1.55 #10 SMP PREEMPT Thu Jan 25 17:46:52 CST 2024 aarch64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
root@linaro-alip:~#
root@linaro-alip:~#
```

Figure 12 Serial port login success

1.4 .A few things to do after porting a Debian system

1.4.1 Updating the Debian software sources

The purpose of updating a software source is to obtain available software from the network to be applied to the system.

We set the software source as debian image source of Tsinghua University open source mirror station. Because the default is foreign software source, the download speed is very slow, so we update to domestic software source.

Edit the /etc/apt/sources.list file in the serial terminal.

```
vi /etc/apt/sources.list
```

Remove the original content and then add the following:

```
deb http://mirrors.tuna.tsinghua.edu.cn/debian/ buster main contrib non-free
deb http://mirrors.tuna.tsinghua.edu.cn/debian/ buster-updates main contrib non-free
deb http://mirrors.tuna.tsinghua.edu.cn/debian/ buster-backports main contrib non-free
```

Save and exit after making the changes.

Enter the following instructions under the serial port terminal to update the software source list and update the software package, it takes a while to wait.

Note: You need to plug in the Internet cable to make sure you can access the Internet! Debian factory default only supports a single network card (that is, the ENET1 interface on the development board), if you need to modify to support dual network card, please Baidu to solve.

```
apt-get update
apt-get upgrade
```

1.4.2 Installing commonly used software

Install common software VLC (video player), viewnior (picture browser), audacious (audio player). Download the software to experience a Debian system running on an ATK-DLMP257 board.

Enter the following commands in the serial terminal.

```
apt-get install vlc viewnior audacious
```

After the installation is complete, you can view the installed software by clicking the icon in the bottom-left corner of the desktop. Here are two figures: (You can connect the USB mouse to the USB interface of the development board)

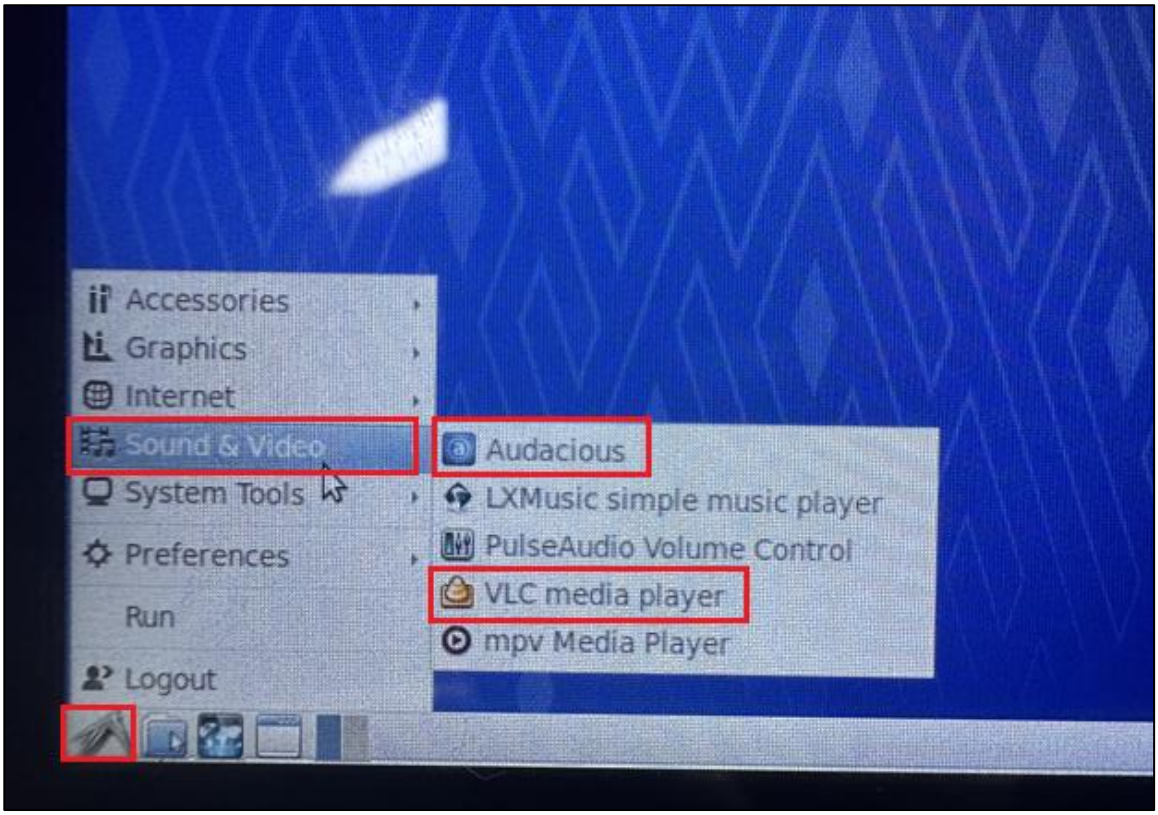

Figure 13 Check your installed audio and video software

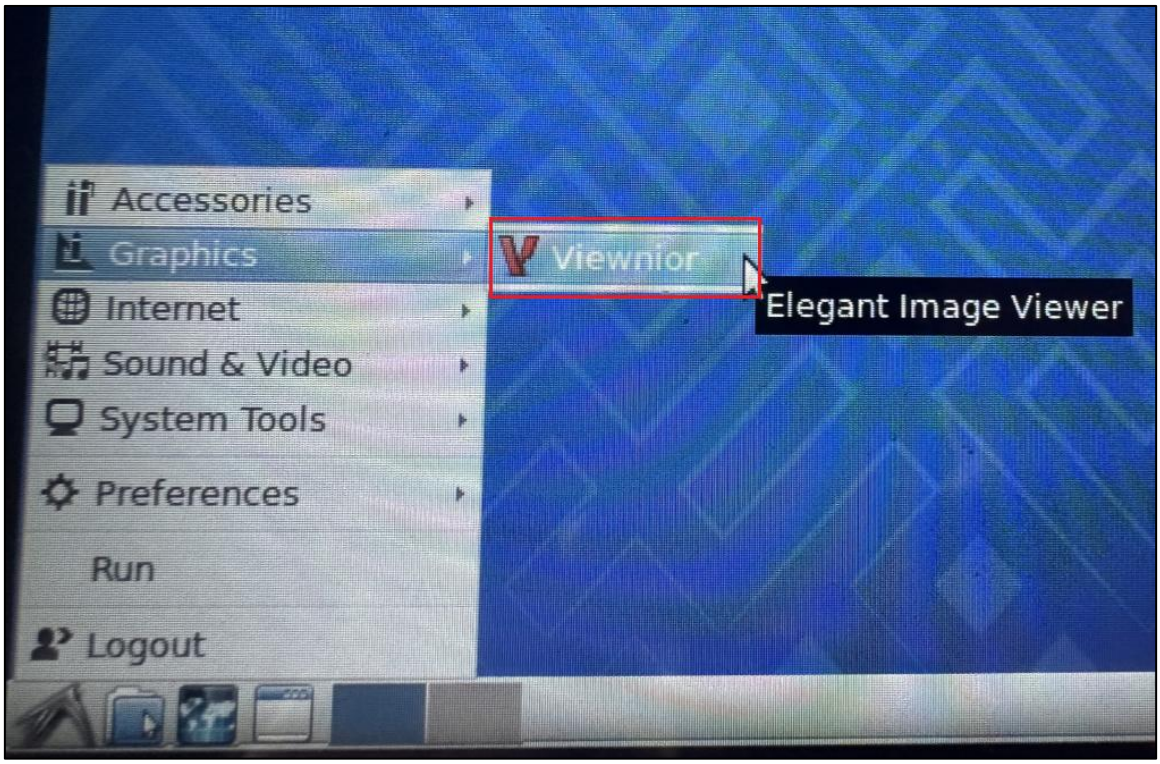

Figure 14 Installed image viewer software

Look at the list of Sound & Video installed software on the far left of your desktop, find PulseAudio Volume Control, and click on it.

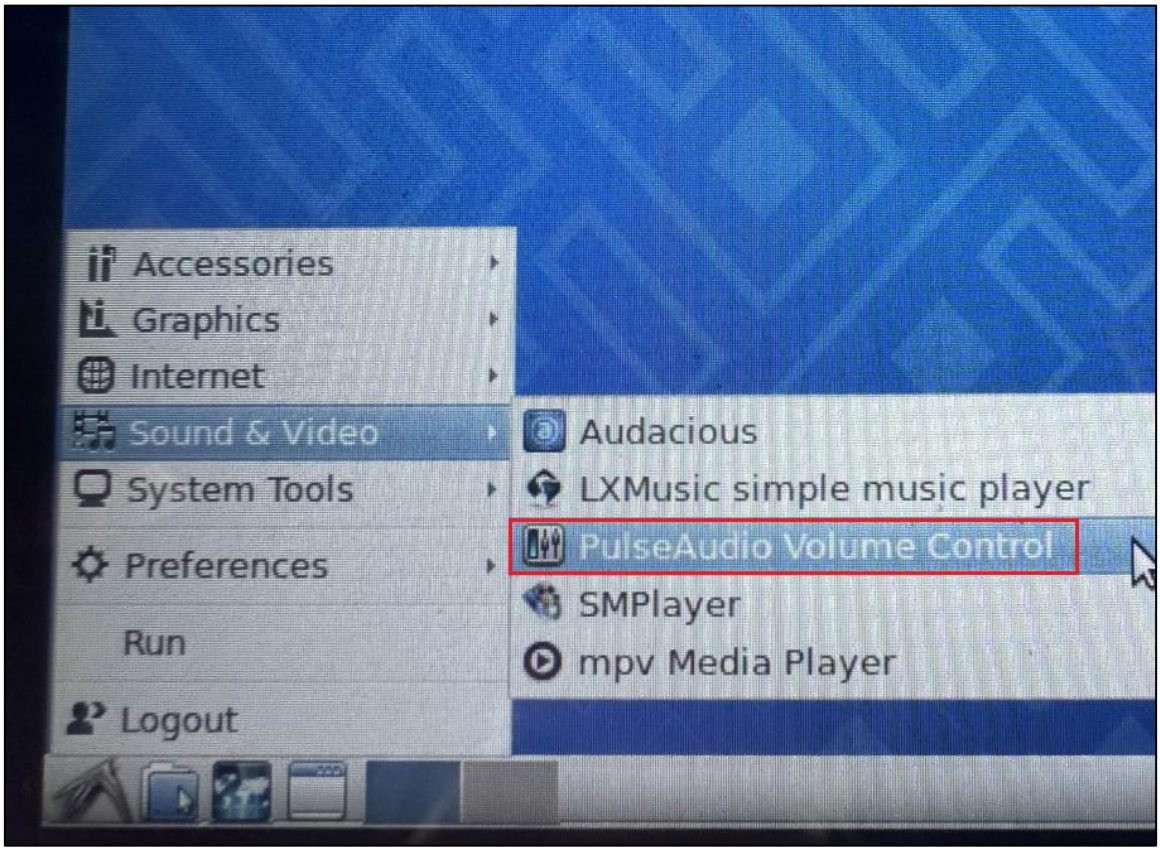

Figure 15 Open the audio manager

You can see here that you can set the system volume, the volume of the left and right channels, etc. We can do this by default, press the x in the upper right corner to close the window.

1.4.3 Test video playback and audio playback

To ensure smooth playback when using VLC to play video, it is recommended to adjust the resolution and bit rate of the video according to the screen size of the personal device. For example, if your device has a screen resolution of 800x480, it is recommended to convert the video to 480p resolution and reduce the bit rate. This makes it smoother to play with SMPlayer. Due to the limited performance of the STM32MP257 chip, playing 1080p video may be stuck or unable to play, so the video quality should be kept as low as possible, it is recommended to test different video Settings to achieve the best results.

To support playback of various audio and video formats, you need to install the necessary GStreamer plugins and support libraries, and modify PulseAudio's configuration files. Follow these steps to install and configure.

1. Install the GStreamer plugin and supporting libraries

```
apt-get install gstreamer1.0-alsa
apt-get install gstreamer1.0-plugins-good
apt-get install gstreamer1.0-plugins-base
apt-get install gstreamer1.0-plugins-bad
apt-get install gstreamer1.0-libav
```

2. Modify the pulseAudio configuration file

```
sudo vi /etc/pulse/default.pa
```

Find the following line in the file and change it:

```
load-module module-alsa-sink device=hw:0,1
```

```
load-module module-switch-on-port-available

### Load audio drivers statically
### (it's probably better to not load these drivers manually, but instead
### use module-udev-detect -- see below -- for doing this automatically)
load-module module-alsa-sink device=hw:0,1
#load-module module-alsa-source device=hw:1,0
#load-module module-oss device="/dev/dsp" sink_name=output source_name=input
#load-module module-oss-mmap device="/dev/dsp" sink_name=output source_name=inpuu
t
#load-module module-null-sink
#load-module module-pipe-sink

### Automatically load driver modules depending on the hardware available
.ifexists module-udev-detect.so
load-module module-udev-detect
.else
### Use the static hardware detection module (for systems that lack udev supportt
)
load-module module-detect
.endif
```

Figure 16 Modifying the PulseAudio configuration file

3. Finally, restart the development board.