RK1108_CVR_V0.2_20161030 Release Note

(Technical Department, Dept.III)

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Revision History

Version No.	Author	Revision Date	Revision Description	Remark
V0.1	Huaping Liao	2016.09.04	Initial Release, Beta Version	
V0.2	Huaping Liao	2016.10.30	Official Release	

Table of Content

Chapter 1 Overview

This SDK is based on Linux 32bit system with its kernel based on Linux-kernel 3.10, which is suitable for RK1108_CVR EVB board and its product development.

The release version is V1.0; it is an official version, only used for development. This version supports 1080P video recording and playback, OV2710, OV4689 and IMX323 camera. Please read document under project directory docs/camera for Specific support list and Camera debugging description. If there is any bug, please feedback to RK Redmine.

Chapter 2 Main Functions

Function	Module Names
Data Communication	Wi-Fi, Ethernet Card, USB, SDCARD
Application Programs	Video Recording, Video Playing

Chapter 3 How to Acquire SDK

SDK is released by ROCKCHIP server. Please refer to Appendix A compiler development environment setting to Build development environment.

Customer apply SDK from ROCKCHIP technology window, must provide SSH public key synchronization server certificate authority to get synchronization code after authorized at the same time. About ROCKCHIP server SSH public key authorization, please refer to Appendix B SSH public key instruction.

3.1 REPO Download

Repo is a script used to manage git, which is mainly used to download warehouse management software. Make sure the repo initialization operation used is provided by ROCKCHIP. Repo engineering download address is as follows:

```
git clone ssh://git@git.rockchip.com.cn:2222/argus-release/argus/repo.git
```

Executing after Download can get into the repo:

```
cd repo
```

```
tar xvf repo.tar.gz
```

Copy extracted repo directory to any position, for the next step to use. Suggest to put in directory /home/user/repo.

3.2 SDK Download and Synchronization

Use step 3.1 to initialize repo project. If the repo project directory is /home/user/repo, RK1108_CVR_SDK download address is as follows:

```
/home/uers/repo/repo init -u
ssh://git@git.rockchip.com.cn:2222/argus-release/manifest.git -b master -m
rk1108_cvr_release.xml
```

Then executing in the current directory can download the whole project code:

```
.repo/repo/repo sync
```

Chapter 4 Software Development Guide

RK1108_CVR kernel version: Linux 3.10, upper applications use Linux based on RK compiling system. To help developers to get into SDK development debug work easily, <RK1108_CVR software development guide>, < Each Version SDK User's Manual > are released along with SDK.

Above documents areavailable in the directory docs/, and will be updated following RK code server.

Chapter 5 SDK Building Instruction

5.1 Cross-compiling environment configuration

5.1.1 Environmental testing

The compilation of application layer depends on the cross-compiling environment. Please remove the cross-compiling tools configured before to avoid chaos. Please enter below command to check if there is any cross-compiling tool configured before:

```
arm-linux-gcc  –version
```

If something output after this command, which means system has cross-compiling tool configured before, need to remove the configured environment.

5.1.2 Configure cross-compiling environment

Cross-compiling tool is under the directory prebuilts/toolschain/usr, the bin/directory and arm-rkcvr-linux-uclibcgnueabihf/bin/ directory need to be set as environment variables .Use the following command:

```
sudo vim /etc/environment
```

Will output:

```
PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin”
```

Put the absolute path of the above two directories to the front of"”"of end line, with ": "separated between two directories.

Type the command again:

```
arm-linux-gcc  –version
```

The following log will be printed, which stands for configuration successfully.

```
arm-linux-gcc.br_real (Buildroot 2016.05-rc2) 4.8.5
```

5.2 kernel Compiling Steps

Enter the kernel directory, execute the following command to generate.config:

```
make rk1108_defconfig
```

Execute the following command, compile the kernel:

```
make rk1108-evb-v10.img –j4
```

Compilation is completed, two mirror files kernel.img and resource.img will be generated under the root directory of kernel.

5.3 Application layer compiling steps

If cross-compiling environment setup is not based on step 5.1, or the server cannot build the environment, then execute commands to generate temporary compiling environment, the environment is limited to the current terminal, power down will be lost:

```
source config/envsetup.sh
```

Executing the following commands can compile all applications and libraries:

```
./build_all.sh
```

This command supports: -jxx, -clean and -distclean parameters.

5.4 Firmware Packaging Steps

Executing below command to package application layer, root file system, kerne.img and dtb, and generate Firmware.img under directory \rockimg\Image-cvr, used for updating.

```
./mkfirmware.sh rk1108-evb-v10
```

Note: Different SDK versions have different compilation and packaging, please refer to < SDK Development Difference Instruction of Each Versions> for more details.

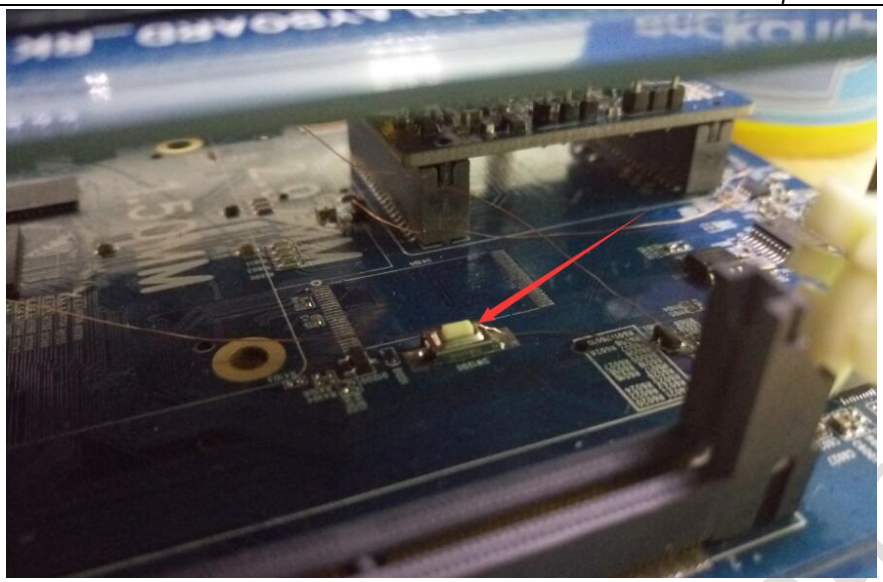
Chapter 6 Firmware Update

6.1 Windows Platform

This tool can be used in winxp/win7/win8/win10.

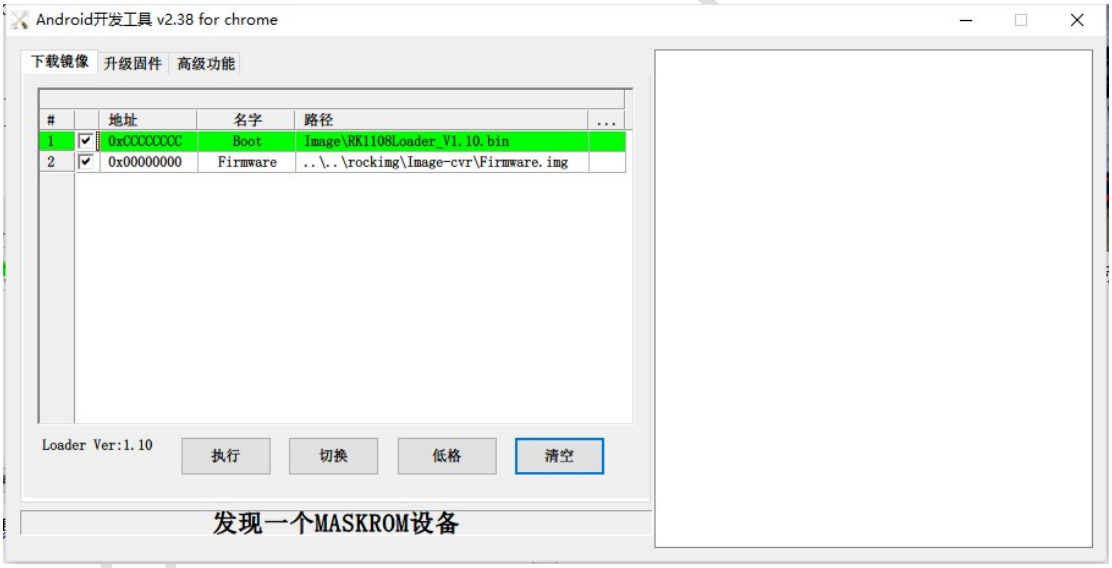
First use the development tools, need update Rockchip MASKROM exclusive drive, which is stored under directory “tools\CVRTools_Release_v1.00\DriverAssitant_v4.5”, running DriverInstall.exe, will be installed automatically.

Enter MASKROM to update all the firmware. Pressing the small white button below and power on, can enter MASKROM mode.



MASROM Power on Sketch

As shown in below figure, equipment detecting and current equipment mode will be prompted under the tool. Choose firmware need to be updated, and click on the execution, the firmware will be updated on the board, after the updating, system can run update power on again.



Updating Tool Instruction

6.2 Linux Platform

Method to enter MASKROM mode under Linux platform is the same with Windows platform. Enter directory tools/Linux_Upgrade_Tool_v1.24/, execute the following commands to complete update:

```
./cvr_upgrade.sh
```

When below information is printed, which means the update is successful:

```
Download boot ok.
Write LBA from file (100%)
Reset Device OK.
```

Chapter 7 Key Layout Instruction

Keys function descriptions are as shown as below:

Reset: Power on again

Mode switch: Switch between photos, videos, play mode

Setting switch: In Settings window, and switch Setting options

Video: Under preview mode, press the "UP" start recording, press again stop.

Key Layout Figure

Appendix A Build Development Environment

1. Initialize Development Environment

This section includes how to build local development environment of RK1108_CVR. The set up should be done under the Linux or Mac OS environment, it is recommended to use Ubuntu14.04 64ibt, in accord with RK development environment to avoid environmental problem.

Note: RK1108_CVR development space is about 35G. If you only want to build a simple development environment, you need at least 45 GB space. To build a complete environment will need more than 100 GB space.

Note: Make sure the operating system used is 64bit, or cross-compiling tools cannot run.

2. Configure a Linux Development Environment

This step is based on latest Ubuntu LTS(14.04), but most versions must ensure that the tool can run.

Note: you can also set up environment in virtual machine. If you run Linux in virtual machine, at least 2 GB RAM/swap is needed, or more than 30GB disk space is needed to create a compiling environment.

Under Ubuntu or MacOS, usually you need to install the following tools:

A. Python 2.6 -- 2.7, you can download from python.org.
B. GNU Make 3.81 -- 3.82, you can download from gnu.org.
C. Git 1.7 or newer. You can download fromgit-scm.com.

3. You need a 64bit version Ubuntu, it is recommended to use Ubuntu14.04. Note: using old Ubuntu version may cause compatibility issues. Use the following command to install Ubuntu required package:

```
$ sudo apt-get install git gnupg flex bison gperf build-essential \
zip tar curl libc6-dev libncurses5-dev:i386 x11proto-core-dev \
libx11-dev:i386 libreadline6-dev:i386 libgl1-mesa-glx:i386 \
libgl1-mesa-dev g++-multilib mingw32 tofrodos \
python-markdown libxml2-utils xsltproc zlib1g-dev:i386 lzop

$ sudo ln -s /usr/lib/i386-linux-gnu/mesa/libGL.so.1 /usr/lib/i386-linux-gn
u/libGL.so
```

4. Configure USB Access

In GUN/Linux system (especially in Ubuntu system), users can't directly connect USB devices under default. Need to configure system to allow access. Recommendations: create /etc/udev/rules.d/51-android.rules (using root user), then

copy the following content to the file. <username> must be actual user name authorized to be connected.

adb protocol on passion (Rockchip products)SUBSYSTEM=="usb", ATTR{idVendor}=="2207",ATTR{idProduct}=="0010",MODE="0600", OWNER="<username>"

New configuration will take effect when the next device access, so need to pull plug device. This method supports Ubuntu Hardy Heron (8.04.x LTS) and Lucid Lynx(10.04.x LTS). Other Ubuntu versions or other GNU/Linux types may require different configurations.

Please refer to :http://source.android.com/source/initializing.html

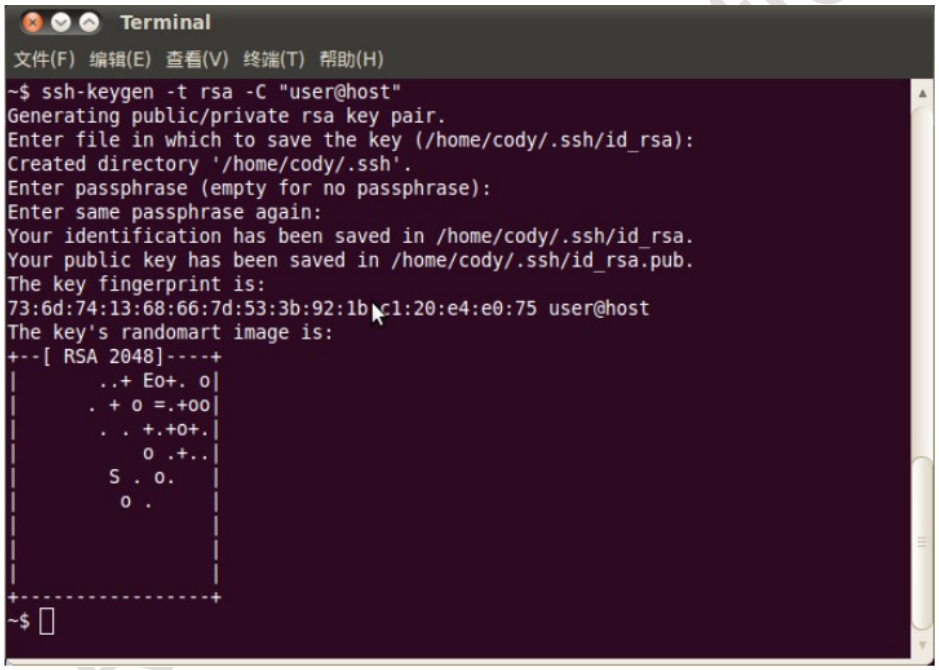
Appendix B SSH Public Key Operation Instruction

Appendix B-1 Public Key Generation

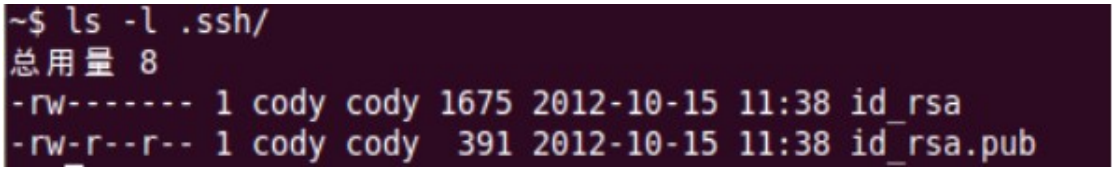
Use the following command to generate:

ssh-keygen -t rsa -C "user@host"

Please replace user@host with your email address.



Completing Command will generate public key in your directory (id_rsa.pub) and private key (id_rsa).



Please keep the private key file id_rsa and password generated, and email the public

key id_rsa.pub to SDK server administrator.

Appendix B - 2 Git Access Application Instruction

Please email the public key file, created according to above chapter to fae@rock-chips.com, to apply for SDK code download permission.