Rockchip RV1126/RV1109 Linux SDK Release Note

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Preface

Overview

The document presents Rockchip RV1126/RV1109 Linux SDK release notes, aiming to help engineers get started with RV1126/RV1109 Linux SDK development and debugging faster.

Intended Audience

This document (this guide) is mainly intended for:

- Technical support engineers
- Software development engineers

Revision History

Date	Version	Author	Revision History
2020-04-28	V0.1	CWW	Initial Alpha version
2020-05-15	V0.2	CWW	Update docs path
2020-06-16	V1.0.0	CWW	Update official version
2020-06-19	V1.1.0	CW	Update for Smart USB Camera SDK
2020-07-11	V1.1.1	CWW	Update 2.1 chapter
2020-12-04	V1.2.0	CWW	Add GPIO Precaution

Contents

1. Overview

This SDK is based on Buildroot 2018.02-rc3, with kernel 4.19 and U-boot v2017.09. It is suitable for RV1126/RV1109 EVB development boards and all other Linux products developed based on it.

The development kit is applicable to but not limited to Smart IPC/Smart Gate/Smart Doorbell/Smart USB camera and other products. It provides flexible interface to to meet customers' customized requirements.

For detailed functions debugging and interface introductions, please refer to the documents under the project's docs/ directory.

2. How to get the SDK

SDK is released by Rockchip server. Please refer to Chapter 3 Software Development Guide to build a development environment.

2.1 How to get RV1126/RV1109 Linux SDK

2.1.1 Getting from Rockchip source code repositories

To get RV1126/RV1109 Linux SDK software package, customers need an account to access the source code repository provided by Rockchip. In order to be able to obtain code synchronization, please provide SSH public key for server authentication and authorization when apply for SDK from Rockchip technical window. About Rockchip server SSH public key authorization, please refer to Chapter 5 SSH Public Key Operation Introduction.

The command for downloading RV1126_RV1109_Linux_SDK is as follows:

```
repo init --repo-url ssh://git@www.rockchip.com.cn/repo/rk/tools/repo -u
ssh://git@www.rockchip.com.cn/linux/rk/platform/manifests -b linux -m
rv1126_rv1109_linux_release.xml
```

Repo, a tool built on Python script by Google to help manage git repositories, is mainly used to download and manage software repository of projects. The download address is as follows:

```
git clone ssh://git@www.rockchip.com.cn/repo/rk/tools/repo
```

2.1.2 Getting from local package

For quick access to SDK source code, Rockchip Technical Window usually provides corresponding version of SDK initial compression package. In this way, developers can get SDK source code through decompressing the initial compression package, which is the same as the one downloaded by repo. Take rv1126_rv1109_linux_sdk_v1.0.0_20200616.tar.bz2 (Please refer to the actual basic package) as an example. After getting an initialization package, you can get the source code by running the following command:

```
mkdir rv1126_rv1109
tar xjf rv1126_rv1109_linux_sdk_v1.0.0_20200616.tar.bz2 -C rv1126_rv1109
cd rv1126_rv1109
.repo/repo/repo sync -l
.repo/repo/repo sync -c
```

Developers can update via `.repo/repo/repo sync -c` command according to update instructions that are regularly released by FAE window.

2.2 How to get Smart USB Camera SDK

For Smart USB Camera products, we provide special SDK software configuration, including UVC, UAC, ePTZ, AI solution, suitable for smart conferencing system, smart screen and other products. Download the Smart USB Camera SDK command as follows:

```
repo init --repo-url ssh://git@www.rockchip.com.cn/repo/rk/tools/repo -u
ssh://git@www.rockchip.com.cn/linux/rk/platform/manifests -b linux -m
rv1126_rv1109_linux_ai_camera_release.xml
```

If you have got RV1126/RV1109 Linux SDK package(rv1126_rv1109_linux_sdk_vX.X.X_2020XXXX.tar.bz2)，you can switch to Smart USB Camera SDK as follows:

```
.repo/repo/repo init -m rv1126_rv1109_linux_ai_camera_release.xml
.repo/repo/repo sync -c
```

3. Software Development Guide

For software development, you can refer to the quick start document in the project directory:

```
<SDK>/docs/RV1126_RV1109/Rockchip_RV1126_RV1109_Quick_Start_Linux_EN.pdf
```

4. Hardware Development Guide

Please refer to user guides in the project directory for hardware development:

```
<SDK>/docs/RV1126_RV1109/Rockchip_RV1126_RV1109_EVB_User_Guide_V1.0_EN.pdf
```

5. The precaution of GPIO power design

The IO level of the controller power domain must be consistent with the IO level of the connected peripheral chip, and the voltage configuration of software must be consistent with the voltage of hardware to avoid GPIO damage.

⚠️ Note:

About matching of GPIO power domain and IO level:
PMUIO0_VDD, PMUIO1_VDD, VCCIO1_VDD, VCCIO2_VDD, VCCIO3_VDD, VCCIO4_VDD, VCCIO5_VDD, VCCIO6_VDD, VCCIO7_VDD, voltage of these GPIO power domain must be consistent with the IO level voltage of the connected peripheral to avoid GPIO damage.
Also need to note that the voltage configuration of software should be consistent with the voltage of hardware: For example, if hardware IO level is connected to 1.8V, the voltage configuration of software should be configured to 1.8V accordingly; if hardware IO level should be connected to 3.3V, and the voltage configuration of software should also be configured to 3.3V to avoid GPIO damage.

6. SSH Public Key Operation Introduction

Please follow the introduction in the "Rockchip SDK Application and Synchronization Guide" to generate an SSH public key and send the email to fae@rock-chips.com, applying for permission to download SDK code. This document will be released to customers during the process of applying for permission.

6.1 Multi-device Use the Same SSH Public Key

If the same SSH public key should be used in different devices, you can copy the SSH private key file id_rsa to "~/.ssh/id_rsa" of the device you want to use.

If the following prompt appears when using a wrong private key, please be careful to replace it with the correct private key.

```
~/tmp$ git clone git@172.16.10.211:rk292x/mid/4.1.1_r1
Initialized empty Git repository in /home/cody/tmp/4.1.1_r1/.git/
The authenticity of host '172.16.10.211 (172.16.10.211)' can't be established.
RSA key fingerprint is fe:36:dd:30:bb:83:73:e1:0b:df:90:e2:73:e4:61:46.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '172.16.10.211' (RSA) to the list of known hosts.
git@172.16.10.211's password: █
```

After adding the correct private key, you can use git to clone code, as shown below.

```
~$ cd tmp/
~/tmp$ git clone git@172.16.10.211:rk292x/mid/4.1.1_r1
Initialized empty Git repository in /home/cody/tmp/4.1.1_r1/.git/
The authenticity of host '172.16.10.211 (172.16.10.211)' can't be established.
RSA key fingerprint is fe:36:dd:30:bb:83:73:e1:0b:df:90:e2:73:e4:61:46.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '172.16.10.211' (RSA) to the list of known hosts.
remote: Counting objects: 237923, done.
remote: Compressing objects: 100% (168382/168382), done.
Receiving objects:   9% (21570/237923), 61.52 MiB | 11.14 MiB/s
```

Adding SSH private key may result in the following error.

```
Agent admitted failture to sign using the key
```
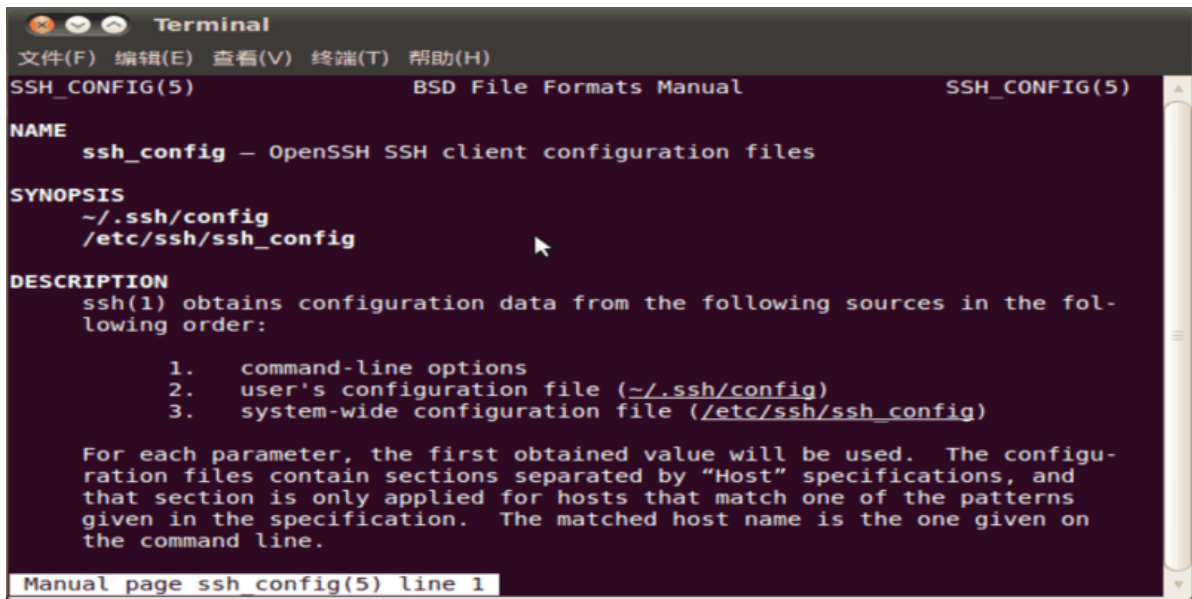
Please enter the following command in console to solve:

```
ssh-add ~/.ssh/id_rsa
```

6.2 Switch Different SSH Public Keys on the Same Device

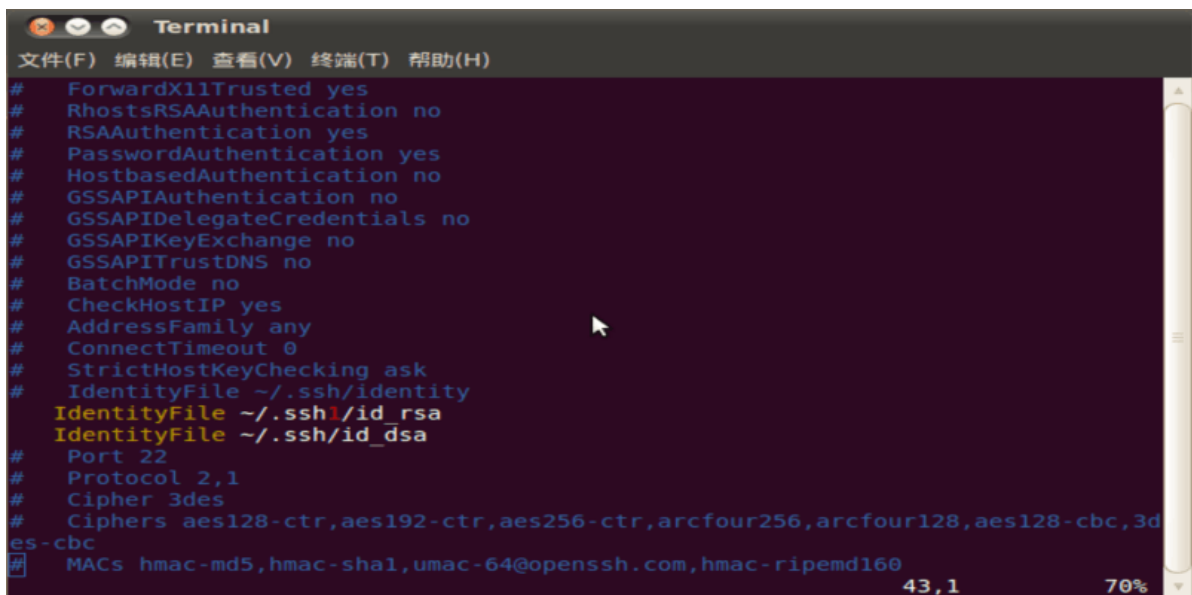You can configure SSH according to the ssh_config documentation.

```
~$ man ssh_config
```


Run the following command to configure SSH configuration of current user.

```
~$ cp /etc/ssh/ssh_config ~/.ssh/config
~$ vi .ssh/config
```

As shown in the figure, SSH uses the file "~/.ssh1/id_rsa" of another directory as an authentication private key. In this way, different keys can be switched.

6.3 Key Authority Management

Server can monitor download times and IP information of a key in real time. If an abnormality is found, download permission of the corresponding key will be disabled.

Keep the private key file properly. Do not grant second authorization to third parties.

6.4 Reference Documents

For more details, please refer to document
"/docs/Others/Rockchip_User_Guide_SDK_Application_And_Synchronization_CN.pdf".