

# Rockchip RK3588 Linux5.10 SDK Release Note

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## Preface

### Overview

The document presents Rockchip RK3588 Linux5.10 SDK release notes, aiming to help engineers get started with RK3588 Linux5.10 SDK development and debugging faster.

### Intended Audience

This document (this guide) is mainly intended for:

Technical support engineers

Software development engineers

### Chipset and System Support

Chipset	Buildroot	Debian	Yocto
RK3588, RK3588S,RK3588S2, RK3588M, RK3588J	Y	Y	Y

## Revision History

Date	Version	Author	Revision History
2022-01-15	V0.0.1	Caesar Wang	Alpha version
2022-04-14	V0.1.0	Caesar Wang	Beta version
2022-04-21	V0.1.1	Caesar Wang	Beta version 0.1.1
2022-05-20	V1.0.0	Caesar Wang	Release version
2022-06-20	V1.0.1	Caesar Wang	Update SDK to v1.0.1
2022-08-20	V1.0.2	Caesar Wang	Update SDK to v1.0.2
2022-09-20	V1.0.3	Caesar Wang	Update SDK to v1.0.3
2023-04-20	V1.1.0	Caesar Wang	Update SDK to v1.1.0
2023-05-20	V1.1.1	Caesar Wang	Update SDK to v1.1.1
2023-06-20	V1.2.0	Caesar Wang	Update SDK to v1.2.0
2023-07-20	V1.2.1	Caesar Wang	Update SDK to v1.2.1
2023-09-20	V1.3.0	Caesar Wang	Update SDK to v1.3.0
2023-12-20	V1.4.0	Caesar Wang	Update SDK to v1.4.0

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# 1. Overview

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This SDK supports three systems based on Buildroot 2021.11, Debian 11, and Yocto4.0, with the kernel based on Kernel 5.10 and the bootloader based on U-boot v2017.09. It is suitable for RK3588 EVB development boards and all Linux products developed based on this board.

This SDK is suitable for, but not limited to, AIoT products such as ARM PC/industrial boards, providing flexible data path combination interfaces to meet the customized requirements for free combination, please refer to the documents under the project's docs/ directory.

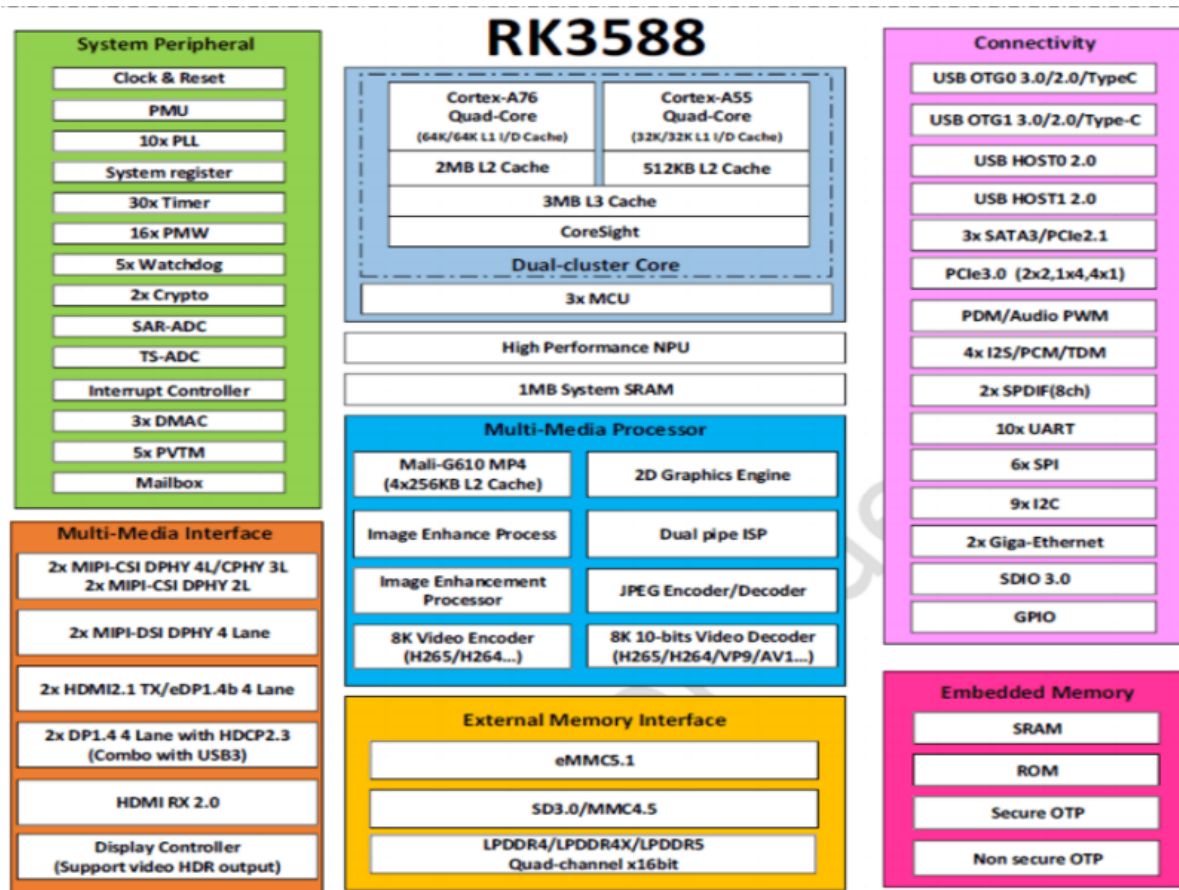
## 2. Main Functions

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Function	Module Name
System	Debian, Buildroot, Yocto
Partition table	uboot, misc, boot, recovery, rootfs, oem, userdata
File System Type	EXT2/3/4, VFAT, NTFS, UBIFS, SquashFS
Upgrade Recovery	OTA, Recovery
Secure Boot	SecureBoot
Stress Test Tool	ROCKCHIP_TEST
Data communication	Wi-Fi, Ethernet card, USB, SD card, SATA, PCI-e interface
Applications	Multimedia playback, camera preview, settings, browser, file management

### 2.1 Hardware functions

For specific hardware interface functions, please refer to the RK3588 chip diagram below



## 3. How to Get the SDK

The SDK is released by Rockchip server. Please refer to Chapter 4 [Software Development Guide](#) to build a development environment.

### 3.1 Get General RK3588 Linux SDK

#### 3.1.1 Get Source Code from Rockchip Code Server

To get RK3588 Linux5.10 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 6 [SSH Public Key Operation Introduction](#).

RK3588 Linux5.10 SDK download command 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/rockchip/platform/manifests -b \
linux -m rk3588_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
```

### 3.1.2 Get Source Code from Local Compression 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 RK3588\_LINUX5.10\_SDK\_RELEASE\_V1.4.0\_20231220.tgz as an example. After getting a initialization package, you can get source code by running the following command:

```
mkdir rk3588
tar xvf RK3588_LINUX5.10_SDK_RELEASE_V1.4.0_20231220.tgz -C rk3588
cd rk3588
.repo/repo/repo sync -l
.repo/repo/repo sync -c
```

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

If you encounter issues downloading the repository, you can use the `--force-sync` parameter to force an update, as in `.repo/repo/repo sync -c --force-sync`. Before doing so, please ensure that any local modifications have been backed up.

After updating the SDK code, a clean operation is required. For example: `./build.sh cleanall`

Note:

The software release version can be viewed through engineering XML, as follows:

```
.repo/manifests$ realpath rk3588_linux_release.xml
e.g., the printed version is v1.4.0 and the update time is 20231220
<SDK>/.repo/manifests/rk3588_linux/rk3588_linux_release_v1.4.0_20231220.xml
```

## 4. Software Development Guide

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For software development, please refer to the quick start documents in the project directory:

```
<SDK>/docs/en/RK3588/Quick-start/Rockchip_RK3588_Quick_Start_Linux_EN.pdf
```

## 5. Hardware Development Guide

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For hardware development, please refer to the following documents in the project directory:

```
<SDK>/docs/en/Socs/RK3588/Hardware$  
├─ Rockchip_RK3588_EVB7_User_Guide_V1.0_EN.pdf  
├─ Rockchip_RK3588_EVB_User_Guide_V1.1_EN.pdf  
├─ Rockchip_RK3588_Hardware_Design_Guide_V1.3_EN.pdf  
├─ Rockchip_RK3588S_EVB_User_Guide_V1.1_EN.pdf  
└─ Rockchip_RK3588S_Hardware_Design_Guide_V1.0_EN.pdf
```

## 6. SSH Public Key Operation Introduction

Please follow the introduction in the “Rockchip\_User\_Guide\_SDK\_Application\_And\_Synchronization\_EN” to generate an SSH public key and send the email to [fae@rock-chips.com](mailto:fae@rock-chips.com), to get the SDK code.

This document will be released to customers during the process of applying for permission.

### 6.1 Multiple Machines Use the Same SSH Public Key

If the same SSH public key should be used in different machines, you can copy the SSH private key file `id_rsa` to “`~/.ssh/id_rsa`” of the machine you want to use.

The following prompt will appear 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 failure to sign using the key
```

Enter the following command in console to solve:

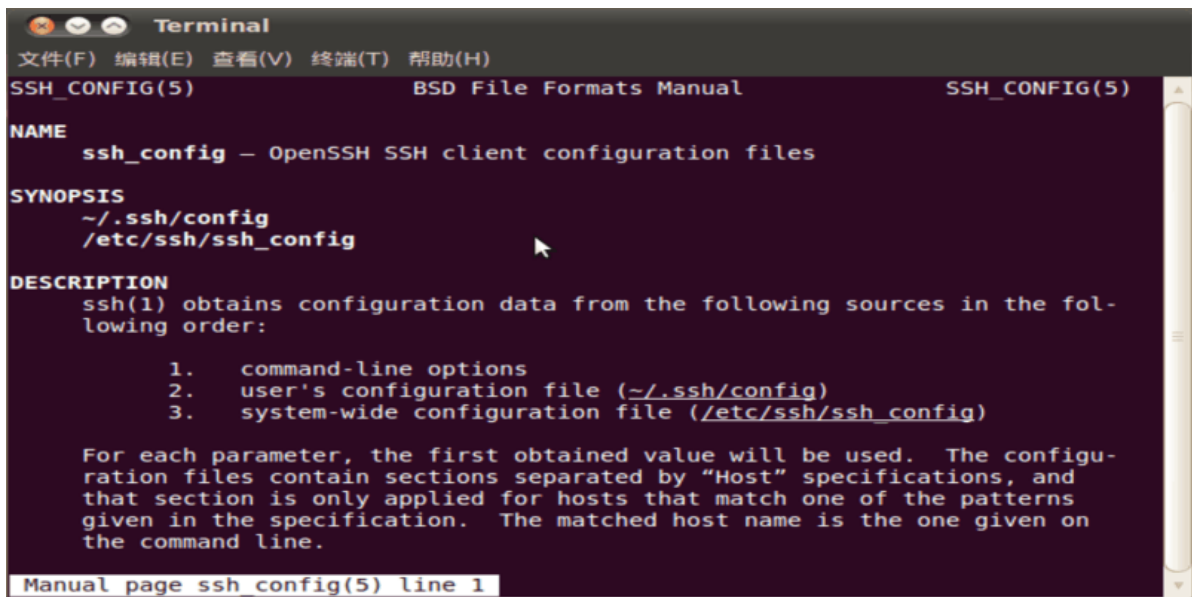
```
ssh-add ~/.ssh/id_rsa
```



## 6.2 One Machine Switches Different SSH Public Keys

You can configure SSH by referring to `ssh_config` documentation.

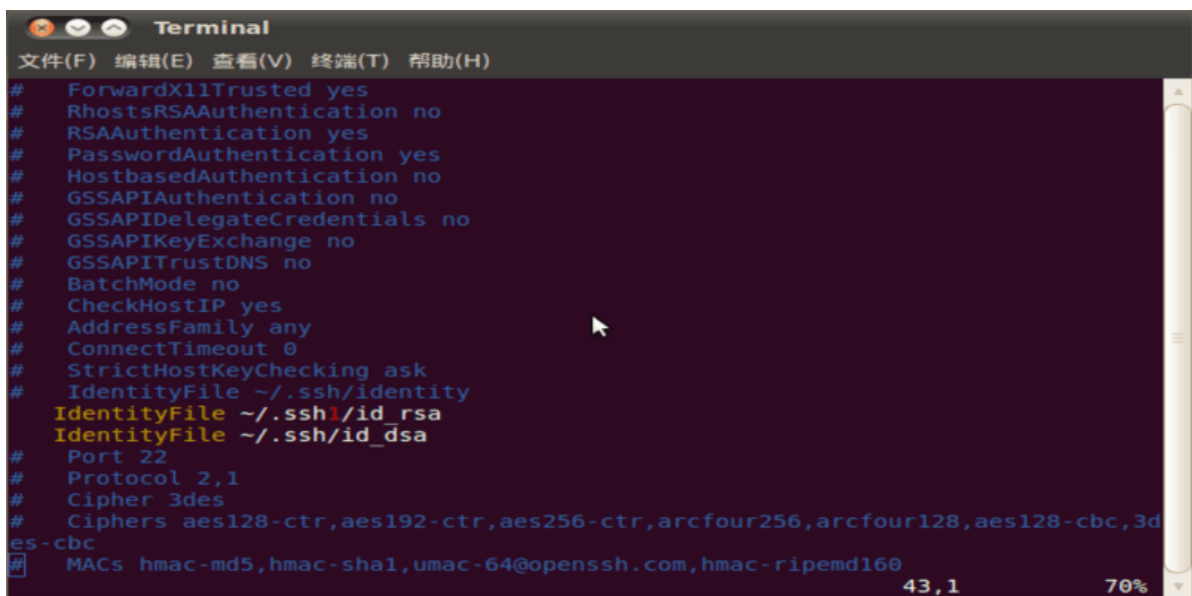
```
~$ man ssh_config
```



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/en/Others/Rockchip\_User\_Guide\_SDK\_Application\_And\_Synchronization\_EN.pdf"