# EM3399 Debian user manual

V1.0

Date: 2017-04-25

# Colophon

Ver	Author	Description	Date
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### **1.Compiler Environment**

#### 1.1 Vmware7.0+ubuntu14.04

Install Vmware7.0 in windows OS , and then install ubuntu14.04 64bit in VMware to compile. You can see the installing steps in the initial version.

### 2. Compilation

### 2.1 Install the compiler

Cross compile toolchain version: aarch64-linux-android-4.9

It is suggested to install the cross compile toolchain to /usr/local/arm/ (The makefile has designated the directory in the source).User also can install the tool chain to the other directory.(if change path,please sync the "CROSS\_COMPILE" in kernel/Makefile) Installing commands:

# mkdir /usr/local/arm
# tar zxvf aarch64-linux-android-4.9.tar.gz -C /usr/local/arm/

#### 2.2 kernel compilation

tar zxvf kernel.tar.gz cd kernel make ARCH=arm64 rockchip\_linux\_defconfig make ARCH=arm64 rk3399-sapphire-excavator-linux.img -j12

After compile finish, you can get resource.img and kernel.img in the directory.

### 2.3 Cure Debian System

Download Boardcon debian system to the board, then modify your files in the system. Finally, do the follow the steps below to make the modified file system.

**Step1**, Insert U-disk to the board.

Step2, Execute the follow command to view the space required for the file system.

# df

root@linaro-ali	ip:/media/1	linaro/WD	D/root# df		
Filesystem	1K-blocks	Used	Available	Us e%	Mounted on
/dev/root	29950948	1502020	27201008	6%	/
devtmpfs	1953212	0	1953212	0%	/dev
tmpfs	1953724	0	1953724	0%	/dev/shm
tmpfs	1953724	17020	1936704	1%	/run
tmpfs	5120	4	5116	1%	/run/lock
tmpfs	1953724	0	1953724	0%	/sys/fs/cgroup
tmpfs	390744	0	390744	0%	/run/user/0
tmpfs	390744	8	390736	1%	/run/user/1000
/dev/mmcblk0p1	1948416	979776	968640	51%	/media/linaro/0000-4823
/dev/sdb1	7548624	4148992	3399632	55%	/media/linaro/WD
root@linaro-ali	ip:/media/1	linaro/WD	0/root#		

Create an empty folder (rootfs), in that folder to make a size of 1.6Gb file system. Execute the follow command in the board of ubuntu system to make file system:

# cd /media/linaro/WD (The udisk0 is the usb disk device name)
#mkdir rootfs
# cd rootfs
# dd if=/dev/zero of=linuxroot.img bs=1M count=1600
# mkfs.ext4 -F -L linuxroot linuxroot.img
# mount -o loop linuxroot.img /opt
# mount /dev/mmcblk1p5 /mnt
# cp -a /mnt/\* /opt
# touch /opt/firstboot
# umount /opt
# umount /mnt

Now that we've got "**linuxroot.img**" in the path: /media/ linaro/WD/rootfs. The linuxroot.img is the final file system image files.

**Step3,** Execute the follow command in the ubuntu system of PC to calculates the actual size of linuxroot.img.

# e2fsck -p -f linuxroot.img
# resize2fs -M linuxroot.img

On the other hand, if you just want to modify the file system, you can use this way.

NOTE: This is operating in the compiled environment. # mount linuxroot.img rootfs/ (The rootfs is your folder name) After the modification: # umount rootfs Then the linuxroot.img is the new file system.

## 3. Install USB driver

### 3.1 install debug serial driver

Step 1, install CP2102 driver

Unzip CP2102WIN7.rar to the windows, double click preInstaller.exe

P210x USB to VART Bridge Controller Driver Se	t me500
C:\Program Files\ <u>SiLabs\</u> MCU\CP210x	Browse
2005-03-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012-04 2012	250



You can check"Computer—>Right mouse button—>Device manager—>Port", As shown in Figure

- P210x USB to UART Bridge Controller (COM5)

### 3.2 install driver

Step 1, install Rockchip driver assistant ( Release\_DriverAssitant/DriverInstall.exe) .

<b>1</b> 驱动卸载

2	
驱动安装	驱动卸载

Step2, after successful installation, plug in the power and connecting OTG cable, in the computer hardware management interface can see the following information.



## 4. Flashing image

1, Connect power cable and usb download cable



2, Press and hold Recover button and then press Reset button, release Revocer button until enter flashmode, as "Found One LOADER Devices" or "Found One MaskRom Devices".

3, Running flashing tool with PC

Tool is in tools/AndroidTool\_Release\_v2.35,Run AndroidTool.exe, choose the target image and then click " Run" button as shown in below picture.

	Address	Name	Path		
<b>▼</b>	0x00000000	Loader	\rockimg\RK3399MiniLoaderAll_V1.0	-	— click and select RK3399MiniLoaderAll_V1.05.bin
- F	0x00000000	Parameter	\rockimg\parameter.txt	100	— click and select parameter.txt
	0x00002000	U-Boot	\rockimg\uboot.img		— click and select uboot.img
	0x00004000	Trust	\rocking\trust.ing		click and select trust.img
	0x00006000	Resource	.: \rockimg\resource.img	1	<ul> <li>click and select resource.img</li> </ul>
	0x0000E000	Kernel	\rockimg\kernel.img		<ul> <li>click and select kernel.img</li> </ul>

4. After the download is complete, the board will reboot automatically.

wnl	ad :	Image Upgrade	Firmware A	dvanced Function	Get FlashInfo Start Get FlashInfo Success	
	<u> </u>			(	Prepare IDB Start	
#	-	Address	Name	Path	Frepare 108 Success	
1	$\mathbf{r}$	0x00000000	Loader	\rockimg\RK3399MiniLoaderAll_V1.0	Download IDD Start	
Z	1	0x00000000	Parameter	\rockimg\parameter.txt	Repet Device Start	
3	1	0x00002000	U-Boot	\rockimg\uboot.img	Reset Device Start	
4	1	0x00004000	Trust	\rocking\trust.ing	Weit For Loader Start	
5	~	0x00006000	Resource	\rockimg\resource.img	Wait For Loader Success	
6		0x0000E000	Kernel	\rockimg\kernel.img	Test Device Start	
7	V	0x00017000	Boot	H:\root\linuxroot.img	Test Device Success	
					Download Parameter (100%)	
					Check Parameter (100%)	
					Download uboot (100%)	
					Check uboot (100%)	
					Download trust (100%)	
					Check trust (100%)	
					Download resource (100%)	
					Check resource (100%)	
Loa	der \	/er:1.05	Run	Switch LowerFormat Clear	Download kernel (100%)	
					Check kernel (100%)	
					Download linuxroot (100%)	
			M D		Check linuxroot (100%)	
			NO De	evices round	Download image OK	

# 5. Test

# 5.1 SecureCRT setting

baudrate parameters configuration

tegory:					
Connection     Logon Actions     Serial     Terminal     Pemulation     Modes     Emacs     Mapped Keys     Advanced     Opearance     Window     Log File     Printing     X/Y/Zmodem	Serial Options				
	P <u>o</u> rt:	COM4	Ŧ	Flow control	
	Baud rate:	1500000	-	DIR/DSR	
	Data bits:	8	•	XON/XOFF	
	P <u>a</u> rity:	None	•		
	Stop bits:	1	•		
	<u>S</u> erial break	length: 100	۲	milliseconds	

### 5.2 HDMI

Connect the HDMI monitor and EM3399 with HDMI cable, then power on. After the board boot into Debian, HDMI monitor will display.



# 5.3 test 3D

Type as follow in LXTerminal: # glmark2-es2



Or full screen test: # glmark2-es2 --fullscreen

### 5.4 test video

Type as follow in LXTerminal to run video application:

#### \$sudo su #test\_dec-qt.sh



Click "open" to select video

	Open Files			- • ×
Look in:	🚞 /media/linaro/WD/testfile	- G	006	:: 🔳
Iinaro	er Name • S	ize Type 91.5 MB mov File	Date Modified 10 Jan8:13:	18
File <u>n</u> ame:	big_buck_bunny_1080p_h264.mov			)pen
Files of type:	All Files (*)		▼ C:	ancel

Double click the video file to play

-	- • ×
	test.mp4 big_buck_bunny_1080p_h264.mov
Open	00:50 / 09:56

# 5.5 audio

There is voice in HDMI but no voice in headphone when connect to HDMI by default.User can change the audio channel as follow:

Step 1, play the audio,

Step 2, START->Sound & Video->PulseAudio Volume Control

3	Vo	lume Control		<u>-</u>	• ×
I Playbad	ck I	Recording	Output D	Vevices	•
🗟 System	Sounds			40	
Silence		100% (0dB)	10	0% (0.00dB)	
📑 player:	Pl on	IDMI-CODEC Ar	nalog Stereo	•	]
Silence		100% (OdB)	10	0% (0.00dB)	
	Show	Application	5		•

Step 3, Click the red box and select the chanel you want.

	Volume Control	
Playback	Recording	Output Devices
🍯 System Sou	nds	44
Silence	100% (OdB)	)
<b>player</b> or	realtek,rt5651-code	c Analog Stereo 🛶 💟
Silence	100% (0dB)	)
	Show: Applications	s. 👻
	Show: Applications	s 🔻

There is voice in headphone but no in HDMI when select "realtek,rt5651-codes Analog Stereo".

# 5.6 ethernet

Plug in an Ethernet cable (RJ45) and start the system, it will obtain IP address Automatic and you can surf the Internet by chrome.



### 5.7 wifi

Step 1, Connect WiFi antenna.

Step 2, Click the network manager icon , then it will scan AP automatically.

Step 3, Select AP and type password. There is Wi-Fi icon in the status bar if connected.

_	Wi-Fi Net	work Auther	ntication Requir	ed	_ = ×
	Authenti	cation req	uired by Wi-l	Fi ne	etwork
	Passwords o Fi network "	or encryption l Boardcon".	ceys are required	to acc	cess the Wi-
	Password:		•••••	å.	1
		Show pass	sword	1 111-2 11	]
			- 0		

Step4, Open the browser to browse the web.

Wew Android single I: x
 ← → C ∩ ① www.board
 Apps @ Debian.org @ Lat

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Boardcon Embedded Design		fiii Product Name Q. Skype charaf con Gault marke Q arm de signet con	
Home Com	pany Products Service	Order News Contact Us	
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	based on Your	laea 🛛 🔍 👱	🙇 shanyou
			Tech Support in
Products	EM3399		C zhou
Action Dependiquement (c)     Single board computer     Computer on Module     Card size board     Customization product     Other Related     Design Services		**Processor Boche, Pro2039, Dual 64-bit Contex-A72 + Quad Contex- A33 @ 2.00H     **AM4 - 400 LFOOH     **AM4 - Chaile And	
CoM Feature Comparison	Overview Hardware	Software Download Price and Order \$40	
	The Boardson EM399 is a head A72 cress Golded at up to 2.00 WWUT module, supporting 4.0 communications and other te advertising divides J the atten- tion guidance and an and and and the guidance of BM399 payers of BM399 payers powerful CPU, GPU, hardse inter- capabilities that support 1200	core single-board computer based on flocktigh PR2388 processor with fairs Corta- bits, and four cortex A23 cores teamed with a NaI-318000H4 GPU, Hearung 30 and C233 video deceding by 6 of 0 fs, Nieth Workson, US3 Special Cogate totharne, and target to 2m1, Andred tablets, VK. 1V40K, latoppa, invelvels, mangetons, minals covering flocktual and consume applications, Induced single single Device. And the International PS3 systems, which, control terminals, third-flockt, VO9 video A16 PR2395 computer onnodule providem most of the Internations will beflates. Ming concertors and several additional functions. Base terminals with fairs operation pagesd. AdjectifyEd1244 video plageace and uppting to frace strandards and training seeds. AdjectifyEd1244 video plageace and uppting.	
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### 5.8 bluetooth

Step1,open Bluetooth manager,

START->Preferences->Bluetooth Manager

Step2, type follow in LXTerminal,

#test-bluetooth &

Step3,click "search" and right click to pair the device which you want to,

Step4, right click to transfer files .

Receive files save at /home/linaro/Downloads/ by default.

Trash			
	Understit Dortes         Algebre Dortes         Statut         Algebre Dortes         Barger         Algebre Dortes         Barger         Barger	Burgebarevabre           Fig dit jeb burge           Fig dit jeb burge     <	
A • • • • •	Bluetooth Devices Inaro@linaro-ali		

0	Bluetooth Devi	ces		- 0 ×	
Adapter Devic	e View Help				
Search	🔹 🗢 🔶	Setup	-	-	
MI Bal Unknown CD:95:57	nd 2 7:E4:09:9A				
Generation Smart photo: 00:0A:00	one 1:00:12:6F				
8	Blueto	oth		• ×	
	Bluetooth				
Pairing request for: 4G (00:0A:00:00:12:6F) Confirm value for authentication: 538410					
	Confirm		Deny	3	



### 5.9 3G(MU709s-2)

Connect 3G modem, 3G antenna and insert SIM card, power on the board. then type as follow in LXTerminal.:

# pppd call wcdma &

# ifconfig

you can surf the internet by 3G now.



## 5.10 external storage

In the board ,there support USB,SD card,mSATA for external storage devices. Support mount automatically,default mount to /media/linaro/.

Note: Only USB and SD card support hot plog but mSATA not.

### 5.11 test gpio

```
support test gpio lists:
GPIO4_C6,GPIO3_D4,GPIO3_B2,GPIO4_C2,
GPIO2_A2,GPIO2_A3,GPIO2_A4,GPIO2_A5,
GPIO1_A0,GPIO1_A1,GPIO1_C6,GPIO1_D0,
GPIO3_D5,GPIO3_D6,GPIO2_B4,GPIO4_D0
```

for exsample:

#gpio GPIO4\_C6 H // control GPIO4\_C6 output high level

#gpio GPIO4\_C6 L // control GPIO4\_C6 output low level