CUBIEBOARD
http://cubieboard.org

Cubieboard2 Android RTL8188EUS Module Debugging

Cubieboard2 RTL8188EUS

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Version	Author	Modification	Check
V-0.1-20150121	Payne	Init version	

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1. Abstract

The document is based on the development that Cubieboard2 rtl8188eu wireless USB WiFi module to realize the function of wireless and set the hotspot function.The main is to modify the BoardConfig.mk and configure the kernel to support rtl8188eu, the default is that kernel configured.

2. Hardware requirements

- Cubieboard2
- Cubieboard WiFi-mod-8188eus-A or WiFi-mod-8188eus-B
- A HDMI cable, network cable
- A mouse, keyboard and display
- A Ubuntu 12.04 system PC

3. Software requirements

3.1. SDK

3.1.1. Download sdk

http://dl.cubieboard.org/model/commom/android-source/a20/

3.1.2.Download in the github

$git clone https://bitbucket.org/cubietech/a20-android4.2_lichee.git

$git clone https://bitbucket.org/cubietech/a20-android4.2_android.git

4. Cubieboard Android RTL8188EUS Development

4.1. Achieve Wireless access function

4.1.1.Configure the kernel

Enter the kernel directory

$cd lichee/linux-3.4/

Copy the file of the kernel configuration to kernel root directory and changed the name as .config.

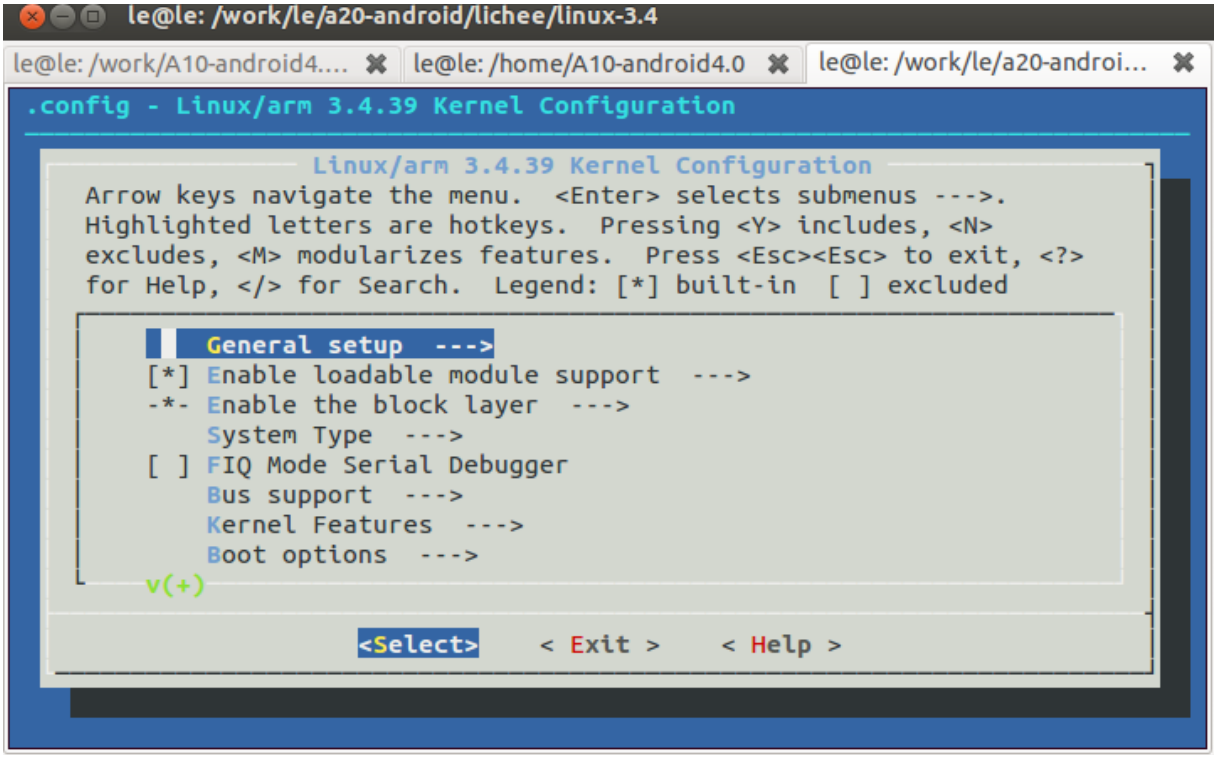
As below:

```
le@le:/work/le/a20-android/lichee/linux-3.4$ cp arch/arm/configs/cubieboard2_config
 .config
```

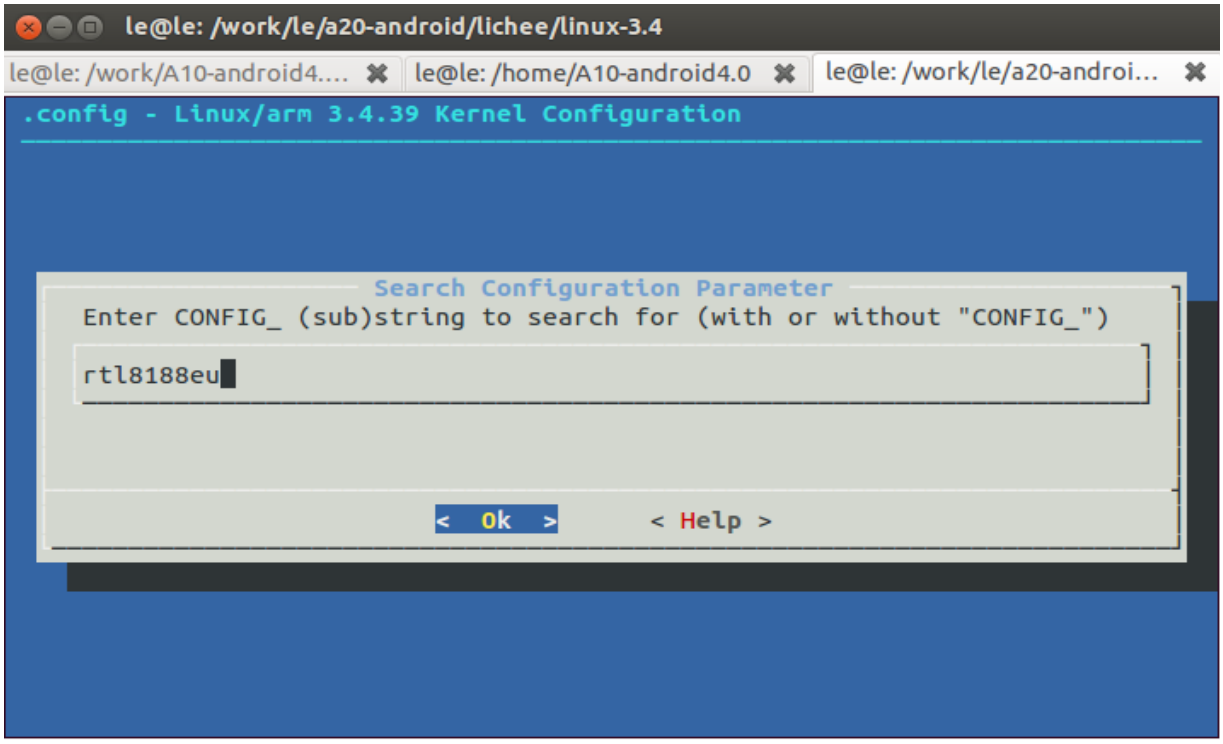
Open the interface of kernel configuration

```
[sudo] password for le:
le@le:/work/le/a20-android/lichee/linux-3.4$ sudo make ARCH=arm menuconfig
```

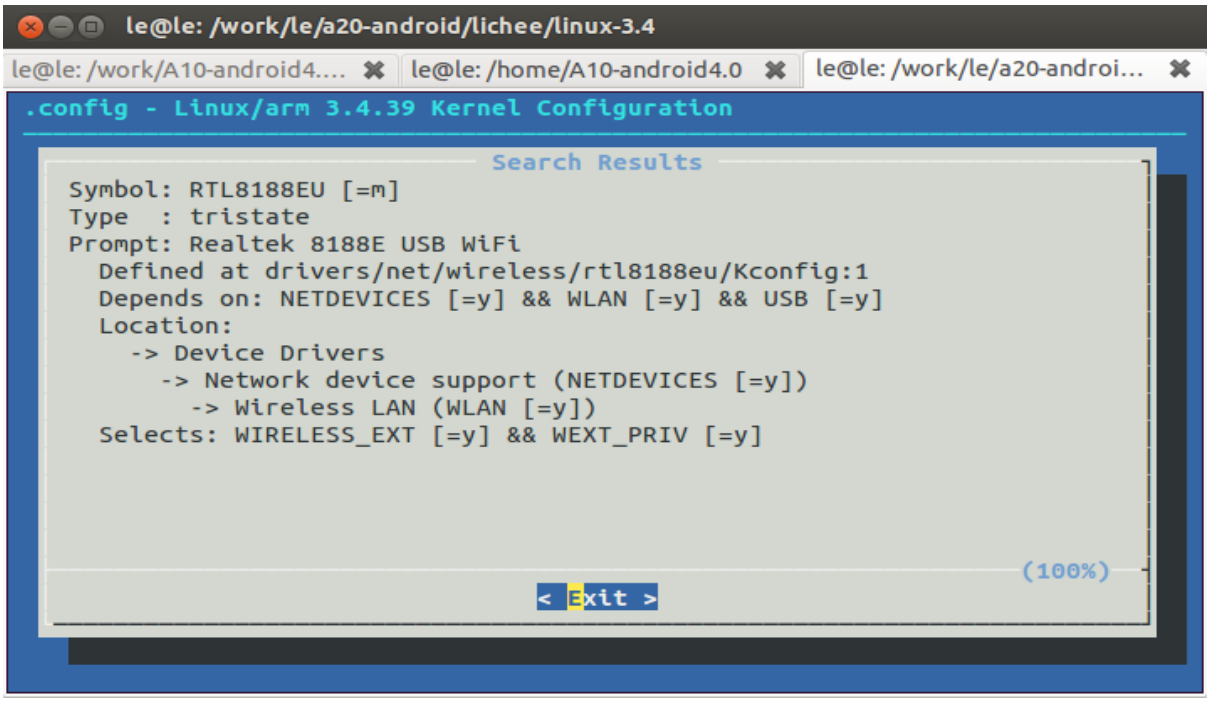
As follow:



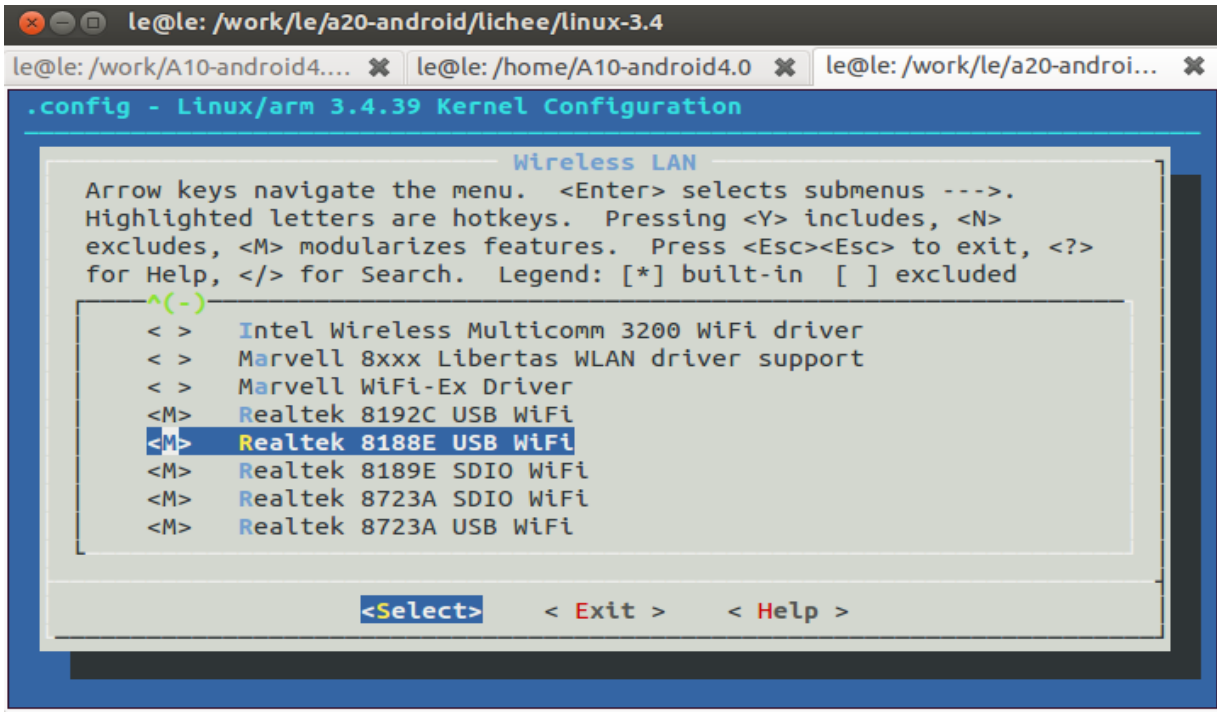
Pressing the "/" to find the location of the rtl8188eu on the keyboard



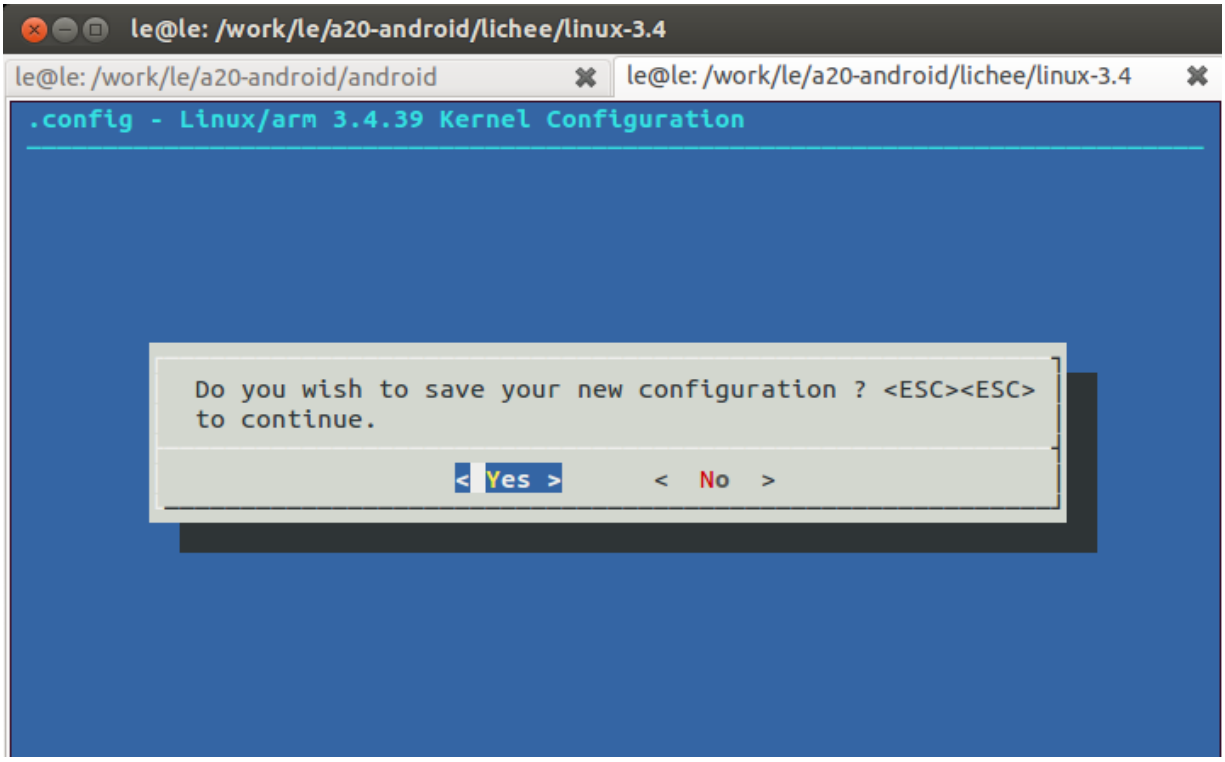
Enter, look below:



Find the option of "Realtek 8188E USB WiFi" according to the above Location, select "M" to make it be compiled into the module:



Exit saving, select "Yes"



The related configuration will be saved in the file of .config, see the .config file in rtl8188eu

As below:

```
CONFIG_RTL8192CU_SW=m
CONFIG_RTL8188EU=m
CONFIG_RTL8189ES=m
CONFIG_RTL8723AS=m
CONFIG_RTL8723AU=m
```

You can see the CONFIG_RTL_8188EU=m, "m" is module

4.1.2. Modify the BoardConfig.mk

BoardConfig.mk to determine which Android to load module of WiFi to be configured to use the rtl8188eu module.

Enter the SDK top-level directory to search BoardConfig.mk position:

```
le@le:/work/le/a20-android$ find -name BoardConfig.mk
./android/build/target/board/generic_x86/BoardConfig.mk
./android/build/target/board/vbox_x86/BoardConfig.mk
./android/build/target/board/emulator/BoardConfig.mk
./android/build/target/board/generic_mips/BoardConfig.mk
./android/build/target/board/generic/BoardConfig.mk
./android/device/softwinner/sugar-cubieboard2/BoardConfig.mk
./android/device/softwinner/sugar-ref001/BoardConfig.mk
./android/device/softwinner/sugar-standard/BoardConfig.mk
```

Obviously this file above highlight

Modified as follows (part of the code):

```
# 1.1 realtek wifi support
ifeq ($(BOARD_WIFI_VENDOR), realtek)
WPA_SUPPLICANT_VERSION := VER_0_8_X
BOARD_WPA_SUPPLICANT_DRIVER := NL80211
BOARD_WPA_SUPPLICANT_PRIVATE_LIB := lib_driver_cmd_rtl
BOARD_HOSTAPD_DRIVER
:= NL80211
BOARD_HOSTAPD_PRIVATE_LIB := lib_driver_cmd_rtl
#SW_BOARD_USR_WIFI := rtl8192cu
#BOARD_WLAN_DEVICE := rtl8192cu
SW_BOARD_USR_WIFI := rtl8188eu
BOARD_WLAN_DEVICE := rtl8188eu
```

Explain:

1、"#" comment function symbols;

2、BOARD_WIFI_VENDOR := realtek WiFi module is specified using realtek;

3、SW_BOARD_USR_WIFI: = rtl8188eu and BOARD_WLAN_DEVICE = rtl8188eu, specified using the rtl8188eu;

4.2. Achieve the function of WiFi hotspot

4.2.1.Modify sys_config.fex

path：a20-android/lichee/tools/pack/chips/sun7i/configs/android/sugar-cubieboard2/sys_config.fex

The file of sys_config.fex determines WiFi module and distribution of GPIO, pin, must be configured to use the rtl8188eus module, need to modify it as follows (part of the code)

[wifi_para]

wifi_used =1

wifi_sdc_id =3

wifi_usbc_id =2

wifi_usbc_type =1

wifi_mod_sel =6

wifi_power = ""

; 6 - rtl8188eu usb wifi

rtk_rtl8188eu_wl_dis = port:PH03<1><default><default><0>

Explain:

1、“; ”is the function of notes;

2、 “Wifi_used "1 representation using WiFi, 0 indicates no use;

3、"Wifi_usbc_type" indicates a connection using USB WiFi which USB interface;

4、 "Wifi_mod_sel" macro representation using which WiFi module;

5、 "Wifi_power" said power supply pin;

6、 The addition of WiFi rtk_rtl8188eu_wl_dis, put usbc2 power control to treat on WiFi power management;

4.3. Compile

4.3.1. Compile the kernel

Enter the source directory of lichee and compile:

$cd A20-android/lichee/

$./build.sh -p sun7i_android

Completed:

```
arm-linux-gnueabi-objcopy --gap-fill=0xff -O binary u-boot u-boot.bin
make[1]:正在离开目录 `/work/le/a20-android/lichee/u-boot'
INFO: build u-boot OK.
INFO: build rootfs ...
INFO: skip make rootfs for android
INFO: build rootfs OK.
INFO: build lichee OK.
le@le:/work/le/a20-android/lichee$
```

4.3.2. Android Compile

Enter the source directory of android:

$cd ../android/

removing compiled product:

$make clean

Initialize the compiler environment, and introduce some auxiliary Shell functions:

$source build/envsetup.sh

Note: the "source build/envsetup.sh" into build/envsetup.sh scripts, including the next step using the lunch function

Use lunch Function and the specified parameter is “cubieboard2-eng”

$lunch 15

Copy the kernel and module:

$extract-bsp

Compile:

$make -j8

Note: "8" for the number of CPU threads, according to his PC machine change

waiting.....

Completed:

```
out/target/product/sugar-cubieboard2/obj/PACKAGING/systemimage_intermediates/uns
parse_system.img: 1488/32768 files (0.0% non-contiguous), 99678/131072 blocks
Install system fs image: out/target/product/sugar-cubieboard2/system.img
out/target/product/sugar-cubieboard2/system.img+out/target/product/sugar-cubiebo
ard2/obj/PACKAGING/recovery_patch_intermediates/recovery_from_boot.p maxsize=548
110464 blocksize=4224 total=402252512 reserve=5537664
le@le:/work/le/a20-android/android$
```

4.3.3.pack after completed

$pack

The firmware will be generated in the lichee/tools/pack

```
le@le: /work/le/a20-android/android
le@le:/work/le/a20-android/android$ ls ../lichee/tools/pack/
chips  out  pack  pctools  sun7i_android_sugar-cubieboard2.img
le@le:/work/le/a20-android/android$
```

4.4. Install system

http://pan.baidu.com/s/1c0phjOk#path=/Model/cubieboard1/Doc/android

4.5. rtl8188eus Module file

The rtl8188eu module transplant related the following file, no longer need to modify these files, you just need to comprehend.

4.5.1. Linux

4.5.1.1. rtl8188eus driver code

```
le@le:/work/le/a20-android/lichee/linux-3.4/drivers/net/wireless/rtl8188eu$ ls
8188eu.ko      8188eu.o     core         include    Makefile       runwpa
8188eu.mod.c   built-in.o   hal          Kconfig    modules.order  wlan0dhcp
8188eu.mod.o   clean        ifcfg-wlan0  make_drv   os_dep
le@le:/work/le/a20-android/lichee/linux-3.4/drivers/net/wireless/rtl8188eu$
```

4.5.1.2. Power supply and GPIO control of API

linux-3.4\arch\arm\mach-sun7i\rf\wifi_pm.c

linux-3.4\arch\arm\mach-sun7i\rf\ wifi_pm_rtl8188eu.c

4.5.2. android

4.5.2.1. wifi.c

android4.2.2\hardware\libhardware_legacy\wifi\wifi.c

Defined loaded module, the module name and path module parameters

```
#elif defined RTL_8188EU_WIFI_USED
/* rtl8188eu usb wifi */
#ifndef WIFI_DRIVER_MODULE_PATH
#define WIFI_DRIVER_MODULE_PATH
#endif
#ifndef WIFI_DRIVER_MODULE_NAME
#define WIFI_DRIVER_MODULE_NAME
#endif
#ifndef WIFI_DRIVER_MODULE_ARG
#define WIFI_DRIVER_MODULE_ARG
#endif
```