

# A20 平台 **android4.2 wifi+bt** 配置说明

V0.2

2013-07-16

## Revision History

Version	Date	Section/ Page	Changes compared to previous issue
V0.1	2013-05-28	PD1	initial version for sdk v1.3
V0.2	2013-07-16	PD1	Add rtl8723as/au



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## 1 概述

目前 A20 android4.2 平台上支持 10 款 wifi 或 wifi+bt 模组，详细信息请参考《A20 android4.2 平台 wifi-bt 模组支持状况列表》，本文档将以 A20 EVB 板平台为例一一说明如何配置每款 wifi 或 wifi+bt 模组。

wifi 可分 USB 接口和 SDIO 接口两种类型，wifi 的全功能包括 station、softap 和 wifi direct。

bt 基本都采用 UART 接口通信。

本文档会不断的更新，文档和代码对应可能会稍有差别。

## 2 rtl8188eu/rtl8188etv

功能：wifi (station/softap/p2p)

接口类型：USB

说明：rtl8188eu 和 8188etv 使用相同的驱动，以下以 rtl8188eu 为例说明

### 2.1 .config

.config 中需要配置如下选项，将 wifi driver 编译为模块

```
CONFIG_RTL8188EU = m
```

### 2.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组，要配置成使用 rtl8188eu 模组需要把 BoardConfig.mk 文件修改成如下（部分代码）。

```
# 1. Wifi Configuration
BOARD_WIFI_VENDOR := realtek
#BOARD_WIFI_VENDOR := broadcom

# 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
```

说明：

- 1、“#”符号起注释作用；
- 2、BOARD\_WIFI\_VENDOR := realtek 指明使用 realtek 的 wifi 模组；
- 3、SW\_BOARD\_USR\_WIFI := rtl8188eu、BOARD\_WLAN\_DEVICE := rtl8188eu 指明使用 rtl8188eu；

## 2.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，使用 rtl8188eus 模组需要作如下修改（部分代码）。

```
# 1. realtek wifi service
# 1.1 realtek wifi sta service
service wpa_supplicant /system/bin/wpa_supplicant -iwlan0 -Dnl80211
-c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot

# 1.2 realtek wifi sta p2p concurrent service
service p2p_supplicant /system/bin/wpa_supplicant \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin -N \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot
```

注意：

- 1、若 init.sun7i.rc 文件无修改后代码，可手动添加；
- 2、需注释掉 broadcom wifi service 相关内容。

## 2.4 sys\_config.fex

sys\_config.fex 文件决定选择的 wifi 模组，以及 GPIO pin 的分配，要配置成使用 rtl8188eus 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```
-----
;wifi configuration
;wifi_sdc_id --- 0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id --- 0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type -- 1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel --- 0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
; 3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
; 5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
; 8 - ap6330, 9 - ap6181
-----
[wifi_para]
```



wifi_used	= 1
wifi_sdc_id	= 3
wifi_usbc_id	= 2
wifi_usbc_type	= 1
wifi_mod_sel	= 6
wifi_power	= ""

说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_usbc\_type”表示使用哪个USB接口连接USB wifi;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;

## 2.5 rtl8188eu 模组相关文件

以下文件是与 rtl8188eu 模组移植相关的,无需再对这些文件作修改,只需了解即可。

### 2.5.1 linux

#### 一、rtl8188eus 驱动代码

linux-3.3\drivers\net\wireless\rtl8188eu

#### 二、电源及 GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm\_rtl8188eu.c

### 2.5.2 android

#### 一、wifi.c

android4.2.2\hardware\libhardware\_legacy\wifi\wifi.c

定义加载的模块路径、模块名和模块参数。

```
#elif defined RTL_8188EU_WIFI_USED
/* rtl8188eu usb wifi */
#ifndef WIFI_DRIVER_MODULE_PATH
#define WIFI_DRIVER_MODULE_PATH          "/system/vendor/modules/8188eu.ko"
#endif
#ifndef WIFI_DRIVER_MODULE_NAME
#define WIFI_DRIVER_MODULE_NAME          "8188eu"
#endif
#ifndef WIFI_DRIVER_MODULE_ARG
```

```
#define WIFI_DRIVER_MODULE_ARG  
#endif
```

```
"ifname=wlan0 if2name=p2p0"
```

Confidential

## 3 rtl8189es

功能：wifi (station/softap/p2p)

接口类型：SDIO

### 3.1 .config

.config 中需要配置如下选项，将 wifi driver 编译为模块

CONFIG\_RTL8189ES = m

### 3.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组，要配置成使用 rtl8189es 模组需要把 BoardConfig.mk 文件修改成如下（部分代码）。

```
# 1. Wifi Configuration
BOARD_WIFI_VENDOR := realtek
#BOARD_WIFI_VENDOR := broadcom

# 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

    SW_BOARD_USR_WIFI := rtl8189es
    BOARD_WLAN_DEVICE := rtl8189es
```

说明：

- 1、“#”符号起注释作用；
- 2、BOARD\_WIFI\_VENDOR := realtek 指明使用 realtek 的 wifi 模组；
- 3、SW\_BOARD\_USR\_WIFI := rtl8189es、BOARD\_WLAN\_DEVICE := rtl8189es 指明使用 rtl8189es；

### 3.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，使用 rtl8189es 模组需要作如下修改（部分代码）。

```
# 1. realtek wifi service
# 1.1 realtek wifi sta service
service wpa_supplicant /system/bin/wpa_supplicant -iwlan0 -Dnl80211
-c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot

# 1.2 realtek wifi sta p2p concurrent service
service p2p_supplicant /system/bin/wpa_supplicant \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin -N \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot
```

注意：

1、若 init.sun7i.rc 文件无修改后代码，可手动添加；

### 3.4 sys\_config.fex

sys\_config.fex 文件决定选择的 wifi 模组，以及 GPIO pin 的分配，要配置成使用 rtl8188eus 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```
;------
;wifi configuration
;wifi_sdc_id --- 0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id --- 0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type -- 1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel --- 0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
; 3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
; 5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
; 8 - ap6330, 9 - ap6181
;------
[wifi_para]
wifi_used = 1
```



```
wifi_sdc_id      = 3
wifi_usbc_id    = 2
wifi_usbc_type  = 1
wifi_mod_sel    = 4
wifi_power     = ""

; 4 - rtl8189es sdio wifi gpio config
rtl8189es_shdn  = port:PH09<1><<default><<default><<0>
rtl8189es_wakeup = port:PH10<1><<default><<default><<1>
```

说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_sdc\_id”表示wifi使用哪个SDIO接口;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;
- 5、; 4 - rtl8189es sdio wifi gpio config 下面的内容为给rtl8189es分配的GPIO。

## 3.5 rtl8189es 模组移植相关文件

以下文件是与rtl8189es模组移植相关的,无需再对这些文件作修改,只需了解即可。

### 3.5.1 linux

#### 一、rtl8189es 驱动代码

```
\linux-3.3\drivers\net\wireless\rtl8188es
```

#### 二、电源及GPIO控制API

```
linux-3.3\arch\arm\mach-sun7i\rf\wifi_pm.c
linux-3.3\arch\arm\mach-sun7i\rf\wifi_pm_rtl8189es.c
```

### 3.5.2 android

#### 一、wifi.c

```
android4.2\hardware\libhardware_legacy\wifi\wifi.c
```

定义加载的模块路径、模块名和模块参数。

```
#elif defined RTL_8189ES_WIFI_USED
/* rtl8189ES sdio wifi */
#ifdef WIFI_DRIVER_MODULE_PATH
#define WIFI_DRIVER_MODULE_PATH "/system/vendor/modules/8189es.ko"
#endif
```

```
#ifndef WIFI_DRIVER_MODULE_NAME
#define WIFI_DRIVER_MODULE_NAME      "8189es"
#endif
#ifndef WIFI_DRIVER_MODULE_ARG
#define WIFI_DRIVER_MODULE_ARG      "ifname=wlan0 if2name=p2p0"
#endif
```

## 4 rtl8192cu

功能: wifi (station/softap/p2p)

接口类型: USB

### 4.1 .config

.config 中需要配置如下选项, 将 wifi driver 编译为模块

```
CONFIG_RTL8192CU = m
```

### 4.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组, 要配置成使用 AR6302(AR6302)模组需要把 BoardConfig.mk 文件修改成如下 (部分代码)。

```
# 1. Wifi Configuration
BOARD_WIFI_VENDOR := realtek
#BOARD_WIFI_VENDOR := broadcom

# 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

    #SW_BOARD_USR_WIFI := rtl8189es
    #BOARD_WLAN_DEVICE := rtl8189es

    #SW_BOARD_USR_WIFI := rtl8723as
    #BOARD_WLAN_DEVICE := rtl8723as

    #SW_BOARD_USR_WIFI := rtl8723au
    #BOARD_WLAN_DEVICE := rtl8723au
```

```
endif
```

说明:

- 1、“#”符号起注释作用;
- 2、BOARD\_WIFI\_VENDOR := realtek 指明使用 realtek 的 wifi 模组;
- 3、SW\_BOARD\_USR\_WIFI := rtl8192cu、BOARD\_WLAN\_DEVICE := rtl8192cu 指明使用 rtl8192cu;

## 4.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，使用 rtl8192cu 模组需要作如下修改（部分代码）。

```
# 1. realtek wifi service
# 1.1 realtek wifi sta service
service wpa_supplicant /system/bin/wpa_supplicant -iwlan0 -Dnl80211
-c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot

# 1.2 realtek wifi sta p2p concurrent service
service p2p_supplicant /system/bin/wpa_supplicant \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin -N \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot
```

注意:

- 1、若 init.sun7i.rc 文件无修改后代码，可手动添加;

## 4.4 sys\_config.fex

sys\_config.fex 文件决定选用的 wifi 模组，以及 GPIO pin 的分配，要配置成使用 rtl8192cu 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```
;-----
;wifi configuration
;wifi_sdc_id --- 0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id --- 0- USB0, 1- USB1, 2- USB2
```



```

;wifi_usbc_type -- 1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel --- 0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;                  3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                  5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                  8 - ap6330, 9 - ap6181
;-----
[wifi_para]
wifi_used          = 1
wifi_sdc_id        = 3
wifi_usbc_id       = 2
wifi_usbc_type     = 1
wifi_mod_sel       = 5
wifi_power         = ""

```

说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_usbc\_type”表示使用哪个USB接口连接USB wifi;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;

## 4.5 rtl8192cu 模组移植相关文件

以下文件是与 rtl8192cu 模组移植相关的,无需再对这些文件作修改,只需了解即可。

### 4.5.1 linux

#### 一、rtl8192cu 驱动代码

linux-3.3\drivers\net\wireless\rtl8192cu

#### 二、电源及 GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm\_rtl8192cu.c

### 4.5.2 android

#### 一、wifi.c

android4.2\hardware\libhardware\_legacy\wifi\wifi.c

定义加载的模块路径、模块名和模块参数。

```
#if defined RTL_8192CU_WIFI_USED
```

```
/* rtl8192cu usb wifi */  
#ifndef WIFI_DRIVER_MODULE_PATH  
#define WIFI_DRIVER_MODULE_PATH        "/system/vendor/modules/8192cu.ko"  
#endif  
#ifndef WIFI_DRIVER_MODULE_NAME  
#define WIFI_DRIVER_MODULE_NAME        "8192cu"  
#endif  
#ifndef WIFI_DRIVER_MODULE_ARG  
#define WIFI_DRIVER_MODULE_ARG        "ifname=wlan0 if2name=p2p0"  
#endif
```

## 5 rtl8723au

功能: wifi (station/softap/p2p) + bt

接口类型: USB

### 5.1 .config

.config 中需要配置如下选项, 将 wifi driver 编译为模块

```
CONFIG_RTL8723AU = m
```

### 5.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组, 以及是否支持蓝牙, 要配置成使用 rtl8723au 模组需要把 BoardConfig.mk 文件修改成如下 (部分代码)。

```
# 1. Wifi Configuration
BOARD_WIFI_VENDOR := realtek
#BOARD_WIFI_VENDOR := broadcom

# 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

    #SW_BOARD_USR_WIFI := rtl8189es
    #BOARD_WLAN_DEVICE := rtl8189es

    #SW_BOARD_USR_WIFI := rtl8723as
    #BOARD_WLAN_DEVICE := rtl8723as

    SW_BOARD_USR_WIFI := rtl8723au
    BOARD_WLAN_DEVICE := rtl8723au
```

```
Endif

# 2. Bluetooth Configuration
# make sure BOARD_HAVE_BLUETOOTH is true for every bt vendor
BOARD_HAVE_BLUETOOTH := true
#BOARD_HAVE_BLUETOOTH_BCM := true
BOARD_HAVE_BLUETOOTH_RTK := true
SW_BOARD_HAVE_BLUETOOTH_NAME := rtl8723au
BOARD_BLUETOOTH_BDROID_BUILDCFG_INCLUDE_DIR:=device/softwinner/wing-evb-v10/bluetooth/
```

#### 说明:

- 1、“#”符号起注释作用;
- 2、BOARD\_WIFI\_VENDOR := realtek 指明使用 realtek 的 wifi 模组;
- 3、SW\_BOARD\_USR\_WIFI := rtl8723au、BOARD\_WLAN\_DEVICE := rtl8723au 指明使用 rtl8723au;
- 4、“BOARD\_HAVE\_BLUETOOTH\_RTK := true”宏指定蓝牙厂商为 Realtek;
- 5、“BOARD\_BLUETOOTH\_BDROID\_BUILDCFG\_INCLUDE\_DIR := device/softwinner/wing-evb-v10/bluetooth/”宏指明配置文件 bdroid\_buildcfg.h 路径;
- 6、“SW\_BOARD\_HAVE\_BLUETOOTH\_NAME := rtl8723au”宏指定蓝牙模组为 rtl8723au。

#### 注意:

- 1、需注释掉#BOARD\_HAVE\_BLUETOOTH\_BCM := true
- 2、若不需要蓝牙功能只需要把相关宏注释掉就可以。

## 5.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，使用 rtl8723au 模组需要作如下修改（部分代码）。

```
#realtek bluetooth

# change back to bluetooth from system
chown bluetooth net_bt_stack /data/misc/bluetooth
mkdir /data/misc/bluedroid 0770 bluetooth net_bt_stack

# power up/down interface
chmod 0660 /sys/class/rfkill/rfkill0/state
chmod 0660 /sys/class/rfkill/rfkill0/type
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/state
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/type
write /sys/class/rfkill/rfkill0/state 0

# bluetooth MAC address programming
```

```
chown bluetooth net_bt_stack ro.bt.bdaddr_path
chown bluetooth net_bt_stack /system/etc/bluetooth
chown bluetooth net_bt_stack /data/misc/bluetooth
setprop ro.bt.bdaddr_path "/data/misc/bluetooth/bdaddr"
```

```
# USB device
insmod /system/vendor/modules/rtk_btusb.ko
chmod 0660 /dev/rtk_btusb
chown bluetooth net_bt_stack /dev/rtk_btusb
```

#### # 1. realtek wifi service

# 1.1 realtek wifi sta service

```
service wpa_supplicant /system/bin/wpa_supplicant -iwlan0 -Dnl80211
-c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot
```

# 1.2 realtek wifi sta p2p concurrent service

```
service p2p_supplicant /system/bin/wpa_supplicant \
-ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin -N \
-iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot
```

注意:

1、若 init.sun7i.rc 文件无修改后代码，可手动添加;

## 5.4 wing\_evb\_v10.mk

wing\_evb\_v10.mk 文件决定拷贝 rtl8723au wifi 的 firmware 到相应的目录，要配置成使用 rtl8723au 模组需要把 wing\_evb\_v10.mk 文件修改成如下（部分代码）。

```
PRODUCT_PACKAGES += \
    TSCalibration2 \
    Bluetooth

# wifi & bt config file
PRODUCT_COPY_FILES += \
```

```
frameworks/native/data/etc/android.hardware.wifi.xml:system/etc/permissions/android.hardware.wifi.xml \
frameworks/native/data/etc/android.hardware.wifi.direct.xml:system/etc/permissions/android.hardware.wifi.direct.xml \
frameworks/native/data/etc/android.hardware.bluetooth.xml:system/etc/permissions/android.hardware.bluetooth.xml \
system/bluetooth/data/main.nonsmartphone.conf:system/etc/bluetooth/main.conf

# Realtek 8723au Bluetooth
PRODUCT_COPY_FILES += \
    device/softwinner/common/hardware/realtek/bluetooth/firmware/rtl8723au/rtk8723a:system/etc/firmware/rtk8723a \
    device/softwinner/common/hardware/realtek/bluetooth/firmware/rtl8723au/rtk8723_bt_config:system/etc/firmware/rtk8723_bt_config \
    device/softwinner/common/hardware/realtek/bluetooth/firmware/rtl8723au/rtk_btusb.ko:system/vendor/modules/rtk_btusb.ko \

PRODUCT_PROPERTY_OVERRIDES += \
    dalvik.vm.heapsize=256m \
    dalvik.vm.heapstartsize=8m \
    dalvik.vm.heapgrowthlimit=96m \
    dalvik.vm.heaptargetutilization=0.75 \
    dalvik.vm.heapminfree=2m \
    dalvik.vm.heapmaxfree=8m \
    persist.sys.usb.config=mass_storage,adb \
    ro.property.tabletUI=false \
    ro.sf.lcd_density=120 \
    ro.udisk.lable=WING \
    ro.product.firmware=v1.3 \
    ro.property.bluetooth.rtk8723a=true \
```

说明:

1、“#”符号起注释作用;

## 5.5 ueventd.sun7i.rc

修改 ueventd.sun7i.rc 文件，增加设备节点:

```
/dev/rtk_btusb          0660  bluetooth  bluetooth
```

## 5.6 config.xml

config.xml 文件路径: \android4.2\device\softwinner\wing-evb-v10\overlay\frameworks\base\core\res\res\values\config.xml

要打开蓝牙功能, 需要在 config.xml 中把蓝牙的 bneq 网口打开, 修改的部分代码如下。

```
<!-- List of regexpressions describing the interface (if any) that represent tetherable
      Wifi interfaces.  If the device doesn't want to support tethering over Wifi this
      should be empty.  An example would be "softap.*" -->
<!--  default: disable Softap feature -->
<string-array translatable="false" name="config_tether_wifi_regexs">
<item>"wlan0"</item>
</string-array>
-->

<!-- List of regexpressions describing the interface (if any) that represent tetherable
      bluetooth interfaces.  If the device doesn't want to support tethering over bluetooth this
      should be empty. -->
<!--  default: disable Bluetooth PAN feature -->
<string-array translatable="false" name="config_tether_bluetooth_regexs">
<item>"bneq\d"</item>
</string-array>
<!-- List of regexpressions describing the interface (if any) that represent tetherable
```

## 5.7 vnd\_<product>.txt

蓝牙配置文件

文件路径: device\softwinner\common\hardware\realtek\bluetooth\libbt-vendor\rtl8723au\include  
创建 vnd\_\$(product).txt 文件, 如 vnd\_wing-evb-v10.txt

```
BLUETOOTH_UART_DEVICE_PORT = "/dev/rtk_btusb"
BTVND_DBG = TRUE
LPM_SLEEP_MODE = FALSE
```

## 5.8 bdroid\_buildcfg.h

android4.2.2\device\softwinner\wing-evb-v10\bluetooth\bdroid\_buildcfg.h 主要配置打开蓝牙时显示的本机名字。

```
#ifndef _BDROID_BUILDCFG_H
#define _BDROID_BUILDCFG_H

#define BTM_DEF_LOCAL_NAME "wing-evb-v10"
```

```
#define BTA_DM_COD {0x5A, 0x01, 0x1C}

#define BTIF_HF_SERVICES (BTA_HSP_SERVICE_MASK)
#define BTIF_HF_SERVICE_NAMES { BTIF_HSAG_SERVICE_NAME }
#endif
```

## 5.9 sys\_config.fex

sys\_config.fex 文件决定选用的 wifi 模组，以及 GPIO pin 的分配，要配置成使用 rtl8723au 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```
;------
;wifi configuration
;wifi_sdc_id    ---  0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id   ---  0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type --  1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel   ---  0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;                3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                8 - ap6330, 9 - ap6181, 10 - rtl8723au
;------

[wifi_para]
wifi_used      = 1
wifi_sdc_id    = 3
wifi_usbc_id   = 2
wifi_usbc_type = 1
wifi_mod_sel   = 10
wifi_power     = ""
```

说明：

- 1、“;” 符号起注释作用；
- 2、“wifi\_used” 为 1 表示使用 wifi，为 0 表示不使用；
- 3、“wifi\_usbc\_type” 表示使用哪个 USB 接口连接 USB wifi；
- 4、“wifi\_mod\_sel” 宏表示使用哪一款 wifi 模组；

## 5.10 rtl8723au 模组移植相关文件

以下文件是与 rtl8723au 模组移植相关的，无需再对这些文件作修改，只需了解即可。



## 5.10.1 linux

### 一、rtl8723au 驱动代码

\linux-3.3\drivers\net\wireless\rtl8723au

### 二、电源及 GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm\_rtl8723au.c

## 5.10.2 android

### 一、wifi.c

android4.2\hardware\libhardware\_legacy\wifi\wifi.c

定义加载的模块路径、模块名和模块参数。

```
#if defined RTL_rtl8723au_WIFI_USED
/* rtl8723au usb wifi +bt */
#ifndef WIFI_DRIVER_MODULE_PATH
#define WIFI_DRIVER_MODULE_PATH      "/system/vendor/modules/8723au.ko"
#endif
#ifndef WIFI_DRIVER_MODULE_NAME
#define WIFI_DRIVER_MODULE_NAME      "8723au"
#endif
#ifndef WIFI_DRIVER_MODULE_ARG
#define WIFI_DRIVER_MODULE_ARG       "ifname=wlan0 if2name=p2p0"
#endif
```

## 6 rtl8723as

功能：wifi (station/softap/p2p) + bt

接口类型：SDIO

### 6.1 .config

.config 中需要配置如下选项，将 wifi driver 编译为模块

CONFIG\_RTL8723AS = m

### 6.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组，以及是否支持蓝牙，要配置成使用 rtl8723as 模组需要把 BoardConfig.mk 文件修改成如下（部分代码）。

```
# 1. Wifi Configuration
BOARD_WIFI_VENDOR := realtek
#BOARD_WIFI_VENDOR := broadcom

# 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

    #SW_BOARD_USR_WIFI := rtl8189es
    #BOARD_WLAN_DEVICE := rtl8189es

    SW_BOARD_USR_WIFI := rtl8723as
    BOARD_WLAN_DEVICE := rtl8723as

    #SW_BOARD_USR_WIFI := rtl8723au
    #BOARD_WLAN_DEVICE := rtl8723au
Endif

# 2. Bluetooth Configuration
# make sure BOARD_HAVE_BLUETOOTH is true for every bt vendor
BOARD_HAVE_BLUETOOTH := true
#BOARD_HAVE_BLUETOOTH_BCM := true
BOARD_HAVE_BLUETOOTH_RTK := true
BLUETOOTH_HCI_USE_RTK_H5 := true
SW_BOARD_HAVE_BLUETOOTH_NAME := rtl8723as
BOARD_BLUETOOTH_BDROID_BUILDCFG_INCLUDE_DIR:=device/softwinner/wing-evb-v10/bluetooth/
```

说明:

- 1、“#”符号起注释作用;
- 2、BOARD\_WIFI\_VENDOR := realtek 指明使用 realtek 的 wifi 模组;
- 3、SW\_BOARD\_USR\_WIFI := rtl8723as、BOARD\_WLAN\_DEVICE := rtl8723as 指明使用 rtl8723as;

- 4、“BOARD\_HAVE\_BLUETOOTH\_RTK := true”宏指定蓝牙厂商为 Realtek;
- 5、“BOARD\_BLUETOOTH\_BDROID\_BUILDCFG\_INCLUDE\_DIR := device/softwinner/wing-evb-v10/bluetooth/”宏指明配置文件 bdroid\_buildcfg.h 路径;
- 5、“SW\_BOARD\_HAVE\_BLUETOOTH\_NAME := rtl8723as”宏指定蓝牙模组为 rtl8723as。

**注意:**

- 1、需注释掉#BOARD\_HAVE\_BLUETOOTH\_BCM := true
- 2、若不需要蓝牙功能只需要把相关宏注释掉就可以。

## 6.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，使用 rtl8723as 模组需要作如下修改（部分代码）。

```
#realtek bluetooth
# UART device
chmod 0660 /dev/ttyS2
chown bluetooth net_bt_stack /dev/ttyS2
mkdir /data/misc/bluedroid 0770 bluetooth net_bt_stack

# power up/down interface
chmod 0660 /sys/class/rfkill/rfkill0/state
chmod 0660 /sys/class/rfkill/rfkill0/type
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/state
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/type
write /sys/class/rfkill/rfkill0/state 0

# bluetooth MAC address programming
chown bluetooth net_bt_stack ro.bt.bdaddr_path
chown bluetooth net_bt_stack /system/etc/bluetooth
chown bluetooth net_bt_stack /data/misc/bluetooth
setprop ro.bt.bdaddr_path "/data/misc/bluetooth/bdaddr"

# bluetooth LPM
#chmod 0220 /proc/bluetooth/sleep/lpm
#chmod 0220 /proc/bluetooth/sleep/btwrite
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/lpm
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/btwrite

# 1. realtek wifi service
# 1.1 realtek wifi sta service
service wpa_supplicant /system/bin/wpa_supplicant -iwlan0 -Dnl80211
-c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
```

```
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot

# 1.2 realtek wifi sta p2p concurrent service
service p2p_suppllicant /system/bin/wpa_suppllicant \
-ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_suppllicant.conf -e/data/misc/wifi/entropy.bin -N \
-iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_suppllicant.conf
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot
```

注意:

2、若 init.sun7i.rc 文件无修改后代码，可手动添加;

## 6.4 wing\_evb\_v10.mk

wing\_evb\_v10.mk 文件决定拷贝 rtl8723as wifi 的 firmware 到相应的目录，要配置成使用 rtl8723as 模组需要把 wing\_evb\_v10.mk 文件修改成如下（部分代码）。

```
PRODUCT_PACKAGES += \
    TSCalibration2 \
    Bluetooth

# wifi & bt config file
PRODUCT_COPY_FILES += \
    frameworks/native/data/etc/android.hardware.wifi.xml:system/etc/permissions/android.hardware.wifi.xml \
    frameworks/native/data/etc/android.hardware.wifi.direct.xml:system/etc/permissions/android.hardware.wifi.direct.xml \
    frameworks/native/data/etc/android.hardware.bluetooth.xml:system/etc/permissions/android.hardware.bluetooth.xml \
    system/bluetooth/data/main.nonsmartphone.conf:system/etc/bluetooth/main.conf

# rtl8723as bt fw and config
#PRODUCT_COPY_FILES += \
    device/softwinner/common/hardware/realtek/bluetooth/firmware/rtl8723as/rtl8723a_fw:system/etc/firmware/rtlbt/rtlbt_fw \
    device/softwinner/common/hardware/realtek/bluetooth/firmware/rtl8723as/rtl8723a_config:system/etc/firmware/rtlbt/rtlbt_config \
```

```
PRODUCT_PROPERTY_OVERRIDES += \  
    dalvik.vm.heapsize=256m \  
    dalvik.vm.heapstartsize=8m \  
    dalvik.vm.heapgrowthlimit=96m \  
    dalvik.vm.heaptargetutilization=0.75 \  
    dalvik.vm.heapminfree=2m \  
    dalvik.vm.heapmaxfree=8m \  
    persist.sys.usb.config=mass_storage,adb \  
    ro.property.tabletUI=false \  
    ro.sf.lcd_density=120 \  
    ro.udisk.lable=WING \  
    ro.product.firmware=v1.3 \  
    ro.property.bluetooth.rtk8723a=true \  

```

说明:

1、“#”符号起注释作用;

## 6.5 ueventd.sun7i.rc

修改 ueventd.sun7i.rc 文件，增加设备节点:

```
/dev/ttyS2          0660  bluetooth  bluetooth
```

## 6.6 config.xml

config.xml 文件路径: \android4.2\device\softwinner\wing-evb-v10\overlay\frameworks\base\core\res\res\values\config.xml

要打开蓝牙功能，需要在 config.xml 中把蓝牙的 bneq 网口打开，修改的部分代码如下。

```
<!-- List of regexps describing the interface (if any) that represent tetherable  
    Wifi interfaces.  If the device doesn't want to support tethering over Wifi this  
    should be empty.  An example would be "softap.*" -->  
<!-- default: disable Softap feature -->  
<string-array translatable="false" name="config_tether_wifi_regexs">  
    <item>"wlan0"</item>  
</string-array>  
-->  
  
<!-- List of regexps describing the interface (if any) that represent tetherable  
    bluetooth interfaces.  If the device doesn't want to support tethering over bluetooth this  
    should be empty. -->
```

```
<!-- default: disable Bluetooth PAN feature -->
<string-array translatable="false" name="config_tether_bluetooth_regexp">
  <item>"bnep\\d"</item>
</string-array>
<!-- List of regexpressions describing the interface (if any) that represent tetherable
```

## 6.7 vnd\_<product>.txt

蓝牙配置文件

文件路径: device\softwinner\common\hardware\realtek\bluetooth\libbt-vendor\rtl8723as\include  
创建 vnd\_\$(product).txt 文件, 如 vnd\_wing-evb-v10.txt

```
BLUETOOTH_UART_DEVICE_PORT = "/dev/ttyS2"
FW_PATCHFILE_LOCATION = "/etc/firmware/"
BT_WAKE_VIA_PROC = TRUE
LPM_IDLE_TIMEOUT_MULTIPLE = 5
BTVND_DBG = TRUE
BTHW_DBG = TRUE
VNDUSERIAL_DBG = TRUE
UPIO_DBG = TRUE
SCO_PCM_IF_CLOCK_RATE = 2
```

## 6.8 bdroid\_buildcfg.h

android4.2.2\device\softwinner\wing-evb-v10\bluetooth\bdroid\_buildcfg.h 主要配置打开蓝牙时显示的本机名字。

```
#ifndef _BDROID_BUILDCFG_H
#define _BDROID_BUILDCFG_H

#define BTM_DEF_LOCAL_NAME "wing-evb-v10"

#define BTA_DM_COD {0x5A, 0x01, 0x1C}

#define BTIF_HF_SERVICES (BTA_HSP_SERVICE_MASK)
#define BTIF_HF_SERVICE_NAMES { BTIF_HSAG_SERVICE_NAME }
#endif
```

## 6.9 sys\_config.fex

sys\_config.fex 文件决定选用的 wifi 模组, 以及 GPIO pin 的分配, 要配置成使用 rtl8723as 模组需要把 sys\_config.fex 文件修改成如下 (部分代码)。

```
;------
```

```

;wifi configuration
;wifi_sdc_id    ---  0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id   ---  0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type --  1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel   ---  0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;
;                3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                8 - ap6330, 9 - ap6181, 10 - rtl8723au
;-----
[wifi_para]
wifi_used       = 1
wifi_sdc_id     = 3
wifi_usbc_id    = 2
wifi_usbc_type  = 1
wifi_mod_sel    = 3
wifi_power      = ""

```

说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_usbc\_type”表示使用哪个USB接口连接USB wifi;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;

## 6.10 rtl8723as 模组移植相关文件

以下文件是与 rtl8723as 模组移植相关的,无需再对这些文件作修改,只需了解即可。

### 6.10.1 linux

一、rtl8723as 驱动代码

linux-3.3\drivers\net\wireless\rtl8723as

二、电源及 GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm\_rtl8723as.c

### 6.10.2 android

一、wifi.c

android4.2\hardware\libhardware\_legacy\wifi\wifi.c

定义加载的模块路径、模块名和模块参数。

A20\_Android4.2 wifi+bt 配置说明

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```
#if defined RTL_rtl8723as_WIFI_USED
/* rtl8723as sdio wifi +bt */
#ifndef WIFI_DRIVER_MODULE_PATH
#define WIFI_DRIVER_MODULE_PATH        "/system/vendor/modules/8723as.ko"
#endif
#ifndef WIFI_DRIVER_MODULE_NAME
#define WIFI_DRIVER_MODULE_NAME        "8723as"
#endif
#ifndef WIFI_DRIVER_MODULE_ARG
#define WIFI_DRIVER_MODULE_ARG        "ifname=wlan0 if2name=p2p0"
#endif
#endif
```



## 7 ap6181

功能: wifi (station/softap/p2p)

接口类型: SDIO

### 7.1 .config

.config 中需要配置如下选项, 将 wifi driver 编译进内核

```
CONFIG_BCMHDHD = y
```

```
CONFIG_BCMHDHD_OOB = y
```

### 7.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 加载哪一款 wifi 模组, 要配置成使用 ap6181 模组需要把 BoardConfig.mk 文件修改成如下 (部分代码)。

```
# 1. Wifi Configuration
#BOARD_WIFI_VENDOR := realtek
BOARD_WIFI_VENDOR := Broadcom
.....
# 1.2 broadcom wifi support
ifeq ($(BOARD_WIFI_VENDOR), broadcom)
    BOARD_WPA_SUPPLICANT_DRIVER := NL80211
    WPA_SUPPLICANT_VERSION      := VER_0_8_X
    BOARD_WPA_SUPPLICANT_PRIVATE_LIB := lib_driver_cmd_bcmdhd
    BOARD_HOSTAPD_DRIVER        := NL80211
    BOARD_HOSTAPD_PRIVATE_LIB   := lib_driver_cmd_bcmdhd
    BOARD_WLAN_DEVICE            := bcmdhd
    WIFI_DRIVER_FW_PATH_PARAM    := "/sys/module/bcmdhd/parameters/firmware_path"

    #SW_BOARD_USR_WIFI := bcm40181
    #WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
    #WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
    #WIFI_DRIVER_FW_PATH_AP  := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

    #SW_BOARD_USR_WIFI := bcm40183
    #WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2.bin"
    #WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_p2p.bin"
    #WIFI_DRIVER_FW_PATH_AP  := "/system/vendor/modules/fw_bcm40183b2_apsta.bin"

    #SW_BOARD_USR_WIFI := AP6210
```

```
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

#SW_BOARD_USR_WIFI := AP6330
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2_ag.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_ag_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40183b2_ag_apsta.bin"

SW_BOARD_USR_WIFI := AP6181
WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

endif
```

#### 说明:

- 1、“#”符号起注释作用;
- 2、“SW\_BOARD\_USR\_WIFI := ap6181”宏指明 wifi 选用 ap6181;

## 7.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，使用 ap6181wifi 模组需要作如下修改（部分代码）。

```
# 2. broadcom wifi service
# 2.1 broadcom wifi bcm40181 bcm40183 station and softap
service wpa_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot

#2.2 broadcom wifi sta p2p concurrent service
service p2p_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -N \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin
    -puse_p2p_group_interface=1
    class main
    socket wpa_wlan0 dgram 660 wifi wifi
    disabled
    oneshot
```

注意:

- 1、若 init.sun7i.rc 文件无修改后代码，可手动添加;
- 2、需注释掉 realtek wifi 相关内容。

## 7.4 wing\_evb\_v10.mk

wing\_evb\_v10.mk 文件决定拷贝 ap6181 wifi 的 firmware 到相应的目录,要配置成使用 ap6181 模组需要把 wing\_evb\_v10.mk 文件修改成如下 (部分代码)。

```
# ap6181 sdio wifi fw and nvram
PRODUCT_COPY_FILES += \
    hardware/broadcom/wlan/firmware/ap6181/fw_bcm40181a2.bin:system/vendor/modules/fw_bcm40181a2.bin \
    hardware/broadcom/wlan/firmware/ap6181/fw_bcm40181a2_apsta.bin:system/vendor/modules/fw_bcm40181a2_apsta.bin \
    hardware/broadcom/wlan/firmware/ap6181/fw_bcm40181a2_p2p.bin:system/vendor/modules/fw_bcm40181a2_p2p.bin \
    hardware/broadcom/wlan/firmware/ap6181/nvram_ap6181.txt:system/vendor/modules/nvram_ap6181.txt \
```

说明:

- 1、“#”符号起注释作用;
- 2、因文件名相同，需要注释掉 ap6210/bcm40181 相关内容。

## 7.5 sys\_config.fex

sys\_config.fex 文件决定 GPIO pin 的分配，要配置成使用 ap6181 模组需要把 sys\_config.fex 文件修改成如下 (部分代码)。

```
;------
;wifi configuration
;wifi_sdc_id    ---  0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id  ---  0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type --  1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel  ---  0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;                3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                8 - ap6330, 9 - ap6181
;------
[wifi_para]
wifi_used      = 1
```

```
wifi_sdc_id      = 3
wifi_usbc_id    = 2
wifi_usbc_type  = 1
wifi_mod_sel    = 9
wifi_power     = ""

; 9 - ap6181 sdio wifi gpio config
ap6xxx_wl_regon      = port:PH09<1><default><default><0>
ap6xxx_wl_host_wake = port:PH10<0><default><default><0>
ap6xxx_bt_regon     = port:PB05<1><default><default><0>
ap6xxx_bt_wake      = port:PI20<1><default><default><0>
ap6xxx_bt_host_wake = port:PI21<0><default><default><0>
ap6xxx_lpo          =
```

#### 说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_sdc\_id”表示wifi使用哪个SDIO接口;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;
- 5、; 9 - ap6181 sdio wifi gpio config 下面的内容为给ap6181分配的GPIO。
- 6、ap6xxx\_lpo为提供32k时钟的GPIO, A20上只有PI12和PI13有这个功能。

## 7.6 ap6181 模组移植相关文件

以下文件是与ap6181模组移植相关的,无需再对这些文件作修改,只需了解即可。

### 7.6.1 linux

#### 一、ap6181 驱动代码

linux-3.3\drivers\net\wireless\bcmdhd

#### 二、GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\mmc\_ap6xxx.c

## 8 ap6210

功能: wifi (station/softap/p2p) + bt

接口类型: SDIO + UART

### 8.1 .config

.config 中需要配置如下选项, 将 wifi driver 编译进内核

```
CONFIG_BCMHDH = y
```

```
CONFIG_BCMHDH_OOB = y
```

### 8.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组、是否开启蓝牙和使用哪一款蓝牙模组, 要配置成使用 ap6210 模组并启用 wifi 和蓝牙功能需要把 BoardConfig.mk 文件的相关代码修改成如下。

```
# 1. Wifi Configuration
#BOARD_WIFI_VENDOR := realtek
BOARD_WIFI_VENDOR := Broadcom
.....
# 1.2 broadcom wifi support
ifeq ($(BOARD_WIFI_VENDOR), broadcom)
    BOARD_WPA_SUPPLICANT_DRIVER := NL80211
    WPA_SUPPLICANT_VERSION      := VER_0_8_X
    BOARD_WPA_SUPPLICANT_PRIVATE_LIB := lib_driver_cmd_bcmdhd
    BOARD_HOSTAPD_DRIVER       := NL80211
    BOARD_HOSTAPD_PRIVATE_LIB := lib_driver_cmd_bcmdhd
    BOARD_WLAN_DEVICE          := bcmdhd
    WIFI_DRIVER_FW_PATH_PARAM  := "/sys/module/bcmdhd/parameters/firmware_path"

    #SW_BOARD_USR_WIFI := bcm40181
    #WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
    #WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
    #WIFI_DRIVER_FW_PATH_AP  := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

    #SW_BOARD_USR_WIFI := bcm40183
    #WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2.bin"
    #WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_p2p.bin"
    #WIFI_DRIVER_FW_PATH_AP  := "/system/vendor/modules/fw_bcm40183b2_apsta.bin"

    SW_BOARD_USR_WIFI := AP6210
```

```

WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

#SW_BOARD_USR_WIFI := AP6330
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2_ag.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_ag_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40183b2_ag_apsta.bin"

#SW_BOARD_USR_WIFI := AP6181
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"
endif

# 2. Bluetooth Configuration
# make sure BOARD_HAVE_BLUETOOTH is true for every bt vendor
BOARD_HAVE_BLUETOOTH := true
BOARD_HAVE_BLUETOOTH_BCM := true
#BOARD_HAVE_BLUETOOTH_RTK := true
SW_BOARD_HAVE_BLUETOOTH_NAME := ap6210
BOARD_BLUETOOTH_BDROID_BUILDCFG_INCLUDE_DIR :=
device/softwinner/wing-evb-v10/bluetooth/

```

#### 说明:

- 1、“#”符号起注释作用;
- 2、“SW\_BOARD\_USR\_WIFI := AP6210”宏指明 wifi 选用 ap6210;
- 3、“BOARD\_HAVE\_BLUETOOTH := true”宏指明使用蓝牙;
- 4、“BOARD\_HAVE\_BLUETOOTH\_BCM := true”宏指定蓝牙厂商为 Broadcom;
- 5、“SW\_BOARD\_HAVE\_BLUETOOTH\_NAME := ap6210”宏指明蓝牙模组名字;
- 6、“BOARD\_BLUETOOTH\_BDROID\_BUILDCFG\_INCLUDE\_DIR := device/softwinner/wing-evb-v10/bluetooth/”宏指明配置文件 bdroid\_buildcfg.h 路径;

#### 注意:

- 1、需注释掉#BOARD\_HAVE\_BLUETOOTH\_RTK := true
- 2、若不需要蓝牙功能只需要把相关宏注释掉就可以。

## 8.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件,要启用 ap6210 模组的 wifi 和蓝牙功能需要作如下修改(部分代码)。

### #broadcom bluetooth

```
# UART device
chmod 0660 /dev/ttyS2
chown bluetooth net_bt_stack /dev/ttyS2

# power up/down interface
chmod 0660 /sys/class/rfkill/rfkill0/state
chmod 0660 /sys/class/rfkill/rfkill0/type
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/state
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/type

# bluetooth MAC address programming
chown bluetooth net_bt_stack /system/etc/bluetooth
chown bluetooth net_bt_stack /data/misc/bluetooth
#chown bluetooth net_bt_stack ro.bt.bdaddr_path
#setprop ro.bt.bdaddr_path "/system/etc/firmware/bd_addr.txt"

# bluetooth LPM
#chmod 0220 /proc/bluetooth/sleep/lpm
#chmod 0220 /proc/bluetooth/sleep/btwrite
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/lpm
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/btwrite

.....
```

### # 2. broadcom wifi service

# 2.1 broadcom wifi bcm40181 bcm40183 station and softap

```
service wpa_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot
```

#2.2 broadcom wifi sta p2p concurrent service

```
service p2p_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -N \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin
-puse_p2p_group_interface=1
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
```

**注意:**

- 1、若 init.sun7i.rc 文件无修改后代码，可手动添加；
- 2、需注释掉 realtek wifi 和 bluetooth 相关内容。

## 8.4 wing\_evb\_v10.mk

wing\_evb\_v10.mk 文件决定拷贝 ap6210 wifi 和 bt 的 firmware 到相应的目录，要配置成使用 ap6210 模组需要把 wing\_evb\_v10.mk 文件修改成如下（部分代码）。

```
PRODUCT_PACKAGES += \  
    TSCalibration2 \  
    Bluetooth  
  
# wifi & bt config file  
PRODUCT_COPY_FILES += \  
frameworks/native/data/etc/android.hardware.wifi.xml:system/etc/permissions/android.hardware.wifi.xml \  
frameworks/native/data/etc/android.hardware.wifi.direct.xml:system/etc/permissions/android.hardware.wifi  
.direct.xml \  
frameworks/native/data/etc/android.hardware.bluetooth.xml:system/etc/permissions/android.hardware.bluetooth.xml \  
system/bluetooth/data/main.nonsmartphone.conf:system/etc/bluetooth/main.conf  
  
# ap6210 sdio wifi fw and nvram  
PRODUCT_COPY_FILES += \  
    hardware/broadcom/wlan/firmware/ap6210/fw_bcm40181a2.bin:system/vendor/modules/fw_bcm401  
81a2.bin \  
    hardware/broadcom/wlan/firmware/ap6210/fw_bcm40181a2_apsta.bin:system/vendor/modules/fw_bc  
m40181a2_apsta.bin \  
    hardware/broadcom/wlan/firmware/ap6210/fw_bcm40181a2_p2p.bin:system/vendor/modules/fw_bc  
m40181a2_p2p.bin \  
    hardware/broadcom/wlan/firmware/ap6210/nvram_ap6210.txt:system/vendor/modules/nvram_ap6210  
.txt \  
    hardware/broadcom/wlan/firmware/ap6210/bcm20710a1.hcd:system/vendor/modules/bcm20710a1.hc  
d
```

**说明:**

- 1、“#” 符号起注释作用；
- 2、因文件名相同，需要注释掉 ap6181/bcm40181 相关内容。



## 8.5 config.xml

config.xml 文件路径: \android4.2\device\softwinner\wing-evb-v10\overlay\frameworks\base\core\res\res\values\config.xml

要打开蓝牙功能，需要在 config.xml 中把蓝牙的 bneq 网口打开，修改的部分代码如下。

```
<!-- List of regexpressions describing the interface (if any) that represent tetherable
      Wifi interfaces.  If the device doesn't want to support tethering over Wifi this
      should be empty.  An example would be "softap.*" -->
<!--  default: disable Softap feature -->
<string-array translatable="false" name="config_tether_wifi_regexs">
<item>"wlan0"</item>
</string-array>
-->

<!-- List of regexpressions describing the interface (if any) that represent tetherable
      bluetooth interfaces.  If the device doesn't want to support tethering over bluetooth this
      should be empty. -->
<!--  default: disable Bluetooth PAN feature -->
<string-array translatable="false" name="config_tether_bluetooth_regexs">
<item>"bneq\d"</item>
</string-array>
<!-- List of regexpressions describing the interface (if any) that represent tetherable
```

注：若相应平台该目录下没 config.xml 文件，可到其他相应平台对应目录下拷贝一份。

## 8.6 vnd\_<product>.txt

蓝牙配置文件 设置波特率，uart 设备文件和 firmware 路径(初始值)，调试信息配置

文件路径: \device\common\libbt\include\

创建 vnd\_\$(product).txt 文件，如 vnd\_wing-evb-v10.txt

```
UART_TARGET_BAUD_RATE=1500000
BLUETOOTH_UART_DEVICE_PORT = "/dev/ttyS2"
FW_PATCHFILE_LOCATION = "/system/vendor/modules/"
LPM_IDLE_TIMEOUT_MULTIPLE = 5
LPM_SLEEP_MODE = FALSE
BTVND_DBG = FALSE
BTHW_DBG = FALSE
VNDUSERIAL_DBG = FALSE
UPIO_DBG = FALSE
```

## 8.7 bdroid\_buildcfg.h

android4.2.2\device\softwinner\wing-evb-v10\bluetooth\bdroid\_buildcfg.h 主要配置打开蓝牙时显示的本机名字。

```
#ifndef _BDROID_BUILDCFG_H
#define _BDROID_BUILDCFG_H

#define BTM_DEF_LOCAL_NAME "wing-evb-v10"

#define BTA_DM_COD {0x5A, 0x01, 0x1C}

#define BTIF_HF_SERVICES (BTA_HSP_SERVICE_MASK)
#define BTIF_HF_SERVICE_NAMES { BTIF_HSAG_SERVICE_NAME }
#endif
```

## 8.8 sys\_config.fex

sys\_config.fex 文件决定 GPIO pin 的分配，要配置成使用 ap6210 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```
-----
;wifi configuration
;wifi_sdc_id    ---  0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id  ---  0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type --  1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel  ---  0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;                3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                8 - ap6330, 9 - ap6181
;
;
;
;
-----
[wifi_para]
wifi_used      = 1
wifi_sdc_id    = 3
wifi_usbc_id   = 2
wifi_usbc_type = 1
wifi_mod_sel   = 7
wifi_power     = ""

; 7 - ap6210 sdio wifi + bt gpio config
; 8 - ap6330 sdio wifi + bt gpio config
; 9 - ap6181 sdio wifi gpio config
```

```
ap6xxx_wl_regon      = port:PH09<1><<default><default><<0>
ap6xxx_wl_host_wake = port:PH10<0><<default><default><<0>
ap6xxx_bt_regon     = port:PB05<1><<default><default><<0>
ap6xxx_bt_wake      = port:PI20<1><<default><default><<0>
ap6xxx_bt_host_wake = port:PI21<0><<default><default><<0>
ap6xxx_lpo          =
```

[mmc3\_para]

```
sdc_used            = 1
sdc_detmode         = 4
sdc_buswidth        = 4
sdc_cmd             = port:PI04<2><<1><<2><<default>
sdc_clk             = port:PI05<2><<1><<2><<default>
sdc_d0              = port:PI06<2><<1><<2><<default>
sdc_d1              = port:PI07<2><<1><<2><<default>
sdc_d2              = port:PI08<2><<1><<2><<default>
sdc_d3              = port:PI09<2><<1><<2><<default>
sdc_det             =
sdc_use_wp          = 0
sdc_wp              =
sdc_isio            = 1
sdc_regulator       = "none"
```

[bt\_para]

```
bt_used            = 1
bt_uart_id         = 2
bt_wakeup          = port:PI20<1><<default><default><<default>
bt_gpio            = port:PI21<1><<default><default><<default>
bt_rst             = port:PB05<1><<default><default><<default>
```

说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_sdc\_id”表示wifi使用哪个SDIO接口;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;
- 5、; 7 - ap6210 sdio wifi + bt gpio config 下面的内容为给ap6210分配的GPIO。
- 6、ap6xxx\_lpo为提供32k时钟的GPIO, A20上只有PI12和PI13有这个功能。

## 8.9 ap6210 模组移植相关文件

以下文件是与 ap6210 模组移植相关的，无需再对这些文件作修改，只需了解即可。

### 8.9.1 linux

#### 一、ap6210 驱动代码

linux-3.3\drivers\net\wireless\bcmdhd

#### 二、GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\mmc\_ap6xxx.c

## 9 ap6330

功能: wifi (station/softap/p2p) + bt

接口类型: SDIO + UART

### 9.1 .config

.config 中需要配置如下选项, 将 wifi driver 编译进内核

```
CONFIG_BCMHDHD = y
```

```
CONFIG_BCMHDHD_OOB = y
```

### 9.2 BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组、是否开启蓝牙和使用哪一款蓝牙模组, 要配置成使用 ap6330 模组并启用 wifi 和蓝牙功能需要把 BoardConfig.mk 文件的相关代码修改成如下。

```
# 1. Wifi Configuration
#BOARD_WIFI_VENDOR := realtek
BOARD_WIFI_VENDOR := Broadcom
.....
# 1.2 broadcom wifi support
ifeq ($(BOARD_WIFI_VENDOR), broadcom)
    BOARD_WPA_SUPPLICANT_DRIVER := NL80211
    WPA_SUPPLICANT_VERSION      := VER_0_8_X
    BOARD_WPA_SUPPLICANT_PRIVATE_LIB := lib_driver_cmd_bcmdhd
    BOARD_HOSTAPD_DRIVER        := NL80211
    BOARD_HOSTAPD_PRIVATE_LIB   := lib_driver_cmd_bcmdhd
    BOARD_WLAN_DEVICE            := bcmdhd
    WIFI_DRIVER_FW_PATH_PARAM    := "/sys/module/bcmdhd/parameters/firmware_path"

    #SW_BOARD_USR_WIFI := bcm40181
    #WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
    #WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
    #WIFI_DRIVER_FW_PATH_AP  := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

    #SW_BOARD_USR_WIFI := bcm40183
    #WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2.bin"
    #WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_p2p.bin"
    #WIFI_DRIVER_FW_PATH_AP  := "/system/vendor/modules/fw_bcm40183b2_apsta.bin"

    #SW_BOARD_USR_WIFI := AP6210
```

```
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

SW_BOARD_USR_WIFI := AP6330
WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2_ag.bin"
WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_ag_p2p.bin"
WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40183b2_ag_apsta.bin"

#SW_BOARD_USR_WIFI := AP6181
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"
endif

# 2. Bluetooth Configuration
# make sure BOARD_HAVE_BLUETOOTH is true for every bt vendor
BOARD_HAVE_BLUETOOTH := true
BOARD_HAVE_BLUETOOTH_BCM := true
#BOARD_HAVE_BLUETOOTH_RTK := true
SW_BOARD_HAVE_BLUETOOTH_NAME := ap6330
BOARD_BLUETOOTH_BDROID_BUILDCFG_INCLUDE_DIR :=
device/softwinner/wing-evb-v10/bluetooth/
```

#### 说明:

- 1、“#”符号起注释作用;
- 2、“SW\_BOARD\_USR\_WIFI := AP6330”宏指明 wifi 选用 ap6330;
- 3、“BOARD\_HAVE\_BLUETOOTH := true”宏指明使用蓝牙;
- 4、“BOARD\_HAVE\_BLUETOOTH\_BCM := true”宏指定蓝牙厂商为 Broadcom;
- 5、“SW\_BOARD\_HAVE\_BLUETOOTH\_NAME := ap6330”宏指明蓝牙模组名字;
- 6、“BOARD\_BLUETOOTH\_BDROID\_BUILDCFG\_INCLUDE\_DIR := device/softwinner/wing-evb-v10/bluetooth/”宏指明配置文件 bdroid\_buildcfg.h 路径;

#### 注意:

- 1、需注释掉#BOARD\_HAVE\_BLUETOOTH\_RTK := true
- 2、若不需要蓝牙功能只需要把相关宏注释掉就可以。

## 9.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件,要启用 ap6330 模组的 wifi 和蓝牙功能需要作如下修改(部分代码)。

### #broadcom bluetooth

```
# UART device
chmod 0660 /dev/ttyS2
chown bluetooth net_bt_stack /dev/ttyS2

# power up/down interface
chmod 0660 /sys/class/rfkill/rfkill0/state
chmod 0660 /sys/class/rfkill/rfkill0/type
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/state
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/type

# bluetooth MAC address programming
chown bluetooth net_bt_stack /system/etc/bluetooth
chown bluetooth net_bt_stack /data/misc/bluetooth
#chown bluetooth net_bt_stack ro.bt.bdaddr_path
#setprop ro.bt.bdaddr_path "/system/etc/firmware/bd_addr.txt"

# bluetooth LPM
#chmod 0220 /proc/bluetooth/sleep/lpm
#chmod 0220 /proc/bluetooth/sleep/btwrite
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/lpm
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/btwrite

.....
```

### # 2. broadcom wifi service

# 2.1 broadcom wifi bcm40181 bcm40183 station and softap

```
service wpa_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot
```

#2.2 broadcom wifi sta p2p concurrent service

```
service p2p_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -N \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin
-puse_p2p_group_interface=1
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
```

**注意:**

- 1、若 init.sun7i.rc 文件无修改后代码，可手动添加；
- 2、需注释掉 realtek wifi 和 bluetooth 相关内容。

## 9.4 wing\_evb\_v10.mk

wing\_evb\_v10.mk 文件决定拷贝 ap6330 wifi 和 bt 的 firmware 到相应的目录，要配置成使用 ap6330 模组需要把 wing\_evb\_v10.mk 文件修改成如下（部分代码）。

```
PRODUCT_PACKAGES += \  
    TSCalibration2 \  
    Bluetooth  
  
# wifi & bt config file  
PRODUCT_COPY_FILES += \  
frameworks/native/data/etc/android.hardware.wifi.xml:system/etc/permissions/android.hardware.wifi.xml \  
frameworks/native/data/etc/android.hardware.wifi.direct.xml:system/etc/permissions/android.hardware.wifi  
.direct.xml \  
frameworks/native/data/etc/android.hardware.bluetooth.xml:system/etc/permissions/android.hardware.bluetooth.xml \  
system/bluetooth/data/main.nonsmartphone.conf:system/etc/bluetooth/main.conf  
  
# ap6330 sdio wifi fw and nvram  
PRODUCT_COPY_FILES += \  
    hardware/broadcom/wlan/firmware/ap6330/fw_bcm40183b2_ag.bin:system/vendor/modules/fw_bcm  
40183b2_ag.bin \  
    hardware/broadcom/wlan/firmware/ap6330/fw_bcm40183b2_ag_apsta.bin:system/vendor/modules/fw  
_bcm40183b2_ag_apsta.bin \  
    hardware/broadcom/wlan/firmware/ap6330/fw_bcm40183b2_ag_p2p.bin:system/vendor/modules/fw_  
bcm40183b2_ag_p2p.bin \  
    hardware/broadcom/wlan/firmware/ap6330/nvram_ap6330.txt:system/vendor/modules/nvram_ap6330  
.txt \  
    hardware/broadcom/wlan/firmware/ap6330/bcm40183b2.hcd:system/vendor/modules/bcm40183b2.hc  
d \  

```

**说明:**

- 1、“#” 符号起注释作用；



## 9.5 config.xml

config.xml 文件路径: \android4.2\device\softwinner\wing-evb-v10\overlay\frameworks\base\core\res\res\values\config.xml

要打开蓝牙功能，需要在 config.xml 中把蓝牙的 bneq 网口打开，修改的部分代码如下。

```
<!-- List of regexpressions describing the interface (if any) that represent tetherable
      Wifi interfaces.  If the device doesn't want to support tethering over Wifi this
      should be empty.  An example would be "softap.*" -->
<!--  default: disable Softap feature -->
<string-array translatable="false" name="config_tether_wifi_regexs">
<item>"wlan0"</item>
</string-array>
-->

<!-- List of regexpressions describing the interface (if any) that represent tetherable
      bluetooth interfaces.  If the device doesn't want to support tethering over bluetooth this
      should be empty. -->
<!--  default: disable Bluetooth PAN feature -->
<string-array translatable="false" name="config_tether_bluetooth_regexs">
<item>"bneq\d"</item>
</string-array>
<!-- List of regexpressions describing the interface (if any) that represent tetherable
```

注：若相应平台该目录下没 config.xml 文件，可到其他相应平台对应目录下拷贝一份。

## 9.6 vnd\_<product>.txt

蓝牙配置文件 设置波特率，uart 设备文件和 firmware 路径(初始值)，调试信息配置

文件路径: \device\common\libbt\include\

创建 vnd\_\$(product).txt 文件，如 vnd\_wing-evb-v10.txt

```
UART_TARGET_BAUD_RATE=1500000
BLUETOOTH_UART_DEVICE_PORT = "/dev/ttyS2"
FW_PATCHFILE_LOCATION = "/system/vendor/modules/"
LPM_IDLE_TIMEOUT_MULTIPLE = 5
LPM_SLEEP_MODE = FALSE
BTVND_DBG = FALSE
BTHW_DBG = FALSE
VNDUSERIAL_DBG = FALSE
UPIO_DBG = FALSE
```

## 9.7 bdroid\_buildcfg.h

android4.2.2\device\softwinner\wing-evb-v10\bluetooth\bdroid\_buildcfg.h 主要配置打开蓝牙时显示的本机名字。

```
#ifndef _BDROID_BUILDCFG_H
#define _BDROID_BUILDCFG_H

#define BTM_DEF_LOCAL_NAME "wing-evb-v10"

#define BTA_DM_COD {0x5A, 0x01, 0x1C}

#define BTIF_HF_SERVICES (BTA_HSP_SERVICE_MASK)
#define BTIF_HF_SERVICE_NAMES { BTIF_HSAG_SERVICE_NAME }
#endif
```

## 9.8 sys\_config.fex

sys\_config.fex 文件决定 GPIO pin 的分配，要配置成使用 ap6210 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```
;------
;wifi configuration
;wifi_sdc_id    ---  0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id  ---  0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type --  1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel  ---  0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;                3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                8 - ap6330, 9 - ap6181
;------
[wifi_para]
wifi_used      = 1
wifi_sdc_id    = 3
wifi_usbc_id   = 2
wifi_usbc_type = 1
wifi_mod_sel   = 8
wifi_power     = ""

; 7 - ap6210 sdio wifi + bt gpio config
; 8 - ap6330 sdio wifi + bt gpio config
; 9 - ap6181 sdio wifi gpio config
ap6xxx_wl_region = port:PH09<1><<default><<default><<0>
```

```
ap6xxx_wl_host_wake = port:PH10<0><default><default><0>
ap6xxx_bt_regon    = port:PB05<1><default><default><0>
ap6xxx_bt_wake     = port:PI20<1><default><default><0>
ap6xxx_bt_host_wake = port:PI21<0><default><default><0>
ap6xxx_lpo         =
```

[mmc3\_para]

```
sdc_used           = 1
sdc_detmode        = 4
sdc_buswidth       = 4
sdc_cmd            = port:PI04<2><1><2><default>
sdc_clk            = port:PI05<2><1><2><default>
sdc_d0             = port:PI06<2><1><2><default>
sdc_d1             = port:PI07<2><1><2><default>
sdc_d2             = port:PI08<2><1><2><default>
sdc_d3             = port:PI09<2><1><2><default>
sdc_det            =
sdc_use_wp         = 0
sdc_wp             =
sdc_isio           = 1
sdc_regulator      = "none"
```

[bt\_para]

```
bt_used           = 1
bt_uart_id        = 2
bt_wakeup         = port:PI20<1><default><default><default>
bt_gpio           = port:PI21<1><default><default><default>
bt_rst            = port:PB05<1><default><default><default>
```

说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_sdc\_id”表示wifi使用哪个SDIO接口;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;
- 5、; 8 - ap6330 sdio wifi + bt gpio config 下面的内容为给 ap6330 分配的 GPIO。
- 6、ap6xxx\_lpo 为提供 32k 时钟的 GPIO, A20 上只有 PI12 和 PI13 有这个功能。

## 9.9 ap6330 模组移植相关文件

以下文件是与 ap6330 模组移植相关的，无需再对这些文件作修改，只需了解即可。

### 9.9.1 linux

#### 一、ap6330 驱动代码

linux-3.3\drivers\net\wireless\bcmdhd

#### 二、GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\mmc\_ap6xxx.c

## 10 bcm40181

功能：wifi (station/softap/p2p)

接口类型：SDIO

### 10.1.config

.config 中需要配置如下选项，将 wifi driver 编译进内核

CONFIG\_BCM40181 = y

CONFIG\_BCM40181\_OOB = y

### 10.2BoardConfig.mk

BoardConfig.mk 文件决定 android 加载哪一款 wifi 模组，要配置成使用 bcm40181 模组需要把 BoardConfig.mk 文件修改成如下（部分代码）。

```
# 1. Wifi Configuration
#BOARD_WIFI_VENDOR := realtek
BOARD_WIFI_VENDOR := Broadcom
.....
# 1.2 broadcom wifi support
ifeq ($(BOARD_WIFI_VENDOR), broadcom)
    BOARD_WPA_SUPPLICANT_DRIVER := NL80211
    WPA_SUPPLICANT_VERSION      := VER_0_8_X
    BOARD_WPA_SUPPLICANT_PRIVATE_LIB := lib_driver_cmd_bcmdhd
    BOARD_HOSTAPD_DRIVER        := NL80211
    BOARD_HOSTAPD_PRIVATE_LIB   := lib_driver_cmd_bcmdhd
    BOARD_WLAN_DEVICE            := bcmdhd
```

```
WIFI_DRIVER_FW_PATH_PARAM := "/sys/module/bcmdhd/parameters/firmware_path"

SW_BOARD_USR_WIFI := bcm40181
WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

#SW_BOARD_USR_WIFI := bcm40183
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40183b2_apsta.bin"

SW_BOARD_USR_WIFI := AP6210
WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

#SW_BOARD_USR_WIFI := AP6330
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2_ag.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_ag_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40183b2_ag_apsta.bin"

#SW_BOARD_USR_WIFI := AP6181
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"
endif
```

说明:

- 1、“#”符号起注释作用;
- 2、“SW\_BOARD\_USR\_WIFI := bcm40181”宏指明 wifi 选用 bcm40181;

## 10.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，使用 bcm40181 wifi 模组需要作如下修改（部分代码）。

```
# 2. broadcom wifi service
# 2.1 broadcom wifi bcm40181 bcm40183 station and softap
service wpa_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
class main
```

```
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot

#2.2 braodcom wifi sta p2p concurrent service
service p2p_suppllicant /system/bin/wpa_suppllicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_suppllicant.conf -N \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_suppllicant.conf -e/data/misc/wifi/entropy.bin
-puse_p2p_group_interface=1
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot
```

**注意:**

- 1、若 init.sun7i.rc 文件无修改后代码，可手动添加；
- 2、需注释掉 realtek wifi 相关内容。

## 10.4 wing\_evb\_v10.mk

wing\_evb\_v10.mk 文件决定拷贝 bcm40181 wifi 的 firmware 到相应的目录，要配置成使用 bcm40181 模组需要把 wing\_evb\_v10.mk 文件修改成如下（部分代码）。

```
# bcm40181 sdio wifi fw and nvram
PRODUCT_COPY_FILES += \
    hardware/broadcom/wlan/firmware/bcm40181/fw_bcm40181a2_p2p.bin:system/vendor/modules/fw_
bcm40181a2_p2p.bin \
    hardware/broadcom/wlan/firmware/bcm40181/fw_bcm40181a2_apsta.bin:system/vendor/modules/fw
_bcm40181a2_apsta.bin \
    hardware/broadcom/wlan/firmware/bcm40181/fw_bcm40181a2.bin:system/vendor/modules/fw_bcm4
0181a2.bin \
    hardware/broadcom/wlan/firmware/bcm40181/nvram_gb9662.txt:system/vendor/modules/nvram_bcm
40181.txt
```

**说明:**

- 1、“#” 符号起注释作用；
- 2、因文件名相同，需要注释掉 ap6181/ap6210 相关内容。

## 10.5 sys\_config.fex

sys\_config.fex 文件决定 GPIO pin 的分配，要配置成使用 bcm40181 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```

;-----
;wifi configuration
;wifi_sdc_id    ---  0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id  ---  0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type --  1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel  ---  0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;                3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                8 - ap6330, 9 - ap6181
;-----
[wifi_para]
wifi_used      = 1
wifi_sdc_id    = 3
wifi_usbc_id   = 2
wifi_usbc_type = 1
wifi_mod_sel   = 1
wifi_power     = ""

; 1 - bcm40181 sdio wifi gpio config
;bcm40181_shdn      = port:PH09<1><<default><default><0>
;bcm40181_host_wake = port:PH10<0><<default><default><0>

```

#### 说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_sdc\_id”表示wifi使用哪个SDIO接口;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;
- 5、; 1 - bcm40181 sdio wifi gpio config 下面的内容为给bcm40181分配的GPIO。

## 10.6bcm40181 模组移植相关文件

以下文件是与bcm40181 模组移植相关的,无需再对这些文件作修改,只需了解即可。

### 10.6.1 linux

#### 一、bcm40181 驱动代码

linux-3.3\drivers\net\wireless\bcmdhd

#### 二、GPIO 控制 API

A20\_Android4.2 wifi+bt 配置说明

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linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\mmc\_bcm40181.c

Confidential



## 11bcm40183

功能: wifi (station/softap/p2p) + bt

接口类型: SDIO + UART

### 11.1.config

.config 中需要配置如下选项, 将 wifi driver 编译进内核

CONFIG\_BCMHDHD = y

CONFIG\_BCMHDHD\_OOB = y

### 11.2BoardConfig.mk

BoardConfig.mk 文件决定 android 要加载哪一款 wifi 模组、是否开启蓝牙和使用哪一款蓝牙模组, 要配置成使用 ap6210 模组并启用 wifi 和蓝牙功能需要把 BoardConfig.mk 文件的相关代码修改成如下。

```
# 1. Wifi Configuration
#BOARD_WIFI_VENDOR := realtek
BOARD_WIFI_VENDOR := Broadcom
.....
# 1.2 broadcom wifi support
ifeq ($(BOARD_WIFI_VENDOR), broadcom)
    BOARD_WPA_SUPPLICANT_DRIVER := NL80211
    WPA_SUPPLICANT_VERSION      := VER_0_8_X
    BOARD_WPA_SUPPLICANT_PRIVATE_LIB := lib_driver_cmd_bcmdhd
    BOARD_HOSTAPD_DRIVER        := NL80211
    BOARD_HOSTAPD_PRIVATE_LIB   := lib_driver_cmd_bcmdhd
    BOARD_WLAN_DEVICE            := bcmdhd
    WIFI_DRIVER_FW_PATH_PARAM    := "/sys/module/bcmdhd/parameters/firmware_path"

    #SW_BOARD_USR_WIFI := bcm40181
    #WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
    #WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
    #WIFI_DRIVER_FW_PATH_AP   := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

    SW_BOARD_USR_WIFI := bcm40183
    WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2.bin"
    WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_p2p.bin"
    WIFI_DRIVER_FW_PATH_AP   := "/system/vendor/modules/fw_bcm40183b2_apsta.bin"

    #SW_BOARD_USR_WIFI := AP6210
```

```

#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"

#SW_BOARD_USR_WIFI := AP6330
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40183b2_ag.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40183b2_ag_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40183b2_ag_apsta.bin"

#SW_BOARD_USR_WIFI := AP6181
#WIFI_DRIVER_FW_PATH_STA := "/system/vendor/modules/fw_bcm40181a2.bin"
#WIFI_DRIVER_FW_PATH_P2P := "/system/vendor/modules/fw_bcm40181a2_p2p.bin"
#WIFI_DRIVER_FW_PATH_AP := "/system/vendor/modules/fw_bcm40181a2_apsta.bin"
endif

# 2. Bluetooth Configuration
# make sure BOARD_HAVE_BLUETOOTH is true for every bt vendor
BOARD_HAVE_BLUETOOTH := true
BOARD_HAVE_BLUETOOTH_BCM := true
#BOARD_HAVE_BLUETOOTH_RTK := true
SW_BOARD_HAVE_BLUETOOTH_NAME := bcm40183
BOARD_BLUETOOTH_BDROID_BUILDCFG_INCLUDE_DIR :=
device/softwinner/wing-evb-v10/bluetooth/

```

#### 说明:

- 1、“#”符号起注释作用;
- 2、“SW\_BOARD\_USR\_WIFI := bcm40183”宏指明 wifi 选用 bcm40183;
- 3、“BOARD\_HAVE\_BLUETOOTH := true”宏指明使用蓝牙;
- 4、“BOARD\_HAVE\_BLUETOOTH\_BCM := true”宏指定蓝牙厂商为 Broadcom;
- 5、“SW\_BOARD\_HAVE\_BLUETOOTH\_NAME := bcm40183”宏指明蓝牙模组名字;
- 6、“BOARD\_BLUETOOTH\_BDROID\_BUILDCFG\_INCLUDE\_DIR := device/softwinner/wing-evb-v10/bluetooth/”宏指明配置文件 bdroid\_buildcfg.h 路径;

#### 注意:

- 1、需注释掉#BOARD\_HAVE\_BLUETOOTH\_RTK := true
- 2、若不需要蓝牙功能只需要把相关宏注释掉就可以。

## 11.3 init.sun7i.rc

init.sun7i.rc 是资源和服务配置相关的文件，要启用 bcm40183 模组的 wifi 和蓝牙功能需要作如下修改（部分代码）。

### #broadcom bluetooth

```
# UART device
chmod 0660 /dev/ttyS2
chown bluetooth net_bt_stack /dev/ttyS2

# power up/down interface
chmod 0660 /sys/class/rfkill/rfkill0/state
chmod 0660 /sys/class/rfkill/rfkill0/type
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/state
chown bluetooth net_bt_stack /sys/class/rfkill/rfkill0/type

# bluetooth MAC address programming
chown bluetooth net_bt_stack /system/etc/bluetooth
chown bluetooth net_bt_stack /data/misc/bluetooth
#chown bluetooth net_bt_stack ro.bt.bdaddr_path
#setprop ro.bt.bdaddr_path "/system/etc/firmware/bd_addr.txt"

# bluetooth LPM
#chmod 0220 /proc/bluetooth/sleep/lpm
#chmod 0220 /proc/bluetooth/sleep/btwrite
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/lpm
#chown bluetooth net_bt_stack /proc/bluetooth/sleep/btwrite

.....
```

### # 2. broadcom wifi service

# 2.1 broadcom wifi bcm40181 bcm40183 station and softap

```
service wpa_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -e/data/misc/wifi/entropy.bin
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot
```

#2.2 broadcom wifi sta p2p concurrent service

```
service p2p_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf -N \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf -e/data/misc/wifi/entropy.bin
-puse_p2p_group_interface=1
class main
socket wpa_wlan0 dgram 660 wifi wifi
disabled
```



## 11.5 config.xml

config.xml 文件路径: \android4.2\device\softwinner\wing-evb-v10\overlay\frameworks\base\core\res\res\values\config.xml

要打开蓝牙功能, 需要在 config.xml 中把蓝牙的 bneq 网口打开, 修改的部分代码如下。

```
<!-- List of regexpressions describing the interface (if any) that represent tetherable
      Wifi interfaces.  If the device doesn't want to support tethering over Wifi this
      should be empty.  An example would be "softap.*" -->
<!--  default: disable Softap feature -->
<string-array translatable="false" name="config_tether_wifi_regexs">
<item>"wlan0"</item>
</string-array>
-->

<!-- List of regexpressions describing the interface (if any) that represent tetherable
      bluetooth interfaces.  If the device doesn't want to support tethering over bluetooth this
      should be empty. -->
<!--  default: disable Bluetooth PAN feature -->
<string-array translatable="false" name="config_tether_bluetooth_regexs">
<item>"bneq\d"</item>
</string-array>
<!-- List of regexpressions describing the interface (if any) that represent tetherable
```

注: 若相应平台该目录下没 config.xml 文件, 可到其他相应平台对应目录下拷贝一份。

## 11.6 vnd\_<product>.txt

蓝牙配置文件 设置波特率, uart 设备文件和 firmware 路径(初始值), 调试信息配置

文件路径: \device\common\libbt\include\

创建 vnd\_\$(product).txt 文件, 如 vnd\_wing-evb-v10.txt

```
UART_TARGET_BAUD_RATE=1500000
BLUETOOTH_UART_DEVICE_PORT = "/dev/ttyS2"
FW_PATCHFILE_LOCATION = "/system/vendor/modules/"
LPM_IDLE_TIMEOUT_MULTIPLE = 5
LPM_SLEEP_MODE = FALSE
BTVND_DBG = FALSE
BTHW_DBG = FALSE
VNDUSERIAL_DBG = FALSE
UPIO_DBG = FALSE
```

## 11.7 bdroid\_buildcfg.h

android4.2.2\device\softwinner\wing-evb-v10\bluetooth\bdroid\_buildcfg.h 主要配置打开蓝牙时显示的本机名字。

```
#ifndef _BDROID_BUILDCFG_H
#define _BDROID_BUILDCFG_H

#define BTM_DEF_LOCAL_NAME "wing-evb-v10"

#define BTA_DM_COD {0x5A, 0x01, 0x1C}

#define BTIF_HF_SERVICES (BTA_HSP_SERVICE_MASK)
#define BTIF_HF_SERVICE_NAMES { BTIF_HSAG_SERVICE_NAME }
#endif
```

## 11.8 sys\_config.fex

sys\_config.fex 文件决定 GPIO pin 的分配，要配置成使用 ap6210 模组需要把 sys\_config.fex 文件修改成如下（部分代码）。

```
;------
;wifi configuration
;wifi_sdc_id    ---  0- SDC0, 1- SDC1, 2- SDC2, 3- SDC3
;wifi_usbc_id  ---  0- USB0, 1- USB1, 2- USB2
;wifi_usbc_type --  1- EHCI(speed 2.0), 2- OHCI(speed 1.0)
;wifi_mod_sel  ---  0- none, 1- bcm40181, 2- bcm40183(wifi+bt),
;                3 - rtl8723as(wifi+bt), 4- rtl8189es(SM89E00),
;                5 - rtl8192cu, 6 - rtl8188eu, 7 - ap6210
;                8 - ap6330, 9 - ap6181
;------
[wifi_para]
wifi_used      = 1
wifi_sdc_id    = 3
wifi_usbc_id   = 2
wifi_usbc_type = 1
wifi_mod_sel   = 2
wifi_power     = ""

; 2 - bcm40183 sdio wifi gpio config
bcm40183_wl_regon    = port:PH09<1><default><default><0>
bcm40183_wl_host_wake = port:PH10<0><default><default><0>
bcm40183_bt_rst     = port:PB05<1><default><default><0>
```

```
bcm40183_bt_regon      = port:PB05<1><default><default><0>
bcm40183_bt_wake      = port:PI20<1><default><default><0>
bcm40183_bt_host_wake = port:PI21<0><default><default><0>
```

[mmc3\_para]

```
sdc_used              = 1
sdc_detmode          = 4
sdc_buswidth         = 4
sdc_cmd              = port:PI04<2><1><2><default>
sdc_clk              = port:PI05<2><1><2><default>
sdc_d0               = port:PI06<2><1><2><default>
sdc_d1               = port:PI07<2><1><2><default>
sdc_d2               = port:PI08<2><1><2><default>
sdc_d3               = port:PI09<2><1><2><default>
sdc_det              =
sdc_use_wp           = 0
sdc_wp               =
sdc_isio             = 1
sdc_regulator        = "none"
```

[bt\_para]

```
bt_used              = 1
bt_uart_id           = 2
bt_wakeup            = port:PI20<1><default><default><default>
bt_gpio              = port:PI21<1><default><default><default>
bt_rst               = port:PB05<1><default><default><default>
```

说明:

- 1、“;”符号起注释作用;
- 2、“wifi\_used”为1表示使用wifi,为0表示不使用;
- 3、“wifi\_sdc\_id”表示wifi使用哪个SDIO接口;
- 4、“wifi\_mod\_sel”宏表示使用哪一款wifi模组;
- 5、; 2 - bcm40183 sdio wifi gpio config 下面的内容为给bcm40183分配的GPIO。

## 11.9 bcm40183 模组移植相关文件

以下文件是与bcm40183 模组移植相关的,无需再对这些文件作修改,只需了解即可。

## 11.9.1 linux

### 一、bcm40183 驱动代码

linux-3.3\drivers\net\wireless\bcmdhd

### 二、GPIO 控制 API

linux-3.3\arch\arm\mach-sun7i\rf\wifi\_pm.c

linux-3.3\arch\arm\mach-sun7i\rf\mmc\_bcm40183.c

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## 12 F&Q

### 12.1 如何编译

修改配置文件后有两种编译方法可以使得修改生效，第一种是整体编译重烧固件，第二种是单独的模块编译然后把生成的文件 push 进相应的目录，详细操作如下。

#### 整体编译

整体编译有两种方法可选

方法一：在 android 主目录下先“make clean”后再“make -j8”；

方法二：分别到 android4.2\hardware\libhardware\_legacy\wifi\和 external\wpa\_supplicant\_8\wpa\_supplicant\目录下使用“touch \*”命令更新目录下所有文件的时间戳，再把 android 主目录下使用“make -j8”命令编译；

#### 单独模块编译

先分别到 android4.2\hardware\libhardware\_legacy\wifi\和 external\wpa\_supplicant\_8\wpa\_supplicant\目录下使用“touch \*”命令更新目录下所有文件的时间戳，然后在相应目录下使用“mm”命令进行编译，再把生的 libhardware\_legacy.so(wifi.c)和 wpa\_supplicant(drv\_wext.c)推入目标机器目录，最后更改执行权限并重启。

若生成的 libhardware\_legacy.so 和 wpa\_supplicant 存放在电脑 D 盘下，则用如下命令把其推到目标机器目录下。

```
adb push D:\wap_supplicant /system/bin/wpa_supplicant
adb push D:\libhardware_legacy.so /system/lib/libhardware_legacy.so
adb shell chmod 777 /system/bin/ wpa_supplicant
adb shell chmod 666 /system/lib/libhardware_legacy.so
```

注意：单独模块编译适合调试使用。

### 12.2 编译报错

修改配置文件后，如果编译的时候报与 wpa\_supplicant\_8 相关的错误，可用以下两种方法解决。

方法一：将 out/target/product/crane-方案名/obj/EXECUTABLES/wpa\_supplicant\_intermediates 下面的中间生成文件删除，再次编译。

方法二：使用方法一后编译还是报错，则需要先使用 make clean 命令清除中间文件和目标文件后，再使用 make -j8 命令进行整体编译。

## 12.3修改不生效

修改配置文件并进行整体编译重烧固件或单独模块编译把生成文件推进目标机器后发现指定的 wifi 模组不能工作，修改配置前那款 wifi 模组还是能正常工作。该问题是因为由于只修改配置文件，wifi 相关的编译文件的时间戳没改变使用不会去重新编译，详细解决方法可参考“如何编译”。

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