RALINK TECHNOLOGY, CORP.

RALINK RT3883 Concurrent iNIC

NOTES & USER'S GUIDE

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Content

1. Introduction

The RT3883 SOC has the capability of working RT3883 and RT309x/RT539x wireless interfaces concurrently.

A.   The interface1 (ra0): RT3883 (5G)

B.   The interface 2 (rai0): RT3090/RT5392 (2.4G)

Station can associate and execute WPS connection for any wireless interface. Moreover, user can configure the settings of any wireless interface by Web GUI.

You can refer to Ralink_AP_SDK_User's_Manual for the Detail information.

2. Setup

2.1 Install

If your SDK does not include RT309x/RT539x support, please refer the following steps to install it.

Requirement:

- RT288x_SDK

- RT3090/RT5392 WiFi driver

- RT3090/RT5392 EEPROM binary files

Procedure:

Step1.

Please copy RT309x/RT539x WiFi driver to RT288x_SDK/linux-2.6.xx.x/drivers/net/wireless

ex:

```
$cp RT3090_ap RT288x_SDK/linux-2.6.xx.x/drivers/net/wireless

$cp RT5392_ap RT288x_SDK/linux-2.6.xx.x/drivers/net/wireless
```

Step2.

Please modify RT288x_SDK/linux-2.6.xx.x/drivers/net/wireless/Makefile

ex:

```
…
ifneq ($(CONFIG_RT2860V2_AP),)
obj-$(CONFIG_RT2860V2_AP)          += rt2860v2_ap/
endif
ifneq ($(CONFIG_RT2860V2_STA),)
obj-$(CONFIG_RT2860V2_STA)         += rt2860v2_sta/
endif
ifneq ($(CONFIG_RT3090_AP),)
obj-$(CONFIG_RT3090_AP)            += RT3090_ap/
endif
ifneq ($(CONFIG_RT5392_AP),)
obj-$(CONFIG_RT5392_AP)            += RT5392_ap/
endif
…
```

Step3.

Please modify RT288x_SDK/linux-2.6.xx.x/ralink/Kconfig

ex:

```
…

source "drivers/net/wireless/rt2860v2_ap/Kconfig"

source "drivers/net/wireless/rt2860v2_sta/Kconfig"
```

```
config    RA_CLASSIFIER

          tristate "Ralink Flow Classifier"

          depends on RT2860V2_AP_VIDEO_TURBINE || RT2860V2_STA_VIDEO_TURBINE

          default n

#source "drivers/net/wireless/rt2860v2_apsta/Kconfig"

source "drivers/net/wireless/RT3090_ap/Kconfig"

source "drivers/net/wireless/RT5392_ap/Kconfig"

…

config RTDEV_PCI

bool

default y if RT2880v2_INIC_PCI || RT3090_AP || RT5392_AP

…
```

Step4.

Please copy EEPROM binary file to RT288x_SDK/source/vendors/Ralink/RT3883

ex:

```
$cp RT3092_PCIe_LNA_2T2R_ALC_V1_2.bin RT288x_SDK/source/vendors/Ralink/RT3883

$cp RT5392_PCIe_2T2R_ALC_V1_2.bin RT288x_SDK/source/vendors/Ralink/RT3883
```

Step5.

Please modify RT288x_SDK/source/vendors/Ralink/RT3883Makefile

ex:

```
…
$(ROMFSINST) -e CONFIG_RALINK_RT3883_3T3R RT2860_default_novlan_3s /etc_ro/Wireless/RT2860AP/RT2860_default_novlan
$(ROMFSINST) -e CONFIG_RALINK_RT3883_3T3R RT2860_default_vlan_3s /etc_ro/Wireless/RT2860AP/RT2860_default_vlan
$(ROMFSINST) -e CONFIG_RALINK_RT3662_2T2R /etc_ro/Wireless/RT2860AP/RT2860_default_novlan
$(ROMFSINST) -e CONFIG_RALINK_RT3662_2T2R /etc_ro/Wireless/RT2860AP/RT2860_default_vlan

$(ROMFSINST) -e CONFIG_RT3090_AP /etc_ro/Wireless/iNIC/RT2860AP.dat
$(ROMFSINST) -e CONFIG_RT3090_AP /etc_ro/Wireless/RT2860AP/RT3092_PCIe_LNA_2T2R_ALC_V1_2.bin

$(ROMFSINST) -e CONFIG_RT3090_AP /etc_ro/Wireless/iNIC/RT2860AP.dat
$(ROMFSINST) -e CONFIG_RT5392_AP /etc_ro/Wireless/RT2860AP/RT5392_PCIe_2T2R_ALC_V1_2.bin
…
```

Step6.

Please modify RT288x_SDK/source/user/rt2880_app/scripts/internet.sh

ex:

```
…
# RTDEV_PCIe support
```

```
if [ "$CONFIG_RTDEV_PCI" != "" ]; then
        ralink_init make_wireless_config rtdev
        if [ "$RT2880v2_INIC_PCI" != "" ]; then
                rmmod iNIC_pci
                insmod -q iNIC_pci
        elif [ "$CONFIG_RT3090_AP" != "" ]; then
                rmmod RT3090_ap_net
                rmmod RT3090_ap
                rmmod RT3090_ap_util
                insmod -q RT3090_ap_util
                insmod -q RT3090_ap
                insmod -q RT3090_ap_net
        elif [ "$CONFIG_RT5392_AP" != "" ]; then
                rmmod RT5392_ap
                insmod -q RT5392_ap
        fi
# RTDEV_USB support
elif [ "$CONFIG_RTDEV_USB" != "" ]; then
…
```

2.2 Compile Configuration

You must switch directory to RT2888x_SDK/source and execute "make menuconfig," like below:

Please choose "Select the Product you wish to target" option to configure the main settings of your target platform.

And then, please exit "Select the Product you wish to target" option and enter "Kernel/Library/Defaults Selection" option.

You must select "Default all settings" option to load default configuration first and select "Customize Kernel Settings" options to turn on 2nd interface.

After load default, you can enter kernel configured main menu.

Please enter "Machine selection" and choice" RT3883 PCI architecture" to "PCIE RC ONLY" mode.
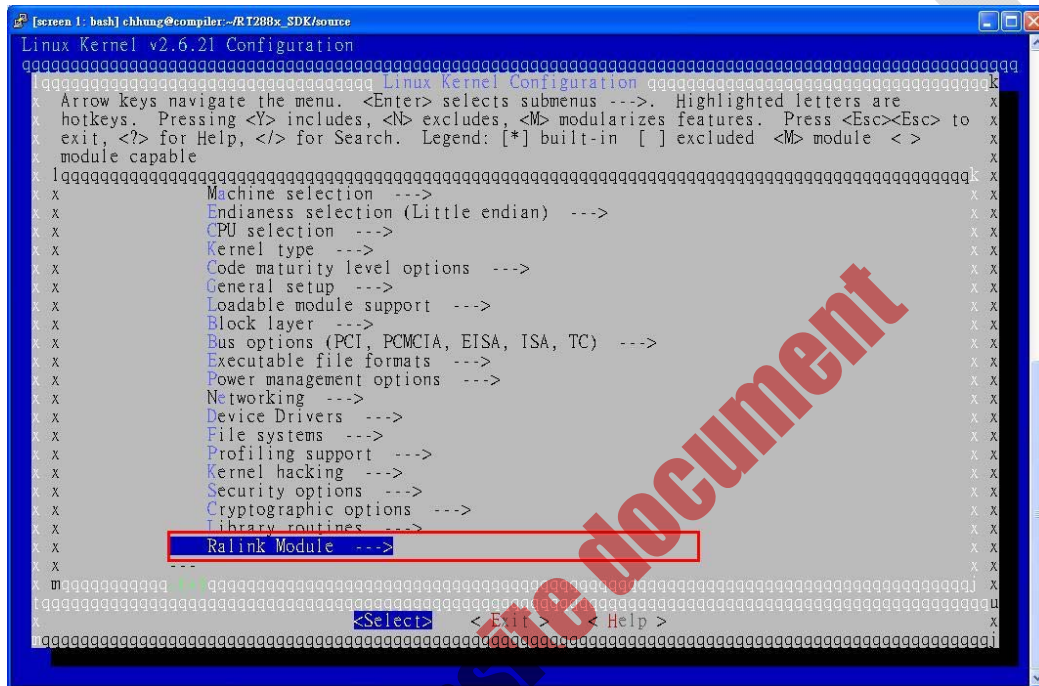
Leave "Machine selection" option.

Please enter "Bus options (PCI, PCMCIA, EISA, ISA, TC)" option and check whether PCI/PCIE support or not, like below:

Leave "Bus options (PCI, PCMCIA, EISA, ISA, TC)" option.

Please enter "Ralink Module" option

You can select RT3090 or RT5392 module to act 2nd WiFi interface, but one of them could be selected.

Leave "Ralink Module" option and then exit "Linux Kernel Configuration".
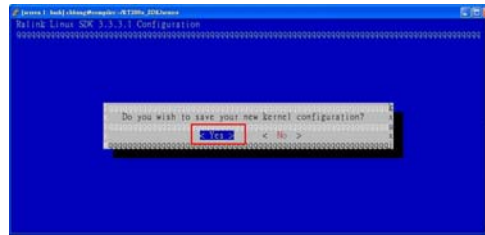
Final, you can execute "make dep" and "make" to build image under the RT288x_SDK/source.

$make dep

$make

3. Usage

If the firmware is built successfully, you can upgrade it into your RT3883 reference board by TFTP Server or Web GUI.

After firmware upgrade, you can use "lsmod" and "ifconfig" commands to check if RT3090_ap is successfully inserted and brought up or not.

2nd WiFi interface module: RT3090_ap / RT5392_ap

RT3883 interface name: ra0

RT3090/RT5392 interface name: rai0

RT3883 profile is located on /etc/Wireless/RT2860/RT2860.dat and RT3090/RT5392 profile is located on /etc/Wireless/iNIC/iNIC_ap.dat. To change RT309x wireless settings, you can edit its profile and re-bring up it, like RT3883.

Certainly, RT3883 and RT3090/RT5392 are shown their detail information or configured settings by iwpriv command, for example:

RT3883:

```
#iwprive ra0 set SSID=RT3883AP

#iwprive ra0 stat

…
```

RT3092:

```
#iwprive rai0 set SSID=RTDEV_AP

#iwprive rai0 stat

…
```