

Android 6.0 ACC1340 WLAN

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1. Porting Environment

Host PC OS: Ubuntu 16.04.4

Target OS : Android 6.0

Target Platform: Nitrogen6X(IMX6Q)

2. Kernel driver porting

2.1. Copy ACC1340 source

```
# cp acc1340 $ANDROID/kernel_imx/driver/net/wireless
```

2.2. Modify Makefile and Kconfig

Edit \$ANDROID/kernel_imx/driver/net/wireless/Makefile

- obj-\$(CONFIG_CW1200) += cw1200/
- obj-\$(CONFIG_ACC1340) += acc1340/

Edit \$ANDROID/kernel_imx/driver/net/wireless/Kconfig

- source "drivers/net/wireless/cw1200/Kconfig"
- source "drivers/net/wireless/acc1340/Kconfig"

2.3. Configure ACC1340 driver

```
# cd $ANDROID
```

```
#export CROSS_COMPILE=prebuilts/gcc/linux-x86/arm/arm-eabi-4.8/bin/arm-eabi;
```

```
# export ARCH=arm
```

```
#cd $ANDROID/kernel_imx
```

Device Drivers->Network device support->Wireless Lan

```

3.14.52 Kernel Configuration
Network device support > Wireless LAN
----- wireless LAN -----
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenu ----). Highlighted
letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><E
to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module <> module
capable

^(-)
<> Intel PRO/wireless 2200BG and 2915ABG Network Connection
<M> Intel wireless WiFi Next Gen AGN - wireless-N/Advanced-N/Ultimate-N (iwlwifi)
<M> Intel wireless WiFi DVM Firmware support
<> Intel wireless WiFi MVM Firmware support
Debugging Options ---->
<> Intel wireless WiFi 4965AGN (iwl4965)
<> Intel PRO/wireless 3945ABG/BG Network Connection (iwl3945)
<> Marvell 8xxx Libertas WLAN driver support
<> Hermes chipset 802.11b support (Orinoco/Prism2/Symbol)
<> Softmac Prism54 support
<> Ralink driver support ----
[*] Realtek rtlwifi family of devices --->
[*] TI wireless LAN support ---->
<> ZyDAS ZD1211/ZD1211B USB-wireless support
<> Marvell WiFi-EX driver
<> CW1200 WLAN support
[*] ACCI340 WLAN support
  [*] ACCI340_WLAN_BUILT_IN
  [*] Platform supports non-power-of-two SDIO transfer
  [*] Use GPIO interrupt
  [*] 5GHz band support
  [*] WAPI support
  [*] STE extensions
  [*] Disable lid beacon hints
  [*] Enable U5500 support
  [*] Driver debug features ---->
  [*] Enable ITP DebugFs
  
```

2.4. Configure kernel mac80211 and cfg80211

Copy db.txt to \$ANDROID/kernel_imx/net/wireless/

Configure kernel Wireless like following figure

```

.config - Linux/arm 3.14.52 Kernel Configuration
> Networking support > wireless
----- wireless -----
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenu ----). Highlighted
letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><E
to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module <> module
capable

--- wireless
[*] cfg80211 - wireless configuration API
  [*] nl80211 testmode command
  [*] enable developer warnings
  [*] cfg80211 regulatory debugging
  [*] cfg80211 certification onus
  [*] enable powersave by default
  [*] cfg80211 DebugFS entries
  [*] use statically compiled regulatory rules database
  [*] cfg80211 wireless extensions compatibility
[*] Generic IEEE 802.11 Networking Stack (mac80211)
  [*] PID controller based rate control algorithm
  [*] Minstrel
  [*] Minstrel 802.11n support
  [*] Default rate control algorithm (Minstrel) ---->
  [*] Enable mac80211 mesh networking (pre-802.11s) support
  [*] Enable LED triggers
  [*] Export mac80211 internals in DebugFS
  [*] Trace all mac80211 debug messages
  [*] Select mac80211 debugging features ----
  
```

2.5. Compile kernel

make zImage dtbs -j8

2.6. Update new kernel to android filesystem

Copy the new zImage and imx6q-nitrogen6x.dtb file to board /boot folder

2.7. Check ACC1340 driver load successful

```
mmc1: new high speed SDIO card at address 0001
```

```
ACC1340 : can't open /data/.psm.info
```

```
ACC1340 : Using default PSM 2
```

```
Allocated hw_priv @ d8336e20
```

```
ACC1340 : can't open /efs/wifi/.mac.info
```

```
ACC1340 : can't open /etc/jffs2/.mac.info
```

```
ACC1340 : can't open /etc/jffs2/.mac.info
```

```
acc1340_load_firmware_acc1260: ENTER
```

```
acc1340_load_firmware_acc1260: bootloader size = 2372, loopcount = 593
```

```
acc1340_load_firmware_acc1260: addr = 0x8000190,data = 0x20746f6e
```

```
acc1340_load_firmware_acc1260: addr = 0x8000320,data = 0xe1a06000
```

```
acc1340_load_firmware_acc1260: addr = 0x80004b0,data = 0x359d2108
```

```
acc1340_load_firmware_acc1260: addr = 0x8000640,data = 0x54736574
```

```
acc1340_load_firmware_acc1260: addr = 0x80007d0,data = 0xebffe74
```

```
acc1340_load_firmware_acc1260:WRITE COMPLETE
```

```
ACC1340 WSM init done.
```

```
Input buffers: 30 x 1632 bytes
```

```
Hardware: 7.9
```

```
WSM firmware [WSC_A04.09.0082 V2.6 Aug 31 2017 11:10:42], ver: 409, build: 82,
```

```
api: 1060, cap: 0x0003
```

```
mxc_vdoa 21e4000.vdoa: i.MX Video Data Order Adapter(VDOA) driver probed
```

```
acc1340_register_common1
```

```
acc1340_register_common2
```

acc1340_register_common3

acc1340 driver version=201807241033-release

3. Android HAL porting

3.1. copy hal/hardware to android source tree

```
# copy -a hal/hardware/* $ANDROID/hardware
```

3.2. Edit BoardConfig.mk

Edit \$ANDROID/device/boundary/nitrogen6x/BoardConfig.mk

```
# WiFi/BT common defines
```

```
BOARD_HAVE_WIFI           := true
BOARD_HAVE_BLUETOOTH      := true
WPA_BUILD_HOSTAPD         := true
WPA_SUPPLICANT_VERSION    := VER_0_8_X
BOARD_WPA_SUPPLICANT_DRIVER := NL80211
BOARD_HOSTAPD_DRIVER       := NL80211
```

```
ifeq ($(BOARD_WLAN_VENDOR),AMPED)
```

```
BOARD_WPA_SUPPLICANT_PRIVATE_LIB := lib_driver_cmd_acc1340
BOARD_WLAN_DEVICE                 := acc1340_mac80211
WIFI_DRIVER_MODULE_NAME           := "acc1340_drv"
#WIFI_DRIVER_MODULE_PATH ismod call driver modules
WIFI_DRIVER_MODULE_PATH           := "/system/lib/modules/acc1340_drv.ko"
BOARD_HOSTAPD_PRIVATE_LIB         := lib_driver_cmd_acc1340
BOARD_SOFTAP_DEVICE               := acc1340_mac80211
USES_AMPED_MAC80211               := true
COMMON_GLOBAL_CFLAGS              += -DUSES_AMPED_MAC80211
#BOARD_HAVE_BLUETOOTH_TI          := true
#BOARD_USE_FORCE_BLE              := true
TARGET_KERNEL_MODULES := \
kernel_imx/drivers/net/wireless/acc1340/acc1340_drv.ko:system/lib/modules/acc1340_
drv.ko
```

```
endif
```

3.3. 2compile libhardware_legacy.so

```
# cd $ANDROID/hardware/libhardware_legacy
```

3.4. Edit init.rc

```
mkdir /data/misc/wifi 0770 wifi wifi
mkdir /data/misc/wifi/sockets 0770 wifi wifi
mkdir /data/misc/wifi/wpa_supplicant 0770 wifi wifi
mkdir /data/misc/dhcp 0770 dhcp dhcp
# give system access to wpa_supplicant.conf for backup and restore
chmod 0660 /data/misc/wifi/wpa_supplicant.conf
chown wifi wifi /data/misc/wifi/wpa_supplicant.conf
```

3.5. Edit init.xxx.rc

```
Edit init.<board>.rc for example init.freescale.rc
```

3.5.1. wpa_supplicant

```
# Prepare for wifi
setprop wifi.interface wlan0
setprop wifi.ap.interface wlan0
service wpa_supplicant /system/bin/wpa_supplicant \
    -iwlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf \
    -O/data/misc/wifi/sockets \
    -g@android:wpa_wlan0
class late_start
socket wpa_wlan0 dgram 660 wifi wifi
disabled
oneshot

service p2p_supplicant /system/bin/wpa_supplicant \
    -ip2p0 -Dnl80211 -c/data/misc/wifi/p2p_supplicant.conf \
    -l/system/etc/wifi/p2p_supplicant_overlay.conf -N \
```

```
-i wlan0 -Dnl80211 -c/data/misc/wifi/wpa_supplicant.conf \  
-l/system/etc/wifi/wpa_supplicant_overlay.conf \  
-O/data/misc/wifi/sockets \  
-e/data/misc/wifi/entropy.bin \  
-puse_p2p_group_interface=1 \  
-g@android:wpa_wlan0  
class late_start  
socket wpa_wlan0 dgram 660 wifi wifi  
disabled  
seclabel u:r:wpa:s0  
oneshot
```

```
service hostapd /system/bin/hostapd /data/misc/wifi/hostapd.conf
```

```
socket hostapd_wlan0 dgram 660 root wifi  
user root  
group wifi  
oneshot  
disabled
```

3.5.2. dhcpd

```
service dhcpd_wlan0 /system/bin/dhcpd -aABDKL
```

```
class main  
disabled  
oneshot
```

```
service dhcpd_p2p /system/bin/dhcpd -aABKL
```

```
class main  
disabled  
oneshot
```

```
service iprenew_wlan0 /system/bin/dhcpd -n
```

```
class main  
disabled  
oneshot
```

```
service iprenew_p2p /system/bin/dhcpd -n
```

class main
disabled
oneshot

4. AP/STA testing

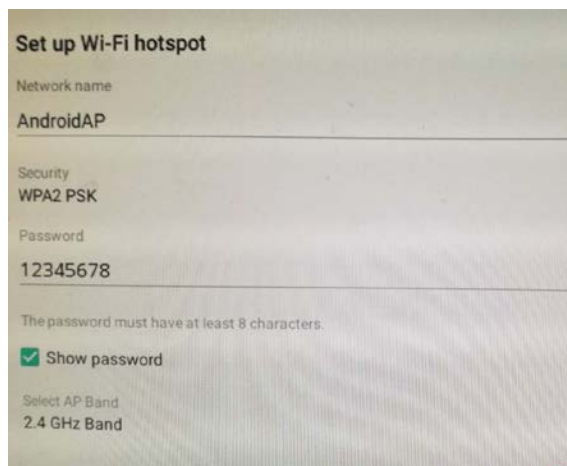
4.1. STA testing

Setting->Wireless&networks ->Wi-Fi select and connect AP.

4.2. AP testing

4.2.1. Setting up Wifi SSID and password

Setting->Wireless & networks ->More ->Tethering & Portable hotspot-> Set up Wi-Fi hotspot



4.2.2. Startup AP

Switch Portable Wi-Fi hotspot on

