



▶ **Marvell.** Moving Forward Faster



CONSUMER ELECTRONICS

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SEAMLESS COMMUNICATIONS

SECURE STORAGE



PXA1826 WiFi Introduction

Agenda

- **Code Architecture**
- **WiFi Scripts**
- **Boot Flow**
- **WiFi config file**
- **Performance and Stability Test**

Code Architecture

▶ Application

- Marvell private application and firmware (package/kernel/marvell-wl/)
 - Application: for debug purpose, uaputl.exe, mlanutl...
 - Firmware: correspond to wifi driver, to be downloaded by wifi driver to wifi device during init process.
- hostapd and wpa_supplicant (package/network/services/hostapd/)
 - ubus object, send wifi events to ubus for management usage, such as up/down/association,etc
 - hostapd is used to start access point.
 - wpa_supplicant is used to connect to an access point.

▶ Driver

- Locate in kernel: marvell/linux/drivers/marvell/ (SD8897/SD8887/PCIE8897...)
- Compiled to kernel modules, to be copied to rootfs depending on your config. See make menuconfig below.



Code Architecture

► **Select wifi device to be supported**

- Support multiple wifi device, to be auto-detected during boot process.
- make menuconfig (Enter Kernel modules → Marvell Wireless)

[illegible]

WiFi Scripts

- ▶ **/etc/init.d/mwlan: start/stop wifi network**
 - Detect wifi device and load the correct kernel modules automatically (SD8897/SD8887/PCIE8897...)
- ▶ **/lib/netifd/wireless/mac80211.sh, /lib/netifd/netifd-wireless.sh, /lib/netifd/hostpad.sh**
 - used by netifd to manage wifi device
 - translate wifi uci config file to hostapd/wpa_supplicant config file
 - user only need to change /etc/config/wireless, scripts will be responsible to translate it to corresponding hostapd/wpa_supplicant config file

Boot Flow

- ▶ **All work done via /etc/init.d/mwlan during boot**
 - power on wifi device
 - load wifi kernel modules
 - generate default wifi uci config file if not existed (/etc/config/wireless)
 - start wifi AP/STA via /sbin/wifi:
 - send wifi start command to netifd via ubus
 - start hostapd/wpa_supplicant process.
 - wifi is up now. Default you can see a Openwrt_2G access point.

WiFi config file

- ▶ **For upper layer application usage, easy to understand**
 - netifd will translate it to hostapd/wpa_supplicant config file
- ▶ **Interface to webui via uci command**
 - send uci command to change wireless config file
 - call script “/etc/init.d/mwlan restart” to restart wifi network
- ▶ **Support both 2.4G and 5G band wifi device**
- ▶ **Support STA**
- ▶ **Example to start 5G AP**
 - uci set wireless.mwlan0_2G.disabled=1 //disable 2.4G first
 - uci set wireless.mwlan1_5G_if.ssid=Openwrt_feilv_5G // set ssid
 - uci set wireless.mwlan1_5G_if.encryption=none // set encryption
 - uci wireless.mwlan1_5G.disabled=0 // enable 5G
 - uci commit wireless // save config
 - wifi up mwlan1_5G // start 5G AP

Performance and Stability Test

▶ **UT test**

- Use CP to send data to wifi device (set config parameters via Catstudio)
- Close to practical downlink UDP case
- Max UDP download speed(SD8897): ~340MBps

▶ **Iperf**

- used for stability test
- exhaust cpu resource, not suitable for throughput test

▶ **PKTGEN**

- Linux kernel network test modules
- Need to enable via make kernel_menuconfig

End