Infineon Linux Wi-Fi driver (FMAC) (v2024_1115) release notes

About this document

Scope and purpose

Thank you for your interest in Infineon's Linux Wi-Fi driver (FMAC). This document provides an overview of the new features, bug fixes, and known issues for the AIROC™ Wi-Fi chips (CYW4373, CYW43439, CYW43455, CYW43012, CYW43022, CYW54591, CYW5557x, and CYW5551x) on the current release for Linux (2024_1115 release version).

Intended audience

This document is intended for anyone who uses the Infineon AIROC™ Wi-Fi chips on a Linux host.

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1 Overview

1.1 High-level summary

This document details the new features and bug fixes for CYW4373, CYW43012, CYW43439, CYW43022, CYW43455, CYW54591, CYW5551x and CYW5557x on the software release.

This software release includes the following:

- FMAC driver
  - ifx-backports GitHub page
- Firmware and Clm blob
  - ifx-Linux-firmware GitHub page
- Supplicant and hostapd
  - ifx-hostap GitHub page

All the above files are also available on the Infineon Developer community page.

- To bring up Wi-Fi with FMAC on the RPI host for kernel 6.6.31, download the image source from the GitHub page
- To bring up Wi-Fi with FMAC on EA iMX8 Nano host for kernel 6.6.23, download the image source from the GitHub page
- To bring up Wi-Fi with FMAC on the non-RPI host for kernel 6.1.97, download the image source from the GitHub page and Infineon Developer community page

1.2 Device firmware change summary

Table 1 Device firmware change summary

Device	SDIO	PCIe
CYW4373	New feature and bug fixes	N/A
CYW43012	New feature and bug fixes	N/A
CYW43022	New feature and bug fixes	N/A
CYW43455	New feature and bug fixes	N/A
CYW54591	New feature and bug fixes	N/A
CYW55571/CYW55572/CYW55573	New feature and bug fixes	New feature and bug fixes
CYW43439	New feature and bug fixes	N/A
CYW55511/ CYW55512/CYW55513	Introduce to the Linux release	N/A

Note: Contact the local Infineon Technologies distribution channel (FAE or local sales representative) to get the latest hardware, NVRAM, and software files.

1.3 Device firmware revision details

Table 2 Firmware revision details

Device		Wi-Fi firmware version
CYW4373	PCIe	13.35.205.100
	SDIO	13.10.246.356
	Industrial	13.10.246.356
	USB	13.10.246.356
CYW43439	SDIO	7.95.98
CYW43455	SDIO	7.45.286
CYW43012	SDIO	13.10.271.329
CYW43022	SDIO	13.34.107.140
CYW55571/ CYW55572/CYW55573	PCIe	18.53.421.21
	SDIO	18.53.421.21
CYW54591	PCIe	13.35.369
	SDIO	13.35.369
CYW55513	SDIO	28.10.387.10

2 Description of changes

This section explains the features, enhancements, and issues that may impact various devices.

2.1 Driver - FMAC changes

- Support for CYW55513 (initial release)
- Backport support from kernel version 4.14 to kernel version 6.1.97
- CYW43022 - fix to handle system crash on UDP traffic during Deep Sleep
- Fix for configuring iovar setting for during multiple BSS scenario
- Rx throughput improvement
- Support for 1x-SHA256 security for 6 Ghz band
- Fix for EAPOL timeout issue during OCE certification
- CYW4373 - fix for wrong vendor ko for USB interface
- CYW54591 - fix for pcie bringup fail noticed on kernel 6.6

2.2 Hostapd/supplicant changes

- Support for DPP3.0 and enablement of PFS flow on event update
- Reset authentication and encryption parameters in hostapd while handling roam event
- Add a configurable link_loss parameter for background scan

Note: Recommend to use softAP with DTIM_PERIOD is 1.dtim_period=1 in hostapd.conf.

2.3 Firmware changes

2.3.1 CYW4373

New features

Component	Description	Implication/advantage
Wi-Fi	N/A	N/A

Wi-Fi certification

Chipset	Quick track CID	WFA program supported
CYW4373-SDIO	WFA124982	11n, 11ac, PMF, P2P, and vulnerability
CYW4373E-SDIO	WFA124668	

Bug fix

- Fix for ping loss between access point (AP) and station (STA) during AP and STA concurrent operation
- Fix for ping failure while system enters suspend/resume

Known issues

N/A

2.3.2 CYW43439

New features

N/A

Wi-Fi certification

Chipset	Quick track CID	WFA program supported
CYW43439	WFA128277	11n, WPA3, PMF, and vulnerability

Bug fix

- WFA certification fixes:
  - WPA3: test case – 4.6.1 – fix for WPA3 connection issue when SAE transition is disable
  - WPA3: test case – 4.2.2 – fix for WPA3 PMK caching connectivity failures
  - SAE: test case – 4.4.1, 4.4.2, 4.4.3 – fix for SoftAP to accept SAE commit message from rejected groups
  - 11w(PMF): test case – 4.3.3.2 – fix for handling the unprotected de-auth frames sent from STA to SoftAP
  - 11n: test case – 4.2.9 – fix for handling connectivity issue on re-assoc request sent from STA to SoftAP
- Fix for low Rx packet error rate (PER)

Known issues

N/A

Description of changes

2.3.3 CYW54591

New features

Component	Description	Implication/advantage
Wi-Fi	WPA3 FT SAE support	Fast BSS transition connection

Wi-Fi certification

Chipset	Quick track CID	WFA program supported
CYW54591	WFA131237	WPA3 (SCV, TLS 1.3) 11n, 11ac, PMF, P2P, and vulnerability

Bug fix

- Fix for low throughput senarios with 11n/ac MIMO rates
- Support with external SAE for fast transition with SAE security
- Fix for connection stability issue caused due to PMK expiry
- Fix for beacon loss noticed specific to TP link access point
- Fix for SA query response errors during Wi-Fi spoof scenarios
- Fix for PER noticed during MIMO rate scaling to SISO rates
- Fix for roam stability noticed with WPA2-PSK security
- Fix for RSSI tuning noticed during 5 Ghz traffic scenario
- Fix for roam issue noticed with PMF enabled AP to PMF disabled AP

Known issues

N/A

Description of changes

2.3.4 CYW43022

New features

Component	Description	Implication/advantage
Wi-Fi	N/A	N/A

Wi-Fi certification

Chipset	Quick track CID	WFA program supported
CYW43022	WFA133143	11n, 11ac, WPA3, PMF, and vulnerability

Bug fix

- WFA certification fixes:
  - 11AC: test case – 5.2.58 – fix for SU transmit beamformee capability advertisement
  - WPA3: test case – 5.8.1, 5.8.3 – fix for roam failure noticed with WPA3 configured AP to WPA2 configured AP
  - QuickTrack-P2P – fix for FW trap noticed during P2P certification suite
- Optimized throughput drop noticed during TX traffic
- Fix for roaming stability noticed with WPA3 security
- Fix for Memory optimization in Deep Sleep state
- Fix for beacon loss optimization noticed due to beacon trim
- Fix for fast channel band selection in Deep Sleep
- Fix for ping loss stability noticed during Deep Sleep exit
- Fix for stability issue noticed during P2P connection establishment with reference client

Known issues

N/A

Note: Deep Sleep is specific to CYW43022 which enabled better lower power during inactivity.

Description of changes

2.3.5 CYW43012

New features

N/A

Wi-Fi certification

Chipset	Quick track CID	WFA program supported
CYW43012	WFA127567	11n, 11ac, WPA3, PMF, and vulnerability

Bug fix

- Fix for IP address release issue noticed on suspend/resume

Known issues

N/A

2.3.6 CYW43455

New features

N/A

Wi-Fi certification

Chipset	Quick track CID	WFA program supported
CYW43455	N/A	11n, 11ac, WPA3, PMF, and vulnerability

Bug fix

- Fix for low throughput issue noticed with 5 Ghz
- Fix for low Rx PER
- Fix for low throughput issue noticed with SoftAP and STA concurrency
- Fix for memory loss issue noticed during WPA3 SAE-FT roam senarios

Known issues

N/A

Description of changes

2.3.7 CYW55571/CYW55572/CYW55573

- CYW55571 – Single band 2.4 Ghz
- CYW55572 – Dual band 2.4/5 Ghz
- CYW55573 – Tri band 2.4/5/6 Ghz

New features

Component	Description	Implication/advantage
Wi-Fi	Support for survey dump	Channel assessment for better channel survey statistics
	Support for dual STA concurrancy	Enables dual STA interface for concurrent AP connection for better data transmission and connection reliability.
	Support for DFS master in Soft AP	Enables support for radar channels in SAP

Wi-Fi certification

Chipset	Quick track CID	WFA program supported
CYW55572	WFA131807	11ax – R2, 6E MBO, OCE, OWE WPA3 (192 bits, TLS 1.3, PSK, SCV) 11n, 11ac, PMF, P2P, and vulnerability
CYW55573	N/A	

Bug fix

- WFA certification fix:
  - WPA3: test case – 5.2.10 – fix for association failure to AP with WPA3 tranistion security
- Fix for beacon loss noticed during low temperature senarios
- Tx power optimisation for better performance
- Fix for regulatory issues noticed with FCC and JP regulatory
- Fix for stability issues noticed with AP and STA concurrency
- Fix for stability issues noticed with STA and P2P concurrancy
- Fix for stability improvements with DFS radar detection rate during CAC
- Fix for connection stability issue caused due to PMK expiry
- Fix for WPA authentication configuration with WPA2/WPA3-1X-SHA256
- Fix for multiphase CAL not getting triggered
- Fix for PA param trimming
- Fix for SA query handling procedure
- Fix for beacon sensitivity degradation with RSSI greater than 10 dB
- Fix for low throughput noticed with SoftAP
- Fix for pingloss noticed with 11AX SoftAP and 5 Ghz STA concurrancy scenario
- Fix for memory loss issue noticed during WPA3 SAE-FT roam senarios
- Fix for memory leak issue noticed during AP and STA concurrency
- Fix for beacon loss noticed during 2.4 Ghz 11 g rates.
- Intermittent - fix for low throughput senarios noticed in 2.4 Ghz band

Description of changes

NVRAM changes

- Fix for TPC tuning in Low-Power mode for 5 Ghz
- Fix for PAPD optimization for 6 Ghz

Note: *Contact the module vendor or local Infineon distribution channel (FAE or local sales representative) to get the NVRAM changes.*

Known issues

[SDIO] [Intermittent] Notice low Rx throughput during WLAN and ACL traffic co-ex senarios.

2.3.8 CYW55511/CYW55512/CYW55513

- CYW55511 – Single band 2.4 Ghz
- CYW55512 – Dual band 2.4/5 Ghz
- CYW55513 – Tri band 2.4/5/6 Ghz

New features

Initial release

Wi-Fi certification

Chipset	WFA program supported
CYW55513	11ax – R2, 6E
	MBO, OCE, OWE
	WPA3 (192 bits, TLS 1.3, PSK, SCV)
	11n, 11ac, PMF, P2P, and vulnerability

Known issues

- Combo COEX - notice UDP low throughput during BLE CIS and Wi-Fi co-ex scenario
- Third party COEX - low Zigbee performance noticed Wi-Fi Rx throughput scenario

3 Documentation

For more details, see the following documents:

- 002-38038: Getting started with Wi-Fi & Bluetooth® combo chip on iMX8 Nano Developer's Kit V3 in Linux

  This guide provides step-by-step instructions to configure the AIROC™ CYW5557x Wi-Fi & Bluetooth® combo chip on the host, to load the FMAC driver, and to establish a Wi-Fi connection between an AP/SoftAP and STA.
- 002-30394: Connectivity technical brief for Linux

  Infineon's Wi-Fi & Bluetooth® or Bluetooth® Low Energy connectivity solutions are integrated into the Linux open-source ecosystem. The supported hardware and software are described in this document, including their features, modes, and limitations.

Glossary

AKM
authentication and key management

AP
access point

ARP
address resolution protocol

CSA
channel switch announcement

DPP
device provisioning protocol

EAPOL
Extensible Authentication Protocol over LAN

mDNS
multicast DNS

NDOE
neighbor discovery offload engine

OCE
Optimized Connectivity Experinence

OWE
opportunistic wireless encryption

P2P
peer to peer

PFS
perfect forward secrecy

PMF
protected management frame

SAE
simultaneous authentication of equals

SAP
soft access point

SCV
server certificate validation

Glossary

TKO
TCP keepalive offload

TLS
Transport layer security

TWT
target wake time

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