AR6002 SDK v2.2.1 RC Release Notes

(Build 2.2.1.83)

December 29, 2009

Table of Contents

1 Overview

This document serves as the Release Notes for 2.2.1 RC release for the AR6002 Software Development Kit(SDK). The Release includes

- Firmware image for the AR6002 SoC
- Source code for the host WLAN driver for Linux Fedora Core 9 with 2.6.25 kernel and modified wpa_supplicant and modified hostapd
- Source code for the host WLAN driver for Android OS and modified wpa_supplicant and hostapd applications
- Source code for the host WLAN driver for Windows Mobile 6.5
- WAPI supplicant binaries for Linux, Android, Windows Mobile 6.5 and RexOS
- AR6002 SDK v2.2.1 RC Release Notes.
- 2.2.1 RC Release Test Results
- AR6000 Family User Guide for Linux
- AR6000 Family User Guide for Windows Mobile 6.5
- AR6000 Family Programmers Guide v2.2

This release provides STA+Soft AP functionally for AR6002 and this release is to enable customers to use it for their application development and testing of their product. This release has gone complete QA testing. The release supports AR6002 rev 2.1 silicon and is tested on SD21/SD22 boards.

2 Release features

Following features are supported in this release.

- STA features
  - Features as in 2.2 release
  - Fixes to the bugs reported in 2.2 RC SDK
  - Low RSSI scan to improve roaming performance
  - STA WAPI feature
  - CCXv4 certifications testing using WM 6.1 for ASDs
- AP Features
  - Features as in 2.2 Release
- Switching between AP mode and STA mode

3 Release Platform

This primary platforms for testing this release is x86 Linux using Fedora Core 9 with 2.6.25 Kernel, SMDK/C100 using Android OS and Samsung SMDK 6400/6410 using Windows Mobile 6.5.

The following platforms were used for Bluetooth Coexistence Tests

1. Qualcomm QSD 8250 platform(BSP 3240 for Android) with AR6002 Rev 2.1 and BTS 4025
2. Qualcomm MSM 7627 platform(BSP xxx for WM 6.6) with AR6002 Rev 2.1 and BTS 4025
3. Qualcomm QSD 8250 platform(BSP for WM 6.5) with AR6002 Rev 2.1 and BTS 4025

4 Testing

This release has undergone Quality Assurance (QA) tests from the Atheros Solutions Product Engineering (SPE) group using a mix of SD21 and SD22 cards..
RC testing was done with the following build packages and the bug fixes have been verified in the subsequent build packages.

- 2.2.1.21 on SMDK6400+WM 6.5 (WiFi testing)
- 2.2.1.28 on Linux/x86 FC9 platform (WiFi testing, WAPI testing)
- 2.2.1.28 on Android/SMDK C100(WiFi testing, WAPI testing)
- 2.2.1.54 on 7627/WM 6.5(BT Coex regression tests)
- 2.2.1.65 on 8250/WM 6.5(BT Coex regression tests)
- 2.2.1.83 on QSD8250/Android(BT coex regression tests)
- 2.2.1.65 on PXAxxx/WM6.1(CCXv4 tests)
- 2.2.1.34 on SMDK6410/WM6.5(WAPI testing)

QA tests include following test suites:

• *x86 Desktop + PCI Ellen/PC ENE + Linux FC9 + SDIO, SMDK C100+Android*

WiFi WPA2
WiFi WMM
WiFi WMM PS (uAPSD)
WPS
VoWiFi Personal
Roaming
Scanning
Performance
Power Consumption

Security
Stress
ARP Offloading
Target Power Management
InterOp with Legacy/11n AP's
Adhoc
WAPI

• ***SMDK6400 + Win Mobile 6.5 + NDIS 5.1 + SDIO***

LTK /CETK
Security MAT
Roaming
Scanning
Performance
WiFi WPA2
WiFi WMM
Stress
WiFi WMM PS (uAPSD)
Power Consumption
CCXv4 on WM6.1
Adhoc
STA WAPI
ARP Offloading
Target Power Management

Extensive BT Coex testing was done during the 2.2 RC Release. For the2.2.1 RC release, the following BT Coex tests were done.

- ***QSD 8250 + Qualcomm Android BSP 3240 + SDIO***
  Bluetooth Co-existence with AR6002 Rev 2.1 and Qualcomm Bluetooth BTS 4025 module(regression testing)
- ***QSD 8250 + Qualcomm WM 6.5 BSP + SDIO***
  Bluetooth Co-existence with AR6002 Rev 2.1 and Qualcomm Bluetooth BTS 4025 module(regression testing)

- ***MSM 7627 + Qualcomm WM 6.6 BSP NDIS 5.1 + SDIO***

Bluetooth Co-existence with AR6002 Rev 2.1 and Qualcomm Bluetooth BTS4025 module (Regression tests)

- ***AP Mode tests on Linux and Windows Mobile 6.5***
  - Basic association tests

- Security mode tests(WEP,WPA,WPA2)
- Power Save Mode tests
- Performance and Stress tests
- Roaming
- Regulatory
- Configuration tests
- Maximum Client Tests

5 Supplicant

Linux/Android testing was done using open source WPA supplicant version 0.5.10 with WPS modifications. WAPI testing was done using the supplicant modified for WAPI feature.

Windows Mobile testing was done using Microsoft WZC supplicant.
For CCX, devicescape Supplicant 2.0.1 was used on Windows Mobile.

6 Hostapd

Linux AP mode testing was done using open source hostapd 0.5.10.

7 Limitations and Known Issues

- The throughput target numbers for WiFi WPA2 and WMM certification tests in x86/Linux have been reduced to 50% of actual target for all latency related tests and to 70% for all throughput related tests.

- The throughput target numbers for WiFi WPA2 and WMM certification tests in Win Mobile/SMDK have been reduced to 35% of actual target for all latency related tests and to 35% for all throughput related tests.

- Bluetooth co-existence is supported only for WLAN – Bluetooth shared antenna configuration. WLAN – Bluetooth Splitter-antenna configuration and dual antenna configuration are not tested.

7.1 Bluetooth Co-Existence Limitations

- When BT is doing scanning and pairing, Wifi could disconnect because BT will occupy the entire medium during scan for several seconds. If WiFi disconnects, it shall reconnect after the completion of inquiry activity.

- Bluetooth supports multiple SCO/eSCO connections. In case of HV3, there could be 3 active connections. However, during coexistence only one connection is allowed. This is most commonly used scenario.

- Bluetooth can establish various types of SCO connections. HV3 (2 slots for SCO + 4 slots idle for Wifi), 2-EV3 (2 slots for SCO + 10 slots idle for Wifi), EV3 (2-slots for SCO +4 slots for Wifi) are the most commonly used connections. However, if headsets establish HV1 or HV2 SCO connections (2 slots for SCO + 0 slots for Wifi), Wifi will not get any time to access the medium and therefore Wifi will not work.

- BT Coexistence supports only one active profile at a time, namely SCO, A2DP or any BT ACL profile.

- In a single-switched antenna configuration since Wifi Rx and BT Tx/Rx paths are not shared, Wifi could miss broadcast and multicast data sent from Wifi AP during that time BT has antenna to do its Tx/Rx activity.

- When BT is doing SCO/eSCO and Wifi is actively sending/receiving traffic, Wifi will stomp high and low-priority BT packets once Wifi sends PS-poll out and is waiting for packet from the AP until a certain timeout value.

7.2 WiFi Defects that have not been fixed in this release

Bug Id	**Description**
63697 63297	In VoWiFi testing, the loss percentage criteria is not met.
65283	In CCXv4 testing using Azimuth setup, test case 10.4.2, uAPSD operation failed with an error message “Trigger frames are not sent”. The scripts report the failure, even though the sniffer captures indicate the presence of trigger frames. Atheros is checking with Cisco on this test.
62809	On 8250/WM 6.5 testing, the Wifi disconnects when the RSSI is 13 or less where as the expected behavior is that WiFi should maintain the link till RSSI reaches a value of 3 or less.
62631	24 hour Rx UDP test did not complete in the QA test bed. However the test passed in a different test bed.
63532	Windows Mobile WMM test in WAPI certification tests failed. WMM tests in 11g mode has issues and so far customers have been using 11b mode for WMM certification.

7.3 BT Coexistence Defects that have not been fixed in this release

Bug ID	Description
65393	On 7627/WM6.6 testing, in the BT FTP+WiFi TCP/UDP test with the device in slave mode, WiFi throughput is low.(less than 1M)
65261	A2DP audio quality degrades when WiFi scan is in progress.
59369	On 8250/WM 6.5, during A2DP audio streaming, if the A2DP connection is torn down and re-established, 8250 platform hangs. This is suspected to be a platform issue.
63610	It is hard to get DHCP address if STA connects to an AP when A2DP streaming is on.
61178	Lower than expected(10M) throughput seen in BT coex performance optimized mode. The rate adaptation algorithm used at the AP has an impact on this. This will have to be validated against various APs.
63072	During 3 hour long duration tests, WiFi traffic stops after sometime(around 90 minutes) in A2DP Coex mode. This issue is suspected to be due to low battery power at the BT device. Under low battery power, the BT deivce will do an inquiry which takes the antenna for the BT.