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WICED Studio Release Notes

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1 Overview

1.1 Scope

This document lists the new features, bug fixes and known limitations of WICED Studio 6.0 SDK software release

1.2 Introduction

WICED Studio 6.0 is the SDK for the Internet of Things (IoT) that combines Wi-Fi and Bluetooth into a single integrated development environment.

In addition to providing WICED APIs and an application framework designed to abstract complexity, WICED Studio 6.0 also leverages many common industry standards.

Benefits/Features:

- Runs on Windows®, Mac® OS X®, and Linux® through Eclipse®-based integrated development environment (IDE)
- Single installer package with support for:
 - Wi-Fi + Bluetooth combo solution
 - Wi-Fi solutions
 - Bluetooth (Basic Rate, Enhanced Data Rate and Bluetooth Low Energy)
- Sample applications for many popular use cases like
 - Connecting to cloud services
 - Audio-over-Bluetooth/Wi-Fi
 - Low-power BLE-based sensors and beacons
 - Smart home gateways
- Code snippets to understand WICED APIs
- Applications for manufacturing and certification

2 New Features

The new features in WICED Studio 6.0 are as follows:

2.1 Documentation

1. Updated WICED-HID-Device-Library.pdf
2. Updated WICED-LED_Display.pdf
3. Enhanced Doxygen annotation to IoT protocols, Audio middleware and BTEWICED stack

2.2 New Chip/Platform Support

None

2.3 Features

2.3.1 Applications

1. [4390x] Added XIP support to allow instructions to be executed in sflash. It's disabled by default and can be enabled by adding 'xip' option to build target. For example, to enable xip of test.console app: test.console-BCM943909WCD1_3-P320-xip download run.

2.3.2 Libraries, Protocols, Drivers

1. [4390x] Flash XIP Support
2. [20706A2]: Wiced_bt_hfp_hf.h: Headset profile support added in HFP library.

2.3.3 Infrastructure

1. WICED Studio installer now uses InstallAnywhere 2017 (instead of IA 2015)
2. WICED Bluetooth Designer is removed (will be added back in 6.1 release)
3. Added KitProg2 UART-USB bridge driver to Wiced Studio.
 - a. Platform support could be via an onboard KP2, like the CY8CKIT_062 or externally via a MiniProg4 or similar.

3 Deprecated Features

1. Removed WICED Bluetooth Designer (will be added back in 6.1 release)
2. Removed NuttX Support
3. Removed FM4_176L_S6E2GM platform support
4. Removed deprecated https_client application (replaced by httpbin_org)
5. Deprecated support for 32-bit Linux OS installer in WICED-Studio.
 - a. Use 64-bit Linux machine.

4 API Changes

4.1 Modified APIs

None

4.2 Added APIs

None

4.3 Deprecated APIs

https_client application related APIs are deprecated

5 Known Issue Fixes

5.1 Applications

None

5.2 Libraries, Protocols, Drivers

1. [all WiFi] Added support to run Bonjour conformance test to handle ethernet cable change.
2. [all WiFi] Added support for fragmented HTTP/2 HEADER frame decoding
3. [Homekit]
 - a. Added Firmware Revision characteristic to the bridge snippet application.
 - b. Increased IP processing thread stack size to 6.5 kB
 - c. Fixes to address Apple R9 adjunct review certification tests
 - d. Added iCloud event logs as part of generic event callback
4. [all WiFi] Resolved Coverity issues to several WICED components\r
5. [all WiFi] Improvements to the ring_buffer utility library
6. [4390x WiFi] Reset sflash controller while deinit_sflash
7. [all WiFi] Added support for DNS address caching
8. [all WiFi] WICED Unified Low power framework that provides callbacks for peripherals/applications/libraries
9. [all WiFi] Added resources_read snippet application
10. [all WiFi] Stability fixes to FreeRTOS
11. [all WiFi] Improvements to BESL/mbedtls fragmentation/reassembly handling
12. [4390x WiFi] Improved gSPI operation
13. [all WiFi] Equip MQTT library to send/receive large buffers in single MQTT frame
14. [all WiFi] Robustness fixes to DTLS, Gedday, DNS and MQTT length checking
15. [all WiFi] Added enterprise roaming support to BESL/mbedtls supplicant
16. [all WiFi] Stability fixes to BESL/mbedtls when running in server mode relating to handling of certain cipher suites
17. [all WiFi] Enhanced BESL/mbedtls to support TLS v1.0 and v1.1 - TLS version support configurable via wiced_defaults.h
18. Deprecated bt_smartbridge app (Replaced by Bluetooth Internet Gateway)
19. Incorporated BT Blueborne security vulnerability fixes to BTEWICED host stack
20. Updated USB VID/PID to use Cypress ID
21. [4390x] Configure sflash to support 1-bit mode by default
22. [all WiFi] Modified AMQP library to receive up to MTU size frames

5.3 Infrastructure

1. WICED SDK resource framework
 - a. Fixed the resource framework issue preventing individual resources such as `clm_blob` to be placed in direct resources. By default, all resources including firmware and `clm_blob` are placed into WICEDFS. If you want to place some resources such as `clm_blob` in direct resources for BCM943364WCD1 platform, do the following:
 - i. Identify the full names for the resources needed to be placed into direct resources. The resource full name is the original name defined in `$(NAME)_RESOURCES` prefixed with “resources/”. For example, the original resource name for production `clm_blob` is “firmware/\$(WLAN_CHIP)/\$(WLAN_CHIP)\$\$(WLAN_CHIP_REVISION)\$(WLAN_CHIP_BIN_TYPE).clm_blob”. Therefore, the full name for production `clm_blob` is “resources/firmware/\$(WLAN_CHIP)/\$(WLAN_CHIP)\$\$(WLAN_CHIP_REVISION)\$(WLAN_CHIP_BIN_TYPE).clm_blob”.
 - ii. In platform makefile, add the list of full names of these direct resources into `INTERNAL_MEMORY_RESOURCES`, separated by whitespace. For above example, add “INTERNAL_MEMORY_RESOURCES = resources/firmware/\$(WLAN_CHIP)/\$(WLAN_CHIP)\$\$(WLAN_CHIP_REVISION)\$(WLAN_CHIP_BIN_TYPE).clm_blob” in `BCM943364WCD1.mk`.
 - b. Note: To place ALL resources including firmware and `clm_blob` into direct resource, change `RESOURCES_LOCATION` to `RESOURCES_IN_DIRECT_RESOURCES` rather than putting the all resources into the `INTERNAL_MEMORY_RESOURCES`.
 - c. Note: To use the WICEDFS on external serial flash, `USES_RESOURCE_FILESYSTEM` should be defined in “platform_config.h” of your platform as “#define USES_RESOURCE_FILESYSTEM”.
2. WICED SDK “download_apps” flag usage for 43364, 43438 and 4343W based platforms

WICED 5.2 or later releases:

 - a. WLAN firmware and CLM blobs are separated.
 - b. By default, WLAN firmware and CLM blobs are placed in WICEDFS on the external flash. Specify “download_apps” in the build target for 43364, 43438 and 4343W based platforms to place WLAN firmware and CLM blobs in WICEDFS on external flash as in the example below:


```
make snip.scan-BCM943364WCD1 download download_apps run
```
 - c. “download_apps” flag enables the WLAN firmware and CLM blobs to be placed on the external flash device. Without this option, it will NOT download WLAN firmware and the CLM blobs as by default they are NOT treated as direct resources anymore.
 - d. If “download_apps” is not specified (just “download run” specified) with WICED 5.2 or later, system will hang as it cannot load WLAN firmware and CLM blob.
 - e. Affected platforms:
 - 43364
 - BCM943364WCD1

- BCM943364WCDA
- 43438
 - BCM943438WCD1
- 4343W
 - BCM4343WWCD1
 - BCM4343WWCD2
 - NEB1DX_01
- f. Optionally, CLM blob can be made a direct resource while leaving WLAN firmware in WICEDFS. This scenario also requires specifying “download_apps” flag.
- g. If both WLAN firmware and CLM blob are made direct resources, there is no need to specify “download_apps” flag.

Prior to WICED 5.2

- a. The WLAN firmware, by default (without specifying “download_apps”), is placed in direct resources which is linked into main application.
 - If the main application along with WLAN firmware cannot fit into the internal flash, make will fail with an appropriate error message.
- b. The user can specify “download download_apps run” to force firmware to be downloaded to external flash.

5.4 Bluetooth Firmware Updates

New CYW20706A2 FW version CYW20706A2_001.002.011.0187

CYW20706A2

1. Fixed Hello sensor: Connection failure with peer apps
2. Fixed Watch: Re-Connection failure with wiced sense kit
3. SIG cert issue) bitrate=0 for AAC should be accepted
4. Fixed Embedded BT stack Blueborne Security Vulnerabilities–CVE#1: CVE-2017-0785
5. Fixed Connection drops with reason LMP/LL response timeout after connection update indication
6. Fixed Handling of two SDP incoming connections simultaneously
7. Fixed Compatibility issue with “FM25Q04” flash for Cypress based 706/7 Modules.
8. Set local BD Address on stack init

5.5 WiFi Firmware Updates

1. New WLAN firmware (5.90.230.22) added for 43362 platforms with KRACK WPA2 fixes
2. New WLAN firmware (7.45.98.38) added for 43364/43438/4343W platforms with KRACK WPA2 fixes
3. New WLAN firmware (7.15.168.101) added for 4390x/54907 platform with KRACK WPA2 fixes
4. New WLAN firmware (6.49.22) added for 43340 platforms with KRACK WPA2 fixes

For more details on the KRACK fixes, refer to “*WiFiSecurityExploits.txt*” document in the WICED SDK.

6 Known Issues:

The list of known issues in WICED Studio 6.0 which are being worked on:

1. CYW4390x Peripheral API usage
 - a. RTC
 - The RTC (Real time clock) API's for CYW4390x is being deprecated due to chip errata for the RTC block on CYW4390x, hence, any APIs under the below location cannot be used.
`Wiced-SDK\WICED\platform\MCU\BCM4390x\peripherals\platform_rtc.c`
 - b. SPI_0 and SPI_1
 - CYW4390x SPI controller (GSIO) has a fixed SPI mode: CPOL 0, CPHA 0, if slave does not support these, or different modes are desired, it is advised to use Bit Banging driver instead.
 - On these SPI peripheral interfaces the hold time is fixed to 25nsec. Slaves that require 25ns or lower hold times will work with the CYW4390x SPI controller.
 - Maximum supported SPI speed is 40Mhz.
 - The SPI_1 cannot be multiplexed with any other GPIO, so it cannot support Bit-Banging driver.
 - The SPI_0 gives option to bit banging driver but the maximum SPI frequency operation on the SPI_0 with bit banging is very low.
 - SPI blocks can be repurposed as I2C, however the WICED SDK does not support this out of the box and certain I2C features may be unavailable when using the SPI blocks as I2C. Cypress does not recommend using the SPI blocks as I2C – the CSC blocks or the bit banging I2C is recommended instead.
 - c. I2C
 - The Cypress Serial Controller hw block has an I2C controller that supports repeated start however it does not support clock stretching
 - Maximum supported frequency is 400Khz
 - I2C_0 can be bit-banged.
 - I2C_1 can not be bit-banged.
2. Secure OTA2, SECURE_SFLASH=1 and SECURE_BOOT=1 is broken and will be fixed in next release.
3. Enterprise security has been verified against IAS server (TLS 1.0) and FreeRADIUS server (TLS 1.0 and TLS 1.2) with EAP-TLS and PEAPv0/MSCHAPv2
4. When WICED DTLS server is configured to use ECC, connection failures may be observed during multiple connect/disconnect sequences. PSK based connections do not exhibit this issue.
5. When WICED device is configured as MQTT client and connects to mosquito server, intermittently unsubscribe ACK packet may time out. To recover, the application may send the unsubscribe request again. This is being investigated and shall be resolved in a future release. This issue is not observed with other MQTT servers.
6. The 802.11n cert test case 5.2.51 fails due to a bug in the sigma_dut application. There are no issues with the underlying WiFi firmware. This will be resolved in a future release.
7. [4390x]: Flash XIP Support – this feature is tested on few sample apps but is not tested for robustness.