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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 6.2 SDK software release

1.2 Introduction

WICED Studio 6.2 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 6.2 also leverages many common industry standards.

Benefits/Features:

1. Runs on Windows®, Mac® OS X®, and Linux® through Eclipse®-based integrated development environment (IDE)
2. 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 6.2 are as follows:

2.1 Documentation

1. CYW920735Q60EVB_01-BaseBoard-Schematic.pdf and CYW920735Q60EVB_01-CarrierBoard-Schematic.pdf is available for CYW20735 Kit.
2. Updated the readme.txt in the install folder: \${INSTALLDIR}\readme.txt
3. Updated version of WICED-SuperMux-Wizard-User-Manual.pdf

2.2 New Chip/Platform Support

1. Added platform support for 20706A2 based CYBT-343026-EVAL board.
2. Added support for CYW920735Q60EVB-01 board.
3. Added support for Arrow QuickSilver EVK Platform (Murata 1GC/CYW43907 based).

2.3 Features

2.3.1 Applications

1. [CYW20719B1] Added LE connection oriented channel sample application.

2.3.2 Libraries, Protocols, Drivers

Bluetooth Audio Hybrid Mode Support (Grouping/Rebroadcast for Logitech)

[CYW20706A2]:

- Added support for sending SBC encoded data starting from the media header to the host.
 - AUDIO_ROUTE_COMPRESSED_TRANSPORT and AUDIO_ROUTE_COMPRESSED_APP routes added to the wiced_audio_route_t enum in the wiced_bt_audio.h
- WICED HCI command - HCI_CONTROL_AUDIO_SINK_COMMAND_CHANGE_ROUTE command added to support changing the route dynamically.

[CYW43907]:

- Support added to receive the encoded SBC data from the BT.
- On change route request, if the streaming is going on, streaming is suspended and change route command is sent from 43907 to A2 and then the streaming is started with the new route.

AWS Library

1. Unified AWS library for AWS IoT Cloud/Greengrass Core connections.

-
2. Can be extended to support different AWS protocols (HTTPS/MQTT/MQTT-Websockets etc.)
 3. Can support one or more MQTT connections.
 - Currently MQTT library limited to support one connection.
 4. Organized AWS data-structures in-line with latest AWS IoT (Thing / Security credentials / Root CA / Greengrass groups)
 5. Changed the layout of AWS IoT applications.
 - Removed usage of MQTT library - using Wiced AWS library instead.
 - Reorg the apps keys/certificates in resources folder.
 - Refactored shadow applications. Removed aws_common.h/c files earlier used by applications.

[4390x] Security Library

1. Upgraded mbedTLS to version 2.6.0
2. Hardware Crypto integration with mbedTLS. Below are the supported hardware crypto features:
 - AES with ECB, CBC, CTR and CFB modes
 - DES with ECB & CBC (only single DES)
 - MD5 to support pure HASH and HMAC operations
 - SHA2 to support pure HASH and HMAC operations
 - SHA1 to support pure HASH and HMAC operations

Coexistence Support

1. Enabled 43364+20719 Coexistence Support
2. Enabled 43364+20706 Coexistence Support

[all WiFi] Enhancements to FreeRTOS/LwIP

1. Upgraded to LwIP 2.0.3
2. Modified auto IP handling in LwIP stack to pass BCT
3. Added websocket library

2.3.3 Infrastructure

1. Upgraded WICED toolchain - GCCv4.9.2 to GNU Arm Embedded Toolchain (Version 7-2017-q4-major) - GCCv7.2.1.
 - a. Moving to latest possible open source GCC toolchain helps with toolchain issues, code optimization and support for advanced/recent ARM Architectures.
2. [CYW4390x]: Download and debug support for Segger Jlink.

3 Deprecated Features

N/A

4 API Changes

4.1 Modified APIs

The following APIs are modified. Please refer to the Doxygen documentation and the referenced header file for definition of the modified API(s).

1. Bluetooth Mesh APIs:

```
common\include\wiced_bt_mesh_core.h
common\include\wiced_bt_mesh_event.h
common\include\wiced_bt_mesh_models.h
common\include\wiced_bt_mesh_provision.h
```

2. 43xxx_Wi-Fi\include\wiced_platform.h

```
wiced_result_t wiced_time_read_8021as(wiced_8021as_time_t* as_time);
```

3. 20719-B1_Bluetooth\include\20719\hal\wiced_hal_pspi.h

Peripheral SPI Driver APIs modified.

4.2 Added APIs

The following APIs are added. Please refer to the Doxygen documentation and the referenced header file for definition of the modified API(s).

1. common\include\wiced_bt_anc.h

```
void wiced_bt_anc_client_process_notification(wiced_bt_gatt_operation_complete_t *p_data);
```

2. 20706-A2_Bluetooth\include\wiced_bt_ancs.h

```
void wiced_bt_ancs_client_process_notification(wiced_bt_gatt_operation_complete_t *p_data);
```

3. 20706-A2_Bluetooth\include\wiced_bt_ble.h

```
wiced_bt_dev_status_t wiced_set_multi_advertisement_scan_response_data( uint8_t * p_data,
uint8_t data_len, uint8_t adv_instance );
```

4. 20719-B1_Bluetooth\include\20719\wiced_bt_ble.h

```
wiced_result_t wiced_bt_ble_get_connection_parameters(wiced_bt_device_address_t bda,
wiced_bt_ble_conn_params_t *p_conn_parameters);
```

5. 43xxx_Wi-Fi\include\wiced_platform.h

```
wiced_result_t wiced_audio_timer_get_nanoseconds( uint32_t audio_sample_rate, uint32_t
*audio_time_secs, uint32_t *audio_time_nanosecs );
```

6. 43xxx_Wi-Fi\include\wiced_rtos.h

```
wiced_result_t wiced_rtos_thread_yield (void);
```

7. 43xxx_Wi-Fi\include\wiced_utilities.h

Added additional helper functions.

8. 20719-B1_Bluetooth\include\20719\wiced_bt_dev.h

```
wiced_result_t wiced_bt_dev_get_remote_name (wiced_bt_device_address_t bd_addr,
wiced_bt_remote_name_cback_t *p_remote_name_result_cback);
```

```
wiced_result_t wiced_bt_coex_enable( uint32_t seci_baud_rate );
```



```
void wiced_bt_coex_disable( void );
```

4.3 Deprecated APIs

1. 43xxx_Wi-Fi\include\wiced_platform.h
wiced_result_t wiced_time_read_8021as_with_audio(uint32_t *master_secs, uint32_t *master_nanosecs, uint32_t *local_secs, uint32_t *local_nanosecs, uint32_t *audio_time_hi, uint32_t *audio_time_lo);
2. 20719-B1_Bluetooth/include/20719/wiced_rtos.h

Deprecated wiced_rtos_timer interface.

5 Known Issue Fixes

5.1 Applications

1. Fix for Android mesh controller crashes when OTA service is not present.
2. [20706 A2] hci_audio_gateway: Fix for connection with Handsfree and SPP is not successful.
3. [20719B1] Low_power_sensor: Fix for device does not wake up on Source Toggling

5.2 Libraries, Protocols, Drivers

1. [CYW4390x]: Fixed issue of XIP mode can't program large file (>1347584 bytes) in sflash.
2. [NetX_Duo]: Fix for stack overflow in DHCP thread.
3. Fix for HomeKit reconnection issue.
4. Fix for HomeKit stop fails on iCloud deinit.
5. Fix for enterprise security memory leak during join_ent & leave_ent.
6. [20706A2] Fix for HomeKit pairing failed with HAT & Home app
7. [CYW4390x]: Apollo BT: Fix for Sinks are getting rebooted frequently when pause/play is done.
8. [all WiFi]: Enterprise: Fix for Failed to associate to IAS server in eap_tls and peap.
9. [all WiFi] BESL - Integrated uECC functions for ECC cipher operations in BESL instead of mbedTLS ECC for performance driven applications (can be configured by the application to pick uECC or mbedTLS-ECC)
10. [CY8CKIT_062]: Fix for Not able to download firmware into the board on windows7, suggest using windows10.
11. [CYW20719B1, CYW20706A2]: Sending/Receiving data from iOS/Windows peer may fail with Serial GATT QT App.
12. [CYW954907]: CERT11AC:5.2.27 Traffic Differentiation in Single BSS with 802.11n STA fails.
13. Fix for mbedTLS: TLS handshake timing for Cipher Suite:
TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
14. [4343w]: Fix for BLE Host mode - central keyboard pairing fails
15. CYW943907AEVAL1F: Fix for Demo.azure_iot_hub app reboots.
16. [20706 A2]: Fix for 'sample_le'(single mode LE) app doesn't start adv after disconnected from client device.
17. [20706A2]: hci_pbap_client: Fix for Unable to connect to iPhone
18. [20706A2]: hci_opp_server: Fix for Unable to transfer file from peer to DUT
19. CYW943907AEVAL1F: Fix for demo.aws.greengrass.publisher app is closing the server connection after publishing a message.
20. [20719B1]: Fix for multi-adv output tx power not being configured properly in wiced_set_multi_advertisement_params api.

21. [43362]: CERT: P2P: Fix for DUT Fails to include P2P IE In beacon after GO NEG.
22. [CYW954907AEVAL1F]: ota_fr: Fix for Factory reset is not working after successful over the air upgrade.
23. [20706 A2]: hci_ble_hid_host: Fix for Connection with BLE mouse gets terminates within 20 seconds.
24. [CYW943362WCD4]: P2P CERT: Fix for DUT Fails to include P2P device ID in Beacons.

5.3 Infrastructure

1. Fix for PSoC 6 doesn't report flash and ram usage correctly.

5.4 Bluetooth Firmware Updates

New CYW20706A2 FW version CYW20706A2_001.002.011.0236

New CYW20719B1 FW version CYW20719B1_002.002.014.0140

CYW20706A2

- Fixes for the following issues:
 - Fix for Null BdAddr if Pairing fail.
 - Fix for COD overwritten when device in Limited Discovery mode.
 - Validated ECDH parameters to prevent MITM exploit.
 - Fix for Memory leak when wiced_bt_a2dp_sink_init() is called twice or more.
 - BTLE_Reg: Fix for failed to create SCO/eSCO/WBS master connection.
 - Fix for Sink audio break issue when sleep enabled
- Enhancements:
 - Minidriver erase written sectors only mode does not work on 32 Meg bet Serial Flash
 - For CVSD use 16K sampling frequency

CYW20719B1

- Fixes for the following issues:
 - Fixed crash when enable LE multi-adv feature.
 - Fix for Debugger Crash with watch_app.
 - Fix for Memory leak when wiced_bt_a2dp_sink_init() is called twice or more.
 - Validated ECDH parameters to prevent MITM exploit.
 - Fix for multi-adv output tx power not being configured properly in wiced_set_multi_advertisement_params api.
 - Fix for Sink audio break issue when sleep enabled.
- Enhancements:
 - Added pwm function into GPIO_set_func API.
 - Completed per antenna RSSI reporting for LE feature and added BLE Switched Diversity implementation.
 - Added wiced api to update coex seci baud rate.
 - Added missing supermux functions in GPIO driver.
 - Added support for the SKY6618 external power amplifier.
 - Updated WICED API to configure TXPU and RXPU.

5.5 WiFi Firmware Updates

4390x/54907

Firmware version: 7.15.168.114

Changes:

- Fix CYW954097AEVAL1F 11AC certification test 5.2.27 issue.
- Fix for low TCP Tx/Rx throughput with ACL
- Synchronize phy watchdog to data flow to avoid packet loss
- Fix Wiced errors setting up softap channel in 5G band

43364/43438/4343W

Firmware version: 7.45.45.50

Changes:

- Coverity Fixes
- Fix for LE connection issue
- Enhanced Krack fix
- Fix for Extended IE handling in assoc request

43340/43340B0.bin

Firmware version: 6.49.26

- Coverity Fixes

43362

Firmware version: 5.90.230.31

- Coverity Fixes
- Softap client number fix
- Fix for adaptivity fix

6 Known Issues:

The list of known issues in WICED Studio 6.2 which are being worked on:

1. WICED SDK uses Eclipse Luna release. This version of Eclipse does not work with Java version 9.0 or higher.
2. CYW943907AEVAL1F: InterOP: Low TX Throughput is seen in 2g legacy mode in PSKTKIP security in TPLINK_WR720N AP.
3. COEX is not supported on CY8CKIT_062 platform. It will be fixed in the next release.
4. CYW20706A2: Unable to perform device discovery in SPI mode.
5. [All WiFi]: Debugger Configuration: "Load Symbols should be marked as checked for platforms that execute code from RAM, CYW4390x based platforms execute code from RAM, while PSoC and ST based platforms execute code from internal flash".
6. 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.
7. With the SECURE_SFLASH=1 compilation, the homekit api's that share the DCT, flash regions are not handled properly. Using this flag breaks few of homekit functionality and the WiFi firmware loading.
8. [CYW943907, CYW4343W, CYW43340]: Enterprise Roaming - PMK Caching fails in peap, eap_tls and eap_ttls security and finally does a fresh association.
9. [CYW43364]: P2P Group Client is unable to associate to Group Owner by pbc and pin association.
10. Enterprise security not supported on CYW43364 Platform.
11. [CYW20719B1]: AFH Channels are not reclaimed as good after WLAN traffic is terminated in LE and BT+LE cases.
12. [CYW20719B1]: Scatternet: Failed to add SCO connection.
13. [CYW20706A2]: Failure to create SCO/eSCO as initiator.
14. [43364 + 20707]: WLAN DUT unable to Scan the AP with ACL/eSCO Slave connection up.
15. [20706A2]: hci_hid_device: Keystrokes are receiving from Hid Host, even after disconnecting from DUT.
16. 20735B1: Ota_fw_upgrade: Getting "error dialogue window" when try to upgrade for the second time on Win10 as peer.
17. CY8CKIT-062(Restful_smart_server): BLE_Device connection is not successful
18. [20719B1 ble keyboard]: On sending keystrokes continuously connection is getting terminated within 20 minutes
19. 20735B1: Low_power_sensor (Type=SDS; Mode=Transport) DUT is getting crashed when try to wake up the device by using button press.
20. In Snip.coap_app with multiple dtls_clients having different PSK identities, SSL/TLS handshake is failing after 3000 iterations of handshake.