



## 变更描述/Description of Change:

### 系统 System

1. 添加确保安全擦除 flash 的 API; Added APIs to ensure erasing the flash safely;  
`bool spi_flash_erase_protect_enable(void)`  
`bool spi_flash_erase_protect_disable(void)`
2. 添加 `-DUSE_OPTIMIZE_PRINTF` 至 `third_party/Makefile`; Added `-DUSE_OPTIMIZE_PRINTF` to `third_party/Makefile`;
3. 从 newlib 2.0.0 中更新 `libc.a` ,从 gcc 4.8.5 中更新 `libgcc.a`; Updated `libc.a` from newlib 2.0.0, and `libgcc.a` from gcc 4.8.5;
4. 移除 ROM Code 中已有功能; Stripped the functions which are already in ROM Code;
5. 添加 `readme` 文档至 `lib` 文件夹, 介绍如何移除原有库; A `readme` file that introduces how to strip the original libraries is added to the `lib` folder;
6. 更新脚本以生成有关 SSL 的 `bin` 文件; Updated scripts to generate SSL-related binaries;
7. 添加 `libm.a` 至 `.irom0.text` 中; Added `libm.a` to `.irom0.text`;
8. 使用 `-ffunction-sections -fdata-sections` 编译库; Compiled some libraries with `-ffunction-sections -fdata-sections`;
9. 修改 `ld` 以添加 `.text.*` 至 `.irom0.text`; Modified `ld` to add `.text.*` to `.irom0.text`;
10. 从 `libmain` 中移除 `time()` 函数; Removed `time()` function from `libmain`;
11. 修复 `deep-sleep` 模式下睡眠参数为 0 或设置长时间睡眠的问题; Fixed the sleep 0 or long-time sleep issue in `deep-sleep` mode;
12. 修复驱动编译问题; Fixed the driver compiling issue;
13. 修复 `ets_delay_us` 声明问题; Fixed `ets_delay_us` declaration;
14. 修复 `os_malloc` 声明问题; Fixed `os_malloc` declaration;
15. 修复系统相对时间不准确的问题; Fixed the issue of the system relative time not being accurate;
16. 修复 FOTA 升级时会擦除 `rf cal` sector 的问题。Fixed the issue of the `rf cal` sector being erased during FOTA upgrade.

### LWIP & espconn

1. [LWIP] 添加 LWIP 源代码至 `third_party` 文件夹; Added LWIP source codes to the `third_party` folder;
2. [LWIP] 重新定义 `lwip` 中的 `err_t`; Redefined `err_t` in `lwip`;
3. [LWIP] 修复 `RST+ACK` 序列码错误; Fixed the sequence number error of `RST+ACK`;
4. [LWIP] 修复 `LWIP_NETIF_TX_SINGLE_PBUF` 使能后发送 TCP 数据包时使用两个以上 `pbuf` 的问题; Fixed the issue of two or more `pbuf` being used when sending one TCP packet with `LWIP_NETIF_TX_SINGLE_PBUF` enabled;
5. [LWIP] 修复单个数据包中 TCP 数据长度大于 1460 的问题; Fixed the issue of the length of TCP data in one packet being more than 1460;

6. [LWIP] 发送 DHCP ACK 后更新 MACADDR 和 IP; Updated MACADDR & IP after sending DHCP ACK;
7. [espconn] 修复 espconn\_sendto 重复发送 UDP 数据包的问题; Fixed the issue of a duplicate UDP packet being sent by espconn\_sendto;
8. [espconn] 允许应用层主动读取 TCP 数据; Allowed the application to actively read TCP data;
9. [espconn] 通信结束后手动获取接收到的数据; Manual fetch of the received data after the communication ends;
10. [espconn] 修复使用 mbedTLS 库时 SSL/TLS 连接 set/clear opt 错误问题。Fixed the SSL/TLS connection set/clear opt error when using the mbedTLS library.

## mbedTLS

1. 添加 mbedTLS 源代码至 third\_party 文件夹; Added mbedTLS source codes to the third\_party folder;
2. 修复 ESP8266 作为 SSL/TLS 客户端运行时可能出现的 mbedTLS 内存泄漏问题; Fixed the issue of mbedTLS having a memory leak in some cases when ESP8266 is running as an SSL/TLS client;
3. 修复有时出现 sent callback 未被调用的问题; Fixed the issue of the “sent callback” function not being called in some cases;
4. 修复在 esp\_cert\_private\_key.bin 中如果 private key 在 cert 之前, 则会加载失败问题; Fixed the load cert failure that occurs if the private key is in front of the cert in the esp\_cert\_private\_key.bin;
5. 修复 disconnect callback 未被调用的问题; Fixed the issue of the “disconnect callback” function being never called;
6. 加快 mbedTLS 握手进程; Speeded up the mbedTLS handshake process;
7. 修复 ESP8266 作为 SSL/TLS 服务器时出现的 already freed 和 exception 异常。Fixed the “already freed” and “exception” errors that occur when ESP8266 acts as an SSL/TLS server.

## AT

1. 更新 AT 版本号为 1.6.2.0; Updated AT version to 1.6.2.0;
2. 添加使能报告信息的新指令 AT+SYMSMSG; Added command AT+SYMSMSG to enable some report information;
3. 添加新指令 AT+CWCOUNTRY; Added command AT+CWCOUNTRY;  
`AT+CWCOUNTRY=<country_policy>,"country_code",<start_channel>,<total_channel_number>`
4. 添加新指令 AT+CIPSERVERMAXCONN; Added command AT+CIPSERVERMAXCONN;  
`AT+CIPSERVERMAXCONN=<num>`
5. 更新指令 AT+CWLAP; Updated command AT+CWLAP;  
`AT+CWLAP =<ssid>[,<mac>,<ch>,<scan_type>,<scan_time_min>,<scan_time_max>]`
6. 更新指令 AT+CWLAPOPT; Updated command AT+CWLAPOPT;  
Mask 0x7F 修改为 Mask 0x7FF ; Mask changed from 0x7F to 0x7FF;
7. 更新 espconn\_recv, 优化 TCP 服务器; Optimized the TCP server by using new espconn\_recv;
8. 修复升级后, 因使用错误 irom string 而导致打印信息出错的问题; Fixed the message-printing error caused

by loading the wrong irom string after the upgrade.;

9. 修复波特率无法设置为 1200 的问题; Fixed the issue of not being able to set the baud rate at 1200;
10. 修复连接 ID 错误时没有报错的问题; Fixed the issue of not returning an error when the link ID is wrong;
11. 修复默认使用 DNS 自动模式的问题; Fixed the issue of the DNS auto mode being used by default;
12. 修复客户端连接数量达到最大承受值时出现的错误连接 ID 的问题; Fixed the wrong link ID issue occurring when the client connection number reaches the maximum limit;
13. 修复最大连接数量超过 5 时出现报错的问题; Fixed the issue of an error being reported when the maximum connection number is more than 5;
14. 修复使用域名创建 UDP 通信时, 提示信息出错的问题; Fixed the incorrect message that appears when creating a UDP transmission by a domain name;
15. 修复 GSLP 长时间休眠的问题; Fixed the long-time sleep issue under GSLP command;
16. 修复如果服务器端有连接建立的同时调用 AT+CIPSTART 会 busy 的问题; Fixed the “busy” error occurring when AT+CIPSTART is called while ESP8266 establishes connections both as a client and a server.
17. 修复 SSID 为 32 字节时查询出错的问题。Fixed wrong SSID query appearing when the length of SSID is 32 bytes.

## Wi-Fi

1. 更新 libphy.a 版本号为 1136; Updated libphy.a to version 1136;
2. 添加设置 WPA2 企业级加密 API; Added APIs to set WPA2 Enterprise identity;  
`int wifi_station_set_enterprise_identity(u8* identity, int len)`  
`void wifi_station_clear_enterprise_identity(void)`
3. 新增被动扫描支持; Added support for passive scan;
4. 新增有关扫描阈值和空闲时间的支持; Added support for scan threshold and dwell time;
5. 添加设置国家码的 API; Added APIs to set country code;
6. 增加支持在扫描 AP 时, 获取更多的信息; Added support for getting more information while scanning for APs;
7. 修复 WiFi KRACK 漏洞; Fixed the WiFi KRACK vulnerability;
8. 修复调用 system\_timer\_reinit 后 softAP 出现错误行为的问题; Fixed softAP wrong behaviors occurring after calling system\_timer\_reinit;
9. 更新 esp\_init\_data\_default.bin 版本号为 v08; Updated esp\_init\_data\_default.bin to v08;  
调整默认目标功耗 (由 esp\_init\_data\_default.bin 的 34th byte 到 39th byte 表示), 降低各级目标功耗, 优化频谱 Mask 和 EVM。Adjusted the default target power (from the 34th byte to the 39th byte in esp\_init\_data\_default.bin), lowered the target power at each level, and optimized the frequency spectrum Mask and the EVM.
10. 增加 Station 模式保持连接的功能; Added the feature of staying connected to AP in Station mode;
11. 添加 softAP 模式分配 station IP 的事件; Added a station IP distribution event in softAP mode;
12. 修复 light-sleep 模式中有时出现的高电流和无法睡眠的问题; Fixed the light-sleep issues related to high

current and failing to sleep in some cases;

13. 修复 softAP 模式下 eapol 的重传机制; Fixed the eapol resend mechanism in softAP mode;
14. 修复某特殊路由器 WPS 验证失败的问题; Fixed the WPS validation failure issue for some special routers;
15. 修正有关 `wifi_set_country` 和 `wifi_get_country` 的 API 描述。Revised the API description of `wifi_set_country` and `wifi_get_country`.

变更影响/Impact of Change:

1. 兼容旧版本 AT 固件, 提升 AT 应用新功能及针对之前版本稳定性进行提升; Improved the AT application-related features and the product's stability, while maintaining compatibility with the old version of the AT firmware;
2. 在 AT 固件中支持最新 SDK 支持的通用功能。The updated AT firmware supports all the general functions supported by the newest SDK.

变更识别方式/ Change Identification Method:

1. 变更前 AT 版本: V1.5.0.0; AT version before the change: V1.5.0.0;
2. 变更后 AT 版本: V1.6.2.0。AT version after the change: V1.6.2.0.

变更前后产品处理:/How to Deal with Products:

FIFO

相关报告/Report(s) Attached:

Related ECN No.: E2018112601

Reliability Report or Plan:

Function Test Report:

RoHS/HF Test Report:

Other Reports (Pls specify):

邮件订阅

Espressif Email Notifications

乐鑫为注册用户提供电子邮件通知服务，用户可通过[乐鑫订阅系统](#)接收技术文档更新、新闻通讯、PCN 等邮件通知。

Espressif sends email notifications of technical documentation changes, along with newsletters, PCNs and other valuable information, to subscribed customers only. If you wish to stay updated on our products and services, please subscribe [here](#).

### 客户响应要求

#### Customer Response Requirements

客户须按照如下要求给予 Espressif PCN 反馈：

Customers are required to respond to Espressif, according to the following guidelines, and confirm receipt of the PCN:

##### 主要变更/For Major Changes:

a) 客户须在乐鑫发出 PCN 后的 30 天内告知已收到 PCN。

Customers should confirm receipt of the PCN within 30 calendar days from the date Espressif sends it to them.

b) 如客户未在接收到 PCN 后的 30 天内告知已收到，则视为客户接受变更。

If customers do not confirm receipt of the PCN within 30 calendar days, they will be regarded as having accepted the proposed changes.

c) 客户告知确认收到 PCN 后，如未在 90 天内反馈其他要求，则视为客户接受变更。

After the customers confirm receipt of the PCN, the lack of any additional responses on their part within 90 calendar days constitutes acceptance of the proposed changes.

##### 轻微变更/For Minor Changes:

a) 如客户未在接收到 PCN 后的 7 天内告知已收到，则视为客户接受变更。

If customers do not confirm receipt of the PCN within 7 calendar days, they will be regarded as having accepted the proposed changes.

请反馈至 [pcn@espressif.com](mailto:pcn@espressif.com)。

Please send feedback to [pcn@espressif.com](mailto:pcn@espressif.com).

### 客户批准/确认信息

#### Customer Approval/Acknowledgement and Remarks

客户公司全称：

Customer's Company Name:

PCN 评审结果/PCN Review Result:

批准/Approval

不批准/Disapproval

需要分析/Further Analysis Required

客户意见/Comment:

公司代表人姓名 Representative's Name:		公司代表人职责 Representative's Job Title:	
公司代表人签名 Representative's Signature:		日期 Date:	