Title: Release Notes
Product: GS2011M/GS2100M Firmware
Version: 5.1.2 BETA Release
Date: 2014 Sep 30

RELEASE NOTE HISTORY

These notes cover the changes since 5.1.1 GA.

The GS2011M/GS2100M Firmware includes the following versions of GainSpan Software products

Code	Version #	Product Description
WFW	5.1.1.7	802.11 MAC/PHY (WLAN) Firmware
GEPS	5.1.2.1	GainSpan Embedded Platform software
S2W	5.1.2.1	Serial to Wi-Fi

Note:

1. GS flash programming tool and Super Block that comes with the package from SDK builder must be used to program the modules.

Supported features

Network Interfaces
* WiFi Station
  - 802.11b/g/n with 802.11n 1x1 HT20 in 2.4GHz
  - WEP-64 Open/Shared, WPA(TKIP), WPA2(AES), WPA2(AES+TKIP) personal security, WPA-Enterprise, WPA2-Enterprise.
  - EAP Type(s)
    * EAP-TLS
    * EAP-TTLS/MSCHAPv2
    * PEAPv0/EAP-MSCHAPv2
    * PEAPv1/EAP-GTC
    * EAP-FAST
  - Standard Legacy and WMM Power save protocols
  - Advanced Switch-To-Active Power Save protocol
  - DTIM and Custom wakeup Intervals for Power Save protocol
  - AMPDU/AMSDU Rx
  - WMM based QoS
  - Association Keepalive with keepalive period configuration
  - Beacon Miss detection with configurable duration
  - Transmit failure indication with configurable fail count
  - Rate Adaptation
  - Tx/Rx Statistics

* WiFi Limited AP
    - 802.11b/g/n with 802.11n 1x1 HT20 in 2.4GHz
    - Supports WEP-64 Open, WPA-Personal(TKIP), WPA2-Personal(AES)
    - Support for 64 STAsin Open security and 16 STAs in WPA2-Personal security.
    - AMPDU Rx for multiple STAs (up to 16 simultaneous sessions)
    - AMSDU Rx
    - Legacy and WMM Power save protocols with power save buffering for up to 64 STAs
    - AP mode power save (sleep between beacons)
    - WMM based QoS
    - L2 forwarding between STAs
    - STA inactivity tracking and disassociation
    - Rate Adaptation
    - Vendor Specific IE support for management frames
    - Tx/Rx Statistics

* Supports following protocols
    - IPv4
    - ARP
    - ICMP
    - UDP
    - TCP
    - DHCP Client
    - DNS Client
    - DHCP Server
    - DNS Server
    - HTTP(S) Client
    - HTTP(S) Server
    - TLS 1.0/1.2 client
    - TLS 1.0 Server
    - mDNS/DNS-SD
    - SNTP Client
    - CoAP Client
    - IGMP (Multicast)

* Supports SSL APIs (TLS v1.0/1.2). The following cipher supported
    - TLS_RSA_WITH_AES_128_CBC_SHA
    - TLS_RSA_WITH_3DES_EDE_CBC_SHA
    - TLS_RSA_WITH_RC4_128_SHA
    - TLS_RSA_WITH_RC4_128_MD5

* Support for Certificate Signed using SHA256 with AES Encryption.

I/O Drivers
* Supports the drivers for the following I/Os
    - SPI
        + Slave (Max clock speed supported 10Mhz)
        + Master (Max clock speed supported 30Mhz)
    - UART (Max baud rate supported 921.6K)
    - SDIO (Max clock rate 33Mhz)
    - PWM

- ADC
- I2C

Power Management
* Supports Standby in Station Mode
* Supports DeepSleep in Station Mode
* Supports DeepSleep in AP Mode

Device Management
* Over the Air FW Update with Digital Signature Verification
* Provisioning
  - Web based Provisioning
  - WPS 2.0
  - Group provisioning (For Android Devices)

Unassociated Mode (Beacon Mode)
* Transmit frames without association
  - Transmit Data, Management and RTS/CTS control frames
  - Transmit timestamp based on 40MHz clock
  - CCA enable/disable, rate, power, channel, etc
* Receive frames without association
  - Receive Frame filter
  - IE based filter for beacon, probe request and response frames

WLAN RF Tests
* Transmit
  Frame transmit with various controls like power, rate, etc
  - TX99, TX100 transmissions
* Receive
  - Frame receive with channel and MAC address controls
  - Statistics display after receive complete/stop

Misc
* Energy Measurement Unit
* ISO TX Support

Reference Applications
* Serial to WiFi
* TLS – Always on sensor application
* TLS Low Power – Low power sensor application

Dependency table
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a. SoC: GS2000 D1
b. Modules: GS2011MxxRev 3.3 or later, GS2100MxxRev 3.2 or later, GS2011MxxS 4.1 or later
c. GS2K_Flashprogram_Plusversion 1.2 beta or later
d. SDK IDE – IAR version 6.5.50

RELEASE NOTES

Release Notes for each product include sections for version, enhancements, modifications and bug fixes:

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+ WFW +
+--------------------------------+

Release

5.1.2.7 – 29 Sep 14

New Features (Since 5.1.1 GA)

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* Advanced Switch-To-Active Power Save protocol

Modifications (Since 5.1.1 GA)

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* Vendor Specific IE support for management frames in AP mode.
* Improved Radio Performance.
* Improved Rx sensitivity.
* Fine tuned Rate Adaptation to improve Tx throughput and reliability in both STA and AP.
* Temperature compensation for TX100

Limitations

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* In Station Mode/Limited AP, WEP 128 Open/Shared does not work
* AMPDU Tx(optional in Wi-Fi Alliance Certification) Not supported
* Unicast data reception does not work in unassociated mode
* Receive sensitivity is not fully optimized; Further optimization planned in next release.

Known Issues
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* 4821: WPS association is failing sometimes to connect with Buffalo WHR-G301N, Linksys APs(E1000, E2000, E2500, E3500, E6200).
* 5130: During large HTTP data transfer after standby, sometimes WLAN reset is seen.
* 5138: WLAN reset occurs in limited AP when deep sleep in enabled during data transfer
* 5148: During TCP data transmission DUT sends ACK packets with Zero MAC Address resulting in dissociation only with Cisco Aironet 1600 AP.

Bug Fixes
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* None

+---+
+ GEPS +
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Release

5.1.2.1 – 29 Sep 14

New Features (Since 5.1.1 GA)
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* Added support for SSL renegotiation. Support for handling SSL session renegotiation on existing/active SSL session.
* DHCP client supports unicast packets from server.
* Hardware Crypto ON/OFF feature added to improve power consumption.

Modifications (Since 5.1.1 GA)
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* Certificate reordering is done in case of SSL. Earlier SSL use to Fail if the certificate chain from the server is not proper.

Limitations
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* None

Known Issues
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* ID 5036: L3 connection fails with TP-LINK TL-340G+ AP
* ID 5041: Sometimes L3 fails with Trendnet TEW-652BRP AP
* ID 5069: Group key renewal is not happening with limited AP.
* ID 4984: Limited AP doesn't give IP address to clients when client count exceeds 50. This issue is seen in a test setup which has a complex mix of client devices being connected (iPads, iPods, smartphones, laptops, GS1011/2011 clients). The issue is not seen when using only GS1011/2011 clients.
* ID 5081: In Long Run, OTA-FWU Push Method Upgrade Procedure is not successful some times. The system continues to work properly after failure of the procedure.
* ID 5089: DHCP Decline is not sent when Duplicate IP address detected

Bug Fixes: (Since 5.1.1 GA)

* ID 5269: System hung during L2 disconnect after WPS failure.
* TCP congestion window calculation issue fixed.
* HTTP server not recovering after send fails due to window full issue fixed.

Serial to Wi-Fi Application

Release

5.1.2.1 – 29 Sep 14

New Features (Since 5.1.1 GA)

* Support I2C AT commands.
* On SPI-DMA interface, added the command response/data buffering/ Flushing so that serial data comes on the host as a single chunk.

Modifications (Since 5.1.1 GA)

* Default wlan retry count modified to 8
* Optimization in the Data Receive callback for better receive throughput.
* Automatic hardware clock gating added to improve power consumption.
* Sending temperature to wlan every 5 seconds added.

Limitation

* Loading of Provisioning and OTAFU Web Pages with HTTPS multiple times is not consistent on Chrome, Firefox.

Known Issues

* ID 5068: Association in TKIP fails when strict security on DUT is changed from AES to TKIP
* ID 5086: Unable to Configure Static ARP entry when DUT is not in associated state
* ID 5023: Additional error prints are observed on the host when HTTPS (client) session open is done with invalid CA certificate
* ID 5010: In unsolicited Rx one byte extra at the end (0x00) is observed
* ID 5059: In Long Run, DUT does not respond to 'at&f' command after 383 iterations of provisioning to client mode. The command at&f is to get the configuration reset to factory defaults for the next iteration of the test
* ID 5097/5142: Sending more than 1KB data using SSL over TCP may stop sending data after several iterations, only headers would be received. Workaround is to send 1KB or less than 1kb chunks of data.
* ATB command behavior is not compatible with GS1011/GS1500 behavior. Workaround is to use SDK builder to set appropriate baud rate.
* ID 5165: With 16 clients connected to Limited AP in WPA-PSK security, during data transfer, observed ARP resolution stops in between data transfer on certain clients even though Limited AP forwards the ARP request packet to the client.

Bug Fixes (Since 5.1.1 GA)

* ID 5254: TCP Disconnect message does not show up, when the connection closed during data transfer.
* ID 5225: DNS request to an unreachable DNS Server is performed and a remote client establishes a connection to an open server port the module deadlocks and does not respond to further commands.
* ID 5226: Dead locks during TCP connect if there is an incoming TCP client connection. If a TCP connect to an unreachable TCP Server is performed and a remote client establishes a connection to an open server port the module deadlocks and does not respond to further commands.
* ID 5228: Module does not react on ping if connect occurred after flow-control off was sent.

GainSpan Corporation
3590 N. First Street
Suite 300
San Jose, CA 95134
Tel: +1 (408) 627-6500
Info@GainSpan.com