Product:	RTL8196C/RTL8198 11n Firmware
Version:	2.5
Date:	June 03 2011

Description:

Realtek provides the turnkey solution for 11n Router/AP in hardware and software. The firmware could be adopted in Realtek EV (evaluation) board, or platforms designed according to Realtek reference circuit.

The current release firmware has only supported for router package. Will add AP package support in the future.

The release firmware image has been included in the package of CMK (Customization Kit). This kit will allow customers to modify the web pages and configuration settings to the target system as their need.

The following sections will describe the hardware requirements, firmware features, to-do list, and the release history.

Hardware Supported:

Realtek 11n FE Router/AP EV board:
- RTL8196C – SoC, including a CPU, Ethernet switch controller, and PCIe interface, USB 2.0 Host interface
- RTL8192CE/RTL8188CE/RTL8188RE/RTL8192D – 802.11 a/b/g/n 2x2/1x1 MAC/BB/RF controller
- SDRAM – 16M bytes SDRAM (16bits) /32M bytes SDRAM(16bits)
- SPI Flash – 2M/4M bytes(note)

Note: SPI flash could support for:
MX25L1605D, MX25L3205D, MX25L6405D, MX25L12805D, MX25L1635D, MX25L3235D, MX25L6445E , MX25L12845E , S25FL016A, S25FL032A, S25FL064P, EN25F16, EN25F32, EN25Q16, EN25Q32，SST25VF032B，GD25Q16，GD25Q32，W25Q16，W25Q32，W25X32 , W25X64 , AT25DF161

Realtek 11n GbE Router/AP EV board:
- RTL8198 – SoC, including a CPU, Ethernet switch controller, PCIe, USB 2.0 Host interface
- RTL8192CE/RTL8192D– 802.11 a/b/g/n MAC/BB/RF controller
- DDR1/DDR2– 32M bytes (note1)
- SPI Flash – 4M bytes (note2)

Note1: could support Samsung, Nanya, Promos, ISSI and Elpida.
Note2: SPI flash could support for:
MX25L1605D, MX25L3205D, MX25L6405D, MX25L12805D, MX25L1635D, MX25L3235D, MX25L6445E , MX25L12845E , S25FL016A, S25FL032A, S25FL064P, EN25F16, EN25F32, EN25Q16, EN25Q32，SST25VF032B，GD25Q16，GD25Q32，W25Q16，W25Q32，W25X32 , W25X64 , AT25DF161

Hardware Limitation:

Although the 8196C EV board use 2M/16M Flash/SDRAM for 8196C+8192C/8188, the free size is too less, so 4M/32M are recommend..

8196C+8192D(pocket AP with 92D support) EV board use 4M/32M Flash/SDRAM.

Firmware Feature Supported:

- 802.11 a/b/g/n Access Point, WiFi compliant
- 802.1x, WEP, WPA TKIP and WPA2 AES/Mixed mode for PSK and TLS (Radius)
- Wireless Auto-channel selection
- WMM and WMM-APSD supported
- WDS supported with WEP, TKIP and AES encryption
- WPS supported in AP and client mode
- IAPP supported
- 802.11 a/b/g/n client mode
  - Support infrastructure mode and ad-hoc mode with roaming capability
  - Support wireless security for WEP, WPA TKIP and WPA2 AES PSK
  - Support MAC Clone (single Ether device) and NAT2.5 (Multiple Ether clients)
  - Support site survey scan and manual connect
  - Support WPA/WPA2 PSK client
  - Support 802.1X
- Wireless ISP supported (set wireless interface on WAN interface)
- Support universal repeater mode
- Wireless access control by MAC address (deny or accept)
- Support multiple SSID and guest access (note 1)
- 802.1d with spanning tree protocol
- TCP/UDP/ICMP/ARP protocol stack
- NAT/NAPT. ALG for: FTP, NetMeeting, SIP, VPN pass-through with multiple sessions (IPSEC, L2TP, PPTP)
- Firewall
- Virtual DMZ
- DHCP client and server
- PPPoE
- PPTP client
- L2TP client
- web server
- DNS relay
- UPnP IGD
- IPSec/VPN gateway and NAT traversal
- DDNS
- NTP client and daylight saving supported
- URL Filtering and DoS (Deny of Service)
- QoS supported by IP or MAC address
- Routing support for RIP1, RIP2 and static route
- System log
- IGMP proxy and snooping
- Support 802.1Q VLAN for Ethernet and wireless
- WAPI support
- SAMBA support
- DLNA support(note 2)
- MLD snooping support

- USB 3G module support
- Hostapd support
- GDB server support
- HTTP server file support
- SNMP support
- FTP server support

Note1: It could support up to 5 AP SSID (including primary) in the same time. Each virtual SSID could be configured with different security, WMM, data rate, band and port access (LAN or WAN). When using multiple SSID, the MAC address of each AP must be pre-configured with a unique address.

Note2: 8196C platform don't support DLNA now.

To-Do List:
- Pass Win7 logo test
- Wireless operation mode for Mesh
- TR069
- DLNA support on 8196C platform

Release History:

** Gateway/AP firmware v2.5 – June 03, 2011 **
- Wireless LAN driver changes as:
  - Fine tune for 92D
  - Fine tune for intel power saving issue
  - Fine tune for Wi-Fi 11n Client logo
  - Fine tune for VeriWave testing
  - Fine tune client mode site survey rule
  - Fine tune ipv6 pass through
  - Fine tune for iwlist scan issue
  - Fine tune for TIM issue
  - Fine tune for WIFI Logo
  - Fine tune for 92D Downlink Performance
  - Fine tune for Efuse
  - Add key ID support for WDS WEP security
  - Add wpa_Supplicant support
  - Add DFS support for 92D
  - Add Antenna diversity
  - Bug fix for beacon error after WPS success when disable broadcast SSID
  - Bug fix for MIC error when client mode
  - Bug fix for High power PA
  - Bug fix IOT issue with AR5007
  - Bug fix 92D TP issue with Intel
  - Bug fix excluded DS IE checking for beacon statistic in client mode at 5G band connection
  - Bug fix tx rate adaptive bitmap setting for short GI
  - Bug fix do NOT perform APK when in MP mode.
  - MP Single Tone for High Power Demoboards

- Add SNMP support
- Add WLAN config file support for 92D
- Add 802.1X client mode support for 92D
- Add 8197B demo board support
- Add 8196CS(iNIC) support
- Add 8198 pure AP package support
- Add FTP server support
- Add WAPI support for 92D
- Add fastpath SPI (stateful packet inspection) support
- Add rtk_cmd support to communicate user application and kernel
- Fine tune WSC for 92D and 92C+92D case
- Fine tune for SAMBA performance
- Fine tune for QoS
- Fine tune for telnetd support
- Fine tune for CONFIG_RTL_STP
- Fine tune for 92D WISP mode
- Fine tune for L2TP connect issue and connect to L2TP server immediately after power on
- Fine tune for DHCP request flow
- Bug fix for two VoIP phone which connect to eth0 communicate fail
- Fine tune fastpath(note 1)

Note1: the fastpath related code has been moved from linux-2.6.30/net/ipv4/fastpath to linux-2.6.30/net/rtl/fastpath.

** Boot code v1.1f –May 26, 2011 **
- Add image size check.

** Gateway/AP firmware v2.4 – Nov 15, 2010 **
- Wireless LAN driver changes as:
  - Fine tune for 8192D
  - Fine tune high power demo board
  - Enhance beacon tx
  - Fine tune for auto channel side band
- Fine tune wireless LAN schedule
- Fine tune WSC for dual MAC dual PHY support
- Hostapd support
- GDB server support
- HTTP server file support
- Two SPI flash support

** Boot code v1.1g –Nov 15, 2010 **
- Two SPI flash support

** Gateway/AP firmware v2.3.1 – Oct 15, 2010 **
- Wireless LAN driver changes as:
  - Fix the issue of power tracking error after driver is re-initialized

- ➢ Fix connection issue of virtual AP when repeater mode is used
- ➢ Refine EDCA dynamic setting of VI for Wifi logo test
- ➢ Prevent broadcast/multicast storm attack
- ➢ Fix the issue that virtual AP will report wrong channel in Beacon when auto channel is used
- ➢ Fine tune the performance of video multicast streaming
- ➢ Update external high power PA setting
- ➢ Add LNA support
- ➢ Fix the WPS connection issue in AP client mode
- ■ Fine tune system stability during stress test
- ■ Fine tune PCIe setting to fix the failure issue during operation in high temperature
- ■ Fix bug for IGMP
- ■ Fix iptables compile error on some OS
- ■ Fix L2TP dial on-demand issue

** Boot code v1.1g –Oct 15, 2010 **
- ■ Fix the issue that slowly press ESC key in boot code console will cause the boot code hang.

** Gateway/AP firmware v2.3 – Aug 20, 2010 **
- ■ Wireless LAN driver changes as:
  - ➢ RTL8192D support
  - ➢ WAPI support
  - ➢ Add IPv6 pass-through in client
  - ➢ Improve wlan driver stability
  - ➢ Refine EDCA dynamic setting of VI for Wi-Fi logo test
- ■ New SPI flash model support
- ■ MLD snooping support
- ■ Client mode 802.1x support
- ■ DLNA support
- ■ Update specific MIB value when updating firmware support
- ■ Update firmware with default setting from WEB support
- ■ USB 3G module support
- ■ Dual RTL8192CE support
- ■ Pocket AP support
- ■ Domain name query support for pocket AP
- ■ Repeater mode WPS support
- ■ Speedup USB performance using IRAM, Speedup SAMBA performance with bypass netfilter.
- ■ Enhance WLAN site survey.
- ■ Refine for ipv6 passthru
- ■ VLAN priority support

** Boot code v1.1f –Aug 20, 2010 **
- ■ New SPI flash model support

** Gateway/AP firmware v2.2.2 – July 26, 2010 **
- ■ Wireless LAN driver changes as:
  - ➢ Fix some IOT issue in both AP and client mode

- Add support for external PA
- Fine tune RF setting
- Improve wlan driver stability
- Add mechanism to detect wifi client shutdown abnormally
- Fix encryption key mismatched issue when a client is associated more than 1 day
- Fix an issue that virtual AP will be disabled when root AP is done with a WPS client
- Fine tune Ethernet PHY setting
- Fix PPPoE dial up issue
- Fix IGMP multicast storm issue.
- Fix RTL8198 reset button issue.
- Fix RTL8198 wlan sta access internet issue
- RTL8198 enable SAMBA support by default setting
- Fix ping issue when disable CONFIG_RTL_IPTABLES_RULE_2_ACL

** Boot code v1.1d –July 2, 2010 **
- Fine tune Ethernet PHY setting

** Gateway/AP firmware v2.2.1 – Jun 4, 2010 **
- Wireless LAN driver changes as:
  - Fix connection issue with iPhone 3GS
  - Fix DTIM broadcast bit didn't be set if broadcast packets are queued in MBSSID interfaces
  - Fix bug of handling QoS Null Data in WMM-PS
  - Add mib to control t/r switch
  - Fix beacon content error in MBSSID interfaces
  - Enable user specify multicast rate used
  - Add GPIO8 LED2 lighting pattern 12
  - Enable config EDCA parameters manually
- Fix client Mode WPS bug.

** Gateway/AP firmware v1.1c – May 9, 2010 **
- Wireless LAN driver changes as:
  - Add Japan 2.4G band (safety) spec support
  - Fix Repeater mode connection issue in 20M mode
  - Add ad-hoc client mode support
  - Forbid WEP encryption used in 11N mode
  - Fine tune some IOT issue
  - Fix WPS issue that WZC will connect AP in 802.1x under WEP encryption
- Fine tune Ethernet PHY setting
- Add RTL8198 formal chip platform support
- Add hardware NAT support on RTL8198(note1)
- Add 802.1Q VLAN support

Note1:

Only RTL8198 platform support hardware NAT, RTL8196C platform don't support this feature.

** Boot code v1.1b– May 9, 2010 **
- Add RTL8198 formal chip support
- Add low speed SPI flash support

** Gateway/AP firmware v2.1 – Feb 4, 2010 **
- Wireless LAN driver changes as:
  - Add client, repeater and WISP support
  - Fine tune performance
  - Fix some bugs in WDS mode
- Support Microsoft Windows 7 Logo for wireless router
- Add RTL8198 platform support
- Add support for DNS over TCP
- Fix the QoS bug by MAC address in UDP type
- Fix web access bug that user still can access web page after applying cancel button in login

** Boot code v1.1– Feb 4, 2010 **
- Add RTL8198 support
- Auto detect flash type

** Gateway/AP firmware v2.0 – Dec 30, 2009 **
First Release

** Boot code v1.0 – Dec 30, 2009 **
First Release