

Product: RTL 8196c 11n Firmware
Version: 1.2
Date: April 26, 2010

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
- RTL8192CE/RTL8188CE/RTL8188RE – 802.11 b/g/n 2x2/1x1 MAC/BB/RF controller
- SDRAM – 16M bytes SDRAM (16bits)
- SPI Flash – 2M bytes

Note: SPI flash could support for:

MXIC (single IO) with 50M Hz: MX25L1605D, MX25L3205D, MX25L6405D, MX25L12805D

MXIC (single, dual and quad IO) with 104M Hz: MX25L3235D, MX25L1635D

SST (single IO) with 50M Hz: SST25VF040B, SST25VF016B, SST25VF032B, SST25VF040B

EON (single IO) with 50M Hz: EN25P64

Winbond (single IO) with 50M Hz: W25Q16

Firmware Feature Supported:

- 802.11 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
- WDS supported with WEP, TKIP and AES encryption
- WMM and WMM-APSD supported
- WPS supported in AP and client mode
- IAPP supported
- 802.11b/g/n client mode
 - Support infrastructure 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
- Wireless ISP supported (set wireless interface on WAN interface)
- Support universal repeater mode (one wlan interface used as AP and client concurrently)
- Wireless access control by MAC address (deny or accept)
- Support multiple SSID and guest access (note1)
- 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
- Support wireless router in 8M SDRAM platform (note2)

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: Since the memory constraint of FLASH/DRAM, some router features are disabled or limited in the system configuration as shown in the following table.

FLASH/DRAM	2M/8M	2M/16M
Feature		
Max SSID number	<i>1(primary)+1(virtual)</i>	<i>1+4</i>
Max WDS number	<i>4</i>	<i>8</i>
Max wireless associated client	<i>16</i>	<i>32</i>
Wireless operation mode	<i>N/A</i>	<i>Client, Repeater and WISP</i>
Web pages	<i>Merged with Linux image</i>	<i>A dedicated Flash bank</i>
Max NAT session number	<i>1024</i>	<i>4096</i>
Windows 7 Logo	<i>N/A</i>	<i>Yes</i>

To-Do List:

- Pass Win7 logo test
- Wireless operation mode for Mesh
- Wireless encryption for WAPI
- TR069

Release History:

**** Gateway/AP firmware v1.2 – April 26, 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
 - Support 11n WiFi 1x1 and 2x2 logo
 - Fix WPS issue that WZC will connect AP in 802.1x under WEP encryption
- Fix the Ethernet driver bug that Ethernet WAN can't receive unicast packet when MSB bit is asserted in WAN port MAC address
- Fine tune Ethernet PHY setting
- Add AP package (bridge) in 1M/8M Flash/SDRAM configuration
- Add pocket AP/Router support

**** Boot code v1.1c – April 26, 2010 ****

- Add low speed SPI flash support

**** Gateway/AP firmware v1.1b –March 31, 2010 ****

- Wireless LAN driver changes as:
 - Add support for 8192CE (2x2) formal chip
 - Fine tune performance and range testing
 - Improve interoperability
 - Add power tracking feature
 - Fix client mode reconnection in wrong bandwidth issue
 - Fix client mode multicast decryption error issue
- Fix the IP multicast and layer2 forwarding table issue in bridge and Ethernet driver
- Fine tune Ethernet PHY parameters

**** Boot code v1.1b –March 31, 2010 ****

- Remove some unused code to reduce code size
- Enable HTTP server in default config
- Fine tune Ethernet PHY parameters
- Modify some parameters for SDRAM setting

**** Gateway/AP firmware v1.1a –March 1, 2010 ****

- Modify timer register data to enlarge timer scale
- Change Ethernet PHY setting for optimization
- Change for formal wireless 8188c chip in wireless driver

**** Boot code v1.1a –March 1, 2010 ****

- Enhance 8196C reliability for temperature corner case
- Modify timer register data to enlarge timer scale for 8196c Revision-B chip
- Change memory controller setting for SDRAM Tx/Rx delay
- Change Ethernet PHY setting for optimization for 8196c Revision-B chip

**** Gateway/AP firmware v1.1 – January 15, 2010 ****

- Wireless LAN driver changes as:
 - Add client, repeater and WISP support
 - Fine tune performance
 - Fix some bugs in WDS mode
- Add support for DNS over TCP
- Fix the QoS bug by MAC address in UDP type
- Add a package to support wireless router in 8M DRAM size
- Fix web access bug that user still can access web page after applying cancel button in login
- Fix some web browse issue in Safari

**** Gateway/AP firmware v1.0a – December 28, 2009 ****

- Wireless LAN driver changes as:
 - Add WDS and multiple SSID support
 - Fine tune performance and improve stability
 - Fine tune wireless inter-operability
 - Fix Tx fragment bug
- Fine tune Ethernet driver to improve stability
- Add 802.1Q VLAN support

**** Boot code v1.0a –December 28, 2009 ****

- Fix SPI Flash erase issue when written size is equal to sector size

**** Gateway/AP firmware v1.0 – November 20, 2009 ****

First Release

**** Boot code v1.0 – November 20, 2009 ****

First Release