RT2501USB Software Release Note

Product Name	RT2501USB Wireless Adaptor
Interface Supported	USB 2.0
Install Package Version	
Driver Version	1.3.2.8
User Interface Version	None
Date	2008-12-12

1. Introduction

This document shows you how to setup the Ralink RT2501USB series driver in Windows CE 5.0/6.0. Check the blog for more information http://ralinkce.blogger.com.

2. Hardware Requirement

The adapter which made by Ralink RT2573 chipset is supported. Check the link the link http://ralinkce.blogspot.com/2007/05/support-manufacturerdevice-list-for.html to find your hardware is supported or not.

3. Software Requirement

1. Platform Builder 5.0 or VS2005+Windows CE 6.0
2. Windows CE 5.0/6.0 QFE20061231 is a plus. The WPA2 is supported after this QEF.
3. Windows CE5.0/6.0 QFE2007M6 is a plus. The EHCI host driver is updated in this QFE.

4. Wireless Features

- Infrasturcture(Station mode)
  i. Open/None
  ii. Open,Shared/WEP
  iii. WPA-PSK/TKIP,AES
  iv. WPA2-PSK/TKIP,AES(i)
  v. WPA/TKIP,AES
  vi. WPA2/TKIP,AES(i)
- Adhoc(Station mode)
  i. Open/None
  ii. Open,Shared/WEP
  iii. WPA-None/TKIP
- AP Mode
  i. Open/None
  ii. Open,Shared/WEP
  iii. WPA-PSK/TKIP,AES
  iv. WPA2-PSK/TKIP,AES, TKIPAES(Mixed)
  v. WPA1PSKWPA2PSK/ TKIP,AES
- WPS Enrollee(Station mode only)
  i. PIN
  ii. PBC
- Ratool
  Ralink Wireless Configure Tool for CMD

Note:
(i). To support WPA2 security feature, Windows CE 5.0/6.0 QFE20061231 is necessary.

5. How to Build Driver into Your Image(NK.BIN)

1. Put *.dll and *.bin in your \WINCE600\PROJECT\XXXXX\RelDir\
2. Add *.bib and *.reg into your project
3. Change your reg file if you want to change driver default parameters.
4. Rebuild your image
5. After start up, WZC Auto-config will pop up

6. Registry Setting Description

1. Please change REG FILE and match your desired device

```
[HKEY_LOCAL_MACHINE\Comm\RT2501USB]
    "DisplayName"="Ralink RT2501USB Wireless LAN Driver"
    "Group"="NDIS"
    "ImagePath"="RT2501USB.DLL"

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\Default\Default\Default\RT25
01USB]
    "Dll"="RT2501USB.DLL"

[HKEY_LOCAL_MACHINE\Drivers\USB\ClientDrivers\RT2501USB]
    "Dll"="RT2501USB.DLL"
```

2. AP Mode Registry Setting Example:

```
[HKEY_LOCAL_MACHINE\Comm\RT2501USB1\Parms]
    "OpMode"=dword:1
    "Channel"=dword:1    ; 1~14
    "SSID"=" RalinkAP-WinCE"    ; Max 32-char ascii
    "AuthenType"=dword:0
;       0: OPEN
;       1: SHARED
;       4: WPA-PSK
;       7: WPA2-PSK
;       9: WPAPSK-WPA2PSK
    "Encryption"=dword:1
;       1: NONE
;       0: WEP
;       4: TKIP
;       6: AES
;       8: TKIPAES
    "WEPKeyUse"=dword:2    ; 1~4
;       Must be 2 if your AuthType is wpa-psk or wpa2-psk
     "WEPKey1"="12345ABCDE"
;       10-char hexadecimal for WEP40
     "WEPKey2"="QWERT"
```

```
;       5-char ascii for WEP40
    "WEPKey3"="1234567890ABCDEFABCDEF1234"
;       26-char hexadecimal for WEP128
    "WEPKey4"="ABCDEFGHIJKLM"
;       13-char ascii for WEP128
;
;       WEP KEY, 5-char ascii or 10-char hexadecimal for WEP40
;               13-char ascii or 26-char hexadecimal for WEP128


"WPAPSK"="432985e9d4167362a98f3598f17285dd23f8403171f679c2bece83c6c78b34
c9"
;       WPA-PSK or WPA2-PSK's 64-char hexadecimal PMK only
```

Note:

(i). Rebuild the image and load to platform.

(ii). After system started, the driver will be loaded and AP will load the settings in registry.

(iii)The auto-config utility for wireless is not work when wireless driver works under AP mode.

(iv). AuthType and Encryption Combination as bellows:

OPEN/NONE

OPEN/WEP

SHARED/WEP

WPA-PSK/TKIP

WPA-PSK/AES

WPA2-PSK/TKIP

WPA2-PSK/AES

WPA2-PSK/TKIPAES

WPAPSKWPA2PSK/TKIP

WPAPSKWPA2PSK/AES

(v). Pass phrase need use wpa_passphrase.exe to generate the PMK in registry

(vi). Internet Connection Sharing in CE can be enable for Software AP, detail can be found in help file or MSDN.

7. Ratool Description

Ratool is a wireless utility for Windows CE command shell. Ratool is from wzctool and add more private Ralink OID functions. User can use this tool to make more detail about Ralink wireless driver.

AP Command Example

1. OPEN/NONE

```
> ratool -ap RT2501USB1 -auth open
> ratool -ap RT2501USB1 -encr none
> ratool -ap RT2501USB1 -ssid RalinkAP
```

2. OPEN(SHARED)/WEP40 - 5-CHAR ASCII WEP KEY

```
> ratool -ap RT2501USB1 -auth open(shared)
> ratool -ap RT2501USB1 -encr wep
> ratool -ap RT2501USB1 -key 1/remove(optional)
> ratool -ap RT2501USB1 -key 1/12345
> ratool -ap RT2501USB1 -ssid RalinkAP
```

3. OPEN(SHARED)/WEP40 - 10-CHAR HEXA WEP KEY

```
> ratool -ap RT2501USB1 -auth open(shared)
> ratool -ap RT2501USB1 -encr wep
> ratool -ap RT2501USB1 -key 1/remove(optional)
> ratool -ap RT2501USB1 -key 1/12345abcde
> ratool -ap RT2501USB1 -ssid RalinkAP
```

4. OPEN(SHARED)/WEP128 - 13-CHAR ASCII WEP KEY

```
> ratool -ap RT2501USB1 -auth open(shared)
> ratool -ap RT2501USB1 -encr wep
> ratool -ap RT2501USB1 -key 2/remove(optional)
> ratool -ap RT2501USB1 -key 2/abcdefghijklm
> ratool -ap RT2501USB1 -ssid RalinkAP
```

5. OPEN(SHARED)/WEP40 - 26-CHAR HEXA WEP KEY

```
> ratool -ap RT2501USB1 -auth open(shared)
> ratool -ap RT2501USB1 -encr wep
```

```
> ratool -ap RT2501USB1 -key 3/remove(optional)
> ratool -ap RT2501USB1 -key 3/1234567890123456789abcdef
> ratool -ap RT2501USB1 -ssid RalinkAP
```

6. WPA-PSK(WPA2-PSK)/TKIP(AES) - 8~63-CHAR ASCII PASSPHRASE

```
> ratool -ap RT2501USB1 -auth wpa-psk(wpa2-psk)
> ratool -ap RT2501USB1 -encr tkip(aes)
> ratool -ap RT2501USB1 -ssid RalinkAP
> ratool -ap RT2501USB1 -wpapsk 1234567890abc…xyz…ABC…XYZ
> ratool -ap RT2501USB1 -ssid RalinkAP
```

7. WPA-PSK(WPA2-PSK)/TKIP(AES) - 64-CHAR HEXA KEY

```
> ratool -ap RT2501USB1 -auth wpa-psk(wpa2-psk)
> ratool -ap RT2501USB1 -encr tkip(aes)
> ratool -ap RT2501USB1 -wpapsk 1234567890abcdef…1234567890abcdef
> ratool -ap RT2501USB1 -ssid RalinkAP
```

WPS Command Example:

1. Configure with PIN mode:

```
> ratool -disablewzcsvc RT2501USB1
> ratool -wps RT2501USB1 -info    ; PIN will be listed
> ratool -wps RT2501USB1 -bssidlist
  Key PIN on Registrar(i)
> ratool -wps RT2501USB1 -pin YourSsid
> ratool -wps RT2501USB1 -status auto
> ratool -wps RT2501USB1 -profile 1(ii)
> ratool -enablewzcsvc RT2501USB1
```

(i). Enter the Enrollee PinCode on the Registrar and start WPS on the Registrar.

Note: How to get the Enrollee PinCode? Use 'ratool -wps RT2501USB1 -info' on the Enrollee.

(ii). If the registration is successful, the Enrollee will get the configure profiles. The Enrollee can connect to the AP with these new parameters.

2. Configure with PBC mode:

```
> ratool -disablewzcsvc RT2501USB1
> ratool -wps RT2501USB1 -info
```

```
> ratool -wps RT2501USB1 -bssidlist
Push button on Registrar(i)
> ratool -wps RT2501USB1 -pbc [Or push hardware button on wireless card]
> ratool -wps RT2501USB1 -status auto
> ratool -wps RT2501USB1 -profile 1(ii)
> ratool -enablewzcsvc RT2501USB1
```

(i). Start PBC on the Registrar.

{ii). If the registration is successful, the Enrollee will get the configure profiles. The Enrollee can connect to the AP with these new parameters.

8. Wi-Fi Protected Setup Overview

This section presents a high-level description of the Wi-Fi Protected Setup(WPS) architecture. Figure 1 depicts the major components and their interfaces as defined by Wi-Fi Protected Setup Spec. There are three logical components involved: the Registrar, the access point (AP), and the Enrollee.

The Enrollee is a device seeking to join a WLAN domain. Once an Enrollee obtains a valid credential, it becomes a member.

A Registrar is an entity with the authority to issue and revoke domain credentials. A registrar can be integrated into an AP.

The AP can be either a WLAN AP or a wireless router.

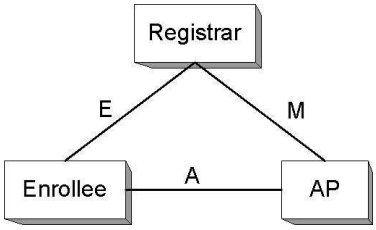

Figure 1. Components and Interfaces

Registration initiation is ordinarily accomplished by a user action such as powering up the Enrollee and, optionally, running a setup wizard on the Registrar (PC).

9. Appendix

1. WZC Autoconfig source code is under \WINCE600\PUBLIC\COMMON\OAK\DRIVERS\NETUI\
2. WZCTOOL source code is under \WINCE600\\PUBLIC\COMMON\OAK\DRIVERS\NETSAMP\WZCTOOL\
3. In AP mode, you can add the Internet Connection Sharing or Bridge feature in you Windows Kernel.