



RALINK TECHNOLOGY, CORP.

RT61 Software Release Note for WinCE

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Product Name	RT61 Wireless Adaptor
Interface Supported	PCI, miniPCI
Install Package Version	
Driver Version	1.2.5.19
User Interface Version	None
Date	2008-11-20



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1.	Introduction.....	4
2.	Hardware Requirements.....	4
3.	Software Requirements	4
4.	Wireless Features	5
5.	Build Image (NK.BIN) Instructions	6
6.	Registry Setting Descriptions	7
7.	RATOOL Descriptions	9
8.	Wi-Fi Protected Setup Overview	12
9.	Appendix.....	13



1. Introduction

This document guides you how to setup the Ralink RT61 series driver in Windows CE operating system. Please refer to the blog for more information:

<http://ralinkce.blogspot.com/>.

2. Hardware Requirements

The adapters (made with the Ralink RT61 series chipset) are supported:

1. Ralink RT2561 (Vender ID = 0x1814 & Device ID = 0x0301)
2. Ralink RT2561S (Vender ID = 0x1814 & Device ID = 0x0302)
3. Ralink RT2661 (Vender ID = 0x1814 & Device ID = 0x0401)

3. Software Requirements

1. Platform Builder 5.0 or VS2005+Windows CE 6.0
2. Windows CE 5.0 QFE20061231 is a plus. The WPA2 is supported after this QEF.



4. Wireless Features

- Infrastructure(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
 - WPS Enrollee(Station mode only)
 - i. PIN
 - ii. PBC
 - Ratool
- Ralink Wireless Configure Tool for CMD

Note:

(i). Windows CE 5.0 QFE20061231 is necessary to support WPA2 security features.



5. Build Image (NK.BIN) Instructions

1. Put *.dll and *.bin in your \WINCE600\PROJECT\XXXXXX\RelDir\
2. Add *.bib and *.reg into your project
3. Make sure your device PCI ID
4. Change your registry file if you want to change driver the default driver parameters.
5. Rebuild your image
6. After booting up, WZC Autoconfig will pop up on screen



6. Registry Setting Descriptions

1. Please change the REGISTRY FILE and match your desired device

```
[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\PCI\Template\RT61]
```

```
"VendorID"=multi_sz:"1814"
```

```
"DeviceID"=multi_sz:"0302"
```

2. AP Mode Registry Setting Example:

```
[HKEY_LOCAL_MACHINE\Comm\PCI\RT611\Parms]
```

```
"OpMode"=dword:1
```

```
"Channel"=dword:1 ; 1~14
```

```
"SSID"=" RalinkAP-WinCE" ; Max 32-char ascii
```

```
"AuthenType"=dword:0
```

```
; 0: OPEN
```

```
; 1: SHARED
```

```
; 4: WPAP-PSK
```

```
; 7: WPA2-PSK
```

```
"Encryption"=dword:1
```

```
; 1: NONE
```

```
; 0: WEP
```

```
; 4: TKIP
```

```
; 6: AES
```

```
"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"="ABCDEFGHJKLM"
```

```
; 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" = "432985e9d4167362a98f3598f17285dd23f8403171f679c2bece83c6c78b34c9"
```

```
; WPA-PSK or WPA2-PSK's 64-char hexadecimal PMK only
```

Note:

- (i). Rebuild the image and load on the platform.
- (ii). After system boot, the driver will be loaded.
- (iii). The auto-config utility for wireless must be disabled when wireless driver is working in AP mode.
- (iv). Authentication and Encryption Combinations as bellow:
 - OPEN/NONE
 - OPEN/WEP
 - SHARED/WEP
 - WPA-PSK/TKIP
 - WPA-PSK/AES
 - WPA2-PSK/TKIP
 - WPA2-PSK/AES
- (v). A pass phrase is needed to use wpa_passphrase.exe to generate the PMK in registry
- (vi). Internet Connection Sharing in CE can be enabled for AP mode. Details can be found in help file or on the MSDN.



7. Ratool Descriptions

Ratool is a wireless utility for Windows CE command shell. Ratool is from wzctool and adds more proprietary Ralink OID functions. The user can make use of this tool to modify the Ralink wireless driver details and settings.

AP Command Example

1. OPEN/NONE

```
> ratool -ap PCI\RT611 -auth open
> ratool -ap PCI\RT611 -encr none
> ratool -ap PCI\RT611 -ssid RalinkAP
```

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

```
> ratool -ap PCI\RT611 -auth open(shared)
> ratool -ap PCI\RT611 -encr wep
> ratool -ap PCI\RT611 -key 1/remove(optional)
> ratool -ap PCI\RT611 -key 1/12345
> ratool -ap PCI\RT611 -ssid RalinkAP
```

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

```
> ratool -ap PCI\RT611 -auth open(shared)
> ratool -ap PCI\RT611 -encr wep
> ratool -ap PCI\RT611 -key 1/remove(optional)
> ratool -ap PCI\RT611 -key 1/12345abcde
> ratool -ap PCI\RT611 -ssid RalinkAP
```

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

```
> ratool -ap PCI\RT611 -auth open(shared)
> ratool -ap PCI\RT611 -encr wep
> ratool -ap PCI\RT611 -key 2/remove(optional)
> ratool -ap PCI\RT611 -key 2/abcdefghijklm
> ratool -ap PCI\RT611 -ssid RalinkAP
```

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

```
> ratool -ap PCI\RT611 -auth open(shared)
> ratool -ap PCI\RT611 -encr wep
```



```
> ratool -ap PCI\RT611 -key 3/remove(optional)
> ratool -ap PCI\RT611 -key 3/12345678901234567890abcdef
> ratool -ap PCI\RT611 -ssid RalinkAP
```

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

```
> ratool -ap PCI\RT611 -auth wpa-psk(wpa2-psk)
> ratool -ap PCI\RT611 -encr tkip(aes)
> ratool -ap PCI\RT611 -ssid RalinkAP
> ratool -ap PCI\RT611 -wpa-psk 1234567890abc...xyz...ABC...XYZ
> ratool -ap PCI\RT611 -ssid RalinkAP
```

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

```
> ratool -ap PCI\RT611 -auth wpa-psk(wpa2-psk)
> ratool -ap PCI\RT611 -encr tkip(aes)
> ratool -ap PCI\RT611 -wpa-psk 1234567890abcdef...1234567890abcdef
> ratool -ap PCI\RT611 -ssid RalinkAP
```

WPS Command Example:

1. Configure with PIN mode:

```
> ratool -disablewzcsvc PCI\RT611
> ratool -wps PCI\RT611 -info ; PIN will be listed
> ratool -wps PCI\RT611 -bssidlist
Key PIN on Registrar(i)
> ratool -wps PCI\RT611 -pin YourSsid
> ratool -wps PCI\RT611 -status auto
> ratool -wps PCI\RT611 -profile 1(ii)
> ratool -enablewzcsvc PCI\RT611
```

(i). Enter the Enrollee's PIN code on the Registrar and start WPS on the Registrar.

Note: How to get the Enrollee PIN code? Use 'ratool -wps PCI\RT611 -info' on the Enrollee.

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

2. Configure with PBC mode:

```
> ratool -disablewzcsvc PCI\RT611
> ratool -wps PCI\RT611 -info
```



```
> ratool -wps PCI\RT611 -bssidlist
```

Push button on Registrar⁽ⁱ⁾

```
> ratool -wps PCI\RT611 -pbc [Or push hardware button on wireless card]
```

```
> ratool -wps PCI\RT611 -status auto
```

```
> ratool -wps PCI\RT611 -profile 1(ii)
```

```
> ratool -enablewzcsvc PCI\RT611
```

(i). Start PBC on the Registrar.

(ii). If the registration is successful, the Enrollee will be given the configuration 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.

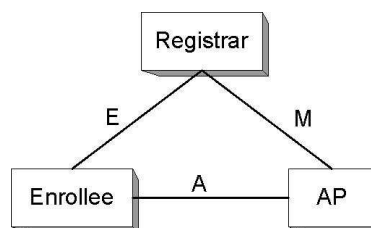


Figure 1. Components and Interfaces

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 in
 \WINCE600\PUBLIC\COMMON\OAK\DRIVERS\NETUI\
2. WZCTOOL source code is in
 \WINCE600\PUBLIC\COMMON\OAK\DRIVERS\NETSAMP\WZCTOOL\
3. The user can add the Internet Connection Sharing or Bridge features to Windows CE kernel in AP mode.