TRENDnet®

User's Guide

TEW-445UB

Table of Contents

1 Introduction

This 108Mbps 802.11g High-Gain Wireless USB Adapter supports the IEEE 802.11b/g (2.4GHz) protocol. It provides a high-speed wireless connection with data rates up to 108Mbps.

To protect your wireless connectivity, the high-speed wireless USB adapter supports 64/128/152-bit WEP data encryption and WPA. Dynamic Frequency Selection (DFS) puts your network on the clearest channel in your location. With this high-speed wireless USB adapter, you will experience the best wireless connectivity available.

This chapter describes the features & benefits, package contents, applications, and network configuration.

1.1 Features & Benefits

Features	Benefits
High Speed Data Rate up to 108 Mbps in Super G mode	Capable of handling heavy data payloads such as MPEG video streaming.
High Output Power up to 23 dBm	A higher power output can increase the range.
Advanced Encryption Standard (AES), Temporal Key Integrity Protocol (TKIP) and Wired Equivalent Privacy (WEP)	Powerful data security.
IEEE 802.1x Client Support	Enhances authentication and security.
Support for 802.11e standard	Wireless Multimedia Enhancements Quality of Service support (QoS)
Advanced Power Management	Low power consumption in power saving mode up to 98%.
Support eXtended Range technology	eXtended Range technology provides Wi-Fi products twice the range of existing designs

1.2 Package Contents

Open the package carefully, and make sure that none of the items listed below are missing. Do not discard the packing materials, in case you need to return the product return. The unit must be returned in its original package.

- One Wireless LAN USB Adapter
- One USB Cable (Type A to Mini B)
- One 2dBi Detachable Antenna
- One Driver and Utility CD-ROM with User's Manual Included
- One Quick Installation Guide

1.3 USB Adapter Description

This wireless USB adapter fits into your computer's USB 1.1 or 2.0 port. The USB adapter has a LED indicator and an external high-sensitivity dipole antenna.

1.4 System Requirements

The following are the minimum system requirements in order to use the USB adapter.

- PC/AT compatible computer with a USB 1.1 or 2.0 interface.
- Windows 2000/XP operating system.
- 20 MB of free disk space for installing the USB adapter driver and utility program.
- CD-ROM Drive
- CPU: 300MHz or above
- Memory: 32MB or above

1.5 Applications

. The following list describes some of the many applications made possible through the power and flexibility of wireless LANs:

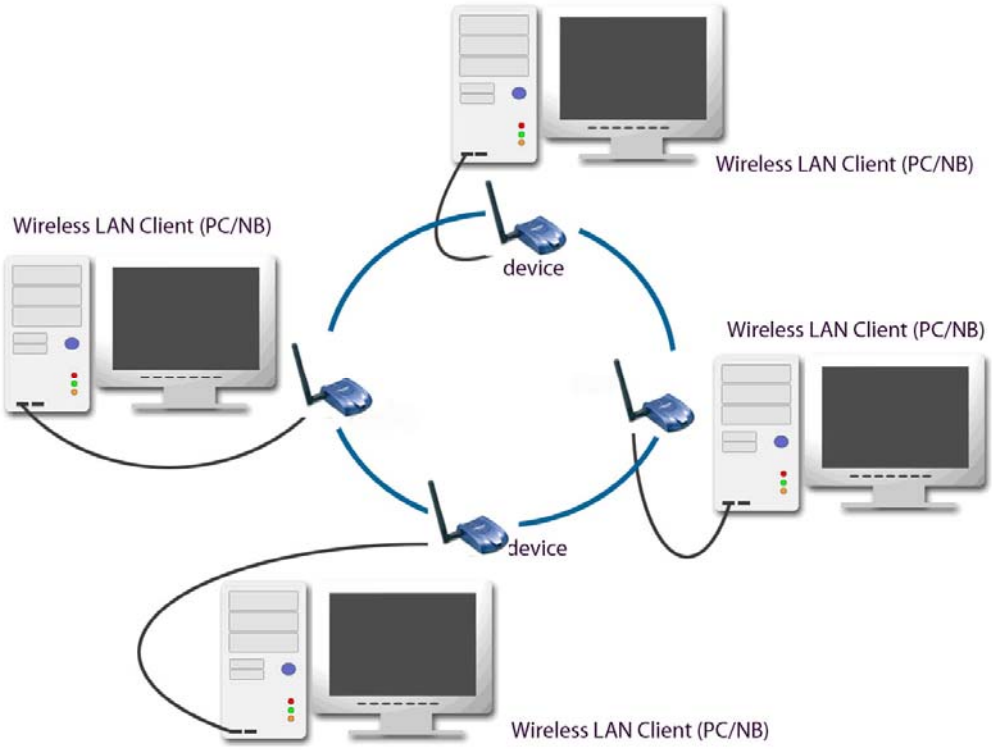
a) **Difficult-to-wire environments**
   There are many situations where wires cannot be easily installed. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.
b) **Temporary workgroups**
   Consider situations in parks, athletic arenas, exhibition centers, disaster-recovery, temporary offices and construction sites where one wants a temporary WLAN established and removed.
c) **The ability to access real-time information**
   Doctors/nurses, point-of-sale employees, and warehouse workers can access real-time information while dealing with patients, serving customers and processing information.
d) **Dynamic environments**
   Show rooms, meeting rooms, retail stores, and manufacturing sites where the workplace is frequently rearranged.
e) **Small Office and Home Office (SOHO) networks**
   SOHO users need a cost-effective, easy–to-install network.
f) **Wireless extensions to Ethernet networks**
   Network managers in dynamic environments can minimize the overhead caused by moves, extensions to networks, and other changes with wireless LANs.
g) **Wired LAN backup**
   Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.

1.6 Network Configuration

To better understand how wireless devices work together to create a wireless network, it might be helpful to depict a few of the possible wireless network configurations. Wireless devices can be configured as:

a) Ad hoc (or peer-to-peer)
b) Infrastructure

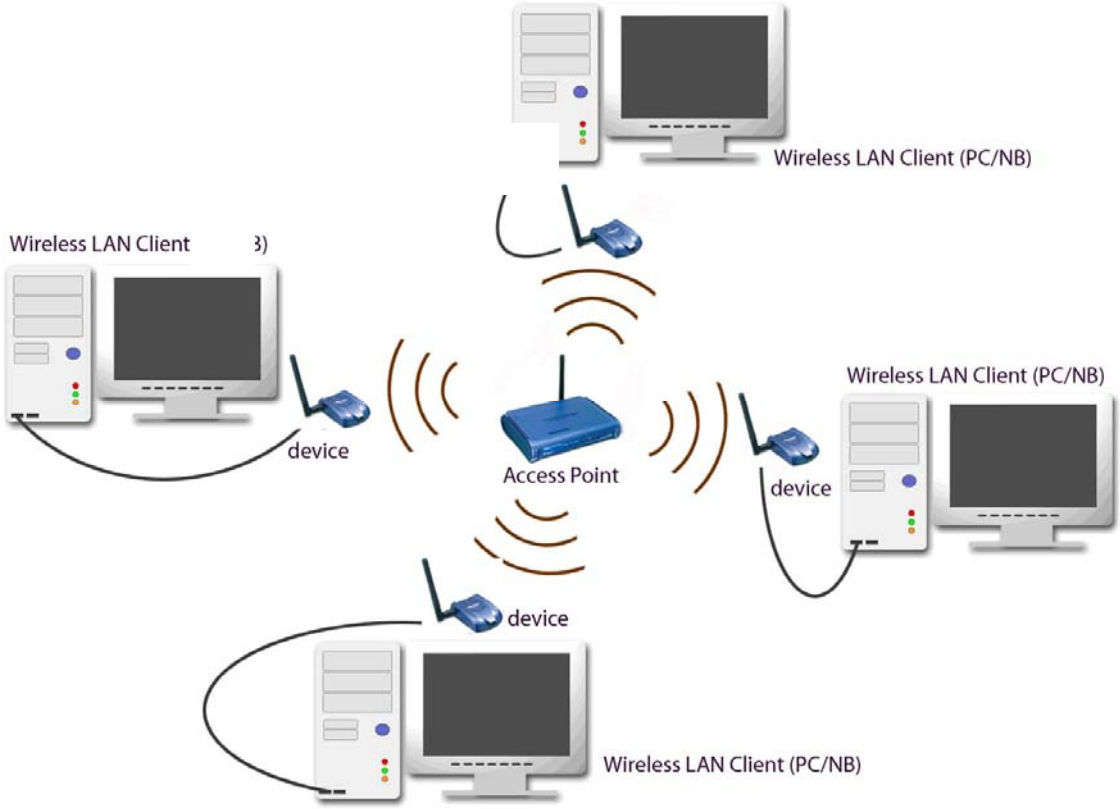
a) Ad hoc (peer-to-peer) Mode



In ad hoc mode, each client is peer-to-peer. The client would only have access to the resources of the other client. Ad hoc mode does not require an access point. This is the easiest and least expensive way for the SOHO to set up a wireless network. The image above depicts a network in Ad hoc mode.

b) Infrastructure Mode

Infrastructure mode requires the use of an access point (AP). In this mode, all wireless communication between clients passes through an AP. It doesn't matter if the AP is stand-alone or wired to an Ethernet network. If used in stand-alone, the AP can extend the range of independent wireless LANs by acting as a repeater. The image below depicts a network in infrastructure mode.



2 Install Drivers & Client Utility

2.1 Before You Begin

Before installing your wireless USB adapter, you need to remove all Wireless LAN drivers that you have previously installed.

During the installation, Windows XP/2K/ME/98 may need to copy systems files from its installation CD. Therefore, you may need a copy of the Windows installation CD at hand before installing the drivers. On many systems, instead of a CD, the necessary installation files are archived on the hard disk in C:\WINDOWS \OPTIONS\CABS directory.

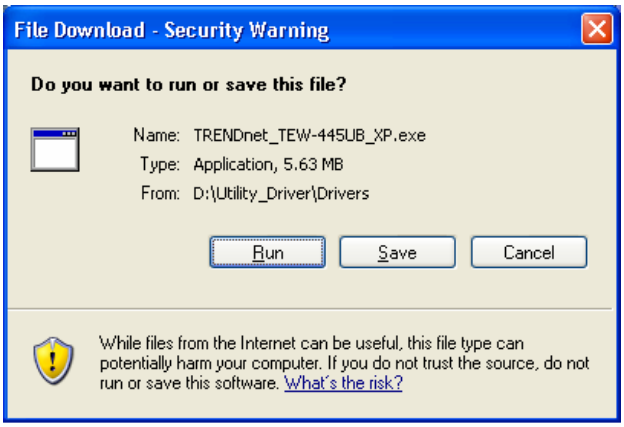
2.2 Installing the Drivers

Windows XP/2000

Follow the steps below in order to install the USB adapter drivers:

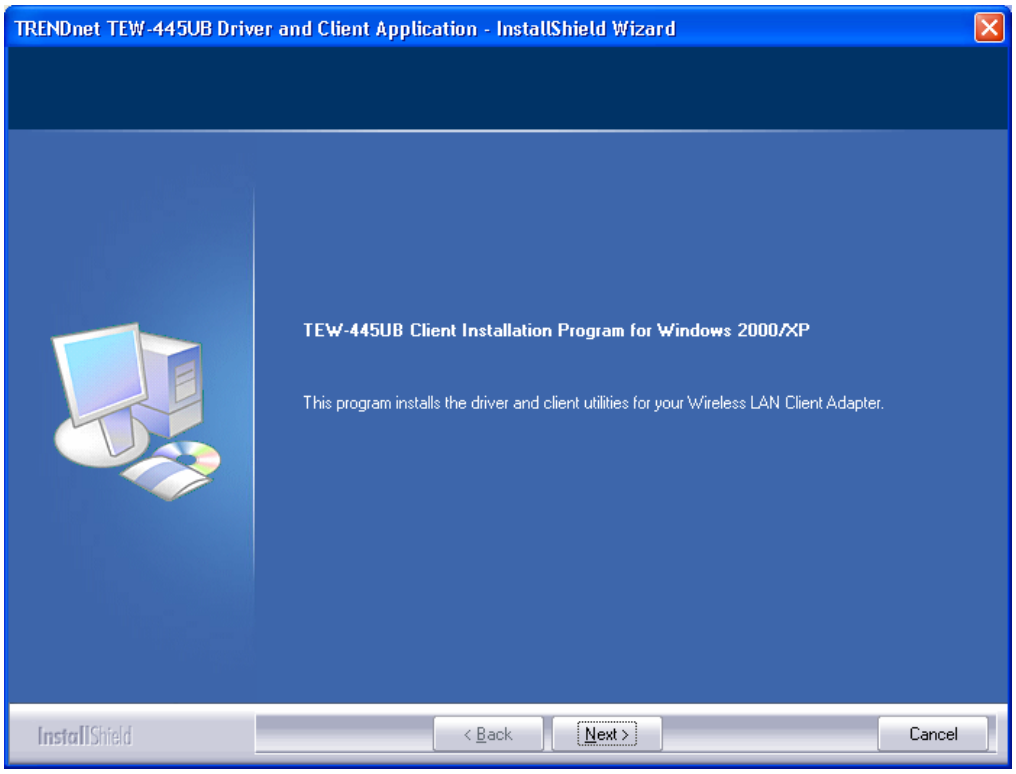
1. Insert the provided CD-ROM into your CD-ROM drive. The autorun screen will appear.
2. Click Install Utility & Driver and then click Windows 2000/XP.

3. Click **Run**.

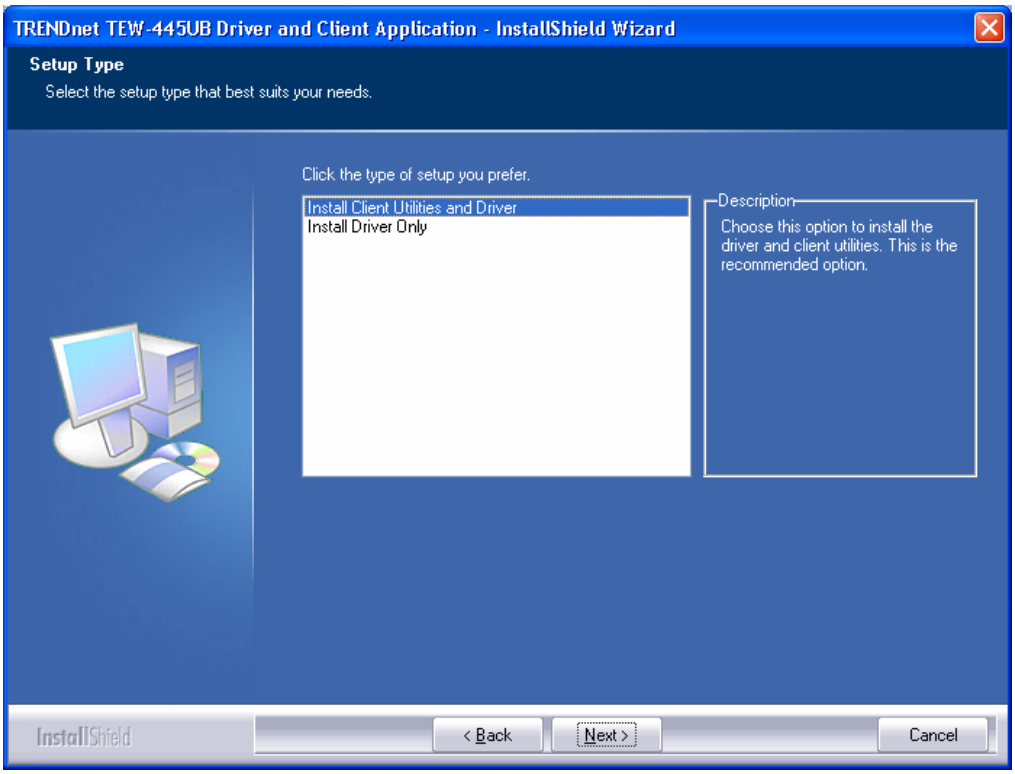


4. Click **Run**.

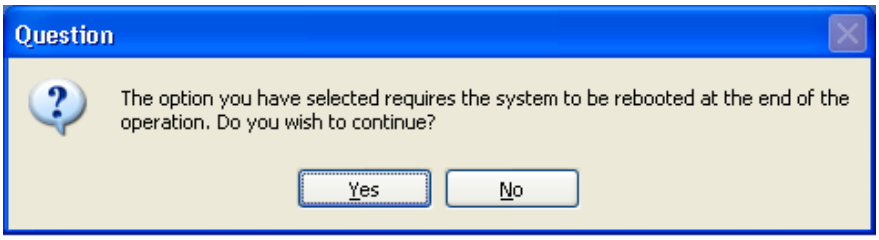
5. Click **Next** to continue.



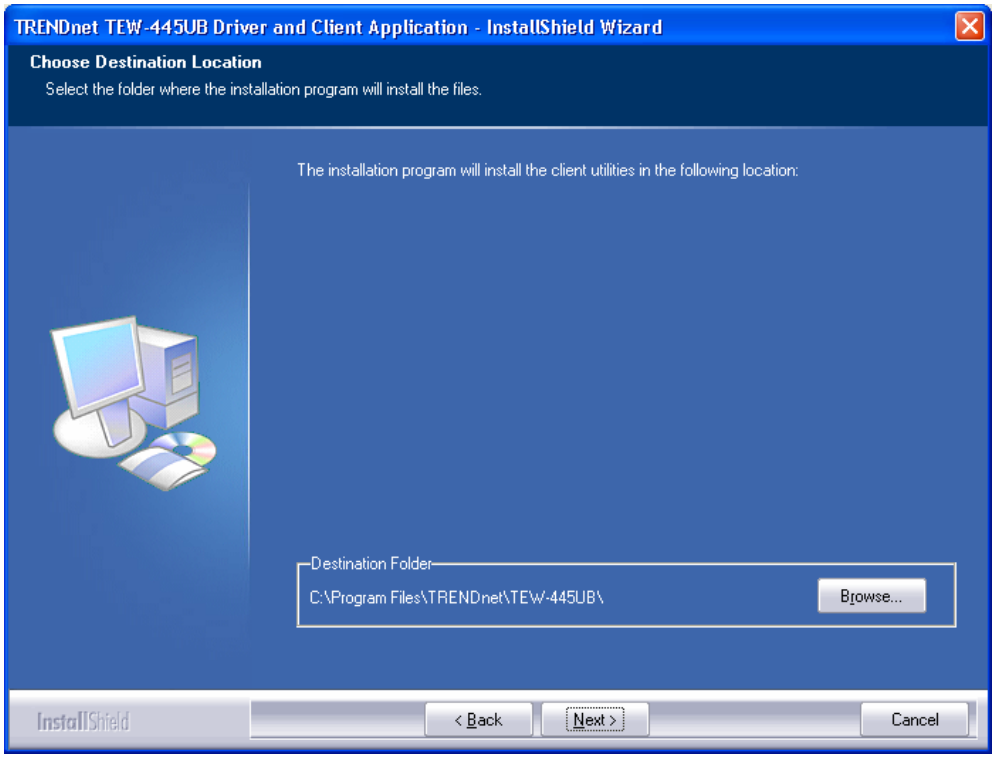
6. Select **Install Client Utilities and Driver** and then click **Next**.



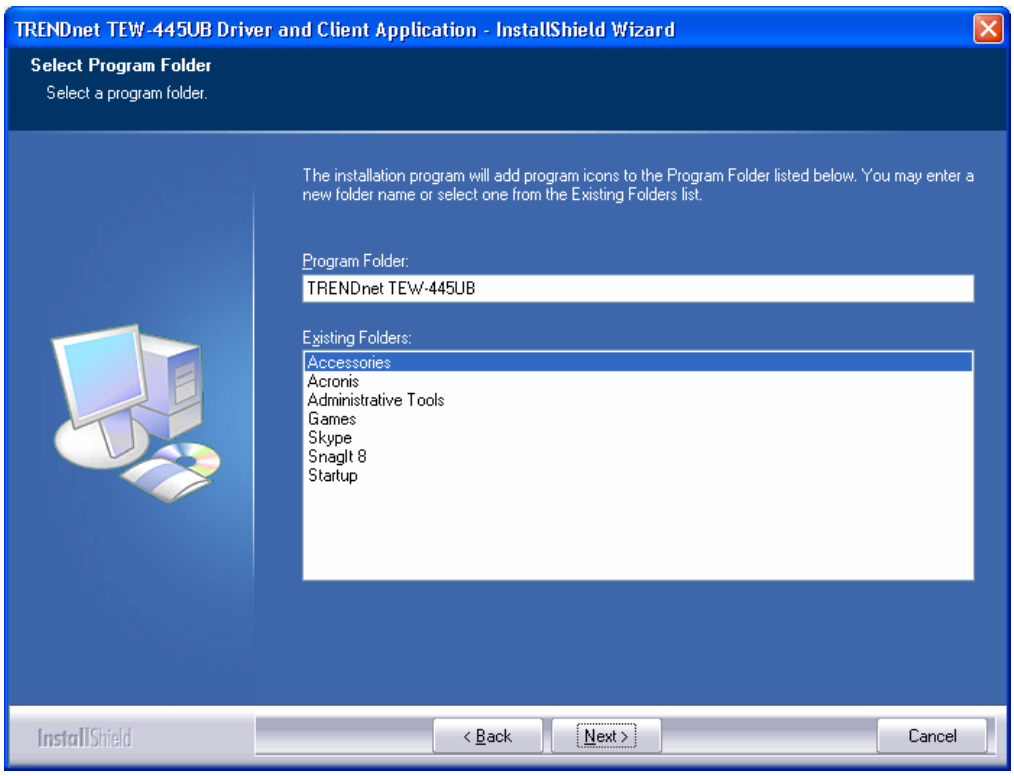
7. This message informs you that the system must be restarted after the installation is complete. Click **Yes** to continue.



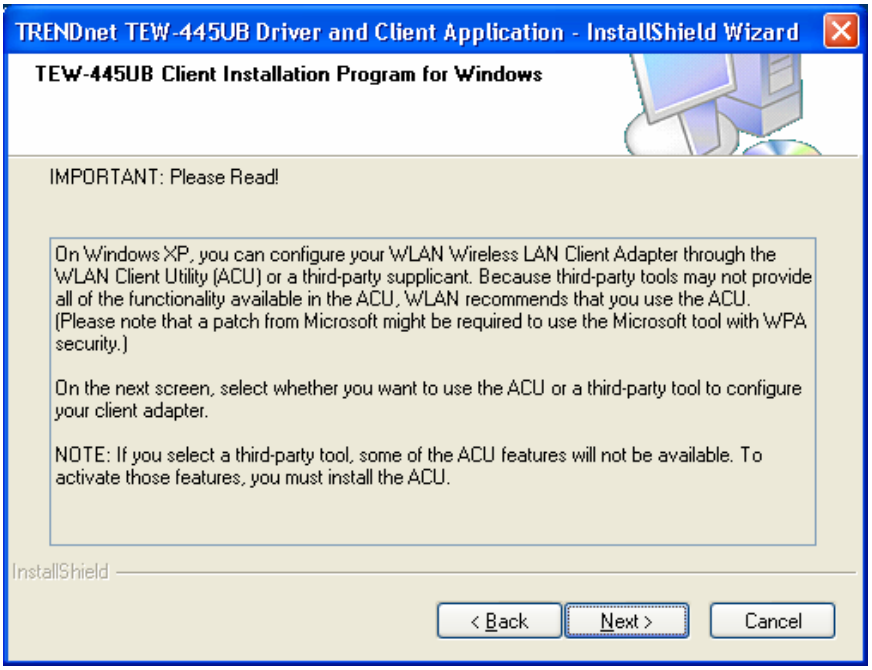
8. Click on the **Browse** button to select another drive or folder to install the drivers, and then click **Next**. If you would like to use the default destination folder, click **Next**.



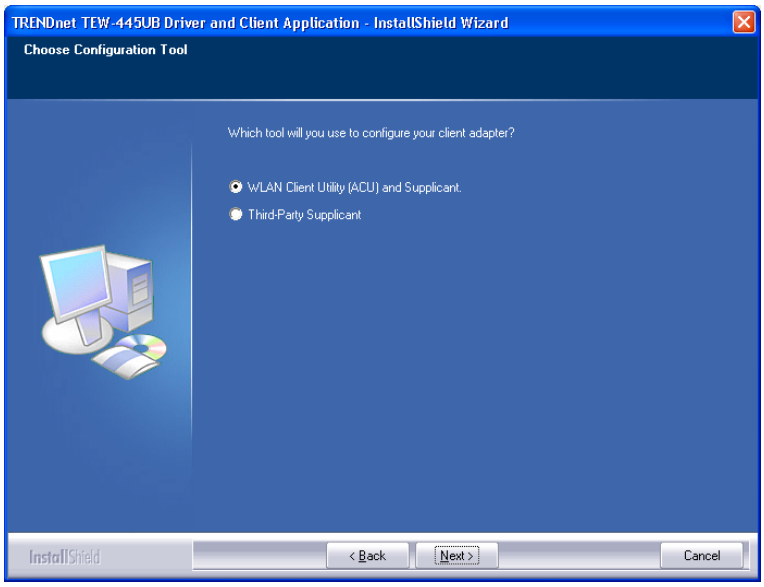
9. Select a program folder for the Start menu, or use the default setting: **WLAN**. Click **Next** to continue.



10. The message below informs you about configuring this device through the 802.11 Client Utility (ACU) or a third party supplicant. If you choose to use a third party supplicant, some of the ACU features will not be available. Click **Next** to continue.

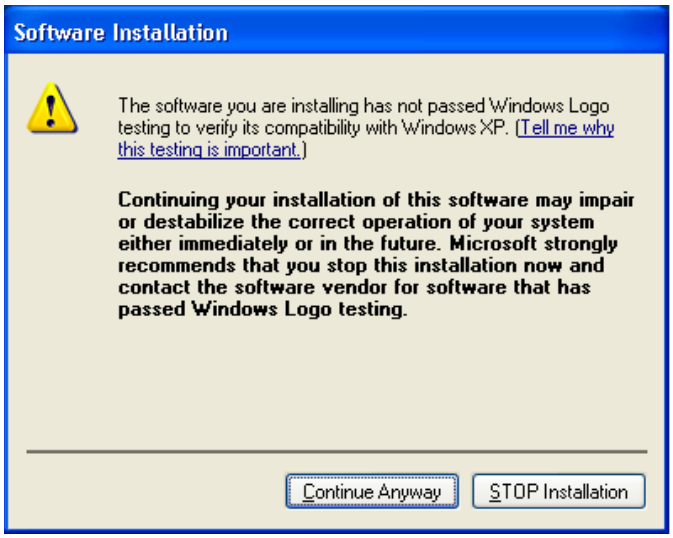


11. Select one of the options. It is recommended that you select the first option: **WLAN Client Utility (ACU) and Supplicant**. Click **Next** to continue.

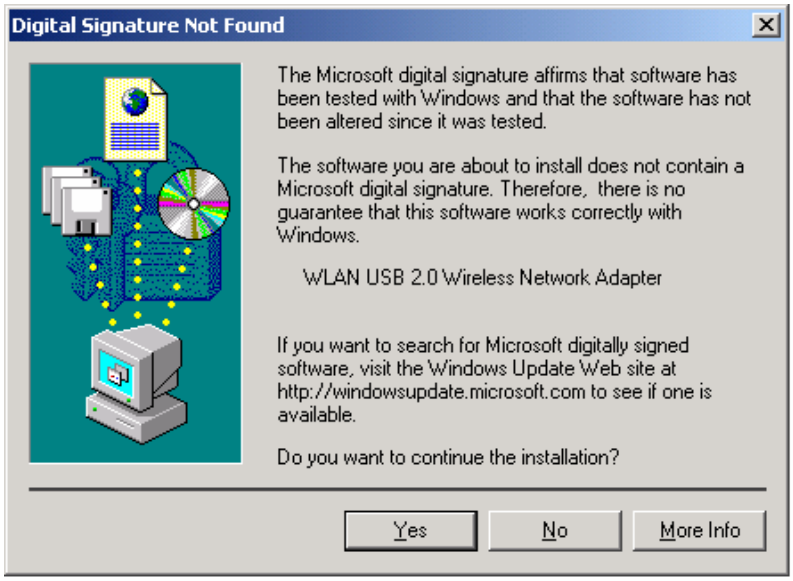


12. When you reach the screen below, plug in the provided USB cable into the TEW-445UB and into an available USB plug on your computer. Cancel the Found New Hardware Wizard and then click **OK**.

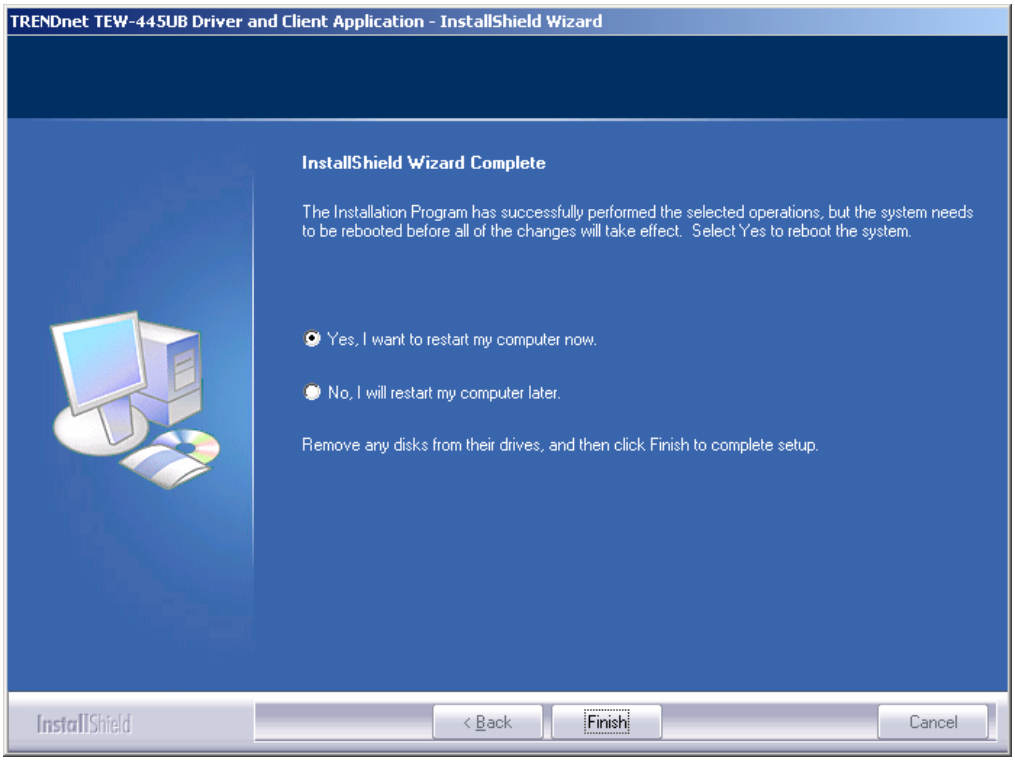
13. If you are using Windows XP, you will see a message regarding Windows Logo Testing, click on the **Continue Anyway** button to continue.



14. If you are using Windows 2000, a **Digital Signature Not Found** window appears. Click **Yes** to continue the installation.



15. Select **Yes, I want to restart my computer now** and then click **Finish**.

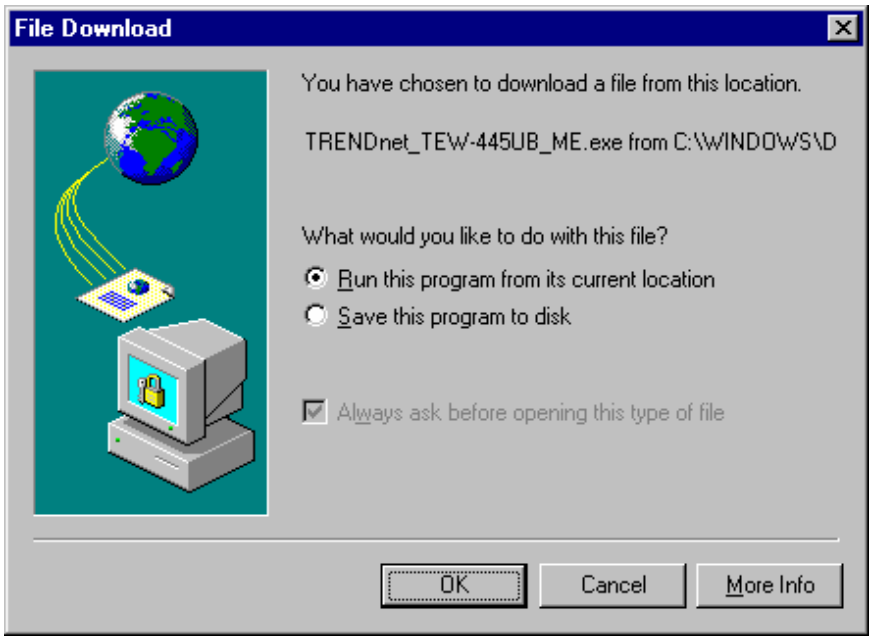


Windows ME/98SE

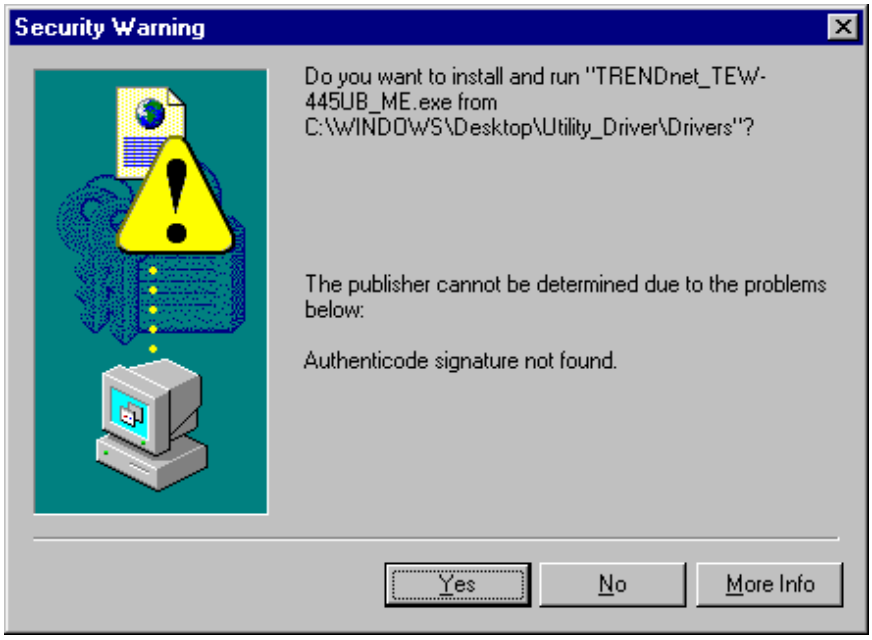
Follow the steps below in order to install the USB adapter drivers:

1. Insert the provided CD-ROM into your CD-ROM drive. The autorun screen will appear.
2. Click Install Utility & Driver and then click Windows 98/ME.

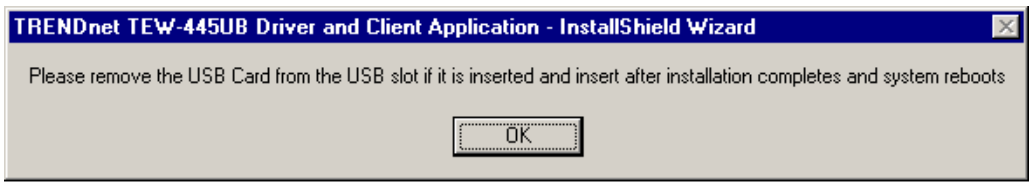
3. Select **Run this program from its current location** and then click **OK**.



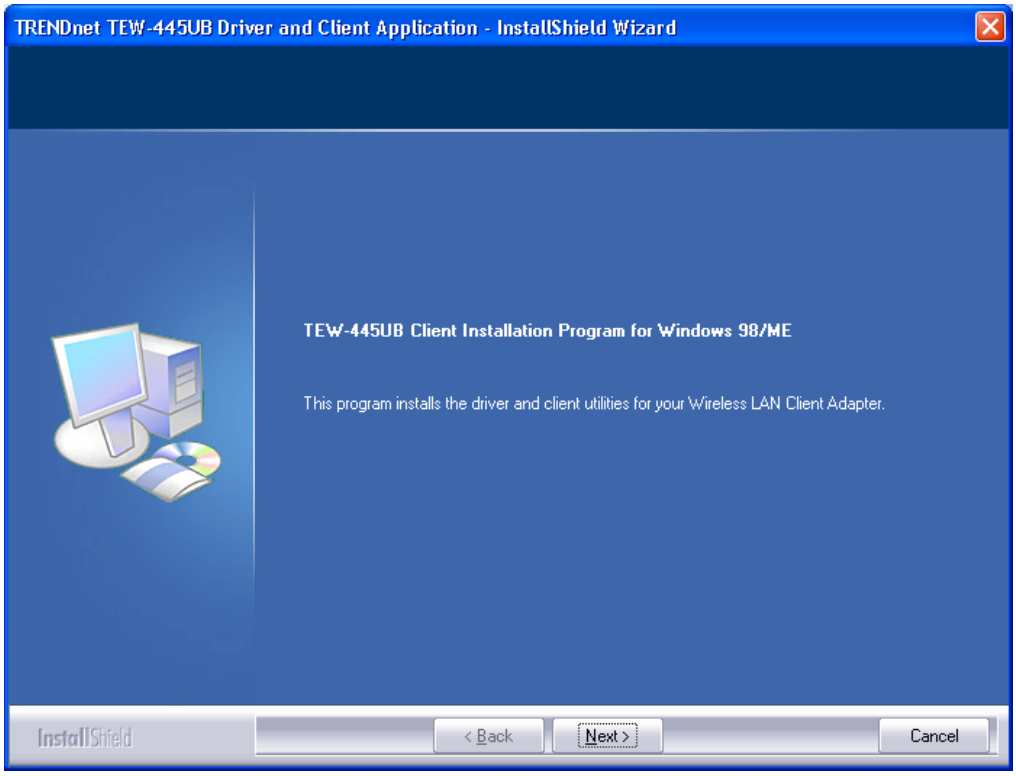
4. Click **Yes**.



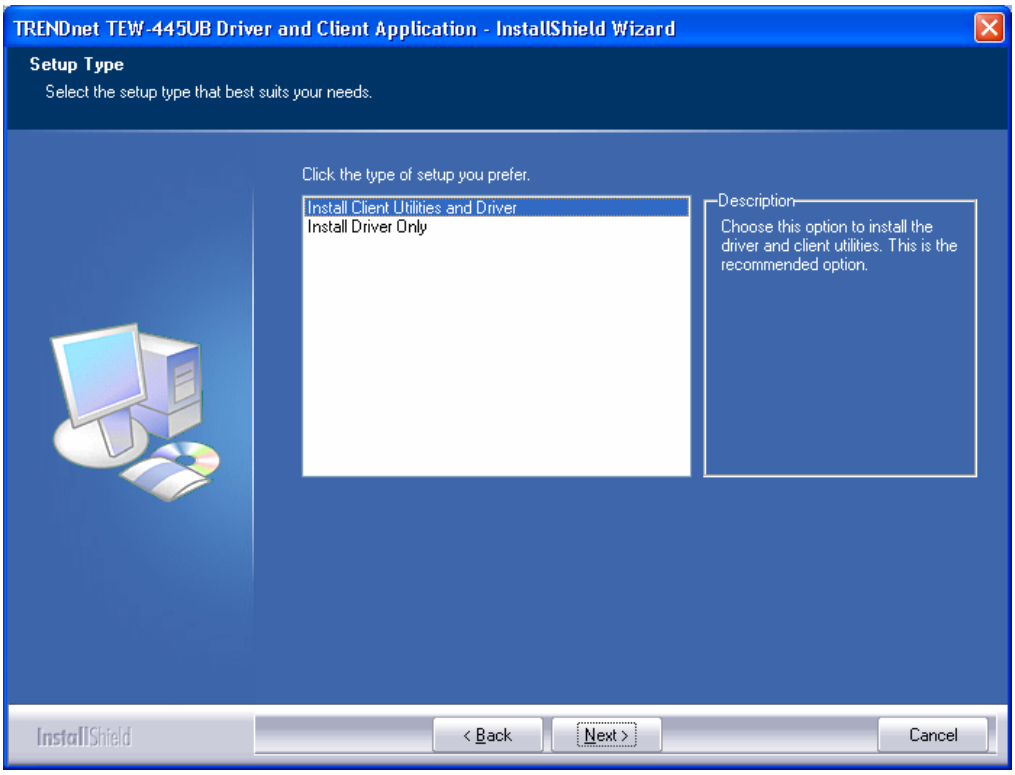
5. Remove the USB adapter from the USB port if it is inserted and then click **OK**.



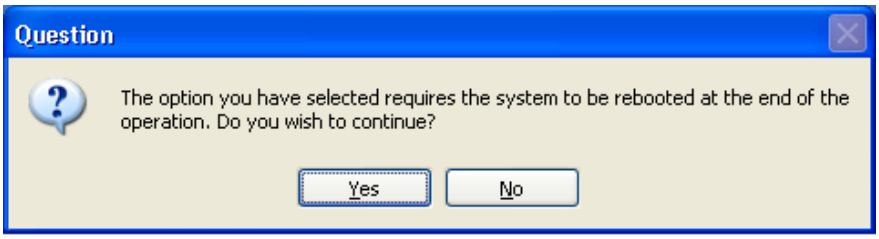
6. Click **Next** to continue.



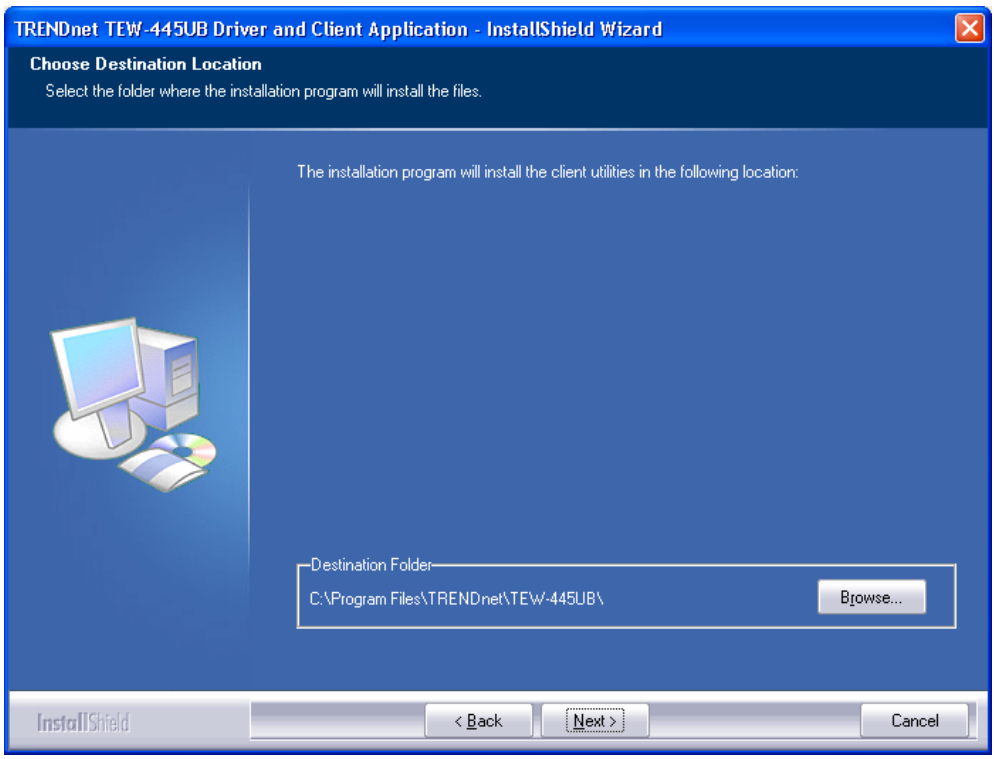
7. Select **Install Client Utilities and Driver** and then click **Next**.



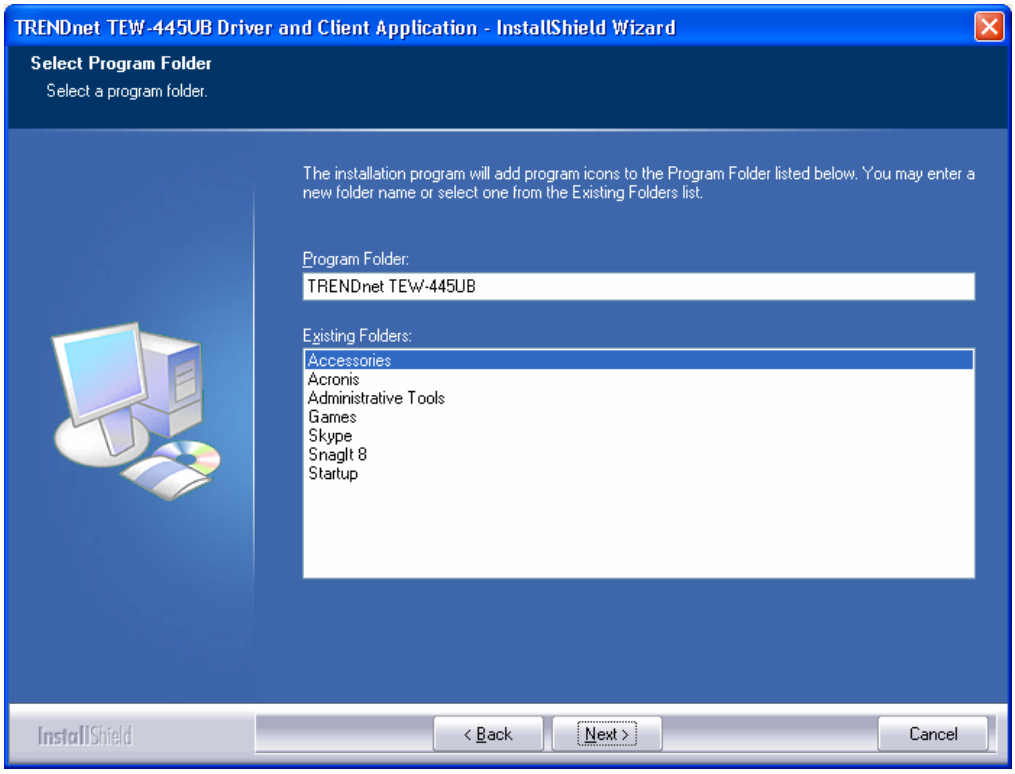
8. This message informs you that the system must be restarted after the installation is complete. Click **Yes** to continue.



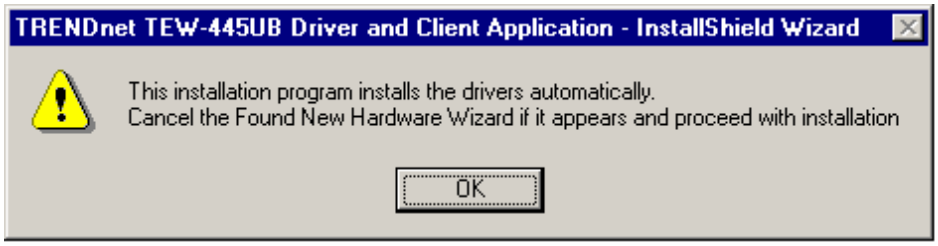
9. Click on the **Browse** button to select another drive or folder to install the drivers, and then click **Next**. If you would like to use the default destination folder, click **Next**.



10. . Click **Next** to continue.



11. When you reach the screen below, plug in the provided USB cable into the TEW-445UB and into an available USB port on your computer. Cancel the Found New Hardware Wizard and then click **OK**.



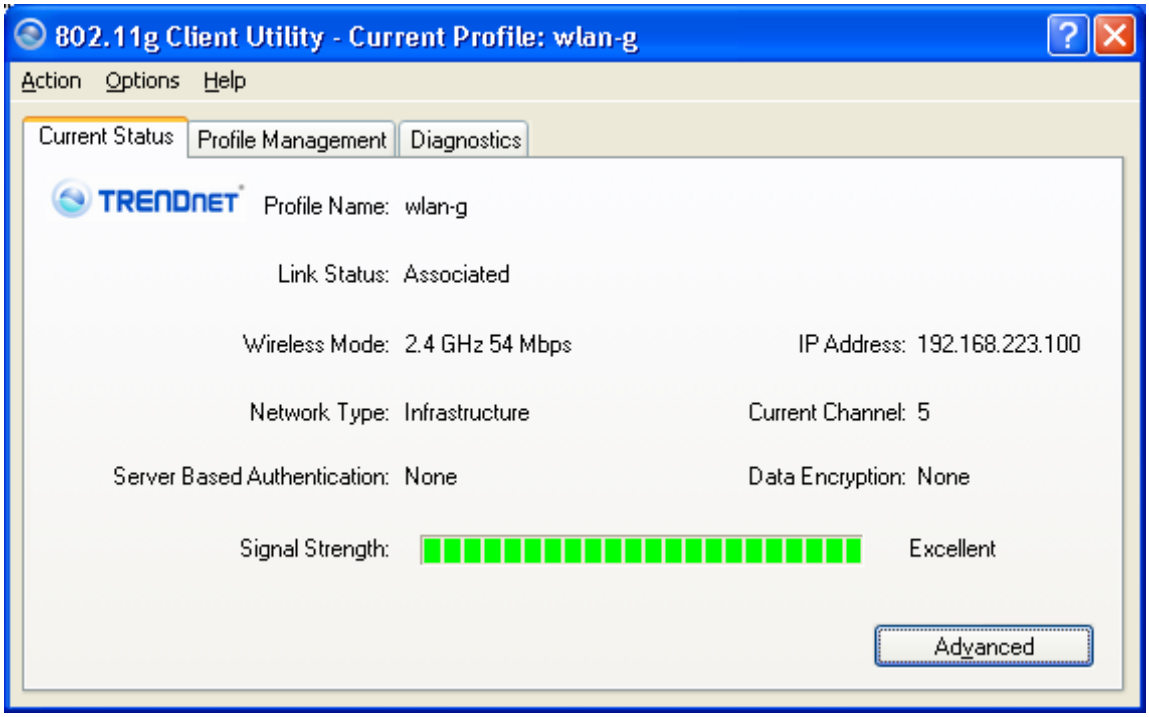
12. Click **OK** to reboot the computer.

3 Using the Client Utility

You will see the Wireless Client Utility icon on your desktop. Double click this icon to open up the utility program.

3.1 Current Status

The **Current Status** tab displays the current status of the wireless radio. The following information is included in this tab:

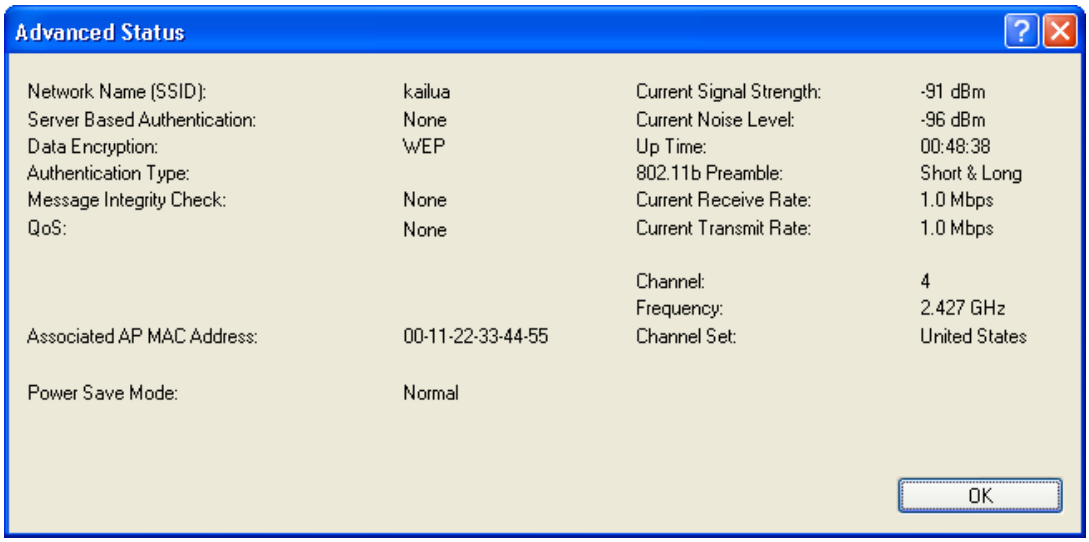


- **Profile Name:** Displays the name of this profile. One device can have many profiles, but only one profile can be loaded at a time.
  Note: The profile name and network name (SSID) are not the same.
- **Link Status:** This indicates the state of the client; associated or not associated.
- **Wireless Mode**: Displays the 802.11 mode (e.g. “2.4GHz 11 Mbps”, “2.4GHz 54 Mbps”, “2.4GHz 108Mbps”).
- **Network Type**: Displays the type of network (e.g. “Infrastructure” or “Ad hoc”).
- **Server Based Authentication**: Displays information about the authentication method.
- **IP address**: Displays the IP address assigned to this device.
- **Current Channel**: Displays the channel of the access point the device is

connected to.

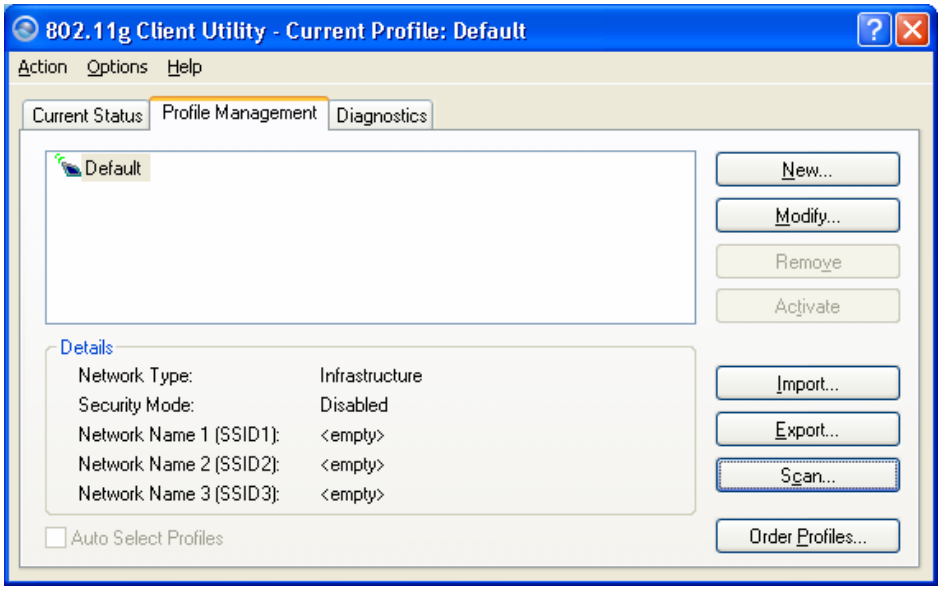
- **Data Encryption**: Displays the type of encryption used.
- **Signal Strength**: Displays the strength of the wireless connection.

Click on the **Advanced** button to display more details about the current status. This window includes information such as: Network Name (SSID), AP MAC address, Power Save Mode, Signal Strength, Noise Level, Channel, Frequency, and Channel Set (country). Click **OK** to close the window.



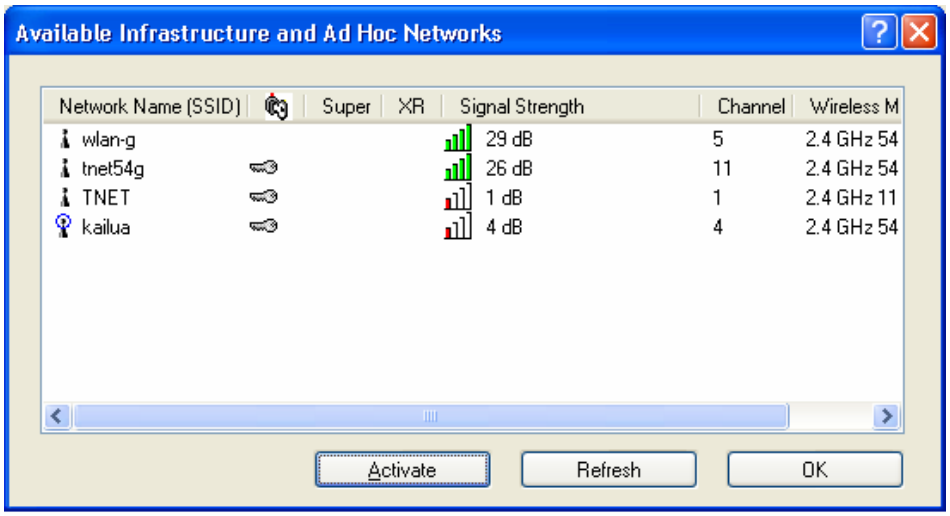
3.2 Profile Management

This tab is used to create a new profile, modify an existing profile, remove an existing profile and activate an existing profile.



3.2.1 Scan for available networks

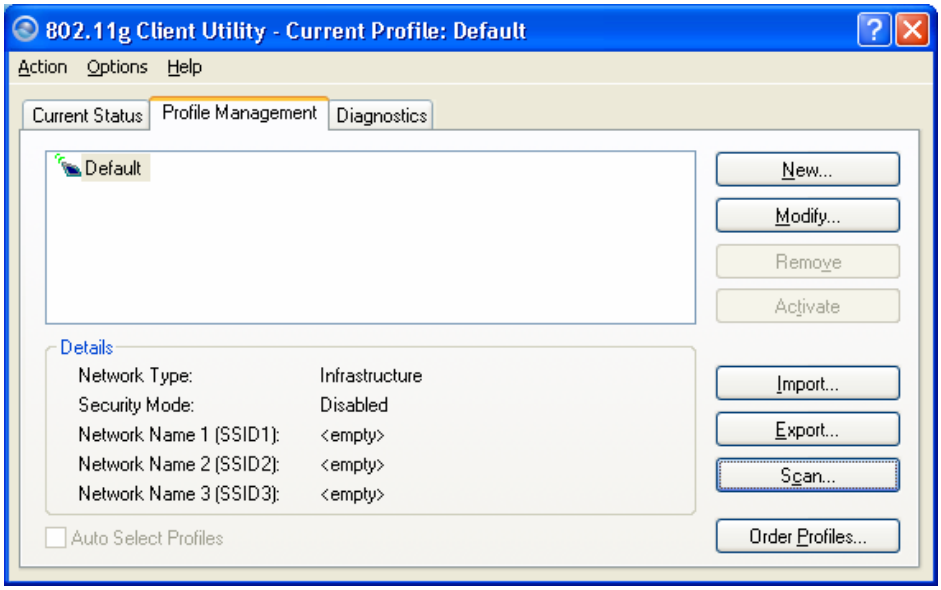
Click on the **Scan** button to view a list of available infrastructure and ad hoc networks. This table lists the Network Name, Encryption Key (if required), Signal Strength, Channel, and Wireless Mode.



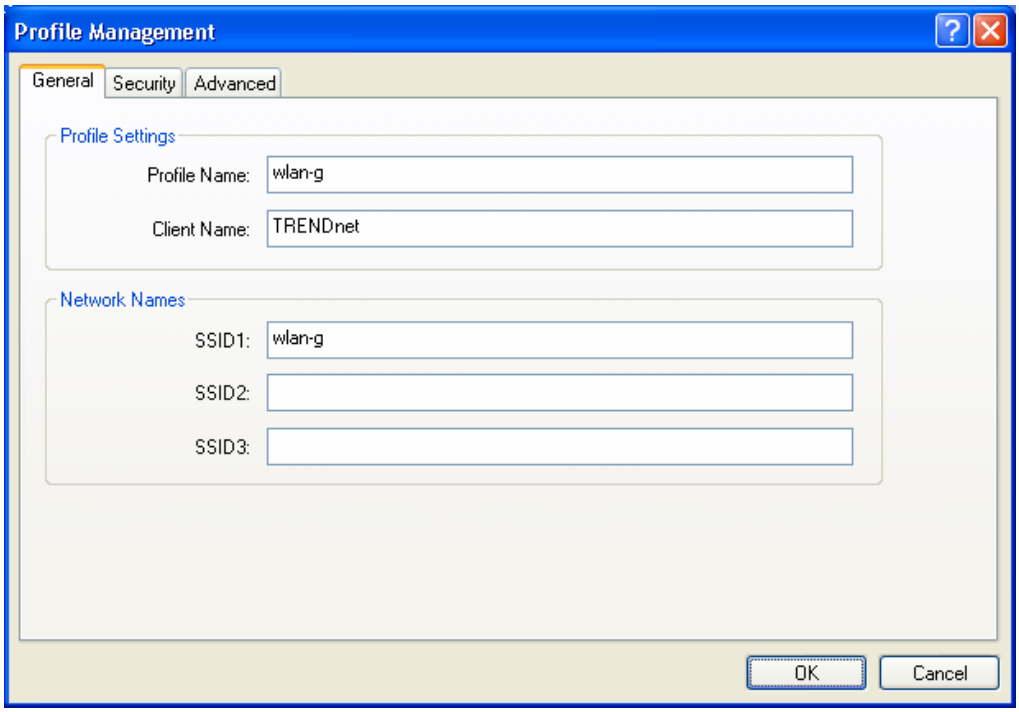
If you would like to associate with a specific network, select the network name (SSID) and then click on the **Activate** button.

3.2.2 Create a New Profile

Multiple profiles can be created for different Network Names (SSIDs). This allows a user to quickly associate with another network, instead of entering the SSID each time.



Click on the **New** button to create a new profile. The window below appears:



- **Profile Name:** Enter a name for this profile; this can be any name that

you may associate with your network. This feature comes in handy when you need to work at several locations where there are different network settings. Using this you can configure a different profile for each of your networks.

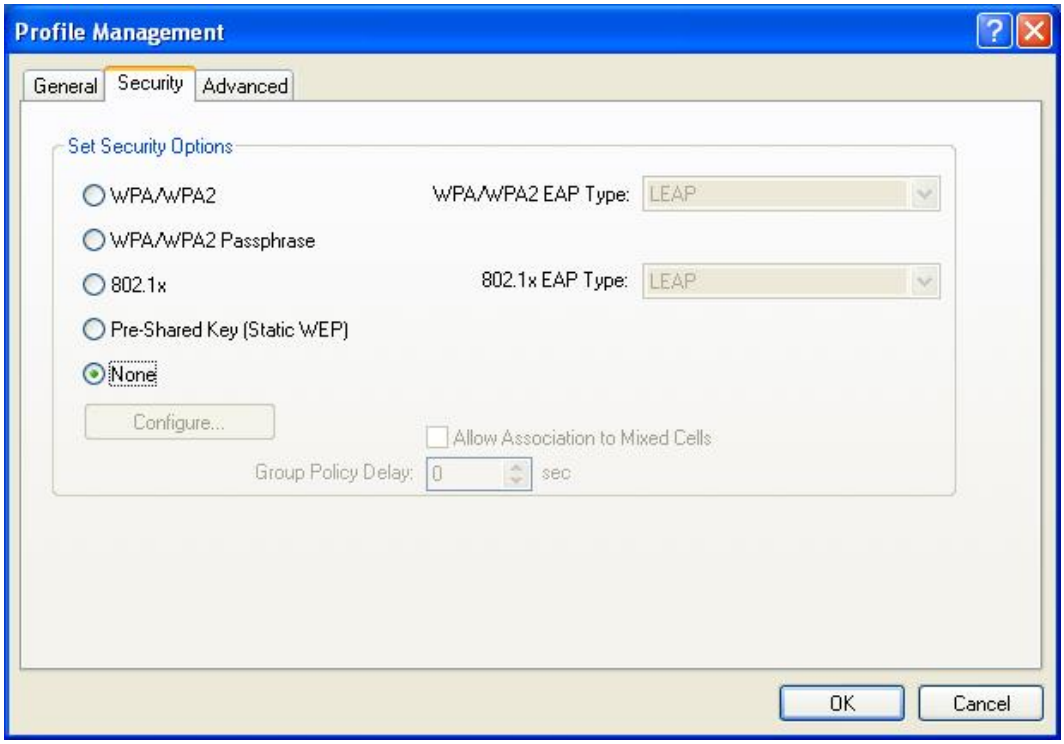
- **Client Name:** Enter any name to describe the profile.
- **SSID1:** Enter the SSID of the network. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive.
- Click **OK** to continue.

3.2.3 Security

The next tab displayed is the **Security** tab. Here you can configure the authentication and encryption method that is used on your network. There are five types of security methods available: none, WPA, WPA-PSK, 802.1x and Pre-shared WEP key. The configuration steps for each method are described below.

3.2.3.1 Security Disabled

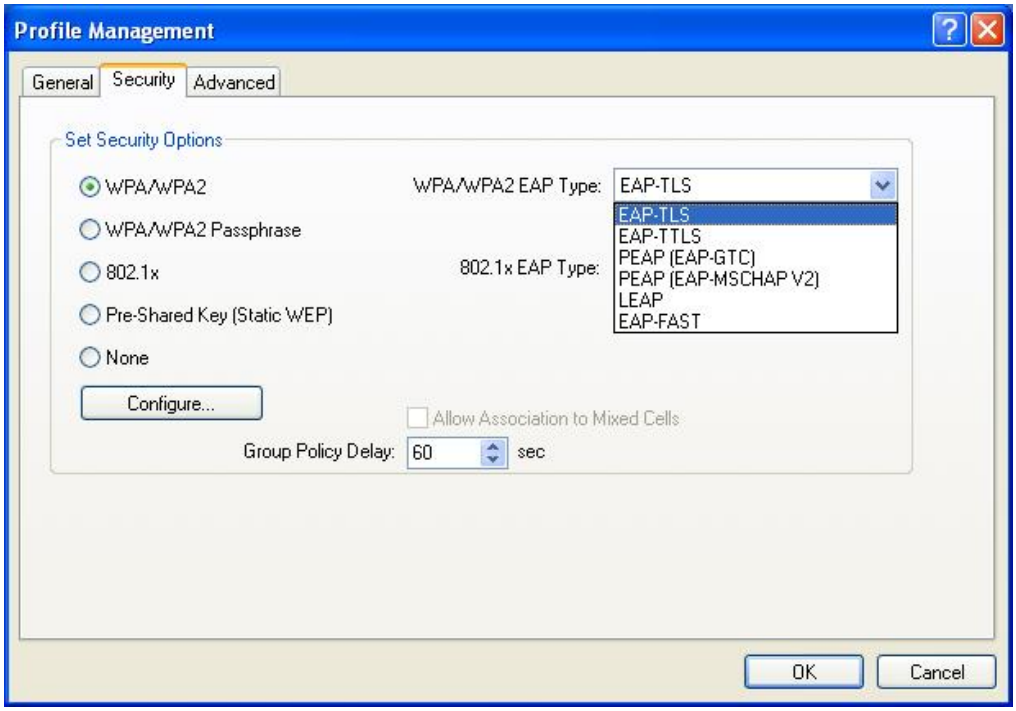
If your network does not require any encryption key, then select **None** in the security tab, and then click **OK**.



3.2.3.2 WPA / WPA2– TLS, TTLS

WPA2 (Wi-Fi Protected Access 2) provides network administrators with a high level of assurance that only authorized users can access the network. WPA (Wi-Fi Protected Access) was designed to improve upon the security features of WEP (Wired Equivalent Privacy). The technology is designed to work with existing Wi-Fi products that have been enabled with WEP. WPA provides improved data encryption through the Temporal Integrity Protocol (TKIP), which scrambles the keys using a hashing algorithm and by adding an integrity-checking feature which makes sure that keys haven't been tampered with.

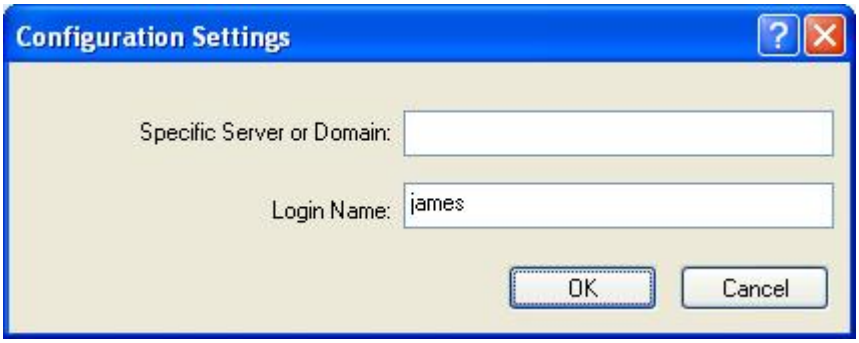
Select the **WPA/WPA2** radio button, and then select **EAP – TLS** or **EAP – TTLS** from the drop-down list. TLS (Transport Layer Security) is an IETF standardized authentication protocol that uses PKI (Public Key Infrastructure) certificate-based authentication of both the client and authentication server.



Click **Configure** to configure the TTLS settings.

- **Trusted Root Certification Authorities:** Select the appropriate certificate authority from the drop-down list.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **Settings**.



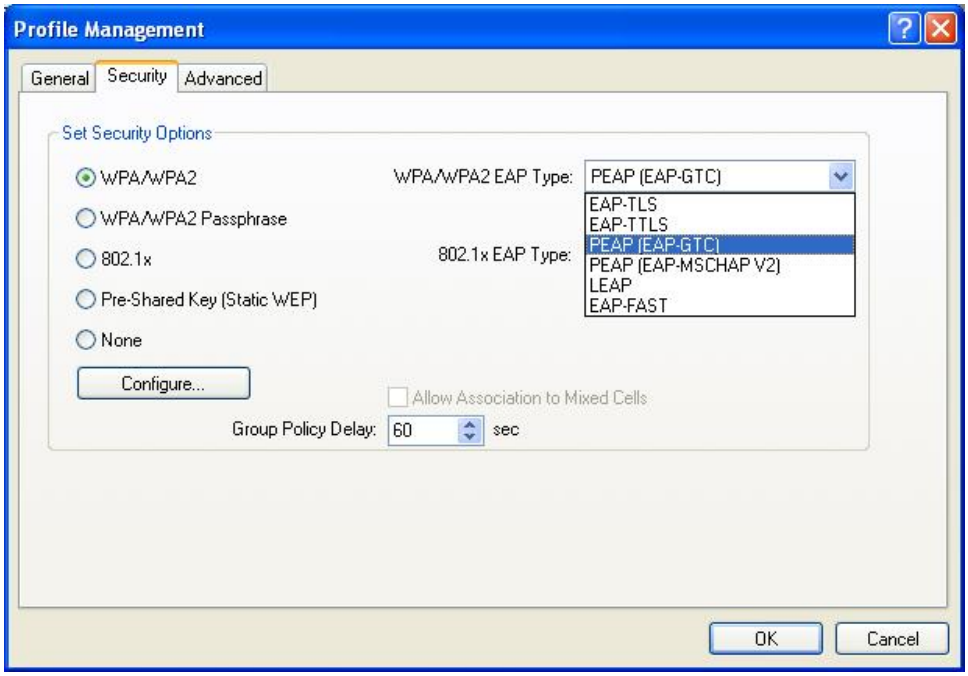
- **Specific Server or Domain:** Leave the server name blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Trusted Root Certification Authorities drop-down list. (Recommended). You can also enter the domain name of the server from which the client will accept a certificate.
- **Login Name:** Enter the login name if required.

Click **OK** to return to the previous window. Click **OK** again to return to the Profile Management window.

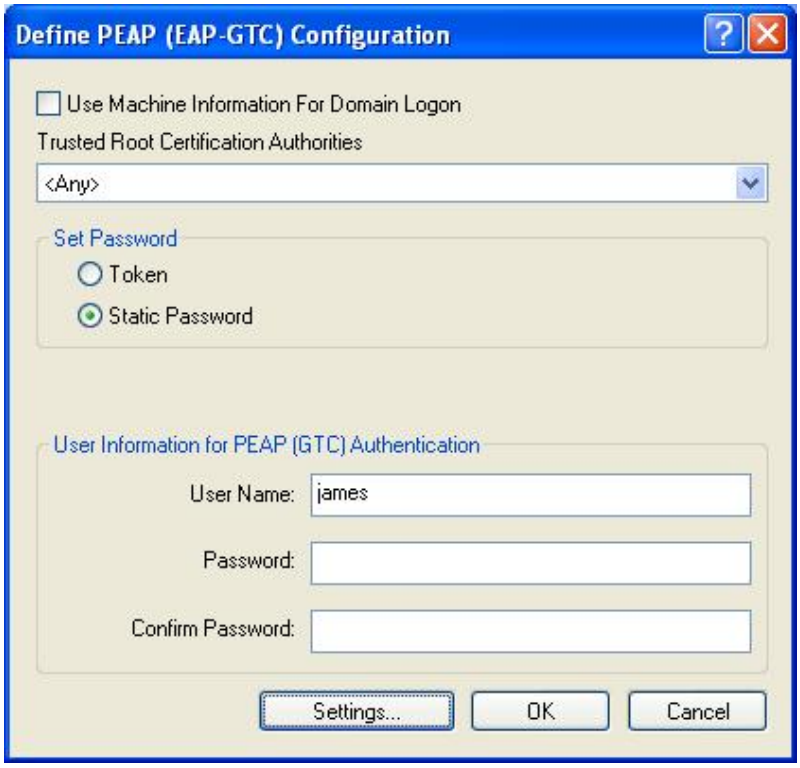
3.2.3.3 WPA/WPA2 – PEAP (EAP-GTC)

PEAP (EAP-GTC) was standardized along with EAP in RFC 2284. EAP-GTC allows the exchange of clear text authentication credentials across the network. The GTC method does provide a way to move a simple username and password from client to server using an EAP method, so it can be used to provide an authentication method. Naturally, if EAP-GTC is used to transport reusable passwords, it must be used inside a tunnel for protection and server authentication. EAP-GTC can be used with both TTLS and PEAP.

Select the **WPA/WPA2** radio button, and then select **PEAP (EAP-GTC)** from the drop-down list.

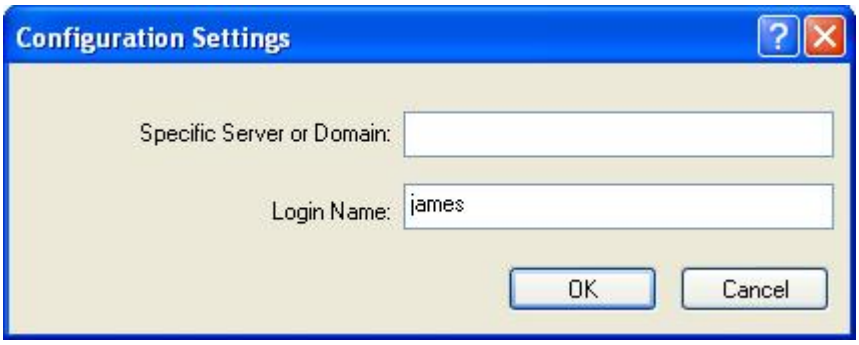


Click **Configure** to configure the PEAP (EAP-GTC) settings.



- **Trusted Root Certification Authorities:** Select the appropriate certificate authority from the drop-down list. .
- **Set Password:** Select **Token** or **Static Password** radio button. The default setting is Static Password.
- **User Name:** Enter the user name for the certificate authority
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **Settings**.



- **Specific Server or Domain:** Leave the server name blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Trusted Root Certification Authorities drop-down list. (Recommended). You can also enter the domain name of the server

from which the client will accept a certificate.

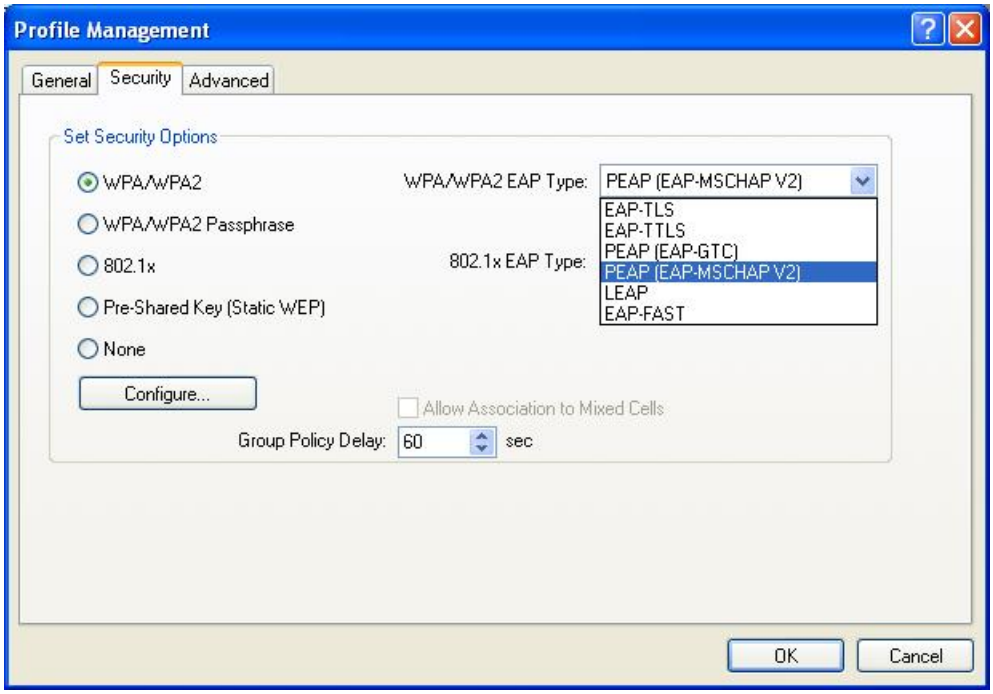
- **Login Name:** Enter the login name if required.

Click **OK** to return to the previous window. Click **OK** again to return to the Profile Management window.

3.2.3.4 WPA/WPA2 – PEAP (EAP-MSCHAP-V2)

The PEAP (EAP-MSCHAP V2) authentication type is based on EAPTLS authentication, but uses a password instead of a client certificate for authentication. PEAP (EAP-MSCHAP V2) uses a dynamic session-based WEP key, which is derived from the device and RADIUS server, to encrypt data.

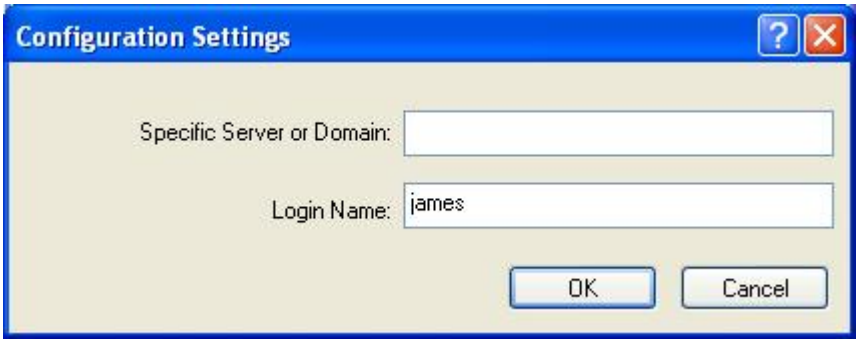
Select the **WPA/WPA2** radio button, and then select **PEAP (EAP-MSCHAP-V2)** from the drop-down list.



Click **Configure** to configure the PEAP (EAP-MSCHAP-V2) settings.

- **Trusted Root Certification Authorities:** Select the appropriate certificate authority from the drop-down list.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **Settings**.



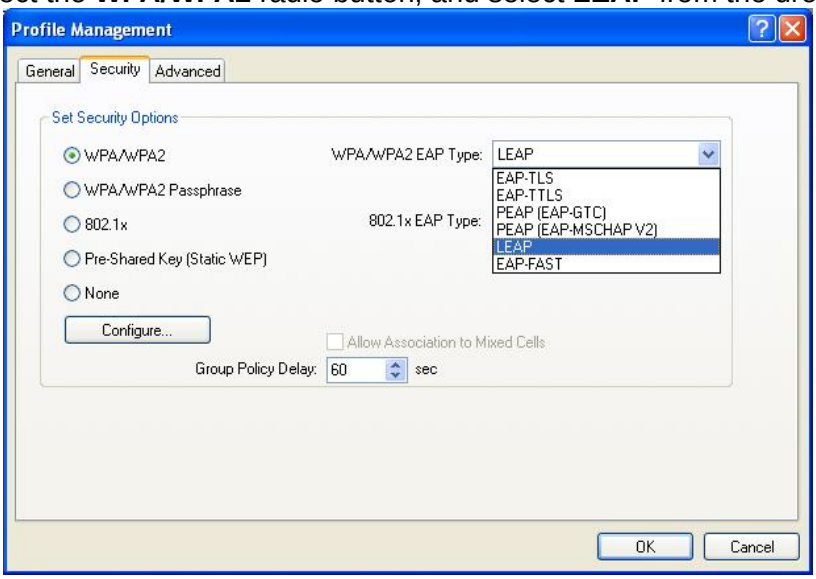
- **Specific Server or Domain:** Leave the server name blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Trusted Root Certification Authorities drop-down list. (Recommended). You can also enter the domain name of the server from which the client will accept a certificate.
- **Login Name:** Enter the login name if required.

Click **OK** to return to the previous window. Click **OK** again to return to the Profile Management window.

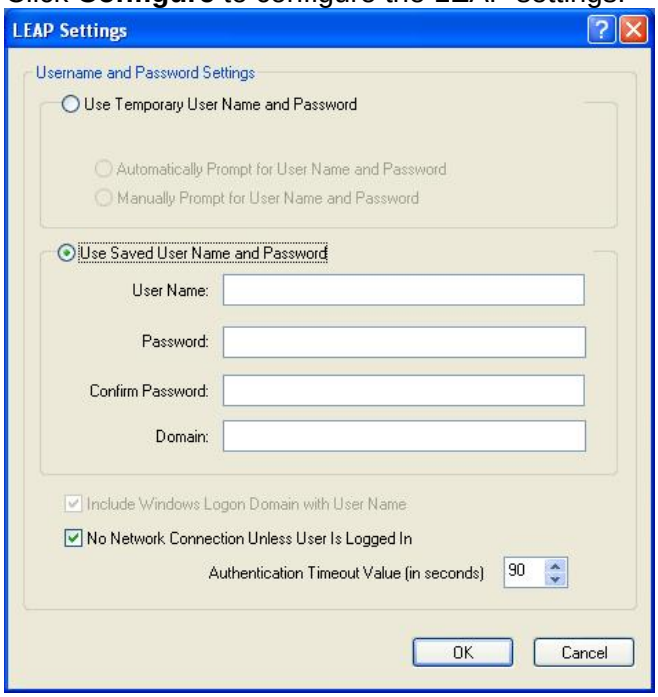
3.2.3.5 WPA/WPA2 – LEAP

LEAP (Lightweight Extensible Authentication Protocol) also known as Cisco-Wireless EAP provides username/password-based authentication between a wireless client and a RADIUS server. LEAP is one of several protocols used with the IEEE 802.1X standard for LAN port access control. LEAP also delivers a session key to the authenticated station, so that future frames can be encrypted with a key that is different than keys used by others sessions. Dynamic key delivery eliminates one big vulnerability; static encryption keys that are shared by all stations in the WLAN.

Select the **WPA/WPA2** radio button, and select **LEAP** from the drop-down list.



Click **Configure** to configure the LEAP settings.

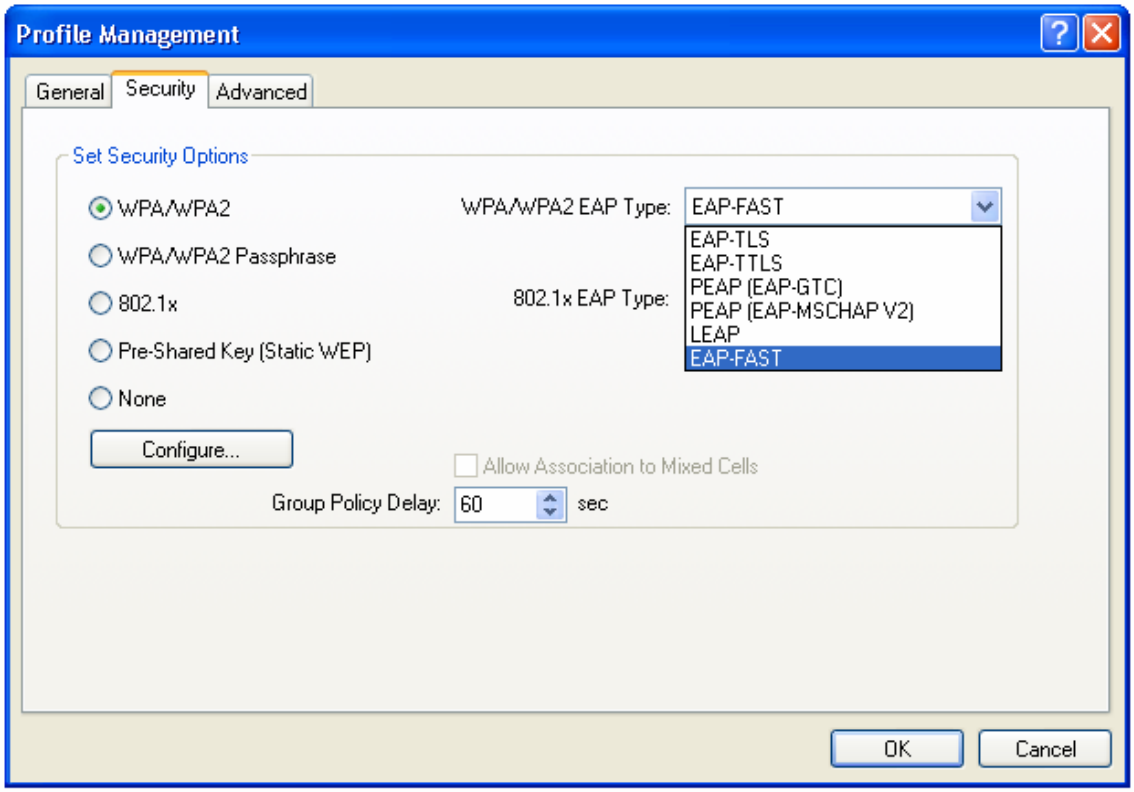


- **Use Temporary User Name and Password:** Select this radio button for a temporary user name and password. This will manually prompt for the user name and password.
- **Use Saved User Name Password:** Select this radio button if the user name and password will be saved in this profile.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

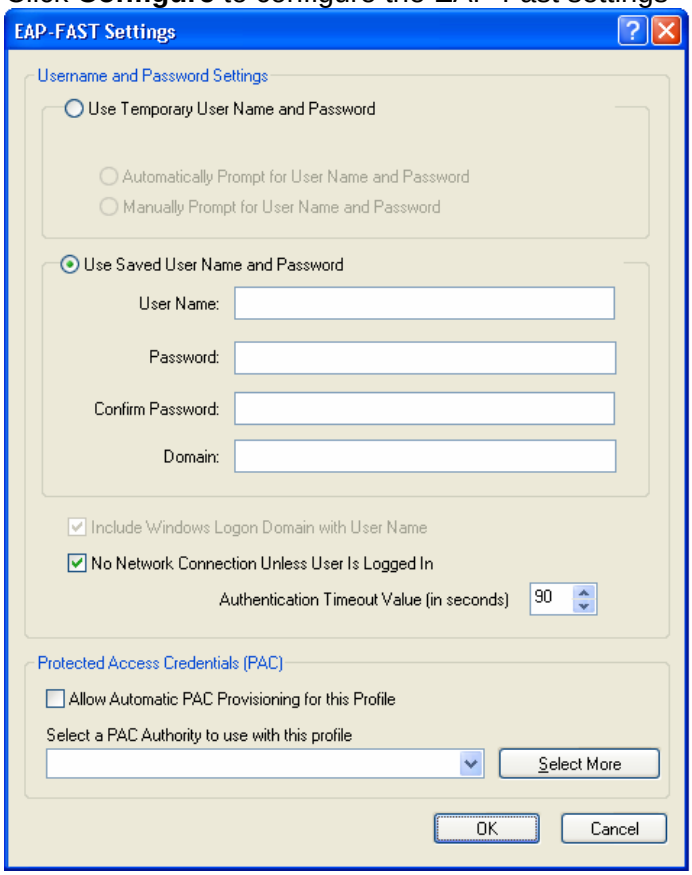
Click **OK** to return to the previous window.

3.2.3.6 WPA/WPA2 – EAP-FAST

EAP-FAST allows customers who cannot enforce a strong password policy to deploy EAP authentication that does not require digital certificates. This method supports a variety of user and password database types and password expiration and change. It is flexible, easy to deploy, and easy to manage. For example, a customer using Cisco LEAP who cannot enforce a strong password policy and does not want to use certificates can migrate to EAP-FAST for protection from dictionary attacks. (See help menu on configuration utility for more details)



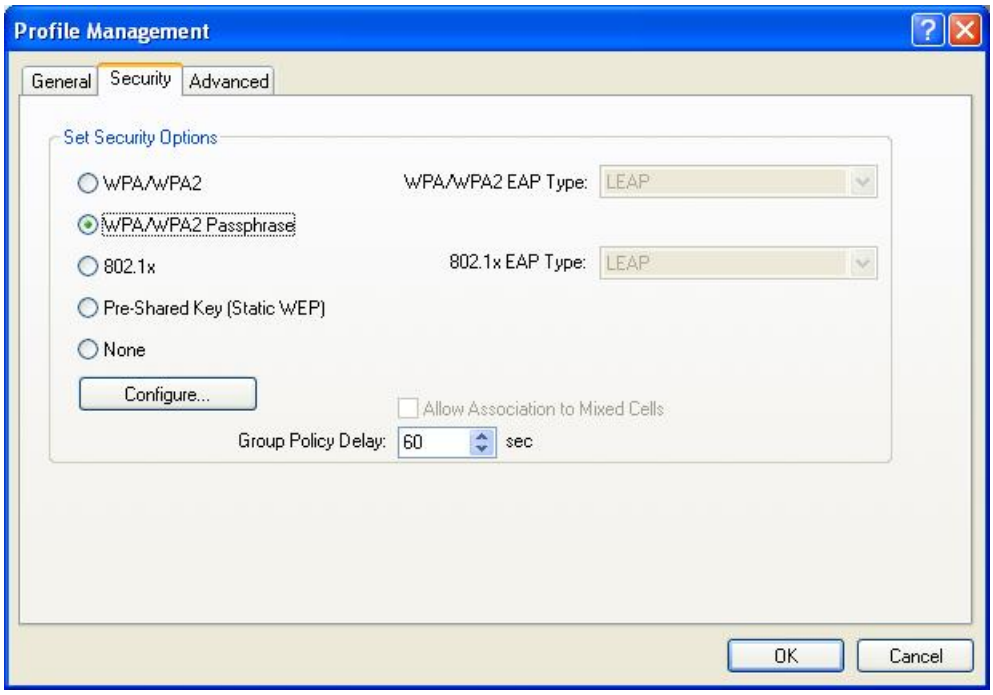
Click **Configure** to configure the EAP-Fast settings



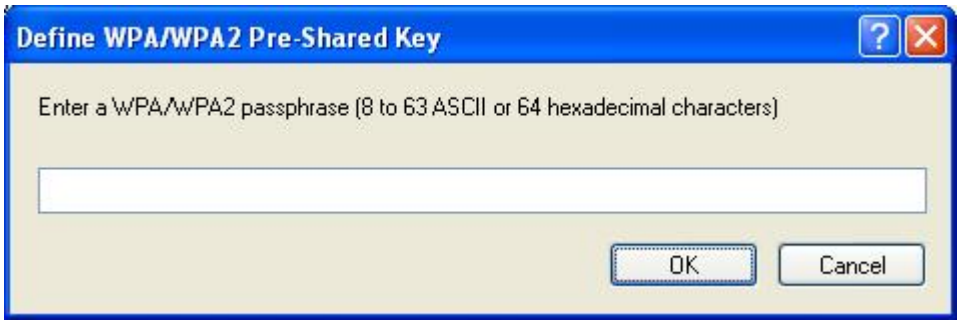
- **Use Temporary User Name and Password:** Selecting this option will manually prompt for the user name and password.
- **Use Saved User Name Password:** Select this radio button if the user name and password will be saved in this profile.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **OK** to return to the previous window.

3.2.3.7 WPA/WPA2 – Passphrase



Select the **WPA/WPA2 Passphrase** radio button and then click **Configure**.



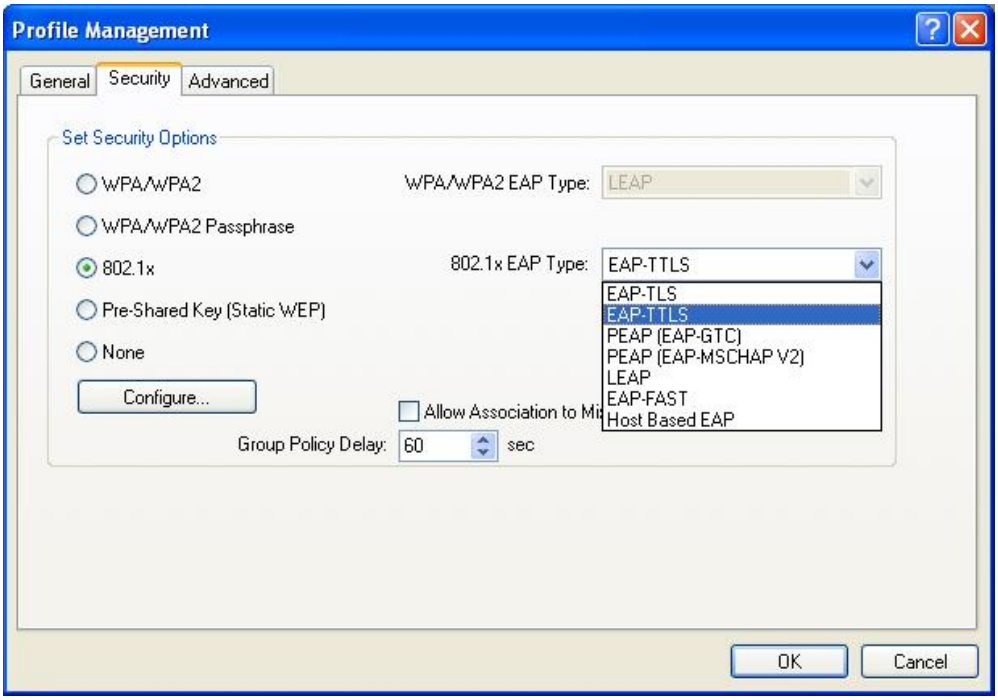
- Enter a WPA/WPA2 passphrase. For ASCII text, enter 8-63 characters, for hexadecimal enter 64 characters).

Click **OK** to return to the previous window. Click **OK** again to return to the Profile Management window.

3.2.3.8 802.1x – TLS, TTLS

802.1X provides an authentication framework for wireless LANs allowing a user to be authenticated by a central authority. 802.1X uses an existing protocol called EAP. EAP (Extensible Authentication Protocol) is an extension to the PPP protocol that enables a variety of authentication protocols to be used. It passes through the exchange of authentication messages, allowing the authentication

software stored in a server to interact with its counterpart in the client.

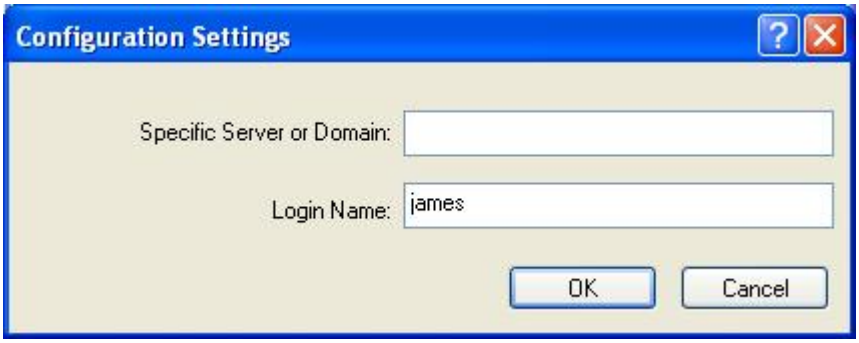


Select the **802.1x** radio button, and then select **EAP – TLS** or **EAP – TTLS** from the drop-down list. TLS (Transport Layer Security) is an IETF standardized authentication protocol that uses PKI (Public Key Infrastructure) certificate-based authentication of both the client and authentication server.

Click **Configure** to configure the TTLS settings.

- **Trusted Root Certification Authorities:** Select the appropriate certificate authority from the drop-down list.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **Settings**.



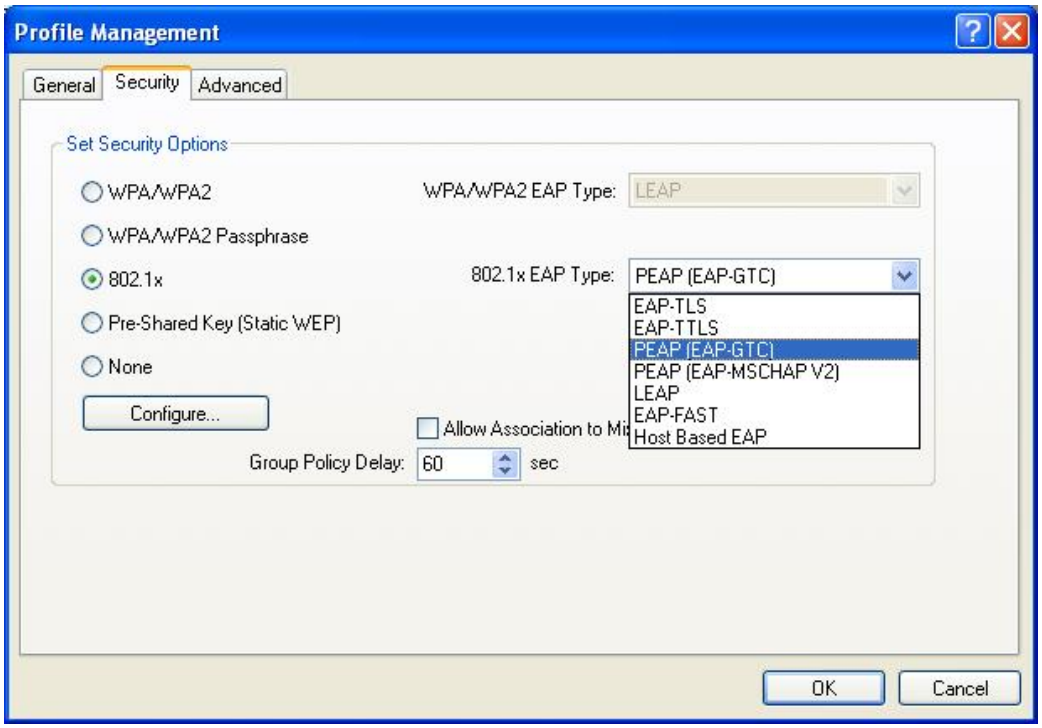
- **Specific Server or Domain:** Leave the server name blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Trusted Root Certification Authorities drop-down list (Recommended). You can also enter the domain name of the server from which the client will accept a certificate.
- **Login Name:** Enter the login name if required.

Click **OK** to return to the previous window. Click **OK** again to return to the Profile Management window.

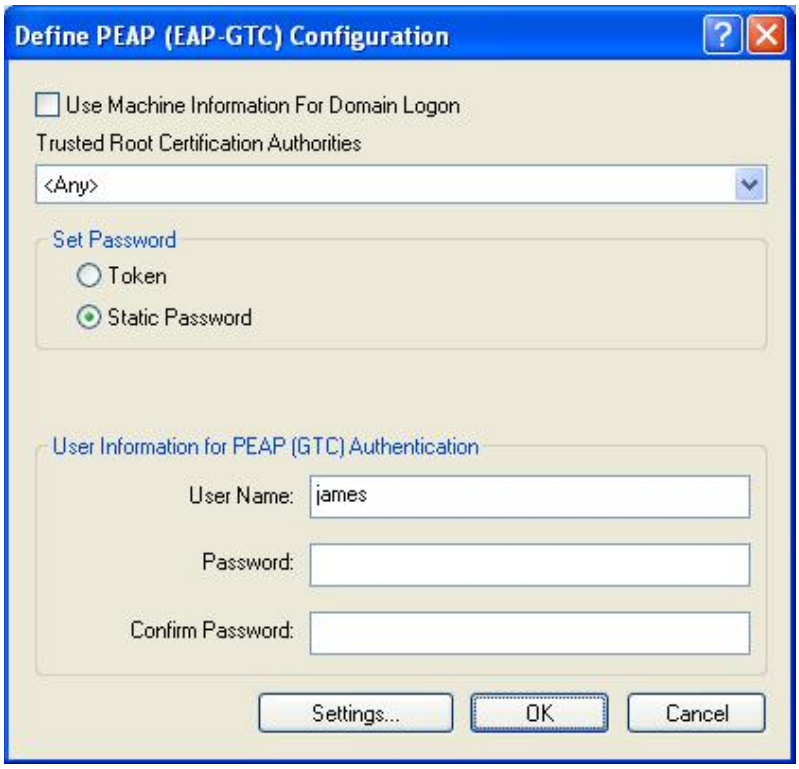
3.2.3.9 802.1x – PEAP (EAP-GTC)

PEAP (EAP-GTC) was standardized along with EAP in RFC 2284. EAP-GTC allows the exchange of clear text authentication credentials across the network. The GTC method does provide a way to move a simple username and password from client to server using an EAP method, so it can be used to provide an authentication method. If EAP-GTC is used to transport reusable passwords, it must be used inside a tunnel for protection and server authentication. EAP-GTC can be used with both TTLS and PEAP.

Select the **802.1x** radio button, and then select **PEAP (EAP-GTC)** from the drop-down list.



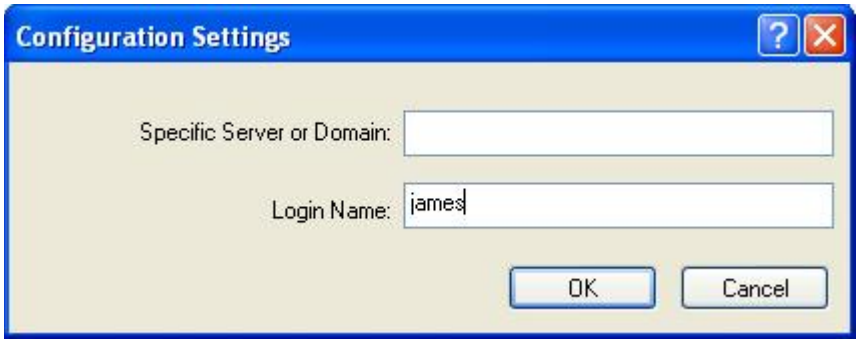
Click **Configure** to configure the PEAP (EAP-GTC) settings.



- **Trusted Root Certification Authorities:** Select the appropriate certificate authority from the drop-down list.

- **User Name:** Enter the user name for the certificate authority.
- **Set Password:** Select **Token** or **Static Password** radio button. The default setting is Static Password.

Click **Settings**.



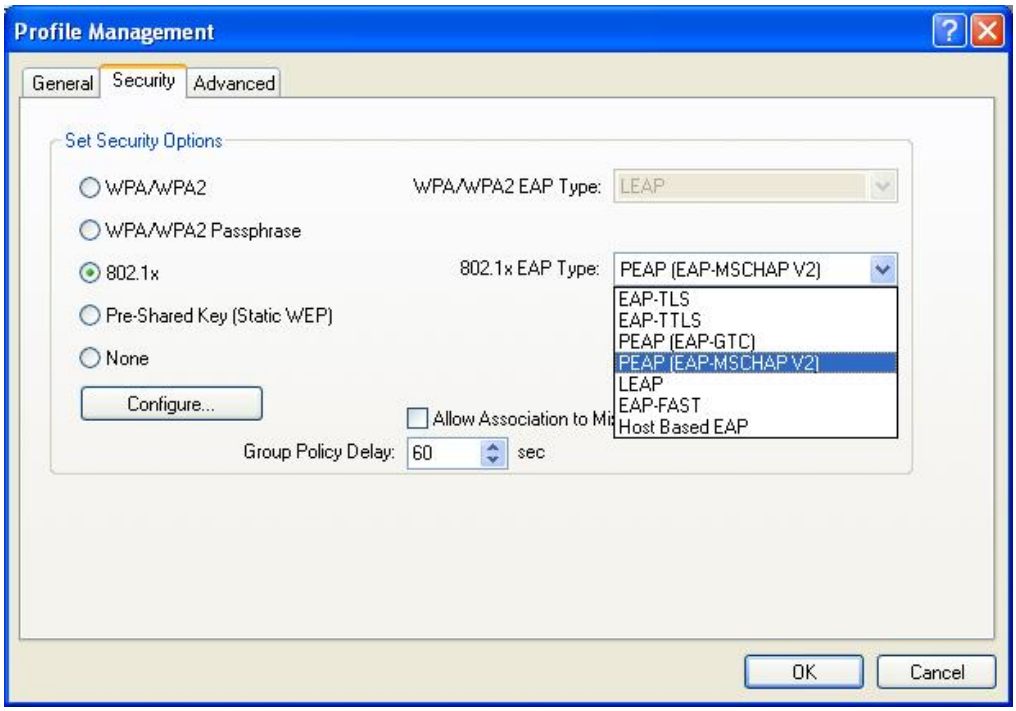
- **Specific Server or Domain:** Leave the server name blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Trusted Root Certification Authorities drop-down list. (Recommended). You can also enter the domain name of the server from which the client will accept a certificate.
- **Login Name:** Enter the login name if required.

Click **OK** to return to the previous window. Click **OK** again to return to the Profile Management window.

3.2.3.10 802.1x – PEAP (EAP-MSCHAP-V2)

The PEAP (EAP-MSCHAP V2) authentication type is based on EAPTLS authentication, but uses a password instead of a client certificate for authentication. PEAP (EAP-MSCHAP V2) uses a dynamic session-based WEP key, which is derived from the device and RADIUS server, to encrypt data.

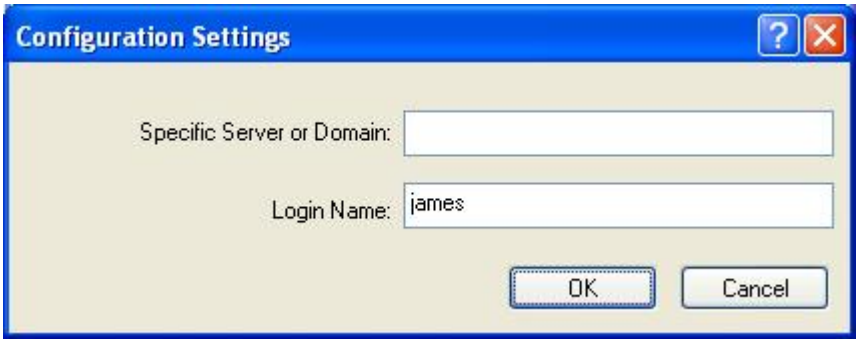
Select the **802.1x** radio button, and then select **PEAP (EAP-MSCHAP-V2)** from the drop-down list.



Click **Configure** to configure the PEAP (EAP-MSCHAP-V2) settings.

- **Trusted Root Certification Authorities:** Select the appropriate certificate authority from the drop-down list.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **Settings**.



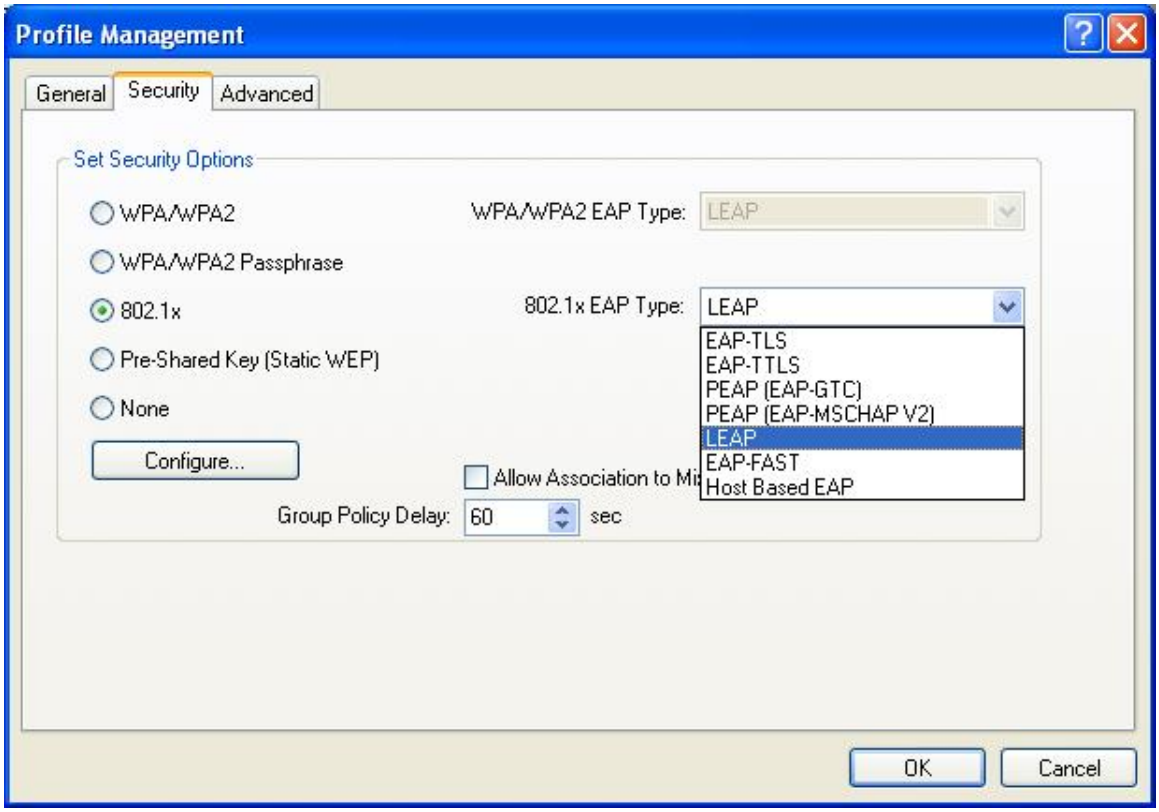
- **Specific Server or Domain:** Leave the server name blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Trusted Root Certification Authorities drop-down list. (Recommended). You can also enter the domain name of the server from which the client will accept a certificate.
- **Login Name:** Enter the login name if required.

Click **OK** to return to the previous window. Click **OK** again to return to the Profile Management window.

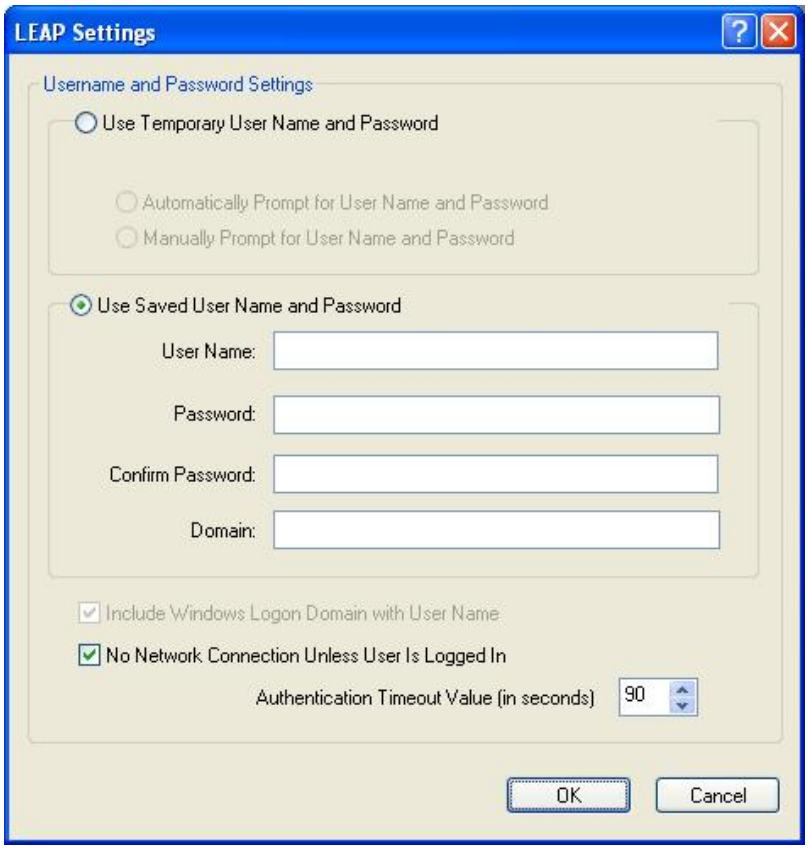
3.2.3.11 802.1x – LEAP

LEAP (Lightweight Extensible Authentication Protocol) also known as Cisco-Wireless EAP provides username/password-based authentication between a wireless client and a RADIUS server. LEAP is one of several protocols used with the IEEE 802.1X standard for LAN port access control. LEAP also delivers a session key to the authenticated station, so that future frames can be encrypted with a key that is different than keys used by others sessions. Dynamic key delivery eliminates one big vulnerability; static encryption keys that are shared by all stations in the WLAN.

Select the **802.1x** radio button, and then select **LEAP** from the drop-down list.



Click **Configure** to configure the LEAP settings.

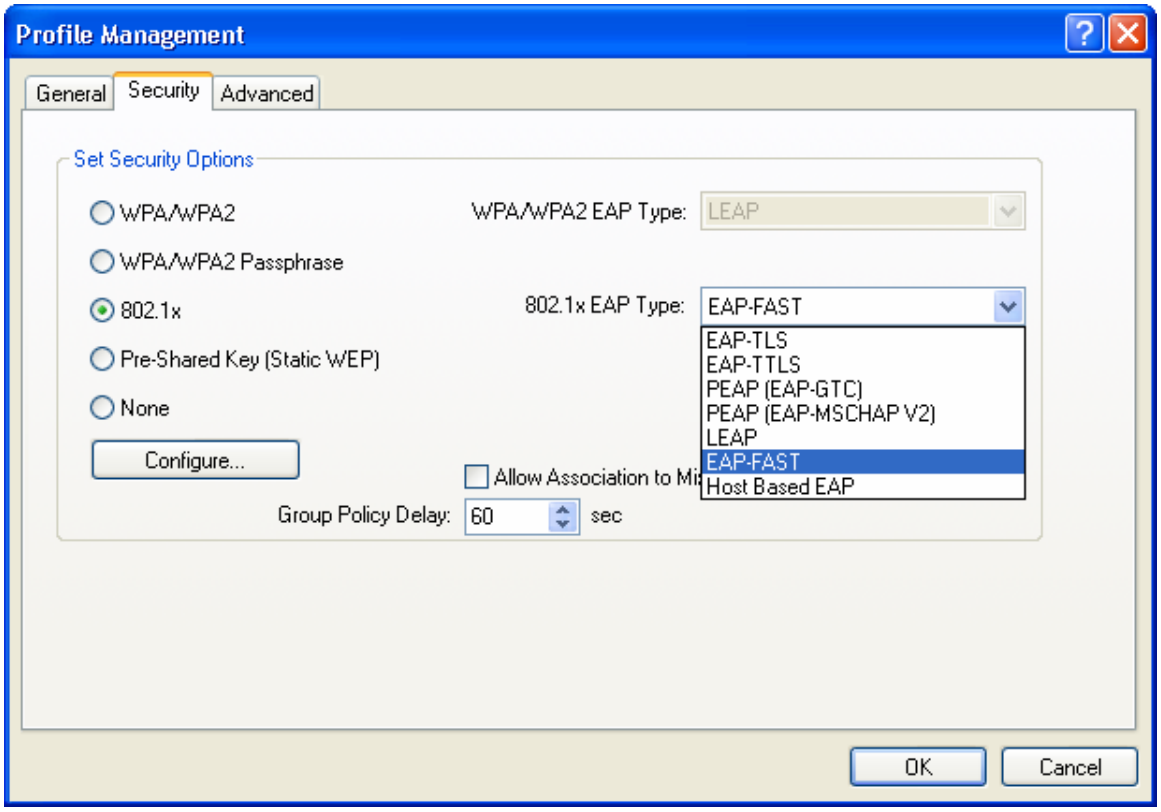


- **Use Temporary User Name and Password:** Selecting this option will manually prompt for the user name and password.
- **Use Saved User Name Password:** Select this radio button if the user name and password will be saved in this profile.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **OK** to return to the previous window.

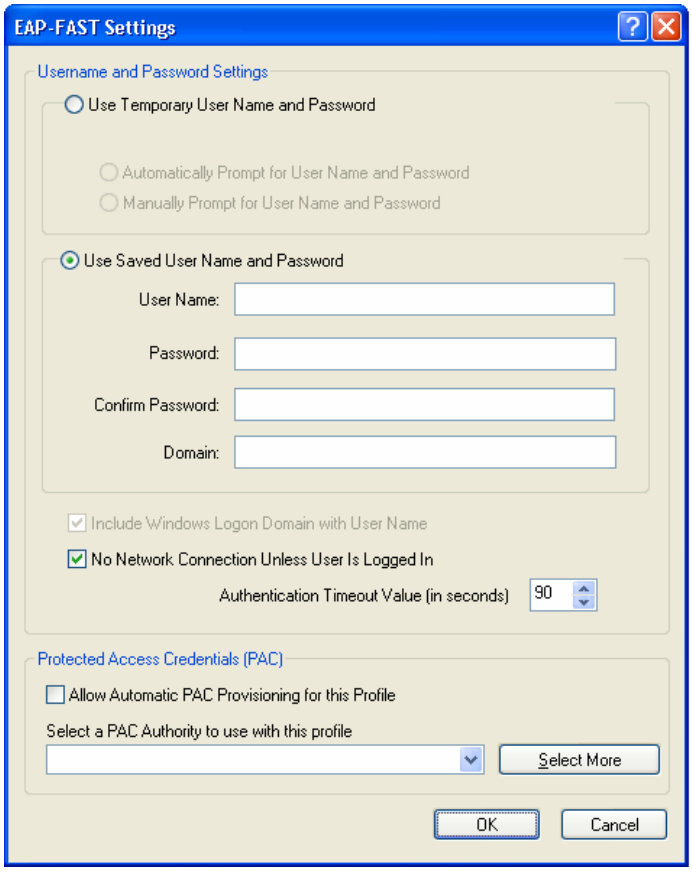
3.2.3.12 802.1x – EAP-FAST

EAP-FAST allows customers who cannot enforce a strong password policy to deploy an 802.1X EAP type that does not require digital certificates. This method supports a variety of user and password database types and password expiration and change. It is flexible, easy to deploy, and easy to manage. For example, a customer using Cisco LEAP who cannot enforce a strong password policy and does not want to use certificates can migrate to EAP-FAST for protection from dictionary attacks. (See help menu on configuration utility for more details)



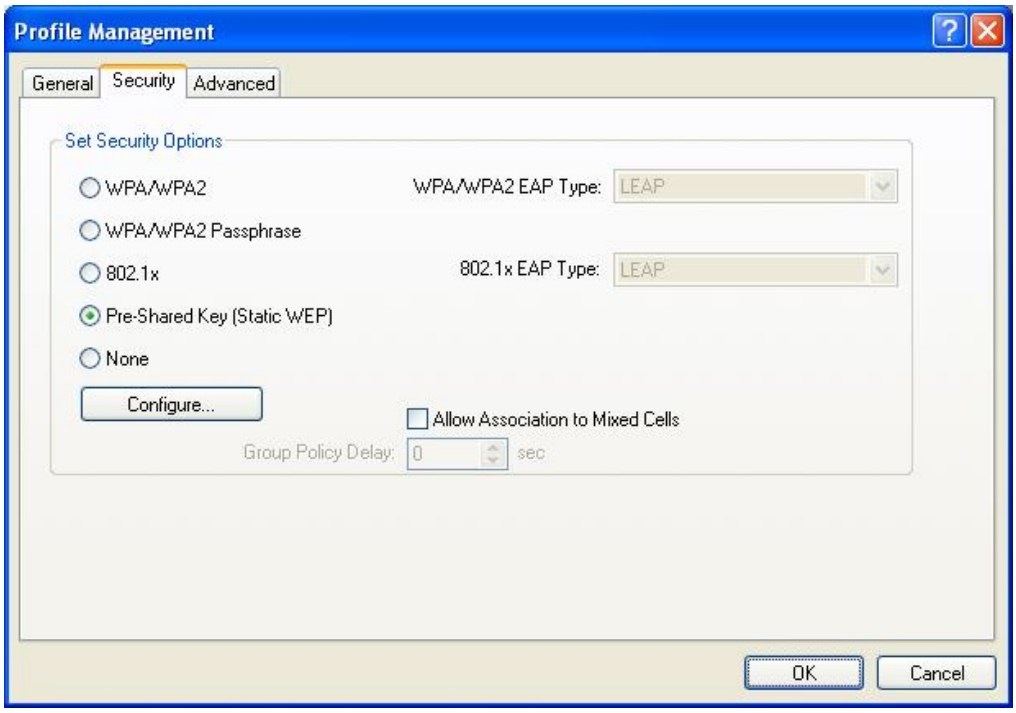
- **Use Temporary User Name and Password:** Selecting this option will manually prompt for the user name and password.
- **Use Saved User Name Password:** Select this radio button if the user name and password will be saved in this profile.
- **User Name:** Enter the user name for the certificate authority.
- **Password:** Enter the password that corresponds with the user name for the certificate authority.
- **Confirm Password:** Retype the password.

Click **OK** to return to the previous window.

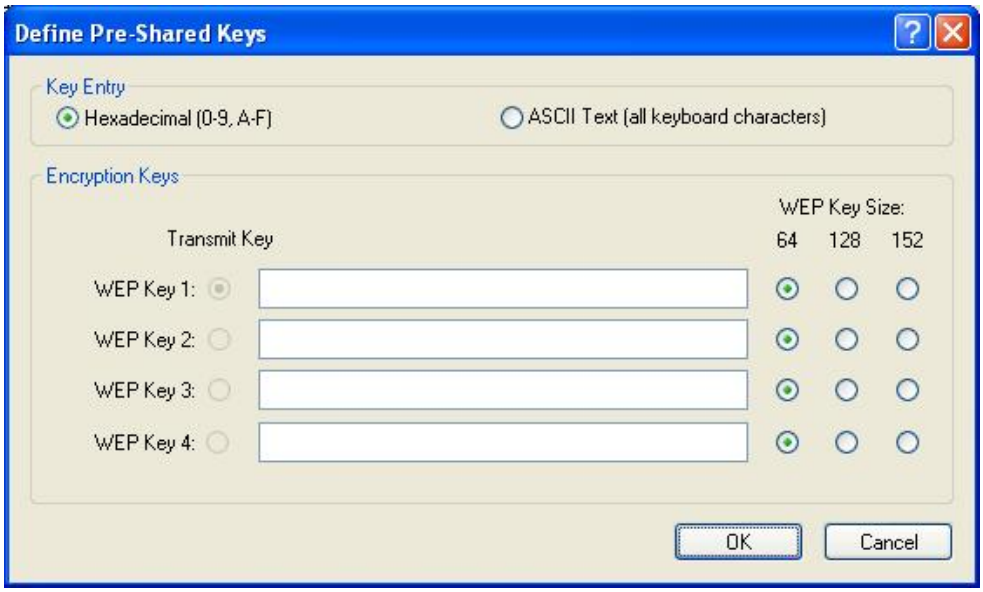


3.2.3.13 Pre-Shared Key (Static WEP)

You may select 64, 128 or 152 bit WEP (Wired Equivalent Privacy) key to encrypt data (Default setting is Disable). WEP encrypts each frame transmitted from the radio using one of the Keys from the panel. When you use WEP to communicate with the other wireless clients, all the wireless devices in this network must have the same encryption key or pass phrase.



Select the **Pre-Shared Key (Static WEP)** radio button and click **Configure**.



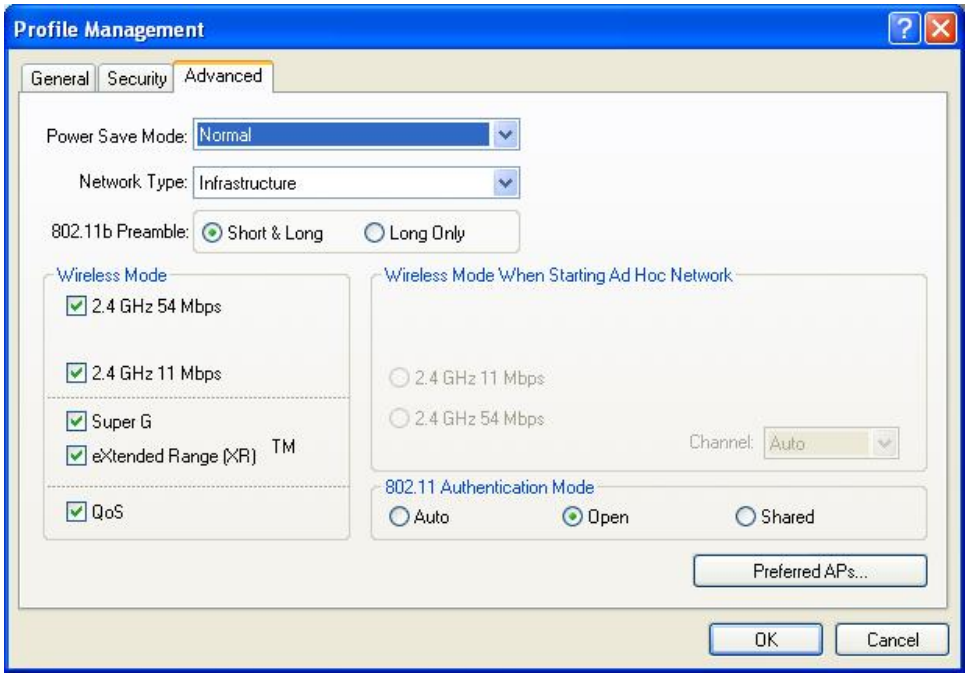
- **Key Entry:** Select **Hexadecimal** or **ASCII** depending on the WEP key that is used.
- **WEP Key Size:** Select **64**, **128**, or **152** bit WEP key size.
- **Transmit Key:** Enter the WEP key in the four WEP key text boxes.

Click **OK** to return to the previous window.

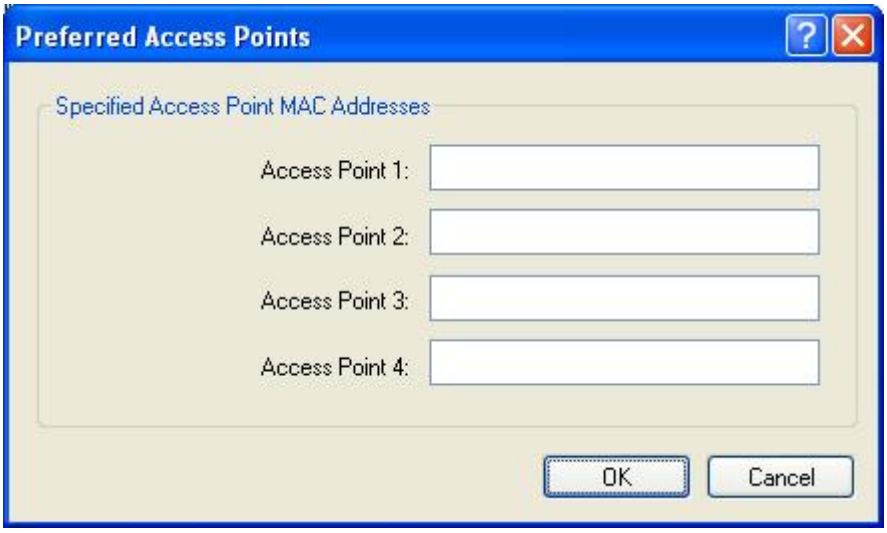
3.2.4 Advanced Settings

Click on the **Advanced** tab in the Profile Management section. Here you can configure the wireless mode, power save mode, and network type.

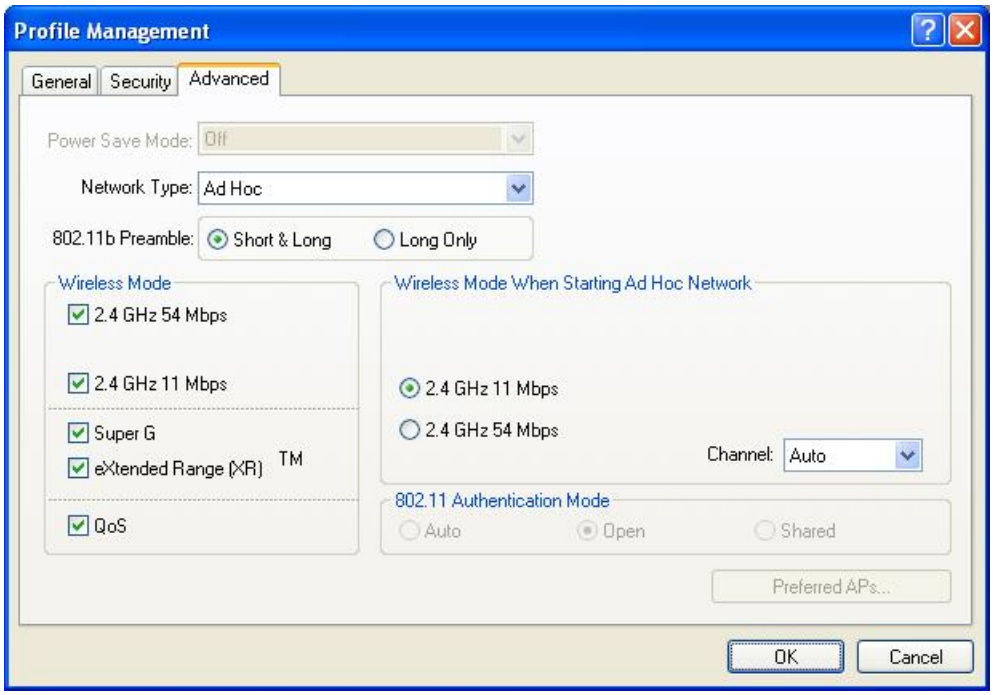
3.2.4.1 Infrastructure Settings



- **Wireless Mode:** Place a check in the preferred frequency and data rate.
- **Power Save Mode:** Select **Maximum**, **Normal**, or **Off** from the drop-down list. Selecting Maximum will save the most power. This is recommended if using a laptop running on battery.
- **Network Type:** Select Infrastructure from the dropdown list if the wireless client is connecting to an access point.
- **802.11b Preamble:** This setting should be the same as the access point. If you are not sure of that setting, select Short & Long.
- **Preferred APs:** Click on this button to add specific access points to this profile. Then enter the MAC addresses of the specific access points and then click **OK** to return to the previous window.



3.2.4.2 Ad Hoc Settings

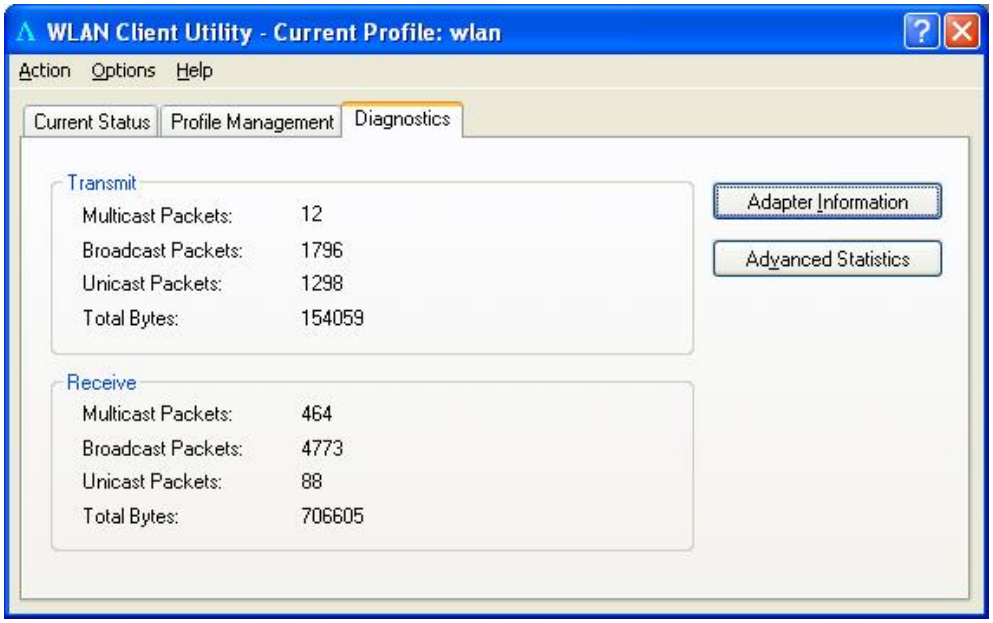


- **Wireless Mode:** Place a check next to the preferred frequency and data rates.
- **Network Type:** Select Ad hoc from the drop-down list if the wireless client is connecting to another wireless client
- **802.11b Preamble:** This setting should be the same as the other wireless client. If you are not sure of that setting, select Short & Long.

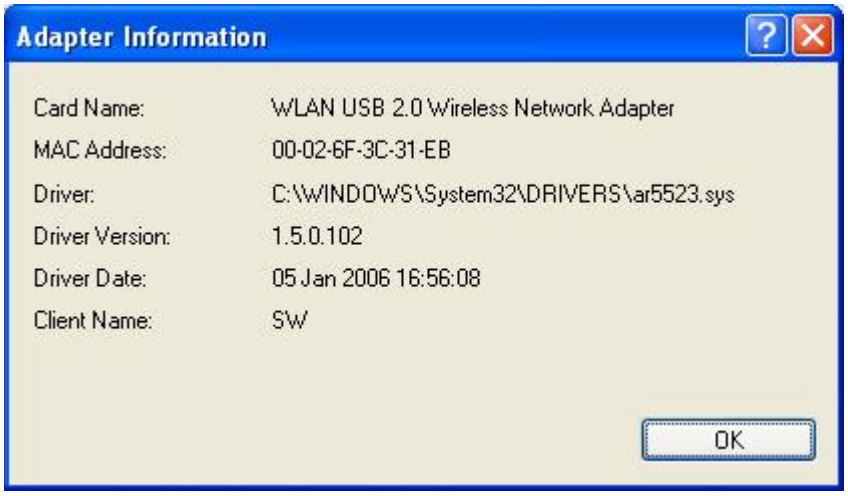
Click **OK** to return to the previous window.

3.3 Diagnostics

The third tab displayed is the **Diagnostics** tab. This tab displays the number of transmitted and received packets.

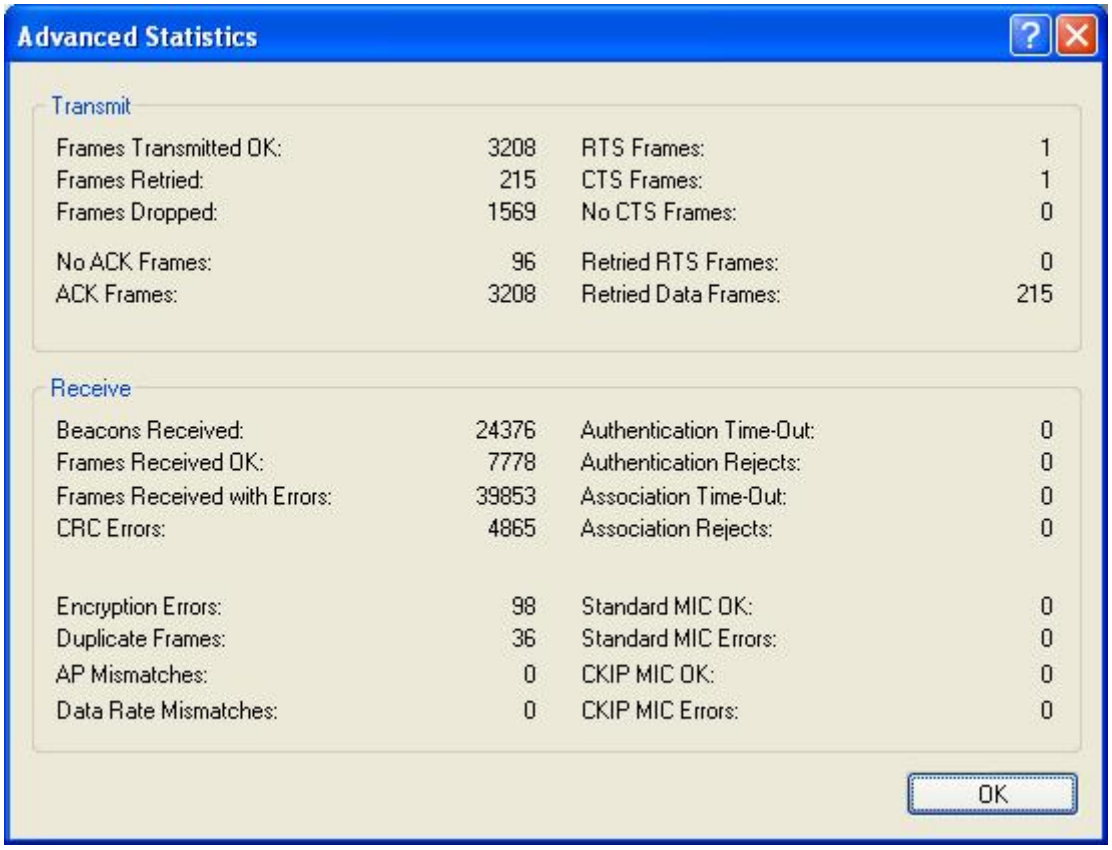


Click on **Adapter Information** to view information about the wireless USB adapter (e.g. Card Name, MAC address, Driver, Driver Version and Driver Date).



Click **OK** to return to the previous window

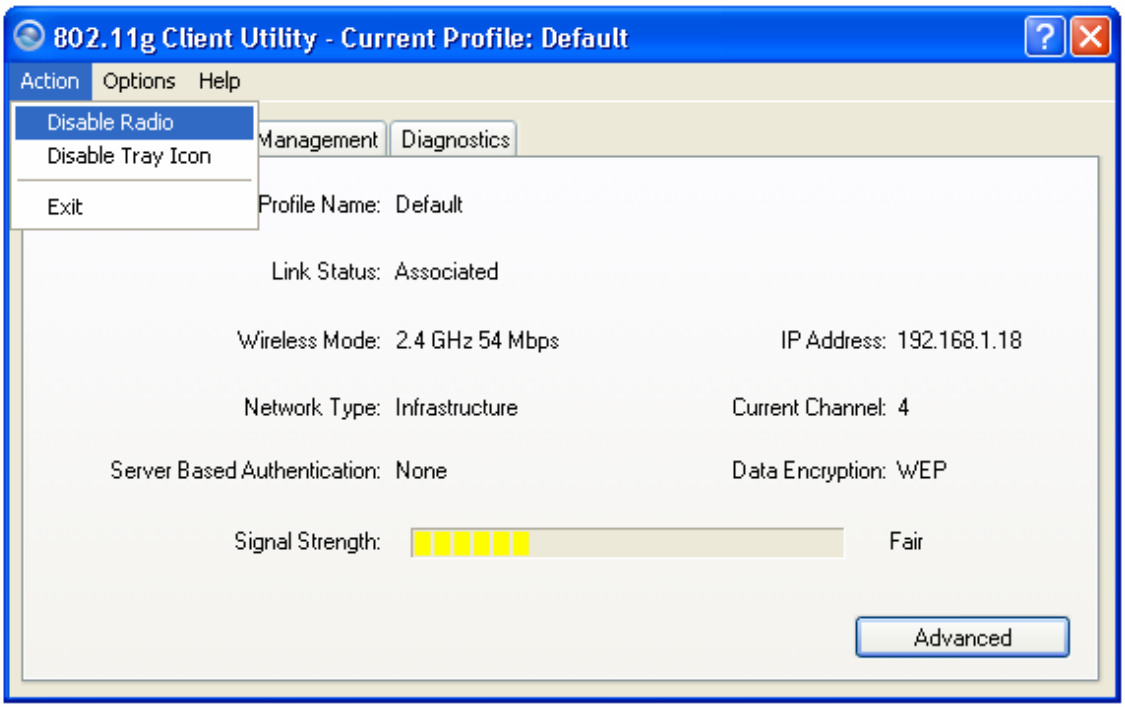
Click **Advanced Statistics** to view detailed statistics about transmit and receive frames.



Click **OK** to return to the previous window

3.4 Enable / Disable Radio

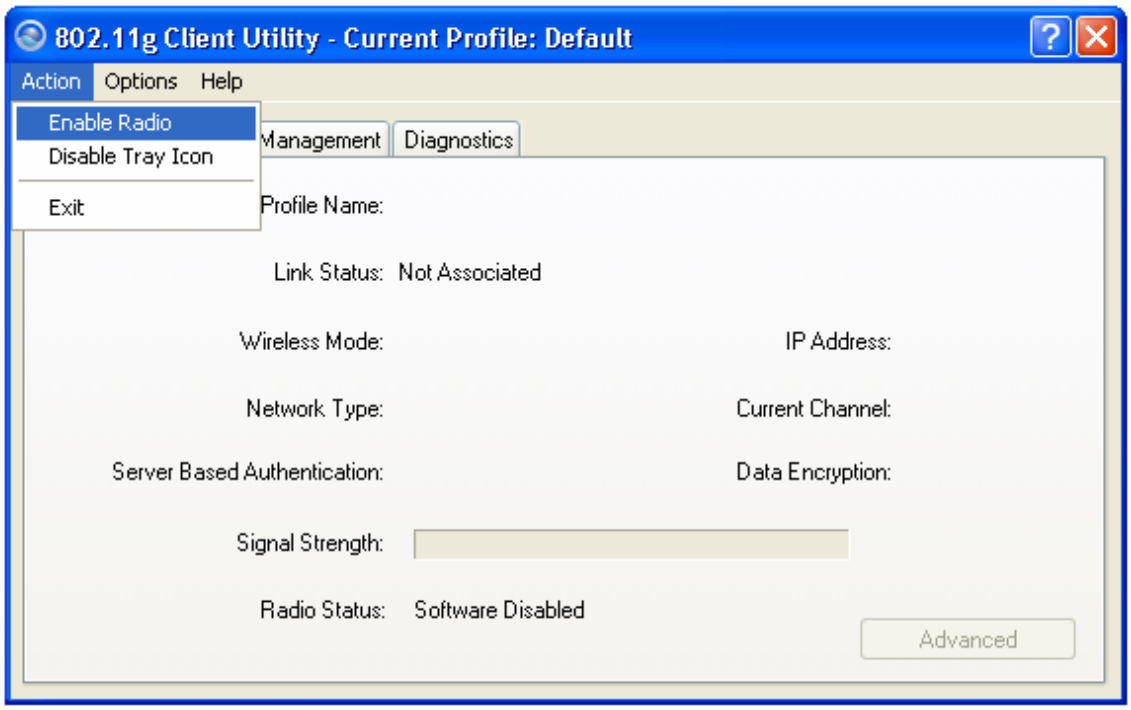
To **disable** the radio, click on **Action** in the menu bar, and then click on **Disable Radio**.



You will then see a confirmation message “The RF signals for the following network card(s) have been successfully disabled”.

Click **OK** to continue.

To **enable** the radio, click on **Action** in the menu bar, and then click on **Enable Radio**.

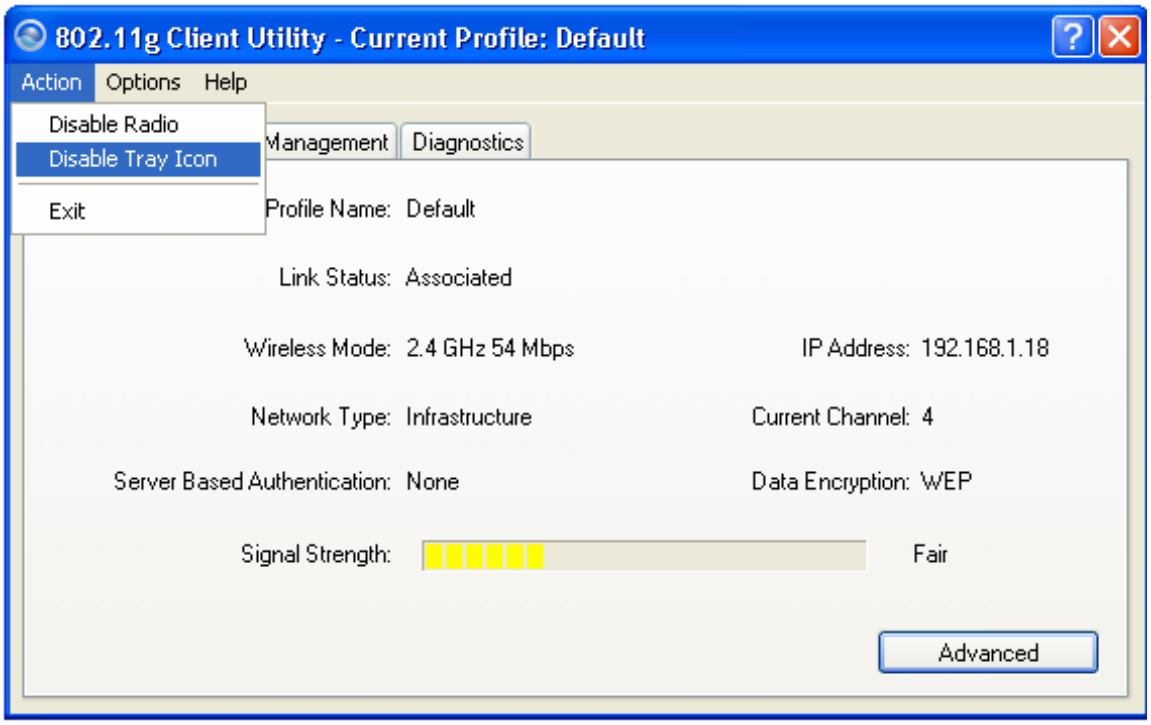


You will then see a confirmation message “The RF signals for the following network card(s) have been successfully enabled”.

Click **OK** to continue.

3.5 Disable Tray Icon

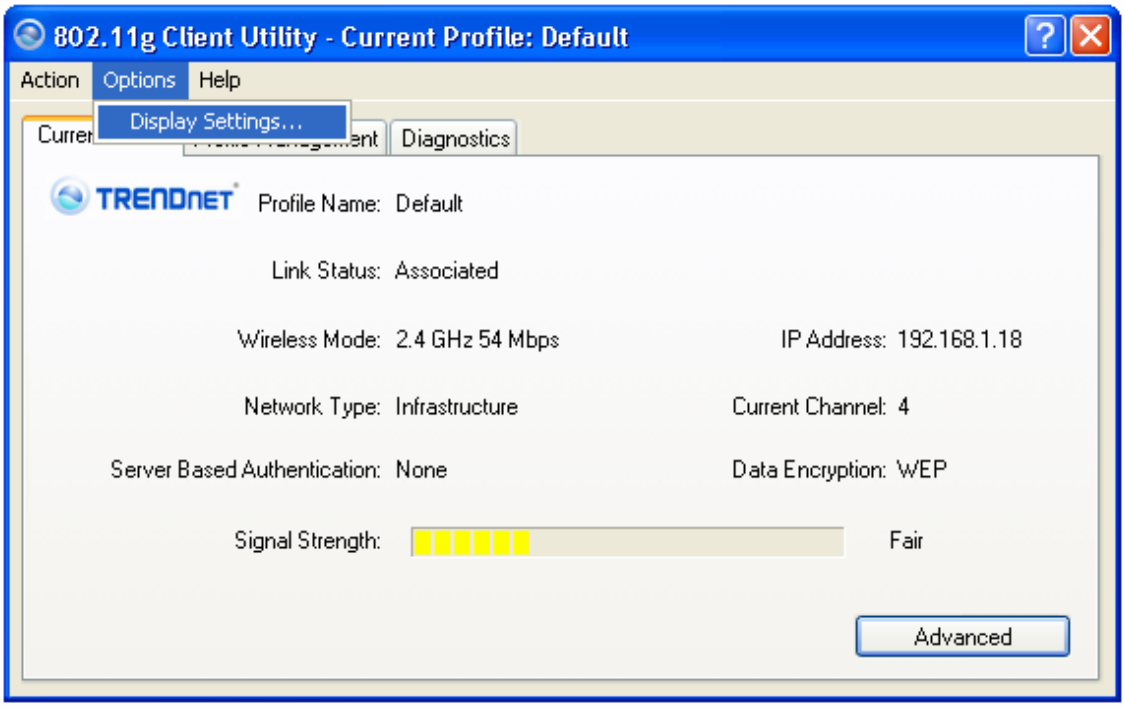
To disable the tray icon, click on **Action** in the menu bar, and then click on **Disable Tray Icon**.



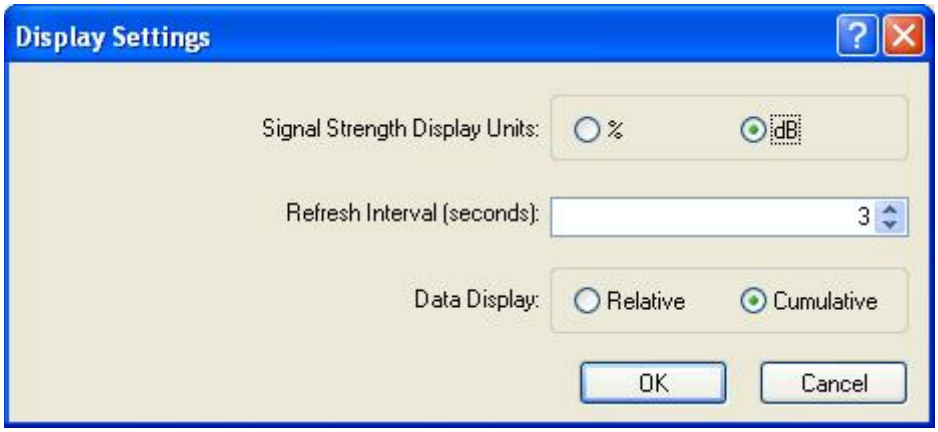
You will then notice that the tray icon has disappeared from the system tray.

3.6 Display Settings

To change the display settings, click on **Options** in the menu bar, and then click on **Display Settings**.



In this window you can change the Signal Strength Display Units from dBm to %, and increase or decrease the refresh interval rate. You can also display date in a cumulative or relative format.



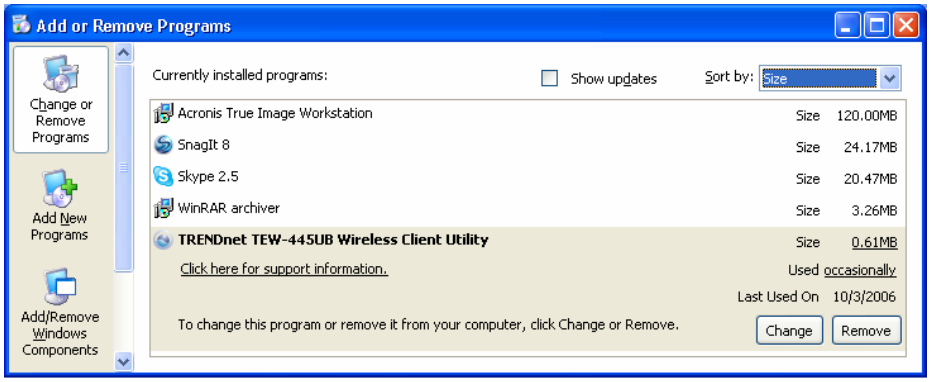
Click **OK** to return to the previous window.

4 Uninstall the Drivers & Client Utility

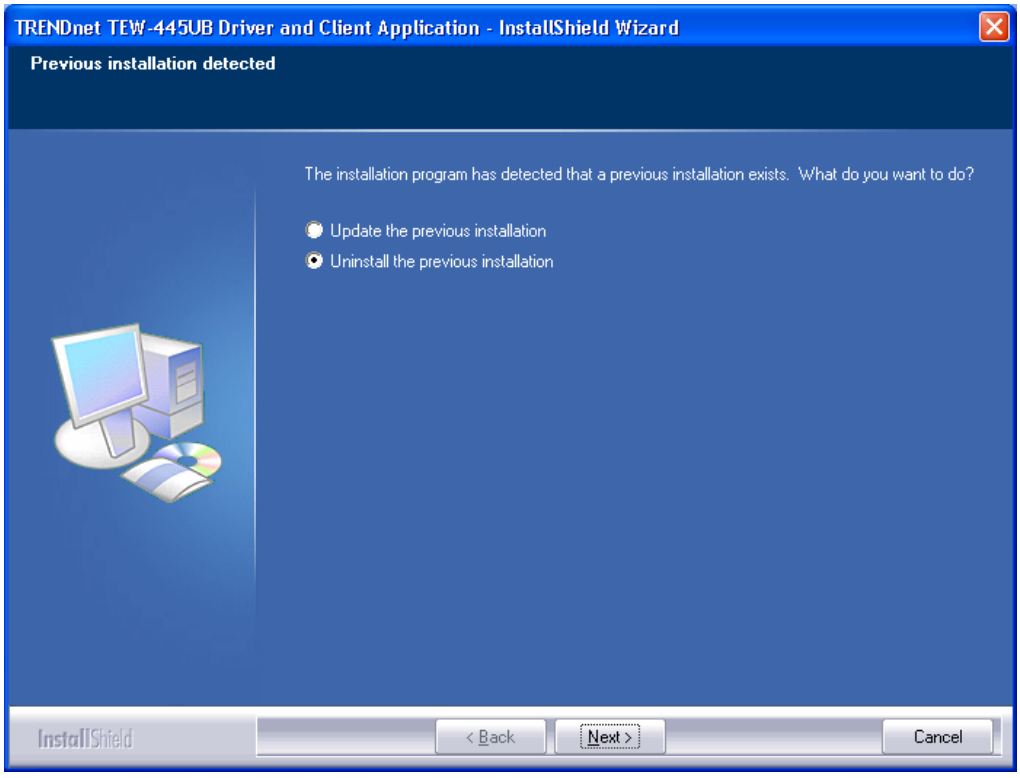
If the device installation is unsuccessful for any reason, the best way to solve the problem is to completely uninstall the device and its utility and repeat the installation procedure again.

Follow the steps below in order to uninstall the Drivers and Client Utility:

1. Click on **Start > Settings > Control Panel > Add or Remove Programs**
2. You will then see the following window. Select the TRENDnet TEW-445UB Wireless Client Utility and then click **Remove**.



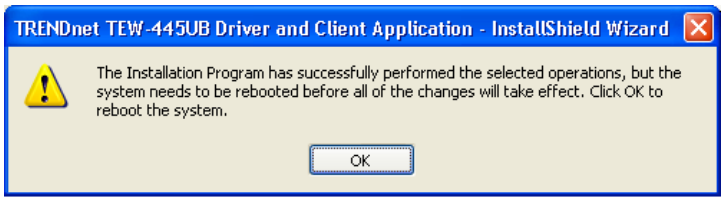
3. Select **Uninstall the previous installation** radio button. Then click **Next**.



4. Click OK.

5. Click **Yes**.

6. Remove the device from your computer and then click **OK**.



Appendix A – Specifications

Data Rates

802.11g: 6, 9, 12, 18, 24, 36, 48, 54, 72, 96 & 108 (Super G) Mbps

802.11b: 1, 2, 5.5, 11Mbps

Standards / Compliance

IEEE802.11, IEEE802.11g, IEEE802.11b, draft IEEE 802.11e, and i standards, IEEE802.1x

Regulation Certifications

FCC Part 15/UL, ETSI 300/328/CE

Operating Voltage

5 V ± 0.25V

Status LEDs

RF link activity

Drivers

Windows XP/2K/ME/98

RF Information

Frequency Band

U.S., Europe and Japan product covering 2.4 to 2.484 GHz, programmable for different country regulations

Media Access Protocol

Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)

Modulation Technology

802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
802.11b: DSSS (DBPSK, DQPSK, CCK)

Operating Channels

11 for North America, 13 for Europe and Japan

Receive Sensitivity (Typical)

- 2.412~2.472G(IEEE802.11g)
  6Mbps@ -91dBm;
  54Mbps@ -76dBm
- 2.412~2.472G(IEEE802.11b)
  11Mbps@ -91dBm;
  1Mbps@ -96dBm

Available transmit power

FCC

- 2.412~2.462G(IEEE802.11g)
  22 dBm @ 6 ~ 24 Mbps
  21 dBm @ 36 Mbps
  20 dBm @ 48 Mbps
  19 dBm @ 54 Mbps
- 2.412~2.462G(IEEE802.11b)
  21 dBm @1~11Mbps

ETSI

- 2.412~2.472G(IEEE802.11g)
  20 dBm @ 6 ~ 24 Mbps
  20 dBm @ 36 Mbps
  20 dBm @ 48 Mbps
  19 dBm @ 54 Mbps
- 2.412~2.472G(IEEE802.11b)
  20 dBm @1~11Mbps

Antenna

Detachable Dipole antenna (2dBi Gain)

Networking

Topology

Ad hoc, Infrastructure

Security

IEEE802.1x support for LEAP/PEAP
WEP 64,128,152bit
WPA (PSK, TKIP)
WPA2 (AES)

Physical

Form Factor

USB 2.0

Dimensions

75.2(L) mm x 53.9(W) mm x 14(H) mm

Weight

40 g/ 1.5oz

Environmental

Temperature Range

Operating: -0°C to 55°C
Storage: -20°Cto 75°C

Humidity (non-condensing)

5%~95% Typical

Package Contents

One USB Adapter
One USB Cable (Type A to Mini B)
One CD-ROM with User's Manual and Drivers
One Quick Installation Guide
One 2dBi Detachable Antenna

Appendix B – FCC Interference Statement

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses, and radiates radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the distance between the equipment and the receiver.
3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:
FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This device complies with FCC RF Exposure limits set forth for an uncontrolled environment, under 47 CFR 2.1093 paragraph (d) (2).
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your □ body.□

□

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 - 11.

Limited Warranty

TRENDnet warrants its products against defects in material and workmanship, under normal use and service, for the following lengths of time from the date of purchase.

TEW-445UB	Three years

If a product does not operate as warranted above during the applicable warranty period, TRENDnet shall, at its option and expense, repair the defective product or deliver to customer an equivalent product to replace the defective item. All products that are replaced will become the property of TRENDnet. Replacement products may be new or reconditioned.

TRENDnet shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to TRENDnet pursuant to any warranty.

There are no user serviceable parts inside the product. Do not remove or attempt to service the product through any unauthorized service center. This warranty is voided if (i) the product has been modified or repaired by any unauthorized service center, (ii) the product was subject to accident, abuse, or improper use (iii) the product was subject to conditions more severe than those specified in the manual.

Warranty service may be obtained by contacting TRENDnet office within the applicable warranty period for a Return Material Authorization (RMA) number, accompanied by a copy of the dated proof of the purchase. Products returned to TRENDnet must be pre-authorized by TRENDnet with RMA number marked on the outside of the package, and sent prepaid, insured and packaged appropriately for safe shipment.

WARRANTIES EXCLUSIVE: IF THE TRENDNET PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT TRENDNET'S OPTION, REPAIR OR REPLACEMENT. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. TRENDNET NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF TRENDNET'S PRODUCTS.

TRENDNET SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR OR MODIFY, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OR OTHER HAZARD.

LIMITATION OF LIABILITY: TO THE FULL EXTENT ALLOWED BY LAW TRENDNET ALSO

EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATE, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT TRENDNET'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

Governing Law: This Limited Warranty shall be governed by the laws of the state of California.
Note: AC/DC Power Adapter, Cooling Fan, and Power Supply carry 1-Year Warranty

TRENDnet Technical Support

US • Canada

Toll Free Telephone: 1(866) 845-3673

24/7 Tech Support

Europe (Germany • France • Italy • Spain • Switzerland • UK)

Toll Free Telephone: +00800 60 76 76 67

English/Espanol - 24/7
Francais/Deutsch - 11am-8pm, Monday - Friday MET

Worldwide

Telephone: +(31) (0) 20 504 05 35

English/Espanol - 24/7
Francais/Deutsch - 11am-8pm, Monday - Friday MET

Product Warranty Registration

Please take a moment to register your product online.
Go to TRENDnet's website at http://www.trendnet.com

TRENDnet
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Torrance, CA 90505
USA