



National Institutes of Health

Cisco Wireless LAN Client Setup Procedures

February 23, 2004

Version 2.2.1

Center for Information Technology

Division of Network Systems and Telecommunications

Network & Engineering Branch

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Document Change History

This section identifies all changes that have been incorporated into the *Cisco Wireless LAN Client Setup Procedures* since the original version.

Date	Version Number	Change Description
March 5, 2003	1.0	Original Version
March 11, 2003	1.1	Update section 2.2, “Installing the Driver for Windows 2000” and section 5.2.3, “User removes the drivers and can’t reinstall them”.
March 31, 2003	1.2	Remove production SSID and update driver paths.
April 2, 2003	1.2.1	Update Troubleshooting section 5.2.2, step 3.
April 8, 2003	1.3	Add Troubleshooting section 5.2.1, “User can authenticate through wireless LAN but cannot access the Internet or network”.
September 25, 2003	2.0	Update procedures for wireless consolidation. Change document title from “Wireless LAN Setup Procedures: Client” to <i>Cisco Wireless LAN Client Setup Procedures</i> .
October 24, 2003	2.1	Update “Introduction”, “Wireless Authentication Overview”, and “Installing the ACU for Windows NT”. Delete outdated information.
January 20, 2004	2.2	Use Key #1 for the WEP encryption key and transmit key for NIH users.
February 23, 2004	2.2.1	Update Figure 32, page 23.

1 Introduction

The National Institutes of Health (NIH) provides wireless access to NIH local area networks (LANs) at the Bethesda campus and certain off-campus locations. A wireless LAN is a flexible data communications system implemented as an extension to, or as an alternative for, a wired LAN. Using radio frequency (RF) technology, wireless LANs transmit and receive data over the air, minimizing the need for wired connections.

The NIH wireless LAN allows a multi-vendor environment. It is configured to use client adapters and access points from multiple vendors, so that any user's client adapter card can communicate with any vendor's access point, providing a seamless wireless network. The wireless LAN uses NIH-wide standard encryption standards as recommended by the National Institute of Standards and Technology (NIST). This ensures privacy of data, as required by the Health Insurance Portability and Accountability Act (HIPAA) of 1996.

1.1 Purpose

This document contains the standard operating procedures for setting up wireless LAN client access for NIH staff using Cisco technology.

1.2 Scope

This document provides procedures for the following tasks:

- Installing the Cisco wireless client adapter driver for Windows and Macintosh
- Installing the Cisco Aironet Client Utility (ACU) for Windows
- Configuring the ACU for Windows and Macintosh
- Troubleshooting

1.3 Audience

These procedures are intended for:

- LAN Administrators

1.4 Materials Needed

Specific Cisco wireless adapter software and firmware is used for each operating system. To set up wireless access you will need the following.

1.4.1 Drivers and Client Utilities (ACU) for Windows and Macintosh

The drivers and client utilities for each operating system are as follows:

- Windows NT/2000/XP (PCMCIA)
 - Driver Version 8.3.10
 - Client Radio Firmware Version 5.20.17

- Aironet Client Utility (ACU) Version 6.1
- Windows 2000/NT/XP (Mini-PCI, built-in)
 - Driver Version 3.5
 - Client Radio Firmware Version 5.20.17
 - Aironet Client Utility (ACU) Version 6.1
- Macintosh 9.x and OS X (10.1 or later)
 - Driver Version 3.0
 - Client Radio Firmware Version 4.25.30
 - Aironet Client Utility (ACU) Version 3.0

1.4.2 Wireless Client Adapter Software Directory

The wireless client adapter software is found on the CD provided or downloaded from the NIH Information Systems Dedicated Procurement (iSDP) [Wireless LAN software page](#).

- For Windows click **Cisco Aironet Client Software**.
- For Macintosh click **MACOSInstallv30.sit**. If you need to upgrade the client radio firmware to version 4.25.30, click **350-PCMCIA-LMC-PCI-v42530.exe**.

1.5 Wireless Authentication Overview

In the NIH wireless LAN environment the various vendors' client adapters, client utilities, and access points are configured to communicate using the NIH standard secure access method. Two means are employed to secure data: 128-bit Wired Equivalent Privacy (WEP) encryption is used when the link is established between the wireless client and the access point. Virtual Private Networking (VPN) with Advanced Encryption Standard (AES) 256 bit or Triple Data Encryption Standard (3DES) 168 bit (depending on the client adapter used) is employed to encrypt NIH user data.

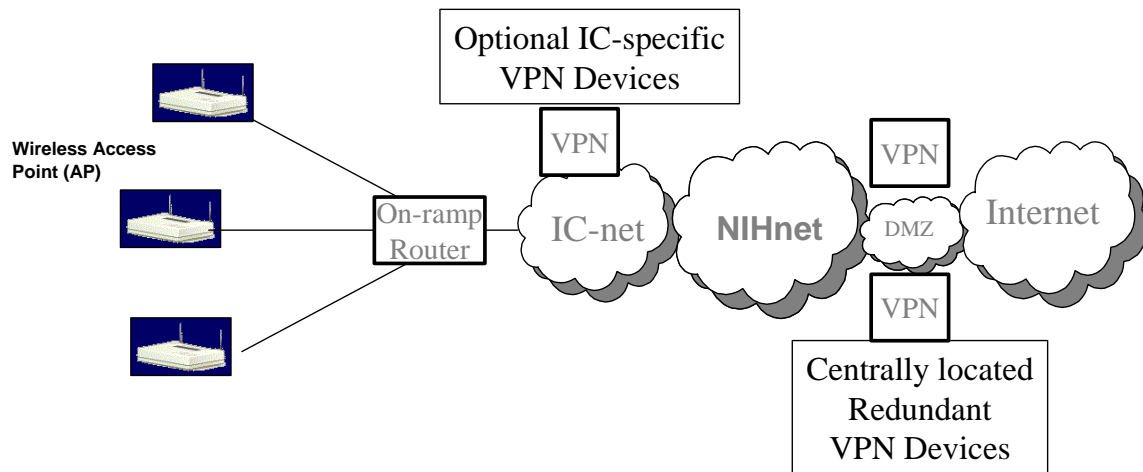
When the user turns on the computer, the wireless adapter tries to associate with the AP via WEP key and Service Set Identifier (SSID), and sends a Dynamic Host Configuration Protocol (DHCP) request to obtain an IP address from the DHCP server. The VPN client then connects to the VPN concentrator and the user signs on using the NT domain (Active Directory) credentials.

Users who are NIH employees authenticate through a VPN concentrator. NIH guests or patients authenticate through Wireless Gateway servers using assigned user names and passwords. Wireless Gateway-authenticated users have very limited Internet access, while VPN users have the same network access as wired users. **Note:** At the "Demilitarized Zone" (DMZ), security checks are applied to all traffic. If users do not authenticate through VPN or Wireless Gateway, their packets will be dropped at the wireless DMZ.

Authentication for NIH users connecting through the wireless LAN is the same as for users connecting via the wired network. The wireless VPN servers and Wireless Gateway participate in the single sign-on process, so that the same password is used to log on to both the wireless and wired networks.

The NIH wireless LAN is illustrated in Figure 1.

Figure 1. NIH Wireless LAN Overview



2 Installing the Cisco Wireless Client Adapter Driver

This section explains how to install the Cisco client adapter driver for Windows NT, 2000, and XP, and Macintosh operating systems. The client adapter driver and client utility can be downloaded from http://sdp.cit.nih.gov/downloads/wireless_lan.asp.

2.1 Installing the Driver for Windows NT

Windows NT supports the 2.4-GHz client adapter only. Therefore, a Windows NT driver is not available for the 5-GHz client adapter. In addition, the laptop must be running Windows NT Service Pack 3 or greater.

1. Download the driver from http://sdp.cit.nih.gov/downloads/wireless_lan.asp and save it in a desired folder, as follows:
 - a. In the **Wireless LAN** list under **Cisco Aironet Client Software**, click **Cisco Aironet Client Software**.
 - b. **Save** the file to a desired folder.
2. Double click the **Windows-Client-Installation-Wizard-v11.zip** icon to unzip the file into the folder in step 1.
3. Double click **Windows-Client-Installation-Wizard-v11.exe** to extract the file into the folder in step 1.

4. Insert the client adapter (PCMCIA) into the laptop's PCMCIA slot. An error message may appear indicating that a least one service or driver failed during system setup. If this message appears, click **OK**.
5. Follow the steps below to obtain an available interrupt request (IRQ):
 - a. Select **Start > Programs > Administrative Tools > Windows NT Diagnostics**.
 - b. Click the **Resources** tab.
 - c. The used IRQs are listed in numerical order along the left side of the **Resources** window. Write down the number of an IRQ that is not being used. You will need this IRQ for step 9.
6. On the laptop desktop, double click **My Computer**, then select **Control Panel > Devices**. Scroll down and select **PCMCIA**. Click **Startup**, select **Automatic**, and click **OK**.
7. Select/Enter the path to where the driver is located (example: E:\wireless-client\version-6.1\PCI-PCM\NT4.0\NDIS4).
8. In the **Select OEM Option** box, select the **Cisco Systems Wireless LAN Adapter** and click **OK**.
9. Enter an available IRQ number, which you obtained in step 5.
10. Click **OK/Close**.
11. The **Microsoft TCP/IP Properties** window should open. If it does not open, double click **My Computer**, **Control Panel**, and **Network**. Click **Protocols**, **TCP/IP**, and **Properties**.
12. Select **Obtain an IP address from a DHCP server**.
13. Click **Yes** to restart the laptop.

The driver installation is complete. Continue with section 3.2, "Installing the ACU for Windows NT".

2.2 Installing the Driver for Windows 2000

1. Download the driver from http://sdp.cit.nih.gov/downloads/wireless_lan.asp and save it to a desired folder, as follows:
 - a. In the **Wireless LAN** list under **Cisco Aironet Client Software**, click **Cisco Aironet Client Software**.
 - b. **Save** the file to a desired folder.
2. Double click the **Windows-Client-Installation-Wizard-v11.zip** icon to unzip the file into the folder in step 1.
3. Double click **Windows-Client-Installation-Wizard-v11.exe** to extract the file into the folder in step 1.

4. Insert the client adapter (PCMCIA) into the laptop's PCMCIA slot. Windows 2000 automatically detects it and briefly opens the **Found New Hardware** window (Figure 2). The **Found New Hardware Wizard** window opens and indicates that the wizard will help you to install the driver (Figure 3).

Figure 2. Found New Hardware Window

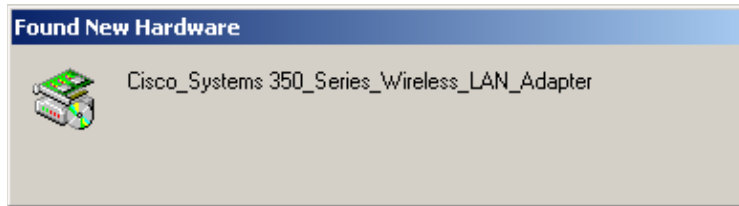
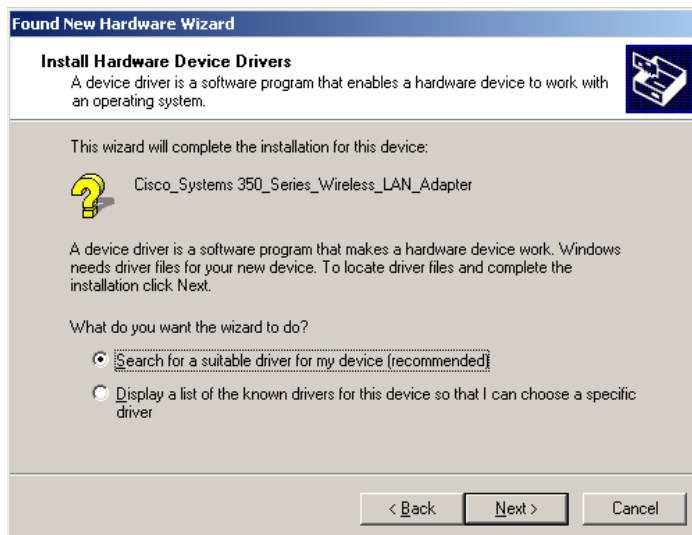


Figure 3. Found New Hardware Wizard Window



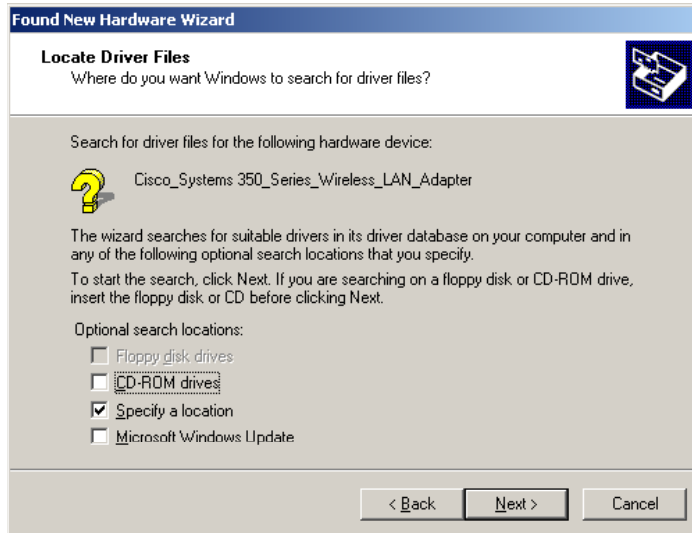
5. Click **Next**. The **Found New Hardware Wizard: Install Hardware Device Drivers** window is displayed (Figure 4).

Figure 4. Found New Hardware Wizard Window: Install Hardware Device Drivers



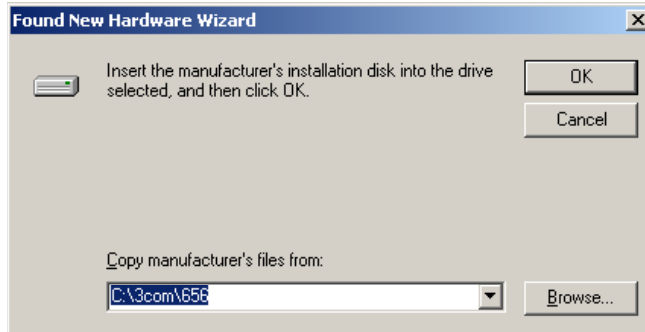
6. Click **Next**. The **Found New Hardware Wizard: Locate Driver Files** window is displayed (Figure 5).

Figure 5. Found New Hardware Wizard Window: Locate Driver Files



7. Deselect the **CD-ROM drives** box and select the **Specify a location** box. Click **Next**. The **Found New Hardware Wizard: Specify Location** window is displayed (Figure 6).

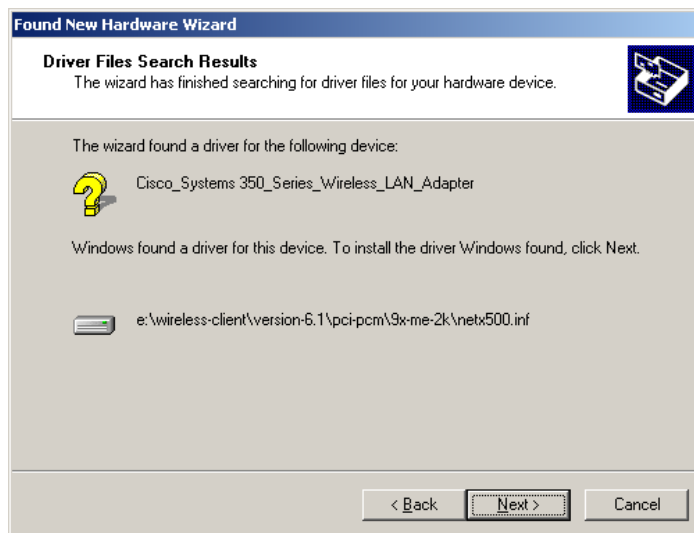
Figure 6. Found New Hardware Wizard Window: Specify Location (1)



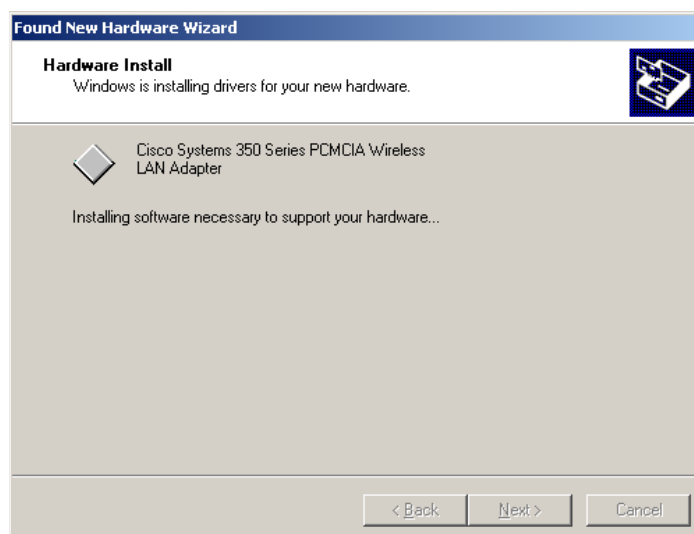
8. In the **Copy manufacturer's files from** box enter the full path to where the driver is located (example: E:\wireless-client\version-6.1\PCI-PCM\9X-Me-2K (Figure 7)).

Figure 7. Found New Hardware Wizard Window: Specify Location (2)

9. Click **OK** to continue. The **Found New Hardware Wizard: Driver Files Search Results** window is displayed (Figure 8).

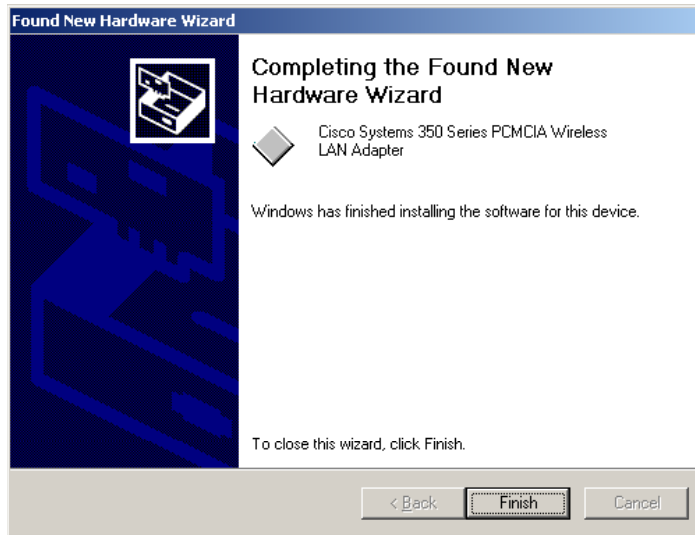
Figure 8. Found New Hardware Wizard Window: Driver Files Search Results

10. Click **Next** and wait while the driver is installed (Figure 9).

Figure 9. Found New Hardware Wizard Window: Hardware Install

- Click **Finish** to complete the install (Figure 10).

Figure 10. Found New Hardware Wizard Window: Completed



- If you are prompted to restart the laptop, click **Yes**.

The driver installation is complete. Continue with section 3.1, "Installing the ACU for Windows 2000 and XP".

2.3 Installing the Driver for Windows XP

The first release of Windows XP comes with native driver version 7.29, which is installed automatically the first time you insert a client adapter. To upgrade to the new driver for the client adapter, perform the following steps:

- Download the driver from http://sdp.cit.nih.gov/downloads/wireless_lan.asp and save it to a desired folder, as follows:
 - In the **Wireless LAN** list under **Cisco Aironet Client Software**, click **Cisco Aironet Client Software**.
 - Save** the file to a desired folder.
- Double click the **Windows-Client-Installation-Wizard-v11.zip** icon to unzip the file into the folder in step 1.
- Double click **Windows-Client-Installation-Wizard-v11.exe** to extract the file into the folder in step 1.
- Insert the client adapter (PCMCIA) into the laptop's PCMCIA slot. Windows XP automatically installs the native driver. Continue the following steps to update the driver.
- Double click **My Computer**, **Control Panel**, and **System**.
- Click the **Hardware** tab and **Device Manager**.

7. Double click **Network Adapters** and the **Cisco Systems Wireless LAN Adapter**.
8. Click the **Driver** tab.
9. Click the **Update Driver** button. The **Welcome to the Hardware Update Wizard** window is displayed.
10. Select the **Install from a list or specific location (Advanced)** option and click **Next**.
11. When prompted to choose the search and installation options, select **Don't search. I will choose the driver to install** and click **Next**.
12. When prompted to select a network adapter to install, click **Have Disk**. The **Install From Disk** window is displayed.
13. Click **Browse**. Select/Enter the path to where the driver is located (example: E:\wireless-client\version-6.1\PCI-PCM\XP), then click **Open**.
14. Click **OK**. The **Select Network Adapter** window is displayed.
15. Select the **Cisco Systems Wireless LAN Adapter** and click **Next**.
16. Click **Finish** when the installation is complete.
17. Click **Close** to close the driver update window, then close the **Device Manager** and **System Properties**.
18. Double click **My Computer**, **Control Panel**, and **Network Connections**.
19. Right click **Wireless Network Connection** and click **Properties**.
20. Select the **Wireless Network** tab.
21. Deselect the **Use Windows to configure my wireless network settings** checkbox.
22. Click **OK**.

The driver installation is complete. Continue with section 3.1, "Installing the ACU for Windows 2000 and XP".

2.4 Installing the Driver for Macintosh

1. Download the driver from http://sdp.cit.nih.gov/downloads/wireless_lan.asp and save it to a desired folder, as follows:
In the **Wireless LAN** list under **Cisco Aironet Client Software**, click **MACOSInstallv30.sit** (the utility installer) and save the file to a desired folder.
2. Open the folder on the hard drive where you expanded the utility installer (*.sit) file.
3. Double click **Cisco WLAN Install** to activate the installer. (You should keep the Cisco WLAN Install file in case you need to uninstall the client utility and driver in the future).

4. If you are using Mac OS X, you must have administrator privileges for the Macintosh. When the **Authenticate** window is displayed, enter your password in the **Password** field. Your Macintosh username will appear in the **Name** field. Click **Ok**.
5. When the **Cisco Aironet Wireless LAN Adapter Software** window is displayed, click **Continue**.
6. Click **Accept** for the terms and conditions of the Software License Agreement.
7. The Cisco WLAN Installer detects the computer operating system and displays the appropriate installation window (see Figure 11 for Mac OS 9 and Figure 12 for Mac OS X).

Figure 11. Cisco WLAN Install Window (Mac OS 9)

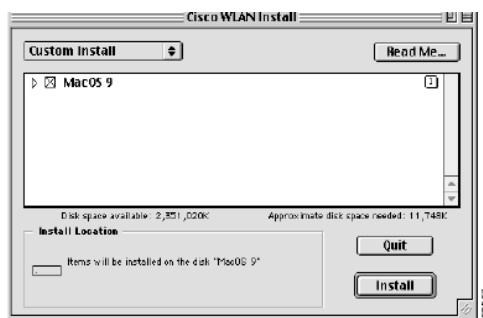
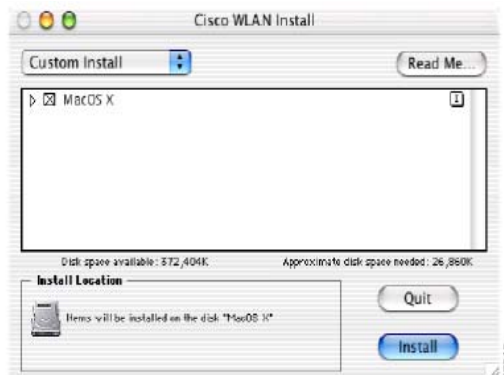


Figure 12. Cisco WLAN Install Window (Mac OS X)



8. When the **Cisco WLAN Install** window is displayed, perform the following operations:
 - a. Expand the Mac OS 9 or Mac OS X software component list by clicking the triangle.
 - b. Click **Install** to begin the installation process.
9. Click **Continue** when a window is displayed indicating the computer must restart after installing the software.
10. A message appears indicating “One moment please...”, then a window is displayed that shows the installation progress. After the files are copied to the Macintosh hard disk, a window is displayed indicating that the installation was

successful. Click **Restart** to restart the computer and finish the client utility installation.

The driver installation is complete.

Note for Macintosh: It is not necessary to install the Cisco Aironet Client Utility separately for Macintosh. Proceed to section 4, “Configuring the Cisco Aironet Client Utility (ACU) for Wireless Client Adapter with Static WEP Option” on page 20.

3 Installing the Cisco Aironet Client Utility (ACU) for Windows Client

After successfully installing the appropriate wireless client driver for Windows PC/Client, install the Aironet Client Utility on the client laptop. Use ACU version 6.1 for Windows NT/2000/XP.

Follow the appropriate instructions for the Windows operating system, as follows:

- Section 3.1: Windows 2000 and XP
- Section 3.2: Windows NT

3.1 Installing the ACU for Windows 2000 and XP

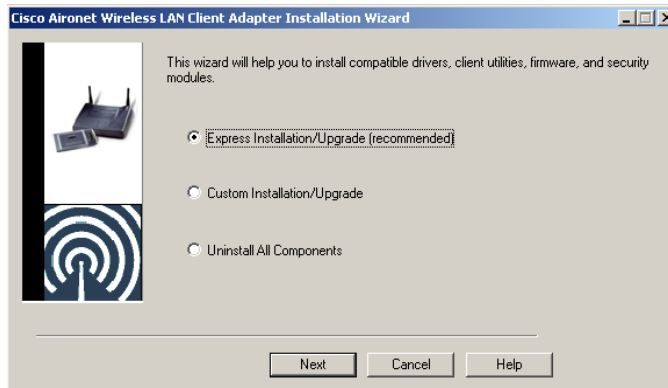
1. Open the folder where you downloaded the wireless client software (see section 2).
2. Double click the **Setup.exe** icon to start the setup program.



Setup.exe

The **Cisco Aironet Wireless LAN Client Adapter Installation Wizard** is displayed (Figure 13).

Figure 13. Cisco Aironet Wireless LAN Client Adapter Installation Wizard



3. Select **Express Installation/Upgrade (recommended)** and click **Next**. The **Cisco Aironet Application Installer** window is displayed while the ACU is installing (Figure 14). Then a message is displayed asking if you want to reboot the computer (Figure 15).

Figure 14. Cisco Aironet Application Installer Window

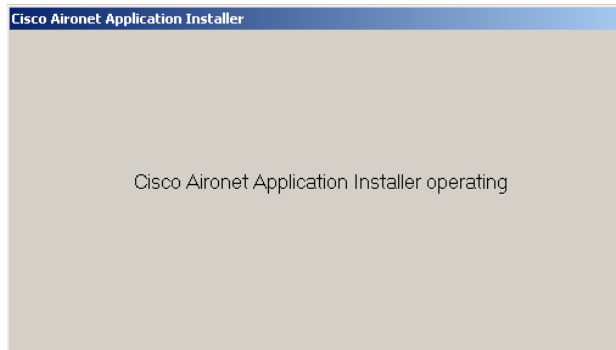
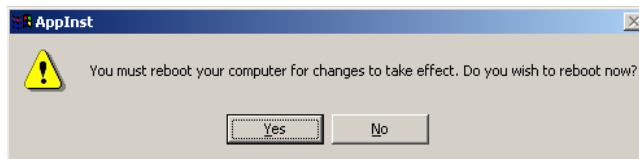


Figure 15. Reboot Message



4. Click **Yes** to reboot the computer.

Proceed to section 4.1, “Configuring ACU for PC Client”, on page 20 to configure wireless access.

3.2 Installing the ACU for Windows NT

1. Open the folder where you downloaded the wireless client software (see section 2).
2. Double click the **Setup.exe** icon to start the setup program.



Setup.exe

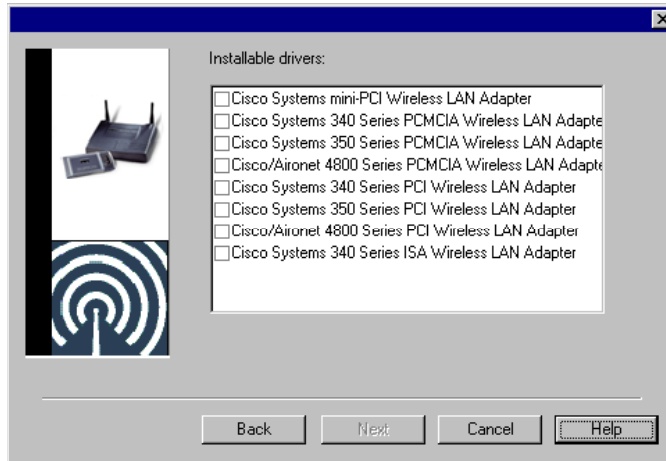
The **Cisco Aironet Wireless LAN Client Adapter Installation Wizard** is displayed (Figure 16).

Figure 16. Cisco Aironet Wireless LAN Client Adapter Installation Wizard



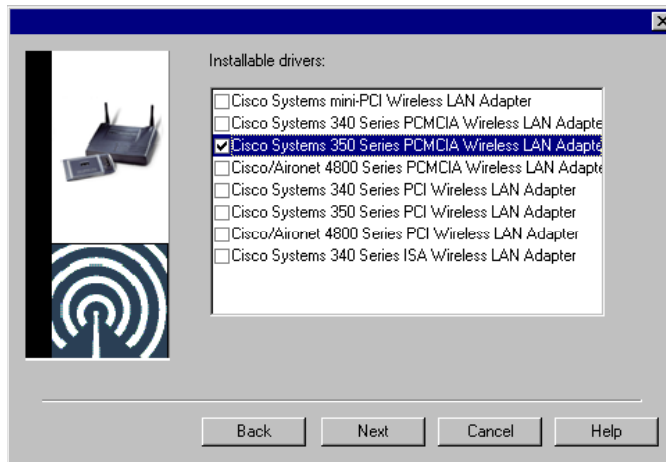
3. Select **Express Installation/Upgrade (recommended)** and click **Next**. The **Installable drivers** window is displayed (Figure 17).

Figure 17. Installable Drivers Window



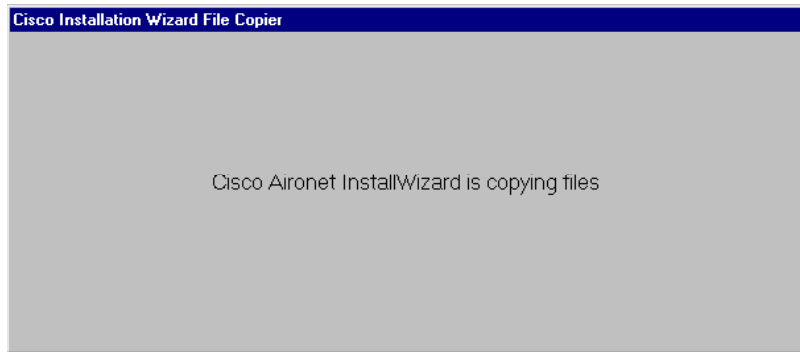
4. Select the appropriate model for the Cisco wireless client, for example, Cisco Systems 350 Series PCMCIA Wireless LAN Adapter (Figure 18). Click **Next**.

Figure 18. Installable Drivers Window – Example



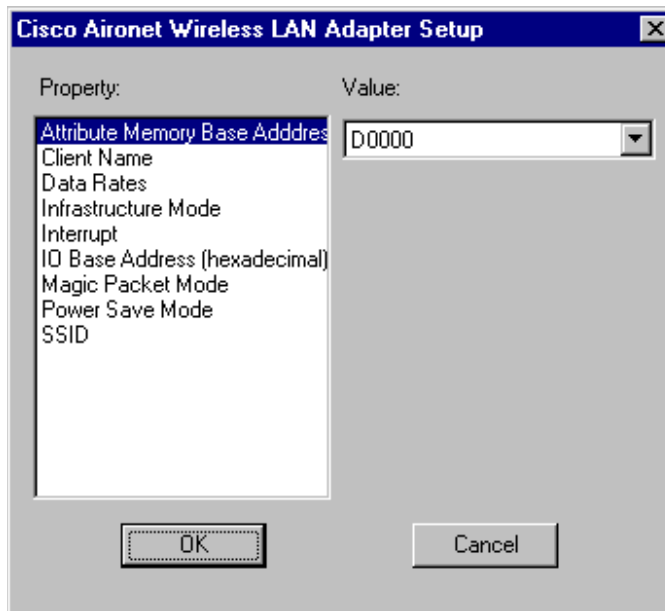
5. The **Cisco Installation Wizard File Copier** window is displayed (Figure 19), indicating that the installation is in process.

Figure 19. Cisco Installation Wizard File Copier Window



Next, the **Cisco Aironet Wireless LAN Adapter Setup** window is displayed (Figure 20).

Figure 20. Cisco Aironet Wireless LAN Adapter Setup Window



6. Click **OK** to continue the installation. The **Bindings Storing** window and **Microsoft TCP/IP Properties** window are displayed (Figure 21 and Figure 22).

Figure 21. Bindings Storing Window

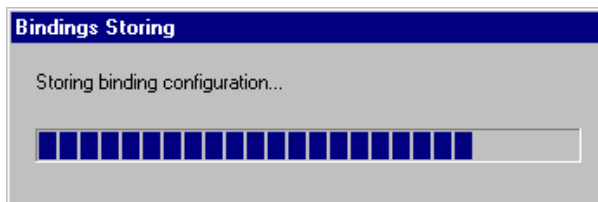
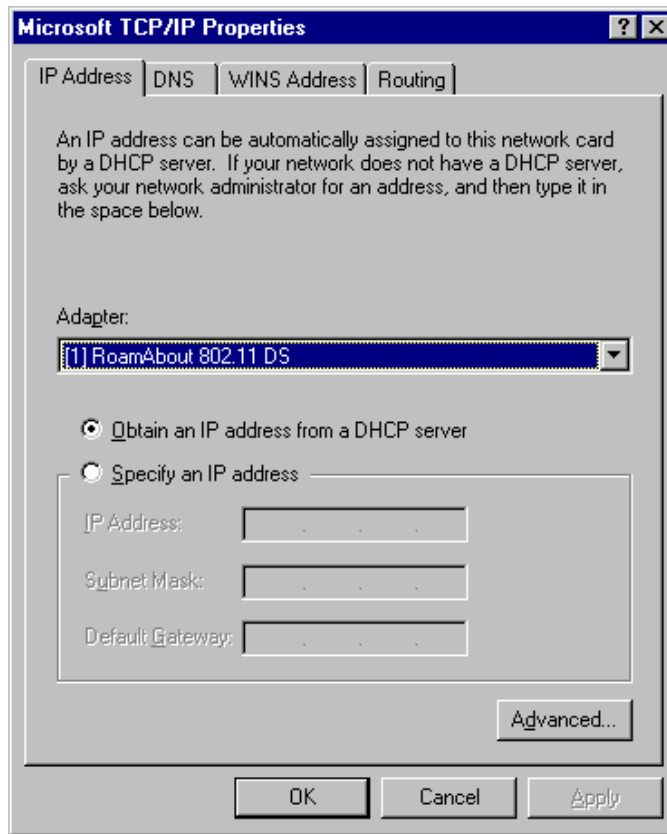


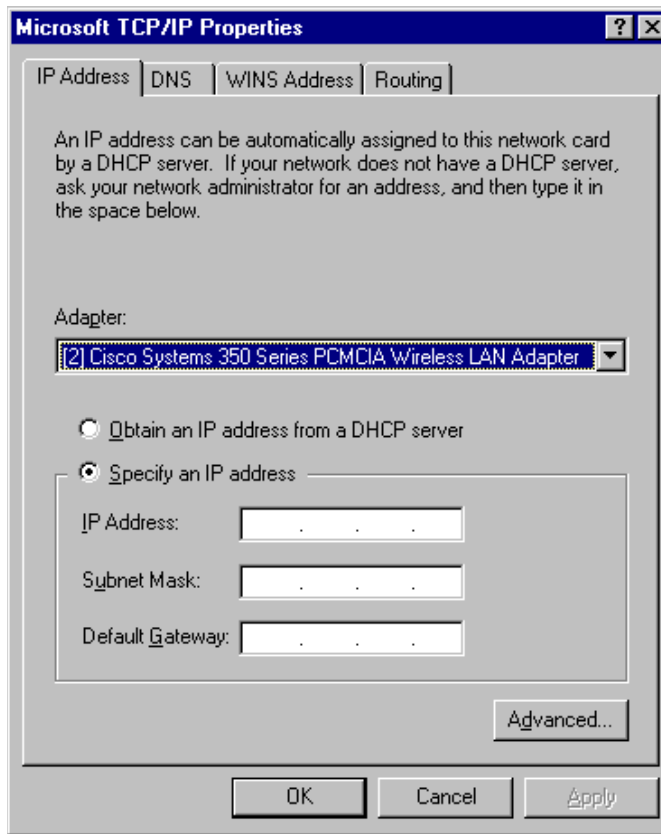
Figure 22. Microsoft TCP/IP Properties Window



7. On the **IP Address** tab of the **Microsoft TCP/IP Properties** window, click the down arrow in the **Adapter** box and select the client you are installing. Example (Figure 23):

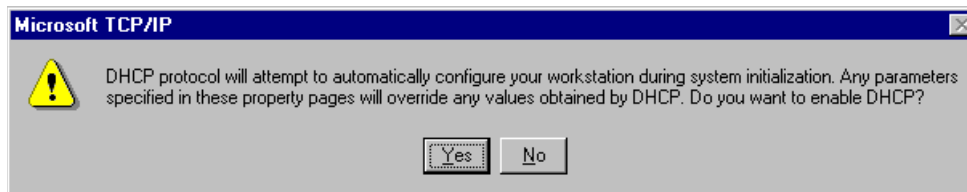
Cisco Systems 350 Series PCMCIA Wireless LAN Adapter

Figure 23. Microsoft TCP/IP Properties Window – Client Selected



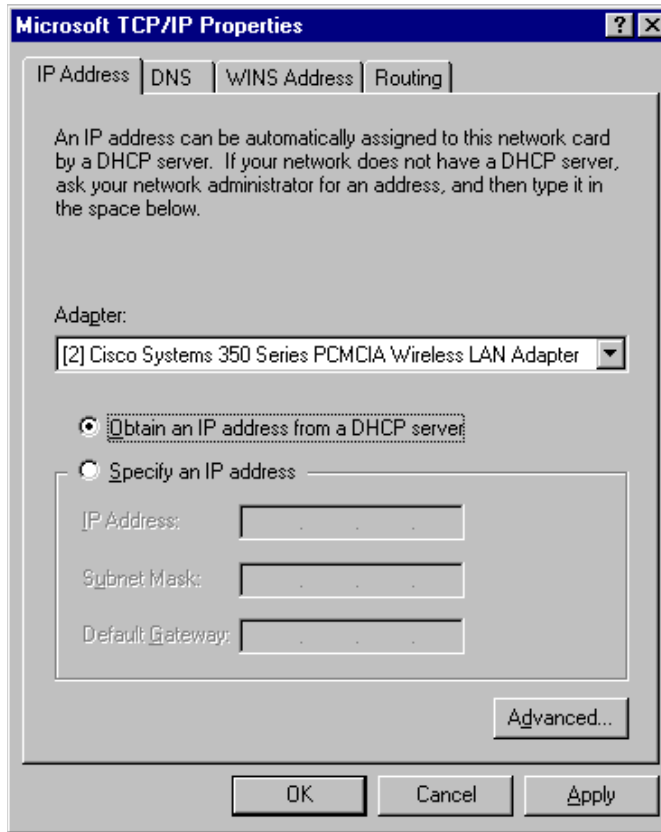
8. Select **Obtain an IP address from a DHCP server**. A Microsoft TCP/IP warning window is displayed (Figure 24).

Figure 24. Microsoft TCP/IP Warning Window



9. Click **Yes** to continue. The **Microsoft TCP/IP Properties** window is displayed again (Figure 25).

Figure 25. Microsoft TCP/IP Properties Window



10. Click **OK** to continue. The **Cisco Aironet Application Installer** window is displayed (Figure 26), followed by a reboot warning message (Figure 27).

Figure 26. Cisco Aironet Application Installer Window

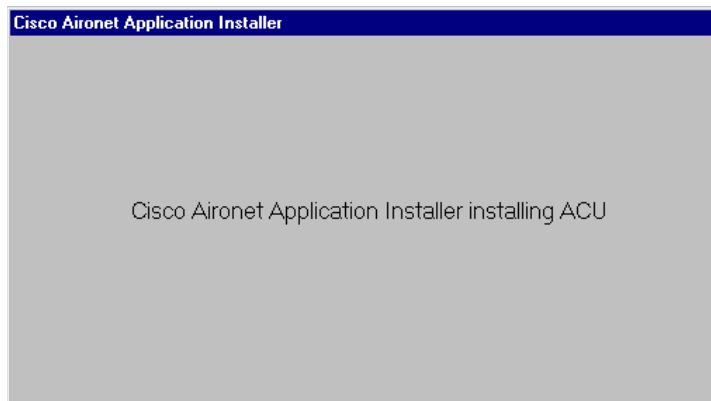
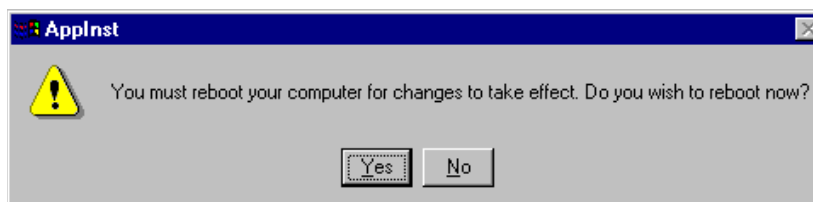


Figure 27. Reboot Warning Message



11. Click **Yes** to reboot the computer.

Proceed to section 4.1, “Configuring ACU for PC Client”, on page 20 to configure wireless access.

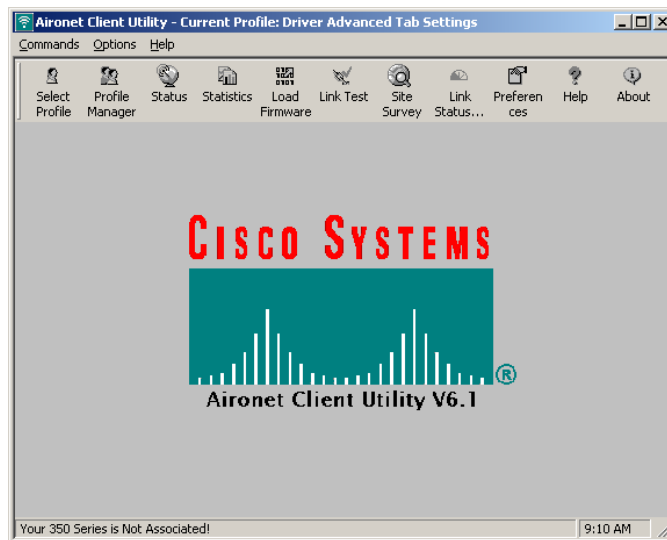
4 Configuring the Cisco Aironet Client Utility (ACU) for Wireless Client Adapter with Static WEP Option

This section explains how to configure the Aironet Client Utility with the static WEP option in order for the computer/client laptop to access the wireless network.

4.1 Configuring ACU for PC Client

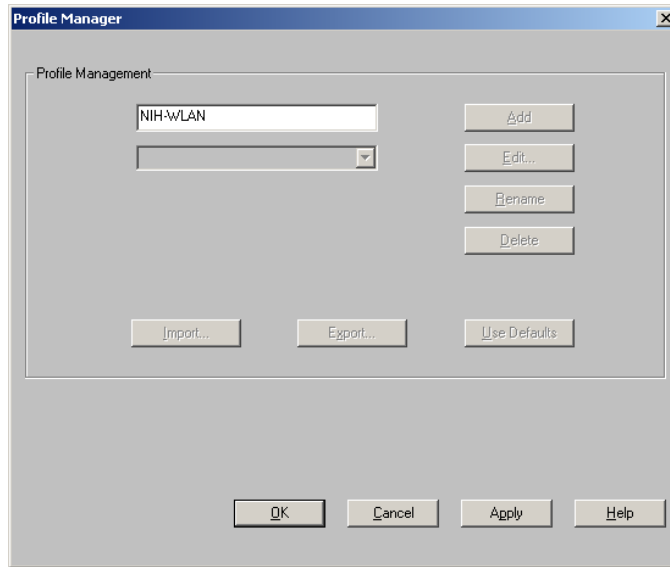
1. Double click on the ACU icon to open the **Aironet Client Utility** window for wireless client adapter setup (Figure 28).

Figure 28. Aironet Client Utility Window (Client Adapter Setup)



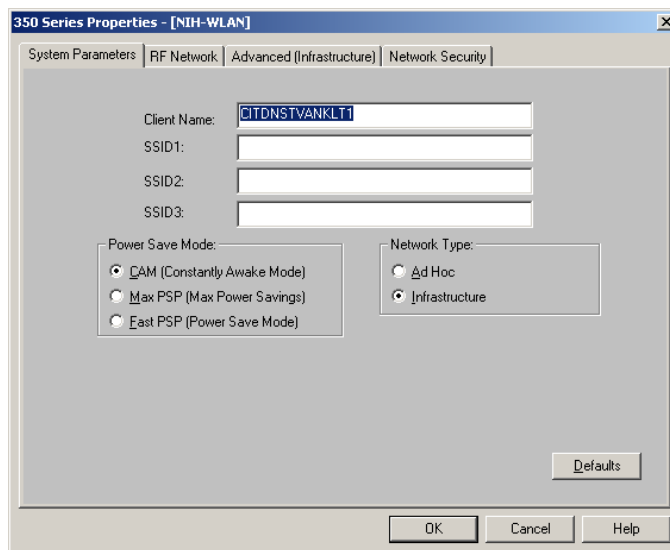
2. Click the **Profile Manager** icon. The **Profile Manager** window is displayed (Figure 29).
 - a. In the **Profile Management** box, click **Add** and enter the profile's name.
Example:
NIH-WLAN

Figure 29. Profile Manager Window



- b. Click **Apply**. The **350 Series Properties** window is displayed (Figure 30).

Figure 30. 350 Series Properties Window



3. Select the **System Parameters** tab in the **Series Properties** window (Figure 31).
- a. Enter the Service Set Identifier (SSID) to identify the specific wireless network to be accessed. Two SSIDs are used: the first is for guest areas, the second is for NIH users. **Note:** This parameter is case-sensitive.

In the **SSID1** box enter

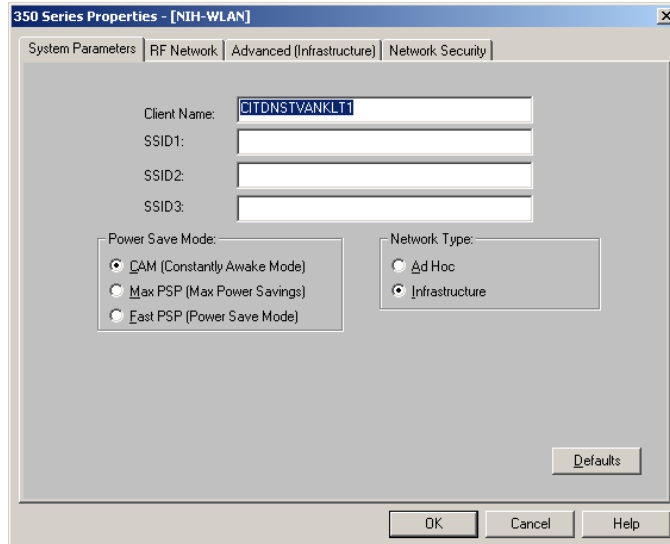
<NIH standard SSID for guest>

In the **SSID2** box enter

<NIH users standard SSID>

- b. In the **Power Save Mode** box make sure that **CAM (Constantly Awake Mode)** is selected.
- c. In the **Network Type** box make sure that **Infrastructure** is selected.

Figure 31. 350 Series Properties Window: System Parameters Tab

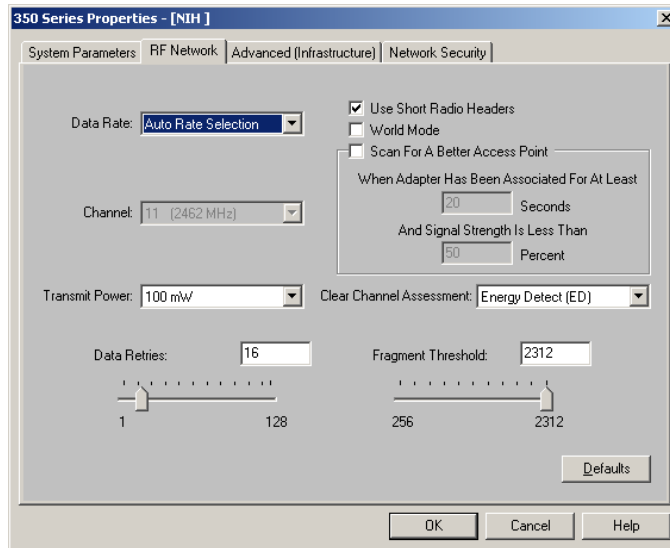


Note: If you leave **SSID1 – SSID3** blank (default), your PC/Client adapter can associate to any access point on the network that is configured to allow broadcast SSID.

In the NIH wireless setting, the access point with which the client adapter is to communicate is not configured to allow broadcast SSID. The value of the **SSID** must match the SSID of the access point. If it does not match, the client/PC adapter cannot access the network.

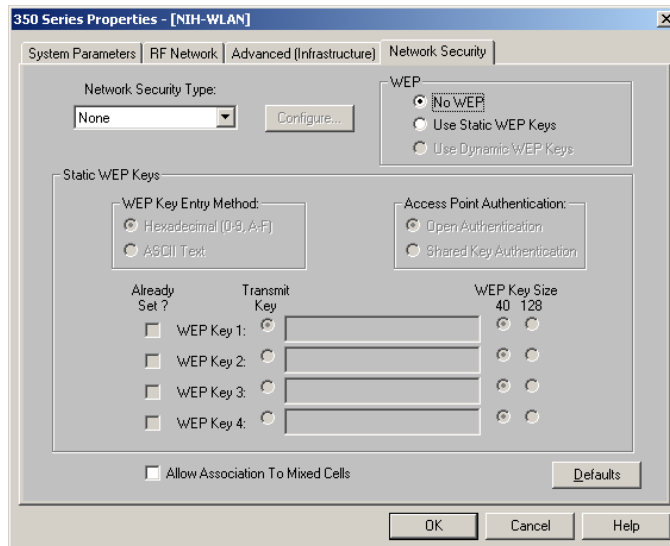
4. Select the **RF Network** tab (Figure 32) in the **Series Properties** window.
 - a. In the **Data Rate** box make sure that **Auto Rate Selection** is selected.
 - b. Make sure that the **Use Short Radio Headers** checkbox is selected. Short Radio Headers improve throughput performance.
 - c. Uncheck the **Scan For A Better Access Point** box.

Figure 32. 350 Series Properties Window: RF Network Tab



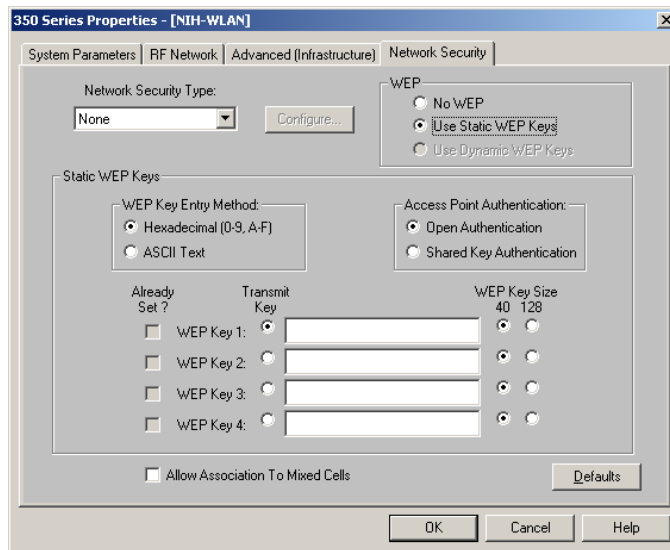
5. Select the **Network Security** tab (Figure 33).
 - a. In the **Network Security Type** box, select **None**.

Figure 33. 350 Series Properties Window: Network Security Tab (1)



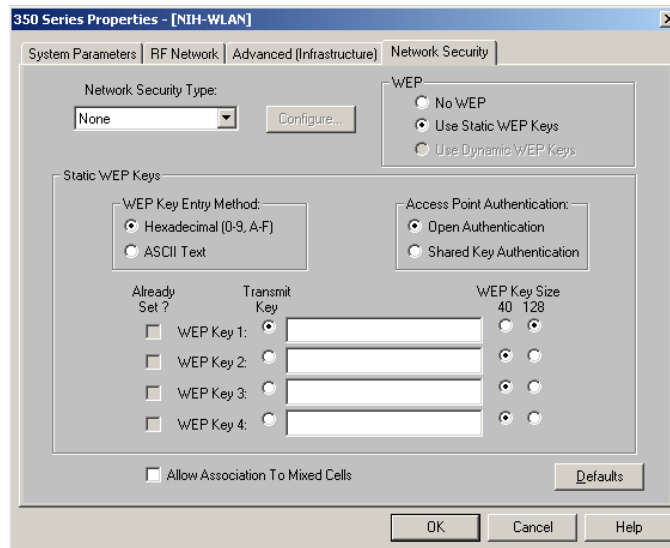
- b. In the **WEP** box select **Use Static WEP Keys** (Figure 34).

Figure 34. 350 Series Properties Window: Network Security Tab (2)



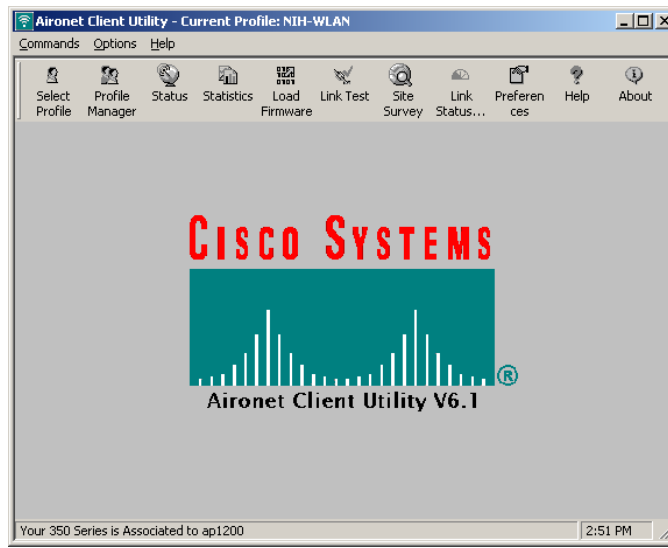
- c. In the **WEP Key Size** column of the **Static WEP Keys** box select 128 for **WEP Key 1** and enter the <NIH standard WEP encryption key> (Figure 35).

Figure 35. 350 Series Properties Window: Network Security Tab



6. Click **OK** all the way out. The message “Your 350 Series is Associated to <name-of-AP>” should be displayed at the bottom of the window (Figure 36).

Figure 36. WEP Authentication Window



4.2 Configuring ACU for Macintosh Client (Cisco PCMCIA Adapter)

The Aironet Client Utility allows you to enable or disable static WEP and to configure the SSID and static WEP keys. **Note:** The Macintosh operating system must be OS 9.x or above to run the client utility.

Follow these steps to configure wireless access for NIH users. For guest users, repeat these steps and enter the correct guest SSID and WEP key for guest. Multiple profiles are not supported.

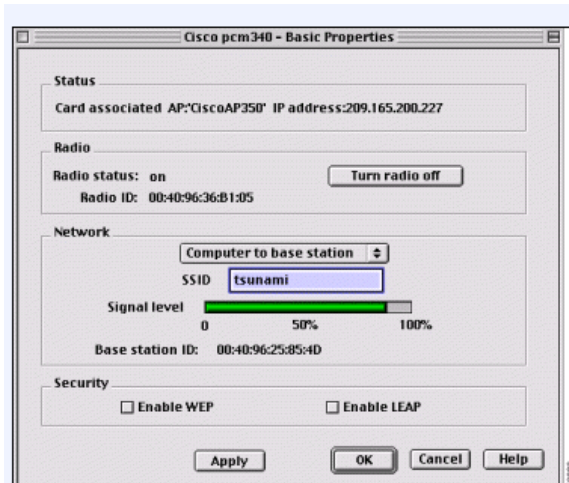
1. On the desktop click the **Aironet Client Utility** icon.

If the client utility is not active on the desktop, do the following:

From the **Finder menu bar** at the top of the screen, select **Go** and click **Applications**. The **Applications** window is displayed.

2. Click the **Aironet Client Utility** icon. The client utility window is displayed, and the computer searches for the client adapter radio. After the radio is found, the **Cisco pcm340 - Basic Properties** window is displayed (Figure 37).

Figure 37. Basic Properties Window



- a. In the **Network** box make sure the **SSID** matches the access point's SSID.
Enter
<NIH standard SSID>
 - b. In the **Security** box select **Enable WEP**.
3. In the **Edit** drop-down menu select **WEP Keys** (Figure 38). Enter
<NIH standard WEP encryption key>

Figure 38. Edit Drop-Down Menu



4.3 Configuring AirPort Client on Macintosh 9.X (AirPort Built-in Adapter)

Follow these steps to configure wireless access for NIH users. For guest users, repeat these steps and enter the correct guest SSID and WEP key for guest. Multiple profiles are not supported.

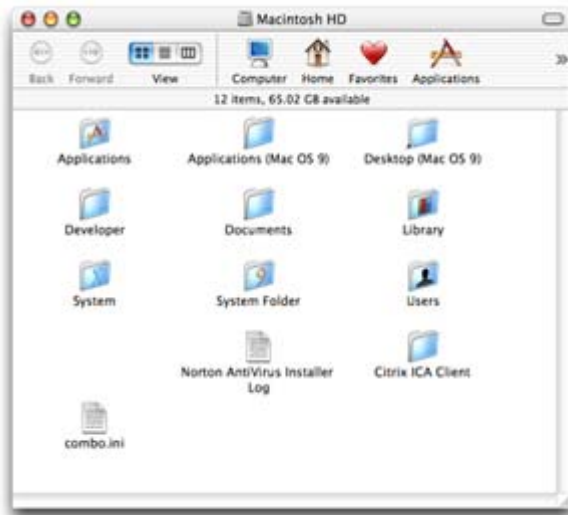
1. On the desktop, click the Apple icon and select **AirPort**.
2. Under **AirPort Network/Choose network**, select **Other**.
3. The name/password of the AirPort Network screen is displayed. Enter the following:
 - a. **Name:** Enter <NIH standard SSID>
 - b. **Password:** Enter <NIH standard WEP encryption key>
4. Click OK. You should see the signal level under the Status.

4.4 Configuring AirPort Client on Macintosh OS X (AirPort Built-in Adapter)

Follow these steps to configure wireless access for NIH users. For guest users, repeat these steps and enter the correct guest SSID and WEP key for guest. Multiple profiles are not supported.

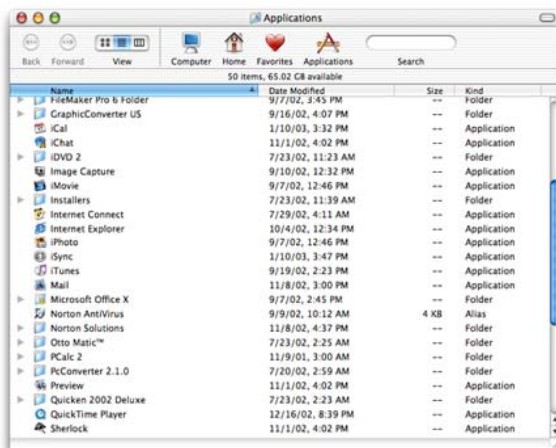
1. On the desktop click the **Macintosh HD** icon. The **Macintosh HD** window is displayed (Figure 39).

Figure 39. Macintosh HD Window



2. Double click the **Applications** folder icon. The **Applications** folder is displayed (Figure 39).

Figure 39. Applications Folder

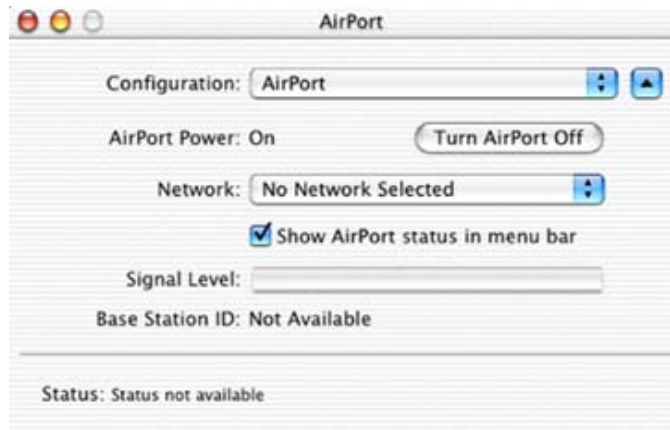


3. Double click **Internet Connect** to open the application.



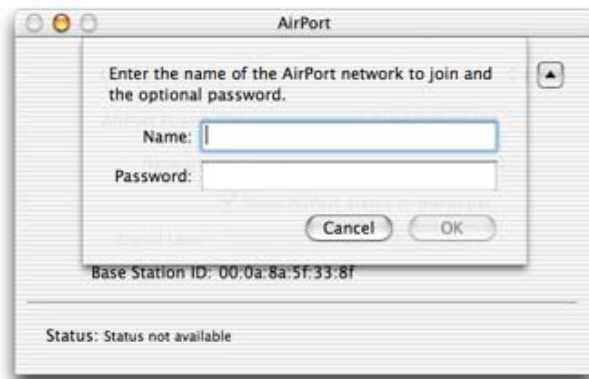
The **AirPort** window is displayed (Figure 40).

Figure 40. AirPort Window



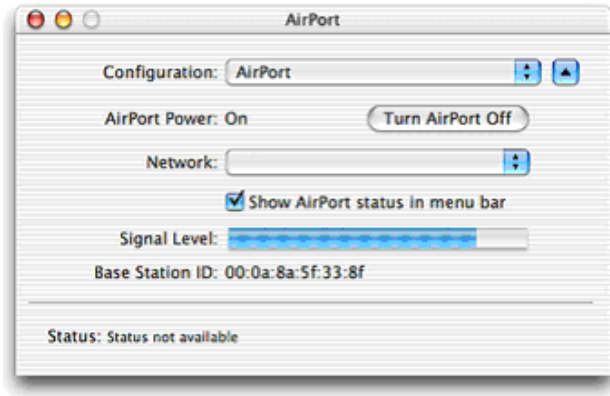
- a. In the **Configuration** box scroll down and select **AirPort**.
- b. For **AirPort Power**, make sure the AirPort is turned **On**.
- c. In the **Network** box scroll down to select **Other**. The **AirPort Name and Password** window is displayed (Figure 41).

Figure 41. AirPort Name and Password Window



- d. In the **Name** box enter <NIH standard SSID for NIH users> for the name of the AirPort network to join.
- e. In the **Password** box enter <NIH standard WEP encryption key>.
- f. Click **OK**. The **AirPort** window is displayed showing the configuration (Figure 42). (The production SSID you entered appears in the **Network** box.)

Figure 42. AirPort Window with Configuration



5 Troubleshooting

This section provides information to help solve problems relating to wireless LAN access.

5.1 System Requirements

To access the wireless LAN you will need at least the following for PC or Macintosh.

5.1.1 PC System

PC system requirements are:

- Windows NT, 2000, or XP
- 486 (33-MHz) processor
- 16 MB RAM
- 39 MB free disk space
- VGA+ compatible display adapter
- 256 colors or at least 16 shades of gray
- 640 x 480 resolution monitor
- CD-ROM drive

5.1.2 Macintosh System

Macintosh system requirements are:

- Mac OS 9.x (Cisco PCMCIA) or above (Mac OS X version 10.1 or later)
- Power PC processor
- 32 MB RAM
- 23 MB disk space
- 256 colors or 16 shades of gray
- 640 x 480 resolution monitor
- CD-ROM drive
- Open Transport Connectivity

5.2 Troubleshooting Procedures

This section explains the procedures for troubleshooting the wireless client.

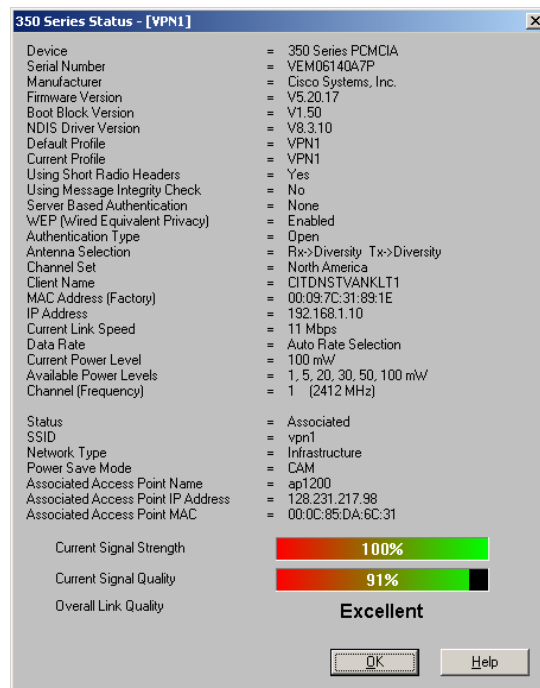
5.2.1 User can authenticate through wireless LAN but cannot access the Internet or network

When a user is able to authenticate through the wireless LAN but cannot access the Internet or network, the reason may be that the user statically assigned an IP address to the wireless client adapter in the TCP/IP settings. Follow the steps below to verify and change the TCP/IP settings.

1. Double click the **Aironet Client Utility** icon on the desktop to bring up the ACU. Verify the name of the access point.
2. Click the **Status** icon on the ACU window to display the **350 Series Status** window (Figure 43). Verify the IP address of the access point.

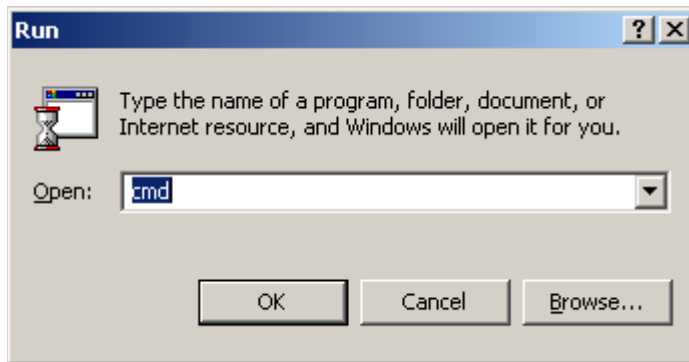
Write down the access point IP address from the bottom of the **Status** window (example: 128 . 231 . 217 . 98). You will need this information later to verify whether a user is on the same network as the access point.

Figure 43. 350 Series Status Window



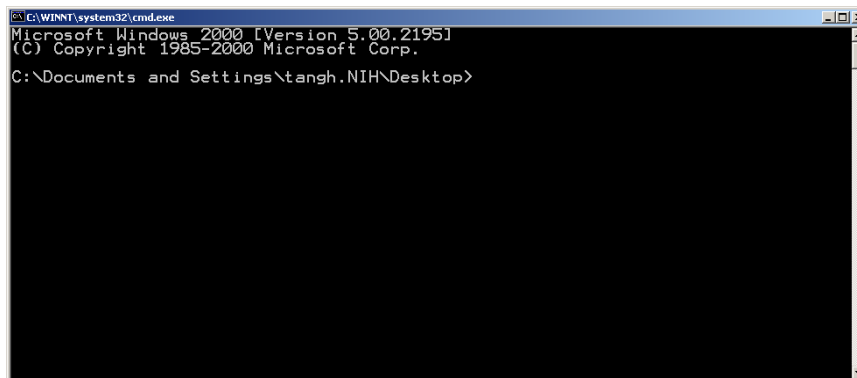
3. Open the command line window as follows:
 - a. Click **Start** and select **Run**.
 - b. Enter `cmd` (for Windows 2000 and XP) or `command` (for Windows 9x, Me, and NT) in the **Open** box (Figure 44).

Figure 44. Run Window



- c. Click **OK** to open. The **Command Line** window is displayed (Figure 45).

Figure 45. Command Line Window

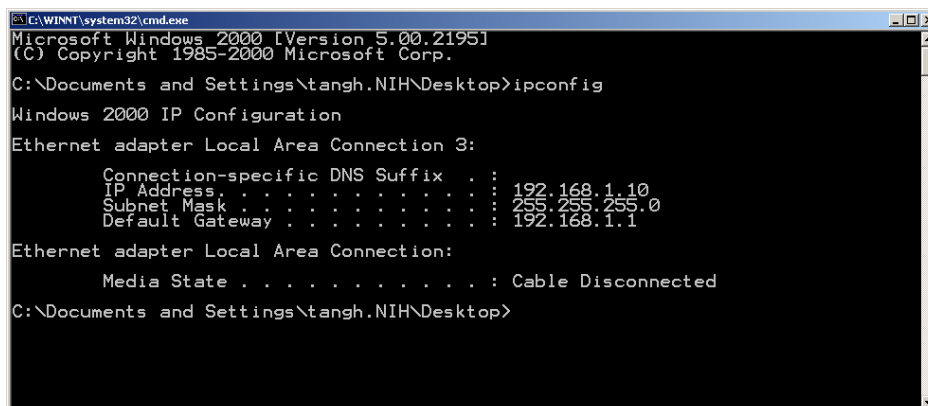


4. At the command line prompt type `ipconfig`. Example:

```
C:\Documents and Settings\tangh.NIH\Desktop>ipconfig
```

Press **Enter** to obtain the TCP/IP settings for the wireless client adapter (Figure 46).

Figure 46. TCP/IP Settings (Static)

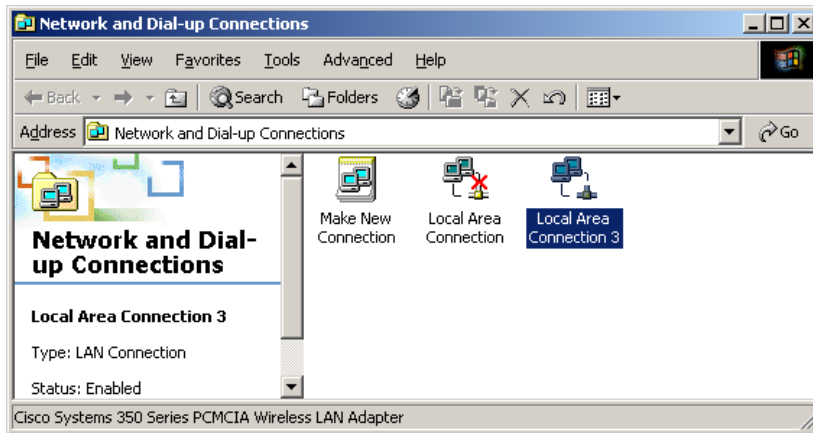


5. Verify whether the IP address is in the same network as the access point. In this example the wireless client adapter was set on the 192.168.1.0 network but the

access point is on the 128.231.217.0 network (see Figure 43). Continue with step 6 to change the TCP/IP setting.

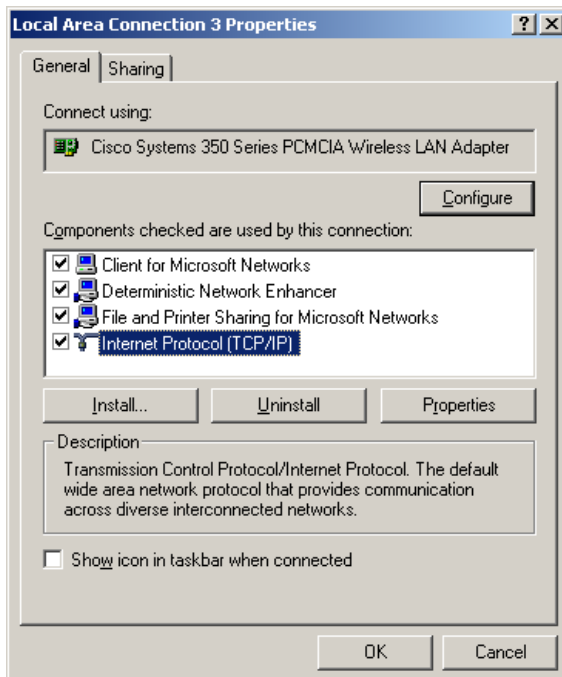
6. On the desktop, right click **My Network Places** (for Windows 2000 and XP) or **Network Neighborhood** (for Windows NT). Select **Properties**. The **Network and Dial-up Connections** window is displayed (Figure 47).

Figure 47. Network and Dial-up Connections Window



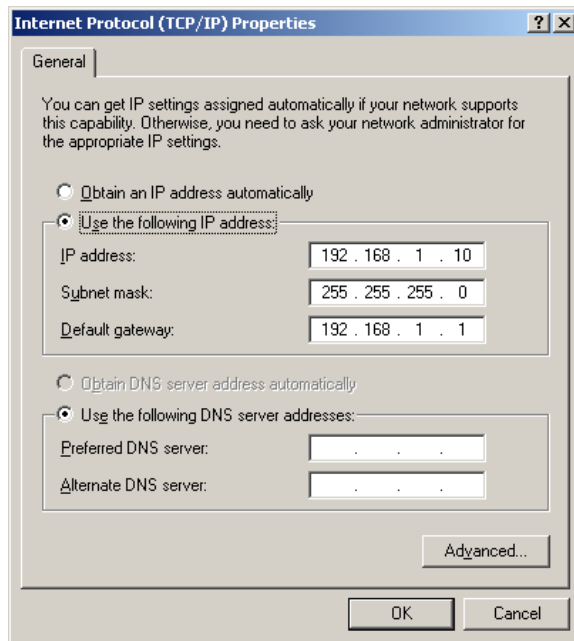
7. Right click the **Wireless Network Connection** icon. Select **Properties**. The **Local Area Connection Properties** window is displayed (Figure 48).

Figure 48. Local Area Connection Properties Window



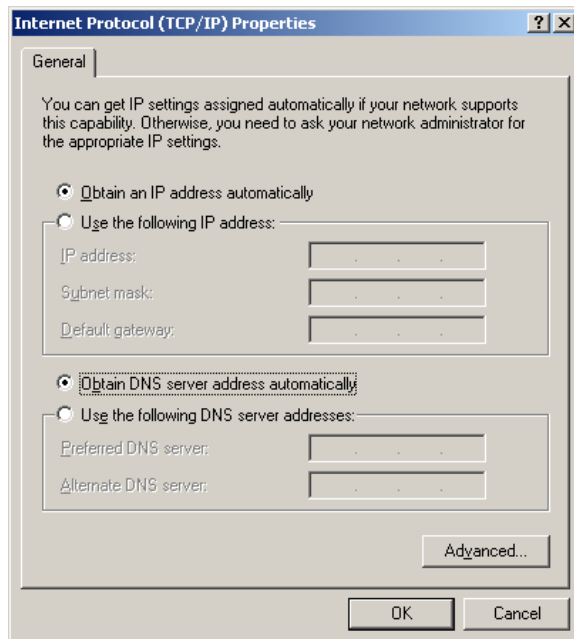
8. Highlight **Internet Protocol (TCP/IP)** and click **Properties**. The **Internet Protocol (TCP/IP) Properties** window is displayed (Figure 49).

Figure 49. Internet Protocol (TCP/IP) Properties Window



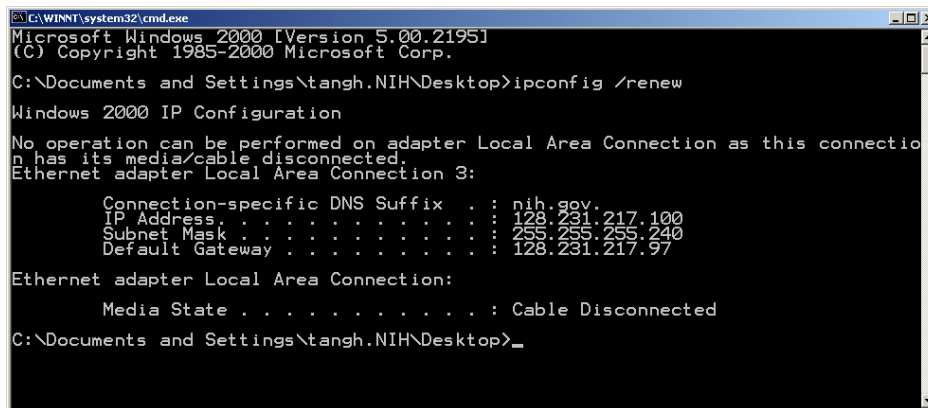
9. Select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons as shown in Figure 50.

Figure 50. Select Automatic Settings



10. Click **OK**. The **Local Area Connection Properties** window is displayed.
11. Click **OK** to accept changes.
12. Go to the command line prompt and execute the `ipconfig /renew` command to renew the IP address. After the IP address renewal process completes, the new IP address should be displayed (Figure 51). Example: 128.231.217.100.

Figure 51. TCP/IP Settings (Dynamic)



```

E:\WINNT\system32\cmd.exe
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\Documents and Settings\tangh.NIH\Desktop>ipconfig /renew

Windows 2000 IP Configuration

No operation can be performed on adapter Local Area Connection as this connection has its media/cable disconnected.
Ethernet adapter Local Area Connection 3:

    Connection-specific DNS Suffix  . : nih.gov
    IP Address . . . . . : 128.231.217.100
    Subnet Mask . . . . . : 255.255.255.240
    Default Gateway . . . . . : 128.231.217.97

Ethernet adapter Local Area Connection:

    Media State . . . . . : Cable Disconnected

C:\Documents and Settings\tangh.NIH\Desktop>_

```

13. Open the VPN client and try to authenticate through the VPN concentrator.
14. Open **Internet Explorer** to verify that you are able to access the Internet.

5.2.2 Users are unable to authenticate through wireless LAN

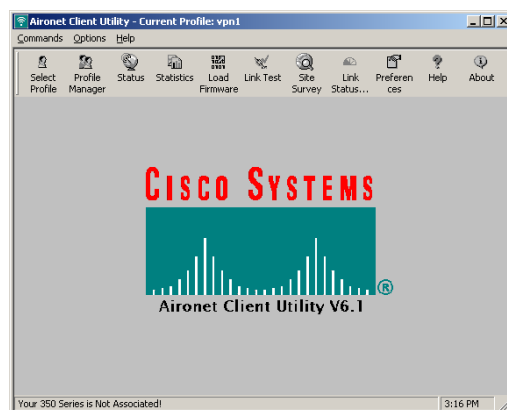
When users cannot to authenticate through the wireless LAN, do the following:

1. Verify that users enter the correct NIH standard SSID and NIH standard WEP encryption key.
2. Verify that users are using adapter driver 8.3.10, radio firmware 5.20.17, and ACU Version 6.1 Do the following to verify adapter driver, radio firmware, and ACU version.

Note: If the client is using the Cisco integrated Mini PCI wireless adapter, the adapter driver should be 3.5 and the radio firmware should be 5.20.17.

- a. Double click the **Aironet Client Utility** icon on the desktop to bring up the ACU. You can verify the version of ACU from the **Aironet Client Utility** window (Figure 52).

Figure 52. Aironet Client Utility Window (Verify ACU Version)



- b. Click the **Status** icon. The **350 Series Status** window is displayed (Figure 53).

Figure 53. 350 Series Status Window



- c. In the **350 Series Status** window verify the following:
 - 1) Adapter driver version: NDIS Driver Version = V8.3.10
 - 2) Radio firmware version: Firmware Version = V5.20.17
3. If users use an older version of the software, do the following to update the software.
 - a. Download the software from http://sdp.cit.nih.gov/downloads/wireless_lan.asp.
 - b. Follow section 3, "Installing the Cisco Aironet Client Utility (ACU) for Windows Client", to upgrade the ACU to version 6.1.

Note: During installation the client adapter must be inserted in the laptop in order to upgrade the client radio firmware and driver. The setup process then can upgrade the client radio firmware and driver to versions that are compatible with ACU version 6.1.
 - c. Login to the system and test the wireless connection.
 - d. Double click the **Aironet Client Utility** icon on the desktop, then click the **Status** icon on the **350/Series Status** window to verify the following:
 - 1) Adapter driver version: NDIS Driver Version = V8.3.10
 - 2) Radio firmware version: Firmware Version = V5.20.17
 - e. Reboot and login to the domain to verify that the client is able to associate with the access point and establish the network connection.

5.2.3 User removes the drivers and can't reinstall them

When a user removes the client adapter drivers and can't reinstall them, do the following:

1. Unplug the PCMCIA wireless adapter.
2. Locate the PCX500.SYS, VXD500.VXD, NETX500.INF, and PCX500mp.SYS files in the C:\Windows\system, C:\Windows\system32, C:\Windows\system32\drivers, C:\Windows\system32\dlldata and/or C:\Windows\inf folders, depending on the version of Windows the user is running. Delete the files.
3. Reboot the system.
4. Plug in the PCMCIA wireless adapter and follow the instructions in section 2, "Installing the Cisco Wireless Client Adapter Driver", to reinstall the adapter driver.
5. After the system boots up, log in to the system and reconfigure the Aironet Client Utility (ACU) because when the client adapter driver is removed, the ACU profile is also removed automatically. Follow the instructions in section 4.1, "Configuring ACU for PC Client", to reconfigure the ACU and test the wireless access.

5.2.4 Cisco Aironet client is unable to associate with access point

When the Microsoft Windows Update feature is used to update the Cisco Aironet adapter driver to version 8.3.10 via wireless LAN on Windows 2000 and XP, the client will be unable to associate with the access point every time the computer is rebooted. This is because the old Aironet Client Utility (ACU) version 5.x and Radio Firmware version 4.25.30 are not fully compatible with the new Cisco Aironet adapter driver version 8.3.10.

Therefore, users need to upgrade the ACU to version 6.1 and Radio Firmware to version 5.20.17. Follow these steps for software download and update:

1. Go to http://sdp.cit.nih.gov/downloads/wireless_lan.asp.
2. In the **Wireless LAN** list under **Cisco Aironet Client Software**, click **Cisco Aironet Client Software** to download and save the following file to a desired folder:
`Windows-Client-Installation-Wizard-v11.zip`.
3. Insert the PCMCIA Cisco Aironet Client adapter.
4. Double click on **Windows-Client-Installation-Wizard-v11.zip** and extract it to the same folder used in step 2.
5. Follow the instructions in section 3 to install the new Cisco Aironet Client Utility (ACU), Radio Firmware, and Client Adapter driver.
6. If necessary follow the instructions in section 4 to reconfigure the ACU.

6 References

Cisco User Guide: [F:\Client Adapter-Installation Guide](#).