

Installation Guide for the WifiBuilder AP and Figaro Configuration Utility

Installing WifiBuilder AP

Welcome to the WifiBuilder Series of 802.11 Wireless Network Diagnostic Tools...

WifiBuilder is the industry's first diagnostic and production access point (AP) and the latest innovation from Nuts About Nets, LLC -- a leader in Wi-Fi diagnostic tools. The WifiBuilder AP runs a customized version of Linux that supports diagnostic applications that are run from your Windows desktop or laptop machine and which are used for installing, troubleshooting and monitoring 802.11 wireless networks. Until now Wi-Fi diagnostic tools have come in the form of handheld, PC-based USB or PCMCIA, or luggable RF analyzers. WifiBuilder is different -- it goes straight to the source. It uses a high-end, dual-band, 802.11N access point for data collection and provides a view into your local RF environment that no other tool can provide. Data collected by the WifiBuilder AP is used by our diagnostic software to troubleshoot performance problems and configure access points for optimal bandwidth and channel usage. The same WifiBuilder AP that is used for troubleshooting problems and performing diagnostics can also be used as your production AP for normal 802.11 network connectivity.

Figaro is a configuration tool for the WifiBuilder AP that allows you to easily change the local and WAN IP addresses, SSID, channel and security settings when using the WifiBuilder AP in production mode.

This Installation Guide provides basic instructions for installing the WifiBuilder diagnostic AP along with Figaro -- a utility for configuring the WifiBuilder AP.

System Requirements for Installing and Configuring WifiBuilder

- PC running Windows XP Professional (SP3), Windows Vista, Windows 7 (32- or 64-bit)
- Microsoft .NET Framework version 3.0 (or later)
- An available LAN port for connecting your PC to the WifiBuilder AP via ethernet cable. If your PC has only a single LAN adapter then a second adapter can easily be added using a USB-to-ethernet adapter.

Hardware Components

- WifiBuilder diagnostic access point (e.g. Cisco / Linksys Model No. WRT400N) with custom Linux image supplied by Nuts About Nets, LLC.

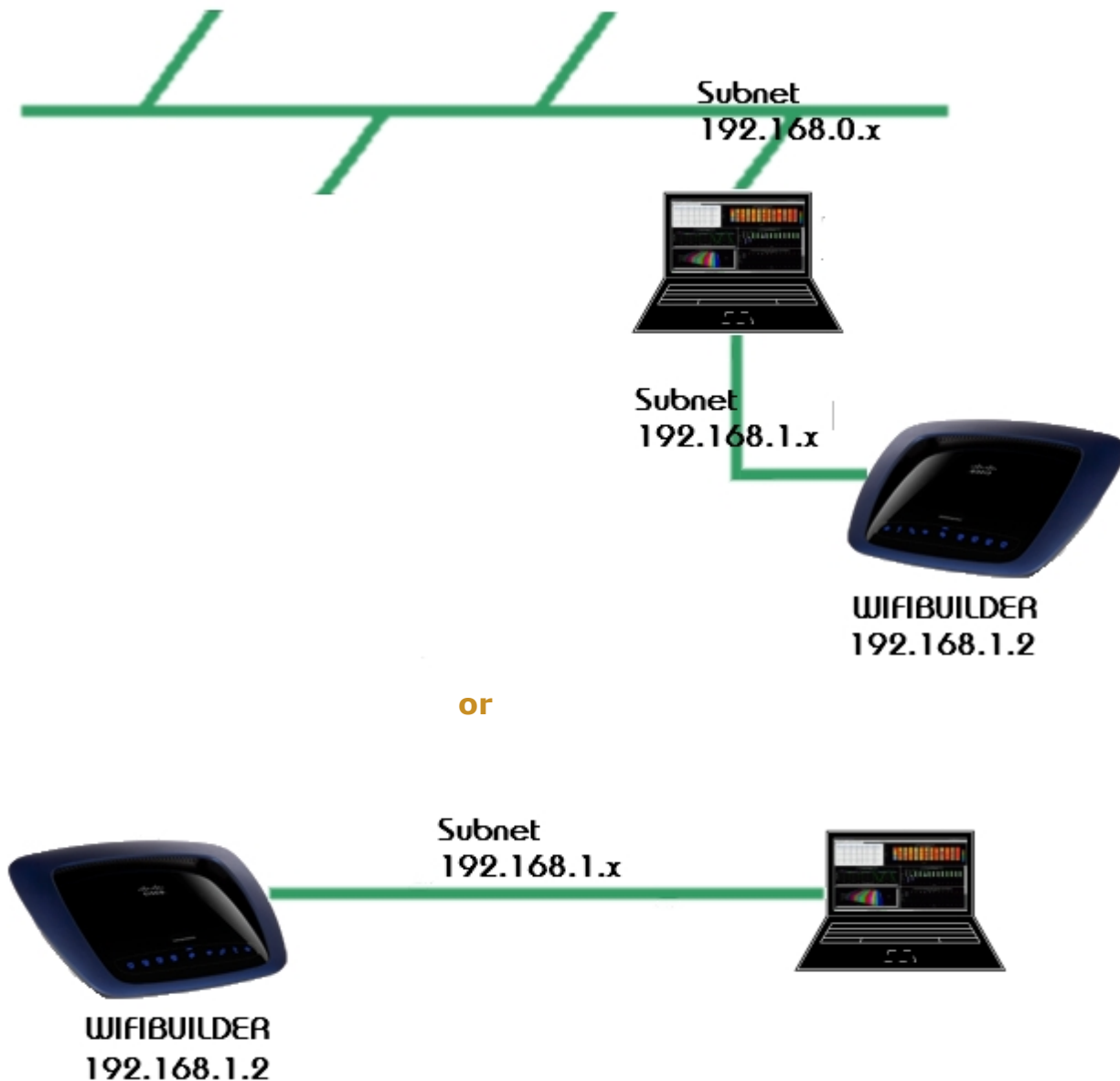
Preliminaries

- You will need administrative privileges in order to configure the network interface that connects to the WifiBuilder AP. Please login to an account on your computer that includes 'Administrator' rights before proceeding with the installation.

Step 1. Connect the WifiBuilder AP To Your Windows PC

There is more than one way to connect the WifiBuilder AP to a PC. The description that follows is the one we recommend when using WifiBuilder as a **standalone** diagnostic tool. It presumes your PC has two LAN adapters -- one for normal Internet connectivity and the other used for direct attachment to the WifiBuilder AP. Furthermore, the LAN adapter used to connect WifiBuilder should be configured to use a different subnet than the one for normal Internet connectivity -- otherwise applications might be confused as to which adapter to use for normal network activity. In this simplest configuration the WifiBuilder AP is connected directly to a PC (i.e. is not connected to a network) and uses its own subnet.

Standalone Diagnostic Tool

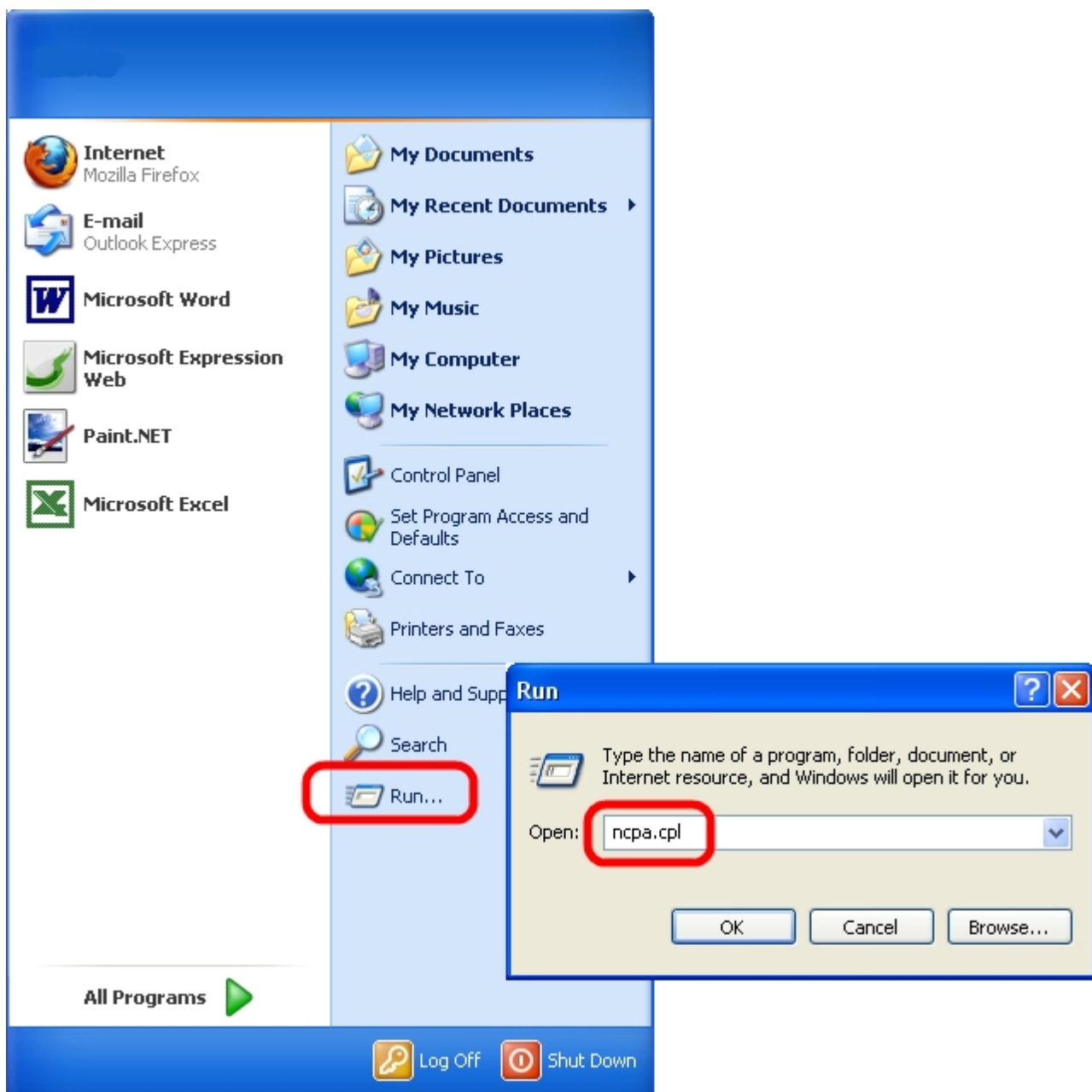


Using a Cat5 ethernet cable connect the WifiBuilder AP to a LAN adapter on your PC. The ethernet cable should be attached to one of the 4 RJ-45 ports on the back of the WifiBuilder AP labeled 'Ethernet' (and **NOT** the port labeled 'Internet'). If your PC does not have an available LAN port then you can also use the 'USB to 10/100 Mbps Adapter' (optional accessory) that may have shipped with WifiBuilder and which provides an additional LAN port (and network interface). The default IP address (192.168.1.2) for the WifiBuilder AP will likely be on a different subnet than the network adapter used for your normal Internet connection, so it requires its own network interface. Also, we'll be configuring the local interface (the one connected to WifiBuilder) to use a static IP address.

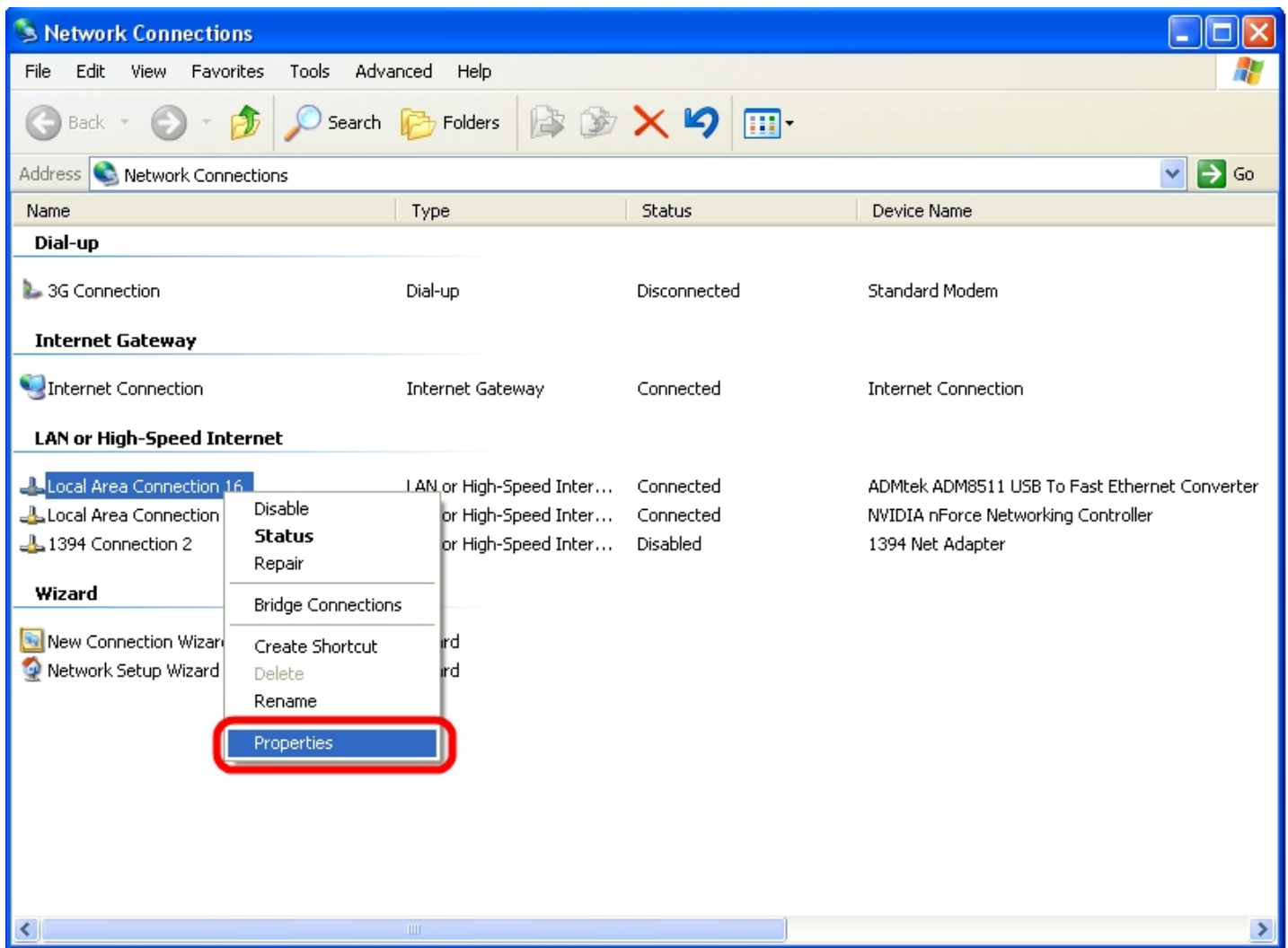
Step 2. Configure the Local Network Interface To Use A Static IP Address

The description that follows uses Windows XP, but the procedure is very similar for Vista and Windows 7, too.

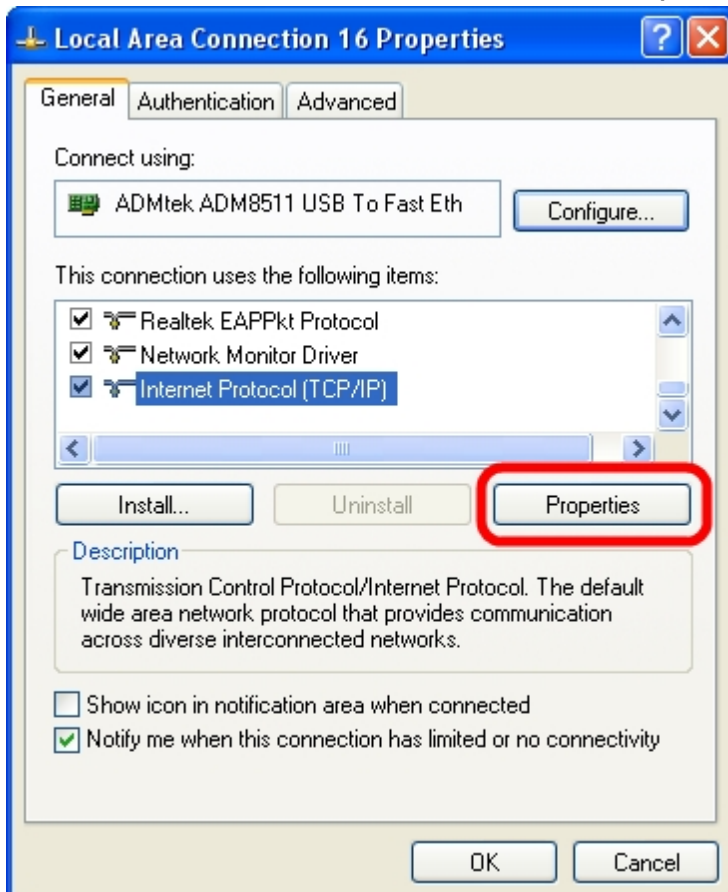
From the 'Start' button launch the Network Connections wizard by running 'ncpa.cpl'.



Select the network interface that is connected to the WifiBuilder AP, right-click and select 'Properties'.



Under the 'General' tab, select Internet Protocol (TCP/IP) and click Properties.



This opens the Internet Protocol (TCP/IP) Properties dialog box. Under the General tab, select 'Use the following IP address' and enter the following values:

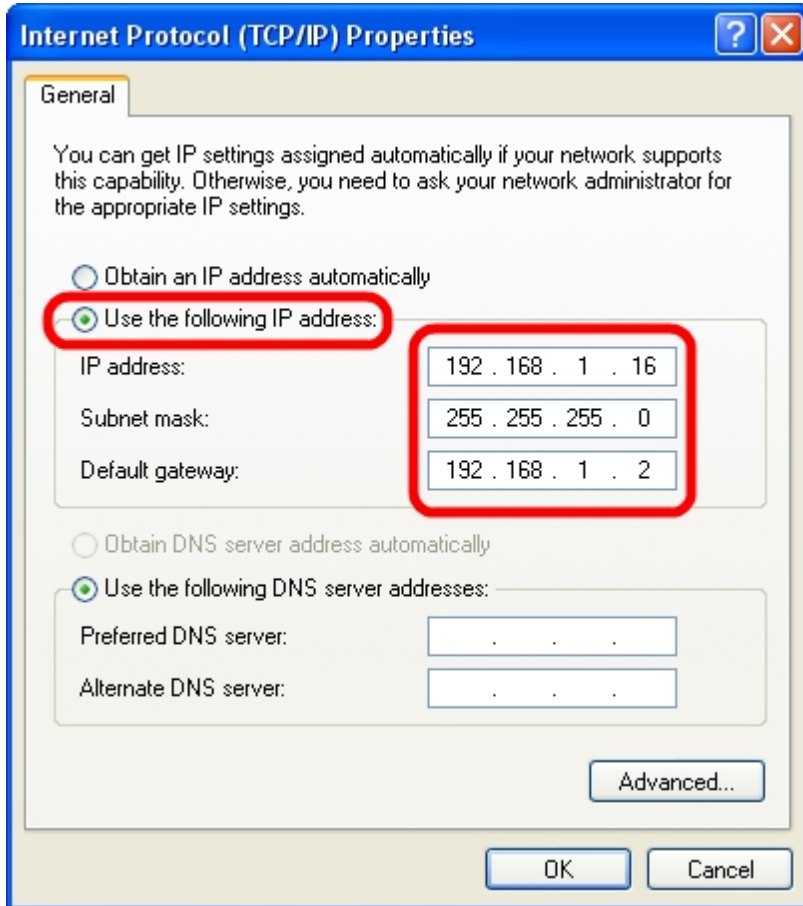
IP Address: 192.168.1.16

Subnet Mask: 255.255.255.0

Default gateway: **192.168.1.2**

You can leave the other fields blank. When done, click 'OK' to close each dialog box.

NOTE: The Default gateway is the IP address of the WifiBuilder AP.



From the command line run 'ipconfig /all' to confirm that your changes have been applied.

Installing and Using Figaro

This section provides basic instructions for installing and using Figaro -- a configuration tool for the WifiBuilder AP. Figaro allows you to easily change the local and WAN IP addresses, SSID, channel and security settings when using the WifiBuilder AP in **production mode**. Figaro runs on the following Windows operating systems: WinXP (SP3), Vista and Windows 7 (32-bit and 64-bit).

Please note that in most cases where WifiBuilder is being used as a **standalone** diagnostic tool on its own subnet (as described in the [previous](#) section) it is not necessary to run Figaro. That is, in **standalone** diagnostic mode there is no reason to change WifiBuilder's default IP address, SSID or security settings -- with one exception -- its default IP address of 192.168.1.2 is on the same subnet as the LAN adapter used for normal network activity.

Only when using WifiBuilder in **production** mode (i.e. as part of your normal network) or if its default IP address of 192.168.1.2 is on the same subnet as the LAN adapter used for normal network activity, should you then consider using Figaro to reconfigure the WifiBuilder AP.

Production Environment



System Requirements for Installing and Using Figaro

- PC running Windows XP Professional (SP3), Windows Vista, Windows 7 (32- or 64-bit)
- Microsoft .NET Framework version 3.0 (or later)
- Connection to one or more WifiBuilder APs (see [previous](#) section)

Installing and Using the Figaro Software

1) Before beginning the installation it will be necessary to download the latest version of the Figaro tool from [here](#).

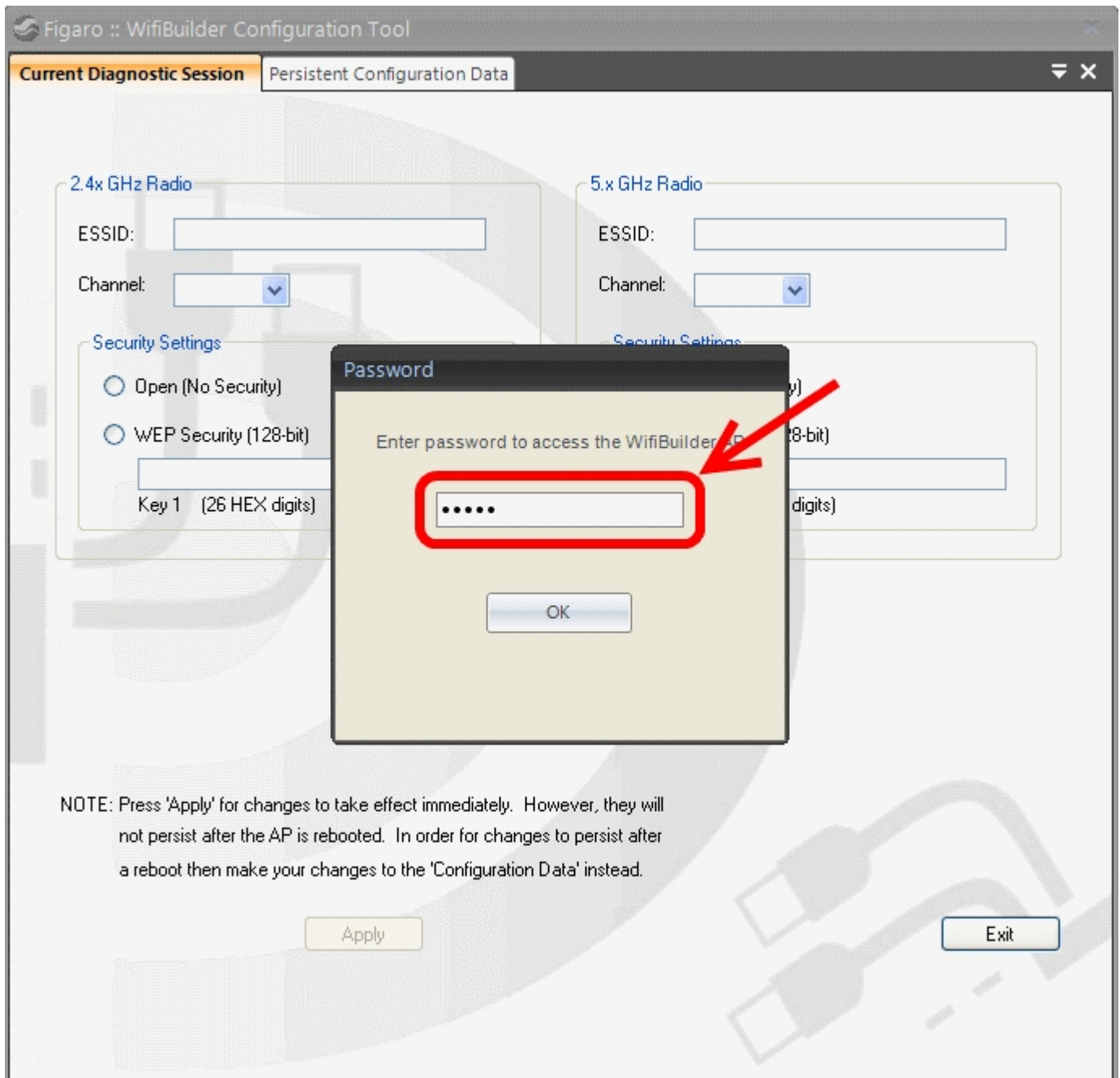
2) You will need administrative privileges in order to install the application software on your computer. Please login to an account on your computer that includes 'Administrator' rights before proceeding with the installation.

3) Run the Figaro installation / setup program. By default the application is installed under in the folder '\\Program Files\\NutsAboutNets\\WifiBuilder\\Figaro' and a desktop icon is created (labeled 'WifiBuilder Figaro').

4) When the installation has completed, launch the Figaro application by clicking the desktop icon.



5) When Figaro starts a dialog box first appears that requires a password to access the WifiBuilder AP. The default password is **'hello'**.



6) After entering the password another dialog box is displayed -- this one requests that you select a network interface and enter the IP address of a WifiBuilder AP. In the figure below, we select the LAN adapter whose IP address is 192.168.1.16 since this adapter is configured (see [previous](#) section) to use

the same subnet as the WifiBuilder AP. We've also entered 192.168.1.2 (the default) for WifiBuilder's IP address. Please note that it is essential that WifiBuilder's IP address and the selected network interface use the same subnet.

Select Local Interface and WifiBuilder IP Address

Adapter Name	Description	Physical Address (MAC)	IP Address
Local Area Connection...	ADMtek ADM8511 USB...	00:14:D1:1B:D6:91	192.168.1.16
Local Area Connection	NVIDIA nForce Networ...	00:1B:FC:01:08:6B	192.168.0.2

NOTE: Select one of the local interfaces (above) for communicating with the WifiBuilder AP.

Enter the IP address of a WifiBuilder access point (e.g. the default IP address is 192.168.1.2):

NOTE: This IP address must be reachable via ICMP using the local interface selected above.

192 . 168 . 1 . 2

OK Cancel

7) In Figaro's main dialog box there are two tabs -- 'Current Diagnostic Session' and 'Persistent Configuration Data'. These correspond to the two types of settings that can be changed.

Current Diagnostic Session:

When you change one of these settings and press 'Apply' it will remain in affect until the next time the WifiBuilder AP is rebooted. In other words, the changes you make here are **not** stored in the AP's flash memory and, hence, are **not** persistent.

ESSID (Extended Service Set ID):

The ESSID is the network name shared among all points in a wireless network. The SSID must be identical for all devices in the wireless network. Also, it allows one wireless network to be clearly distinguishable from another. The ESSID is case-sensitive and must not exceed 32 keyboard characters. The WifiBuilder AP has two ESSIDs -- one each for the 2.4x GHz and 5.x GHz radios.

Channel (2.4x GHz Radio):

This is the channel that will be used for Wireless-G and Wireless-N (2.4GHz) networking. In North America the allowed 2.4GHz channels are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11. In Europe, channels 12, and 13 are also allowed.

Channel (5.x GHz Radio): This is the channel that will be used for Wireless-A and Wireless-N (5GHz) networking.

In North America the allowed 5GHz channels are 36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, and 165. In Europe the allowed 5 GHz channels are 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, and 140.

Security Settings:

Uses WEP Encryption -- a basic encryption method. You can choose between 'Open' (i.e. no security) or 128-bit WEP. If you choose 128-bit WEP then it is also necessary to enter a sequence of 26 hexadecimal digits (i.e. [0-9] and [A-F]). For example: 0123456789ABCDEF0123456789

Figaro :: WifiBuilder Configuration Tool

Current Diagnostic Session Persistent Configuration Data

2.4x GHz Radio

ESSID: Atheros_XSpan_2G

Channel: 6

Security Settings

☒ Open (No Security)

☐ WEP Security (128-bit)

Key 1 (26 HEX digits)

5.x GHz Radio

ESSID: Atheros_XSpan_5G

Channel: 40

Security Settings

☒ Open (No Security)

☐ WEP Security (128-bit)

Key 1 (26 HEX digits)

NOTE: Press 'Apply' for changes to take effect immediately. However, they will not persist after the AP is rebooted. In order for changes to persist after a reboot then make your changes to the 'Configuration Data' instead.

Apply Exit

Persistent Configuration Data:

When you change one of these settings and press 'Commit' it will then be stored in the AP's flash memory -- but it won't take affect until the AP is rebooted. To reboot the AP press the 'Reboot AP' button.

WifiBuilder Password:

This is the password required to run Figaro or any desktop software application that accesses WifiBuilder's diagnostic capabilities.

Default Locale:

This controls which 802.11 channels are allowed -- you can choose either North America or Europe.

Local IP Settings:

This is WifiBuilder's local IP address. This IP address must be on the same subnet as your PC's LAN adapter -- the one used to connect to the WifiBuilder AP (see [previous](#) section). By default, WifiBuilder's local IP address is 192.168.1.2.

WAN IP Settings:

This is the 'Default Gateway' that WifiBuilder uses to access the outside world. Your network administrator or ISP will provide you with the 'Gateway Address', which is the ISP server's IP address.

Figaro :: WifiBuilder Configuration Tool

Current Diagnostic Session Persistent Configuration Data

WifiBuilder Password: hello

Default Locale

- ☒ North America
- ☐ Europe

Local IP Settings

Local IP Address: 192 . 168 . 1 . 2

Netmask: 255 . 255 . 255 . 0

WAN IP Settings

WAN IP Address: 192 . 168 . 2 . 1

Netmask: 255 . 255 . 255 . 0

2.4x GHz Radio

ESSID: Atheros_XSpan_2G

Channel: 6

Security Settings

- ☒ Open (No Security)
- ☐ WEP Security (128-bit)

Key 1 (26 HEX digits)

5.x GHz Radio

ESSID: Atheros_XSpan_5G

Channel: 40

Security Settings

- ☒ Open (No Security)
- ☐ WEP Security (128-bit)

Key 1 (26 HEX digits)

NOTE: Press 'Commit' to store changes in the AP's flash memory.
These changes will not take affect until the AP is rebooted.

Commit Reboot AP Exit

Contact Us

Nuts About Nets, LLC

2855 152nd Ave NE, Redmond WA 98052

Tel: 425.881.6506

General information and sales: sales@NutsAboutNets.com

Technical Support: support@NutsAboutNets.com

Web Site: www.NutsAboutNets.com