300Mbps Wireless N Draft AP

TEW-630APB

User Manual

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 can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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 to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- 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 equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

European Union Notice:

Radio products with the CE marking comply with the R&TTE Directive (1999/5/EC), the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.
Compliance with these directives implies conformity to the following European Norms:

- EN 60950 Product Safety
- EN 300 328 Technical requirement for radio equipment
- EN 301 489-1/-17 General EMC requirements for radio equipment

Trademark recognition

All product names used in this manual are the properties of their respective owners and are acknowledged.

Table of Contents

Getting Started with the WAP-372U

Congratulations on purchasing the WAP-372U! This manual provides information for setting up and configuring the WAP-372U. This manual is intended for both home users and professionals.

The following conventions are used in this manual:

THE NOTE SYMBOL INDICATES ADDITIONAL INFORMATION ON THE TOPIC AT HAND.

THE TIP SYMBOL INDICATES HELPFULL INFORMATION AND TIPS TO IMPROVE YOUR NETWORK EXPERIENCE.

THE CAUTION SYMBOL ALERTS YOU TO SITUATIONS THAT MAY DEGRADE YOUR NETWORKING EXPERIENCE OR COMPROMISE

LIKE NOTES AND TIPS, THE IMPORTANT SYMBOL INDICATES INFORMATION THAT CAN IMPROVE NETWORKING. THIS INFORMATION SHOULD NOT BE OVERLOOKED.

Package Contents

- WAP-372U 11n (Draft) AP
- CAT-5 Ethernet Cable (the WAP-372U's Ethernet ports is Auto-MDIX)
- Power Adapter (5.0V, 2.5A)
- CD-ROM with Manual
- Quick Installation Guide

Using a power supply with a different voltage than the one included with your product will cause damage and void the warranty for this product.

Minimum System Requirements

- Computers with Windows, Macintosh, or Linux-based operating systems with an installed Ethernet adapter and CD-ROM.
- Internet Explorer Version 6.0 or Netscape Navigator Version 7.0 and Above

Wireless LAN Networking

This section provides background information on wireless LAN networking technology. Consult the "Glossary" for definitions of the terminology used in this section.

THE INFORMATION IN THIS SECTION IS FOR YOUR REFERENCE. CHANGING NETWORK SETTINGS AND PARTICULARLY SECURITY SETTTINGS SHOULD ONLY BE DONE BY AN AUTHORIZED ADMINISTRATOR.

Transmission Rate (Transfer Rate)

The WAP-372U provides various transmission (data) rate options for you to select. In most networking scenarios, the factory default Best (Auto) setting proves the most efficient. This setting allows your WAP-372U to operate at the maximum transmission (data) rate. When the communication quality drops below a certain level, the WAP-372U automatically switches to a lower transmission (data) rate. Transmission at lower data speeds is usually more reliable. However, when the communication quality improves again, the WAP-372U gradually increases the transmission (data) rate again until it reaches the highest available transmission rate.

Types of Wireless Networks

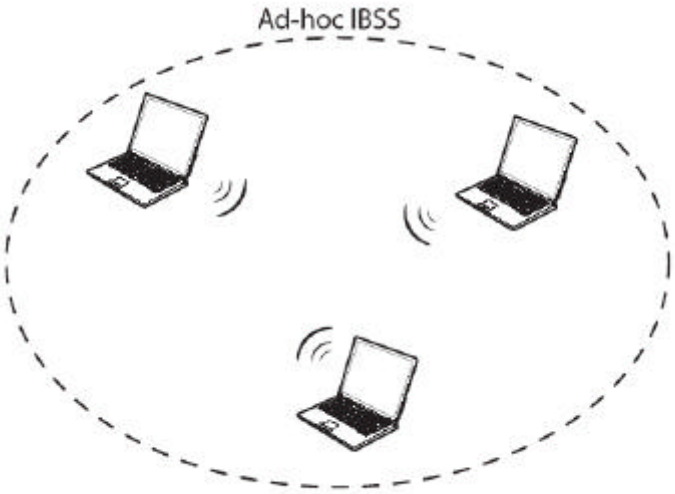
Wireless LAN networking works in either of the two modes: ad-hoc and infrastructure. In infrastructure mode, wireless devices communicate to a wired LAN via access points. Each access point and its wireless devices are known as a Basic Service Set (BSS). An Extended Service Set (ESS) is two or more BSSs in the same subnet. In ad hoc mode (also known as peer-to-peer mode), wireless devices communicate with each other directly and do not use an access point. This is an Independent BSS (IBSS).

To connect to a wired network within a coverage area using access points, set the WAP-372U operation mode to Infrastructure (BSS). To set up an independent wireless workgroup without an access point, use Ad-hoc (IBSS) mode.

AD-HOC (IBSS) NETWORK

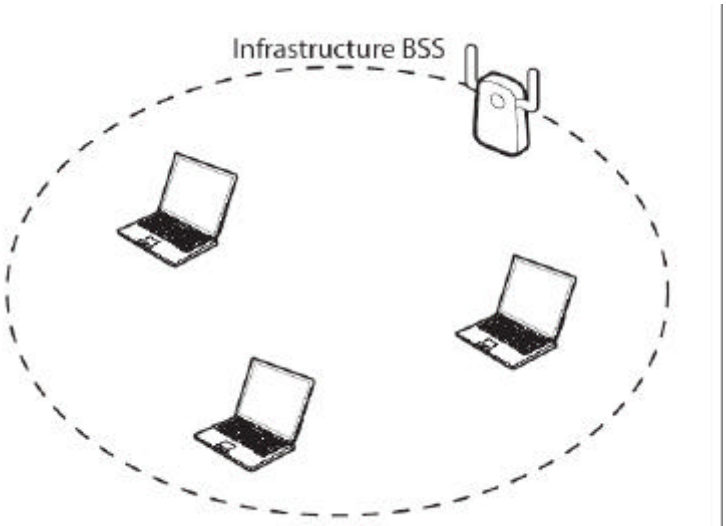
Ad-hoc mode does not require an access point or a wired network. Two or more wireless stations communicate directly to each other. An ad-hoc network may sometimes be referred to as an Independent Basic Service Set (IBSS).

To set up an ad-hoc network, configure all the stations in ad-hoc mode. Use the same SSID and channel for each station.



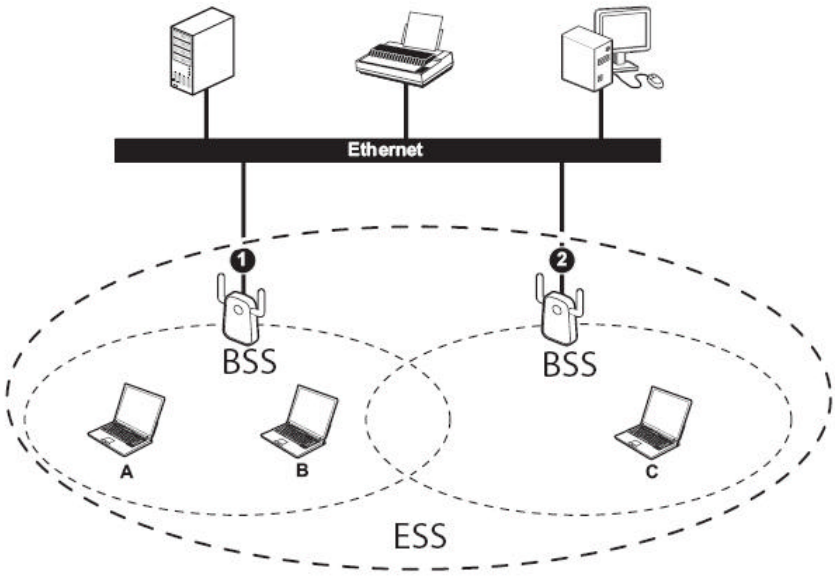
Ad-hoc (also known as peer-to-peer) network diagram

When a number of wireless stations are connected using a single access point, you have a Basic Service Set (BSS).



Infrastructure (IBSS) network diagram

In the ESS diagram below, communication is done through the access points, which relay data packets to other wireless stations or devices connected to the wired network. Wireless stations can then access resources, such as a printer, on the wired network.



Infrastructure (ESS) network diagram

In an ESS environment, users are able to move from one access point to another without losing the connection. In the diagram below, when the user moves from BSS (1) to BSS (2) the WAP-372U automatically switches to the channel used in BSS (2).

Introduction

The WAP-372U is an 802.11n (draft) high-performance, wireless AP that supports high-speed wireless networking at home, at work or in public places.

Unlike most APs, the WAP-372U provides data transfers at up to 300 Mbps when used with other 11n (draft) products. This AP is backwards compatible with 802.11b/g products. This means that you do not need to change your entire network to maintain connectivity. You may sacrifice some of 802.11g's speed when you mix 802.11n (draft) and 802.11g devices, but you will not lose the ability to communicate when you incorporate the 802.11n (draft) into your 802.11g network. You may choose to slowly change your network by gradually replacing the 802.11g devices with 802.11n (draft) devices.

Features

- Supports IEEE 802.11n (draft) & 11b/g 2.4GHz wireless Local Area Network (WLAN) application
- 2.412 to 2.484GHz frequency band operation
- Compliant with IEEE 802.3 & 3u standards
- Support OFDM and CCK modulation
- Data rates of 1,2.5.5,6,9,12,18,24,36,48,54Mbps and 802.11n (draft) offering up to 300Mbps.
- Support one LAN port
- Support WEP & WPA security
- Support three external antennas

Hardware Overview

Real Panel

DC-IN

The DC power input connector is a single jack socket to supply power to the WAP-372U. Please use the Power Adapter provided on the WAP-372U package.

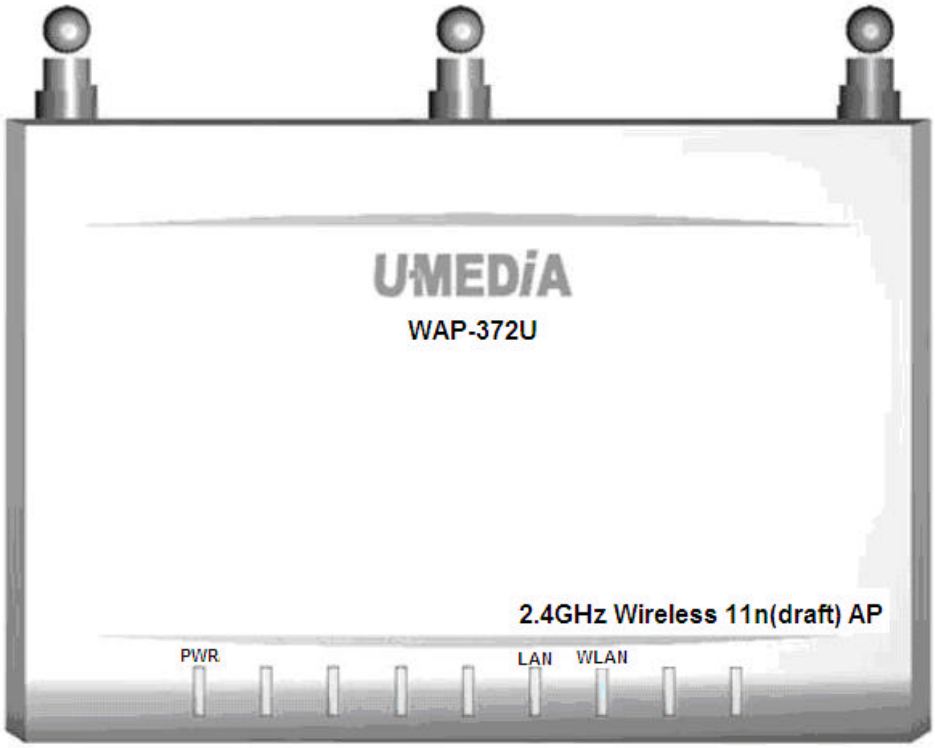
Auto MDI/MDIX LAN Ports

This port automatically senses the cable type when connecting to Router.

Reset Button

Pressing the reset button restores the AP to its original factory default settings.

LEDs



POWER LED

A solid light indicates a proper connection to the power supply.

LAN LED

A solid light indicates a connection to a Router on the LAN port. This LED blinks during data transmission.

WLAN LED

A solid light indicates that the wireless segment is ready. This LED blinks during wireless data transmission.

Installation Considerations

The WAP-372U AP lets you access your network, using a wireless connection, from virtually anywhere within its operating range. Keep in mind, however, that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF (radio frequency) noise in your home or business. The key to maximizing wireless range is to follow these basic guidelines:

1 Keep the number of walls and ceilings between the WAP-372U and other network devices to a minimum - each wall or ceiling can reduce your wireless product's range from 3-90 feet (1-30 meters.) Position your devices so that the number of walls or ceilings is minimized.

2 Be aware of the direct line between network devices. A wall that is 1.5 feet thick (.5 meters), at a 45-degree angle appears to be almost 3 feet (1 meter) thick. At a 2-degree angle it looks over 42 feet (14 meters) thick! Position devices so that the signal will travel straight through a wall or ceiling (instead of at an angle) for better reception.

3 Building Materials can impede the wireless signal - a solid metal door or aluminum studs may have a negative effect on range. Try to position wireless devices and computers with wireless adapters so that the signal passes through drywall or open doorways and not other materials.

4 Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate extreme RF noise.

Getting Started

For a typical wireless setup at home, please do the following:

1. Plug the power adapter to outlay, and connect the power jack to the WAP-372U.
2. Connect the Ethernet LAN port of the WAP-372U to your PC.
3. Open your web browser, and type http://192.168.1.100 to login WAP-372U.
4. When the authentication window is popped up, type the **admin** for the username, and leave the password as blank, then type enter to login the web page of the WAP-372U.
5. Configure the desired wireless setting.
6. Connect the Ethernet port of the WAP-372U to your router.

Using the Configuration Menu

Whenever you want to configure your WAP-372U, you can access the Configuration Menu by opening the Web-browser and typing in the IP Address of the WAP-372U. The WAP-372U's default IP Address is http://192.168.1.100.

- Open the Web browser.
- Type in the **IP Address** of the AP (http://192.168.1.100).

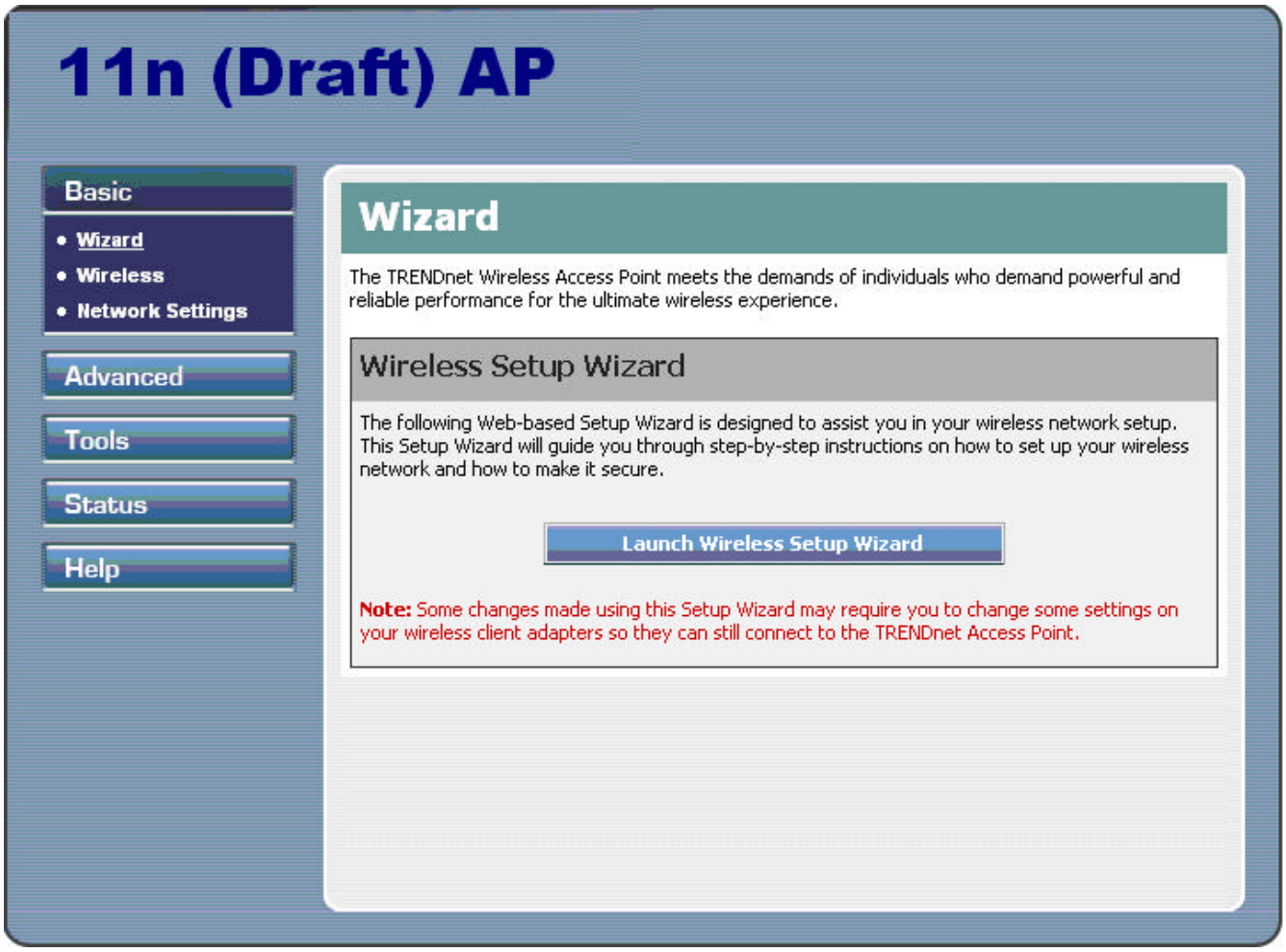
If you have changed the default IP Address assigned to the WAP-372U, make sure to enter the correct IP Address.

- Type **admin** in the **User Name** field.
- Leave the **Password** blank.
- Click **Login In.**

Basic

The Basic tab provides the following configuration options: Wizard, Wireless and Network Settings.

Basic_Wizard



Wireless Setup Wizard

If you are new to networking and have never configured an access point before, click on **Launch Wireless Setup Wizard** and the wizard will guide you through a few simple steps to get your network up and running.

Basic_Wireless

The wireless section is used to configure the wireless settings for your Access Point. Note that changes made in this section may also need to be duplicated on wireless clients that you want to connect to your wireless network.

To protect your privacy, use the wireless security mode to configure the wireless security features. This device supports three wireless security modes including: WEP, WPA-Personal, and WPA-Enterprise. WEP is the original wireless encryption standard. WPA provides a higher level of security. WPA-Personal does not require an authentication server. The WPA-Enterprise option does require a RADIUS authentication server.

Wireless Radio

This status indication shows you the wireless radio is on or off.

Wireless Network Name

When you are browsing for available wireless networks, this is the name that will appear in the list (unless Visibility Status is set to Invisible, see below). This name is also referred to as the SSID. For security purposes, it is highly recommended to change from the pre-configured network name.

Enable Auto Channel Scan

If you select this option, the Access Point automatically finds the channel with least interference and uses that channel for wireless networking. If you disable this option, the Access Point uses the channel that you specify with the following **Wireless Channel** option.

Wireless Channel

A wireless network uses specific channels in the wireless spectrum to handle communication between clients. Some channels in your area may have interference from other electronic devices. Choose the clearest channel to help optimize the performance and coverage of your wireless network.

802.11 Mode

If all of the wireless devices you want to connect with this Access Point can connect in the same transmission mode, you can improve performance slightly by choosing the appropriate "Only" mode. If you have some devices that use a different transmission mode, choose the appropriate "Mixed" mode.

Channel Width

The "Auto 20/40 MHz" option is usually best. The other options are available for special circumstances.

Transmission Rate

By default the fastest possible transmission rate will be selected. You have the option of selecting the speed if necessary.

Visibility Status

The Invisible option allows you to hide your wireless network. When this option is set to Visible, your wireless network name is broadcast to anyone within the range of your signal. If you're not using encryption then they could connect to your network. When Invisible mode is enabled, you must enter the Wireless Network Name (SSID) on the client manually to connect to the network.

Security Mode

Unless one of these encryption modes is selected, wireless transmissions to and from your wireless network can be easily intercepted and interpreted by unauthorized users.

WEP

A method of encrypting data for wireless communication intended to provide the same level of privacy as a wired network. WEP is not as secure as WPA encryption. To gain access to a WEP network, you must know the key. The key is a string of characters that you create. When using WEP, you must determine the level of encryption. The type of encryption determines the key length. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in HEX (hexadecimal - using

characters 0-9, A-F) or ASCII (American Standard Code for Information Interchange - alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember. The ASCII string is converted to HEX for use over the network. Four keys can be defined so that you can change keys easily. A default key is selected for use on the network.

Example:

64-bit hexadecimal keys are exactly 10 characters in length. (12345678FA is a valid string of 10 characters for 64-bit encryption.)

128-bit hexadecimal keys are exactly 26 characters in length. (456FBCDF123400122225271730 is a valid string of 26 characters for 128-bit encryption.)

64-bit ASCII keys are up to 5 characters in length (DMODE is a valid string of 5 characters for 64-bit encryption.)

128-bit ASCII keys are up to 13 characters in length (2002HALOSWIN1 is a valid string of 13 characters for 128-bit encryption.)

Note that, if you enter fewer characters in the WEP key than required, the remainder of the key is automatically padded with zeros.

WPA-Personal and WPA-Enterprise

Both of these options select some variant of Wi-Fi Protected Access (WPA) -- security standards published by the Wi-Fi Alliance. The **WPA Mode** further refines the variant that the Access Point should employ.

WPA Mode: WPA is the older standard; select this option if the clients that will be used with the Access Point only support the older standard. WPA2 is the newer implementation of the stronger IEEE 802.11i security standard. With the "WPA or WPA2" option, the Access Point tries WPA2 first, but falls back to WPA if the client only supports WPA. The strongest cipher that the client supports will be used. With the "WPA2 Only" option, the Access Point associates only with clients that also support WPA2 security. The AES cipher will be used across the wireless network to ensure best security.

Group Key Update Interval: The amount of time before the group key used for broadcast and multicast data is changed.

WPA-Personal

This option uses Wi-Fi Protected Access with a Pre-Shared Key (PSK).

Pre-Shared Key: The key is entered as a pass-phrase of up to 63 alphanumeric characters in ASCII (American Standard Code for Information Interchange) format at both ends of the wireless connection. It cannot be shorter than eight characters, although for proper security it needs to be of ample length and should not be a commonly known phrase. This phrase is used to generate session keys that are unique for each wireless client.

Example:

Wireless Networking technology enables ubiquitous communication

WPA-Enterprise

This option works with a RADIUS Server to authenticate wireless clients. Wireless clients should have established the necessary credentials before attempting to authenticate to

the Server through this Gateway. Furthermore, it may be necessary to configure the RADIUS Server to allow this Gateway to authenticate users.

Authentication Timeout: Amount of time before a client will be required to re-authenticate.

RADIUS Server IP Address: The IP address of the authentication server.

RADIUS Server Port: The port number used to connect to the authentication server.

RADIUS Server Shared Secret: A pass-phrase that must match with the authentication server.

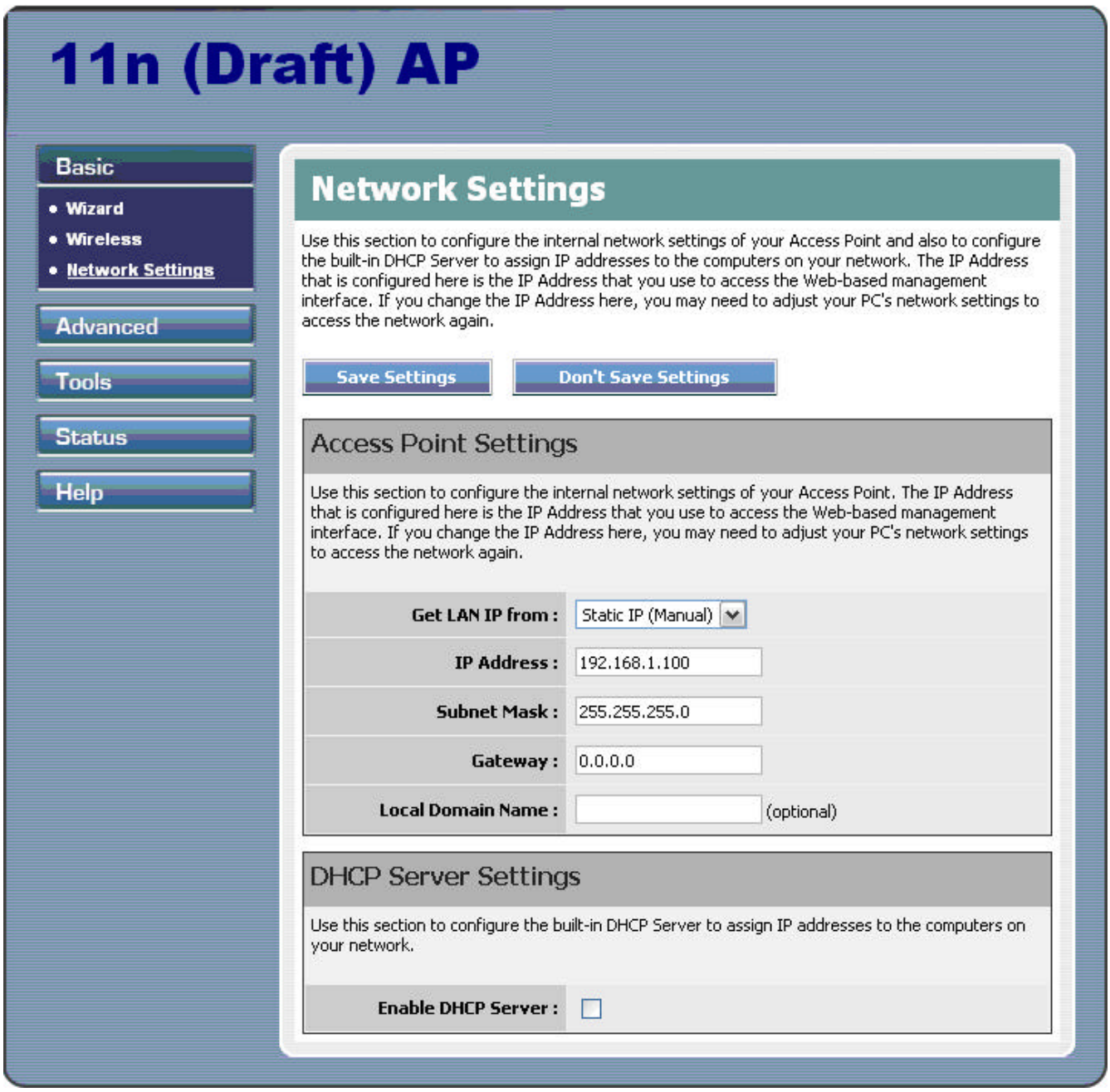
MAC Address Authentication: If this is selected, the user must connect from the same computer whenever logging into the wireless network.

Advanced:

Optional Backup RADIUS Server

This option enables configuration of an optional second RADIUS server. A second RADIUS server can be used as backup for the primary RADIUS server. The second RADIUS server is consulted only when the primary server is not available or not responding. The fields **Second RADIUS Server IP Address**, **RADIUS Server Port**, **Second RADIUS server Shared Secret**, **Second MAC Address Authentication** provide the corresponding parameters for the second RADIUS Server.

Basic_Network Settings



Access Point Settings

These are the settings of the LAN (Local Area Network) interface for the Access Point. The Access Point's local network (LAN) settings are configured based on the IP Address and Subnet Mask assigned in this section. The IP address is also used to access this Web-based management interface.

Get LAN IP From

Choose "DHCP (Dynamic)" if your router supports DHCP and you want the router to assign an IP address to the AP. In this case, you do not need to fill in the following fields. Choose "Static IP (Manual)" if your router does not support DHCP or if for any other reason you need to assign a fixed address to the AP. In this case, you must also configure the following fields.

Note that you cannot choose "DHCP (Dynamic)" if you have enabled the "DHCP Server" option on the DHCP page; the AP cannot be both a DHCP client and a DHCP server.

IP Address

The IP address of the AP on the local area network. Assign any unused IP address in the range of IP addresses available for the LAN. For example, 192.168.1.100.

Subnet Mask

The subnet mask of the local area network.

Gateway

The IP address of the router on the local area network.

Local Domain Name

This entry is optional. Enter a domain name for the local network. The AP's DHCP server will give this domain name to the computers on the wireless LAN. So, for example, if you enter mynetwork.net here, and you have a wireless laptop with a name of chris, that laptop will be known as chris.mynetwork.net. Note, however, if the AP's settings specify "DHCP (Dynamic)" Address, and the router's DHCP server assigns a domain name to the AP, that domain name will override any name you enter here.

DHCP Server Settings

DHCP stands for Dynamic Host Configuration Protocol. The DHCP section is where you configure the built-in DHCP Server to assign IP addresses to the computers and other devices on your local area network (LAN).

Enable DHCP Server

In most situations, the router provides DHCP services, and you can leave this option disabled. However, if for any reason the router does not provide DHCP services, enable this option. The AP's DHCP Server will then manage the IP addresses and other network configuration information for wireless clients associated with the AP.

The computers (and other devices) connected to your LAN also need to have their TCP/IP configuration set to "DHCP" or "Obtain an IP address automatically".

When you set **Enable DHCP Server**, the following options are displayed.

DHCP IP Address Range

These two IP values (*from* and *to*) define a range of IP addresses that the DHCP Server uses when assigning addresses to computers and devices on your Local Area Network. Any addresses that are outside of this range are not managed by the DHCP Server; these could, therefore, be used for manually configured devices or devices that cannot use DHCP to obtain network address details automatically.

It is possible for a computer or device that is manually configured to have an address that does reside within this range. In this case the address should be reserved, so that the DHCP Server knows that this specific address can only be used by a specific computer or device.

Your Access Point, by default, has a static IP address of 192.168.1.100. This means that addresses 192.168.1.101 to 192.168.1.254 can be made available for allocation by the DHCP Server.

Example:

Your Access Point uses 192.168.1.1 for the IP address. You've assigned a computer that you want to designate as a Web server with a static IP address of 192.168.1.101. You've assigned another computer that you want to designate as an FTP server with a static IP address of 192.168.1.102. Therefore the starting IP address for your DHCP IP address range needs to be 192.168.1.103 or greater.

Example:

Suppose you configure the DHCP Server to manage addresses From 192.168.1.101 To 192.168.1.199. This means that 192.168.1.1 to 192.168.1.99 and 192.168.1.200 to 192.168.1.254 are NOT managed by the DHCP Server. Computers or devices that use addresses from these ranges are to be manually configured. Suppose you have a web server computer that has a manually configured address of 192.168.1.101. Because this falls within the "managed range" be sure to create a reservation for this address and match it to the relevant computer.

DHCP Lease Time

The amount of time that a computer may have an IP address before it is required to renew the lease. The lease functions just as a lease on an apartment would. The initial lease designates the amount of time before the lease expires. If the tenant wishes to retain the address when the lease is expired then a new lease is established. If the lease expires and the address is no longer needed than another tenant may use the address.

Always Broadcast

If all the computers on the LAN successfully obtain their IP addresses from the Access Point's DHCP server as expected, this option can remain disabled. However, if one of the computers on the LAN fails to obtain an IP address from the Access Point's DHCP server, it may have an old DHCP client that incorrectly turns off the broadcast flag of DHCP packets. Enabling this option will cause the Access Point to always broadcast its responses to all clients, thereby working around the problem, at the cost of increased broadcast traffic on the LAN.

Add/Edit DHCP Reservation

This option lets you reserve IP addresses, and assign the same IP address to the network device with the specified MAC address any time it requests an IP address. This is almost the same as when a device has a static IP address except that the device must still request an IP address from the Access Point. The Access Point will provide the device the same IP address every time. DHCP Reservations are helpful for server computers on the local network that are hosting applications such as Web and FTP. Servers on your network should either use a static IP address or use this option.

Computer Name

You can assign a name for each computer that is given a reserved IP address. This may help you keep track of which computers are assigned this way. Example: Game Server.

IP Address:

The LAN address that you want to reserve.

MAC Address

To input the MAC address of your system, enter it in manually or connect to the Access Point's Web-Management interface from the system and click the **Copy Your PC's MAC Address** button.

A MAC address is usually located on a sticker on the bottom of a network device. The MAC address is comprised of twelve digits. Each pair of hexadecimal digits are usually separated by dashes or colons such as 00-0D-88-11-22-33 or 00:0D:88:11:22:33. If your network device is a computer and the network card is already located inside the computer, you can connect to the Access Point from the computer and click the **Copy Your PC's MAC Address** button to enter the MAC address.

As an alternative, you can locate a MAC address in a specific operating system by following the steps below:

Windows 98 Windows Me	Go to the Start menu, select Run, type in winipcfg, and hit Enter. A popup window will be displayed. Select the appropriate adapter from the pull-down menu and you will see the Adapter Address. This is the MAC address of the device.
Windows 2000 Windows XP	Go to your Start menu, select Programs, select Accessories, and select Command Prompt. At the command prompt type ipconfig /all and hit Enter. The physical address displayed for the adapter connecting to the Access Point is the MAC address.
Mac OS X	Go to the Apple Menu, select System Preferences, select Network, and select the Ethernet Adapter connecting to the Access Point. Select the Ethernet button and the Ethernet ID will be listed. This is the same as the MAC address.

DHCP Reservations List

This shows clients that you have specified to have reserved DHCP addresses. An entry can be changed by clicking the Edit icon, or deleted by clicking the Delete icon. When you click the Edit icon, the item is highlighted, and the "Edit DHCP Reservation" section is activated for editing.

Number of Dynamic DHCP Clients

In this section you can see what LAN devices are currently leasing IP addresses.

Revoke

The Revoke option is available for the situation in which the lease table becomes full or nearly full, you need to recover space in the table for new entries, and you know that some of the currently allocated leases are no longer needed. Clicking Revoke cancels the lease for a specific LAN device and frees an entry in the lease table. Do this only if the device no longer needs the leased IP address, because, for example, it has been removed from the network.

Reserve

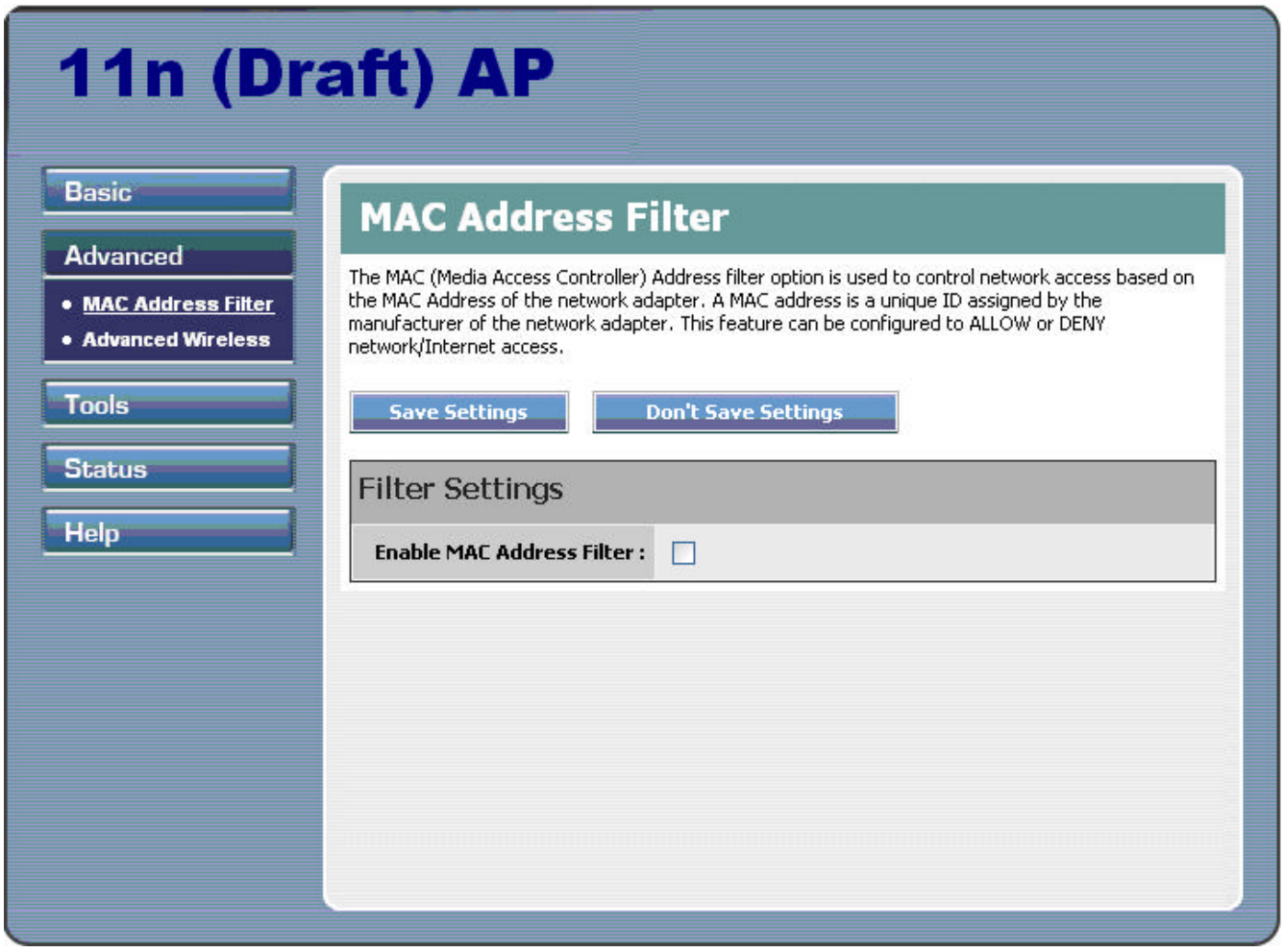
The Reserve option converts this dynamic IP allocation into a DHCP Reservation and adds the corresponding entry to the DHCP Reservations List.

Advanced

The Advanced tab provides the following configuration options: **MAC Address Filter and Advanced Network.**

Advanced_MAC Address Filter

The MAC address filter section can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to your network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.



Enable MAC Address Filter

When this is enabled, computers are granted or denied network access depending on the mode of the filter.

Note: Misconfiguration of this feature can prevent any machine from accessing the network. In such a situation, you can regain access by activating the factory defaults button on the Access Point itself.

Filter Settings

Mode

When "only allow listed machines" is selected, only computers with MAC addresses listed in the MAC Address List are granted network access. When "only deny listed machines" is selected, any computer with a MAC address listed in the MAC Address List is refused access to the network.

Filter Wireless Clients

When this is selected, the MAC address filters will be applied to wireless network clients.

Filter Wired Clients

When this is selected, the MAC address filters will be applied to wired network clients.

Add/Edit MAC Address

In this section, you can add entries to the MAC Address List below, or edit existing entries.

Enable

MAC address entries can be activated or deactivated with this checkbox.

MAC Address

Enter the MAC address of the desired computer or connect to the Access Point from the desired computer and click the **Copy Your PC's MAC Address** button.

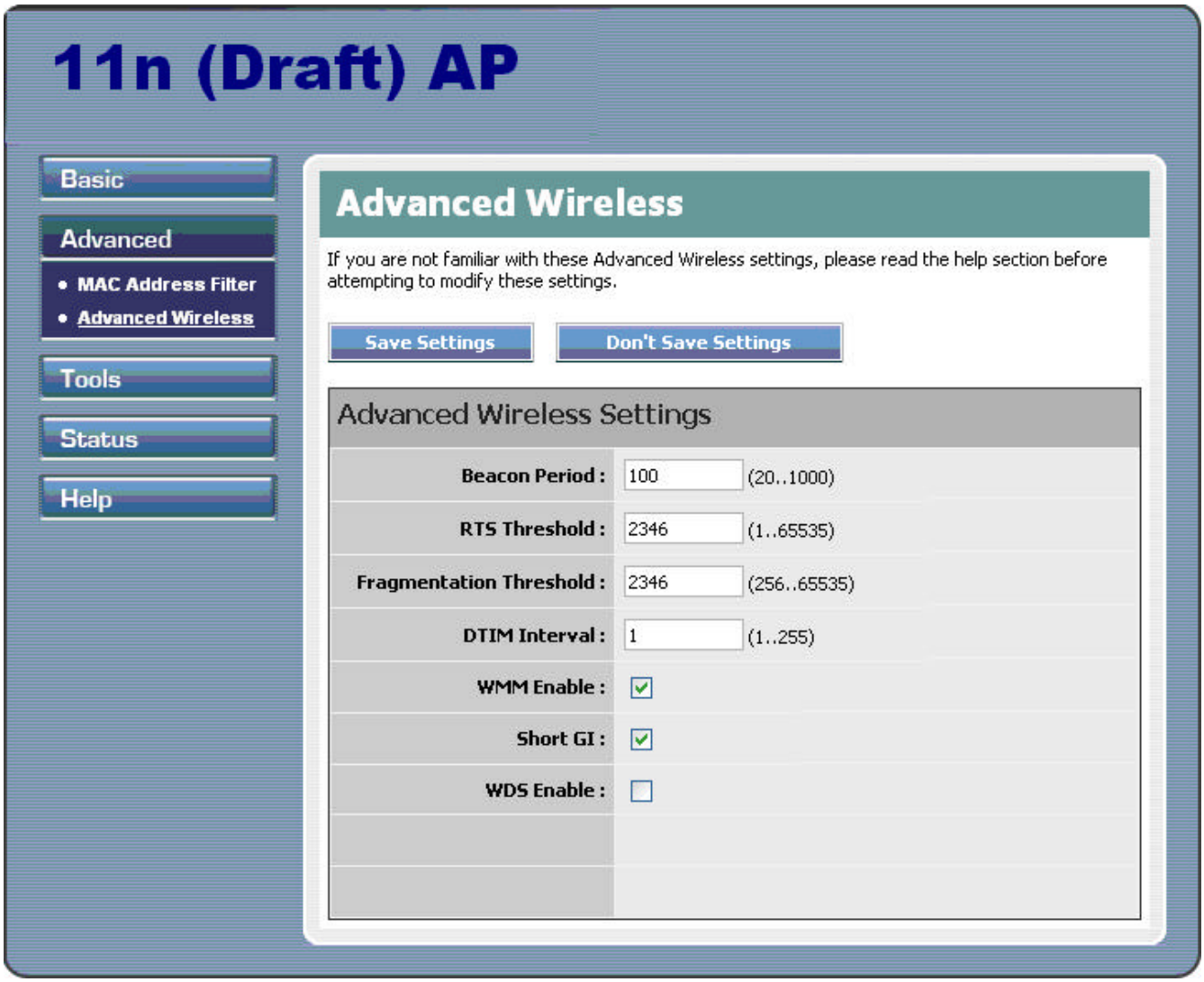
Save

Saves the new or edited MAC Address entry in the following list. When finished updating the MAC Address List, you must still click the **Save Settings** button at the top of the page to make the changes effective and permanent.

MAC Address List

The section lists the current MAC Address filters. A MAC Address entry can be changed by clicking the Edit icon, or deleted by clicking the Delete icon. When you click the Edit icon, the item is highlighted, and the "Edit MAC Address" section is activated for editing.

Advanced_Advanced Wireless



Beacon Period

Beacons are packets sent by a wireless Access Point to synchronize wireless devices. Specify a Beacon Period value between 20 and 1000. The default value is set to 100 milliseconds.

RTS Threshold

This setting should remain at its default value of 2346. If you encounter inconsistent data flow, only minor modifications to the value are recommended.

Fragmentation Threshold

This setting should remain at its default value of 2346. Setting the Fragmentation value too low may result in poor performance.

DTIM Interval

A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages. When the wireless Access Point has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Wireless clients detect the beacons and awaken to receive the broadcast and multicast messages. The default value is 1. Valid settings are between 1 and 255.

WMM Enable

Enabling WMM can help control latency and jitter when transmitting multimedia content over a wireless connection.

Short GI

Using a short (400ns) guard interval can increase throughput. However, it can also increase error rate in some installations, due to increased sensitivity to radio-frequency reflections. Select the option that works best for your installation.

WDS Enable

When WDS is enabled, this access point functions as a wireless repeater and is able to wirelessly communicate with other APs via WDS links. Note that WDS is incompatible with WPA -- both features cannot be used at the same time. A WDS link is bidirectional; so this AP must know the MAC Address (creates the WDS link) of the other AP, and the other AP must have a WDS link back to this AP. Make sure the APs are configured with same channel number.

WDS AP MAC Address

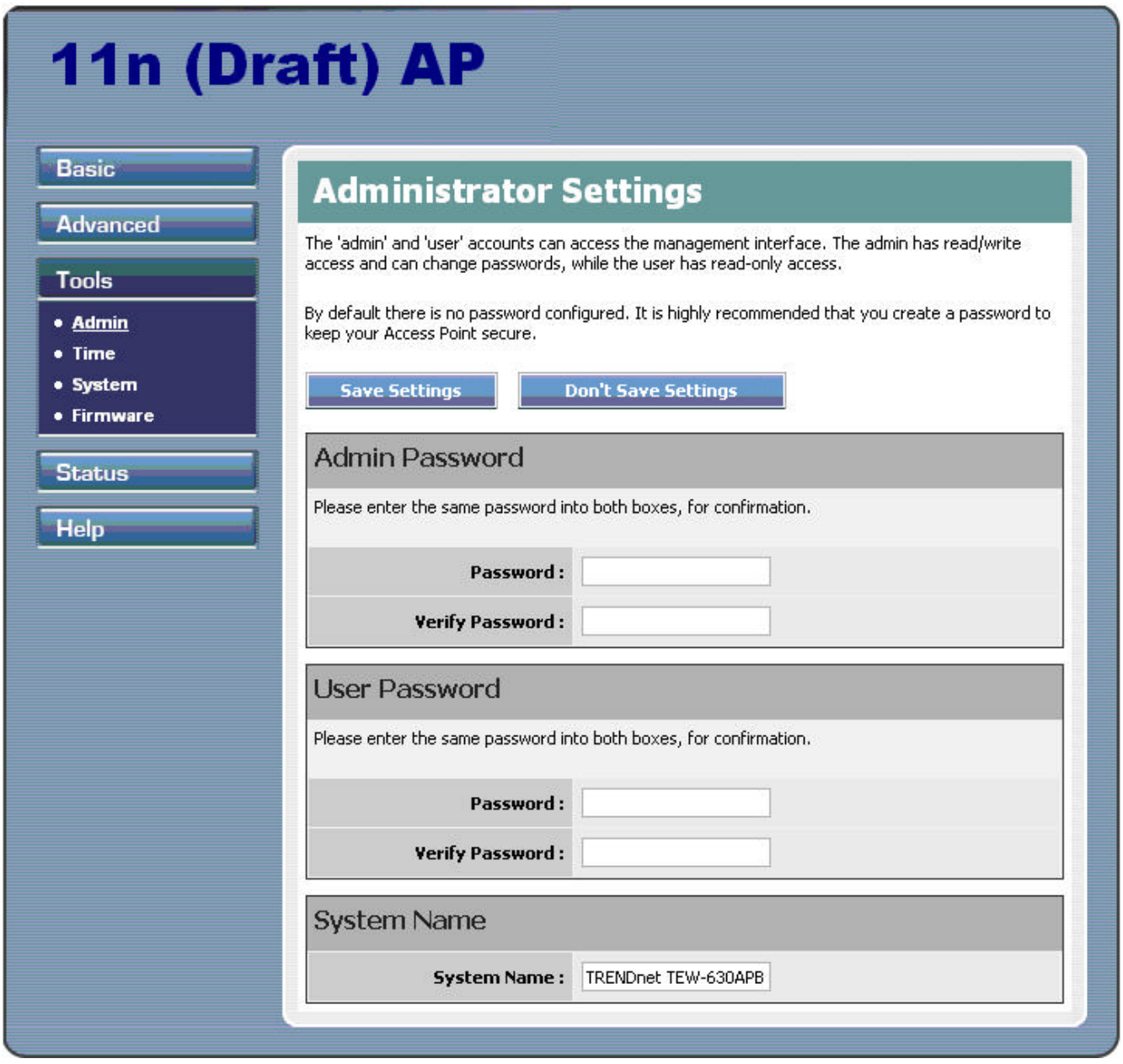
Specifies one-half of the WDS link. The other AP must also have the MAC address of this AP to create the WDS link back to this AP. Enter a MAC address for each of the other APs that you want to connect with WDS.

Tools

The Tools tab provides the following configuration options: **Admin, Time, System and Firmware.**

Tool_Admin

The Admin option is used to set a password for access to the Web-based management. By default there is no password configured. It is highly recommended that you create a password to keep your new Access Point secure.



Admin Password

Enter a password for the user "admin", who will have full access to the Web-based management interface.

User Password

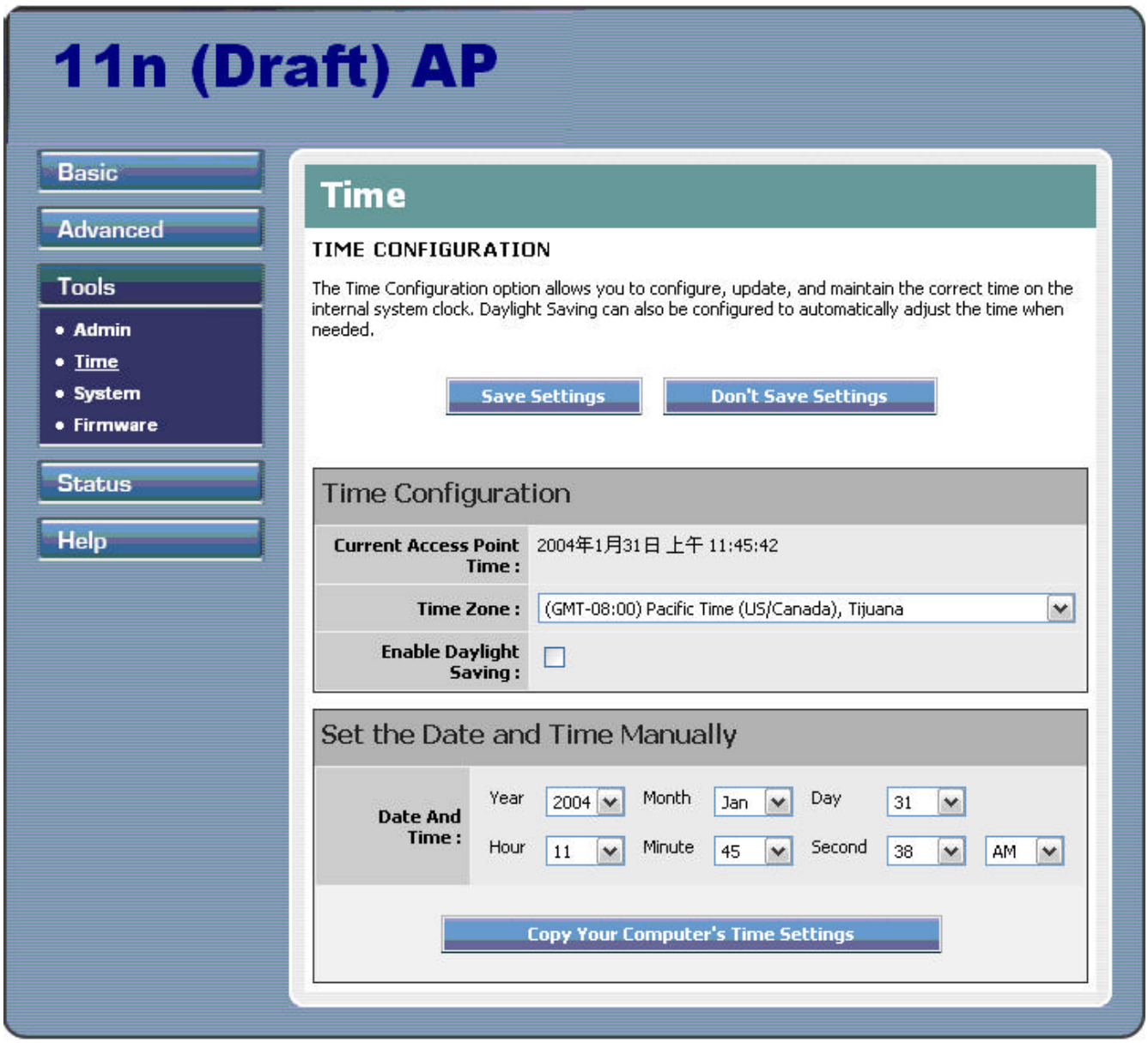
Enter a password for the user "user", who will have read-only access to the Web-based management interface.

System Name

The name of the Access Point can be changed here.

Tool_Time

The Time Configuration option allows you to configure, update, and maintain the correct time on the Access Point's internal system clock. From this section you can set the time zone that you are in and set the Time Server. Daylight saving can also be configured to automatically adjust the time when needed.



Time Configuration

Current Access Point Time

Displays the time currently maintained by the Access Point. If this is not correct, use the following options to configure the time correctly.

Time Zone

Select your local time zone from pull down menu.

Enable Daylight Saving

Check this option if your location observes daylight saving time.

Daylight Saving Offset

Select the time offset, if your location observes daylight saving time.

DST Start and DST End

Select the starting and ending times for the change to and from daylight saving time. For example, suppose for DST Start you select Month="Oct", Week="3rd", Day="Sun" and Time="2am". This is the same as saying: "Daylight saving starts on the third Sunday of October at 2:00 AM."

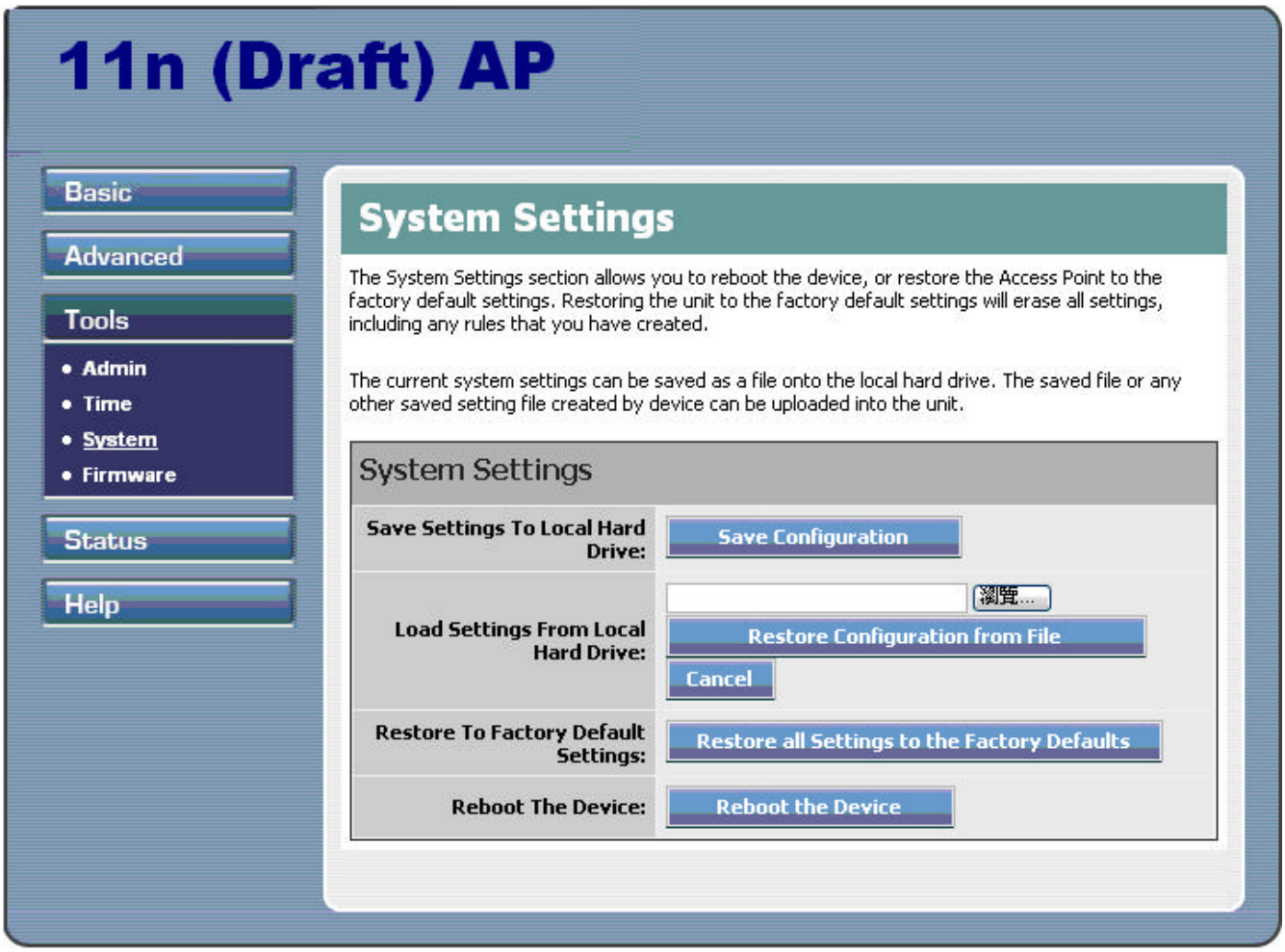
Set the Date and Time Manually

If you do not have the NTP Server option in effect, you can either manually set the time for your Access Point here, or you can click the **Copy Your Computer's Time Settings** button to copy the time from the computer you are using. (Make sure that computer's time is set correctly.)

Note: If the Access Point loses power for any reason, it cannot keep its clock running, and will not have the correct time when it is started again. To maintain correct time for schedules and logs, either you must enter the correct time after you restart the Access Point, or you must enable the NTP Server option.

Tool_System

This section allows you to manage the Access Point's configuration settings, reboot the Access Point, and restore the Access Point to the factory default settings. Restoring the unit to the factory default settings will erase all settings, including any rules that you've created.



Save Settings To Local Hard Drive

This option allows you to save the Access Point's configuration to a file on your computer. Be sure to save the configuration before performing a firmware upgrade.

Load Settings From Local Hard Drive

Use this option to restore previously saved Access Point configuration settings.

Restore To Factory Default Settings

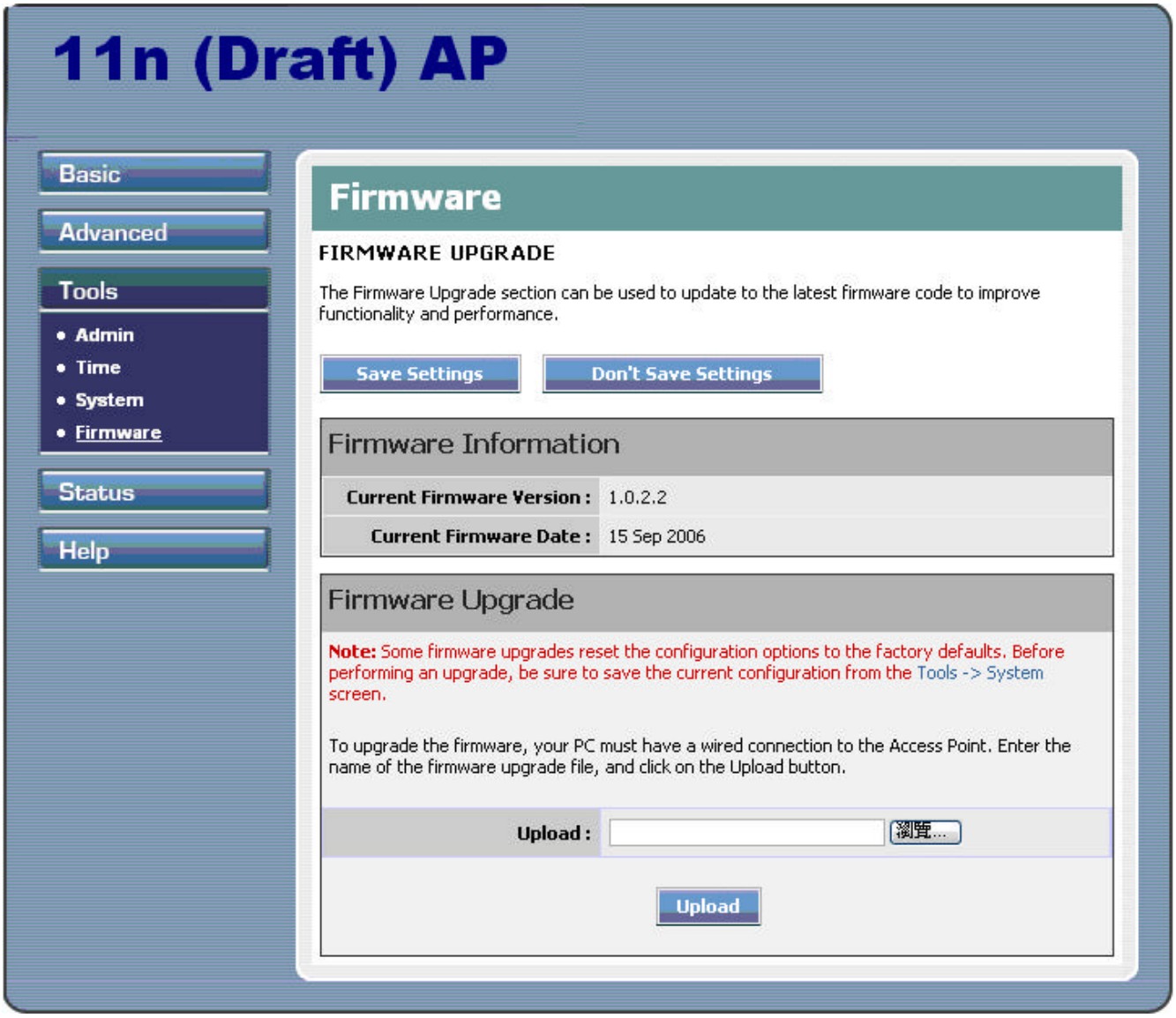
This option restores all configuration settings back to the settings that were in effect at the time the Access Point was shipped from the factory. Any settings that have not been saved will be lost. If you want to save your Access Point configuration settings, use the Save Settings option above.

Reboot The Device

This restarts the Access Point. Useful for restarting when you are not near the de

Tool_Firmware

The Firmware Upgrade section can be used to update to the latest firmware code to improve functionality and performance.



To upgrade the firmware, follow these steps:

1. Click the **Browse** button to locate the upgrade file on your computer.
2. Once you have found the file to be used, click the **Upload** button below to start the firmware upgrade process. This can take a minute or more.
3. Wait for the Access Point to reboot. This can take another minute or more.
4. Confirm updated firmware revision on status page.

Firmware Information

Here are displayed the version numbers of the firmware currently installed in your Access Point and the most recent upgrade that is available.

Firmware Upgrade

Note: Firmware upgrade cannot be performed from a wireless device. To perform an upgrade, ensure that you are using a PC that is connected to the Access Point by wire.

Note: Some firmware upgrades reset the configuration options to the factory defaults. Before performing an upgrade, be sure to save the current configuration from the Tools -> Admin screen.

Upload

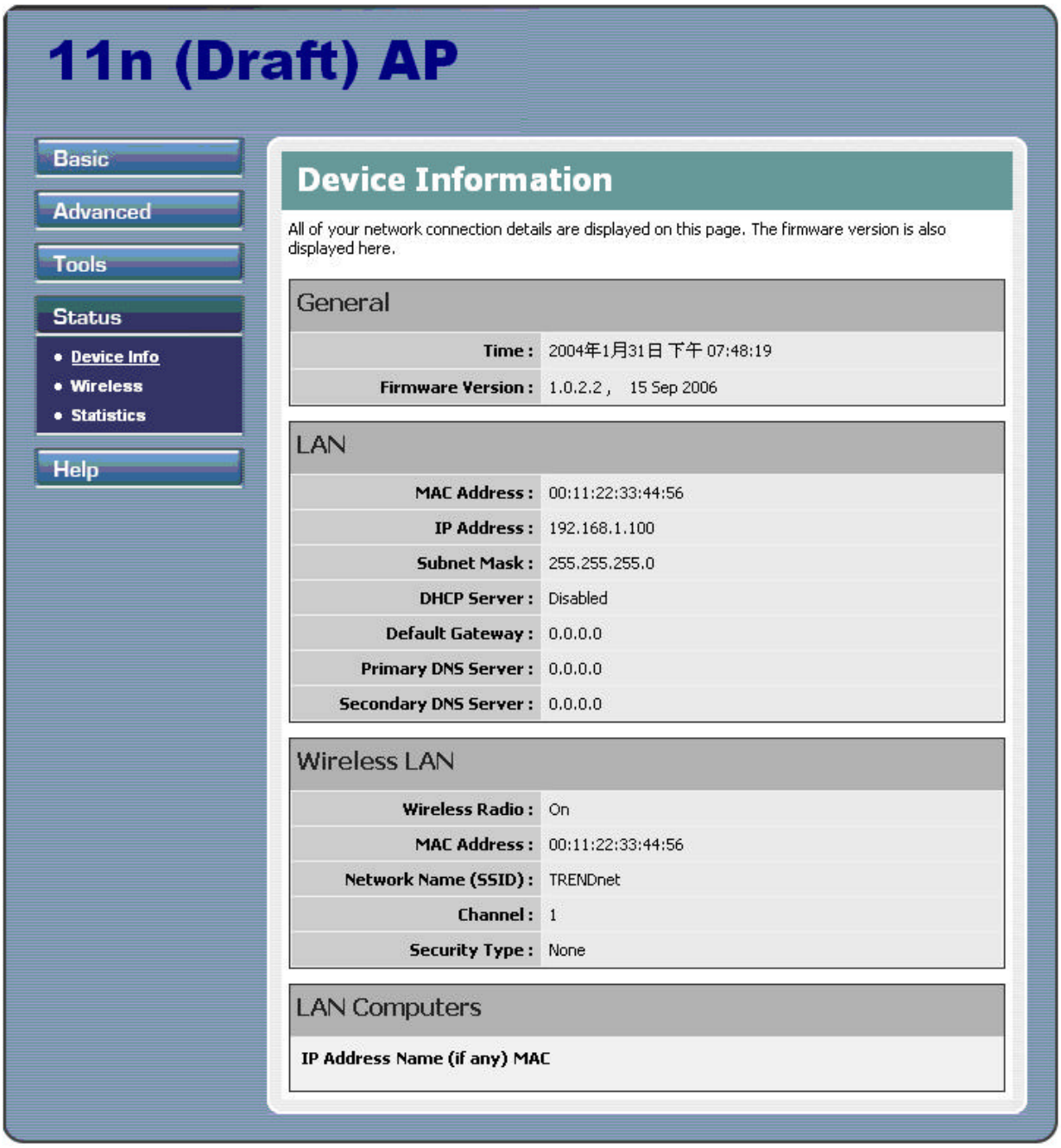
Once you have a firmware update on your computer, use this option to browse for the file and then upload the information into the Access Point.

Status

The Status tab provides the following configuration options: **Device Info, Wireless and Statistics.**

Status_Device Info

All of your network connection details are displayed on the Device Info page. The firmware version is also displayed here.

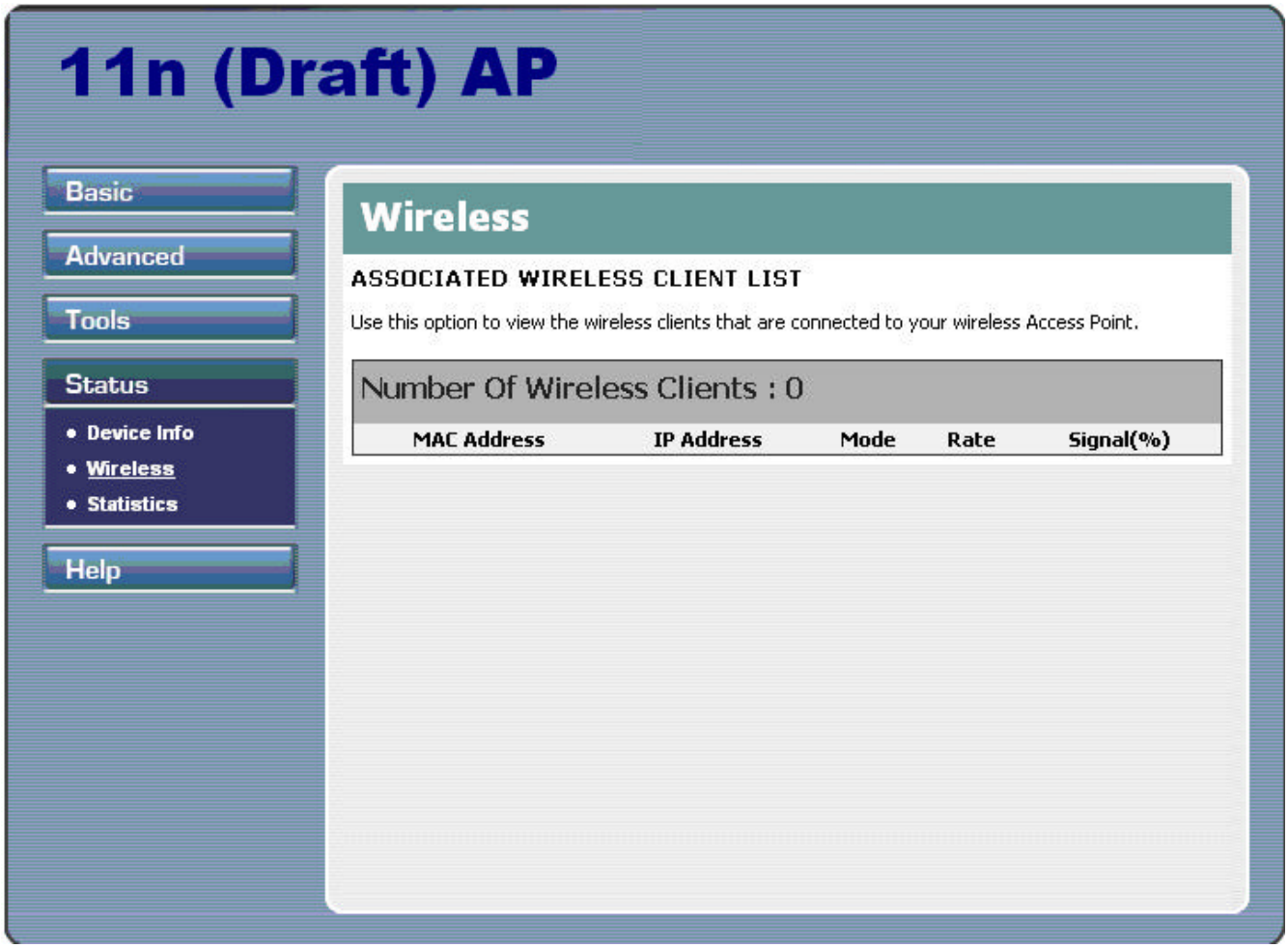


LAN Computers

This area of the screen continually updates to show all DHCP enabled computers and devices connected to the LAN side of your Access Point. The detection "range" is limited to the address range as configured in DHCP Server. Computers that have an address outside of this range will not show. If the DHCP Client (i.e. a computer configured to "Automatically obtain an address") supplies a Host Name then that will also be shown. Any computer or device that has a static IP address that lies within the detection "range" may show, however its host name will not.

Status_Wireless

The wireless section allows you to view the wireless clients that are connected to your wireless Access Point.



MAC Address

The Ethernet ID (MAC address) of the wireless client.

IP Address

The LAN-side IP address of the client.

Mode

The transmission standard being used by the client. Values are 802.11b, 802.11g, or 802.11ng respectively.

Rate

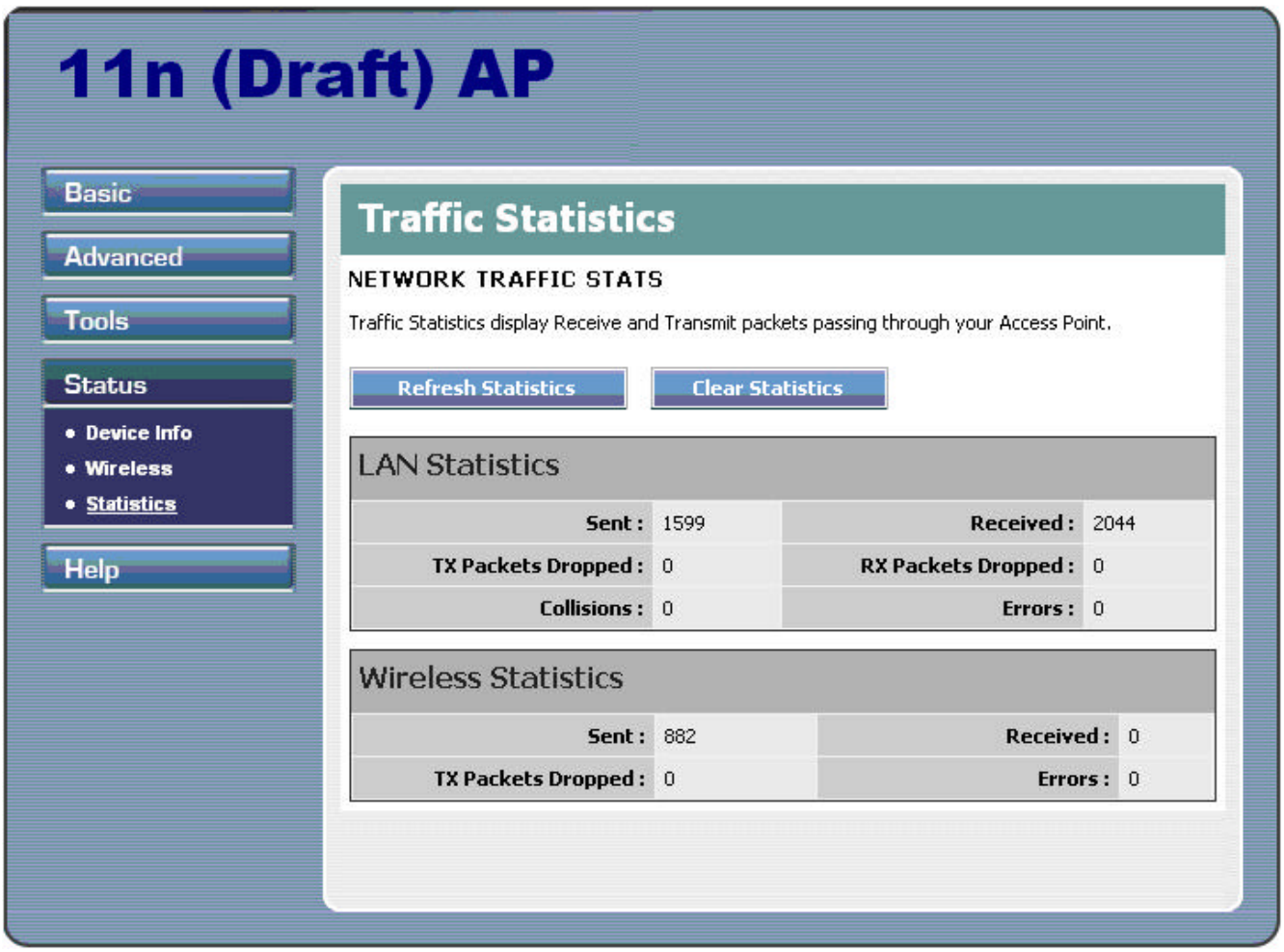
The actual transmission rate of the client in megabits per second.

Signal

This is a relative measure of signal quality. The value is expressed as a percentage of theoretical best quality. Signal quality can be reduced by distance, by interference from other radio-frequency sources (such as cordless telephones or neighboring wireless networks), and by obstacles between the Access Point and the wireless device.

Status_Statistics

The Statistics page displays all of the LAN and Wireless packet transmit and receive statistics.



Sent

The number of packets sent from the Access Point.

Received

The number of packets received by the Access Point.

TX Packets Dropped

The number of packets that were dropped while being sent, due to errors, collisions, or Access Point resource limitations.

RX Packets Dropped

The number of packets that were dropped while being received, due to errors, collisions, or Access Point resource limitations.

Collisions

The number of packets that were dropped due to Ethernet collisions (two or more devices attempting to use an Ethernet circuit at the same time).

Errors

The number of transmission failures that cause loss of a packet. A noisy radio-frequency environment can cause a high error rate on the wireless LAN.

Glossary

A

Access Control List

ACL. This is a database of network devices that are allowed to access resources on the network.

Access Point

AP. Device that allows wireless clients to connect to it and access the network

Ad-hoc network

Peer-to-Peer network between wireless clients

Address Resolution Protocol

ARP. Used to map MAC addresses to IP addresses so that conversions can be made in both directions.

Advanced Encryption Standard

AES. Government encryption standard

Alphanumeric

Characters A-Z and 0-9

Antenna

Used to transmit and receive RF signals.

ASCII

American Standard Code for Information Interchange. This system of characters is most commonly used for text files

Attenuation

The loss in strength of digital and analog signals. The loss is greater when the signal is being transmitted over long distances.

Authentication

To provide credentials, like a Password, in order to verify that the person or device is really who they are claiming to be

Automatic Private IP Addressing

APIPA. An IP address that that a Windows computer will assign itself when it is configured to obtain an IP address automatically but no DHCP server is available on the network

B

Backward Compatible

The ability for new devices to communicate and interact with older legacy devices to guarantee interoperability

Bandwidth

The maximum amount of bytes or bits per second that can be transmitted to and from a network device

Beacon

A data frame by which one of the stations in a Wi-Fi network periodically broadcasts network control data to other wireless stations.

Bit rate

The amount of bits that pass in given amount of time

Bit/sec

Bits per second

BOOTP

Bootstrap Protocol. Allows for computers to be booted up and given an IP address with no user intervention

Broadcast

Transmitting data in all directions at once

Browser

A program that allows you to access resources on the web and provides them to you graphically

C

CAT 5

Category 5. Used for 10/100 Mbps or 1Gbps Ethernet connections

Client

A program or user that requests data from a server

Collision

When do two devices on the same Ethernet network try and transmit data at the exact same time.

Cookie

Information that is stored on the hard drive of your computer that holds your preferences to the site that gave your computer the cookie

D

Data

Information that has been translated into binary so that it can be processed or moved to another device

Data-Link layer

The second layer of the OSI model. Controls the movement of data on the physical link of a network

dBd

Decibels related to dipole antenna

dBi

Decibels relative to isotropic radiator

dBm

Decibels relative to one milliwatt

Decrypt

To unscramble an encrypted message back into plain text

Default

A predetermined value or setting that is used by a program when no user input has been entered for this value or setting

DHCP

Dynamic Host Configuration Protocol: Used to automatically assign IP addresses from a predefined pool of addresses to computers or devices that request them

Digital certificate:

An electronic method of providing credentials to a server in order to have access to it or a network

Direct Sequence Spread Spectrum

DSSS: Modulation technique used by 802.11b wireless devices

DNS

Domain Name System: Translates Domain Names to IP addresses

Domain name

A name that is associated with an IP address

Download

To send a request from one computer to another and have the file transmitted back to the requesting computer

Duplex

Sending and Receiving data transmissions at the sane time

Dynamic IP address

IP address that is assigned by a DHCP server and that may change. Cable Internet providers usually use this method to assign IP addresses to their customers.

E

EAP

Extensible Authentication Protocol

Encryption

Converting data into cyphertext so that it cannot be easily read

Ethernet

The most widely used technology for Local Area Networks.

F

File server

A computer on a network that stores data so that the other computers on the network can all access it

File sharing

Allowing data from computers on a network to be accessed by other computers on the network with different levels of access rights

Firewall

A device that protects resources of the Local Area Network from unauthorized users outside of the local network

Firmware

Programming that is inserted into a hardware device that tells it how to function

Fragmentation

Breaking up data into smaller pieces to make it easier to store

FTP

File Transfer Protocol. Easiest way to transfer files between computers on the Internet

Full-duplex

Sending and Receiving data at the same time

G

Gain

The amount an amplifier boosts the wireless signal

Gateway

A device that connects your network to another, like the internet

Gbps

Gigabits per second

Gigabit Ethernet

Transmission technology that provides a data rate of 1 billion bits per second

GUI

Graphical user interface

H

Half-duplex

Data cannot be transmitted and received at the same time

Hashing

Transforming a string of characters into a shorter string with a predefined length

Hexadecimal

Characters 0-9 and A-F

Hop

The action of data packets being transmitted from one AP to another

Host

Computer on a network

HTTP

Hypertext Transfer Protocol is used to transfer files from HTTP servers (web servers) to HTTP clients (web browsers)

HTTPS

HTTP over SSL is used to encrypt and decrypt HTTP transmissions

Hub

A networking device that connects multiple devices together

I

ICMP

Internet Control Message Protocol

IEEE

Institute of Electrical and Electronics Engineers

IGMP

Internet Group Management Protocol is used to make sure that computers can report their multicast group membership to adjacent APs

IIS

Internet Information Server is a WEB server and FTP server provided by Microsoft

Infrastructure

In terms of a wireless network, this is when wireless clients use an Access Point to gain access to the network

Internet

A system of worldwide networks which use TCP/IP to allow for resources to be accessed from computers around the world

Internet Explorer

A World Wide Web browser created and provided by Microsoft

Internet Protocol

The method of transferring data from one computer to another on the Internet

Internet Protocol Security

IPsec provides security at the packet processing layer of network communication

Internet Service Provider

An ISP provides access to the Internet to individuals or companies

Intranet

A private network

Intrusion Detection

A type of security that scans a network to detect attacks coming from inside and outside of the network

IP

Internet Protocol

IP address

A 32-bit number, when talking about Internet Protocol Version 4, that identifies each computer that transmits data on the Internet or on an Intranet

IPsec

Internet Protocol Security

IPX

Internetwork Packet Exchange is a networking protocol developed by Novel to enable their Netware clients and servers to communicate

ISP

Internet Service Provider

J

Java

A programming language used to create programs and applets for web pages

K

Kbps

Kilobits per second

Kbyte

Kilobyte

L

LAN

Local Area Network

Latency

The amount of time that it takes a packet to get from the one point to another on a network. Also referred to as delay

LED

Light Emitting Diode

Legacy

Older devices or technology

Local Area Network

A group of computers in a building that usually access files from a server

LPR/LPD

"Line Printer Requestor"/"Line Printer Daemon". A TCP/IP protocol for transmitting streams of printer data.

L2TP

Layer 2 Tunneling Protocol

M

MAC address

A unique hardware ID assigned to every Ethernet adapter by the manufacturer.

Mbps

Megabits per second

MDI

Medium Dependent Interface is an Ethernet port for a connection to a straight-through cable

MDIX

Medium Dependent Interface Crossover, is an Ethernet port for a connection to a crossover cable

MIB

Management Information Base is a set of objects that can be managed by using SNMP

Modem

A device that Modulates digital signals from a computer to an analog signal in order to transmit the signal over phone lines. It also Demodulates the analog signals coming from the phone lines to digital signals for your computer

MPPE

Microsoft Point-to-Point Encryption is used to secure data transmissions over PPTP connections

MTU

Maximum Transmission Unit is the largest packet that can be transmitted on a packet-based network like the Internet

Multicast

Sending data from one device to many devices on a network

N

NAT

Network Address Translation allows many private IP addresses to connect to the Internet, or another network, through one IP address

NetBEUI

NetBIOS Extended User Interface is a Local Area Network communication protocol. This is an updated version of NetBIOS

NetBIOS

Network Basic Input/Output System

Netmask

Determines what portion of an IP address designates the Network and which part designates the Host

Network Interface Card

A card installed in a computer or built onto the motherboard that allows the computer to connect to a network

Network Layer

The third layer of the OSI model which handles the routing of traffic on a network

Network Time Protocol

Used to synchronize the time of all the computers in a network

NIC

Network Interface Card

NTP

Network Time Protocol

O

OFDM

Orthogonal Frequency-Division Multiplexing is the modulation technique for both 802.11a and 802.11g

OSI

Open Systems Interconnection is the reference model for how data should travel between two devices on a network

OSPF

Open Shortest Path First is a routing protocol that is used more than RIP in larger scale networks because only changes to the routing table are sent to all the other APs in the network as opposed to sending the entire routing table at a regular interval, which is how RIP functions

P

Password

A sequence of characters that is used to authenticate requests to resources on a network

Personal Area Network

The interconnection of networking devices within a range of 10 meters

Physical layer

The first layer of the OSI model. Provides the hardware means of transmitting electrical signals on a data carrier

Ping

A utility program that verifies that a given Internet address exists and can receive messages. The utility sends a control packet to the given address and waits for a response.

PoE

Power over Ethernet is the means of transmitting electricity over the unused pairs in a category 5 Ethernet cable

Port

A logical channel endpoint in a network. A computer might have only one physical channel (its Ethernet channel) but can have multiple ports (logical channels) each identified by a number.

PPP

Point-to-Point Protocol is used for two computers to communicate with each over a serial interface, like a phone line

PPPoE

Point-to-Point Protocol over Ethernet is used to connect multiple computers to a remote server over Ethernet

PPTP

Point-to-Point Tunneling Protocol is used for creating VPN tunnels over the Internet between two networks

Preamble

Used to synchronize communication timing between devices on a network

Q

QoS

Quality of Service

R

RADIUS

Remote Authentication Dial-In User Service allows for remote users to dial into a central server and be authenticated in order to access resources on a network

Reboot

To restart a computer and reload it's operating software or firmware from nonvolatile storage.

Rendezvous

Apple's version of UPnP, which allows for devices on a network to discover each other and be connected without the need to configure any settings

Repeater

Retransmits the signal of an Access Point in order to extend it's coverage

RIP

Routing Information Protocol is used to synchronize the routing table of all the APs on a network

RJ-11

The most commonly used connection method for telephones

RJ-45

The most commonly used connection method for Ethernet

RS-232C

The interface for serial communication between computers and other related devices

RSA

Algorithm used for encryption and authentication

S

Server

A computer on a network that provides services and resources to other computers on the network

Session key

An encryption and decryption key that is generated for every communication session between two computers

Session layer

The fifth layer of the OSI model which coordinates the connection and communication between applications on both ends

Simple Mail Transfer Protocol

Used for sending and receiving email

Simple Network Management Protocol

Governs the management and monitoring of network devices

SIP

Session Initiation Protocol. A standard protocol for initiating a user session that involves multimedia content, such as voice or chat.

SMTP

Simple Mail Transfer Protocol

SNMP

Simple Network Management Protocol

SOHO

Small Office/Home Office

SPI

Stateful Packet Inspection

SSH

Secure Shell is a command line interface that allows for secure connections to remote computers

SSID

Service Set Identifier is a name for a wireless network

Stateful inspection

A feature of a firewall that monitors outgoing and incoming traffic to make sure that only valid responses to outgoing requests are allowed to pass though the firewall

Subnet mask

Determines what portion of an IP address designates the Network and which part designates the Host

Syslog

System Logger -- a distributed logging interface for collecting in one place the logs from different sources. Originally written for UNIX, it is now available for other operating systems, including Windows.

T

TCP

Transmission Control Protocol

TCP/IP

Transmission Control Protocol/Internet Protocol

TCP Raw

A TCP/IP protocol for transmitting streams of printer data.

TFTP

Trivial File Transfer Protocol is a utility used for transferring files that is simpler to use than FTP but with less features

Throughput

The amount of data that can be transferred in a given time period

Traceroute

A utility displays the routes between you computer and specific destination

U

UDP

User Datagram Protocol

Unicast

Communication between a single sender and receiver

Universal Plug and Play

A standard that allows network devices to discover each other and configure themselves to be a part of the network

Upgrade

To install a more recent version of a software or firmware product

Upload

To send a request from one computer to another and have a file transmitted from the requesting computer to the other

UPnP

Universal Plug and Play

URL

Uniform Resource Locator is a unique address for files accessible on the Internet

USB

Universal Serial Bus

UTP

Unshielded Twisted Pair

V

Virtual Private Network

VPN: A secure tunnel over the Internet to connect remote offices or users to their company's network

VLAN

Virtual LAN

Voice over IP

Sending voice information over the Internet as opposed to the PSTN

VoIP

Voice over IP

W

Wake on LAN

Allows you to power up a computer though it's Network Interface Card

WAN

Wide Area Network

WCN

Windows Connect Now. A Microsoft method for configuring and bootstrapping wireless networking hardware (access points) and wireless clients, including PCs and other devices.

WDS

Wireless Distribution System. A system that enables the interconnection of access points wirelessly.

Web browser

A utility that allows you to view content and interact with all of the information on the World Wide Web

WEP

Wired Equivalent Privacy is security for wireless networks that is supposed to be comparable to that of a wired network

Wi-Fi

Wireless Fidelity

Wi-Fi Protected Access

An updated version of security for wireless networks that provides authentication as well as encryption

Wide Area Network

The larger network that your LAN is connected to, which may be the Internet itself, or a regional or corporate network

Wireless ISP

A company that provides a broadband Internet connection over a wireless connection

Wireless LAN

Connecting to a Local Area Network over one of the 802.11 wireless standards

WISP

Wireless Internet Service Provider

WLAN

Wireless Local Area Network

WPA

Wi-Fi Protected Access. A Wi-Fi security enhancement that provides improved data encryption, relative to WEP.

X

xDSL

A generic term for the family of digital subscriber line (DSL) technologies, such as ADSL, HDSL, RADSL, and SDSL.

Y

Yagi antenna

A directional antenna used to concentrate wireless signals on a specific location

Z

#

1

802.11

A family of specifications for wireless local area networks (WLANs) developed by a working group of the Institute of Electrical and Electronics Engineers (IEEE).