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AR5BAP-00031 Access Point User's Guide

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Document Conventions

Text Conventions

bold	Bold type within paragraph text indicates commands, file names, directory names, paths, output, or returned values. Example: The DK_Client package will not function unless the **wdreg_install** batchfile is used.
italic	Within commands, italics indicate a variable that the user must specify. Example: **mem_alloc** *size_in_bytes* Titles of manuals or other published documents are also set in italics.
`Courier`	The Courier font indicates output or display. Example: `Error: Unable to allocate memory for transfer!`
[ ]	Within commands, items enclosed in square brackets are optional parameters or values that the user can choose to specify or omit.
{ }	Within commands, items enclosed in braces are options from which the user must choose.
|	Within commands, the vertical bar separates options.
…	An ellipsis indicates a repetition of the preceding parameter.
>	The right angle bracket separates successive menu selections. Example: Start > Programs > DK > wdreg_install.

Notices

NOTE: This message denotes neutral or positive information that calls out important points to the text. A note provides information that may apply only in special cases.

CAUTION: Cautions call special attention to hazards that can cause system damage or data corruption, to a lesser degree than warnings.

WARNING: Warnings call special attention to hazards that can cause system damage, data corruption, personal injury, or death.

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Preface

The intent of this document is to familiarize users with the Atheros AR5BAP-00031 Access Point (AP), its setup, configuration, and usage. After reading this user's guide, the user should be able to install, configure, control, and maintain the Atheros Access Point.

About this Document

The document consists of the following chapters and appendices:

Chapter 1	**Introduction**—Describes the Access Point package contents and system requirements.
Chapter 2	**AP Network Attachment and Configuration**—Describes the Access Point network connections and initial software configuration.
Appendix A	**AP Web Server**—Describes the use of the web server to configure the Access Point.
Appendix B	**Regulatory Compliance Information**—Important user information and instructions concerning operating this device in accordance with National spectrum usage laws for radio devices.

1

Introduction

The Atheros Access Point implements an IEEE 802.11b/g wireless LAN (WLAN) AP or data-oriented Residential Gateway (RG) supporting up to 256 station associations. Rates of 6 to 54 Mbps are supported in standard IEEE 802.11g mode, up to 11 Mbps in 802.11b mode, and up to 108 Mbps in Atheros Turbo Mode™.

System Requirements

The AP contains a small boot executive that allows the main operating system software to be downloaded using the Ethernet port over an FTP connection. The Operating system software can also reside in the Flash memory of the AP, which allows booting without the need to download the operating system from the host PC over an FTP connection. A configuration file is created in Flash memory to store user-configurable parameters such as WEP keys. A terminal or PC with an Ethernet connection is required to perform the initial AP configuration. An FTP server is required for firmware update to the AP.

Use the AP Web Server for firmware updates. Refer to Appendix A, "Firmware Update Configuration Window" for information on the web server.

2

AP Network Attachment and Configuration

This section provides procedures for connecting and configuring the AP to a Host PC (HPC). Configuration can be performed either from a web browser accessing the built-in web server, or by entering command using the command line interface (CLI). For detailed information on using the web server, refer to "AP Web Server" in Appendix A. For detailed information on using CLI, refer to "AP Command-Line Interface" in Appendix B. For "Factory Default Settings" refer to Appendix B.

AP Network Connections

Connect the HPC to the AP using one of the following two methods:

- Use an Ethernet crossover cable (not supplied) to connect directly to the Ethernet port of the HPC. For more information on Ethernet cables, see Table 2-1.
- Use standard Ethernet cables (not supplied) to connect through a hub or Ethernet switch.

See Figure 2-1 for an example of the AP to the HPC connections.

Follow these steps to establish the network connections:

1. Connect the AP Ethernet port to the HPC Ethernet card through the Ethernet hub/switch or an Ethernet crossover cable.

2. Connect the optional RS-232 port to the HPC serial port through a serial cable. Refer to Appendix C for more information on the serial interface.

3. Plug in the provided power supply to the AP power supply connector.

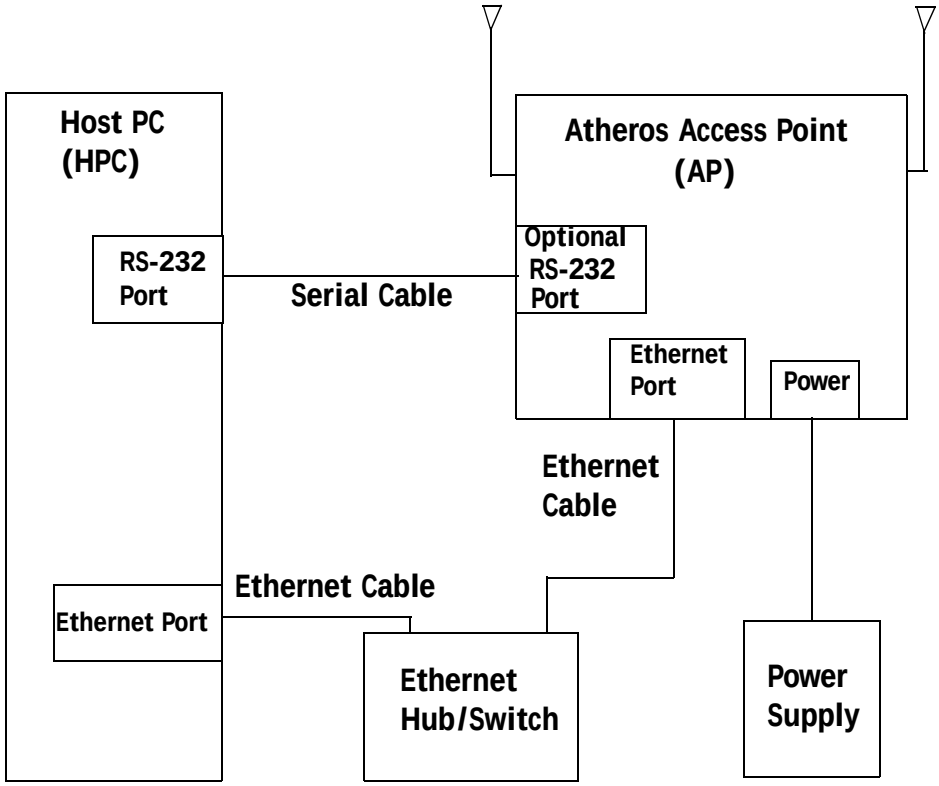


Figure 2-1. **Access Point to HPC Connections**

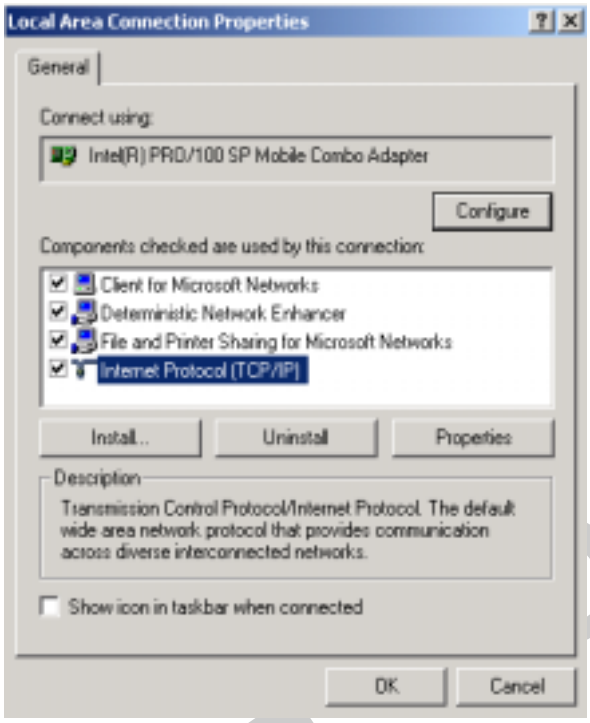
Network Configuration

Follow these steps to configure the HPC for AP network control:

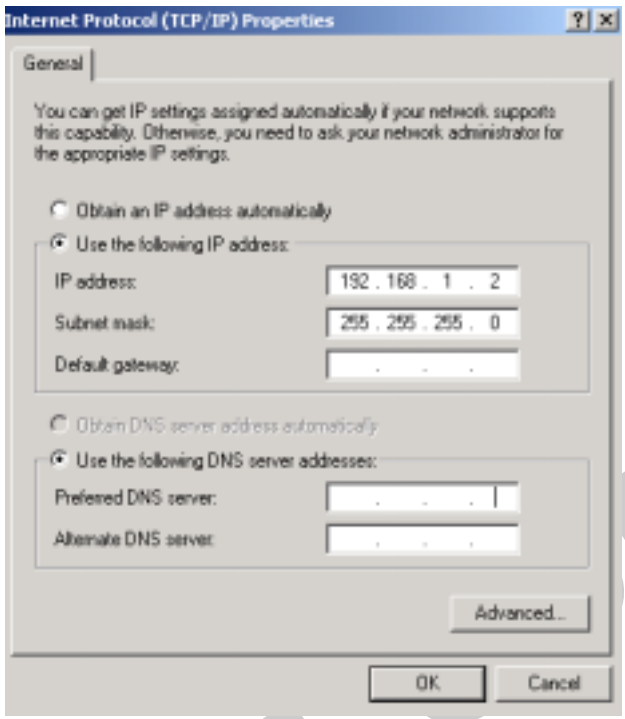
1. From the HPC's Start menu, choose Settings and open the Network and Dial-up Connections dialog box.

2. Right-click on the Local Area Connection icon that belongs to the Ethernet controller connected to the AP, and select Properties.

3. Within the Local Area Connection Properties dialog box, choose Internet Protocol (TCP/IP) and click Properties.



4. Configure the IP address for the Ethernet connection in the Internet Protocol (TCP/IP) Properties dialog box.



5. Click OK to continue and close the Internet Protocol Properties dialog box.

AP Hardware Configuration

The Atheros AP hardware allows the configuration of one WLAN. Figure 2-2 shows the physical location of WLAN, panel connectors on the AP hardware, and the location of the antennae cables. Table 2-1 summarizes the type of cable to use when using the Ethernet wired ports on the AP. You may use either, or both Ethernet ports.

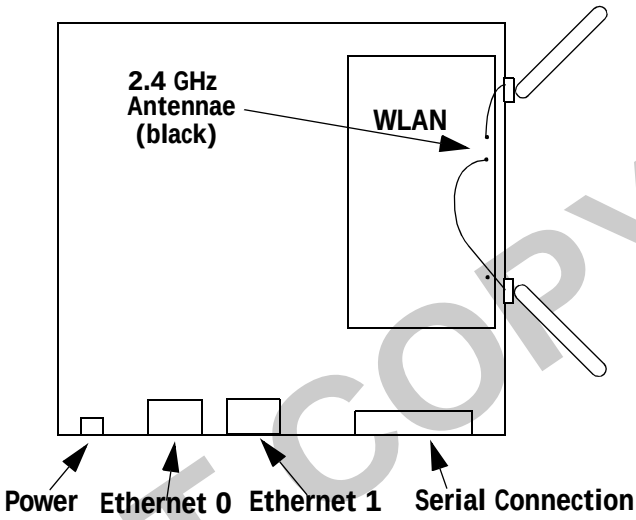


Figure 2-2. **AP Physical Description**

Table 2-1. **Ethernet Port Configuration**

Ethernet Port Number	Dumb Hub or Switch	Computer	Auto-Sensing Hub or Switch
0	Crossover cable	Straight cable	Crossover or straight cable
1	Straight cable	Crossover cable	Crossover or straight cable

AP Initial Configuration

This section describes how to configure the AP after booting from Flash memory. Refer to "Firmware Update Configuration Window" on page A-21 to load the Operating image file to the Flash file system, if the operating system software should be updated.

Configure the AP for its channel frequency and Service Set Identifier (SSID) unique to the application. This configuration can be done either through a web browser with access to the built-in AP web server, or by issuing commands through the command line interface (CLI).

The AP can be configured at any time to tailor it for the application environment. For more information on configuring the AP using the web browser, refer to "AP Web Server" in Appendix A. For more information on using the CLI, refer to "AP Command-Line Interface" in Appendix B.

The following description illustrates the use of the web browser. For information on using the CLI, refer to "Command-Line Interface" on page 2-9.

Web Browser

Follow these steps to configure the channel frequency and SSID using a web browser:

1. Launch a web browser (Netscape Navigator or Internet Explorer are examples of commonly used web browsers).

2. From the HPC, enter the IP address that is assigned to the AP as the URL address, for example http://192.168.1.1.

The Access Point Web Server homepage will appear (see Figure 2-3).

Figure 2-3. **AP Web Server Homepage**

3. Select the Access Point Web Server hotlink.

4. A dialog box appears requesting login authorization. When prompted, enter the following information to log in:

   Log in: **Admin** (case-sensitive)

   Password: **5up**

5. Click OK to complete the login process.

6. Select the Configuration hotlink from the navigation menu.

The System Configuration window appears (see Figure 2-4).

Figure 2-4. **System Configuration Window**

7. Enter the SSID (name or address) for the AP in the SSID field. The SSID must be 1–32 characters in length.

   To configure a single SSID to have more than one AP in a single SSID, specify a unique System Name for each AP within that single SSID.

   Depending on firmware settings, the channel of operation may not be accessible and will be automatically determined depending on the current regulatory domain (i.e. country of operation).

8. Click Update to commit the changes.

Change other settings at this time. Refer to Appendix A for more information about each configuration option.

9. After all configuration changes are complete, reboot the AP to enable them. To reboot the AP, click on the REBOOT AP button that appears.

Command-Line Interface

The following procedures show the steps required to configure the AP SSID and channel frequency (where allowed) using the command-line (CLI) interface and Telnet.

After the AP boots and the operating system software loads, use Telnet to access the AP through the default AP IP address as follows:

1. Select Start > Run from the Microsoft Win2K tool bar.
2. Type **cmd** in the Open dialog box and click OK.
3. In the command line prompt, type **telnet 192.168.1.20** and press the Enter key.
4. When prompted, enter the following information to log in:

   Username: **Admin** (case sensitive)

   Password: **5up**

5. Press Enter to complete the login process. The Atheros Access Point Software revision prompt appears:

```
Atheros Access Point Rev. X.Y.Z
```

6. Use the **set ssid <SSID>** command to specify the SSID.
7. Use the **set channel <channel>** command to change the radio channel.
8. Use the **reboot** command and then press Enter, which reboots the AP, to enable any changes.
9. To view CLI command options, use the **help** command or refer to Appendix B for details about CLI options.

A

AP Web Server

Configure the access point (AP) either through a web browser interface to the AP web server, or using the command-line interface (CLI) through telnet. The web server resides in the AP and is accessible from any station (STA) that is connected to the AP Infrastructure network.

This appendix describes configuring the AP through the AP Web Server.

Accessing the AP Web Server

Follow these steps to access the AP Web Server:

1. Launch a web browser (Netscape Navigator or Internet Explorer are examples of commonly used web browsers).

2. From the HPC, enter the IP address that is assigned to the AP as the URL address. For example, enter http://192.168.1.1.

The Access Point Web Server homepage appears (see Figure A-1).

Figure A-1. **AP Web Server Homepage**

Customize the appearance of the Access Point Web Server homepage by replacing any of the three .GIF files used on the page. Use FTP to store the replacement .GIF files to the AP. Table A-1 summarizes the three .GIF files to replace to customize the homepage.

Table A-1. **Homepage .GIF Files**

Filename	Description
logo.gif	Replaces the current Atheros logo with another .GIF file.
tagline.gif	Replaces the tagline "Driving the wireless future" with a new tagline.
cover.jpe	Replaces the Atheros AR5001AP chipset photograph with a new photograph.

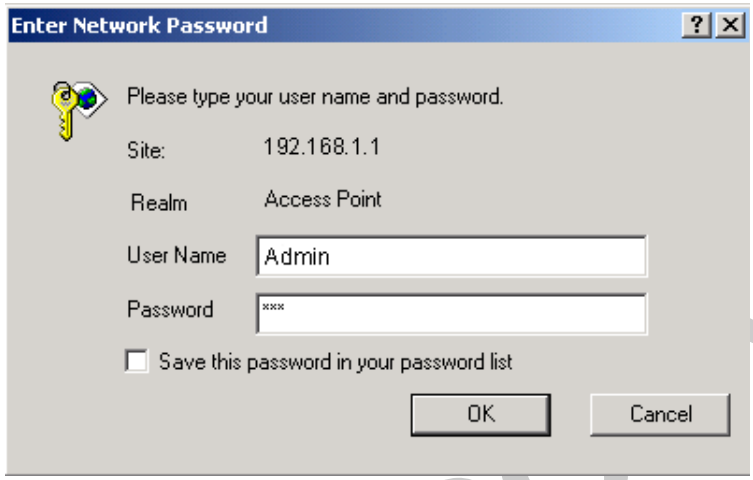
For example, the .GIF file containing the full path filename for a company logo can be replaced with another .GIF file.

3. Select the Atheros Access Point Web Server hotlink.

4. A dialog box appears requesting login authorization. When prompted, enter the following information to log in:

   Log in: **Admin** (case sensitive)

   Password: **5up**



5. Click OK to complete the login process.

NOTE: The web browser must support frames and Java script must be enabled.

The Access Point Web Server Statistics window appears (see Figure A-2.)

Figure A-2. **Statistics Window**

Configuration Windows

The Web Server Configuration windows allow viewing and editing of configuration information for the AP. The Web Server provides configuration windows for:

- System configuration parameters
- 2.4 GHz radio configuration parameters
- 2.4 GHz statistics
- Security
- Configuration scripts
- Firmware updates

To access any of these AP configuration screens, click on the desired hotlink from the navigation bar on any configuration screen (see Figure A-3.)

Figure A-3. **AP Web Server Navigation Bar**

Working with Configuration Windows

The Web Server Configuration windows provide a user-friendly interface to aid in quick configuration of the AP. After making any additions or changes to any configuration window, update the configuration file to save the changes. The new configuration is not in effect until the AP is rebooted.

Follow these steps to update configuration files:

1. Enter the configuration updates or changes in the appropriate configuration fields.

2. Click Update.

3. Click Reboot AP to make the changes effective.

The web server loses connectivity with the Web Server as the AP reboots.

To reestablish the connection with the Web Server, wait until the AP has completed rebooting and navigate to the Web Server to resume communication.

System Configuration Window

The System Configuration window allows the setting of general operating information for the AP. Click on Configuration from any window to access the System Configuration window (see Figure A-4).

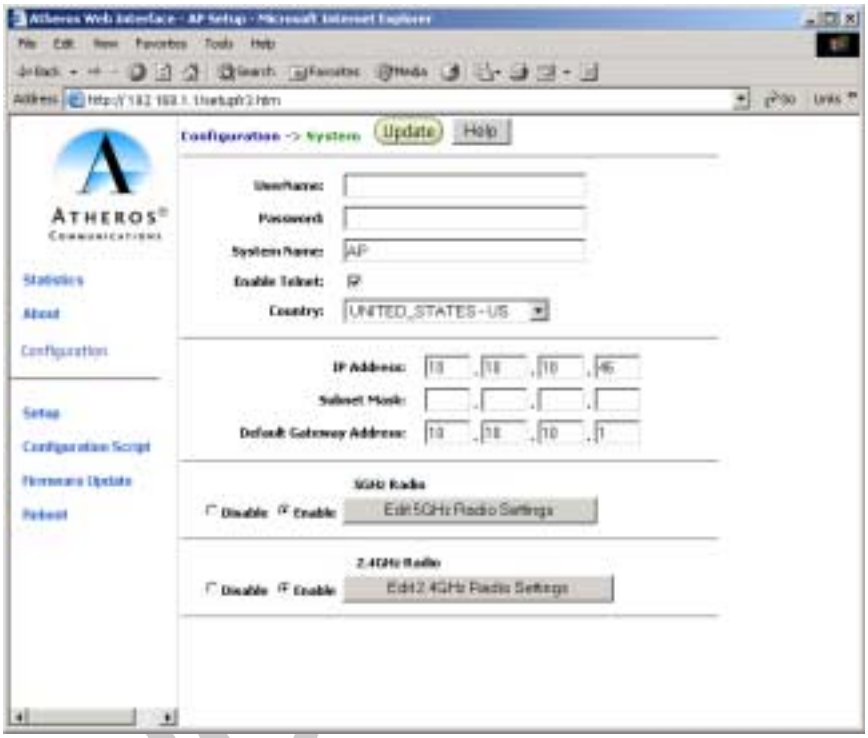


Figure A-4. **AP System Configuration Window**

Other settings can also be changed at this time.

Table A-2 summarizes the data fields on the System Configuration window.

Table A-2. **System Configuration Window Field Descriptions**

General Configuration Field	Description
User Name	Specifies the user name.
Password	Specifies the password.
System Name	Specifies a unique name for AP. Enter a unique text string of up to 32 characters in length.
Enable Telnet	Use the checkbox to allow telneting into the AP.
Country	Specifies the country where the AP is operating. Use the drop-down menu to specify the country where the equipment will operate from. The allowable choices may be limited by firmware installed on your version of the product depending on Regulatory Domain (country) of operation.
IP Address	Specifies the IP address of the AP.
Subnet Mask	Specifies the subnet mask for the AP.
Default Gateway Address	Specifies the default gateway for the AP.
2.4 GHz Radio	Use the radio buttons to enable/disable 2.4 GHz radio operation.
Edit 2.4 GHz Radio Settings	Click this button to edit the configuration for 2.4 GHz radio operation. (refer to"2.4 GHz Radio Configuration Window" on page A-9).

2.4 GHz Radio Configuration Window

The 2.4 GHz Radio Configuration window allows the setting of generic 2.4 GHz radio operating information for the AP. The Device's firmware may limit the allowable settings depending on Regulatory Domain (country) of operation. From the AP System Configuration window, click on Edit 2.4 GHz Radio Settings to access the 2.4 GHz Radio Configuration window (see Figure A-5).

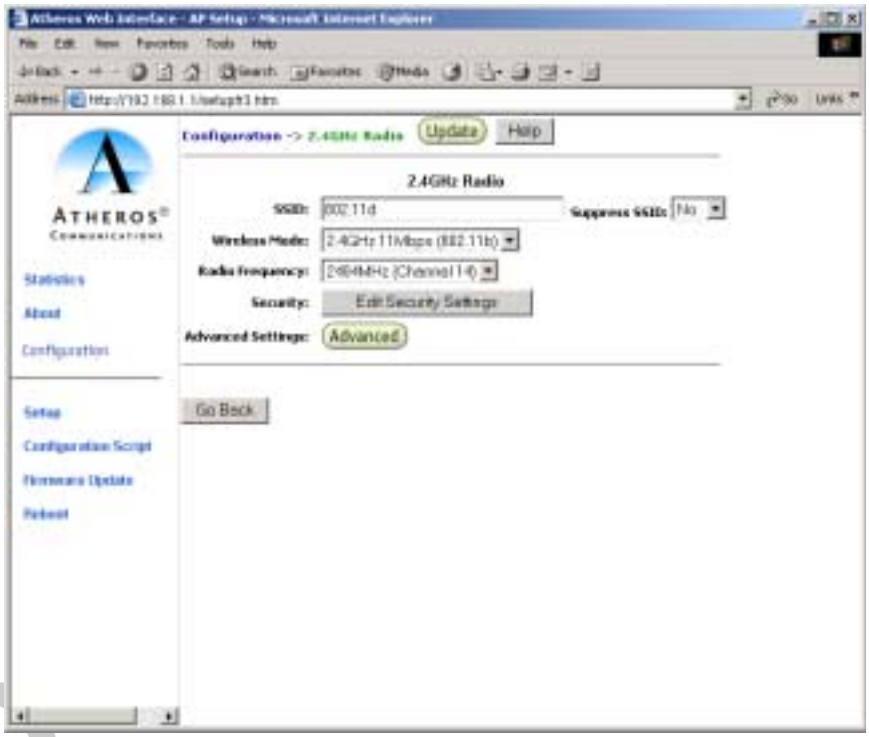


Figure A-5. **2.4 GHz Radio Configuration Window**

Table A-3 summarizes the data fields on the 2.4 GHz Radio Configuration window.

Table A-3. **2.4 GHz Radio Configuration Window Field Descriptions**

General Configuration Field	Description
SSID	Identification of the AP. Enter a number or address between 1 and 32 characters in length that the STAs are associating with in Infrastructure mode. More than one AP in an SSID can be specified here. Use the System Name field to uniquely identify each AP.
Suppress SSID	Use the checkbox to prevent broadcast of the AP's SSID in beacons. When enabled, the SSID in beacons are not transmitted and only those STAs with prior knowledge of an AP's SSID can associate with that AP.
Wireless Mode	The wireless LAN mode specifies both frequency range and data rates. Firmware loaded on your version of the Access Point may limit channel setting depending on the Regulatory Domain (country) of operation
Security: Edit Security Settings	Click here to edit the security configuration for 2.4 GHz radio operation
Advanced Settings	Click here to enter advanced configuration for 2.4 GHz radio operation (refer to "2.4 GHz Radio Advanced Configuration Window" on page A-18).

2.4 GHz Security Configuration Window

The 2.4 GHz Radio Security Configuration window allows the setting of security information for the AP. From the 2.4 GHz Radio Configuration window, click on Edit Security Settings to access the 2.4 GHz Security Configuration window (see Figure A-6).

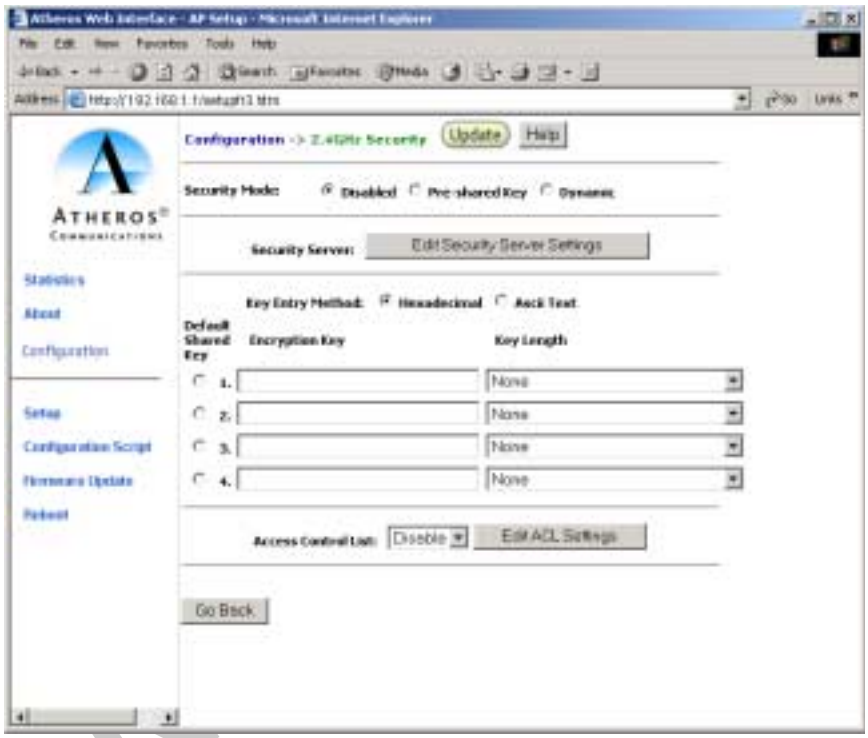


Figure A-6. **2.4 GHZ Security Configuration Window**

Table A-4 summarizes the data fields on the 2.4 GHz Security Configuration window.

Table A-4. **2.4 GHz Security Field Descriptions**

Security Configuration Field	Description
Security Mode	Use the radio buttons to specify the security mode.
Security Server	Click Edit Security Server Settings to change the configuration of the security server.
Key Entry Method	Use the radio buttons to specify the key entry method as either hexadecimal or ASCII.
Default Shared Key	Use the radio button to specify which encryption key to use as the default shared key.
Encryption Key	Specifies the encryption key used for broadcast/ multicast frames.
Key Length	Specifies the key length: ■ None ■ 10 Hex digits or 5 ASCII text ■ 26 Hex digits or 13 ASCII text ■ 32 Hex digits or 16 ASCII text
Access Control List	Specifies the state of the Access Control List (ACL). Use the drop-down menu to specify the state of ACL, where: ■ Disable—Unrestricted Access: By default, while checking of the ACL is enabled, the access control list itself is empty. This is the same as disabling the checking on the ACL. ■ Enable—Restricted Access: An ACL entry must exist before ACL can be enabled. While ACL is enabled, stations with valid shared keys and stations with matching “allow” entries on the ACL are authenticated. ■ Strict—Restricted (w/ACL match): Requires an ACL entry that specifies the station's assigned unique key or the station is denied association. In the strict mode, stations with valid share keys and not on the ACL are not authenticated. The stations must have unique keys defined and matching “allow” ACL entries specified, in order to associate with the AP.
Edit ACL Settings	Click here to edit the configuration of the ACL operation for 2.4 GHz (refer to “2.4 GHz Access Control List Configuration Window” on page A-15).

Edit Security Server Settings

The RADIUS Server Configuration window allows configuration of a RADIUS server for authentication purposes in 802.1X networks. See Figure A-7 for an illustration of the RADIUS Server Configuration window.

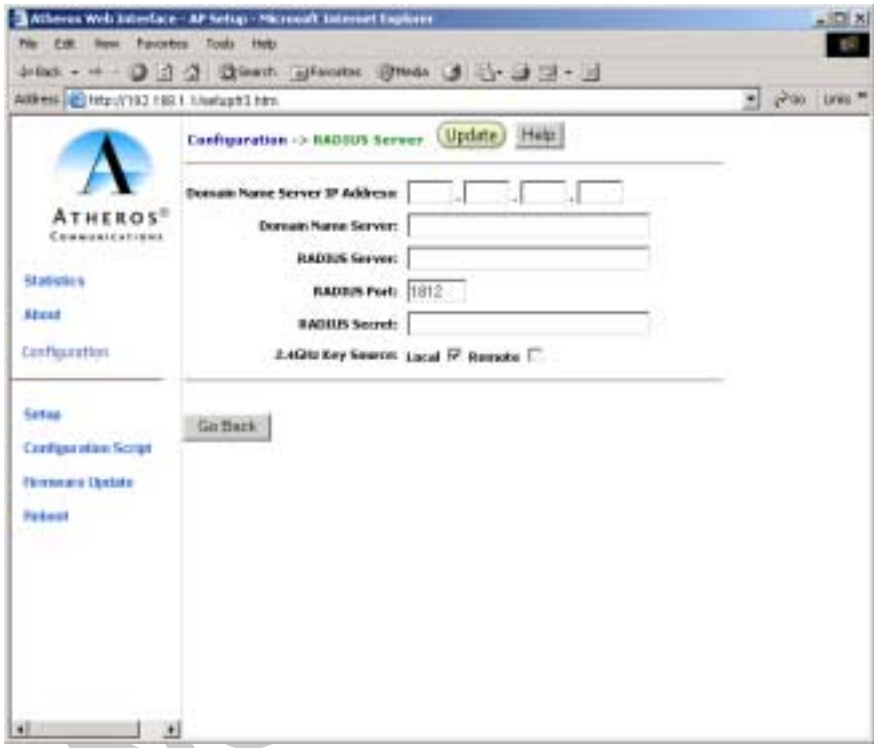


Figure A-7. **2.4 GHz RADIUS Server Configuration Window**

Table A-5 summarizes the data fields on the 2.4 GHz RADIUS Server Configuration window.

Table A-5. **2.4 GHz RADIUS Server Configuration Field Descriptions**

Security Configuration Field	Description
Domain Name Server IP Address	Specifies the IP address of the domain name server.
Domain Name Server	Specifies the name of the domain name server.
RADIUS Server	Specifies the IP address of the RADIUS server.
RADIUS Port	Specifies the port of the RADIUS server.

Table A-5. **2.4 GHz RADIUS Server Configuration Field Descriptions**

Security Configuration Field	Description
RADIUS Secret	Specifies the password for the RADIUS server.
RADIUS Key Source	Specifies the location of the RADIUS keys. Use the "local" checkbox to specify the RADIUS keys are located in the AP. Use the "remote" checkbox to specify the RADIUS keys are located in the RADIUS server.

2.4 GHz 802.1X Configuration

The IEEE 802.1X protocol is designed to support port-based authentication and secure key distribution. It can be used to distribute unique encryption keys for an entire BSS. Atheros provides support for this protocol on both the AP and the STA.

To enable 802.1X on the AP, take the following steps on the 2.4 GHz RADIUS Server Configuration window:

1. Specify the domain name server IP address.
2. Specify the name of the domain server.
3. Specify a RADIUS Server name.
4. Specify a RADIUS Server secret.
5. Specify the location of the 2.4 GHz Key Source as *Remote*.

2.4 GHz Access Control List Configuration Window

The 2.4 GHz Radio Configuration window allows the setting of security information for the AP. From the 2.4 GHz Security Configuration window, click on Edit ACL Settings to access the 2.4 GHz ACL Configuration window (see Figure A-8).

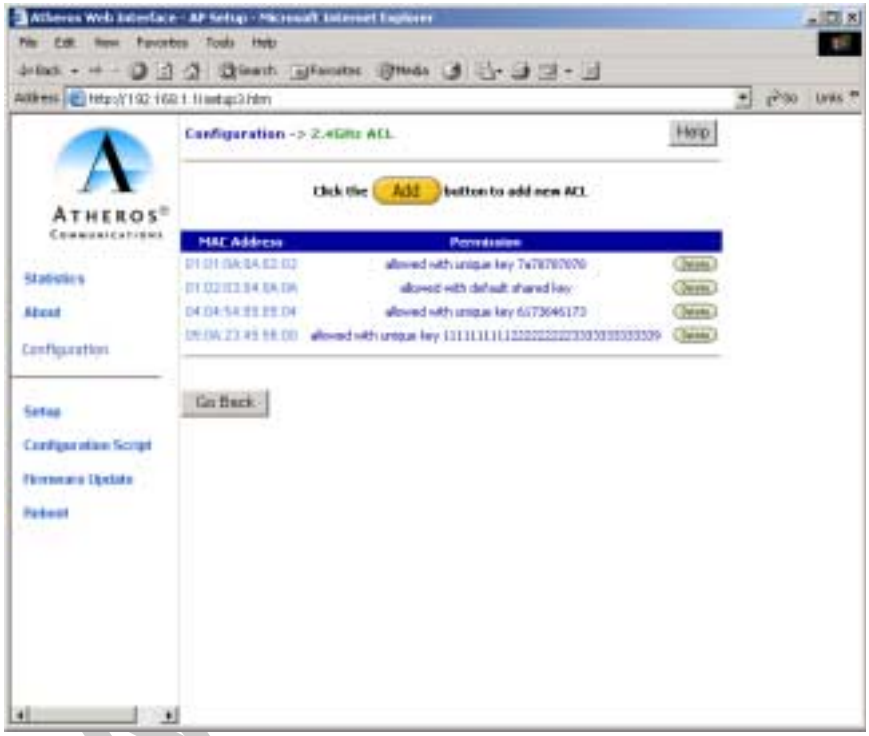


Figure A-8. **2.4 GHz Access Control List Configuration Window**

Click Delete to remove any list item.

Adding New Access Control Lists

The 2.4 GHz Security New ACL Configuration window allows you to add new access control list item. From the 2.4 GHz ACL Configuration window, click Add to list to enter new list items (see Figure A-9).

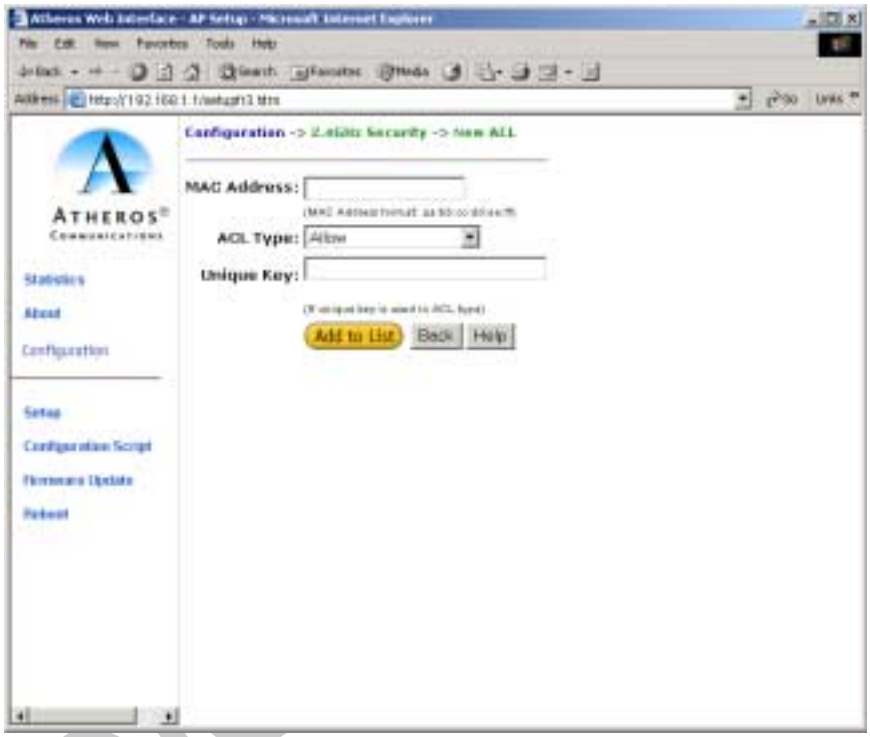


Figure A-9. **2.4 GHz New Access Control List Configuration Window**

Table A-6 summaries the data fields on the 2.4 GHz New Access Control List window

Table A-6. **2.4 GHz New Access Control List Field Descriptions**

Per Station Privacy Field	Description
MAC Address	Specifies the MAC address for the STA to be included in the ACL.
ACL Type	Specifies the current state of each STA, where: ■ Allowed—Enable access for this MAC address to the ACL. ■ Denied—Deny access for this MAC address to the ACL. ■ Default Shared Key—This MAC address would use the default shared key. ■ 64/128/152 Bits—Specifies lengths for shared keys.
Unique Key	Enter a unique key.

Adding Access Control List Permissions

The 2.4 GHz ACL Configuration window allows you to add permission for each list item. From the 2.4 GHz ACL Configuration window, click on a MAC address in the list to view the 2.4 GHz Security Edit ACL Configuration window (see Figure A-10).

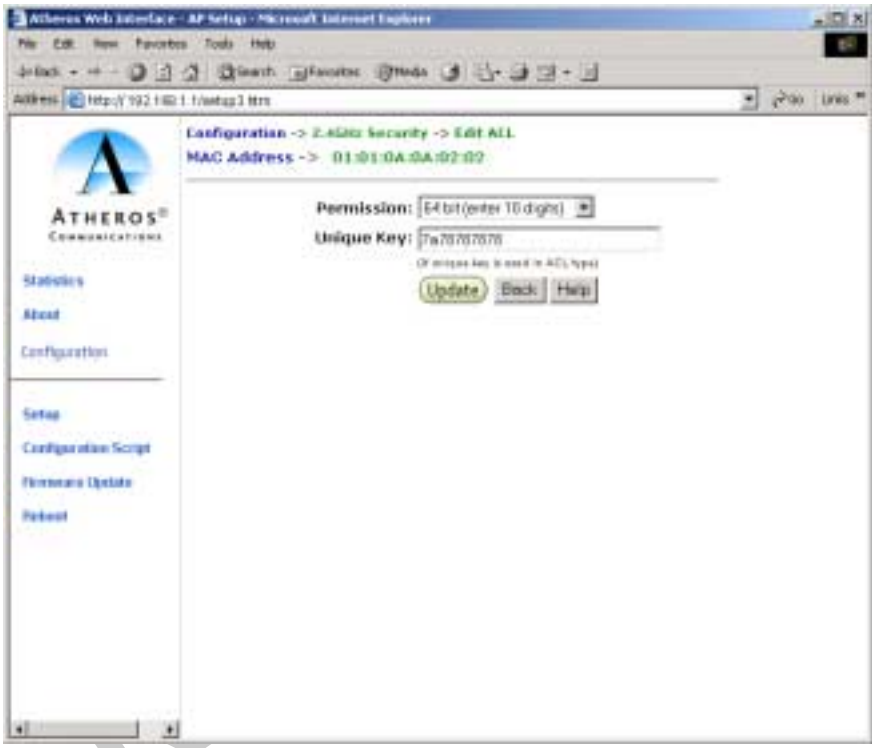


Figure A-10. **2.4 GHz Security Edit ACL Configuration Window**

Table A-7 summaries the data fields on the 2.4 GHz Security Edit ACL Configuration window.

Table A-7. **2.4 GHz Security Edit Access Control List Field Descriptions**

Per Station Privacy Field	Description
Permission	Specifies the current state of each STA, where: ■ Allowed—Enable access for this MAC address to the ACL. ■ Denied—Deny access for this MAC address to the ACL. ■ Default Shared Key—This MAC address would use the default shared key. ■ 64/128/152 Bits—Specifies lengths for shared keys
Unique Key	Enter a unique key.

2.4 GHz Radio Advanced Configuration Window

The 2.4 GHz Radio Advanced Configuration window allows the setting of 2.4 GHz advanced, radio operating information for the AP. Device's firmware may limit allowable settings depending on Regulatory Domain (country) of operation. From the 2.4 GHz Radio Configuration window, click on Advanced to access the 2.4 GHz Radio Advanced Configuration window (see Figure A-11).

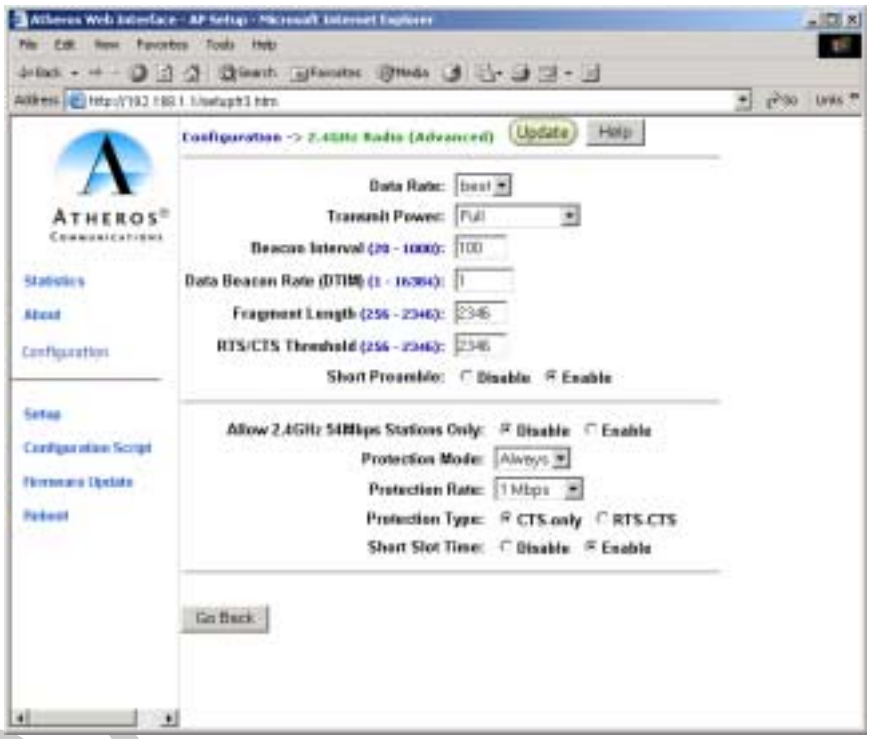


Figure A-11. **2.4 GHz Radio Advanced Configuration Window**

Table A-8 summarizes the data fields on the 2.4 GHz Radio Advanced Configuration window.

Table A-8. **2.4 GHz Radio Advanced Configuration Window Field Descriptions**

Advanced Configuration Field	Description
Data Rate	Specifies rate of data transmission. Select the desired rate from the drop-down menu. The Best selection will adapt the rate to the best available.
Beacon Interval	Specifies the Beacon Interval value. Enter a value between 20 and 1000.
Data Beacon Rate	Specifies the Data Beacon Rate. Enter a value between 1 and 16384 that specifies the Delivery Traffic Indication Message (DTIM).
Fragment Length	Specifies the fragment length. Enter a value between 256 and 2346.
RTS/CTS Threshold	Specifies the value of the RTS/CTS threshold. Enter a value between 256 and 2346.
Short Preamble	Use the radio button to specify short preamble (11b) usage. When enabled, both short and long preambles are used. When disabled, only long preambles are used.
Allow 2.4 GHz 54 Mbps Stations Only	Use the radio button to enable or disable the association of 2.4 GHz 54 Mbps station only.
Protection Mode	Specifies the operation of CTS protection mode: ■ None ■ Always ■ Auto
Protection Rate	Specifies the operation of CTS protection rate: ■ 1 Mbps ■ 2 Mbps ■ 5.5 Mbps ■ 11 Mbps
Protection Type	Specifies the operation of CTS protection type: ■ CTS only ■ RTS-CTS
Short Slot Time	Use the radio button to specify short time shot usage.

Script Configuration Window

The Script Configuration window allows execution of text scripts of CLI commands. For example, construction of a text script to enter the shared keys for stations. All set commands can be used in scripts, except **set security**, **set password**, **find bss**, **ftp, password**, and **ping**.

Figure A-12 illustrates an example of an AP Script Configuration Window.

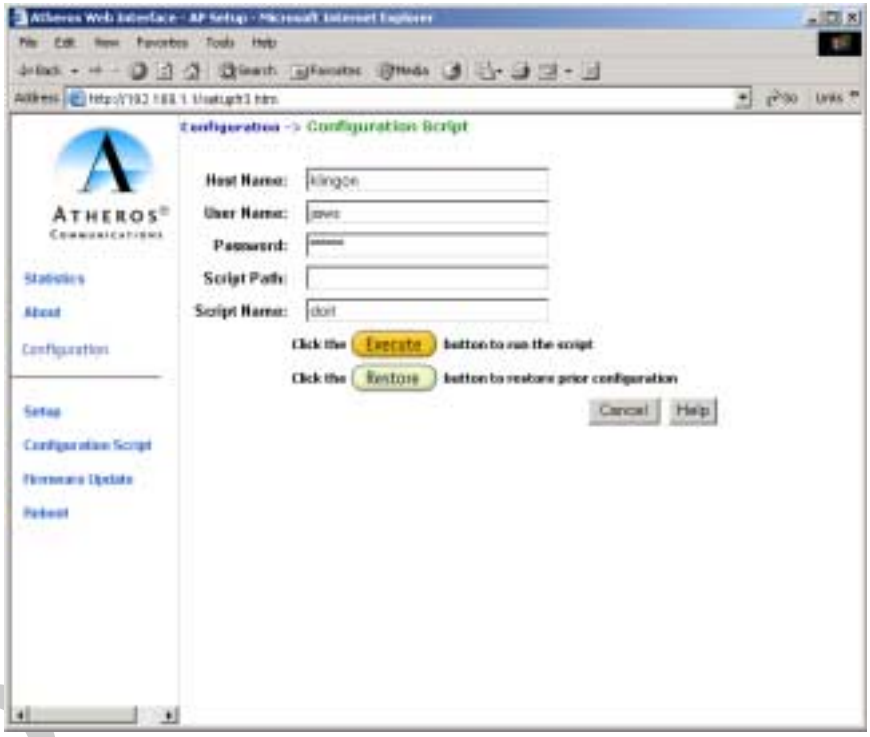


Figure A-12. **Configuration Script Configuration Window**

Follow these steps to use scripts:

1. Develop the scripts for the application.
2. Enter the host name where the script resides.
3. Enter the user name and password for the host.
4. Specify the script path and the script name in the data entry fields in the Configuration Script window.
5. Click Execute to run the script.

   To revert to the previous configuration, click Restore.

Firmware Update Configuration Window

The Firmware Update Basic Configuration window allows viewing of the FTP location of new firmware. The default values for the Host Name, Image Path, and Image Name appear in the window.

To access the Firmware Update window, click on Firmware Update in the navigation bar. The Firmware Update Configuration Window appears (see Figure A-13).

Figure A-13. **AP Firmware Update Configuration Window**

The AP uses the File Transfer Protocol (FTP) to download the Operating image from the HPC. An FTP server utility is required to perform the data transfer between the AP and HPC.

Follow these steps to enable firmware updates:

1. From the Firmware Update Basic window, click on Advanced.

   The AP Firmware Update Advanced Configuration window appears (see Figure A-14).

Figure A-14. **Advanced Firmware Update Configuration Window**

The Firmware Update Advanced Configuration window allows the setting of new information on the FTP location of new firmware or filename of the firmware.

2. Enter the Host Name or host PC's IP address, User Name, Password, Image Path, and Image Name in the data-entry fields.

   To revert to the default-vendor values, click Use Factory FTP Location.

3. Click Update Firmware to store the new firmware changes.

   To restore the previous firmware, click Restore.

Statistics Windows

From the AP Web Server, choose the Statistics hyperlink to go to the Access Point Statistics window. By default, this is the first window that appears once the AP Web Server opens.

The AP Statistics window allows viewing of the assigned ID, MAC address, and current state of the AP and all stations currently part of its BBS (Basic Service Set). The top-level Statistics window automatically updates each minute.

AP Statistics

To view statistics on the AP, click on the MAC address hyperlink for the desired AP in the Statistics window. The BSS Stats window for the selected AP will appear. See Figure A-15 for an example of a BSS Stats window for an AP.

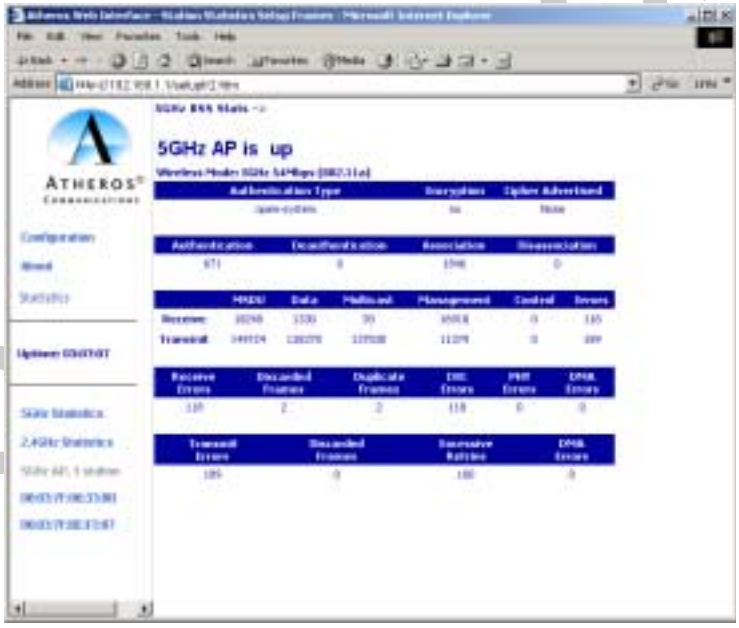


Figure A-15. **Basic Service Set Statistics Window for an AP**

The BSS Stats window for AP is divided into sections that provide the AP configuration, Access Point SME statistics (station association information), or Access Point (Transmit and Receive) Statistics. Refer to Table A-9 for a description of the BSS Statistics for AP window fields.

Table A-9. **BSS Stats Field for AP Descriptions**

BSS Stats Field	Description
State	Current state of the AP.
Authentication Type	Specifies open-system or shared key.
Encryption	Specifies the enabled state of encryption; either yes or no.
Cipher Advertised	Specifies current state of advertised cipher negotiations, AES and/or WEP, and None (clear).
Authentication/Deauthentication	Number of times a STA attempted authentication and deauthentication.
Association/Deassociation	Number of times a STA attempted associations and deassociations.
MSDU	Maximum Service Data Unit. Specifies the number of packets sent and received by the AP.
Data/Management/Control	Packets can either be data, control, or management. Specifies the number of packets sent and received for each.
Multicast	Specifies the number of multicast packets both sent and received.
Errors	Specifies the error count for both transmit and receive.
Receive Errors	Specifies the number of receive errors.
Discarded Frames	Specifies the number of receive discarded frames.
Duplicate Frames	Specifies the number of receive duplicate frames.
CRC Errors	Specifies the number of receive CRC errors.
PHY Errors	Specifies the number of receive PHY errors.
DMA Errors	Specifies the number of receive DMA errors.
Transmit Errors	Specifies the number of transmit errors.
Discarded Frames	Specifies the number of transmit discarded frames.
Excessive Retries	Specifies the number of transmit excessive retries.
DMA Errors	Specifies the number of transmit DMA errors.

The AP Stats window automatically updates every five seconds.

Station Statistics

To view statistics on any STA, click on the MAC address hyperlink for the desired STA. The BSS Stats window for the selected STA will appear. See Figure A-16 for an example BSS Stats window for a station.

Figure A-16. **Basic Service Set Statistics Window for Station**

The BSS Stats window for stations provides the station configuration and statistics for the selected station.

Table A-10 summarizes the information fields on the BSS Stats window for a STA.

Table A-10. **BSS Stats Fields for STA Descriptions**

BSS Stats Window for STA Field	Description
AID	The ID of the STA.
State	The current state of the STA
Power Save	Specifies the enabled state of the power save option; either yes or no.
Encryption	Specifies current state of encryption; AES and/or WEP, and None (clear).
Advertised Cipher	Specifies the supported cipher types.
Unicast Cipher	Specifies the current unicast cipher type used.
Multicast Cipher	Specifies the current multicast cipher type used.
Authentication/Deauthentication	Number of times a STA attempted authentication and deauthentication.
Association/Deassociation	Number of times a STA attempted associations and deassociations.
MSDU	Maximum Service Data Unit. Specifies the number of packets sent and received by the STA.
Data/Management/Control	Packets can either be data, control, or management. Specifies the number of packets sent and received for each.
Multicast	Specifies the number of multicast frames.
Errors	Specifies the error count for both transmit and receive sides.
Signal Strength	Specifies the strength of the transmit and receive signals in dBm.
Data Rate (Mbps)	Specifies the transmit and receive data rate in Mbps.
Receive Errors	Specifies the number of receive errors.
Discarded Frames	Specifies the number of receive discarded frames.
Duplicate Frames	Specifies the number of receive duplicate frames.
CRC Errors	Specifies the number of receive CRC errors.
PHY Errors	Specifies the number of receive PHY errors.
DMA Errors	Specifies the number of receive DMA errors.
Transmit Errors	Specifies the number of transmit errors.
Discarded Frames	Specifies the number of transmit discarded frames.
Excessive Retries	Specifies the number of transmit excessive retries.
DMA Errors	Specifies the number of transmit DMA errors.

B

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

NOTE: The Atheros Access Point firmware limits operation to only the channels allowed in a particular Region or Country (i.e. Regulatory Domain). Therefore, all options described in this user's guide may not be available in your version of the device.

FCC Requirements for Operation in the Unites States

Radio Frequency Interference Warnings & Instructions

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 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 or more of the following methods:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an electrical outlet on a circuit different from that which the radio receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Modifications made to the product, unless expressly approved by Atheros Communication, could void the user 's right to operate the equipment.

RF Exposure

This device has been evaluated for compliance with FCC RF Exposure limits.

CAUTION: To ensure compliance with FCC RF exposure requirements, the antenna used for this device must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operated in conjunction with any other antenna or radio transmitter.

Declaration Of Conformity

We Atheros Communications, Inc.,

529 Almanor Ave.,Sunnyvale,CA 94085

declare under our sole responsibility that the model AR5BAP-00031 Access Point product complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.