

Wi-Fi Protected Access 2 (WPA 2) Configuration Example

Document ID: 67134

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Introduction

This document explains the advantages of the use of Wi-Fi Protected Access 2 (WPA 2) in a Wireless LAN (WLAN). The document provides two configuration examples on how to implement WPA 2 on a WLAN. The first example shows how to configure WPA 2 in enterprise mode, and the second example configures WPA 2 in personal mode.

Note: WPA works with Extensible Authentication Protocol (EAP).

Prerequisites

Requirements

Ensure that you have basic knowledge of these topics before you attempt this configuration:

- WPA
- WLAN security solutions

Note: Refer to Cisco Aironet Wireless LAN Security Overview for information on Cisco WLAN security solutions.

Components Used

The information in this document is based on these software and hardware versions:

- Cisco Aironet 1310G Access Point (AP)/Bridge that runs Cisco IOS® Software Release 12.3(2)JA
- Aironet 802.11a/b/g CB21AG Client Adapter that runs firmware 2.5
- Aironet Desktop Utility (ADU) that runs firmware 2.5

Note: The Aironet CB21AG and PI21AG client adapter software is incompatible with other Aironet client adapter software. You must use the ADU with CB21AG and PI21AG cards, and you must use the Aironet Client Utility (ACU) all other Aironet client adapters. Refer to Installing the Client Adapter for more information on how to install the CB21AG card and ADU.

Note: This document uses an AP/bridge that has an integrated antenna. If you use an AP/bridge which requires an external antenna, ensure that the antennas are connected to the AP/bridge. Otherwise, the AP/bridge is unable to connect to the wireless network. Certain AP/bridge models come with integrated antennas, whereas others need an external antenna for general operation. For information on the AP/bridge models that come with internal or external antennas, refer to the ordering guide/product guide of the appropriate device.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Background Information

WPA is a standard-based security solution from the Wi-Fi Alliance that addresses the vulnerabilities in native WLANs. WPA provides enhanced data protection and access control for WLAN systems. WPA addresses all known Wired Equivalent Privacy (WEP) vulnerabilities in the original IEEE 802.11 security implementation and brings an immediate security solution to WLANs in both enterprise and small office, home office (SOHO) environments.

WPA 2 is the next generation of Wi-Fi security. WPA 2 is the Wi-Fi Alliance interoperable implementation of the ratified IEEE 802.11i standard. WPA 2 implements the National Institute of Standards and Technology (NIST)-recommended Advanced Encryption Standard (AES) encryption algorithm with the use of Counter Mode with Cipher Block Chaining Message Authentication Code Protocol (CCMP). AES Counter Mode is a block cipher that encrypts 128-bit blocks of data at a time with a 128-bit encryption key. The CCMP algorithm produces a message integrity code (MIC) that provides data origin authentication and data integrity for the wireless frame.

Note: CCMP is also referred to as CBC-MAC.

WPA 2 offers a higher level of security than WPA because AES offers stronger encryption than Temporal Key Integrity Protocol (TKIP). TKIP is the encryption algorithm that WPA uses. WPA 2 creates fresh session keys on every association. The encryption keys that are used for each client on the network are unique and specific to that client. Ultimately, every packet that is sent over the air is encrypted with a unique key. Security is enhanced with the use of a new and unique encryption key because there is no key reuse. WPA is still considered secure and TKIP has not been broken. However, Cisco recommends that customers transition to WPA 2 as soon as possible.

WPA and WPA 2 both support two modes of operation:

- Enterprise mode
- Personal mode

This document discusses the implementation of these two modes with WPA 2.

WPA 2 Support with Cisco Aironet Equipment

WPA 2 is supported on this equipment:

- Aironet 1130AG AP series and 1230AG AP series
- Aironet 1100 AP series
- Aironet 1200 AP series
- Aironet 1300 AP series

Note: Equip these APs with 802.11g radios and use Cisco IOS Software Release 12.3(2)JA or later.

WPA 2 and AES are also supported on:

- Aironet 1200 series radio modules with the part numbers AIR–RM21A and AIR–RM22A

Note: The Aironet 1200 radio module with the part number AIR–RM20A does not support WPA 2.

- Aironet 802.11a/b/g Client Adapters with firmware version 2.5

Note: Cisco Aironet 350 series products do not support WPA 2 because their radios lack AES support.

Note: Cisco Aironet 1400 Series Wireless Bridges do not support WPA 2 or AES.

Configure in Enterprise Mode

The term **enterprise mode** refers to products that are tested to be interoperable in both Pre–Shared Key (PSK) and IEEE 802.1x modes of operation for authentication. The 802.1x is considered to be more secure than any of the legacy authentication frameworks because of its flexibility in support of a variety of authentication mechanisms and stronger encryption algorithms. WPA 2 in enterprise mode performs authentication in two phases. Configuration of open authentication occurs in the first phase. The second phase is 802.1x authentication with one of the EAP methods. AES provides the encryption mechanism.

In enterprise mode, clients and authentication servers authenticate each other with the use of an EAP authentication method, and the client and server generate a Pairwise Master Key (PMK). With WPA 2, the server generates the PMK dynamically and passes the PMK to the AP.

This section discusses the configuration that is necessary to implement WPA 2 in the enterprise mode of operation.

Network Setup

In this setup, an Aironet 1310G AP/Bridge that runs Cisco Lightweight Extensible Authentication Protocol (LEAP) authenticates a user with a WPA 2–compatible client adapter. Key management occurs with the use of WPA 2, on which AES–CCMP encryption is configured. The AP is configured as a local RADIUS server that runs LEAP authentication. You must configure the client adapter and the AP in order to implement this setup. The sections Configure the AP and Configure the Client Adapter show the configuration on the AP and the client adapter.

Configure the AP

Complete these steps to configure the AP using GUI:

1. Configure the AP as a local RADIUS server that runs LEAP authentication.
 - a. Choose **Security > Server Manager** in the menu on the left and define the IP address, ports, and shared secret of the RADIUS server.

Because this configuration configures the AP as a local RADIUS server, use the IP address of the AP. Use the ports 1812 and 1813 for local RADIUS server operation.

- b. In the Default Server Priorities area, define the default EAP authentication priority as 10.0.0.1.

Note: 10.0.0.1 is the local RADIUS server.

The screenshot displays the Cisco Aironet 1300 Series Wireless Bridge configuration interface. The left sidebar shows the navigation menu with 'Security' expanded and 'Server Manager' selected. The main content area is titled 'Cisco Aironet 1300 Series Wireless Bridge' and 'SERVER MANAGER'. The 'Security: Server Manager' section includes a 'Backup RADIUS Server' area with fields for 'Backup RADIUS Server' and 'Shared Secret'. Below this is the 'Corporate Servers' section, which contains a 'Current Server List' with a dropdown set to 'RADIUS'. The list shows '<NEW>' and '10.0.0.1'. To the right of the list, there are fields for 'Server' (10.0.0.1), 'Shared Secret', 'Authentication Port (optional)' (1812), and 'Accounting Port (optional)' (1813). At the bottom, the 'Default Server Priorities' section shows 'EAP Authentication' with 'Priority 1' set to '10.0.0.1'. 'MAC Authentication' and 'Accounting' are also listed with their respective priorities.

2. Choose **Security > Encryption Manager** from the menu on the left and complete these steps:
 - a. From the Cipher menu, choose **AES CCMP**.

This option enables AES encryption with the use of Counter Mode with CBC-MAC.

Cisco Aironet 1300 Series Wireless Bridge

Hostname: bridge
bridge uptime is 5 minutes

Security: Encryption Manager

Encryption Modes

☐ None

☐ WEP Encryption

Cisco Compliant TKIP Features: ☐ Enable Message Integrity Check (MIC) ☐ Enable Per Packet Keying (PPK)

☒ Cipher

Encryption Keys

	Transmit Key	Encryption Key (Hexadecimal)	Key Size
Encryption Key 1:	<input type="radio"/>	<input type="text"/>	<input type="text" value="128 bit"/>
Encryption Key 2:	<input checked="" type="radio"/>	<input type="text"/>	<input type="text" value="128 bit"/>
Encryption Key 3:	<input type="radio"/>	<input type="text"/>	<input type="text" value="128 bit"/>
Encryption Key 4:	<input type="radio"/>	<input type="text"/>	<input type="text" value="128 bit"/>

b. Click **Apply**.

3. Choose **Security > SSID Manager** and create a new Service Set Identifier (SSID) for use with WPA 2.

a. Check the **Network EAP** check box in the Authentication Methods Accepted area.

Cisco Aironet 1300 Series Wireless Bridge

Hostname: bridge
bridge uptime is 6 minutes

Security: SSID Manager

SSID Properties

Current SSID List

< NEW >
WPA2
autoinstall

SSID:

VLAN: [Define VLANs](#)

Network ID: (0-4096)

Authentication Settings

Authentication Methods Accepted:

☐ Open Authentication:

☐ Shared Authentication:

☒ Network EAP:

Note: Use these guidelines when you configure the authentication type on the radio interface:

- ◇ Cisco clients Use Network EAP.
- ◇ Third-party clients (which include Cisco Compatible Extensions [CCX]-compliant products) Use Open Authentication with EAP.
- ◇ A combination of both Cisco and third-party clients Choose both Network EAP and

Open Authentication with EAP.

- b. Scroll down the Security SSID Manager window to the Authenticated Key Management area and complete these steps:
 - a. From the Key Management menu, choose **Mandatory**.
 - b. Check the **WPA** check box on the right.
- c. Click **Apply**.

Note: The definition of VLANs is optional. If you define VLANs, client devices that associate with use of this SSID are grouped into the VLAN. Refer to Configuring VLANs for more information on how to implement VLANs.

The screenshot shows the 'Authenticated Key Management' configuration window. The 'Key Management' dropdown is set to 'Mandatory', and the 'WPA' checkbox is checked. The 'WPA Pre-shared Key' field is empty, and the radio buttons are set to 'ASCII'. Below this is the 'Accounting Settings' section with 'Enable Accounting' unchecked and 'Accounting Server Priorities' set to 'Use Defaults'. The 'General Settings' section has 'Advertise Extended Capabilities of this SSID' unchecked, with sub-options for WPS support and secondary broadcast SSID also unchecked. 'Enable IP Redirection on this SSID' is also unchecked, with the IP address set to 'DISABLED' and the IP filter set to '< NONE >'.

4. Choose **Security > Local Radius Server** and complete these steps:
 - a. Click the **General Set-Up** tab located at the top of the window.
 - b. Check the **LEAP** check box and click **Apply**.
 - c. In the Network Access Servers area, define the IP address and shared secret of the RADIUS server.

For the local RADIUS server, use the IP address of the AP.

Cisco Aironet 1300 Series Wireless Bridge

Hostname: bridge bridge uptime is 8 minutes

Security: Local RADIUS Server - General Set-Up

Local Radius Server Authentication Settings

Enable Authentication Protocols: ☐ EAP FAST ☒ LEAP ☐ MAC

Apply Cancel

Network Access Servers (AAA Clients)

Current Network Access Servers

< NEW >
10.0.0.1

Delete

Network Access Server: 10.0.0.1 (IP Address)

Shared Secret:

Apply Cancel

Individual Users

d. Click **Apply**.

5. Scroll down the General Set-Up window to the Individual Users area and define the individual users.

The definition of the user groups is optional.

Individual Users

Current Users

< NEW >
user1

Delete

Username: user1

Password:

Confirm Password:

Group Name: < NONE >

☐ MAC Authentication Only

Apply Cancel

User Groups

Current User Groups

< NEW >

Delete

Group Name:

Session Timeout (optional): (1-4294967295 sec)

Failed Authentications before Lockout (optional): (1-4294967295)

Lockout (optional): ☐ Infinite ☒ Interval (1-4294967295 sec)

VLAN ID (optional):

SSID (optional): Add

Delete

This configuration defines a user with the name "user1" and a password. Also, the configuration selects NT hash for the password. After completion of the procedure in this section, the AP is ready to accept authentication requests from clients. The next step is to configure the client adapter.

CLI Configuration

Access Point

```
ap#show running-config
Building configuration...

.
.
.
aaa new-model

!--- This command reinitializes the authentication,
!--- authorization and accounting functions.

!
!
aaa group server radius rad_eap
  server 10.0.0.1 auth-port 1812 acct-port 1813

!--- A server group for RADIUS is created called "rad_eap"
!--- that uses the server at 10.0.0.1 on ports 1812 and 1813.

.
.
.
aaa authentication login eap_methods group rad_eap

!--- Authentication [user validation] is to be done for
!--- users in a group called "eap_methods" who use server group "rad_eap".

.
.
.
!
bridge irb
!
interface Dot11Radio0
  no ip address
  no ip route-cache
  !
  encryption vlan 1 key 1 size 128bit
    12345678901234567890123456 transmit-key

!---This step is optional
!--- This value seeds the initial key for use with
!--- broadcast [255.255.255.255] traffic. If more than one VLAN is
!--- used, then keys must be set for each VLAN.

encryption vlan 1 mode wep mandatory

!--- This defines the policy for the use of Wired Equivalent Privacy (WEP).
!--- If more than one VLAN is used,
!--- the policy must be set to mandatory for each VLAN.

broadcast-key vlan 1 change 300

!--- You can also enable Broadcast Key Rotation for each vlan and Specify the time
!--- after which Broadcast key is changed. If it is disabled Broadcast Key is still
!--- used but not changed.

ssid cisco vlan 1

!--- Create a SSID Assign a vlan to this SSID

authentication open eap eap_methods
```



```

authentication network-eap eap_methods

!--- Expect that users who attach to SSID "cisco"
!--- request authentication with the type 128 Open EAP and Network EAP authentication
!--- bit set in the headers of those requests, and group those users into
!--- a group called "eap_methods."

!
speed basic-1.0 basic-2.0 basic-5.5 basic-11.0
rts threshold 2312
channel 2437
station-role root
bridge-group 1
bridge-group 1 subscriber-loop-control
bridge-group 1 block-unknown-source
no bridge-group 1 source-learning
no bridge-group 1 unicast-flooding
bridge-group 1 spanning-disabled
.
.
.
interface FastEthernet0
no ip address
no ip route-cache
duplex auto
speed auto
bridge-group 1
no bridge-group 1 source-learning
bridge-group 1 spanning-disabled
!
interface BV11
ip address 10.0.0.1 255.255.255.0

!--- The address of this unit.

no ip route-cache
!
ip default-gateway 10.77.244.194
ip http server
ip http help-path
http://www.cisco.com/warp/public/779/smbiz/prodconfig/help/eag/ivory/1100
ip radius source-interface BV11
snmp-server community cable RO
snmp-server enable traps tty
radius-server local

!--- Engages the Local RADIUS Server feature.

nas 10.0.0.1 key shared_secret

!--- Identifies itself as a RADIUS server, reiterates
!--- "localness" and defines the key between the server (itself) and the access point(itself).

!
group testuser

!--- Groups are optional.

!
user user1 nthash password1 group testuser

!--- Individual user

user user2 nthash password2 group testuser

!--- Individual user

```

```
!--- These individual users comprise the Local Database
!
radius-server host 10.0.0.1 auth-port 1812 acct-port
    1813 key shared_secret

!--- Defines where the RADIUS server is and the key between
!--- the access point (itself) and the server.

radius-server retransmit 3
radius-server attribute 32 include-in-access-req format %h
radius-server authorization permit missing Service-Type
radius-server vsa send accounting
bridge 1 route ip
!
!
line con 0
line vty 5 15
!
end
```

Configure the Client Adapter

Complete these steps:

Note: This document uses an Aironet 802.11a/b/g Client Adapter that runs firmware 2.5 and explains the configuration of the client adapter with ADU version 2.5.

1. In the Profile Management window on the ADU, click **New** in order to create a new profile.

A new window displays where you can set the configuration for WPA 2 enterprise mode operation. Under the General tab, enter the Profile Name and the SSID that the client adapter will use.

In this example, the profile name and the SSID are WPA2:

Note: The SSID must match the SSID that you configured on the AP for WPA 2.

Profile Management

General | Security | Advanced

Profile Settings

Profile Name: WPA2

Client Name: C0DC3-LAPTOP

Network Names

SSID1: WPA2

SSID2:

SSID3:

OK Cancel

2. Click the **Security** tab, click **WPA/WPA2/CCKM**, and choose **LEAP** from the WPA/WPA2/CCKM EAP Type menu.

This action enables either WPA or WPA 2, whichever you configure on the AP.

Profile Management

General | Security | Advanced

Set Security Options

☒ WPA/WPA2/CCKM

☐ WPA/WPA2 Passphrase

☐ 802.1x

☐ Pre-Shared Key (Static WEP)

☐ None

WPA/WPA2/CCKM EAP Type: LEAP

802.1x EAP Type: LEAP

Configure...

☐ Allow Association to Mixed Cells

☐ Locked Profile

Group Policy Delay: 60 sec

OK Cancel

3. Click **Configure** in order to define LEAP settings.
4. Choose the appropriate Username and Password Settings, based on the requirements, and click **OK**.

This configuration chooses the option Automatically Prompt for User Name and Password. This

option enables you to manually enter the user name and password when LEAP authentication takes place.

LEAP Settings

☒ Always Resume the Secure Session

Username and Password Settings

☒ Use Temporary User Name and Password

☐ Use Windows User Name and Password

☒ Automatically Prompt for User Name and Password

☐ Manually Prompt for User Name and Password

☐ Use Saved User Name and Password

User Name:

Password:

Confirm Password:

Domain:

☐ Include Windows Logon Domain with User Name

☒ No Network Connection Unless User Is Logged In

Authentication Timeout Value (in seconds)

OK Cancel

5. Click **OK** in order to exit the Profile Management window.
6. Click **Activate** in order to enable this profile on the client adapter.

Cisco Aironet Desktop Utility - Current Profile: LEAP

Action Options Help

Current Status Profile Management Diagnostics

Default

NoSecurity

WPA

New...

Modify...

Remove

Activate

Import...

Export...

Scan...

Order Profiles...

Details

Network Type: Infrastructure

Security Mode: LEAP

Network Name 1 (SSID1): WPA2

Network Name 2 (SSID2): <empty>

Network Name 3 (SSID3): <empty>

☐ Auto Select Profiles

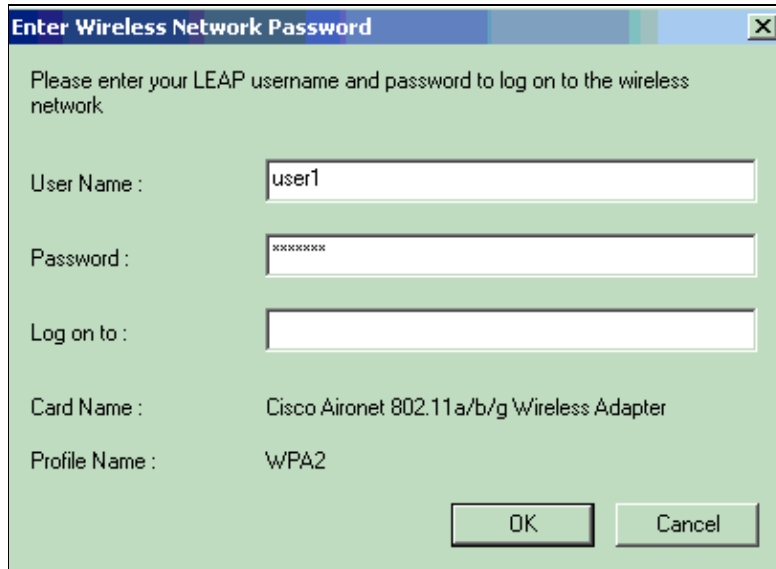
Note: If you use Microsoft Wireless Zero Configuration (WZC) to configure the client adapter, by default, WPA 2 is not available with WZC. So, in order to allow WZC-enabled clients to run WPA 2, you must install a hot fix for Microsoft Windows XP. Refer to the Microsoft Download Center – Update for Windows XP (KB893357) for the installation.

After you install the hot fix, you can configure WPA 2 with WZC.

Verify

Use this section to confirm that your configuration works properly.

1. When the Enter Wireless Network Password window displays, enter the user name and password.

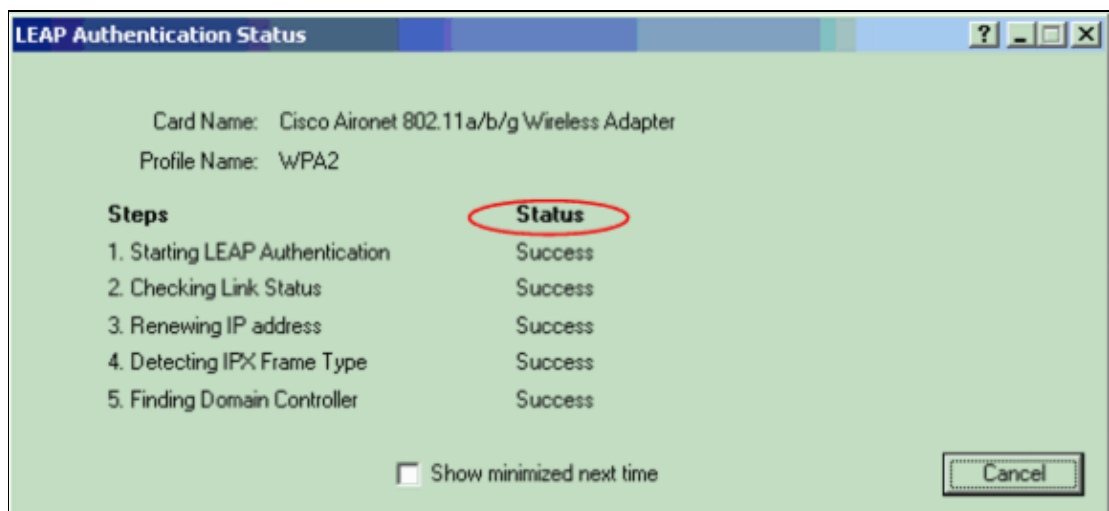


The dialog box titled "Enter Wireless Network Password" has a green background. It contains the following fields and labels:

- User Name :** A text box containing "user1".
- Password :** A text box containing "xxxxxxx".
- Log on to :** An empty text box.
- Card Name :** Labeled "Cisco Aironet 802.11a/b/g Wireless Adapter".
- Profile Name :** Labeled "WPA2".
- At the bottom right are **OK** and **Cancel** buttons.

The next window is LEAP Authentication Status. This phase verifies the user credentials against the local RADIUS server.

2. Check the Status area in order to see the result of the authentication.



The dialog box titled "LEAP Authentication Status" has a green background. It displays the following information:

- Card Name:** Cisco Aironet 802.11a/b/g Wireless Adapter
- Profile Name:** WPA2
- A table with two columns: **Steps** and **Status**. The **Status** column header is circled in red.

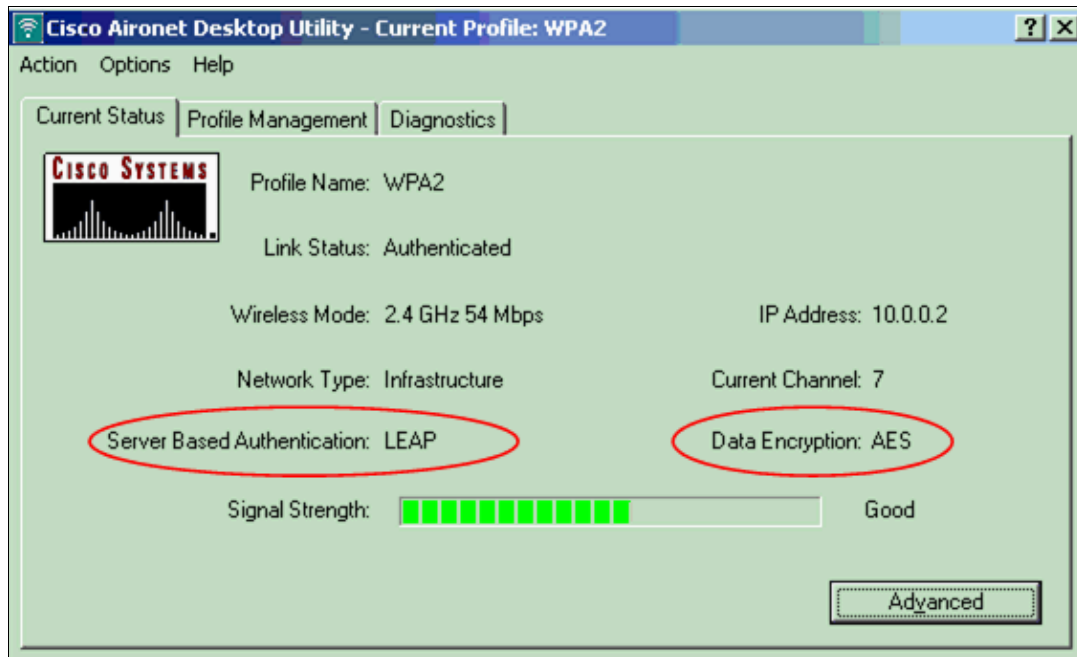
Steps	Status
1. Starting LEAP Authentication	Success
2. Checking Link Status	Success
3. Renewing IP address	Success
4. Detecting IPX Frame Type	Success
5. Finding Domain Controller	Success

At the bottom, there is a checkbox labeled "Show minimized next time" and a **Cancel** button.

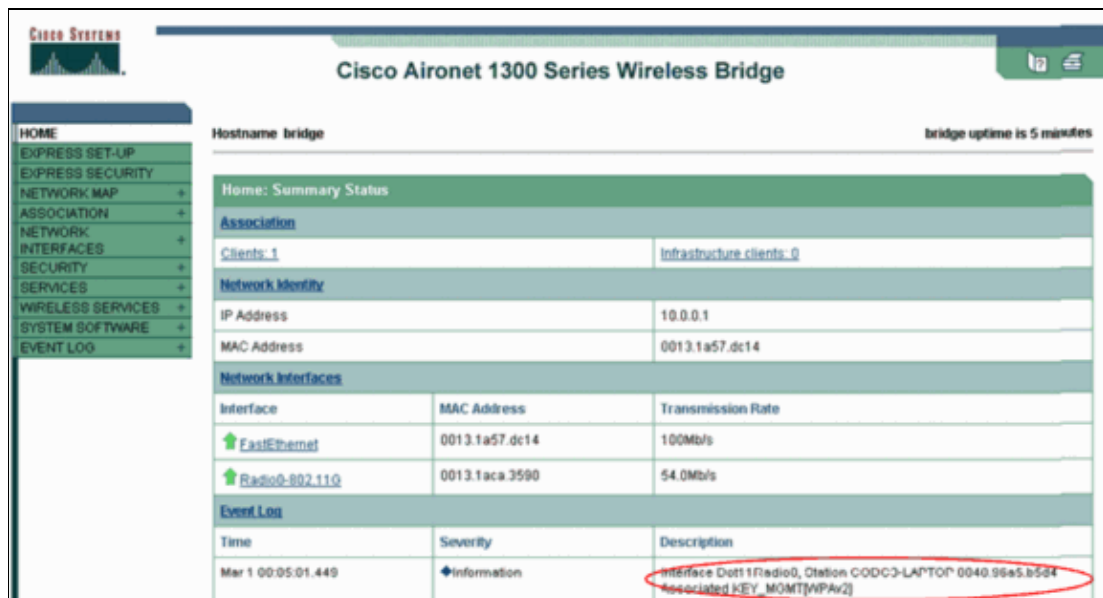
When authentication is successful, the client connects to the wireless LAN.

3. Check the ADU Current Status in order to verify that the client uses AES encryption and LEAP authentication.

This shows that you have implemented WPA 2 with LEAP authentication and AES encryption in the WLAN.



4. Check the AP/bridge Event Log in order to verify that the client has been authenticated successfully with WPA 2.



Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Configure in Personal Mode

The term **personal mode** refers to products that are tested to be interoperable in the PSK-only mode of operation for authentication. This mode requires manual configuration of a PSK on the AP and clients. PSK authenticates users via a password, or identification code, on both the client station and the AP. No authentication server is necessary. A client can gain access to the network only if the client password matches the AP password. The password also provides the keying material that TKIP or AES uses to generate an

encryption key for the encryption of the data packets. Personal mode is targeted to SOHO environments and is not considered secure for enterprise environments. This section provides the configuration that you need to implement WPA 2 in the personal mode of operation.

Network Setup

In this setup, a user with a WPA 2-compatible client adapter authenticates to an Aironet 1310G AP/Bridge. Key management occurs with the use of WPA 2 PSK, with AES-CCMP encryption configured. The sections Configure the AP and Configure the Client Adapter show the configuration on the AP and the client adapter.

Configure the AP

Complete these steps:

1. Choose **Security > Encryption Manager** in the menu on the left and complete these steps:
 - a. From the Cipher menu, choose **AES CCMP**.

This option enables AES encryption with the use of Counter Mode with CCMP.

The screenshot shows the Cisco Aironet 1300 Series Wireless Bridge configuration interface. The left sidebar contains a menu with options: HOME, EXPRESS SET-UP, EXPRESS SECURITY, NETWORK MAP, ASSOCIATION, NETWORK INTERFACES, SECURITY, Admin Access, Encryption Manager (selected), SSID Manager, Server Manager, Advanced Security, SERVICES, WIRELESS SERVICES, SYSTEM SOFTWARE, and EVENT LOG. The main content area is titled "Security: Encryption Manager" and shows the "Encryption Modes" section. The "Cipher" option is selected, and the "AES CCMP" cipher is chosen from the dropdown menu. Below this, the "Encryption Keys" section is visible, showing a table with columns for "Transmit Key", "Encryption Key (Hexadecimal)", and "Key Size". The table has four rows for "Encryption Key 1" through "Encryption Key 4". The "Transmit Key" column has radio buttons, with "Encryption Key 2" being selected. The "Encryption Key (Hexadecimal)" column has input fields, and the "Key Size" column has dropdown menus, all set to "128 bit".

	Transmit Key	Encryption Key (Hexadecimal)	Key Size
Encryption Key 1:	<input type="radio"/>	<input type="text"/>	128 bit
Encryption Key 2:	<input checked="" type="radio"/>	<input type="text"/>	128 bit
Encryption Key 3:	<input type="radio"/>	<input type="text"/>	128 bit
Encryption Key 4:	<input type="radio"/>	<input type="text"/>	128 bit

- b. Click **Apply**.
2. Choose **Security > SSID Manager** and create a new SSID for use with WPA 2.
 - a. Check the **Open Authentication** check box.

Cisco Systems Cisco Aironet 1300 Series Wireless Bridge

Hostname: bridge bridge uptime is 7 minutes

Security: SSID Manager

SSID Properties

Current SSID List

< NEW >	SSID: WPA2PSK
WPA2PSK	VLAN: < NONE > Define VLANs
tsunami	Network ID: (0-4096)

Delete

Authentication Settings

Authentication Methods Accepted:

☒ Open Authentication: < NO ADDITION >

☐ Shared Authentication: < NO ADDITION >

☐ Network EAP: < NO ADDITION >

b. Scroll down the Security: SSID Manager window to the Authenticated Key Management area and complete these steps:

a. From the Key Management menu, choose **Mandatory**.

b. Check the **WPA** check box on the right.

Authenticated Key Management

Key Management: Mandatory CCKM WPA

WPA Pre-shared Key: [REDACTED] ASCII Hexadecimal

Accounting Settings

☐ Enable Accounting

Accounting Server Priorities:

☒ Use Defaults Define Defaults

☐ Customize

Priority 1: < NONE >

Priority 2: < NONE >

Priority 3: < NONE >

General Settings

☐ Advertise Extended Capabilities of this SSID

☐ Advertise Wireless Provisioning Services (WPS) Support

☐ Advertise this SSID as a Secondary Broadcast SSID

☐ Enable IP Redirection on this SSID

IP Address: DISABLED

IP Filter (optional): < NONE > Define Filter

c. Enter the WPA PSK shared secret key or the WPA PSK passphrase key.

This key must match the WPA PSK key that you configure on the client adapter.
d. Click **Apply**.

The AP can now receive authentication requests from the wireless clients.

Configure the Client Adapter

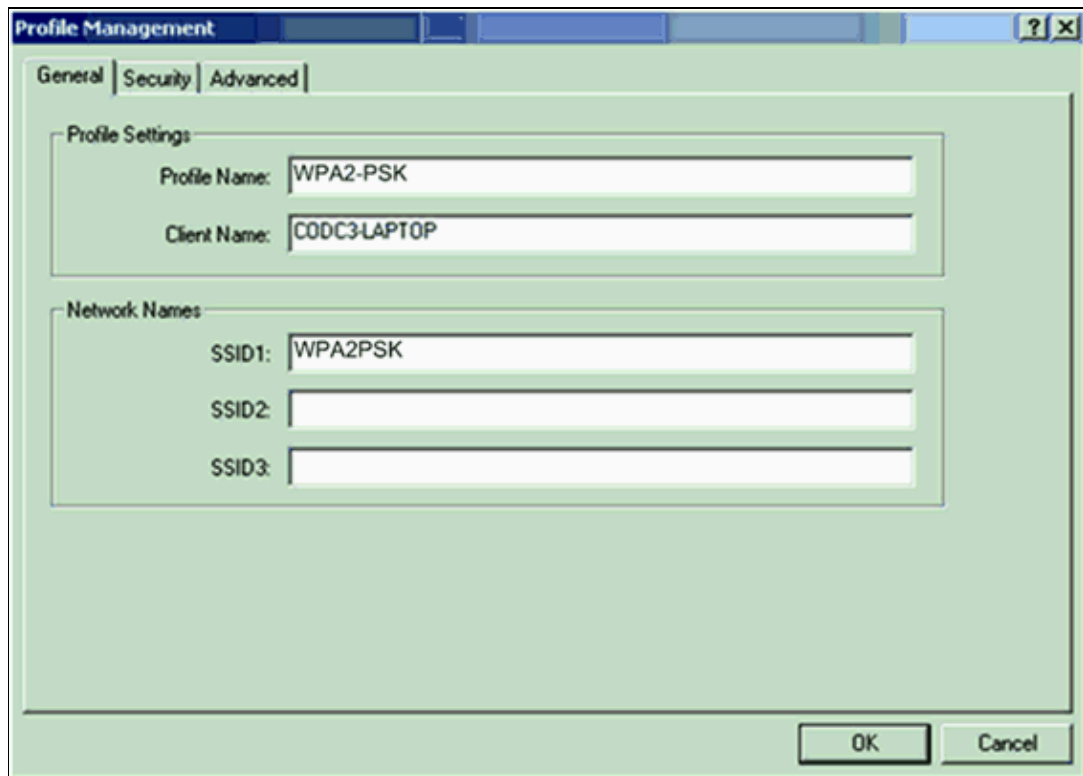
Complete these steps:

1. In the Profile Management window on the ADU, click **New** in order to create a new profile.

A new window displays where you can set the configuration for WPA 2 PSK mode of operation. Under the General tab, enter the Profile Name and the SSID that the client adapter will use.

In this example, the profile name is WPA2-PSK and the SSID is WPA2PSK:

Note: The SSID must match the SSID that you configured on the AP for WPA 2 PSK.

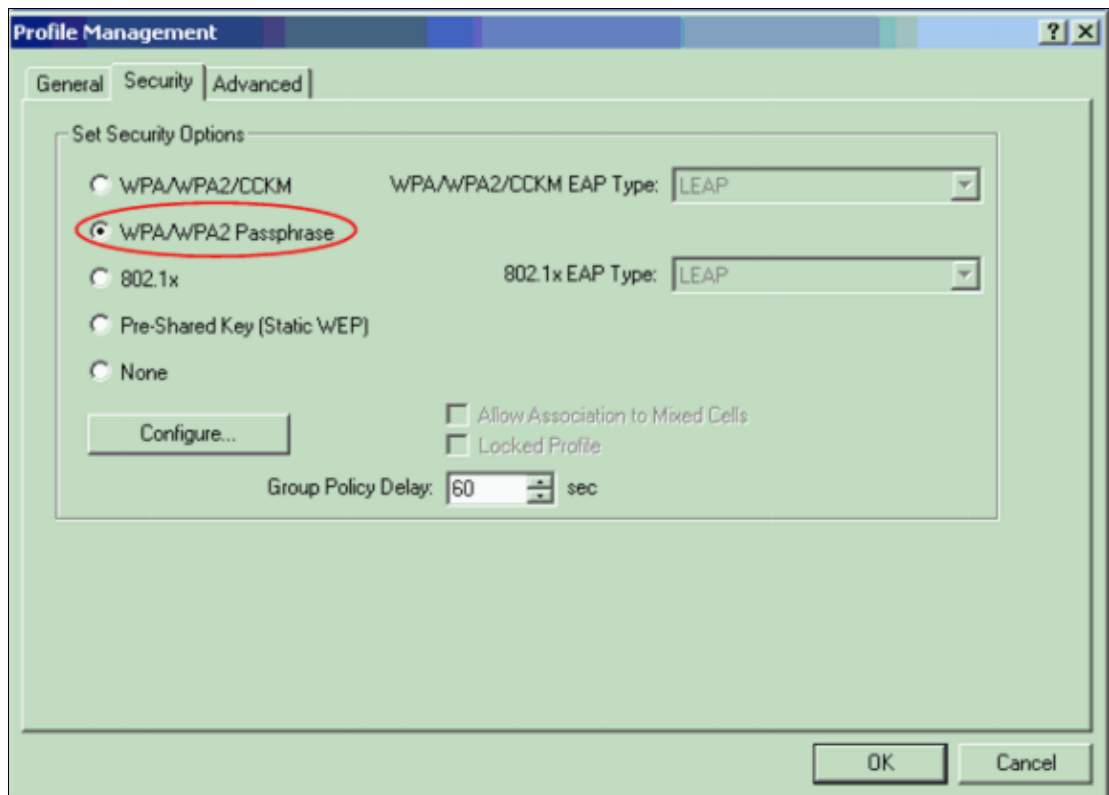


The screenshot shows a 'Profile Management' window with three tabs: 'General', 'Security', and 'Advanced'. The 'General' tab is selected. It contains two sections: 'Profile Settings' and 'Network Names'. In 'Profile Settings', 'Profile Name' is 'WPA2-PSK' and 'Client Name' is 'CODC3-LAPTOP'. In 'Network Names', 'SSID1' is 'WPA2PSK', and 'SSID2' and 'SSID3' are empty. At the bottom are 'OK' and 'Cancel' buttons.

Field	Value
Profile Name	WPA2-PSK
Client Name	CODC3-LAPTOP
SSID1	WPA2PSK
SSID2	
SSID3	

2. Click the **Security** tab and click **WPA/WPA2 Passphrase**.

This action enables either WPA PSK or WPA 2 PSK, whichever you configure on the AP.



3. Click **Configure**.

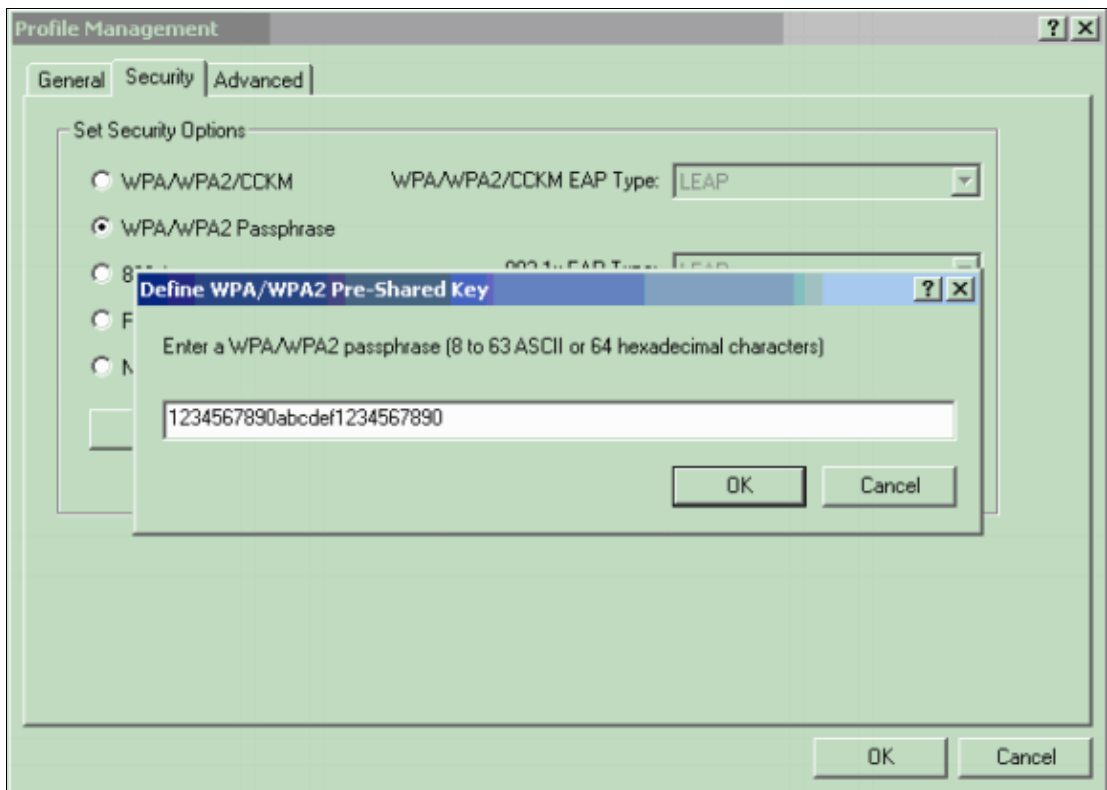
The Define WPA/WPA2 Pre-Shared Key window displays.

4. Obtain the WPA/WPA2 passphrase from your system administrator and enter the passphrase in the WPA/WPA2 passphrase field.

Obtain the passphrase for the AP in an infrastructure network or the passphrase for other clients in an ad hoc network.

Use these guidelines in order to enter a passphrase:

- ◆ WPA/WPA2 passphrases must contain between 8 and 63 ASCII text characters or 64 hexadecimal characters.
- ◆ Your client adapter WPA/WPA2 passphrase must match the passphrase of the AP with which you plan to communicate.



5. Click **OK** in order to save the passphrase and return to the Profile Management window.

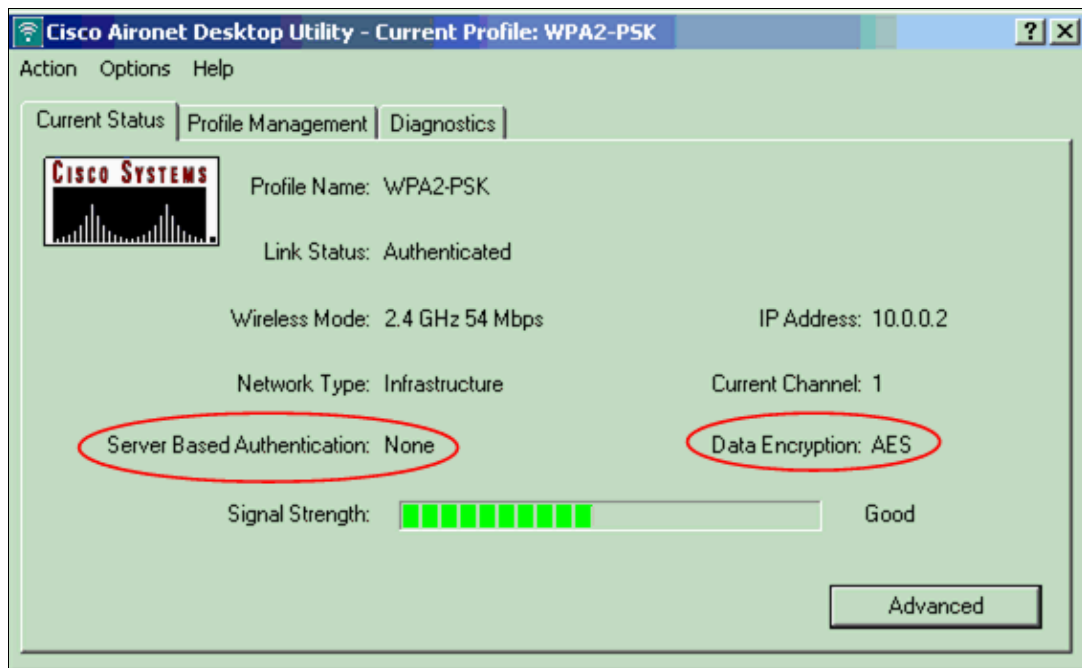
Verify

Use this section to confirm that your configuration works properly.

After the WPA 2 PSK profile is activated, the AP authenticates the client based on the WPA 2 passphrase (PSK) and provides access to the WLAN.

1. Check the ADU Current Status in order to verify successful authentication.

This window provides an example. The window shows that the encryption that is used is AES and that no server-based authentication is performed:



2. Check the AP/bridge Event Log in order to verify that the client has been authenticated successfully with WPA 2 PSK mode of authentication.



Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- [Configuring Cipher Suites and WEP](#)
- [Configuring Authentication Types](#)
- [WPA Configuration Overview](#)
- [WPA2 – Wi-Fi Protected Access 2](#)
- [Wireless Support Page](#)
- [Technical Support & Documentation – Cisco Systems](#)

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Updated: Jan 21, 2008

Document ID: 67134
