Configure Wireless Security Settings on a WAP

Introduction

Configuring the wireless security on your Wireless Access Point (WAP) is highly-essential to protect your wireless network from intruders that may compromise the privacy of your wireless devices as well as the data transmitting over your wireless network. You can configure the wireless security on your wireless network by setting up MAC Filter, Wi-Fi Protected Access (WPA/WPA2) Personal, and WPA/WPA2 Enterprise.

MAC Filtering is used to filter the wireless clients to access the network using their MAC addresses. A client list will be configured to either allow or block the addresses on the list to access the network, depending on your preference. To learn more about MAC Filtering, click here.

WPA/WPA2 Personal and WPA/WPA2 Enterprise are security protocols used to protect privacy by encrypting the transmitted data over the wireless network. WPA/WPA2 is compatible with IEEE standards 802.11E and 802.11i. Compared to Wired Equivalent Privacy (WEP) security protocol, WPA/WPA2 have improved the authentication and encryption features.

WPA/WPA2 Personal is for home use and WPA/WPA2 Enterprise is for business-scaled network. WPA/WPA2 Enterprise provides greater security and centralized control over the network compared to WPA/WPA2 Personal.

In this scenario, wireless security is going to be configured on the WAP to protect the network from intruders using WPA/WPA2 Personal and Enterprise settings.

Objective

This article aims to show you how to configure WPA/WPA2 Personal and Enterprise security protocols to improve the security and privacy of your wireless network.

Note: This article assumes that a Service Set Identifier (SSID) or a Wireless Local Area Network (WLAN) has already been created on your WAP.

Applicable Devices

- WAP100 Series
- WAP300 Series
- WAP500 Series

Software Version

- 1.0.2.14 – WAP131, WAP351
- 1.0.6.5 – WAP121, WAP321
- 1.3.0.4 – WAP371
- 1.1.0.7 – WAP150, WAP361

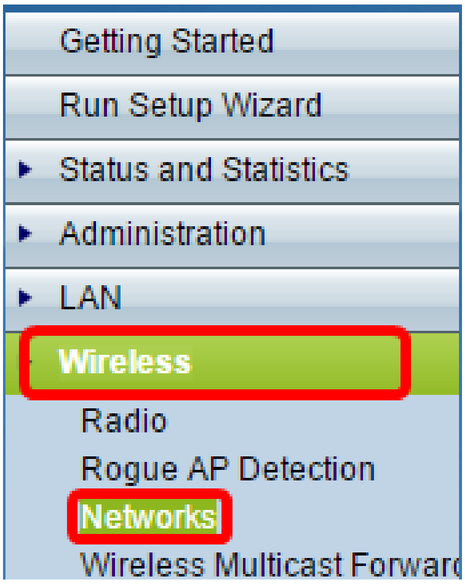
- 1.2.1.5 - WAP551, WAP561
- 1.0.1.11 – WAP571, WAP571E

Configure Wireless Security Settings

Configure WPA/WPA2 Personal

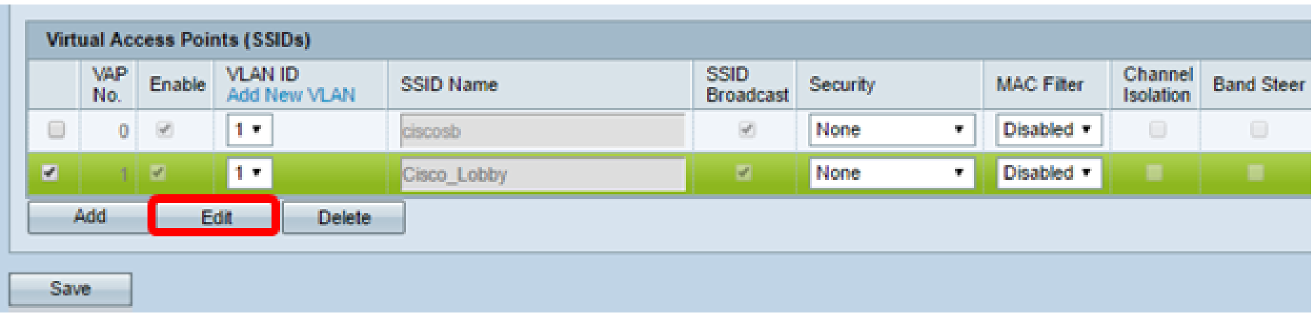
Step 1. Log in to the web-based utility of your access point and choose **Wireless > Networks**.

Note: In the image below, the web-based utility of the WAP361 is used as an example. Menu options may vary depending on the model of your device.



Step 2. Under the Virtual Access Points (SSIDs) area, check the check box of the SSID you want to configure and click **Edit**.

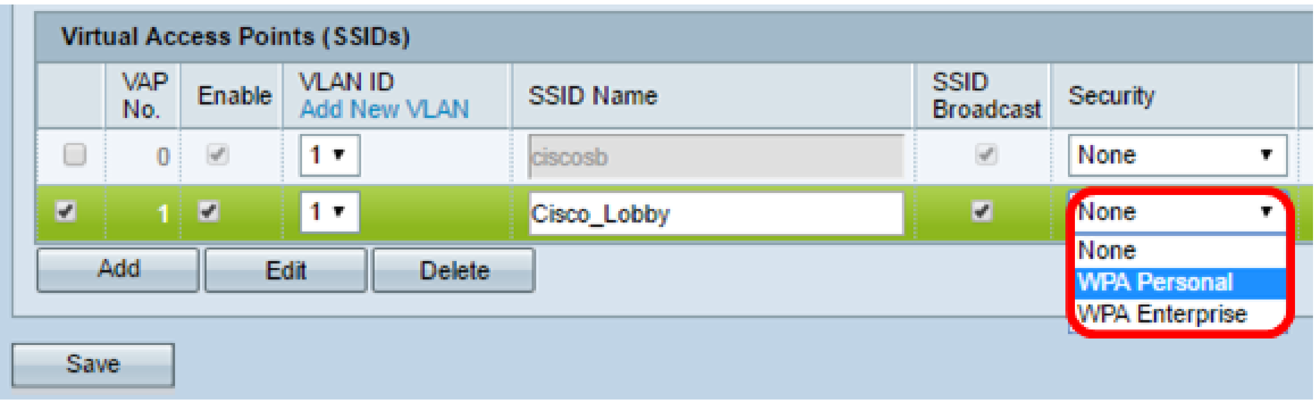
Note: In this example, VAP1 is chosen.



Virtual Access Points (SSIDs)

	VAP No.	Enable	VLAN ID Add New VLAN	SSID Name	SSID Broadcast	Security	MAC Filter	Channel Isolation	Band Steer
☐	0	☑	1	ciscosb	☑	None	Disabled	☐	☐
☑	1	☑	1	Cisco_Lobby	☑	None	Disabled	☐	☐

Step 3. Click **WPA Personal** from the Security drop-down list.



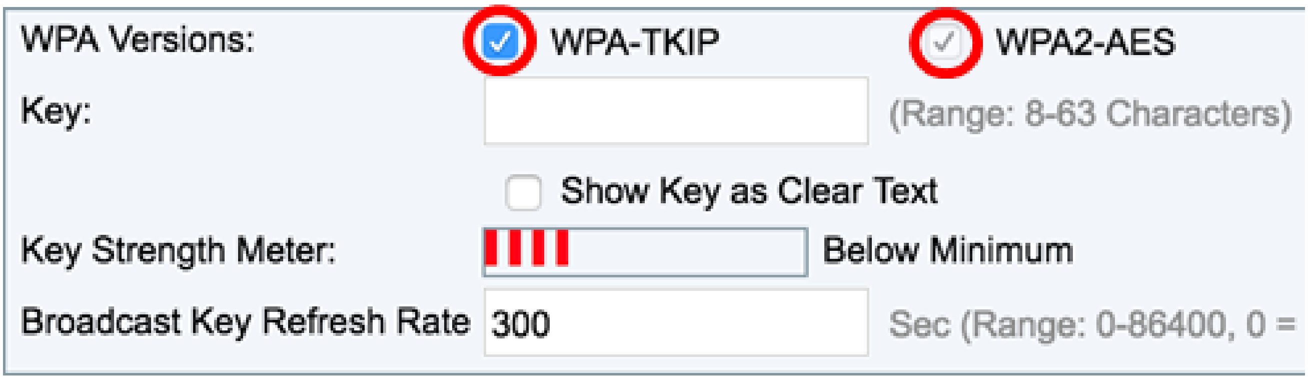
Virtual Access Points (SSIDs)

	VAP No.	Enable	VLAN ID Add New VLAN	SSID Name	SSID Broadcast	Security
☐	0	☑	1	ciscosb	☑	None
☑	1	☑	1	Cisco_Lobby	☑	None

Step 4. Choose the WPA version (WPA-TKIP or WPA2-AES) by checking the check box. Two may be chosen at once.

- WPA-TKIP — Wi-Fi Protected Access-Temporal Key Integrity Tool. The network has some client stations that only support the original WPA and TKIP security protocol. Note that choosing only WPA-TKIP for access point is not allowed as per the latest Wi-Fi Alliance requirement.
- WPA2-AES — Wi-Fi Protected Access-Advanced Encryption Standard. All client stations on the network support WPA2 and AES-CCMP cipher/security protocol. This WPA version provides the best security per IEEE 802.11i standard. As per the latest Wi-Fi Alliance requirement, the WAP has to support this mode all the time.

Note: For this example, both check boxes are checked.



WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

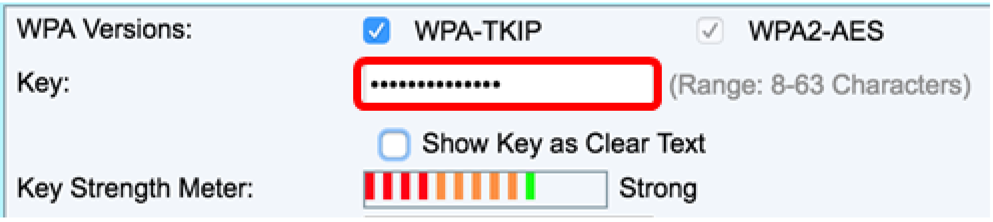
Key: (Range: 8-63 Characters)

☐ Show Key as Clear Text

Key Strength Meter: Below Minimum

Broadcast Key Refresh Rate 300 Sec (Range: 0-86400, 0 =

Step 5. Create a password consisting of 8-63 characters and enter it in the *Key* field.



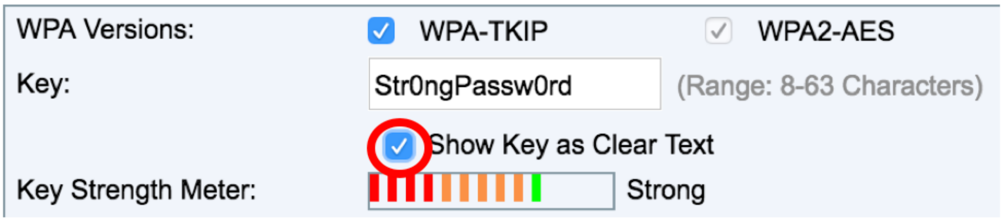
WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

Key: •••••••••••••• (Range: 8-63 Characters)

☐ Show Key as Clear Text

Key Strength Meter: Strong

Note: You can check the **Show Key as Clear Text** box to show the password you created.



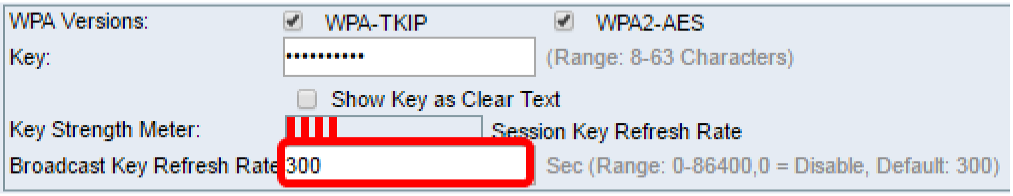
WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

Key: Str0ngPassw0rd (Range: 8-63 Characters)

☑ Show Key as Clear Text

Key Strength Meter: Strong

Step 6. (Optional) In the *Broadcast Key Refresh Rate* field, enter a value or the interval at which the broadcast (group) key is refreshed for clients associated with this VAP. The default is 300 seconds and the valid range is from 0 to 86400 seconds. A value of 0 indicates that the broadcast key is not refreshed.



WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

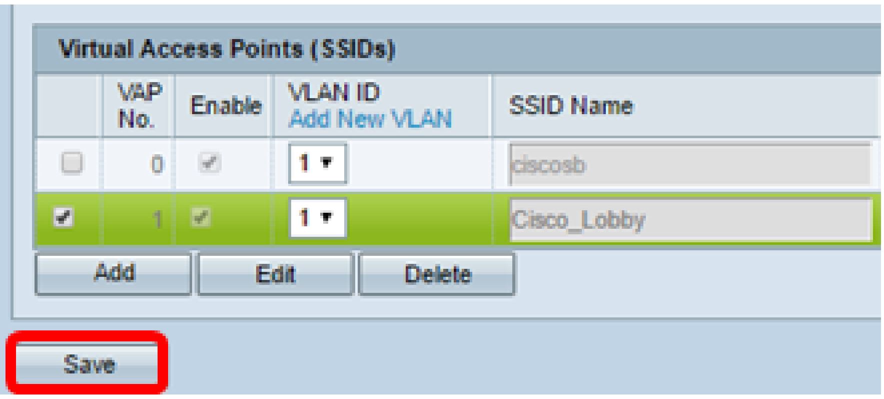
Key: •••••••••• (Range: 8-63 Characters)

□ Show Key as Clear Text

Key Strength Meter: Session Key Refresh Rate

Broadcast Key Refresh Rate 300 Sec (Range: 0-86400,0 = Disable, Default: 300)

Step 7. Click **Save**.



Virtual Access Points (SSIDs)

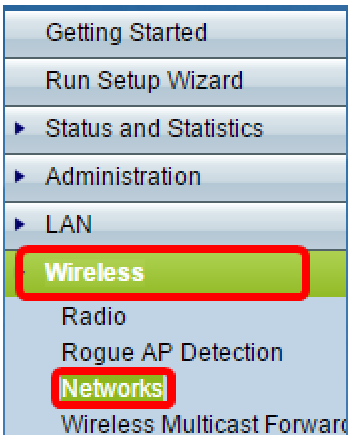
	VAP No.	Enable	VLAN ID Add New VLAN	SSID Name
□	0	☑	1	ciscosb
☑	1	☑	1	Cisco_Lobby

You now have configured WPA Personal on your WAP.

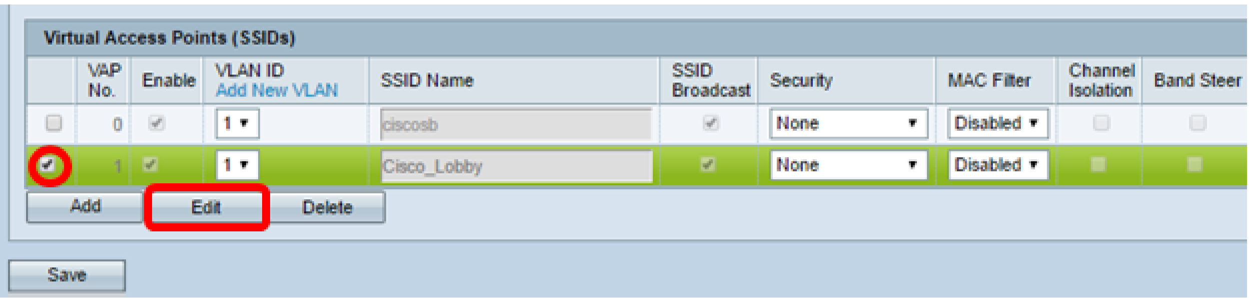
Configure WPA/WPA2 Enterprise

Step 1. Log in to the web-based utility of your access point and choose **Wireless > Networks**.

Note: In the image below, the web-based utility of the WAP361 is used as an example.



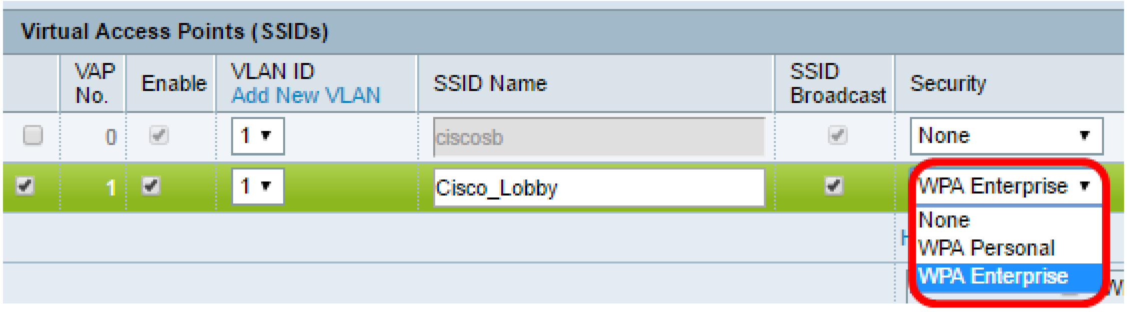
Step 2. Under the Virtual Access Points (SSIDs) area, check the SSID you want to configure and click the **Edit** button below it.



Virtual Access Points (SSIDs)

	VAP No.	Enable	VLAN ID Add New VLAN	SSID Name	SSID Broadcast	Security	MAC Filter	Channel Isolation	Band Steer
□	0	☑	1 ▾	ciscosb	☑	None ▾	Disabled ▾	□	□
☑	1	☑	1 ▾	Cisco_Lobby	☑	None ▾	Disabled ▾	□	□

Step 3. Choose **WPA Enterprise** from the Security drop-down list.



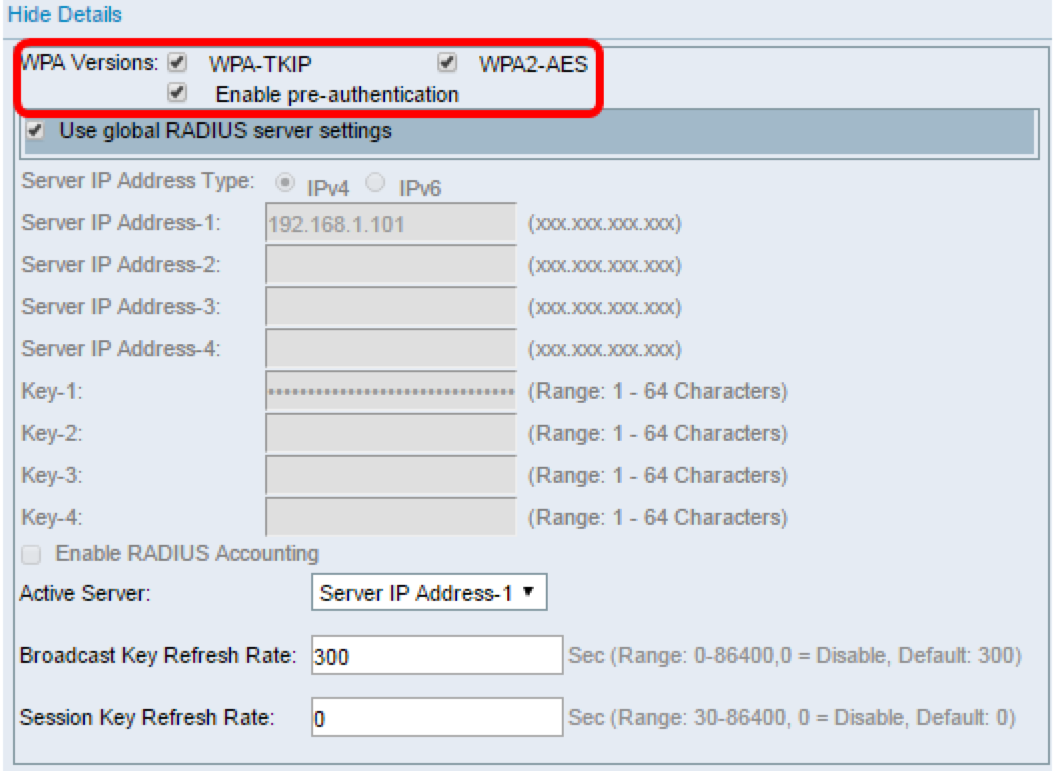
Virtual Access Points (SSIDs)

	VAP No.	Enable	VLAN ID Add New VLAN	SSID Name	SSID Broadcast	Security
□	0	☑	1 ▾	ciscosb	☑	None ▾
☑	1	☑	1 ▾	Cisco_Lobby	☑	WPA Enterprise ▾

Step 4. Choose the WPA version (WPA-TKIP, WPA2-AES, and Enable pre-authentication).

- Enable pre-authentication— If you choose WPA2-AES only or both WPA-TKIP and WPA2-AES as the WPA version, you can enable pre-authentication for the WPA2-AES clients. Check this option if you want the WPA2 wireless clients to send the pre-authentication packets. The pre-authentication information is relayed from the WAP device that the client is currently using to the target WAP device. Enabling this feature can help speed up the authentication for roaming clients who connect to multiple Access Points (AP).

Note: This option does not apply if you selected WPA-TKIP for WPA versions because the original WPA does not support this feature.



Hide Details

WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

☑ Enable pre-authentication

☑ Use global RADIUS server settings

Server IP Address Type: ● IPv4 ○ IPv6

Server IP Address-1:	192.168.1.101	(xxx.xxx.xxx.xxx)
Server IP Address-2:		(xxx.xxx.xxx.xxx)
Server IP Address-3:		(xxx.xxx.xxx.xxx)
Server IP Address-4:		(xxx.xxx.xxx.xxx)
Key-1:	•••••••••••••••••••••••••••••••••••	(Range: 1 - 64 Characters)
Key-2:		(Range: 1 - 64 Characters)
Key-3:		(Range: 1 - 64 Characters)
Key-4:		(Range: 1 - 64 Characters)

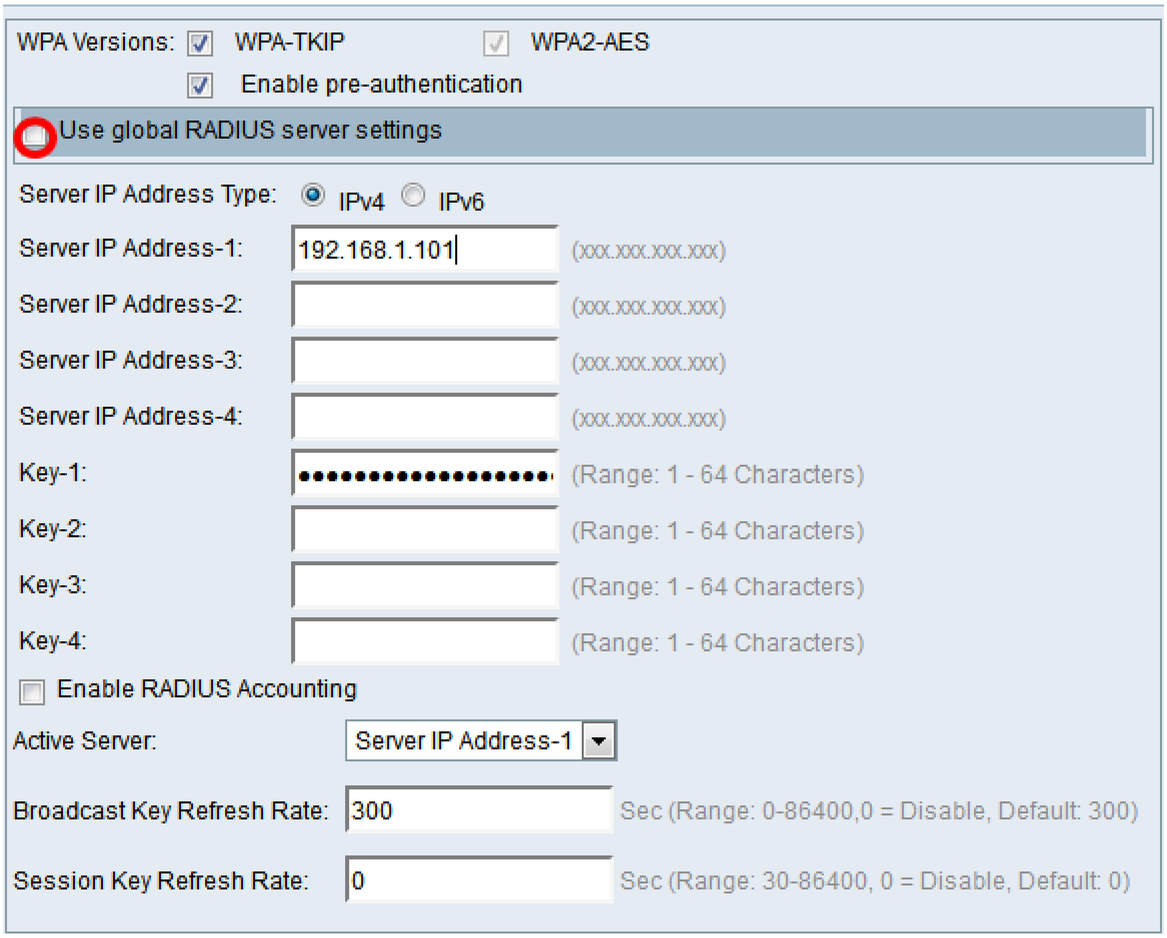
□ Enable RADIUS Accounting

Active Server: Server IP Address-1 ▾

Broadcast Key Refresh Rate: 300 Sec (Range: 0-86400,0 = Disable, Default: 300)

Session Key Refresh Rate: 0 Sec (Range: 30-86400, 0 = Disable, Default: 0)

Step 5. (Optional) Uncheck the **Use global RADIUS server settings** check box to edit the settings.



WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

☑ Enable pre-authentication

□ Use global RADIUS server settings

Server IP Address Type: ● IPv4 ○ IPv6

Server IP Address-1:	192.168.1.101	(xxx.xxx.xxx.xxx)
Server IP Address-2:		(xxx.xxx.xxx.xxx)
Server IP Address-3:		(xxx.xxx.xxx.xxx)
Server IP Address-4:		(xxx.xxx.xxx.xxx)
Key-1:	•••••••••••••••••••	(Range: 1 - 64 Characters)
Key-2:		(Range: 1 - 64 Characters)
Key-3:		(Range: 1 - 64 Characters)
Key-4:		(Range: 1 - 64 Characters)

□ Enable RADIUS Accounting

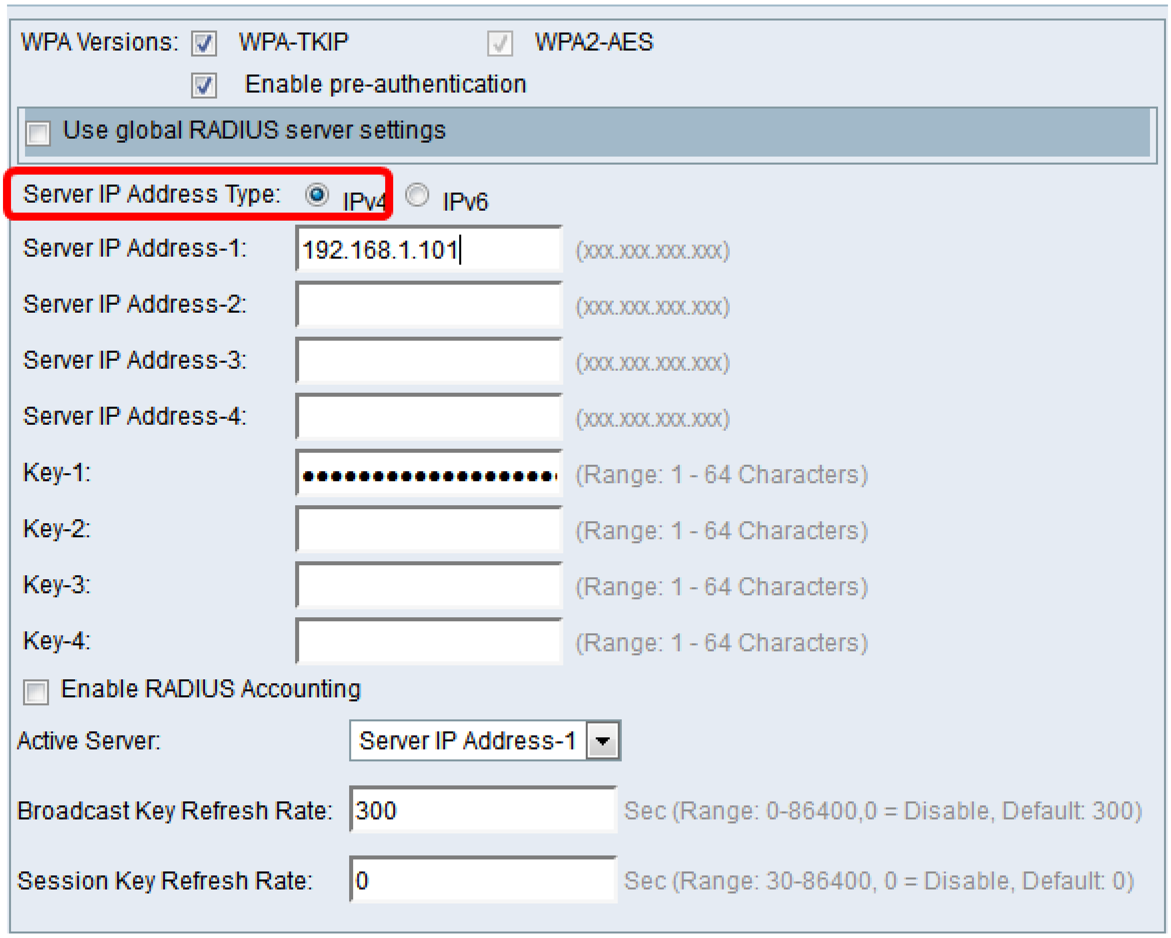
Active Server: Server IP Address-1 ▾

Broadcast Key Refresh Rate: 300 Sec (Range: 0-86400,0 = Disable, Default: 300)

Session Key Refresh Rate: 0 Sec (Range: 30-86400, 0 = Disable, Default: 0)

Step 6. (Optional) Click the radio button for the correct **Server IP Address Type**.

Note: For this example, IPv4 is chosen.



WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

☑ Enable pre-authentication

□ Use global RADIUS server settings

Server IP Address Type: ● IPv4 ○ IPv6

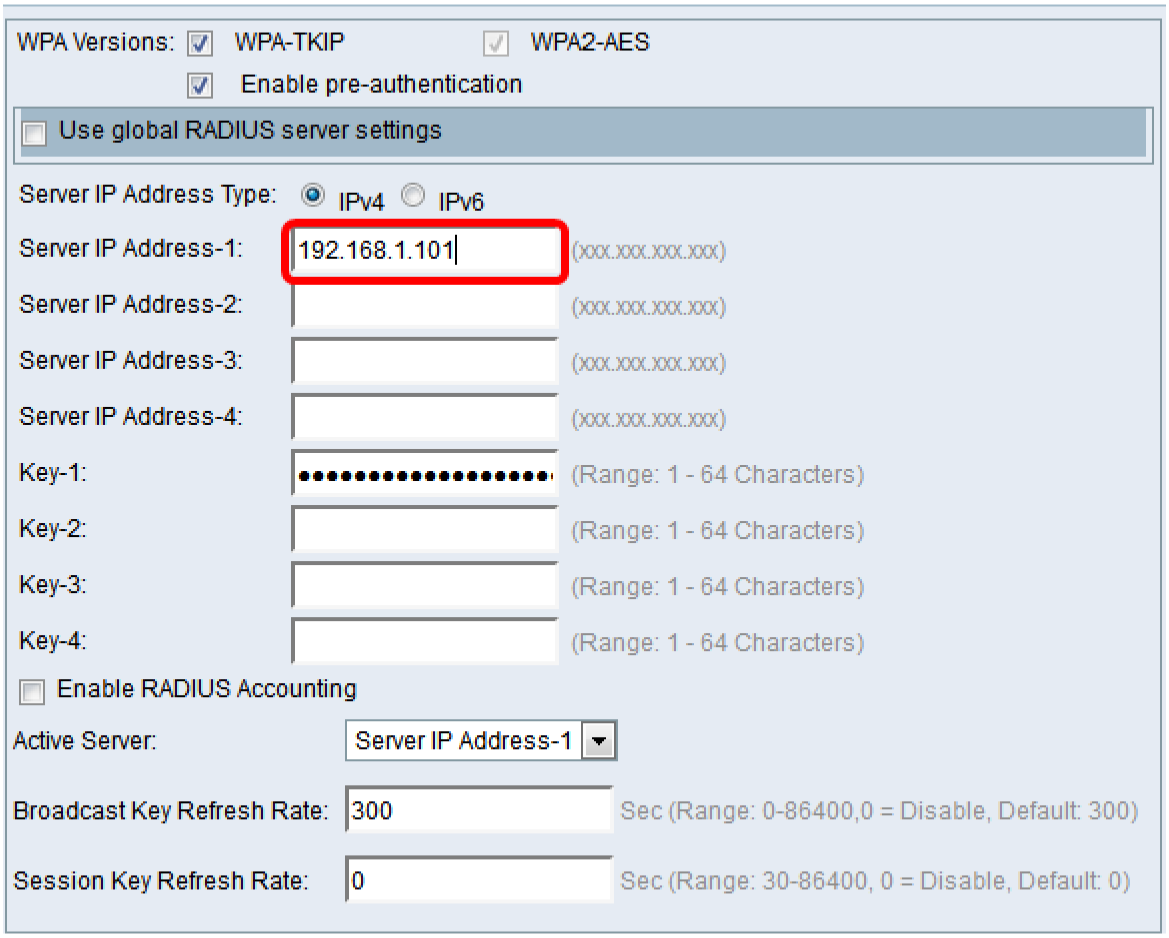
Server IP Address-1:	192.168.1.101	(xxx.xxx.xxx.xxx)
Server IP Address-2:		(xxx.xxx.xxx.xxx)
Server IP Address-3:		(xxx.xxx.xxx.xxx)
Server IP Address-4:		(xxx.xxx.xxx.xxx)
Key-1:	•••••••••••••••••••	(Range: 1 - 64 Characters)
Key-2:		(Range: 1 - 64 Characters)
Key-3:		(Range: 1 - 64 Characters)
Key-4:		(Range: 1 - 64 Characters)

□ Enable RADIUS Accounting

Active Server:	Server IP Address-1	
Broadcast Key Refresh Rate:	300	Sec (Range: 0-86400,0 = Disable, Default: 300)
Session Key Refresh Rate:	0	Sec (Range: 30-86400, 0 = Disable, Default: 0)

Step 7. Enter the IP address of the RADIUS server in the *Server IP Address* field.

Note: For this example 192.168.1.101 is used.



WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

☑ Enable pre-authentication

□ Use global RADIUS server settings

Server IP Address Type: ● IPv4 ○ IPv6

Server IP Address-1: 192.168.1.101 (xxx.xxx.xxx.xxx)

Server IP Address-2: (xxx.xxx.xxx.xxx)

Server IP Address-3: (xxx.xxx.xxx.xxx)

Server IP Address-4: (xxx.xxx.xxx.xxx)

Key-1: •••••••••••••••••••• (Range: 1 - 64 Characters)

Key-2: (Range: 1 - 64 Characters)

Key-3: (Range: 1 - 64 Characters)

Key-4: (Range: 1 - 64 Characters)

□ Enable RADIUS Accounting

Active Server: Server IP Address-1

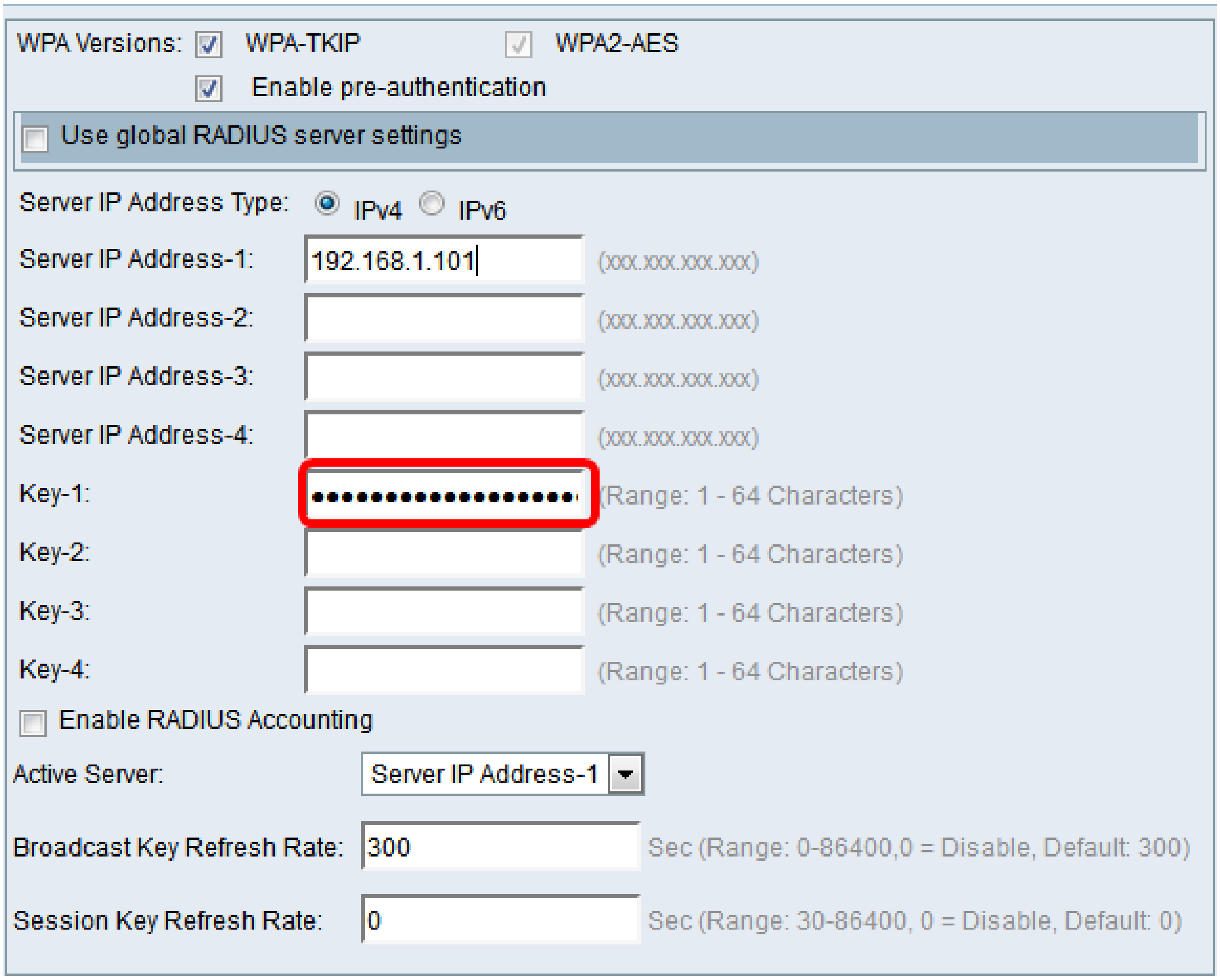
Broadcast Key Refresh Rate: 300 Sec (Range: 0-86400,0 = Disable, Default: 300)

Session Key Refresh Rate: 0 Sec (Range: 30-86400, 0 = Disable, Default: 0)

Step 8. In the *Key* field, enter the password key corresponding to your RADIUS server that the WAP uses to authenticate to the RADIUS server. You can use from 1 to 64 standard alphanumeric and special characters.

Note: The keys are case-sensitive and must match the key configured on the RADIUS server.

Step 9. (Optional) Repeat Steps 7-8 for every RADIUS server in your network that you want the WAP to communicate with.



WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

☑ Enable pre-authentication

□ Use global RADIUS server settings

Server IP Address Type: ● IPv4 ○ IPv6

Server IP Address-1: 192.168.1.101 (xxx.xxx.xxx.xxx)

Server IP Address-2: (xxx.xxx.xxx.xxx)

Server IP Address-3: (xxx.xxx.xxx.xxx)

Server IP Address-4: (xxx.xxx.xxx.xxx)

Key-1: ••••••••••••••••••• (Range: 1 - 64 Characters)

Key-2: (Range: 1 - 64 Characters)

Key-3: (Range: 1 - 64 Characters)

Key-4: (Range: 1 - 64 Characters)

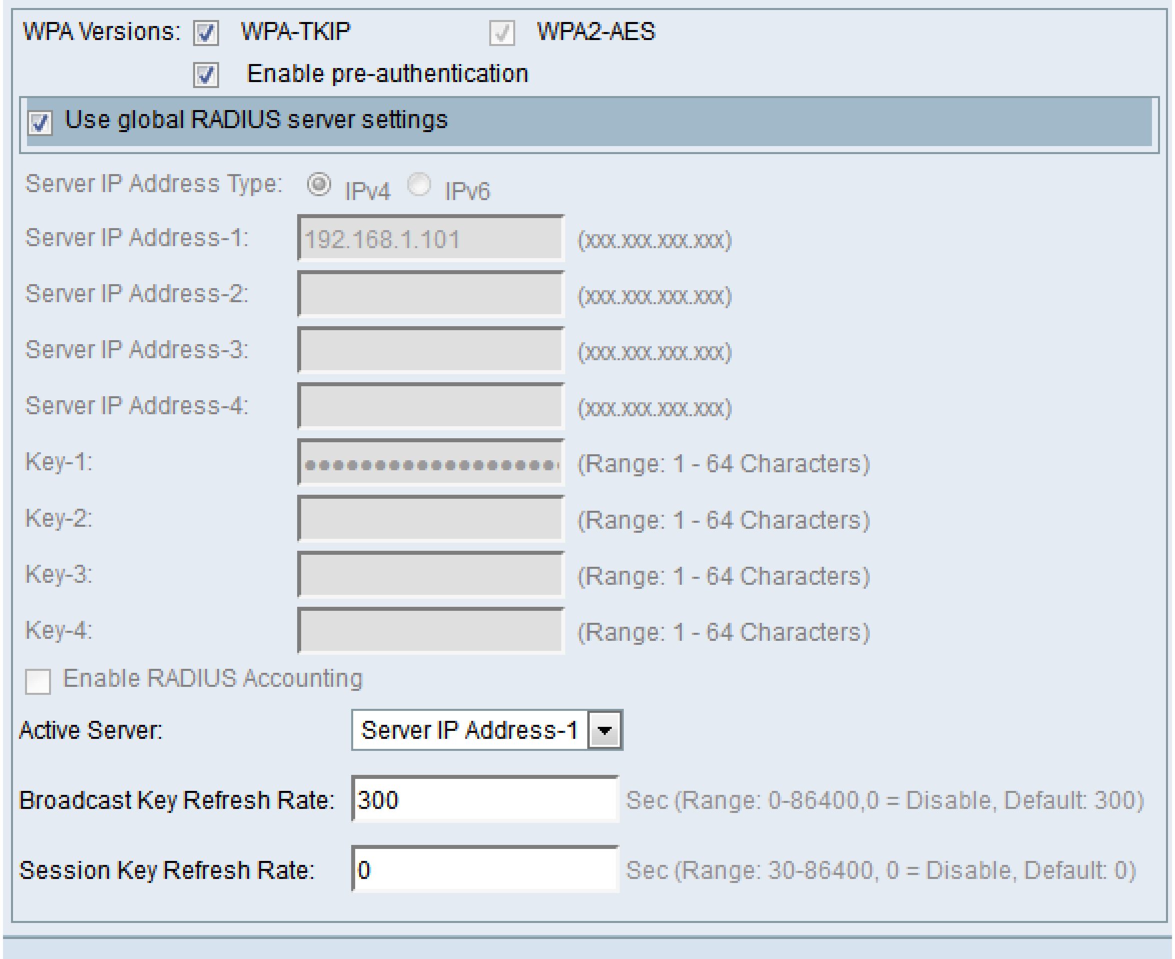
□ Enable RADIUS Accounting

Active Server: Server IP Address-1

Broadcast Key Refresh Rate: 300 Sec (Range: 0-86400,0 = Disable, Default: 300)

Session Key Refresh Rate: 0 Sec (Range: 30-86400, 0 = Disable, Default: 0)

Step 10. (Optional) Check the **EnableRADIUS Accounting** check box to enable tracking and measuring of the resources a user has consumed (system time, the amount of data transmitted). Enabling this feature will allow RADIUS accounting for both the primary and backup servers.



WPA Versions: ☑ WPA-TKIP ☑ WPA2-AES

☑ Enable pre-authentication

☑ Use global RADIUS server settings

Server IP Address Type: ● IPv4 ○ IPv6

Server IP Address-1: 192.168.1.101 (xxx.xxx.xxx.xxx)

Server IP Address-2: (xxx.xxx.xxx.xxx)

Server IP Address-3: (xxx.xxx.xxx.xxx)

Server IP Address-4: (xxx.xxx.xxx.xxx)

Key-1: •••••••••••••••••• (Range: 1 - 64 Characters)

Key-2: (Range: 1 - 64 Characters)

Key-3: (Range: 1 - 64 Characters)

Key-4: (Range: 1 - 64 Characters)

□ Enable RADIUS Accounting

Active Server: Server IP Address-1

Broadcast Key Refresh Rate: 300 Sec (Range: 0-86400,0 = Disable, Default: 300)

Session Key Refresh Rate: 0 Sec (Range: 30-86400, 0 = Disable, Default: 0)

Step 11. Click Save.

You now have successfully configured WPA/WPA2 Enterprise security on your WAP.