



Configuring a Wireless LAN Connection

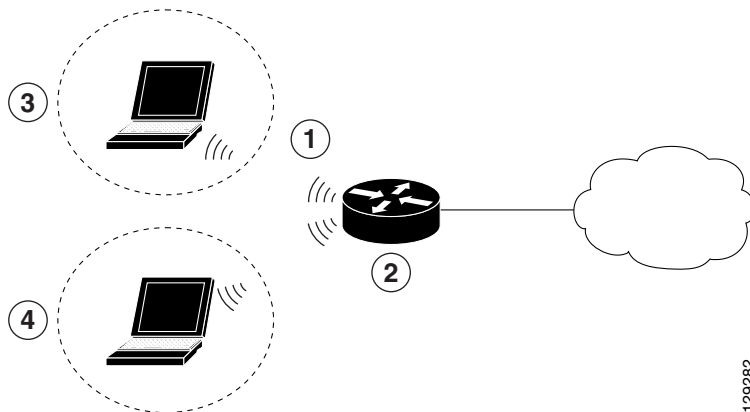
The Cisco 1800 series integrated services fixed-configuration routers support a secure, affordable, and easy-to-use wireless LAN solution that combines mobility and flexibility with the enterprise-class features required by networking professionals. With a management system based on Cisco IOS software, the Cisco routers act as access points, and are Wi-Fi certified, IEEE 802.11 a/b/g-compliant wireless LAN transceivers.

You can configure and monitor the routers using the command-line interface (CLI), the browser-based management system, or Simple Network Management Protocol (SNMP). This chapter describes how to configure the router using the CLI. Use the **interface dot11radio** global configuration CLI command to place the device into radio configuration mode.

See the [Cisco Access Router Wireless Configuration Guide](#) for more detailed information about configuring these Cisco routers in a wireless LAN application.

Figure 9-1 shows a wireless network deployment.

Figure 9-1 Sample Wireless LAN



1	Wireless LAN (with multiple networked devices)
2	Cisco 1800 series integrated services router connected to the Internet
3	VLAN 1
4	VLAN 2

In the configuration example that follows, a remote user is accessing the Cisco 1800 series integrated services router using a wireless connection. Each remote user has his own VLAN.

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Configuration Tasks

Perform the following tasks to configure this network scenario:

- [Configure the Root Radio Station](#)
- [Configure Bridging on VLANs](#)
- [Configure Radio Station Subinterfaces](#)

An example showing the results of these configuration tasks is shown in the section “[Configuration Example](#).”



Note

The procedures in this chapter assume that you have already configured basic router features as well as PPPoE or PPPoA with NAT. If you have not performed these configurations tasks, see [Chapter 1, “Basic Router Configuration,”](#) [Chapter 3, “Configuring PPP over Ethernet with NAT,”](#) and [Chapter 4, “Configuring PPP over ATM with NAT,”](#) as appropriate for your router. You may have also configured DHCP, VLANs, and secure tunnels.

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Configure the Root Radio Station

Perform these steps to create and configure the root radio station for your wireless LAN, beginning in global configuration mode:

	Command	Purpose
Step 1	interface <i>name number</i> Example: Router(config)# interface dot11radio 0 Router(config-if)#	Enters interface configuration mode for the specified wireless interface.
Step 2	broadcast-key [[vlan <i>vlan-id</i>] change <i>secs</i>] [membership-termination] [capability-change] Example: Router(config-if)# broadcast-key vlan 1 change 45 Router(config-if)#	Specifies the time interval (in seconds) between rotations of the broadcast encryption key used for clients. Note Client devices using static Wired Equivalent Privacy (WEP) cannot use the access point when you enable broadcast key rotation—only wireless client devices using 802.1x authentication (such as Light Extensible Authentication Protocol [LEAP], Extensible Authentication Protocol-Transport Layer Security [EAP-TLS], or Protected Extensible Authentication Protocol [PEAP]) can use the access point. Note This command is not supported on bridges. See the Cisco IOS Commands for Access Points and Bridges document for more details.
Step 3	encryption <i>method algorithm key</i> Example: Router(config-if)# encryption vlan 1 mode ciphers tkip Router(config-if)#	Specifies the encryption method, algorithm, and key used to access the wireless interface. The example uses the VLAN with optional encryption method of data ciphers.
Step 4	ssid <i>name</i> Example: Router(config-if)# ssid cisco Router(config-if-ssid)#	Creates a Service Set ID (SSID), the public name of a wireless network. Note All of the wireless devices on a WLAN must employ the same SSID to communicate with each other.

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	Command	Purpose
Step 5	vlan <i>number</i> Example: Router(config-if-ssid)# vlan 1 Router(config-if-ssid)#	Binds the SSID with a VLAN.
Step 6	authentication <i>type</i> Example: Router(config-if-ssid)# authentication open Router(config-if-ssid)# authentication network-eap eap_methods Router(config-if-ssid)# authentication key-management wpa	Sets the permitted authentication methods for a user attempting access to the wireless LAN. More than one method can be specified, as shown in the example.
Step 7	exit Example: Router(config-if-ssid)# exit Router(config-if)#	Exits SSID configuration mode, and enters interface configuration mode for the wireless interface.
Step 8	speed <i>rate</i> Example: Router(config-if)# basic-1.0 basic-2.0 basic-5.5 6.0 9.0 basic-11.0 12.0 18.0 24.0 36.0 48.0 54.0 Router(config-if)#	(Optional) Specifies the required and allowed rates, in Mbps, for traffic over the wireless connection.
Step 9	rts [<i>retries</i> <i>threshold</i>] Example: Router(config-if)# rts threshold 2312 Router(config-if)#	(Optional) Specifies the Request to Send (RTS) threshold or the number of times to send a request before determining the wireless LAN is unreachable.
Step 10	power [<i>client</i> <i>local</i>] [cck [<i>number</i> maximum] ofdm [<i>number</i> maximum]] Example: Router(config-if)# power local cck 50 Router(config-if)# power local ofdm 30 Router(config-if)#	(Optional) Specifies the radio transmitter power level. See the Cisco Access Router Wireless Configuration Guide for available power level values.
Step 11	channel [<i>number</i> least-congested] Example: Router(config-if)# channel 2462 Router(config-if)#	(Optional) Specifies the channel on which communication occurs. See the Cisco Access Router Wireless Configuration Guide for available channel numbers.

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	Command	Purpose
Step 12	station-role [<i>repeater</i> <i>root</i>] Example: Router(config-if)# station-role root Router(config-if)#	(Optional) Specifies the role of this wireless interface. You must specify at least one root interface.
Step 13	exit Example: Router(config-if)# exit Router(config)#	Exits interface configuration mode, and enters global configuration mode.

Configure Bridging on VLANs

Perform these steps to configure integrated routing and bridging on VLANs, beginning in global configuration mode:

	Command or Action	Purpose
Step 1	bridge [<i>number</i> <i>crb</i> <i>irb</i> <i>mac-address-table</i>] Example: Router(config)# bridge irb Router(config)#	Specifies the type of bridging. The example specifies integrated routing and bridging.
Step 2	interface <i>name number</i> Example: Router(config)# interface vlan 1 Router(config)#	Enters interface configuration mode. We want to set up bridging on the VLANs, so the example enters the VLAN interface configuration mode.
Step 3	bridge-group <i>number</i> Example: Router(config)# bridge-group 1 Router(config)#	Assigns a bridge group to the interface.
Step 4	bridge-group <i>parameter</i> Example: Router(config)# bridge-group spanning-disabled Router(config)#	Sets other bridge parameters for the bridging interface.

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	Command or Action	Purpose
Step 5	interface <i>name number</i> Example: Router(config)# interface bvi 1 Router(config)#	Enters configuration mode for the virtual bridge interface.
Step 6	ip address <i>address mask</i> Example: Router(config)# ip address 10.0.1.1 255.255.255.0 Router(config)#	Specifies the address for the virtual bridge interface.

Repeat [Step 2](#) through [Step 6](#) above for each VLAN that requires a wireless interface.

Configure Radio Station Subinterfaces

Perform these steps to configure subinterfaces for each root station, beginning in global configuration mode:

	Command	Purpose
Step 1	interface <i>type number</i> Example: Router(config)# interface dot11radio 0.1 Router(config-subif)#	Enters subinterface configuration mode for the root station interface.
Step 2	description <i>string</i> Example: Router(config-subif)# description Cisco open Router(config-subif)#	Provides a description of the subinterface for the administrative user.
Step 3	encapsulation dot1q <i>vlanID</i> [native second-dot1q] Example: Router(config-subif)# encapsulation dot1q 1 native Router(config-subif)#	Enables IEEE 802.1q encapsulation on the specified subinterface.
Step 4	no cdp enable Example: Router(config-subif)# no cdp enable Router(config-subif)#	Disables the Cisco Discovery Protocol (CDP) on the wireless interface.

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	Command	Purpose
Step 5	bridge-group <i>number</i> Example: Router(config-subif)# bridge-group 1 Router(config-subif)#	Assigns a bridge group to the subinterface.
Step 6	exit Example: Router(config-subif)# exit Router(config)#	Exits subinterface configuration mode, and enters global configuration mode.

Repeat these steps to configure more subinterfaces, as needed.

Configuration Example

The following configuration example shows a portion of the configuration file for the wireless LAN scenario described in the preceding sections.

```

!
bridge irb
!
interface Dot11Radio0
no ip address
!
broadcast-key vlan 1 change 45
!
!
encryption vlan 1 mode ciphers tkip
!
ssid cisco
vlan 1
authentication open
authentication network-eap eap_methods
authentication key-management wpa
!
ssid ciscowep
vlan 2
authentication open
!
ssid ciscowpa
vlan 3
authentication open
!
speed basic-1.0 basic-2.0 basic-5.5 6.0 9.0 basic-11.0 12.0 18.0 24.0 36.0 48.0 54.0
rts threshold 2312
power local cck 50
power local ofdm 30
channel 2462
station-role root
!
interface Dot11Radio0.1
description Cisco Open
encapsulation dot1Q 1 native
no cdp enable

```

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```
bridge-group 1
bridge-group 1 subscriber-loop-control
bridge-group 1 spanning-disabled
bridge-group 1 block-unknown-source
no bridge-group 1 source-learning
no bridge-group 1 unicast-flooding
!
interface Dot11Radio0.2
encapsulation dot1Q 2
bridge-group 2
bridge-group 2 subscriber-loop-control
bridge-group 2 spanning-disabled
bridge-group 2 block-unknown-source
no bridge-group 2 source-learning
no bridge-group 2 unicast-flooding
!
interface Dot11Radio0.3
encapsulation dot1Q 3
bridge-group 3
bridge-group 3 subscriber-loop-control
bridge-group 3 spanning-disabled
bridge-group 3 block-unknown-source
no bridge-group 3 source-learning
no bridge-group 3 unicast-flooding
!
interface Vlan1
no ip address
bridge-group 1
bridge-group 1 spanning-disabled
!
interface Vlan2
no ip address
bridge-group 2
bridge-group 2 spanning-disabled
!
interface Vlan3
no ip address
bridge-group 3
bridge-group 3 spanning-disabled
!
interface BVI1
ip address 10.0.1.1 255.255.255.0
!
interface BVI2
ip address 10.0.2.1 255.255.255.0
!
interface BVI3
ip address 10.0.3.1 255.255.255.0
!
```