



## Lab 5.4.4 Configure Radio Interfaces through the GUI

Estimated Time: 20 minutes

Number of Team Members: Students will work in teams of two.

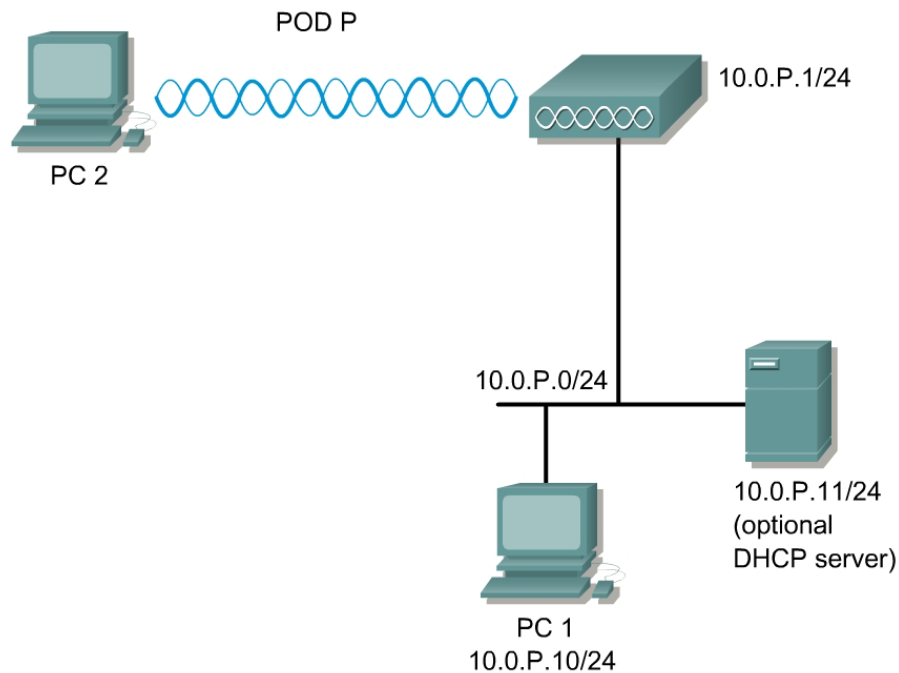
### Objective

In this lab, the student will use the Radio 802.11b-setting page to enter basic channel and data rate information for the AP radio. The Radio 802.11b page will also be accessed to enter basic settings for the transmit power, antennas, and operating thresholds on the AP.

### Scenario

This section describes how to configure the AP radio. Use the AP Radio interface pages in the management system will be used to set the radio configuration.

### Topology



## Preparation


The student PC should be connected to the AP through an isolated wired network or crossover cable. The AP should be set to factory defaults. A DHCP service may be used to assign an address to the AP.

<u>Team</u>	<u>AP Name</u>	<u>SSID</u>	<u>Address</u>
1	Pod1	AP1	10.0.1.1/24
2	Pod2	AP2	10.0.2.1/24

## Tools and Resources

- Cisco APs
- PCs with properly installed Cisco wireless client adapters and utility.
- Several PCs on the wired network that can maintain connectivity to the configuration management pages on the AP.

## Step 1 Radio Interface information



### Cisco 1200 Access Point

HOME

EXPRESS SET-UP

NETWORK MAP +

ASSOCIATION

NETWORK INTERFACES +

SECURITY +

SERVICES +

WIRELESS SERVICES +

SYSTEM SOFTWARE +

EVENT LOG +

Hostname ap

ap uptime is 17 minutes

Home: Summary Status

Association

Clients: 0Repeaters: 0

Network Identity

IP Address10.0.1.1

MAC Address000b.fd4a.700c

Network Interfaces

Interface	MAC Address	Transmission Rate
↑ FastEthernet	000b.fd4a.700c	100Mb/s
↑ Radio0-802.11B	0007.85b3.c270	11.0Mb/s
↑ Radio1-802.11A	000b.fd01.05b7	54.0Mb/s

Event Log

Time	Severity	Description
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Refresh

- Open a browser and type in the IP address of the AP that was assigned in the Preparation section of this lab. Log into the AP by pressing TAB while in the username box then type in the default password "Cisco".

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**Note** The password is case sensitive. This should open the AP **HOME** page.

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- b. Obtain the AP information from this page. It is important for the network administrator to be familiar with the settings on the network equipment.
- c. Are there any **Clients** or **Repeaters** connected to the AP? What is the number for each?

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- d. What is the **IP Address** of the AP?

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- e. What **Network Interfaces** are available?

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- f. What is the **Ethernet/FastEthernet** MAC address?

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- g. If available, what is the Radio 802.11b MAC address?

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- h. If available, what is the Radio 802.11b Transmission rate?

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- i. If available, what is the Radio 802.11a MAC address?

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- j. If available, what is the Radio 802.11a Transmission rate?

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## Step 2 Network Interface settings

The screenshot shows the Cisco 1200 Access Point configuration interface. The top navigation bar includes tabs for RADIO0-802.11B STATUS, DETAILED STATUS, SETTINGS, and CARRIER BUSY TEST. The left sidebar contains a menu with options like HOME, EXPRESS SET-UP, NETWORK MAP, ASSOCIATION, NETWORK INTERFACES, IP Address, FastEthernet, Radio0-802.11B, Radio1-802.11A, SECURITY, SERVICES, WIRELESS SERVICES, SYSTEM SOFTWARE, and EVENT LOG. The main content area is titled 'Network Interfaces: Radio0-802.11B Settings'. It displays the following settings:

- Hostname: ap (uptime is 11 minutes)
- Enable Radio: ☒ Enable, ☐ Disable
- Current Status (Software/Hardware): Enabled ↑, Up ↑
- Role in Radio Network: ☒ Access Point Root (Fallback to Radio Island), ☐ Access Point Root (Fallback to Radio Shutdown), ☐ Access Point Root (Fallback to Repeater), ☐ Repeater Non-Root
- Data Rates: Best Range, Best Throughput
- Data Rates table:

Data Rates	Require	Enable	Disable
1.0Mb/sec	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.0Mb/sec	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.5Mb/sec	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.0Mb/sec	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

If available, click on the **NETWORK INTERFACES>Radio0-802.11B**. Next, click the **SETTINGS** tab. Record the following settings from the Radio Interface page:

- a. What is the Enable Radio setting and Current Status?

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- b. What is the role of this AP?

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- c. What speeds are configured for the data rates?

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- d. What is the Enable Radio setting and Current Status?

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- e. What is the role of this AP?

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- f. What speeds are configured for the data rates?

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Scroll down the Network Interface Settings page to view the information displayed in the figure for this step.

Transmitter Power (mW): ☐ 1 ☐ 5 ☐ 20 ☐ 30 ☐ 50 ☐ 100 ☒ Max

Limit Client Power (mW): ☐ 1 ☐ 5 ☐ 20 ☐ 30 ☐ 50 ☐ 100 ☒ Max

Default Radio Channel: Least Congested Frequency Channel 1 2412 Mhz

Least Congested Channel Search:  
(Use Only Selected Channels)

Channel 1 - 2412 MHz  
Channel 2 - 2417 MHz  
Channel 3 - 2422 MHz  
Channel 4 - 2427 MHz  
Channel 5 - 2432 MHz  
Channel 6 - 2437 MHz  
Channel 7 - 2442 MHz  
Channel 8 - 2447 MHz  
Channel 9 - 2452 MHz  
Channel 10 - 2457 MHz  
Channel 11 - 2462 MHz

World Mode  
Multi-Domain Operation: ☐ Enable ☒ Disable

Radio Preamble ☒ Short ☐ Long

Receive Antenna: ☒ Diversity ☐ Left ☐ Right

Transmit Antenna: ☒ Diversity ☐ Left ☐ Right

Aironet Extensions: ☒ Enable ☐ Disable

g. What is the Transmitter Power setting?

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h. What is the Default Radio Channel?

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i. What are the other settings on this page? Repeat the **Network Interface Settings** steps for the Radio1-802.11A.

Network Interface Settings

### Step 3 Connect to the AP with a wireless PCI NIC

Using a laptop or desktop with a wireless adapter, connect to the correct AP. Make sure the wireless device is not connected by way of the wired network.

- Configure and select a profile to connect to the AP. Make sure the SSID is configured in the profile to match the AP.
- Configure a unique **Client Name** in the profile, such as a first initial last name of one of the team members
- Make sure to check or configure the TCP/IP settings of the laptop or desktop to connect to the proper IP network. If a DHCP server is running, configure TCP/IP to receive the address automatically, or configure static IP setting.
- Now check to see if the ACU icon in the system tray is green, which indicates a successful link to the AP. Double click on the icon to verify the correct **AP Name** and **AP IP Address**.



### Step 4 Association page

**Cisco 1200 Access Point**

Hostname ap ap uptime is 17 minutes

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**Association**

Clients: 0 Repeaters: 0

View: ☒ Client ☒ Repeater Apply

Radio802.11B						

Radio802.11A						

Refresh

- To check which clients are associated to this AP, go to the **ASSOCIATION** page and click on the Association button.
- Record the MAC Addresses of the devices associated to this AP:

MAC ADDRESS

- Test connectivity to other devices using ping, Telnet, http, and ftp. This will vary depending on the devices connected and configured on the wired network.

## Step 5 Advanced Radio settings

Scroll to the bottom of the Network Interface Settings page to view the information displayed in the figure for this step.

Ethernet Encapsulation Transform:	<input checked="" type="radio"/> RFC1042	<input type="radio"/> 802.1H	
Reliable Multicast to WGB:	<input checked="" type="radio"/> Disable	<input type="radio"/> Enable	
Public Secure Packet Forwarding:	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable	
Beacon Period:	<input type="text" value="100"/> (20-4000 Kusec)	Data Beacon Rate (DTIM):	<input type="text" value="2"/> (1-100)
Max. Data Retries:	<input type="text" value="32"/> (1-128)	RTS Max. Retries:	<input type="text" value="32"/> (1-128)
Fragmentation Threshold:	<input type="text" value="2346"/> (256-2346)	RTS Threshold:	<input type="text" value="2312"/> (0-2347)
Repeater Parent AP Timeout:	<input type="text" value="0"/> (0-65535 sec)		
Repeater Parent AP MAC 1 (optional):	<input type="text"/> (HHHH.HHHH.HHHH)		
Repeater Parent AP MAC 2 (optional):	<input type="text"/> (HHHH.HHHH.HHHH)		
Repeater Parent AP MAC 3 (optional):	<input type="text"/> (HHHH.HHHH.HHHH)		
Repeater Parent AP MAC 4 (optional):	<input type="text"/> (HHHH.HHHH.HHHH)		

Apply Cancel

- What is the Reliable Multicast to WGB setting? What wireless device does this setting pertain to?  
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- What is Public Secure Packet Forwarding setting? Why would this be enabled?  
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- What is the Beacon Period? What are the advantages and disadvantages of lowering or raising the value?  
\_\_\_\_\_
- What is the Data Beacon Rate (DTIM)? What are the advantages and disadvantages of lowering or raising the value?  
\_\_\_\_\_
- What is the Max Data Retries setting? What are the advantages and disadvantages of lowering or raising the value?  
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- f. What is RTS Max Retries setting? What are the advantages and disadvantages of lowering or raising the value?

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- g. What is the Fragmentation Threshold? What are the units for this value?

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- h. What is the RTS Threshold setting?

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- i. What is Repeater Parent AP timeout?

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- j. What is Repeater Parent AP MAC 1 (optional)?

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- k. What is Repeater Parent AP MAC 2 (optional)?

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- l. What is Repeater Parent AP MAC 3 (optional)?

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- m. What is Repeater Parent AP MAC 4 (optional)?

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### Step 6 Make changes to the radio interface of the AP (Optional)

Make changes to the radio interface. Perform the setting changes through the web browser interface. As changes are made, use several of the Cisco Aironet client utility tools to test various settings on the radio interface. Take care to make one change at a time and monitor the performance change in either of the site survey or link status meter tools.

Make a change to the APs receive and transmit antenna settings. By default they are set to diversity. Change the setting to left or right. Have your lab partner move about the site with the laptop and see if there is any degradation or improvement in the radio signal.

- a. Which antenna setting had the best performance?

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- b. Which antenna setting had the worst performance?

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**Note** If there is delay caused by congestion, change the channel settings and see if performance is improved. Remember, on the 802.11b, there are only three non-overlapping channels (1, 6, and 11) that can be used in the BSS/ESS topology that this lab is creating. Coordinate channel settings with other team members or set the AP to seek a less congested channel.

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c. Which channel setting had the best performance?

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d. Which channel setting had the worst performance?

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e. Change the Transmitter Power settings and make note of any data rate performance or range. Was there any enhancement or degradation in the performance of the AP? With the instructors permission, see how far the wireless client can roam with the lowest/highest setting.

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f. If there was, which Transmitter Power setting gave the furthest range or strongest signal?

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g. Which Transmitter Power setting gave the fastest data rate?

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