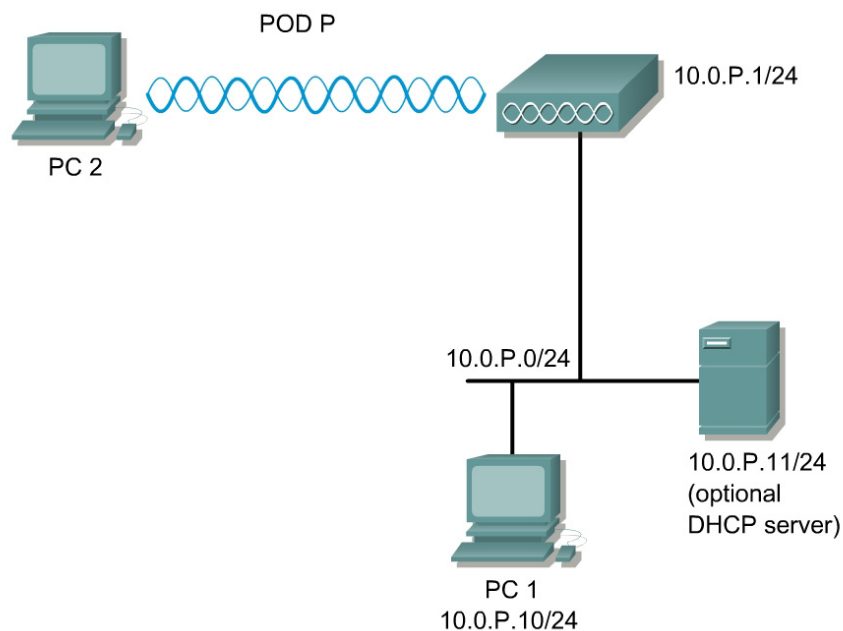


Lab 3 Configure Ethernet/FastEthernet Interface and Radio Interface through the IOS CLI

Scenario

This section describes how to configure the AP radio Ethernet FastEthernet interfaces to lock in speed and duplex settings and enter basic channel and data rate information for the AP radio.

Topology



Preparation

Below are the basic settings to be applied 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

- One Cisco 1200 AP
- x
- x PCs with properly installed Cisco wireless client adapters and utility.
- x Several PCs on the wired network that can maintain connectivity to the configuration management pages on the AP.

Command	Description
configure terminal	enter global configuration mode
interface fastEthernet <i>interface number</i>	enter the device Ethernet/fastEthernet interface
duplex <i>auto/full/half</i>	set the role of the AP device
show interfaces <cr>/<i>interface number</i>	View the interface(s) detailed status
show ip interface brief	View a brief status of IP interfaces
show running-config	View the running configuration
speed <i>10/100/auto</i>	set the data rate of the AP
configure terminal	enter global configuration mode
interface dot11radio	enter the device radio interface. The number is 0 for
number	11b and 1 for 11a. Depending on the installed radio(s), one or both will be available.
station-role	set the role of the AP device
speed basic	set the data rate of the AP
power client	set the power level output of the AP
channel	set the channel of the AP
world-mode	set world-mode on the AP
preamble	set the preamble
antenna	set the receive or transmit antenna

Step 1 Configure Ethernet/FastEthernet Interfaces through IOS CLI

Typically, an IP address is configured on the BVI interface only. However, there are some other settings which should be set on the FastEthernet interface. Below is a command table which will be used in this step.

Console into the AP

- a. Beginning in configuration mode. Follow these steps to set the AP Ethernet/FastEthernet settings:

PodP(config)#**interface fastEthernet 0**

- b. Now see what duplex settings are possible.

PodP(config-if)#**duplex ?**

auto Enable AUTO duplex configuration

full Force full duplex operation
half Force half-duplex operation
c. Set the duplex to full

PodP(config-if)#**duplex full**

d. Now see what speed settings are possible.

PodP(config-if)# **speed ?**

10 Force 10 Mbps operation

100 Force 100 Mbps operation

auto Enable AUTO speed configuration

e. Now set the speed to 100 Mbps.

PodP(config-if)#**speed 100**

PodP(config-if)#**end**

f. Check the running configuration.

PodP#**show running-config**

g. Display the FastEthernet interface status

PodP#**show interfaces fastEthernet 0**

i. Now check the detailed status of all the interfaces

PodP#**show ip interface brief**

PodP#**show interfaces**

Step 2 View the available 802.11b radio settings

The AP radio has many available settings.

Use the following commands to view the available commands for the 802.11b radio:

PodP(config)#**interface dot11radio 0**

PodP(config-if)#?

antenna	dot11 radio antenna setting
beacon	dot11 radio beacon
channel	Set the radio frequency
description	Interface specific description
dot11	IEEE 802.11 config interface commands
dot1x	IEEE 802.1X subsystem
exit	Exit from interface configuration mode

fair-queue	Enable Fair Queuing on an Interface
mac-address	Manually set interface MAC address
power	Set radio transmitter power levels
preamble-short	Use 802.11 short radio preamble
rts	dot11 Request To Send
shutdown	Shutdown the selected interface
speed	Set allowed radio bit rates
ssid	Configure radio service set parameters
station-role	role of the radio
world-mode	Dot11 radio world mode

Notice that there are many more configuration settings available.

Step 3 Configuring the role in radio network

To configure the AP as a root device that is connected to the wired LAN or as a repeater (non-root) device that is not connected to the wired LAN.

View the available station roles. Then configure the AP as a root AP:

```
PodP(config-if)#station-role ?
repeater Repeater access point
root Root access point
```

```
PodP(config-if)#station-role root
```

Step 4 Configuring radio data rates

To use the data rate settings to choose the data rates the AP uses for data transmission. The rates are expressed in megabits per second.

View the available speeds.

```
PodP(config-if)#speed ?
```

```
1.0          Allow 1 Mb/s rate
11.0         Allow 11 Mb/s rate
2.0          Allow 2 Mb/s rate
5.5          Allow 5.5 Mb/s rate
basic-1.0    Require 1 Mb/s rate
basic-11.0   Require 11 Mb/s rate
basic-2.0    Require 2 Mb/s rate
basic-5.5    Require 5.5 Mb/s rate
range        Set rates for best range
throughput   Set rates for best throughput
<cr>
```

```
PodP(config-if)#
```

Use the following commands to set up the AP for 11-Mbps service only:

```
PodP(config-if)#speed basic-11.0 1.0 2.0 5.5
```

Step 5 Configuring radio transmit power

The power level on client devices that associate to the AP and the AP radio power can be manually set. Use the help to view the power settings which can be configured.

```
PodP(config-if)#power ? client
```

Client radio transmitter power level local Local radio transmitter power level

See which power levels are configurable on the AP.

```
PodP(config-if)#power local ?
```

```
<1-100> One of: 1 5 20 30 50 100 maximum Set local power to allowed maximum PodP(config-if)#
```

Configure the AP radio power to 5mW.

```
PodP(config-if)#power local 5
```

```
*Mar 1 02:07:19.457: %LINK-5-CHANGED: Interface Dot11Radio0, changed state to reset *Mar 1 02:07:19.475: %LINK-3-UPDOWN: Interface Dot11Radio0, changed state to up PodP(config-if)#
```

When a client device associates to the AP, the AP sends the maximum power level setting to the client. Follow these steps to specify a maximum allowed power setting on all client devices that associate to the AP, the example below sets the radio transmit power to 100mW:

```
PodP(config-if)#power client 100
```

```
PodP(config-if)#
```

Now lower the setting to 5mw:

```
PodP(config-if)#power client 5
```

```
*Mar 1 02:01:42.123: %LINK-5-CHANGED: Interface Dot11Radio0, changed state to reset *Mar 1 02:01:42.141: %LINK-3-UPDOWN: Interface Dot11Radio0, changed state to up
```

```
PodP(config-if)#
```

Step 6 Configuring radio channel settings

The default channel setting for the AP radios is least congested. At startup, the AP scans for and selects the least congested channel. For the most consistent performance after a site survey, it is recommended that a static channel setting for each AP be assigned. The channel settings on your AP correspond to the frequencies available in your regulatory domain.

See what channels are available.

```
PodP(config-if)#channel ?
```

```
<1-2462> One of: 1 2 3 4 5 6 7 8 9 10 11 2412 2417 2422 2427  
2432 2437 2442 2447 2452 2457 2462
```

```
least-congested Scan for best frequency
```

```
PodP(config-if)#
```

Follow the steps below to assign a static channel setting for the AP. The example below sets the radio to channel 1:

```
PodP(config-if)#channel 1
```

```
(or the channel frequency) *Mar 1 02:10:46.872: %LINK-5-CHANGED: Interface  
Dot11Radio0, changed state to reset *Mar 1 02:10:46.890: %LINK-3-UPDOWN:  
Interface Dot11Radio0, changed state to up
```

```
PodP(config-if)#
```

Now assign a least congested channel setting for the AP. The example below sets the radio to the least congested channel setting:

```
PodP(config-if)#channel least-congested
```

```
*Mar 1 02:12:38.761: %LINK-5-CHANGED: Interface Dot11Radio0, changed state to  
reset *Mar 1 02:12:39.760: %LINEPROTO-5-UPDOWN: Line protocol on Interface  
Dot11Radio 0, changed state to down *Mar 1 02:12:43.265: %DOT11-6-FREQ_USED:  
Interface Dot11Radio0, frequency 2412 selected *Mar 1 02:12:43.285: %LINK-3-  
UPDOWN: Interface Dot11Radio0, changed state to up *Mar 1 02:12:44.267:  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Dot11Radio 0, changed state to  
up
```

```
PodP(config-if)#
```

Notice the output on the console displays the AP selecting the frequency that is least congested at that point and time.

Step 7 Disabling and enabling short radio preambles

The radio preamble (sometimes called a *header*) is a section of data at the head of a

packet that contains information that the AP and client devices need when sending and receiving packets. The radio preamble can be set to long or short:

Short—A short preamble improves throughput performance. Cisco Aironet Wireless LAN Client Adapters support short preambles. Early models of Cisco Aironet's Wireless LAN Adapter (PC4800 and PC4800A) require long preambles.

Long—A long preamble ensures compatibility between the AP and all early models of Cisco Aironet Wireless LAN Adapters (PC4800 and PC4800A). If these client devices do not associate to your APs, you should use short preambles.

Follow these steps to disable short radio preambles:

```
PodP(config-if)#no preamble-short
```

```
*Mar 1 02:16:03.156: %LINK-5-CHANGED: Interface Dot11Radio0, changed state to reset
*Mar 1 02:16:03.174: %LINK-3-UPDOWN: Interface Dot11Radio0, changed state to up
PodP(config-if)#
```

Follow these steps to enable short radio preambles:

```
PodP(config-if)#preamble-short
```

```
*Mar 1 02:16:24.843: %LINK-5-CHANGED: Interface Dot11Radio0, changed state to reset
*Mar 1 02:16:24.861: %LINK-3-UPDOWN: Interface Dot11Radio0, changed state to up
PodP(config-if)#
```

Step 8 Configuring transmit and receive antennas

The AP can be set to select the antenna the AP uses to receive and transmit data. There are three options for both the receive and the transmit antenna:

Diversity—This default setting tells the AP to use the antenna that receives the best signal. If your AP has two fixed (non-removable) antennas, you should use this setting for both receive and transmit.

Right—If your AP has removable antennas and you install a high-gain antenna on the AP's right connector, you should use this setting for both receive and transmit. When you look at the AP's back panel, the right antenna is on the right.

Left—If your AP has removable antennas and you install a high-gain antenna on the AP's left connector, you should use this setting for both receive and transmit. When you look at the AP's back panel, the left antenna is on the left.

View the available antenna settings

```
PodP(config-if)#antenna ?
```

```
receive receive antenna setting
```

```
transmit transmit antenna setting
```

Follow these steps to set the AP receive and transmit to right: (the interfaces will reset after each change.)

```
PodP(config-if)#antenna receive right  
PodP(config-if)#antenna transmit right
```

Follow these steps to set the AP receive and transmit to left:

```
PodP(config-if)#antenna receive left  
PodP(config-if)#antenna transmit left
```

Follow these steps to set the AP back to receive and transmit to diversity:

```
PodP(config-if)#antenna receive diversity  
PodP(config-if)#antenna transmit diversity
```

View the available antenna settings.

- a. What command is needed? What settings are available?

Configure the AP to receive and transmit to right. (the interfaces will reset after each change.)

- b. What commands are needed?

Set the AP to receive and transmit to left.

- c. What commands are needed?

Set the AP back to receive and transmit to diversity.

- d. What commands are needed?