Lab 7.3.4 Directional Antennas

Estimated Time: 15 minutes

Number of Team Members: Students will work in groups of two students per team.

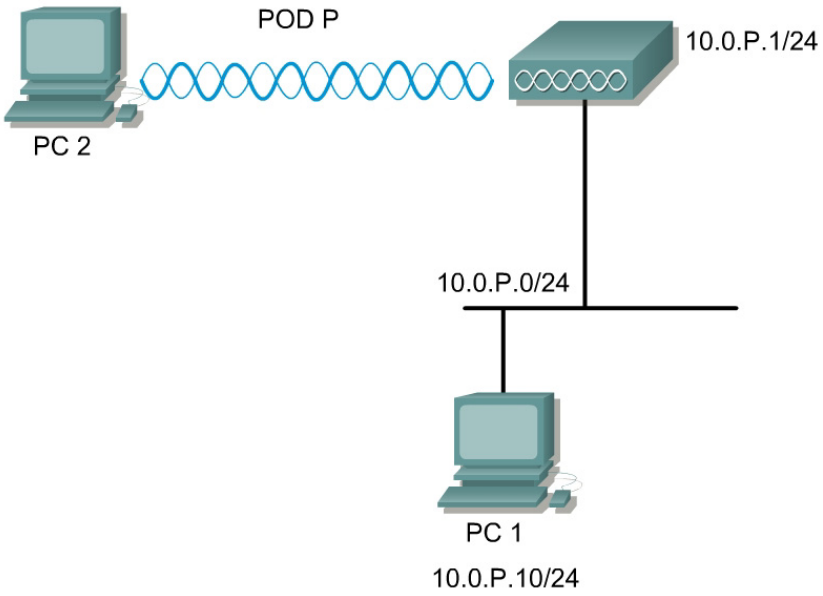
Objective

In this lab, students will test the range capabilities of the Cisco Aironet AP with a directional antenna configuration.

Scenario

Directional antennas will create a coverage area in a particular area caused by the condensed energy of the signal being pushed in a certain direction. Very little energy is in the backside of a directional antenna.

Topology



Preparation

Prior to the lab, the student should have a Cisco Aironet 1200 AP configured as a root unit and performing properly. A laptop computer is also needed with a Cisco Aironet 802.11a and a 802.11b client adapter and the utilities installed and performing properly.

Tools and Resources or Equipment

Each team will require the following:

- Cisco Aironet AP with the following:
  - Cisco Integrated 802.11a patch antenna for AP1200.
  - Laptop Personal Computer with a 802.11b client adapter properly installed
  - Cisco Aironet AIR-ANT1949 13.5 dBi Yagi Mast Mount antenna to be tested.(optional)

Step 1 Directional antenna (11a patch)

In order to set up the Cisco Aironet directional antenna, complete the following steps:

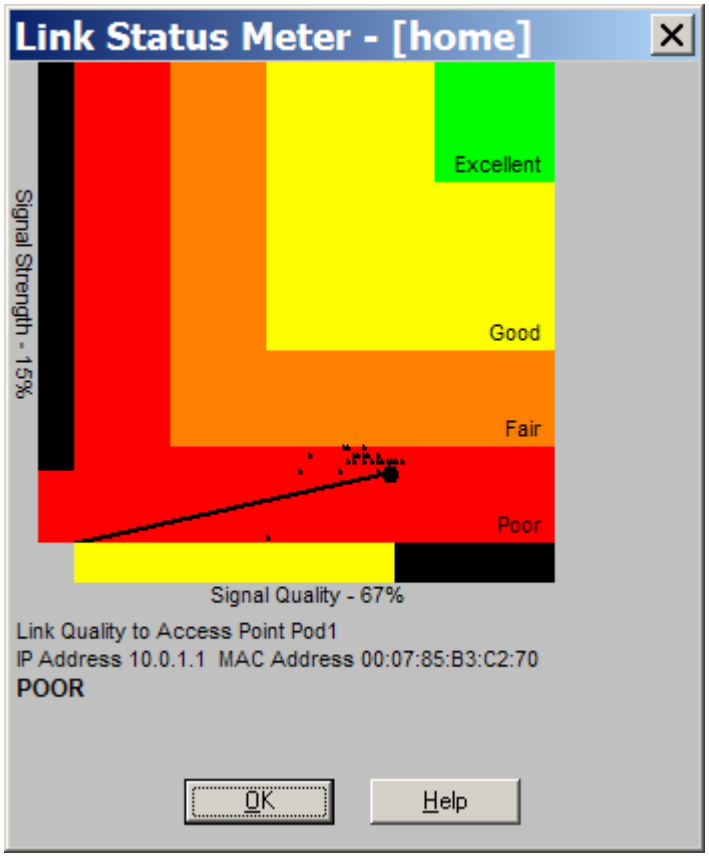
a. For Lab purposes, orient the Patch antenna by placing the antenna in the closed position, which is its directional polarization. The antenna should be pointing toward the area of coverage.

b. The AP can be turned on and configured.

c. Open a Web browser and type in the AP IP address in the browser address box.

d. Check the Receive and Transmit mode of the antenna on the AP **Radio0-802.11A** page.

e. When using the built in Patch antenna on the AP, the Receive and Transmit antenna modes should be set to **Diversity**. This allows the AP to use the both antennas for transmitting and receiving. Apply these settings.



f. On the PC, Double click on the Link Status Meter (LSM) icon on the laptop and note the Signal Quality and Signal Strength meter.

g. Move the laptop computer around the room and possibly the building to note any changes in the Link Status Meter. This will give an indication of the coverage area which is given to this particular antenna configuration.

h. Sketch the shape of the coverage of the antenna used. Show the AP and the PC client at their farthest distance.

i. What is the signal quality?

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j. What is the signal strength?

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Step 2 Yagi directional antenna (optional)

In order to set up the Cisco Aironet directional antenna, complete the following steps:

a. Turn the power off on the AP and unscrew both standard dipole antennas from the rear of the AP. Then install the Yagi Mast Mount antenna to the AP by screwing the antenna TNC connector to the AP right TNC connector.

b. For Lab purposes, orient the Yagi Mast Mount antenna by placing the antenna in a horizontal position, which is its polarization. The antenna should be pointing toward the area of coverage. Positioning of the Yagi Mast Mount is very important and affects the coverage area.

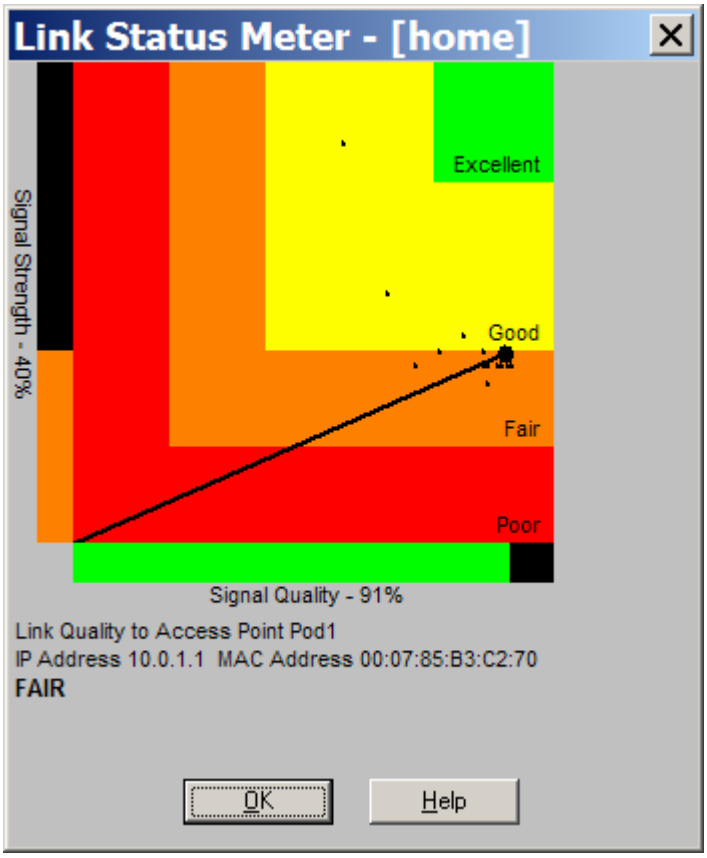
c. The AP can be turned on and configured.

d. Open a Web browser and type in the AP IP address in the browser address box.

e. Check the Receive and Transmit mode of the antenna on the AP **Radio0-802.11** page.

Receive Antenna:	(•) Diversity	( ) Left	( ) Right
Transmit Antenna:	(•) Diversity	( ) Left	( ) Right

f. When using a single Yagi Mast Mount antenna on the AP, the Receive and Transmit antenna modes should be set to **right**. This allows the AP to use the right antenna for transmitting and receiving. Apply these settings.



g. Double click on the Link Status Meter (LSM) icon on the laptop and note the Signal Quality and Signal Strength meter.

h. Move the laptop computer around the room and possibly the building to note any changes in the Link Status Meter. This will give an indication of the coverage area which is given to this particular antenna configuration.

i. Sketch the shape of the coverage of the antenna used. Show the AP and the PC client at their farthest distance.

j. What is the signal quality?

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k. What is the signal strength?

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