Lab 10.2.7.2 Survey the Facility

Estimated Time: Actual time will vary depending on the size of the site.

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

Objective

In this lab, students will perform a site survey of an assigned location. Students should include all of the following in site survey results:

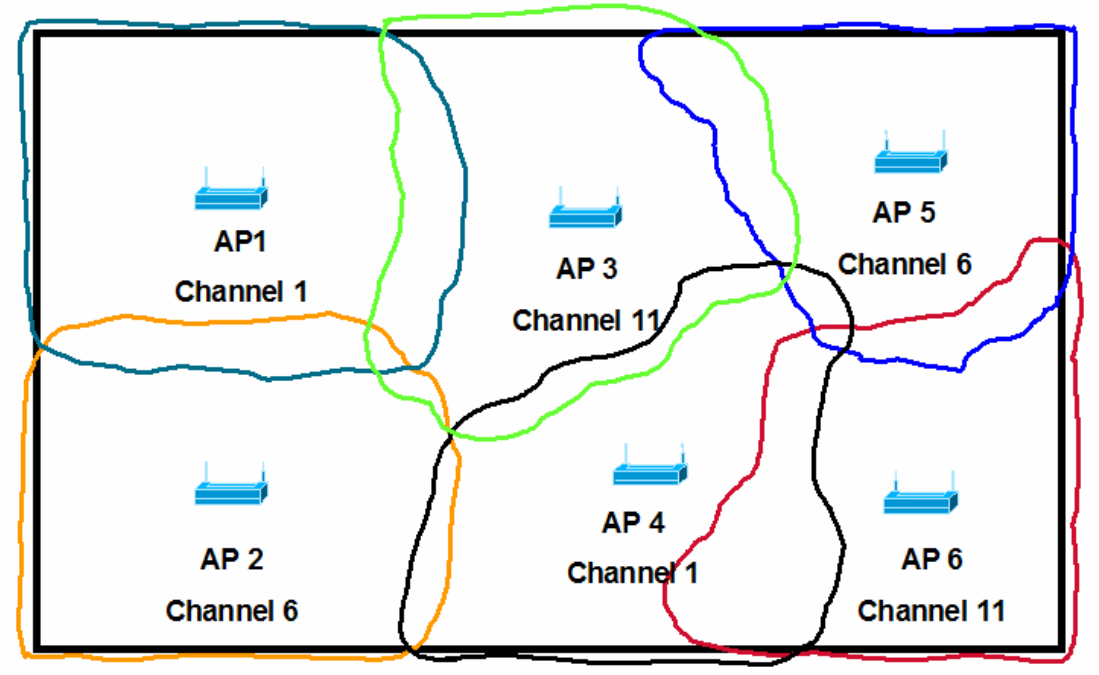
- Channel selections
- Data rates
- Antenna selection

Scenario

A site survey provides detailed information about the following:

- Where the APs are to be located
- How they will be mounted
- How they will be connected to the network
- Where any cabling or power may need to be installed

By providing the customer with a detailed site survey report, the IT manager can turn the necessary portions over to a local contractor. The contractor can then install the network cabling and power cabling that may be needed to provide the wireless local-area network (WLAN) connectivity to the network.



Preparation

The student should perform all of the following in preparation for this lab:

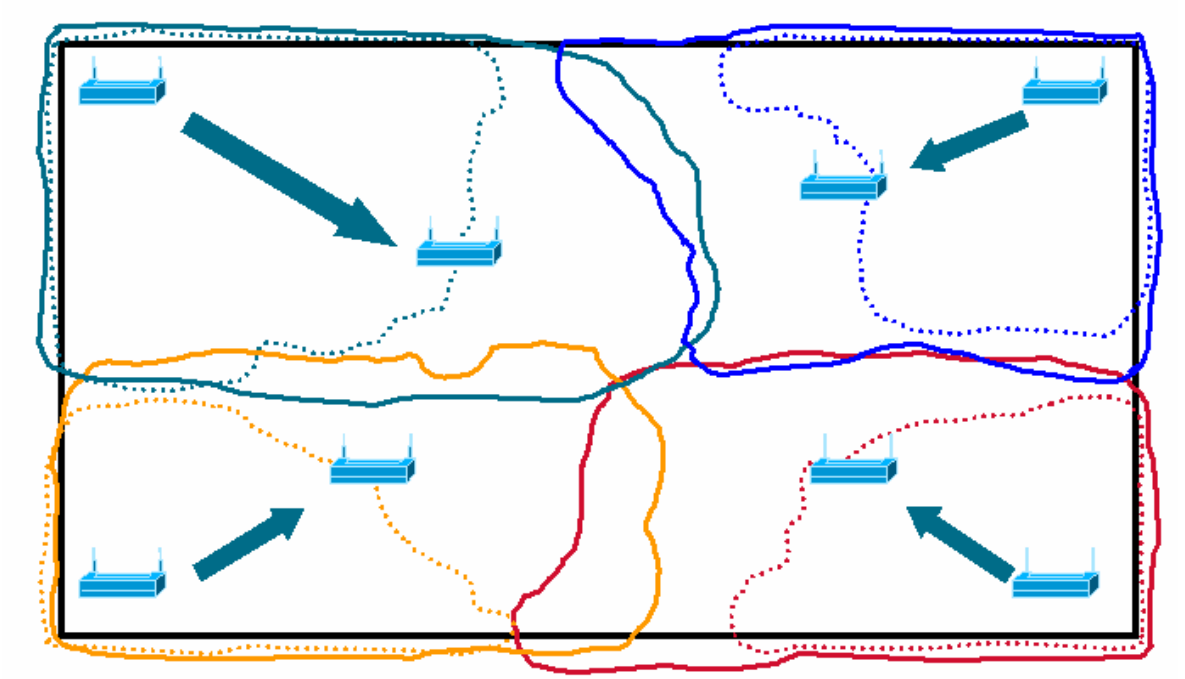
- Read through the lab prior to conducting the site survey.
- Perform the site survey when the RF link is functioning with all other systems and noise sources operational.
- Execute the site survey entirely from the mobile station.
- Conduct the site survey with all variables set to operational values for use in the active mode.
- Obtain a site map and permission to use the areas that are to be surveyed in advance.

Tools and resources

The following tools and resources will be helpful with this lab:

- An AP with a valid IP address.
- A PC with a client adapter and client utilities installed.
- A site map of the area you are surveying.
- An optional site survey kit for performing the site survey at an extended site other than the classroom.

Step 1 Begin the site survey in a corner of the facility

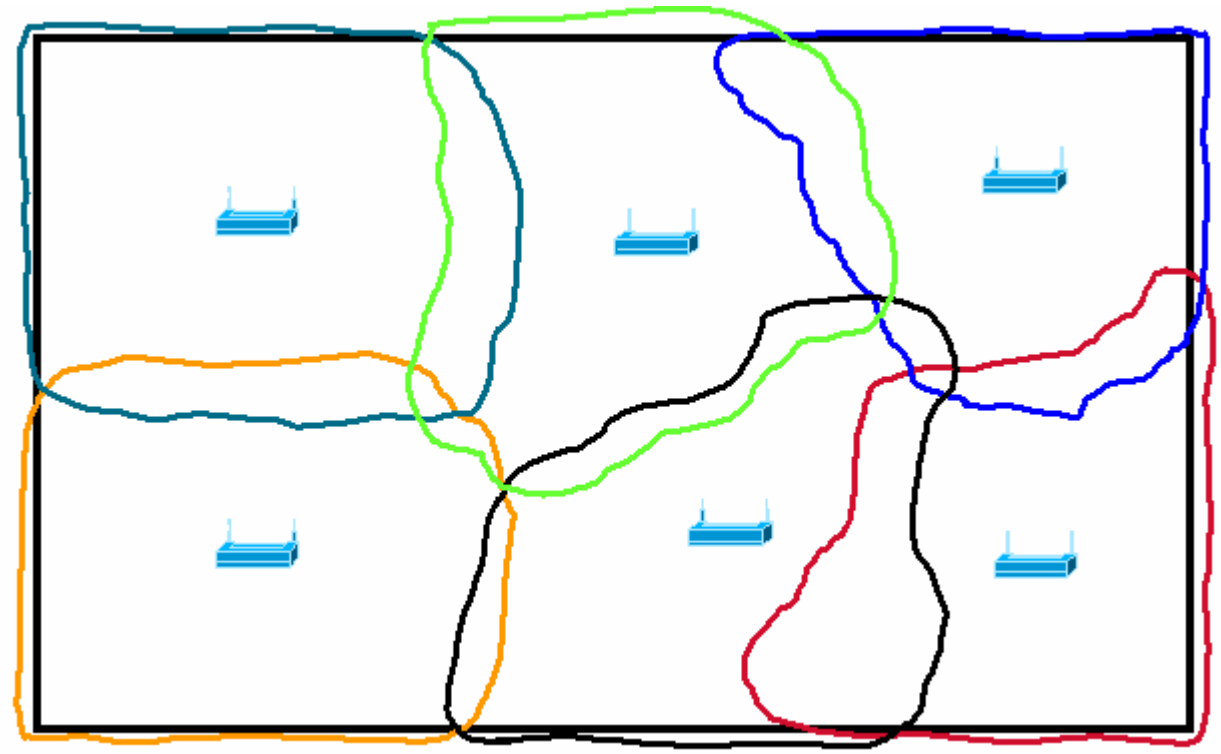


The easiest way to start a site survey is to pick one area of the facility that needs coverage. Choose a corner and place the AP in that corner. Survey the coverage of that AP and make a note of where the furthest point of coverage is from it. Then move the AP to the furthest coverage point.

Note If the AP is placed in the corner, as much as 75 percent of your coverage cell might be wasted covering an area outside the building that does not need coverage.

Sketch the actual site below which is surveyed. Indicate where the AP is located. Draw the pattern of coverage.

Step 2 Plan for overlap



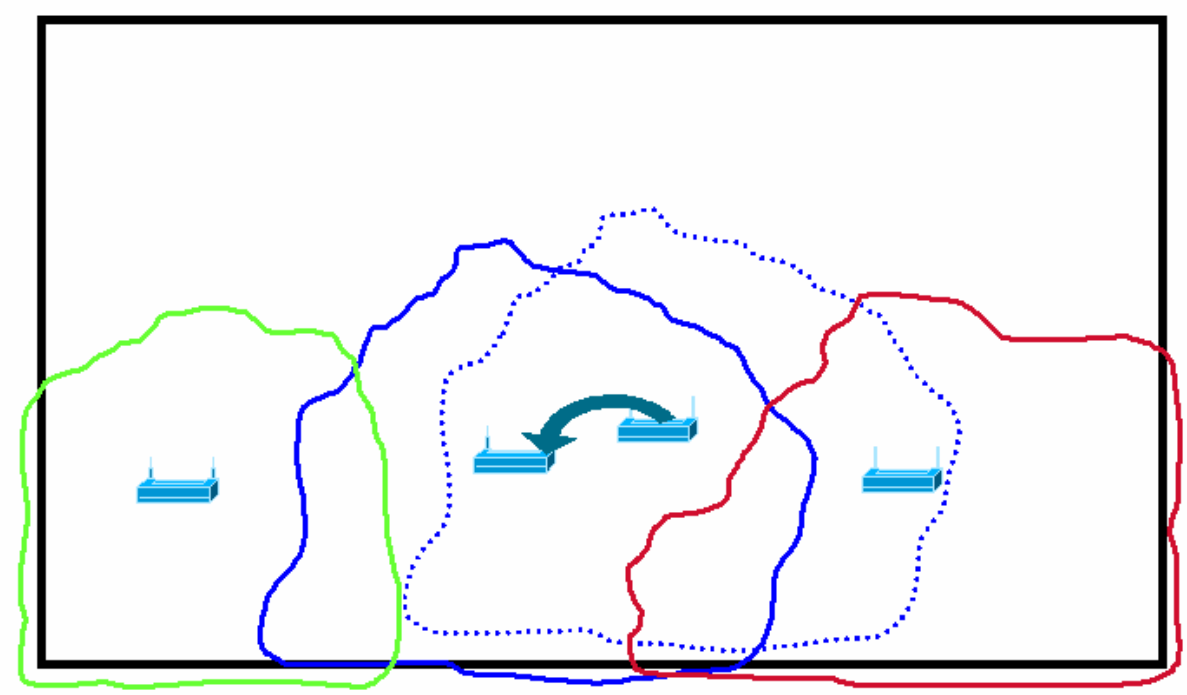
Once the AP has been moved, survey its coverage. It may be necessary to move the AP several times in order to find the best placement.

Once the best location for that AP has been decided on, move to a different corner of the facility and repeat the process. In a more advanced survey, repeating the process four times might only provide coverage around the perimeter of the facility.

Now fill in the holes in coverage. This is where experience and judgment will come into play. Some engineers might elect to survey the perimeter and then fill in the center. Remember, if seamless coverage is needed, the coverage cells must overlap. For a standard survey, 15 percent overlap is usually sufficient to provide for smooth, transparent handoffs.

Sketch the actual site below which is surveyed. Indicate where the APs will be located. Draw the patterns of coverage.

Step 3 Survey from the middle



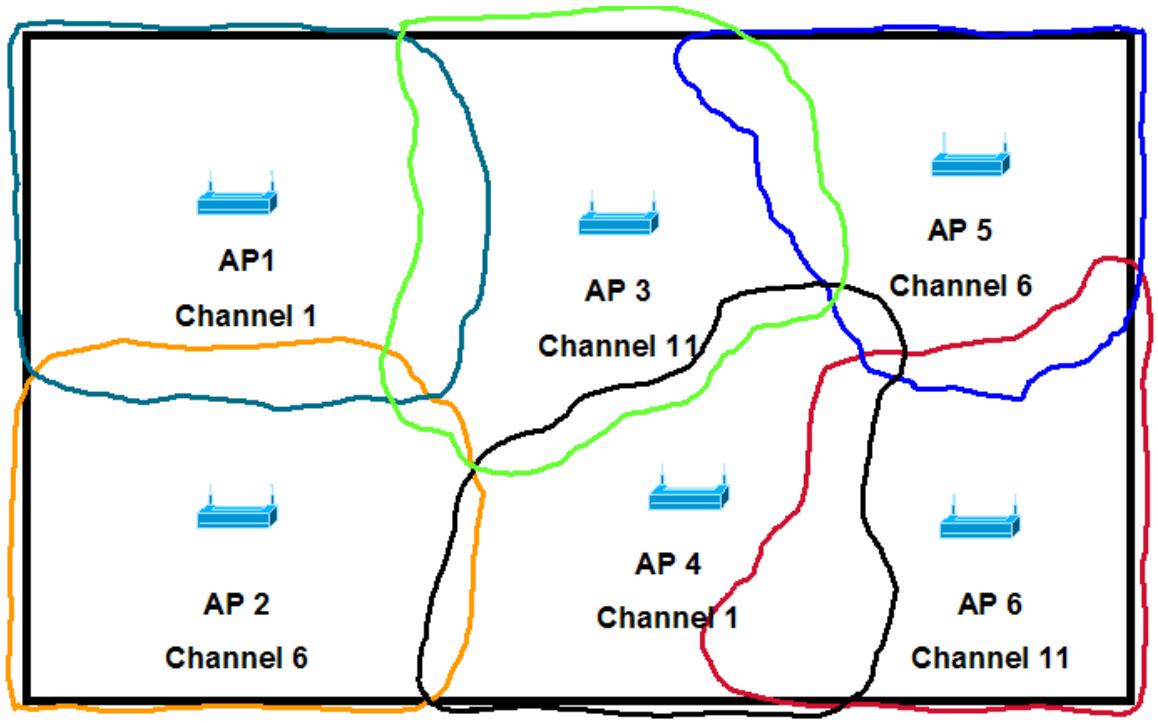
Survey the first two areas and fill in the middle

Another approach is to survey the first two APs and find the coverage areas.

Place an AP at the edge of the first AP cell, survey the coverage, and then move the AP out further to utilize its entire cell. This allows the size of the cell to be roughly judged. Then survey the new location to determine feasibility and adjust as necessary.

Once the AP location has been decided, continue this process until the entire facility is covered.

Step 4 Channel selection

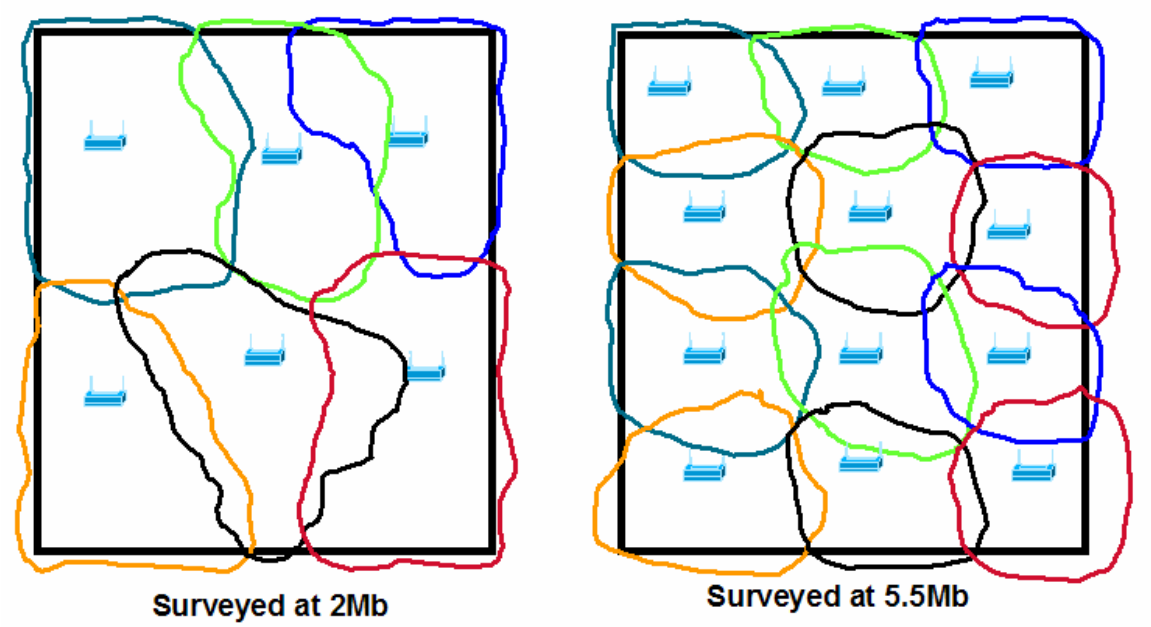


When surveying, take into account the fact that there are only three non-overlapping channels when using 802.11b and 802.11g. In order to maximize the data rate, use these channels. Using the non-overlapping channels insures that the APs will not interfere with each other.

As the WLAN is being designed, survey using the channel that the AP is intended to operate on. Part of the surveying duties is to test for interference. If every AP is surveyed using the same channel, andnot the actual channel the AP will be using, it will be difficult to verify that no interference exists on the channel that the AP will actually be using.

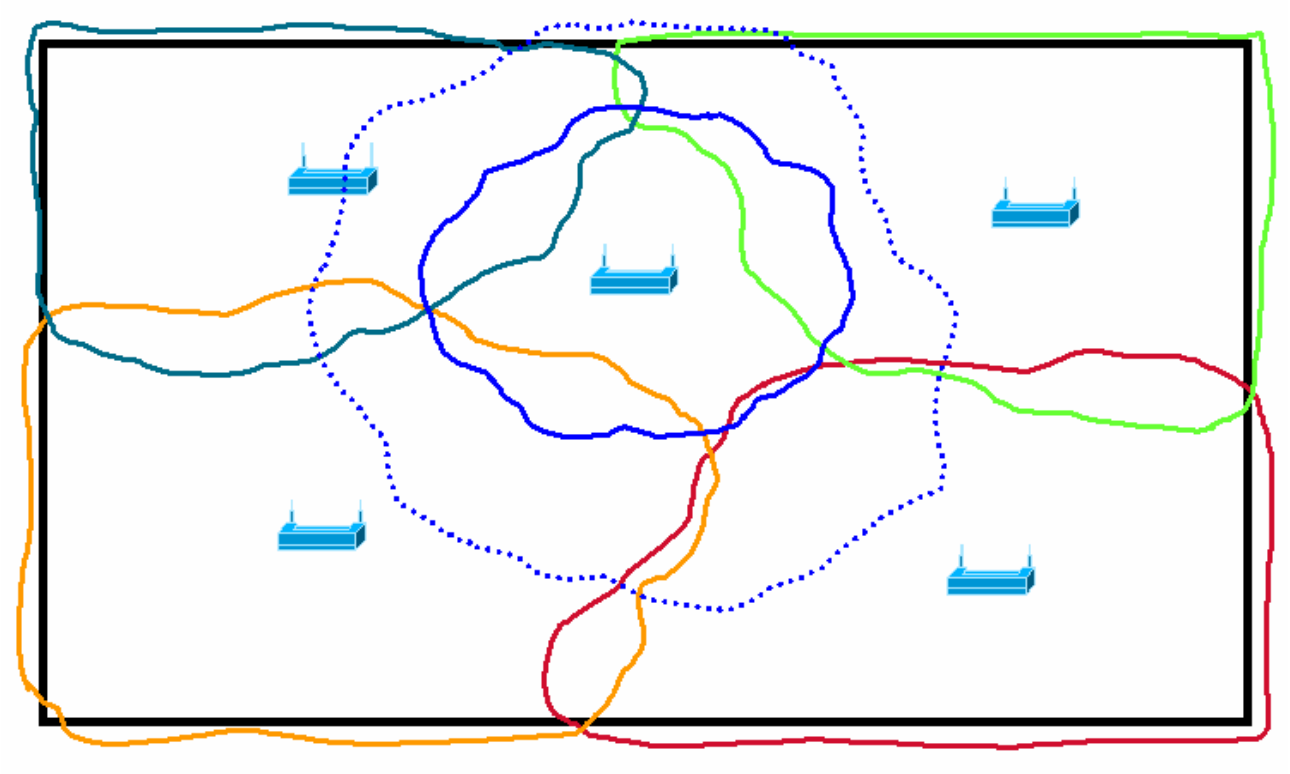
Sketch the actual site below which is surveyed. Indicate where the APs will be located and the channels to be used. Draw the patterns of coverage.

Step 5 Survey the data rates



Once the minimum data rate that the customer will be using has been determined, survey at that data rate. The data rate that is chosen will drastically affect the results of the site survey. In the example in the figure, the same area is surveyed at two different data rates. If the survey is done at 2Mb it takes six APs to cover the facility. If the survey is done at 5.5Mb it might take twelve APs to cover the facility.

Step 6 Antenna choice, power level and cell size



The student may elect to use a different antenna to obtain more coverage from the APs, use smaller antennas and add more APs. Another possibility is changing the power levels on one or more of the APs to change the size of the coverage cell or cells. Finally, the student may elect to use a combination of these options to get the coverage they need.

