Want, Don’t Want, Don’t Care- Meeting Design Specs

Want, Don't Want, Don't Care

The goal of Wireless Networks is to provide an appropriate and workable layer-1 (L1)solution for the accurate transmission of data across a wireless medium.

To this end, we work hard to get the correct number of access points, with the proper power settings, using the best antenna patterns to cover the area we are interested in.

Want

In the 'old days', we employed the 'AP on a stick' method of site surveys in a pre-deployment mode trying to come up with the best possible design. We'd end the survey with a design showing access points and their 'coverage' patterns (sometimes called a heat map – though it had absolutely nothing to do with heat).

In this 'AP on a stick' process, after placing an access point in a temporary position, we'd walk away until with reached the lower limit of whatever our design goal was: Perhaps -70dB or -67dB. Since we'd met the design goal in that direction, we'd stop.

But the RF energy projecting from the access point in question did not stop; it kept going. Since we never completed the site survey to the end of the radiation pattern, our designs did not, and could not, tell us where we'd run into interference with other access points. This would give us what we wanted… thus this is the **WANT** area.

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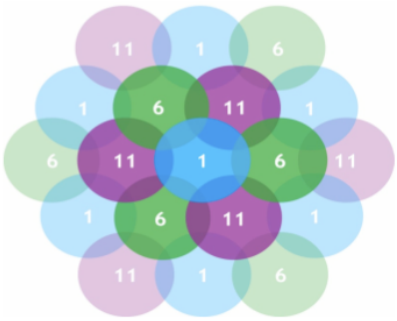
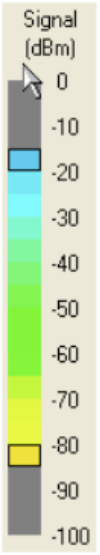
The is the 'easy' one… Remember "Coverage is Easy." See other article on "How to Spec your Physical Layer"

Coverage patterns ended up looking something like this. With nice simple circles all lining up in neat rows.



The DON'T CARE area is where there is RF radiation, but at a level that is below the threshold of our device to actually use.

Don't Care



Now let's talk about the **DON'T CARE** area. This is the area where there is RF radiation, but at a level that is below the threshold of our device to actually use. Our client station (STA) can't demodulate this RF radiation, so it's just RF interference, but it's at an RF power level too low to make the STA stop and wait for another client or access point to finish talking.

In other words, this area has too quiet of an RF signal to be considered in the frequency's collision domain.

With AirMagnet Survey we can raise the color bar on the right side to make the areas with 'less than ourgoal' turn grey.

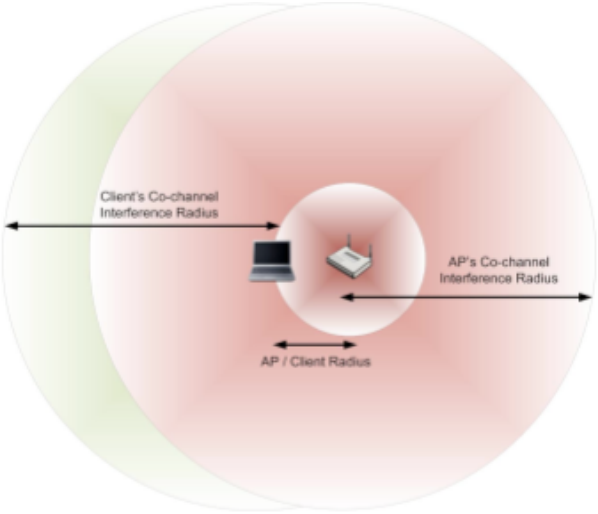
This is usually set to -85dBm but some devices aremore sensitive, and you might need to set your **DON'T CARE** to -90dBm.

Don't Want

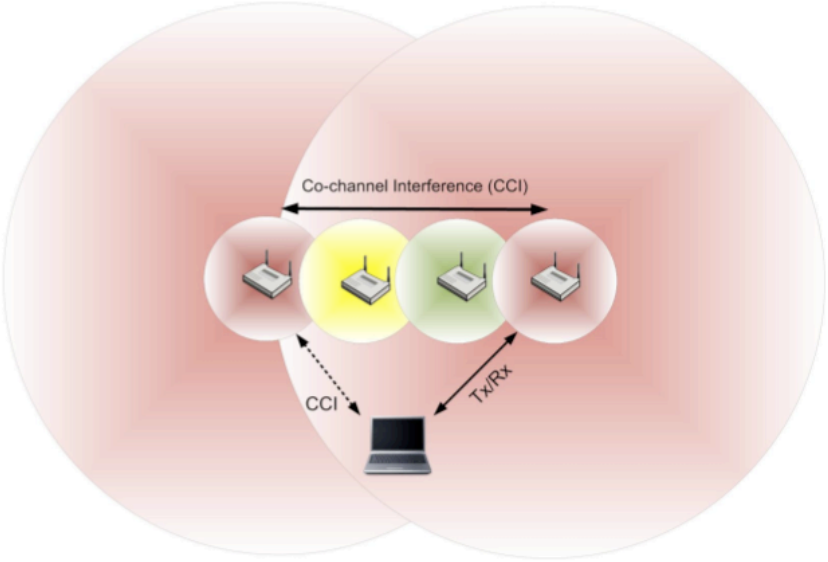
Now we get to the difficult one. This is the one we normally don't even measure in an 'AP on a Stick' survey.

This is the one that **really** causes a lot of problems.

One vendor draws their graphics to explain this in the following diagram. Note the **WANT** area is inside the dark circle, and the RF that is less than the desired goal still continues to radiate, causing interference and a large collision domain to all devices within the larger circle.

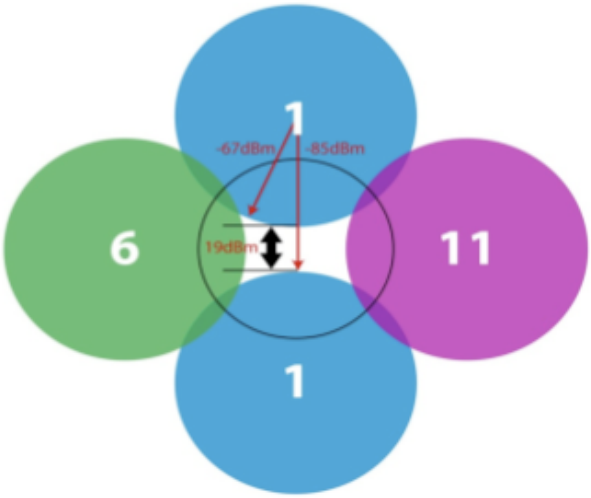


The trouble isn't when two access points are next to each other. Since we have channels 1, 6, and 11 to use as non-overlaping channels, we can have a little 'buffer' between the same channels.

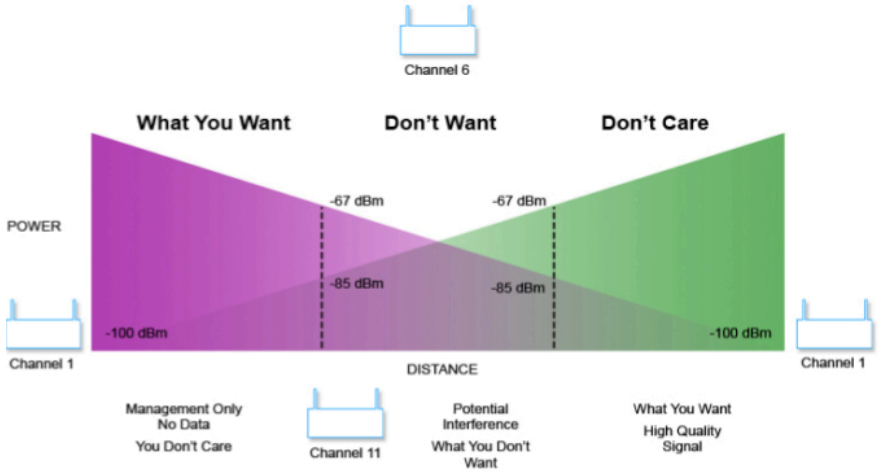


The problem starts because we didn't 'look' to see where the **DON'T WANT** area was in our survey. So we never noticed the first access point's RF, that was less than what we wanted, continued all the way past the buffer zone and continued into the next 'same channel' access points' coverage area.

One graphic from a vendor details it like this.



I think an easier way to explain this situation is to turn the graphic on its side, like this.



Leaving the access point on the left, the RF propagates and loses RF energy along the way until it reaches the design goal, or the **WANT** line. We normally stop at this point in our surveys, but you must continue on to see where the RF continues.

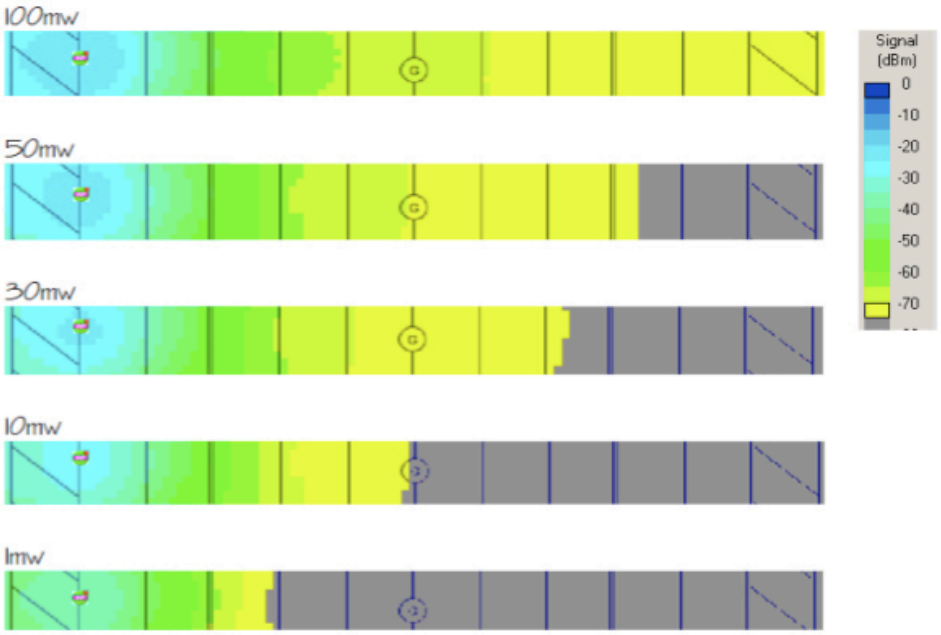
The signal degrades and attenuates as we go further to the right, eventually reaching the level at which we no longer care. This is the DON'T CARE line.

In between the access point on the left, and the access point on the right, the area that is below the goal threshold is to be covered by the other two access points on channels 6 and 11.

Coming back from the right, we have the same thing. The access point on the right (channel 1) starts strong, and as we move to the left continues to get weaker until it reaches the design goal (**WANT**). After that, there is still RF on channel 1, but it is below our goal and thus is deemed DON'T WANT.

Another name for the DON'T WANT is RF interference.

Another name for the **DON'T WANT** is RF interference. If the two access points on channel 1 are too close, the signal from the right AP will interfere with the signals from the left AP. In order to get access points on the same channel closer together (get the angles of the dropping signals to be steeper) you have to lower the power. High power gives you a 'long tail', and lower power give you a much shorter 'tail'.



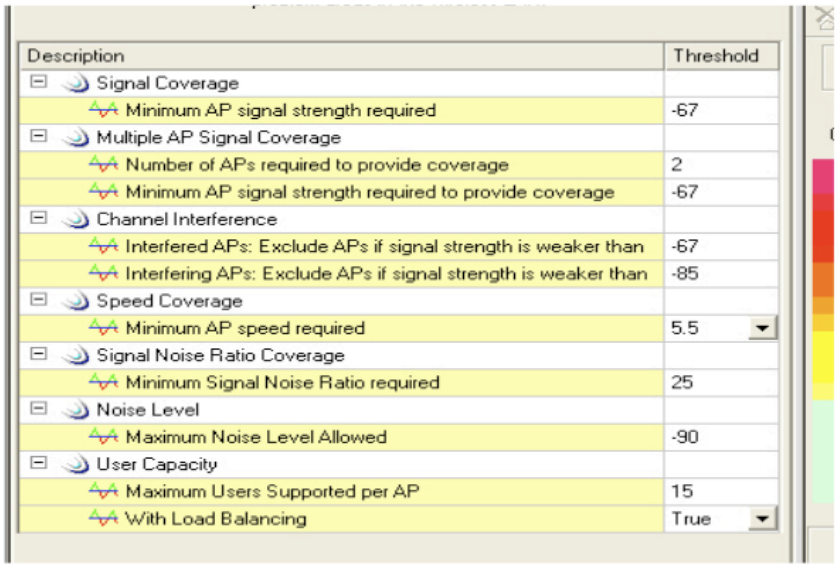
Setting AirMagnet AirWise Interference Settings

In AirMagnet AirWise there is a feature that allows one to visually show where interference meets or exceeds the design parameter. Remember, different devices have different design parameters.

To set the WANT, DON'T WANT, and DON'T CARE values in AirWise, we need to re-label them to meet the Airmagnet vocabulary.

To set the **WANT**, **DON'T WANT**, and **DON'T CARE** values in AirWise, we need to re-label them to meet the AirMagnet vocabulary.

The end of the **WANT** area is the same as your design goal for minimum AP signal strength required.



Description	Threshold
Signal Coverage	
Minimum AP signal strength required	-67
Multiple AP Signal Coverage	
Number of APs required to provide coverage	2
Minimum AP signal strength required to provide coverage	-67
Channel Interference	
Interfered APs: Exclude APs if signal strength is weaker than	-67
Interfering APs: Exclude APs if signal strength is weaker than	-85
Speed Coverage	
Minimum AP speed required	5.5
Signal Noise Ratio Coverage	
Minimum Signal Noise Ratio required	25
Noise Level	
Maximum Noise Level Allowed	-90
User Capacity	
Maximum Users Supported per AP	15
With Load Balancing	True

The end of the **WANT** value is the start of the **DON'T WANT** area (if it is below our WANT, it must be our DON'T WANT). In AirWise, this is labeled with a weird English phrase of "*Interfered APs: Exclude APs* signal if strength is weaker than."
Then the end of interference, where the signal is below the threshold of causing any harm is called the **DON'T CARE**. In AirWise, this is labeled with another phrase "Interfering APs: Exclude APs signal if strength is weaker than."

Conclusions

So there you go. Simple easy terms to define where you ***Want*** RF, where the RF signals on a specific frequency will cause interference – ***Don't Want***, and the area where the signal is too weak to make a difference – ***Don't Care***.

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