Client roaming and connectivity decisions explained

Roaming is a client side decision in 802.11 WiFi. Client devices listen for beacon frames or send probe requests to discover APs advertising the preferred SSID. The clients driver uses the received signal strength of beacons or probe responses to make decisions on whether to change APs or remain connected to the current AP. In terms of roaming, there are several points to keep in mind:

- Wireless clients may not roam until received signal dips below a specified proprietary threshold on the wireless NIC. In this instance, client 1 associated to AP 1 will not roam to AP 2 despite AP 2’s probe response reflecting a higher RSSI value.
- Attenuation due to free space path loss in an open environment is typically easier to predict. However, indoors RF scattering and reflection can create sources of multipath interference. While physical proximity between client and AP has a large impact on RSSI, it is not the only factor.
- If a client device is having trouble roaming (e.g., hanging on to an AP too long), it may be desireable to toggle the device’s roaming aggressiveness to a higher setting. The screen shot below shows where this parameter can be set on a Windows 7 laptop.

**Note:** Figure 1 is only an example of where the roaming aggressiveness settings are on a client machine, the settings may be somewhere else or managed in a different fashion based on the NIC in use.

**Note:** Apple products do not have roaming aggressiveness settings.

Figure 1: Roaming aggressiveness settings for a Windows 7 laptop using an Intel Centrino wireless card. Navigate to the device manager under the control panel settings
The following properties are available for this network adapter. Click the property you want to change on the left, and then select its value on the right.

Property: 302.11n Channel Width for band 2.4
          302.11n Channel Width for band 5.2
          302.11n Mode
          Ad Hoc Channel 802.11b/g
          Ad Hoc GoS Mode
          Bluetooth(R) AMP
          Fat Channel Intolerant
          Mixed Mode Protection
          Preferred Band
          Roaming Aggressiveness
          Transmit Power
          Wireless Mode

Value:

3. Medium