6 GHZ & REGULATORY

Standard Power Buys Power by Spending Channels

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At 20 MHz in the US it reaches 41 of the 59 channels LPI can use, with 18 dB more power. At 160 MHz it reaches 4 of 7, with only 9 dB. Widen the channel and both halves of that trade move against you at once.

Parts 1 through 4 covered power: PSD, the 6 dB client backoff, the client advantage that widens as channels narrow, and the geofenced class. All four raised the same question and left it unanswered. Should you run Standard Power indoors? The answer starts with your channel width.

The trade, in numbers Standard Power is authorized in 5.925 to 6.425 GHz and 6.525 to 6.875 GHz. LPI is authorized across 5.925 to 7.125 GHz, the entire band. What Standard Power loses is the middle and the top: U-NII-6 sits between the two ranges it keeps, and U-NII-8 sits above them. No Standard Power channel may span the 100 MHz hole at 6.425 to 6.525 GHz, so every channel has to fit whole inside one range or the other. That fit is imperfect even at 20 MHz, and it gets worse as channels widen.

Put the two halves together and the decision takes a shape. Narrow channels are where Standard Power's power advantage is largest and where it keeps the biggest share of the available channels. Wide channels are where it is weakest on both counts.

Where the restriction comes from The labels U-NII-5 through U-NII-8 appear nowhere in Part 15; they are FCC order and industry shorthand. Part 15 grants rather than prohibits, so the accurate phrasing is that the Standard Power authorization does not extend to U-NII-6 and U-NII-8.

Why AFC stops at two sub-bands U-NII-6 and U-NII-8 as the bands where "many of the incumbent operations are mobile." AFC cannot protect what it cannot look up. A transmitter that moves has no location on file. Standard Power exists only where AFC can work.

And channel counts are IEEE, not FCC. The rules define frequency ranges and power limits, never channels. Lay the 6 GHz channel grid over the authorized ranges and two edges come up short.

One product behavior to ask about At least one vendor ties an access point configured for Standard Power with LPI fallback to the Standard Power channel list in both modes, so it gives up U-NII-6 and U-NII-8 even while running as LPI. That is sound engineering, since the AP never has to change channel when the grant lapses. It is also a product decision rather than a rule, so ask your vendor which way theirs behaves.

Indoors, Standard Power is a narrow-channel reach tool and Low Power Indoor is a wide-channel capacity tool. Settle the width first and the power system then follows. That ordering holds for the geofenced class as well, since GVP is authorized in the same two sub-bands as Standard Power and inherits the same hole in the middle.

Which do you settle first on your next indoor 6 GHz design: the channel width, or the Tx power?

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