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Legal Featured Article

April 19, 2011

'Super Wi-Fi' White Spaces Test Launches in East Houston Neighborhood



By Gary Kim, Contributing Editor

Rice University wireless communications researchers and Houston non-profit Technology For All have begun providing "Super Wi-Fi" service in a neighborhood of 3,000 residents in East Houston, using "white spaces" spectrum.

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White spaces are blocks of spectrum that for one reason or another are not used. In the past, where TV frequencies were separated in frequency to prevent interference in metro areas. Where the frequencies corresponding to "channel 2" were used, channel 3 was kept vacant, channel 4 was used, but channel five was kept vacant. The pattern varies from market to market.

With or without the transition to HDTV, which is commonly cited as the reason for the availability of white spaces spectrum, those big chunks of spectrum were "available," but were not used.

Microsoft, Dell (News - Alert) and Google are among companies that have backed the use of "white spaces" spectrum for wireless data services, available for use on a non-licensed basis to provide campus-sized areas broadband access, but without the upfront capital expense of licensed spectrum.

The Federal Communications Commission's rules do not specify what applications can be used in white spaces, but users must avoid interference with other licensed users when doing so. As Wi-Fi uses non-licensed spectrum, so the FCC (News - Alert), and many other interests, think white spaces could both provide broadband coverage to underserved areas and be the springboard to new applications and services.

The "non-interference" requirements will generally require careful management of power levels, for example, since there might be many other transmitters also using any particular block of white space. In the same way that in-home Wi-Fi is degraded by interference from other household appliances, so white spaces services will face interference from other users and providers sharing the same spectrum.

But white spaces will be attractive for several reasons. First, the spectrum is non-licensed, meaning application and service providers are free to experiment

with business models and services without investing lots of capital in spectrum rights. There are signal propagation advantages as well. Signals at lower frequencies penetrate walls better than signals at higher frequencies, which is why you see so many of your neighbors standing on their front porches talking on their mobiles.

The TV spectrum, though, uses lower frequencies that penetrate walls much better than signals in the 2 GHz range often used for 3G services, for example.

The rules governing use of white spaces require that devices have the ability to sense spectrum availability, avoid interference with TV and other licensed users, as well as users of wireless microphones, for example, which are sensitive to higher-power signals nearby.

The test of "Super Wi-Fi" is in part a technology trial, with just one set of transmitters. In a "full production" environment, it is conceivable there will be multiple transmitters, which will cause interference with other users of the Super Wi-Fi spectrum in the same area.

TFA had earlier launched a free community broadband Wi-Fi network in the East Houston neighborhood of Pecan Park in 2004, serving a three-square-mile area.

The Super Wi-Fi trial operates under a grant from the National Science Foundation. Ultimately, would-be providers will have to figure out whether a viable and self-sustaining business model also can be created, something that has proven difficult for many community broadband efforts.

Gary Kim (News - Alert) is a contributing editor for TMCnet. To read more of Gary's articles, please visit his columnist page.

Edited by Juliana Kenny

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