

## **802.11n is certified as a standard... about 5 years late**

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The drafting of the IEEE 802.11n standard has been a prime example on how the work in committees can go wrong. The various changes in the plot of the 802.11n soap opera are too numerous to list here, but this project, together with equally unfortunate 802.20 project, have revealed problems in the IEEE 802.11 working group decision making process. Particularly, in these groups every individual has one vote, instead of one-company, one-vote principle and moreover a proposal has to get over 75% of all votes to get accepted. Thus it is possible to prevent a competing proposal from being approved simply by bringing enough delegates to an IEEE meeting and a deadlock will follow.

When it comes to 802.11n, WiFi Alliance has been certifying pre-standard (Draft 2.0) based 802.11n products since 2007. Manufacturers have adopted this pre-standard specification in large numbers and thus the importance of the 'final' standard has somewhat diminished. Moreover, 802.11n has had to make sure that the final certified standard is compatible with the Draft 2.0 standard in order to avoid confusion.

The 802.11n standard employs multi-antenna techniques and wider channel bandwidth to achieve higher data throughput. The standard is backwards compatible with earlier 802.11 standards and can operate on both 2.4 and 5 GHz frequency bands. However, if it is used together with other 802.11b and 802.11g systems on the 2.4 GHz band, its data throughput may suffer considerably. There are also other interference sources on the 2.4 GHz license-exempt band, such as Bluetooth devices. The 5 GHz band is thus recommended for 802.11n systems from the interference point of view, but the problem here is that most existing WLAN hardware can only use the 2.4 GHz band and thus couldn't be used in a new 802.11n (5 GHz) network.