

SPECTRUM CONGESTION – IS IT A TECHNICAL PROBLEM?

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Recent measurements find that 80% of WiFi devices crowd into the 2.4 GHz band, ignoring the greater bandwidth and reduced congestions available in the 5.8 GHz band. Even worse, within the 2.4 GHz band a few channels carry the majority of the traffic. This spectral crowding makes no technical sense when there are other channels and far less congested bandwidth available to these devices. The trend to congregate is observed with medical devices, which have expanded options and a clear mandate for reliability. Medical devices even have dedicated frequency bands, however, they concentrate on the most popular and crowded bands, along with a wide range of consumer devices.

This paper will report the data that these statements are based on. It will then offer the hypothesis that the determinative factors in RF protocol and operating band are not technical but economic, psychological and sociological. The decisions on RF protocols and operating band are predetermined by hiring and management practices, performance metrics and rewards. This hypothesis leads to the conclusion that until these dynamics can be aligned with the need for improved spectral utilization. The first solution to improve spectral congestion is one which results in a correlation between product development and business practices with the requirements of improved spectral utilization efficiency.

The paper will conclude by an analysis of the UPCS band, which has developed in a counter-trend fashion. By studying this exception to the dominant trend important insights may be gained on how device utilization of spectrum might be more effectively spread and spectral crowding reduced.