

Using Wi-Fi For Mobile Data Network Expansion

An Essay By Martin Coleman.

Given the recent problems with mobile phone networks and network congestion¹, a solid solution must be found that will stay true to service provisioning, network expansion and be able to accommodate the growing need for mobile data and application use, whether it be messaging, live data, streaming video, SIP/VoIP, games, social media, etc.

From networks that were designed for simple quality voice and text messaging using SMS on the GSM network, it would be difficult to expect that they now hold up to the task of handling much more bandwidth demanding needs, from many more users than ever before, without bringing the network down to it's knees due to congestion. Bringing in femtocells has been a suggested solution² and purchasing more frequencies on the airwaves is also in consideration³, but there is one more solution that could be much more suitable.

Wi-Fi (a.k.a. Wireless Fidelity), or wireless networking using the 802.11b/g/n standards is a much better alternative to buying more frequencies and using femtocells to cover the 2G/3G/UMTS/HSDPA black spots due to the maturity and flexibility of the technology.

Wi-Fi equipment is cheaper than installing another phone tower, which when they are placed throughout the landscape produces an eyesore and clutter. Wi-Fi equipment is also much more consumer friendly through using unlicensed bands and being cheaper for an average household to acquire, let alone needing a multi-million dollar budget.

Range is decreasing to be a problem via the ability to add more capable antennas to Wi-Fi routers thereby extend their reach into suburbia and local neighbourhoods. A standard 3db antenna will reach a few rooms inside and a little outside of a house, but with a 9-12 or more dB antenna using a more fault tolerant 802.11b protocol, the practical and usable range would increase substantially.

Speed is also an important factor in mobile data use and applications, and while the real-world speed of 2G/3G varies considerably⁴ depending on weather, obstructions, network congestion, signal interference, etc. Wi-Fi in general can be more fault tolerant with an adequate installation of

1 Paul Wright, http://apcmag.com/another_unlimited_callsinternet_deal_but_can_optus_cope.htm

2 Stephen Withers, <http://www.itwire.com/your-it-news/mobility/46454-optus-begins-femtocell-trial>

3 Tim Lohman, http://www.computerworld.com.au/article/352673/csiro_trial_wireless_over_analogue_tv_spectrum/

4 http://en.wikipedia.org/wiki/Comparison_of_wireless_data_standards#Peak_bit_rate_and_throughput

antenna, antenna placement, channel selection and power which would offer far greater speeds of service than 2G/3G offerings from nearby towers. Speed which is paramount when using streaming media and gaming from smartphones and internet tablets, with users preferring less latency for faster network response.

Infrastructure is also easily met using Wi-Fi as it does not need extra systems to be implemented. Wi-Fi can be attached to any standard internet connection whether it is powered by Wi-Fi mesh, microwave, copper phone line, fibre, ISDN or free space optics. A basic internet connection and power outlet is all a Wi-Fi Access Point requires to provide service, which is much easier in contrast to a cellular phone tower comprising of fibre back-haul, power, UPS for battery backup, purchasing or leasing of land, construction costs and maintenance concerns.

Wi-Fi is already here and established as a proven, reliable and capable technology for servicing the needs of aggressive and bandwidth hungry applications, services and mobile data use through smartphones and internet tablets. Deploying femtocells does not completely cure the network congestion problem and could be seen as more of a band-aid interim fix rather than a complete solution that resolves the demand upon networks for mobile data use.

Between the cost of equipment, speed of service deployment, practical range and speed and the ability to be a slide-in solution, mass Wi-Fi deployment would be an ideal fix for the increasing use of mobile data, smartphone, and internet tablets.

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