

Moving from islands to an ocean of WiFi

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WiFi is found in homes, offices and 'hotspots' throughout the world. Although, WiFi dots the landscape, it doesn't cover it, so we need expensive mobile data packages. Data networks are a mixed blessing for cell phone operators; although they can charge for them, the investment to keep up with consumer demand for bandwidth is high and frequency spectrum scarce. The expansion of WiFi hotspots to hotzones to a continuous WiFi ocean would solve bandwidth problems for operators and consumers alike.



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Take a seat. Any seat will do. Now, what is the first thing you look for?

WiFi, of course, at coffee shops, at airports, at bookstores and hotels, libraries and stadiums, homes, offices, schools and universities - in short, wherever people spend most of their waking hours, we expect to find WiFi. It has become second nature: we sit down, pull out our mobile device and look for the nearest, strongest hotspot and connect.

Although we look for WiFi everywhere, we still associate WiFi with rather small physical locations. It could be quite a large location, like a university campus or the London Olympic Games, but it is still a specific location. The name for these WiFi locations, 'hotspots', reinforces the image - 'spots' or isolated points on the landscape.

Perhaps it is time to think differently about WiFi, to see - and have - WiFi not as isolated

islands in a sea, but as the surrounding ocean. It is not hard to picture a time when WiFi is no longer available only at discrete points of connectivity, but as a near-continuous blanket of data streams and then to picture how this will occur. First, those isolated WiFi hotspots will become parts of much larger WiFi hotzones. The hotzones will gradually start to coalesce and overlap - a city centre outdoor network; for instance, will integrate with indoor hotel lobbies and conference centers, so that business visitors have seamless WiFi connectivity throughout their workday.

With a WiFi - as-ocean perspective, you can easily see a different future for WiFi. It will be a reversed image of what exists today: WiFi will be ubiquitous and cellular data will merely fill the gaps.

This will occur because of the transformative nature of smart devices and the way we consume applications. In an April 2012

report entitled 'Tablets Will Rule the Future Personal Computing Landscape', Forrester Research reported that 56 million tablets had been sold worldwide. They projected that 375 million tablets will be sold by 2016 and, in all likelihood, the bulk of them, like 80 per cent of today's iPads, will be WiFi only. Applications are already primarily data and often multimedia-heavy; they need high bandwidth/low-latency access to function at their best. Then there The growth of the 'Internet of things', i.e., the wireless sensors that enable 'smart home' automation, smart grids, tracking and security systems, and health care monitors - will also fuel the need for ubiquitous, seamless WiFi connectivity.

The cellular carriers can read the writing on the wall - and they know well the limitations that cellular technology and the scarcity of radio-frequency spectrum puts them under. They cannot grow their cellular networks fast enough to keep up with the data eruption

- and even if they could, there is not enough spectrum to go around. As LTE and VoIP continue to grow, even voice will increasingly travel by IP. Then too, the cellular carriers have no way of monetizing iPads and other WiFi-only devices.

Accordingly, cellular carriers will likely be major drivers of the 'WiFi -as-ocean' future. It is really a simple business decision. WiFi networks are more cost-effective than cellular, picocell or femtocell alternatives, so it is not hard to see the roadmap the cellular carriers will follow to spread.

Let us start with hotzone build-out. China Mobile is in the midst of deploying some two million WiFi hotspots and Japan's KDDI planned to increase their hotspot count ten-fold in 2012 alone. However, these build-out initiatives often feel a lot like a land-grab movement, as cellular carriers are signing contracts with multi-location hotspot hosts. The top four cell carriers in Japan, for instance, are contracting with convenience store chains and other franchises with high-traffic, value-adding-service potential, so that hotspots are rapidly proliferating.

While these land-grab ventures perpetuate the island metaphor, some are actually part of a concerted and integrated WiFi-cell strategy. A number of cellular carriers are focusing on large public venues, like shopping malls and stadiums, and some of these 'island' trophies are more like inland seas. Consider university campuses, for instance, where cell coverage is often poor and cell tower installation is often both complicated and expensive. Some universities, with 40,000 or more students and dozens of buildings, are similar to small cities. There is also a renewed drive to establish municipal hotzones; Singapore's municipal WiFi is just the beginning.

A critical piece of the cellular companies' integrated WiFi-cell strategy is cellular offload. Although cellular companies initially tried to charge higher prices for higher data usage to make it unattractive, this only drives their high-data users into the arms of more competitively priced carriers. Some cell companies tried to ignore the problem, assuming that high-data users would find their own ways to use WiFi for their high-data applications, but that strategy tended to erode loyalty.

Now cellular carriers are partnering with or acquiring WiFi providers to offload excess data traffic; AT&T's acquisition of Wayport is an example. In the first half of 2012 alone,

China Mobile's WiFi traffic more than doubled compared to 2011. Interestingly, this is both a push and pull strategy: the cell companies are pushing traffic onto their WiFi networks to avoid overloading their cell networks, while knowledgeable consumers, seeking better performance and sometimes reduced costs, are shifting their data traffic onto WiFi.

Automating the offload of traffic onto WiFi by pre-configuring the phone or downloading helper applications to do so is the next step. Japan's DoCoMo is one of the carriers developing applications for WiFi offload. Cellular carriers that are not developing their own WiFi networks are likely to seek bilateral agreements and roaming contracts with third-party WiFi networks similar to those that once dominated the cellular world. Some cellular companies are already offering tiered pricing plans that bundle WiFi access into their subscription pricing.

Because of all this, the hotspot 'dots' are growing ever more numerous and larger and will soon start to coalesce into ever larger zones of WiFi coverage. Cellular networks would still provide some complementary services, like high-speed mobility, but most of the data would be carried by WiFi networks, making cell networks almost vestigial, like the extra-deep roots of our canine teeth - useful, but not critical. Some cell companies might balk at using an integrated cell-WiFi strategy, but the competitive pressures to do so will be intense. Cable network providers like Comcast are already starting to develop WiFi based mobile networks to grab traffic from cell operators. Cell companies have already started to face steadily increasing competition from alternative service providers like Skype and the second coming of Google Voice.

Consumers that automatically look for WiFi will see 'WiFi -as-ocean' as a great advance. 'WiFi -as-ocean', however is still a work in progress, consumers still have to search for it; it is not found wherever one happens to be, whenever it is needed.

'WiFi -as-ocean' still needs work; it needs more device and service development, automated connectivity and better local networks to facilitate its widespread expansion:

- Device development - Consumer device vendors are already competing to offer better WiFi: the dual-band iPhone5 and Kindle both providing better service and faster download

speeds with WiFi. What's more, low-cost devices already sold in emerging markets such as India and China are incorporating WiFi as a standard feature.

- Service development - WiFi access at airports is still a paid service at many airports. In the future it will be free and ubiquitous, and probably paid for by, say, location-based advertising from airport concourse merchants and airlines that will use WiFi to download a digital boarding pass to the WiFi device in your pocket. WiFi will completely change the user experience at sporting events, shopping malls, and restaurants; indeed, WiFi will be everywhere you want to be.

- Automated connectivity, and more - It's called, 'Next Generation Hotspot', and is based on the WiFi Alliance's Passpoint certification; as it's introduced and becomes more widespread over the next few years, it's going to change the WiFi experience with features such as automated hotspot selection, automated user authentication, and data and fraud protection.

- WLAN techno-innovation - Since consumers use WiFi for audio and video, WiFi is developing sophisticated streaming features to deliver a user experience equivalent to or better than that with wired LAN. In time, WiFi will be able to dynamically scale to accommodate the ebb and flow of crowds. It will also offer location/navigation services for hotzones, tailored to the venue.

In a few years, if trends continue, we expect to see more than half of all mobile traffic carried on WiFi networks rather than by cellular data networks. As WiFi coverage expands from hotspots to hotzones, the zones will tend to join. With near continuous WiFi coverage wherever people gather, there will be less need to subscribe to expensive cellular network data packages.

Is the age of cellular over? Of course not, we will always need macro coverage, and WiFi's range is insufficient. Today, many people have given up their landlines; as cellphones meet their needs. With time, people will, likewise, be happy with WiFi alone - we only have to rethink our WiFi experience to turn islands into oceans. ●