

Embracing the Wi-Fi Revolution

By Jesse Cryderman

If you are reading this story over a wireless connection, chances are it is being delivered by Wi-Fi. Whether by tablet, smartphone, laptop, PC, or connected television, when users are stationary, which is 65 to 80 percent on average, Wi-Fi is king. These days, if you're anywhere near civilization, you are likely under the umbrella of Wi-Fi coverage. From small town America to the Tube in London, to flights in between, communications service providers (CSPs) are beginning to cash in on the Wi-Fi revolution, and for many good reasons:

Ubiquity: While 2G, 3G, and 4G networks around the world operate on varying standards, Wi-Fi is the same in Santorini, Greece as it is in Seoul, Korea. This means not only can CSPs offer international roaming plans to their own customers, but can partner with other global carriers to expand revenue sharing opportunities.

- **Lower Cost:** Wi-Fi is transmitted over unlicensed spectrum, which dramatically accelerates time to market and lowers costs of operation.

- **Lower CapEx:** The capital expenditure required to deploy Wi-Fi access points is substantially less, on average about 40-50 percent lower.

- **Ease of Installation:** Wi-Fi connectivity is inexpensive and easier to install, and it is universally deployed in billions of consumer handsets, tablets, laptops, and other devices.

- **New Market Opportunities:** The vast majority of M2M traffic will be delivered over Wi-Fi, according to M2M research firm Machina Research. Enabling Wi-Fi solution enables CSPs to tap into these opportunities as they emerge.

What's more, consumers are increasingly moving to Wi-Fi versus their traditional wireless networks, and this trend will likely increase as consumers react to pain points surrounding the price of mobile data, which, despite forming the foundation of most wireless operators' profit in the latest earnings reports, is being metered out at more expensive rates under new "shared data" plans. As you can see in Figure 1, for tablets and notebooks, the rate of Wi-Fi adoption is increasing, while cellular use is falling.

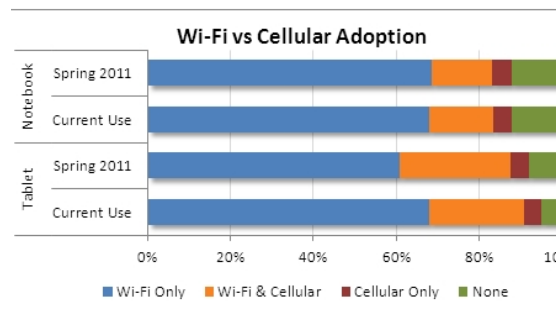


Figure 1
Source: NPD Group

The new network is as much a Wi-Fi story as it is an LTE or wireline story. Let's take a closer look at just how big the Wi-Fi boom will be and some of the ways in which CSPs can embrace the Wi-Fi revolution and overcome inherent challenges. Also, we'll take a look at how this effects the vendor landscape, and explore some new use cases for Wi-Fi.

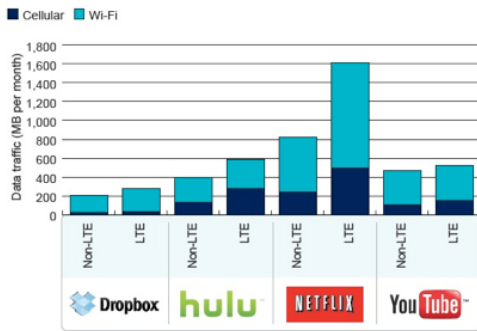
The wireless boom isn't LTE

While the wireless data world is already increasingly moving to Wi-Fi, this news is just foreshadowing for what's to come; between now and 2015, the market is really going to explode. The latest [Cisco Visual Networking Index](#) predicts that Wi-Fi internet will outpace wired internet traffic by 2015, delivering 37.2 exabytes per month. By that time, traditional mobile data networks--including LTE--will deliver just 6 exabytes monthly. Keeping pace, Informa Telecoms and Media expects Wi-Fi hotspots to increase 350 percent over the next four years. Even today, mobile data consumption on smartphones isn't scaling with faster mobile data networks the way some might have predicted, as you can see in Figure 2.

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Fig. 18: US, smartphone-originated traffic distribution by access technology on LTE versus non-LTE Android smartphones, selected applications, May-12

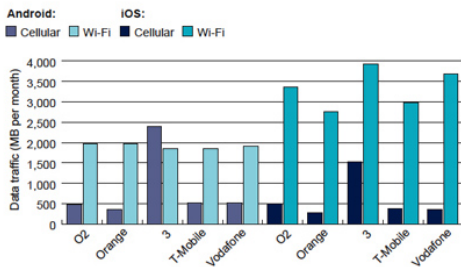


Source: Mobidia

Figure 2
Source: Mobidia

In the U.K., the vast majority of mobile data is over Wi-Fi (with the exception of Android users on 3's network), as you can see in Figure 3 below. This is how mobile data usage plays out across most of Europe and Asia.

UK, average smartphone-originated data traffic (MB per month) by OS and operator, May-12



Source: Mobidia

Figure 3
Source: Mobidia

Communication service providers are taking note. The Wireless Broadband Alliance recently reported that nearly 60 percent of wireless service providers, “believe Wi-Fi hotspots are either ‘very important’ or ‘crucial’ to their customers’ experience, in order to offload busy mobile broadband networks and to provide value-added services.”

Roadmap for the Wi-Fi play

By now, the conundrum presented by the hockey-stick demand for mobile data is well known: how can CSPs deliver increasingly more mobile data for the same price and continue to make money? Communications service providers are employing four basic strategies to cope with the data crunch: traffic shaping (e.g. throttling, bandwidth caps, premium charging); infrastructure upgrades (e.g. LTE); backhaul upgrades;

Deployment of Wi-Fi by CSPs has blanketed the city of London with carrier-branded connectivity to support the Olympics.

and data offload (e.g. Wi-Fi, smallcell, etc.). Wi-Fi offers many more benefits beyond offload (more on that later), but the immediate business arguments for deploying Wi-Fi are: a reduction in CapEx for wireless coverage versus 3G/4G; rapid deployment; and global interoperability.

Total operational cost savings by employing a network of Wi-Fi hotspots in dense urban areas is in

CapEx Assumptions	WiFi AP	LTE Macro Cell
Cost of 3-Sector BTS		\$45,000
Cost of WiFi Access Point	\$500	
New Site Acquisition	\$600	\$150,000
Collocation		\$50,000
Backhaul	\$300	\$5,000
OpEx Assumptions	WiFi AP	LTE Macro Cell
Monthly Site Rental	\$20	\$1,000
Site Maintenance /month	\$10	\$200

Figure 4
Source: 2012, Wireless 20/20, LLC

the neighborhood of hundreds of millions of dollars per city. As you can see in Figure 4, Wi-Fi CapEx is a fraction compared to LTE.

In terms of Wi-Fi deployment, each city presents a different case. Wireless 20/20 offers a business case analysis tool that models deployment plans and can help wireless service providers determine the best mix of access technologies in a particular city.

Network planning is one piece of the puzzle. Internationally, it may make more sense for CSPs to partner with Wi-Fi hotspot networks operated by other carriers, or pure-play Wi-Fi companies, like Boingo Wireless. In terms of hardware, it may make more sense to deploy hybrid base stations and femtocells that have both 3G/4G radios as well as native Wi-Fi; such gear is available from companies like Alcatel-Lucent, Ericsson, Nokia Siemens Networks, Huawei, and ZTE. And then there is the critical software component that addresses four critical functional needs: discovery, seamless authentication, security, and service continuity. These functions are outlined in the next-gen hotspot standard (NGH), advanced by the Wireless Broadband Alliance and commercialized for devices by the Wi-Fi Alliance as the Passpoint Initiative.

Carrier Wi-Fi today

Around the world, CSPs are moving fast to take advantage of both the cost savings and the increasing consumer preference for Wi-Fi connectivity. During a presentation at Mobile World Congress in Barcelona, Wang Jianzhou, chairman and CEO of China Mobile said, "Wi-Fi has proved to be a very important supplement to the cellular network." He should know; in March we learned that For China Mobile, Wi-Fi traffic grew 398 percent year-over-year in 2011. In Japan, KDDI partnered with Ruckus Wireless to boost its Wi-Fi offload capacity from 10,000 access points in mid-2011 to 100,000 this March. SK Telecom has announced the deployment of Wi-Fi integrated LTE femtocells in 84 cities. AT&T is leading in carrier Wi-Fi in the U.S., as it operates a network of more than 25,000 hotspots offering free or fee-based connectivity in airports, stadiums, McDonalds and Starbucks across the country. And in London, BT spearheaded an aggressive plan to deploy 500,000 Wi-Fi hotspots to deliver data and connectivity to info-hungry attendees at the 30th Olympic Games.

Wi-Fi is clearly a major piece of network strategy for global CSPs. David Chambers, director of OSS Solution Marketing, Amdocs, explained the cost dynamics, and framed the scope of carrier interest:

"The additional cost of integrating carrier Wi-Fi into small cells is relatively low," Chambers says. "Adding this capability into newly deployed small cells enables greater capacity and brings an extra dimension to the overall solution. Our survey found that many network planners will mandate that Wi-Fi is integrated into new 3G and 4G small cells, with 22 percent of our sample anticipating it will be installed in over half of their total cellsites by 2017."

New business opportunities

Offloading mobile data to the Wi-Fi realm is clearly a way to save money and manage the mobile data boom, but what other business opportunities are available to CSPs?

In a recent whitepaper, which brands Wi-Fi the "new mobile," Cisco highlights five new business strategies that monetize service provider Wi-Fi:

- Offering zero-rated Wi-Fi access via advertising
- Enabling zero-rated Wi-Fi access through personalized marketing
- Delivering secured access to cloud storage and resources over Wi-Fi
- National and International Wi-Fi roaming
- Enhanced in-store shopping experiences

There are certainly more business opportunities for carrier Wi-Fi in the future, including robotics,

Wi-Fi is the predominant form of connectivity to the Internet, the prevailing M2M access technology, and the preferred method of access for tablet users.

telematics, M2M, and business services. An in-depth report released by the Wireless Broadband Alliance in July indicates that: 66 percent of business travelers would pay for faster Wi-Fi, even in the presence of a free option; 34 percent of mobile users would pay for faster Wi-Fi; and 32 percent would pay based on the use of the network.

Further, wired service providers have an uphill battle against wireless service providers in the U.S. Cisco reports that even though most terrestrial broadband providers include free Wi-Fi in their bundles, most people associate free Wi-Fi with a mobile provider. This means mobile service providers already have a head-start in the consumer segment. We already see AT&T aggressively flexing their Wi-Fi muscle, with a variety of Wi-Fi only plans ranging in price from \$3.99 single-session passes to \$15.99 monthly access.

Nearly ubiquitous Wi-Fi connectivity has even given rise to a new class of smartphone and service provider: the Wi-Fi only crowd. The latest example of this is Republic Wireless, a wireless service provider that offers unlimited everything for \$19 per month by relying almost exclusively on Wi-Fi offload.

Wi-Fi is the new mobile

While reporting from Management World in Dublin and Mobile World Congress in Dublin, Pipeline editors made a preponderance of calls and texts--whether in a city street, a crowded bar, or conference center--over Wi-Fi. Yet today, the process is still not nearly wrinkle-free.

In the new network, everyone stands to gain from Wi-Fi: service providers, vendors, and consumers. Service providers will be able to push down their costs and explore new revenue streams by turning to Wi-Fi. As service providers move to rapidly deploy next-gen Wi-Fi hotspots and Wi-Fi-enabled femtocells, infrastructure vendors will see a spike in this business segment. Billing and operations software providers and vendors of policy management solutions will become increasingly relevant to manage the seamless discovery, authentication, security and service experience that must be transparent to the end user; they must help service providers deliver the WBA's NGH standard. And, the end-user stands to benefit from controlled expenses and the same experience, regardless of the access technology.