

Wireless Carriers Offloading Data Traffic to Wi-Fi

BY MICHAEL HARRIS

Wi-Fi is the most popular high-speed wireless Internet access method for computer users. Soon, the same may be true for mobile phones. Why? Because Wi-Fi is faster, cheaper and more broadly available than other mobile data technology. In the coming years, more U.S. mobile users could access the Internet through Wi-Fi than cell towers.

Sound crazy? Consider this. Today, there are 10 times more Wi-Fi “base stations” in the U.S. than cell towers. More than 30 million homes have a Wi-Fi access point with a broadband Internet connection.¹ Outside the home, Wi-Fi is available at work and school. Additionally, there are more than 93,000 public Wi-Fi “hotspots” in the U.S.² More than 55 million cell phones sold in the U.S. this year will be Wi-Fi capable.³

These trends are poised to accelerate faster than a Wi-Fi connection. According to Coda Research, the portion of U.S. homes with Wi-Fi access will top 70 percent within 5 years. In 2015, two out of three mobile handsets sold will include Wi-Fi, and at that time, 80 percent of the projected 149 million owners of mobile devices with Wi-Fi on their device will use it.

“There are 10 times more Wi-Fi ‘base stations’ in the U.S. than cell towers.”

ABI Research



FIGURE 1: Typical Wi-Fi Router: a home “base station”

Wi-Fi 101

Wi-Fi, an abbreviation for “wireless fidelity,” is a brand name for wireless networking technology based on IEEE 802.11 technology standards. About 800 million new Wi-Fi capable devices are manufactured each year, including everything from routers (see Figure 1) and laptop computers to video game consoles, mobile phones, MP3 players, printers, digital cameras and TV set-top boxes. Wi-Fi is used to link these devices together, as well as to local area networks and the Internet through a variety of service providers.

¹ ABI Research, ² Jwire, ³ Strategy Analytics



FIGURE 2: Wi-Fi access point suspended on an aerial cable TV line

Wi-Fi is widely used in homes, businesses and school campuses, as well as public hotspot locations, such as cafes, hotels, airports and train stations. Wi-Fi can even be found installed on street lights, utility poles and aerial cable TV lines (Figure 2).

The technology operates in unlicensed wireless spectrum in the 2.4 GHz and 5 GHz frequency ranges. There are several types of Wi-Fi in use, as shown in Table 1. The most common include 802.11b and 802.11g, which offer a maximum data rate of 54 Mbps and a coverage range of 100 feet indoors and 300

feet outdoors. The newest flavor, 802.11n, more than doubles Wi-Fi's range and boosts maximum available speeds to a whopping 450 Mbps.

TABLE 1: Types of Wi-Fi

Wi-Fi Technology	Frequency Band	Maximum data rate
802.11a	5 GHz	54 Mbps
802.11b	2.4 GHz	11 Mbps
802.11g	2.4 GHz	54 Mbps
802.11n	2.4 GHz, 5 GHz, 2.4 or 5 GHz (selectable), or 2.4 and 5 GHz (concurrent)	450 Mbps

Source: Wi-Fi Alliance

Wi-Fi Meets Mobile

Skyrocketing data usage on mobile networks is forcing the Wi-Fi issue. According to Morgan Stanley Research, through the end of 2013, mobile data traffic is expected to rise by a 131 percent compounded annual growth rate (CAGR). Consumers are eager to save on climbing mobile data charges. Carriers are interested in ways to reduce mobile network congestion while avoiding expensive cell site expansions.

For consumers, Wi-Fi means faster download speeds on their mobile devices at a lower cost. 3G mobile technologies available today on mobile carrier networks are far slower than Wi-Fi. For example, as shown in Table 2, the maximum download speed of an EVDO data connection on a CDMA mobile network is 3.1 Mbps. On GSM mobile networks, the maximum is 14.4 Mbps with HSPA. The newer HSPA+ boosts that number to 42 Mbps, but each one fails to match the 54 Mbps capacity of Wi-Fi with 802.11g.

TABLE 2: Wi-Fi Speeds vs. 3G/4G Mobile

3G Mobile Technology	Maximum Speed
1xEV-DO Rel. A	3.1 Mbps downlink 1.8 Mbps uplink
HSPA	1.8-14.4 Mbps downlink 3.84K - 2 Mbps uplink
HSPA+	42 Mbps downlink 22 Mbps uplink
4G Mobile Technology	
3GPP LTE	100 Mbps downlink 50 Mbps uplink
WiMAX 802.16e	46 Mbps downlink 7 Mbps uplink
Wi-Fi Alternatives	
802.11g	54 Mbps downlink 54 Mbps uplink
802.11n	450 Mbps downlink 450 Mbps uplink

Even much-touted, leading-edge 4G mobile technologies, such as LTE and WiMAX, trail Wi-Fi's trajectory. While LTE offers an impressive maximum download speed of 100 Mbps, it offers less than a quarter of the capacity of 802.11n.

Not only is WiFi faster, it can also be cheaper for consumers. A study by Informa found 45 percent of mobile data usage happens within a customer's home. For consumers with a Wi-Fi enabled broadband Internet connection at home, free mobile data access is available for the entire family. That compares to paying AT&T or Verizon \$25 or more per month, per mobile phone for 3G data coverage. For a family of four mobile data users, switching to Wi-Fi delivers more than \$1,000 in annual savings.

“The good news for wireless carriers is that the more consumers use Wi-Fi, the less capacity carriers need to add to cell sites and backhaul networks, reducing capital and ongoing operating costs.”

Informa



FIGURE 3: McDonald's is now offering Wi-Fi at many U.S. locations

As a result, wireless carriers are jumping on the Wi-Fi bandwagon too. AT&T, the number-two mobile player, operates more than 23,000 Wi-Fi hotspots in the U.S. In the first nine months of 2010, AT&T said 228 million Wi-Fi connections were made through its hotspots. Partnering with AT&T, McDonald's has started offering free Wi-Fi access at 11,500 of its U.S. restaurant locations (Figure 3). How about a side of Wi-Fi with those fries?

Besides the Big Arches, cable TV companies are among the biggest boosters of Wi-Fi. Cablevision Systems Corp. has installed “tens of thousands” of Wi-Fi access points on its wires throughout the New York area, as illustrated in Figure 4. Access is offered free to Cablevision's residential Internet customers. Comcast has joined the game too, recently launching 2,000 hotspots in the Philadelphia region, plus parts of New Jersey and northern Delaware.

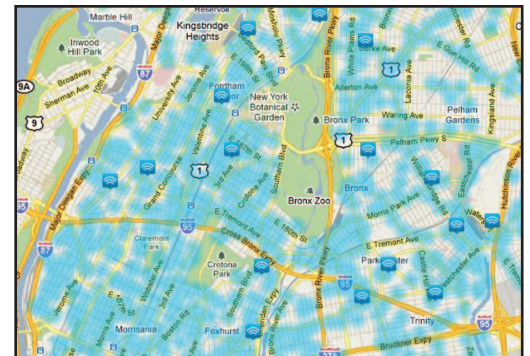


FIGURE 4: Cablevision's Wi-Fi blankets the Big Apple

When at home, work, or near a hotspot, users simply change their smartphone settings to use Wi-Fi for data connectivity, rather than their carrier's 3G or 4G wireless network. A number of applications for Apple's iPhone and Google Android devices automate the process of finding and logging into Wi-Fi networks. Internet-centric mobile applications, like Skype for voice and video communications, and Facebook for social networking fly with Wi-Fi.

Increasingly, Wi-Fi looks like a win-win proposition for both consumers and mobile carriers. Consumers can surf the Internet faster and save on monthly data charges, while carriers may reduce the need to add as much cell site capacity. In the mobile marketplace, that's the “why” for Wi-Fi.

About the Author

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