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Wi-Fi

After Missteps and Delays, the Cable Industry Is Once Again Remaking Its Wireless Future

The largest cable operators in the United States are once again marching hand in hand into a brave new wireless future—this time, in Wi-Fi.

Quietly, over the past several years, Comcast Corp., Time Warner Cable Inc., Cox Communications, Bright House Networks, and Cablevision Systems Corp. have activated more than 200,000 Wi-Fi hotspots within their service footprints along the Eastern Seaboard, West Coast, and major cities in the Midwest, which, when taken together, form an unparalleled resource for competing against the likes of Verizon Communications Inc. and AT&T Inc. in the market for both wired *and* wireless communications services.

The companies know this well, which is why they created a ''collective'' network for their hotspots, ''CableWiFi,'' and made them available to each other's home broadband subscribers—in many cases for free.

At least so far, the companies have marketed their Wi-Fi hotspots merely as a value-added benefit for customers, a reason not to switch to Verizon's FiOS or AT&T's U-verse for cable TV and Internet access. They have taken pains, in fact, to position Wi-Fi not as an alternative, but as a supplement to the wireless data services offered by Verizon and AT&T.

''Wi-Fi provides an additional mobility component for our customers,'' explained Rick Chessen, senior vice president of law and regulatory policy for the National Cable and Telecommunications Association, the industry's trade group, speaking during the Practising Law Institute's Cable and Broadband 2014 conference in New York in January. ''This is a really great add-on to their broadband Internet service. And, for us, it's a way to make our service more sticky than a traditional triple play.''

That all may be true, but there also has never been more opportunity, more convergence of forces for the cable industry's players to solidify their position in the wireless business and become direct competitors to the nationwide carriers than right now.

A Favorable FCC Decision Coming. This month, the Federal Communications Commission will vote to free up some 100 megahertz of spectrum in the 5.1 gigahertz band for use by high-powered, outdoor Wi-Fi equipment, part of a broader plan by the agency to release more 5 GHz frequencies for shared Wi-Fi use over the next five years.

To say that this would be a boon to the cable industry would be a vast understatement.

The latest Wi-Fi standard, 802.11ac—known as ''Gigabit Wi-Fi'' or ''5G Wi-Fi''—uses 5 GHz band radio frequencies exclusively, and promises connection speeds of up to 1.3 gigabits per second, more than enough to handle data-intensive tasks like sharing files and streaming high-definition video.

It's worth noting, too, that each of the five cable operators' Wi-Fi networks have operated primarily in the 2.4 GHz band, in which signals travel farther but are more susceptible to interference from other public Wi-Fi hotspots (in coffee shops, airports, and parks) and common household appliances (like microwave ovens, garage-door openers, and baby monitors). Thus the FCC's opening up of the 5.1 GHz band for Wi-Fi on a shared basis will have the added effect of alleviating congestion in the 2.4 GHz band as well.

''There's really not a lot of 'green field' spectrum out there,'' Chessen said, noting that it is still too early for Wi-Fi use of the 600 MHz broadcast TV band and 3.5 MHz band. ''We have to find spectrum to share.''

One of the problems is that Wi-Fi was never intended for large outdoor spaces and tens of thousands of data-hungry users; Wi-Fi was originally meant for peoples' homes and other smaller spaces with more modest Internet demands.

''We're seeing the proliferation of Wi-Fi everywhere,'' said Michael Calabrese, the director of the Wireless Future Project at the New America Foundation, in an interview with Bloomberg BNA. Calabrese's organization is part of a broad-based coalition of groups including the National Cable and Telecommunications Association and companies such as Google Inc. and Qualcomm that has been urging the FCC to set aside more spectrum for unlicensed Wi-Fi use. ''The prevalence of both smartphones and tablets with high-resolution screens is a recipe for overloading Wi-Fi despite its tremendous spectral efficiency.''

Fortunately for the cable operators, device manufacturers have long been preparing for this, what some in the industry have termed a ''crunch.'' In recent years, companies like Apple Inc. and Samsung Electronics Co. have built new tablets and handhelds with both 2.4 GHz *and* 5.1 GHz band-enabled Wi-Fi chips, convinced that the 5 GHz band—now in use by private organizations and federal government agencies on a shared, unlicensed basis—will become the next beachhead for Wi-Fi.

''It's just natural for manufacturers, as they are planning their new product lines, to ask 'what are we going to do as far as connectivity options?' '' said Greg Ennis, vice president of technology for the Wi-Fi Alliance, a

consortium of 600 companies that certifies Wi-Fi devices, in an interview with Bloomberg BNA. ''Well, Wi-Fi is step one. And 5 GHz is the next step. That's where the technology is going; that's where the market is going; and that's where the regulatory efforts are going.''

But while big cable and manufacturers may be rushing toward a 5-gigahertz future, potential roadblocks do exist.

5 GHz Already a Crowded House? The 100 MHz block of spectrum proposed for new, high-power Wi-Fi transmissions—in 5.1 GHz, the 5150-5250 MHz portion of the Unlicensed National Information Infrastructure (U-NII) band—is already in use on a shared basis by government agencies and other private companies.

One such company, Covington, La.-based Globalstar Inc., is licensed to operate satellites in the 5.1 GHz band (from 5091 MHz to 5250 MHz). Up until now, Globalstar has shared these frequencies with unlicensed operations restricted to *indoor* transmissions, and at very low power.

Globalstar is concerned that if the FCC ups the allowable power limit in the band to 1 Watt for *outdoor* Wi-Fi, the company's satellite systems—specifically, four MSS (mobile satellite service) feeder links that serve 85,000 customers globally—will be degraded by interference, and may only get worse. (To date, Globalstar has not contested a proposed 500 percent increase in the power limit for indoor operations of UNII-1 access points—from 50mW to 250mW—but remains in staunch opposition to an ''unlimited'' rollout of hotspots outdoors nationwide.)

''Nobody can predict with certainty exactly how many Wi-Fi access points [the cable companies] and others will deploy outdoors in the coming years,'' L. Barbee Ponder IV, Globalstar's general counsel and vice president of regulatory affairs, said in an interview with Bloomberg BNA. ''Cable has stated that they plan to deploy extensive gigabit Wi-Fi networks outdoors, that there is currently a 'spectrum crunch' in the 2.4 GHz band, and that the 5 GHz band is therefore 'critical' to their future plans. . . . Given the FCC's stated goal of revising its rules in order to encourage the growth of outdoor Wi-Fi networks operating within the 5 GHz band, the only reasonable assumption it can reach is that dramatic growth will occur.''

In a May 2013 report to the FCC, Globalstar estimated that as few as 201 Wi-Fi access points in the 5.1 GHz band could drown out its satellite signals.

Two months later, at the behest of the cable industry, CableLabs and the University of Colorado issued a rebuttal report claiming that Globalstar had used an ''inappropriate definition of interference, premised on a generic International Telecommunications Union-developed standard for noise as measured at the satellite.'' The report contended that Globalstar did not account for the ''technical characteristics'' of its own satellite system, nor did the company ''seek to forecast the outcome of central policymaking importance, which is the potential impact to satellite phone users.''

''A more holistic approach to modeling interference risk, which accounts for any potential impact on satellite phone users by examining both the uplink and the downlink in Globalstar's duplex system, would yield more accurate results than those proffered by Globalstar,'' the report added. ''. . . Hundreds of millions, or even billions of Wi-Fi access points could operate in the UNII-1 band simultaneously before increasing the noise in Globalstar's system by even a small amount that would likely to be imperceptible to end users.''

In other recent meetings with FCC officials, Globalstar's critics also have tried to highlight a separate-but-related proposal by the company to operate a terrestrial low-power service (TLPS) over 11.5 MHz of previously licensed S-band spectrum at 2483.5-2495 MHz and the adjacent 10.5 MHz of unlicensed spectrum at 2473-2483.5 MHz. Such a proposed service could create interference with 2.4 GHz Wi-Fi channels, they have argued.

Not coincidentally, Globalstar, much like the cable operators, is seeking to expand beyond its niche market into Wi-Fi. In late January, the company introduced a product that will allow consumers to set up Wi-Fi in places where there are no cellular signals, like rural and sparsely populated areas.

The company's new product, Sat-Fi, will compete directly with Thuraya Telecommunications Co.'s SatSleeve, which transforms a regular smartphone into a satellite phone. That device works with Apple's iPhone and Samsung's Galaxy S3 and S4 models, which include 5 GHz Wi-Fi radios.

With Sat-Fi, as many as eight devices will be able to use a hotspot simultaneously for low-data-rate applications such as e-mail and texting, though only one phone call can be placed at a time.

In an interview with Bloomberg News on Feb. 4, Globalstar's CEO James Monroe said that within two years Sat-Fi should be less expensive than a conventional smartphone.

But, meanwhile, the company continues to lobby FCC officials to maintain the current ban on using outdoor equipment in the U-NII-1 channel. According to people familiar with the matter, the FCC's proposed order would authorize a power limit of 1 Watt, exactly what the cable industry wants and needs for its Wi-Fi expansion plans.

A History of Missteps in Wireless. The cable companies have been trying for years—mostly unsuccessfully—to develop a strategy for entering the wireless sector.

In 2006, Comcast, Time Warner Cable, Cox Communications, and Bright House formed a joint venture with Sprint Nextel Corp. called SpectrumCo. and paid $2.4 billion at auction for prime AWS (Advanced Wireless Services) band licenses. For a brief period, Cox actually tried to become a cellular carrier, but abandoned the effort in November 2011, citing ''the lack of wireless scale necessary to compete in the marketplace.'' Just weeks later, Comcast, Time Warner Cable, and Bright House entered into a deal with Verizon Wireless to not only sell their spectrum but jointly market each other's services. Cox subsequently signed on to the idea.

According to an analysis by Bloomberg BNA's *Broadband Advisory Services*, this and other joint ventures involving the cable operators and Sprint—namely the ''Pivot'' endeavor and the cable operators' participation in Sprint's Xohm Wi-Max—proved ''far too unwieldy under a management-by-committee structure, unsatisfactory revenue-sharing arrangements, and the complexity of creating new billing systems.''

Comcast, Time Warner Cable, and Bright House Networks actually were among the early investors in Sprint's Xohm Wi-Max and its spinoff and combination

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with Clearwire Corp., but never made more than a ''half-hearted effort'' to promote the service, *Broadband Advisory Services* noted in its analysis. In fact, Comcast and Time Warner never attracted more than a few tens of thousands of bundled customers, and Bright House never even launched. The effort officially ended in 2011 when the cable operators announced their spectrum sale to Verizon. And, from the little information that has trickled out on the progress of the Verizon Wireless co-marketing deal, this has not worked well either for either party, *Broadband Advisory Services* says.

But with that cash windfall that the cable operators received from Verizon from selling their spectrum, they have invested in, among other things, Wi-Fi, even with the cloud of history hanging over them.

''The cable guys basically look at wireless like it's HBO—'Oh, we'll just bolt that on to the price plan. It's another add-on.' But wireless is very difficult business,'' Roger Entner, a telecommunications industry analyst and founder of Recon Analytics, a market research firm, told Bloomberg BNA in an interview.

''Cable companies are certainly the big winners in more Wi-Fi spectrum being made available, and, yes, they want to make this a competitor to the wireless carriers—because the wireless carriers are also offering landline phone, TV, and broadband Internet service,'' Entner added. ''It's about the cable guys providing an *outdoors* component to their offer. And I think it's quite a viable threat. But I don't think it will ever replace a wireless carrier.''

For one, to effectively compete head to head with the wireless carriers, ''handoff'' from one CableWiFi hotspot to another is essential. Here, the cable operators might have technology on their side.

'Handoff' Made Easier, But Ubiquity Still an Issue. Two industry groups, the Wireless Broadband Alliance and Wi-Fi Alliance, are promoting what has been termed the ''Passpoint'' standard, also known as Hotspot 2.0 or HS2, to enable seamless handoffs. (Comcast and Time Warner Cable are members of both organizations.)

The way Passpoint works is that a user's mobile device automatically logs on to any hotspot within range, which eliminates the need to search for a Wi-Fi network and re-authenticate each time that user moves to a new hotspot or between a cellular network and a public Wi-Fi connection.

According to the two organizations, more than 27 global operators have participated in three phases of WBA trials, and to date, more than 400 devices have obtained Passpoint certification, including a wide range of smartphones and tablets.

Even this may not be enough for the cable operators to become full-fledged competitors to Verizon, AT&T, Sprint, and T-Mobile. In the end, Wi-Fi networks operate over unlicensed spectrum, which means that anyone can make use of it, potentially congesting frequencies and causing interference. By contrast, the major wireless carriers paid billions of dollars to the federal government for licenses to their spectrum. They, and they alone, control who uses their networks. (At the same time, the carriers themselves increasingly use Wi-Fi networks to divert data traffic off their systems and eliminate congestion caused by bandwidth-hungry users.)

But one development that would help the cable companies would be to have so-called ''Wi-Fi First'' services, like those offered by Republic Wireless, Scratch Wireless, and TextNow Wireless, catch on with consumers. All three of these companies' services rely on connecting the user to a Wi-Fi hotspot first, then ''handing off'' that user to Sprint's 3G (third-generation) network when Wi-Fi is out of range.

That could present an opportunity for the cable operators to compete more directly against Verizon, AT&T, and T-Mobile, or possibly sell access to their CableWiFi network on a wholesale basis.

In order for this to be a viable threat, however, the CableWiFi network would have to be truly ubiquitous, and capable of allowing ultra-fast connection speeds, with no gaps in coverage.

''Right now, where the real competition might be between CableWiFi and the wireless carriers is for data minutes,'' Jeff Silva, a senior policy analyst at Medley Global Advisors, told Bloomberg BNA in an interview. ''There's the possibility that with the increased availability of these hotspots, consumers will change their behavior such that they'll start doing more of their heavy data consumption on Wi-Fi hotspots, maybe switching to companies like Republic or Scratch. But the Wi-Fi hotspots don't have the same ease of use and seamlessness of smartphones on the national network. I don't see it even coming close. The smartphone remains so convenient. People want what they want when they want it.''

BY PAUL BARBAGALLO AND TIM MCELGUNN

CableWiFi: A Company-by-Company Breakdown

On Feb. 13, the same day that Comcast and Time Warner announced their agreement to merge, the companies launched a new coalition called WifiForward to bolster efforts to expand access to Wi-Fi.

In addition to Comcast and Time Warner and the National Cable and Telecommunications Assocation, the group's members include Google Inc. and Microsoft Corp.

The group's mission is as follows: ''to protect and strengthen existing unlicensed spectrum designations; free up new spectrum for unlicensed use at a variety of frequencies, including low, medium, and high frequency bands; and establish investment-friendly, transparent and predictable unlicensed rules that encourage growth and deployment.''

Unquestionably, WifiForward will add muscle to an already strong lobbying effort that the cable operators are making in Washington to free up more airwaves that support Wi-Fi.

Below, a closer look at where each of those companies stand with their ambitious Wi-Fi expansion.

Comcast

Of all the cable operators, Comcast is in the most advantageous position to turn CableWiFi into a true nationwide wireless network that could compete for customers against Verizon, AT&T, Sprint Corp., and T-Mobile USA Inc.

For one, Comcast's proposed takeover of Time Warner Cable would give the company another 28,000 Wi-Fi hotspots in dense urban areas such as Los Angeles; Austin, Texas; Kansas City, Mo.; Charlotte, N.C.; and New York City.

Also consider that Comcast is planning to convert its residential broadband customers' *private* Wi-Fi routers into *public* hotspots. The company has already begun hooking up new gateways in peoples' homes that trans-

mit two Wi-Fi signals—one for the family and one for the public (any Comcast customer), capable of supporting data speeds of 15 megabits per second (Mbps) to 20 Mbps.

If the company obtains regulatory clearance to acquire Time Warner Cable, Comcast will have a combined 29 million high-speed residential and small business customers, each of which is a potential new dual-mode hotspot.

''Wi-Fi is at the center of our strategy to offer our customers the best online experience, whether it's the fastest Wi-Fi experience in the home, or a fast and reliable Wi-Fi environment outside the home,'' Tom Nagel, senior vice president of business development for Comcast Cable, said in a statement released last July. ''Our neighborhood hotspot initiative is an aggressive plan to give our Xfinity Internet customers even more ways to securely and seamlessly connect to the Internet, with the potential for millions of hotspots to support their growing number of wireless devices.''

Speaking during Comcast's 2013 fourth quarter and full year earnings call, CEO Brian Roberts said, ''So is it an opportunity someday to add Wi-Fi to our network outside of the home? Well, we're doing that in some cities, we are testing different technologies. There are other companies who are also doing that with their own business purposes, and we just. . .announced with the San Francisco 49ers that we're going to do their entire stadium and have new capabilities. That may very well expand into your neighborhood and into your commute patterns and into restaurants as we've already seen in a lot of cities. It's a very interesting area, I think it's synergistic for us. And we're keeping tabs on it.''

On Capitol Hill and at the FCC, Comcast has been the most aggressive in pushing Wi-Fi-friendly policies.

All told, Comcast has increased lobbying expenditures by 23 times over 2001 levels, to $18.8 million last year—behind only Northrop Grumman Corp. in spending by a single company.

Time Warner Cable

Although Time Warner Cable is a founding member of the CableWiFi alliance, the company was initially slower than Comcast and Cablevision with its Wi-Fi build-outs. However, in 2012, the company accelerated its efforts to counter competitors' higher-speed service plans. For example, soon after Google Fiber confirmed that it would build a gigabit network in Austin, Time Warner announced that it would build out a city-wide Wi-Fi network, offering free access for its high-speed data subscribers and a fee-based offering for non-subscribers. As of June 2013, the company had deployed 150 hotspots in Austin.

That build-out, along with extensive deployments in its New York City and Los Angeles service areas, have brought the company to 30,000 total Wi-Fi access points as of the end of 2013.

Speaking at Practising Law Institute's Cable and Broadband 2014 conference in New York City in January, Rachel Welch, group vice president in Time Warner Cable's government relations department, said the company was installing Wi-Fi hotspots in areas where consumers are, not building a ubiquitous network.

''It's complementary,'' she said, responding to a question about whether Wi-Fi competes with wireless carriers head to head. ''Our Wi-Fi network doesn't exist without our wired network.''

''Licensed services have ubiquity; unlicensed has no ubiquity,'' she added.

Cox Communications

After a slow start on Wi-Fi, Cox has integrated Wi-Fi hotspots in a number of markets with the other CableWiFi members, most recently announcing the completion of work with Bright House Networks' that gives their respective subscribers' access to hotspots in markets including Orlando, Tampa, Daytona, Northern Virginia, Connecticut and Indiana. Cox, however, has not yet added its major system in Las Vegas to the list of CableWiFi markets, despite deploying a temporary network comprising 200 hot spots in parts of the city during the Consumer Electronics Show in December 2013.

Cablevision

Cablevision was the first major cable operator to commit to Wi-Fi as a strategic priority. The company launched its Wi-Fi service in 2007, and since then has invested hundreds of millions of dollars to expand its footprint across the New York Tri-State area, one of the busiest commuting corridors in the United States. The company now claims to have more than 100,000 access points in operation, making it the largest contiguous Wi-Fi network in the country.

The company has launched Wi-Fi services at NJ Transit facilities and is now in talks with the Metropolitan Transit Authority about installing Wi-Fi hotspots in the Long Island Railroad and Metro North systems.

Cablevision also is following Comcast's lead in rolling out dual-mode home routers and, by doing so, is now on track to reach one million access points in 2014.

Cablevision is also the one CableWiFi member that has spoken seriously about adding a voice service to its Wi-Fi offering. In 2010, Cablevision began testing a wireless phone product that would operate on both its Wi-Fi network and cellular networks, trademarked with the Optimum Mobile brand.

Cablevision is now setting its sights on selling Wi-Fi as a service to enterprise customers. In the company's 4Q13 earnings call, Cablevision's President and CEO James Dolan said: ''The B2B (business-to-business) market is kind of an interesting marketplace as businesses end up using more and more connectivity in order to drive the businesses. Essentially, if they're using Wi-Fi to do things like connect vending machines and do their business for them, those are all opportunities for a company that's really good in connectivity.''

Bright House Networks

Bright House offers CableWiFi access in some parts of its California, Florida, Indiana, and Michigan markets, but has not announced how many hotspots it has turned on.

Other Cable Operators

While the five CableWiFi members have said publicly that they hope to include smaller operators, to date none have joined. Charter, the fourth-largest cable operator, and Suddenlink, the eighth largest, have not built out enough of a Wi-Fi footprint to make them attractive additions to the alliance.

In its 4Q13 earnings call, Charter CEO and President Tom Rutledge said, ''We have not gone out yet and put [Wi-Fi] in a public space, and really, that's just been a question of priority. In past operations I've managed, I've been a big proponent of Wi-Fi. I still am, but Charter's priorities are more basic still, and we need to get our product set significantly superior to our competitors

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and grow our penetration. And we're focused on the day-to-day task of doing that.''

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