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Led by Intel, True Believers in Wi-Fi Say It Will Endure



Peter Foley for The New York Times

Andrew S. Grove, left, the chairman of Intel, and Craig R. Barrett, the chief executive, at a conference in Idaho, where they promoted the virtues of Wi-Fi technology.

By JOHN MARKOFF

SUN VALLEY, Idaho, July 11 — Is the Wi-Fi boom about to bust? Even though that has lately become the fashionable view, the answer is probably no.

Critics argue that there are too many competitors trying to deliver high-speed wireless connections to the Internet. Prices for most commercial Wi-Fi services are too high, they say, and free or subsidized operations abound, including those like the one [McDonald's](#) started rolling out last week at its fast food restaurants in San Francisco. [Page C7.]

All this will make it practically impossible, the skeptics insist, for anyone to build a profitable business in Wi-Fi, a short-range wireless radio technology that frees personal computers from their physical tethers to the Internet.

But a number of true believers in Wi-Fi were present at this mountain resort during an annual conference, organized by the investment banker Herbert Allen, that brings together technology, media and entertainment industry leaders. The [Intel Corporation](#) in particular is betting a lot of money on Wi-Fi. And that may be exactly what the new technology needs to succeed.

Intel's two top executives, Craig R. Barrett and Andrew S. Grove, were here this year to preach the virtues of Wi-Fi, in the belief that it will be a powerfully disruptive force in the telecommunications industry.

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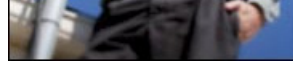
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It has certainly been a disruptive force at Intel. The industry and analysts have focused their attention on the current frenzy to build wireless Internet locations, known as hot spots, at airports, coffeehouses and hotels. But Intel has a much bolder wireless plan: it wants to close the so-called last-mile gap between homes and the Internet backbone with cheap, super-fast connections so that businesses can deliver interactive entertainment and a host of other digital products and services right into America's living rooms and dens.



Kim Kulish for The New York Times
Tim Pozar is helping to create a community Wi-Fi network in San Francisco.

The new Intel bet is remarkable given that the company initially backed the wrong wireless standard, putting its resources behind a competing standard known as Home RF.

But Intel, the world's biggest maker of computer chips, changed its strategy after its executives realized the power and potential pervasiveness of the unregulated Wi-Fi wireless networking standard, technically known as the 802.11 standard.

The Wi-Fi standard was developed and commercialized at [Apple Computer](#) and many other companies as early as 1999. Ultimately, though, it gained widespread popularity on its own, Mr. Barrett acknowledged in an interview here, as a grass-roots, from-the-bottom-up movement.

That success stands in striking contrast to top-down wireless data strategies, like the 3G cellular approach pushed by the telecommunications industry, which has so far been an expensive bust.

Mr. Barrett now says that people who predict a Wi-Fi shakeout are missing the point, as well as failing to see the deeper implications of the technology.

"What is missing is the realization of how many legs this technology has," he said.

In the three months since Intel introduced its wireless PC chips, the company has come to dominate the Wi-Fi market. It is now putting Wi-Fi circuitry in all of its chip sets for portable computers, investing widely in Wi-Fi industry start-ups and spending almost its entire annual marketing budget in a \$300 million advertising campaign trumpeting the virtues of its unwired Centrino brand.

"Intel has raised the level of the water and is floating all the boats," said Glenn Fleishman, editor of Wi-Fi Networking News, a Web-based daily newsletter.

Of even greater potential import, Intel plans to start a test in Texas in a few months that will use a combination of wireless technologies, including Wi-Fi, to bring broadband Internet connections directly to homes.

Last week the company quietly announced that it was teaming with a small equipment maker, [Alvarion](#), of Tel Aviv, Israel, to back a free wireless standard, 802.16, that is intended to send data over distances of as much as 30 miles and at speeds of up to 70 megabits a second.

The data rate is high enough to comfortably stream high-definition television video broadcasts, and the range makes it possible to quickly deploy a system in a large urban or suburban area.

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By comparison, current Wi-Fi technology is limited to several hundred feet and maximum speeds of 54 megabits a second. The Intel test, however, will explore using the 802.16 standard, known as WiMax, to distribute the data to Wi-Fi antennas in local neighborhoods.

If Intel is able to jump-start the market to reach millions of homes with a relatively inexpensive interactive data and video service, the technology could quickly alter the communications landscape.

That is already starting to happen. There is now an explosion of Wi-Fi hot spots in hotels, coffee shops, restaurants and airports, and a new wave of hand-held gadgets will soon supplement portable personal computers for a class of mobile workers that analysts are calling windshield warriors.

In a speech here on Thursday, Mr. Barrett sketched out a portrait of a market that it is growing rapidly.

There are now about 40 million Wi-Fi users, he said, and new access points are selling at the rate of about 15,000 a day, which makes Wi-Fi a much faster-growing technology than cellular telephony.

While prices for connection times are certain to keep falling, industry executives say they are already seeing usage patterns that suggest that Wi-Fi commercial services are working and are here to stay.

Moreover, they say they think the commercial services will complement and not compete with free services that are emerging in urban areas around the country.

"We have a good business model in hotels, said Dave Vucina, chief executive officer of Wayport Inc., a provider of Wi-Fi hot spots in hotels, airports, restaurants and other locations that is based in Austin, Tex.

In the hotels that Wayport serves, he said, the company is seeing nightly usage rates of 8 to 12 percent for each occupied room. He said he thought that the rate could go as high as 15 to 24 percent.

Those numbers are credible, industry analysts said, because out of the 40 million business travelers in the United States, 30 million now carry personal computers.

"We think the next big stage of this business will be the `windshield warrior,' " he said, a term that encompasses millions of blue collar and white collar workers, from traveling sales representatives to delivery and repair workers, who now need to check electronic mail and use the Internet on the job.

The central issue in the debate is whether those workers will be able to meet their data needs with next-generation cellular telephone networks, or whether the far higher data rates available on Wi-Fi networks will prove preferable.

"Salespeople on the road who used to look for pay phones now have data needs as well as voice," Mr. Vucina said.

"We believe we can be successful by rolling this service out strategically with large retail brands," he added. "The argument that free wireless Internet services will undercut the growth of providers such as Wayport, Cometa and T-Mobile is not

supported by consumer behavior."

"I can get free coffee at my office," he said, "but I still go to [Starbucks](#)."

Business travelers are willing to pay \$9.95 to use Wi-Fi in their hotel rooms, supporters say, and they will be willing to pay \$6.95 in airports. The difference is that commercial, as opposed to free, services will offer consistent high-bandwidth quality connections.

"The question isn't whether they will pay," Mr. Vucina said, "but what they will be willing to pay."

The McDonald's restaurant chain has announced Wi-Fi service tests in New York City with Cometa — a venture involving Intel, [I.B.M.](#), A. T.&T. — and in the San Francisco Bay Area with Wayport.

"It makes plain sense," said Dan Thompson, McDonald's West Division president. "We are very convenient, we are ubiquitous."

Alan Reiter, publisher of Wireless Internet and Mobile Computing, an industry newsletter based in Chevy Chase, Md., said all the new ventures highlighted an important issue. "There is a lively debate going on," he said, "over whether Wi-Fi should be free or not."

He pointed to examples of some chains that have decided to use the service as a loss leader. Evidence supporting the powerful attraction of Wi-Fi comes in reports that both Schlotzky's Deli and the Wyndham hotel chains have recently claimed that free Wi-Fi has measurably increased business.

By the same token, because more than 60 percent of Starbucks' business comes before 9 a.m., he said, the company may be able to use Wi-Fi to help lift sales during less-busy times of the day.

"They have plenty of room after 9 a.m. and they think they can use Wi-Fi to drive traffic," Mr. Reiter said.

While large corporations are still talking about trial deployments, the grass-roots movement that Mr. Barrett talked about is already in full bloom.

In many regions around the country, citywide Wi-Fi networks that are freely available are being deployed in rapidly growing numbers by small groups of volunteers and computer networking hobbyists.

In San Francisco, for example, two community groups, SFLAN and Bay Area Research Wireless Network, have combined their efforts to create a network "barn raising."

The groups now have 12 public nodes that are connected in a simple mesh. Volunteers who are willing to spend \$1,000 for a simple Wi-Fi antenna and router are interconnecting by pointing at one another around the city, making signals available locally in a radius of approximately a city block from each antenna.

The groups plan to deploy 20 more nodes next month and will soon put antennas on top of Twin Peaks, a high point in the city, and on Yerba Buena Island in the middle of San Francisco Bay. said Tim Pozar, a radio engineer who is one of the leaders of the

effort.

The Yerba Buena antenna will allow the group to leapfrog free Wi-Fi to the East Bay. "Our idea," Mr. Pozar said, "is that our network will make it easy for all kinds of communities to build similar networks."



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