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ISP Fixed Wireless



Internet World Wireless 2001 Fixed Wireless Opportunities Forum

Manufacturers of laser and radio equipment proclaim that they have the technology to bring the Gigabit Internet to every small business in the United States. Next-generation radios will operate in bands from 20 GHz to 220 GHz.



by **Alex Goldman**

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The consensus at the Fixed Wireless Opportunities forum was twofold:

- 1) Fiber optic cable provides better service than fixed wireless, but as long as there are obstacles to deploying fiber, fixed wireless will retain a significant market niche. Fiber is better for backbones, but wireless is better for the last mile.
- 2) Broadband RF, combined with laser, will soon be able to provide reliable Gb/sec service with 99.99% up time.

BridgeWave Unveils Point-to-Multipoint Radio

[BridgeWave Communications](#), a manufacturer of broadband RF equipment, announced the development of an affordable point-to-multipoint radio operating in the 20GHz to 42GHz (microwave) band. The radio is designed to extend wired networks.

Gregg Levin, Senior VP of Marketing and Business Development, said, "In the next few years, the 256Kb, 512 Kb, or the 'best effort' service that is common today will not be acceptable," Levin said. He noted that as business demands more bandwidth at a better quality of service (QoS), fixed wireless will take business from DSL.

Use mass-produced DSL and cable equipment. . .

Levin admitted that existing wired equipment, such as cable modems, SOHO routers, and DSLAMs, all of which has been developed for the mass market, has features and prices that should be taken advantage of, even in a fixed wireless network.



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Extend broadband networks that are already deployed

Source: [BridgeWave Communications](#)

In his sample network architecture, Levin used a Cable Modem Termination System (CMTS) operating under the DOCSIS standard, which connected to BridgeWave's radio through a physical optical/electrical converter.

... for an affordable network

Levin proceeded to define the word "affordable" as it applies to fixed wireless broadband.

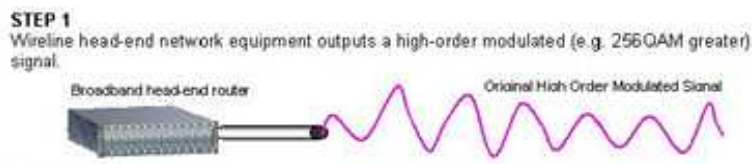
Levin said that in today's economics, there are two types of fixed wireless broadband, radio and laser. For laser, assume an equipment and networking cost of \$50,000 per building, requiring 10 to 20 business subscribers per building. With a takeup rate of 20%, that means that the smallest affordable building has 50 business tenants. For RF, assuming a \$250,000 base station, and \$15,000 per subscriber site, you need 10 to 20 buildings in a small area near the base station.

The dream for the rest of America, the areas that lack this subscriber density, is a base station costing \$20,000, a networking cost for a small building of \$500, and CPE of \$5,000 per subscriber. Given this scenario, 10 to 20 total subscribers, with only 1 or 2 in each building, would make the service viable.

Levin said that residential services, which are sold more cheaply, would require approximately five times the density.

Proprietary SCM technology

Levin explained that his converter uses a proprietary technology called Signal Code Modulation (SCM) to convert 8-bit cable modem signals into 4-bit radio signals. The modulation takes an 8-bit 256 QAM (Quadrature Amplitude Modulation) signal, and splits it into two components, a digital 4-bit 16 QAM signal, and an analog remainder.



The proprietary SCM process

Source: [BridgeWave Communications](#)

The 16 QAM signal oscillates between +8 and -8, and the analog remainder is an analog value between +1 and -1. The analog remainder is amplified 8 times, and the resulting signal split by Time Division Multiple Access (TDMA) into two components, the remainder and the base signal.

Thus SCM technology allows ISPs to use cable or DSL equipment at the customer premises and the network head. Bridgwave makes the radios at each end, and off-the-shelf equipment can be used for the rest of the network.

First sale

BridgeWave's first sale was a strategic investment by [Scientific-Atlanta](#) in

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October, 2000.

At the time, Paul Connolly, Vice President of Marketing and Network Architectures at Scientific-Atlanta, said, "Scientific-Atlanta's strategic investment in BridgeWave is intended to provide broadband customers with the technology to reach new small and medium size business customers, enabling new revenue opportunities from their existing HFC cable plant. Integrating BridgeWave's technology in our Prisma® fiber nodes will allow our customers to provide wireless extended data rates services for High Speed Internet and LAN / WAN access services over the HFC transport infrastructure."

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