



The **Wireless** Authority

Wireless

WEEK

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Beaming Out The Last Mile

FSO offers a viable alternative to costly T1 lines and could pay for itself in the long haul.

After struggling with technical and marketing challenges over the past several years, free space optical technology may be in for a refreshing change. Whether used in homeland security, backhaul or Wi-Fi hot spot applications, FSO is finding a niche to call its own.

Proponents say the technology is easy to deploy and inexpensive, and interest is growing, especially in the wake of the Sept. 11, 2001, terrorist attacks that revealed the limitations of existing broadband networks. Today, FSO is being used as backup to existing fiber infrastructure by Fortune 500-level companies such as Merrill Lynch & Co.

But wireless carriers are the primary target for many FSO firms that are looking to supply short-haul links as growing spectrum congestion makes traditional microwave links too cumbersome. Plus, wireless operators

are being forced to cut down on capital expenditures, and FSO proponents say their technology is less costly to deploy than the old-school T1 lines.

Remember Terabeam, the Kirkland, Wash.-based pioneer in FSO service? The company is mum about some of its latest projects because they involve classified work for the Department of Defense. But after a hefty number of layoffs the past two years, the company has altered its focus slightly. Now it is primarily a gear vendor after stints as both a service provider and equipment maker. The privately held company, headed by former AT&T Wireless CEO Dan Hesse, is positioning itself to take better advantage of what could be some exciting up-and-coming applications.

See page 6 for the full story.



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LNP Battle May Go Both Ways

BY MARK ROCKWELL

They're certainly not shy about opposing wireless local number portability, but with the deadline for making it available the major wireless carriers are preparing for its inevitability.

With CTIA leading the lobbying charge, the big carriers continue to press their case with the FCC that the mandate of wireless number portability is an unnecessary, intrusive "fraud on consumers," in the words of association President and CEO Tom Wheeler.

But at the same time, the Sprints, Verizons and AT&Ts of the world can't sit idly by while LNP goes into effect. The ability of subscribers to keep their phone numbers when they jump from one carrier to another is both a great fear and a great enticement to the national wireless carriers. They see it as a powerful competitive tool they don't necessarily want to be without, even if they don't want it in the first place.

See page 10 for the full story.



Wireless Hot In Arctic

What's going on with wireless in the technology hotbed of Sweden? Plenty, and *Wireless Week* went there to check it out. See what we found near the Arctic Circle and elsewhere in the Scandinavian country. [Page 16](#)

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6 Broadband Wireless

Free space optical technology has faced hurdles in the past but could see the light of day with major homeland security applications and backhaul potential for traditional voice and data carriers.



8 Legislative efforts to boost wireless broadband have raised some eyebrows in the wireless industry, while new broadband deployments in Jacksonville, Fla., could become an interesting test bed for the rest of the industry.

CORRECTION

In a story in the Jan. 1 issue of *Wireless Week* about U.S. carrier capital expenditures, there was an error about the cumulative capital expenditure on carrier networks since 1985. The correct capital investment made by U.S. carriers from June 1985 until June 2002 was \$118,418,677,000, according to CTIA.

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Party On, People

There are scandals and then there's the Nancy Victory spectrum cap "Partygate" or whatever the notoriously lemming-like Washington press corps decided to dub it.

We're talking about the newswire report that took what looks like a paperwork snafu and turned it into an unsubstantiated inference that the director of the National Telecommunications and Industry Association was influenced unduly to recommend a lifting of the spectrum cap.

It's the type of story that some in the Washington media love, all sizzle and no steak. The size of the alleged influence (a party donation of about \$480) and the connection with the wireless industry lobbyists who Ms. Victory believably describes as friends (not an unusual relationship in an area as incestuous as the Beltway) made the story somewhat laughable, but it got attention nonetheless during a holiday-shortened news week.

So, what's the big deal about an incident and a story that likely blew over faster than an Oakland Raiders fan after a three-day tailgating binge? From this end, the big deal is how much the media cover what goes on in Washington vs. how little attention is paid to the actual substance of stories

that purport to "get behind the scenes" but in fact are simply pieces pandering to the public's appetite for scandal.

For example, by focusing on the Victory party and the alleged influence of those who participated in it the stories totally ignored the broader issue at the core of this whole affair: the spectrum cap and the industry's campaign to get it lifted.

The wireless industry lobbied for years—years, mind you—for spectrum cap relief. Should we believe that a \$480 party (which I'm guessing doesn't get you much more than a couple of cases of Chardonnay, some barbecue and a couple of sponge cakes in Washington) is what moved Ms. Victory to formulate a position in favor of lifting the cap?

In a fervor to dig up the next Enron with as little real effort as possible, the national news media and those who followed them on this story focused too strongly on a single grain of sand while ignoring the beach where it lay. That is, the alleged influence scandal became the story, over and above the far more interesting story of what the spectrum cap is, why it's being eased and what the huge ramifications are for taxpayers, customers and wireless

service providers.

In a nutshell, that's the type of reporting that tends to get the most attention out of Washington. Noted journalist James Fallows described the phenomenon in great detail in his 1997 book, "Breaking the News: How the American Media Undermines Democracy." And we see this type of coverage on a regular basis in wireless.

One of our competing publications (hint: it's the magazine that touts itself as a weekly but only published 51 issues last year) frequently runs contrived "back room" angles on Washington stories, which with some frequency result in letters to the editor that complain rightly about slanted coverage. This type of coverage widely is regarded as a joke but it involves such serious matters as wireless health issues or the move to realign 800 MHz license holders, which tend to grab the attention of readers in the industry regardless of how well the stories are handled in print.

Yet, the steady stream of sensational story angles coming out of Washington seems to have dulled the senses of the reading public—even the relatively focused public that follows a specific industry such as wireless—to



BILL MENEZES, EDITOR IN CHIEF

a point where questions that should be getting asked about such stories aren't being asked by enough readers.

Questions like, is there another agenda at work when details of Nancy Victory's ethics filings get pushed under the nose of the national media? Or when a wireless publication mischaracterizes an industry group's position on a key policy issue?

Maybe that's the real story.

Afterthought: If \$480 is the going rate for buying influence on major Washington policy these days, put me down for \$1,000. I've got a couple of things on my mind regarding public schools and air pollution.

SOUND OFF!



In a survey by Siemens, 66 percent of respondents listed cost as the top trait that attracted them to their phones, followed by ease of use (62 percent) and functionality (59 percent). Brand reputation was named by more than half of respondents, trailed by appearance (37 percent) and 'personality' (20 percent). **What was the primary driver that led to your phone?**

1. Price
2. Ease of use
3. Functions
4. Brand
5. Appearance
6. 'Personality'

To register your answer, go to WirelessWeek.com, scroll down and click on the SoundOff link on the right-hand side of the home page.

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From fog interference to the notion that it might fry passing pigeons, free space optical technology has faced a number of technical and marketing challenges as it struggled to gain a toehold in telecom over the past few years.

That may be changing quickly as the broadband wireless platform is seen as a solution with major homeland security applications and a possible role as cheap access and backhaul technology for traditional voice and data carriers.

Though proponents say the technol-

ogy "definitely has some relatively large limitations," says Lindsay Schroth, Yankee Group's broadband access technologies analyst. "It's meant for very specific applications that require large bandwidth."

But interest in the technology is growing, especially in the wake of the Sept. 11, 2001, terrorist attacks that showed the limitations of existing broadband networks in severely damaged locations. Because existing wireline and fiber infrastructure was damaged during the attack, Fortune 500-

Lighting The Last Mile

Inexpensive and rapidly deployable, free space optics is finding its niche as broadband link alternative.

BY SUE MAREK

ogy is easy to deploy and inexpensive, the tech and distance limitations of the laser-based access platform has rendered it a niche play in the minds of many investors, potential customers and industry experts.

level companies such as Merrill Lynch & Co. used FSO to set up temporary communications links from one building to another in lower Manhattan.

Now that security concerns have heightened the focus even more on redundant networks, Merrill and others are using FSO as a backup to their existing fiber infrastructure.

Kirkland, Wash.-based Terabeam Corp., one of the pioneering free space optics service providers, was instrumental in helping Merrill reconnect its Manhattan-area sites after Sept. 11.

Terabeam currently has a research and development contract with the Department of Defense's Defense Advanced Research Projects Agency to develop components similar to what the company currently has deployed, but can be used in different types of form factors. According to Terabeam's Chairman, President and CEO Dan Hesse, some of these different form factors include military vehicles that will use Terabeam's technology as a mobile communications device. But to learn any more you need a security clearance. "Some of the things we can talk about and some we can't



FSONA Communications is designing combination free space optical and Wi-Fi systems to mitigate interference and improve hot spot performance.

because much of what we do for them is classified," Hesse says.

Nevertheless, Hesse is encouraged by the government's interest and the increased attention to spatially diverse networks. In other words, before Sept. 11 many companies thought that if they had a fiber link from two different providers they were protected in case of a disaster. But in their post-Sept. 11 thinking, enterprises now understand that to be fully redundant they need two completely different technologies, such as a wireline and wireless option. "We are working with different departments of the U.S. government to ensure network diversity," Hesse says.

But the government is only one facet of this growing interest in free space optics. The primary target for many of these firms is wireless carriers that are looking for short-haul links. According to Steve Hane, vice president of business development from FSO firm

Lightpointe, U.S. mobile operators are becoming more interested in using FSO for backhaul. Two key reasons: Growing spectrum congestion is making traditional microwave links more cumbersome to use and operators are being forced to slash their capital budgets. "If you are trying to slash your capex, reduce operating expenses or are using microwave radios but getting spectrum congestion, you will want to look at free space," Hane says.

According to Hane, FSO traditionally has been more popular with carriers outside of North America, particularly in countries where provisioning a T1 can be costly and difficult to obtain. But in the past few years, U.S. carriers have been more open to FSO technology because of the economics - T1s aren't exactly cheap and readily available in all locations of the U.S. market, either. "We have heard from two major carriers that even



©TIM WEBER

But Hesse says that the main reason wireless operators are looking at FSO is because traditional T1s don't get the job done anymore. Carriers are seeing tremendous increases in wireless traffic thanks to big bucket plans that encourage subscribers to use their phones more. "The cost tradeoff of T1s makes wireless start to look financially attractive," Hesse says.

That can't happen soon enough for companies such as Terabeam, which has undertaken several rounds of lay-offs in the past two years and will be down to about 175 people at end of the quarter from a peak

of more than 500. However, the economy wasn't the only driver in the lay-offs: The company has altered its focus slightly, morphing into primarily a gear vendor after being both a service provider and equipment maker.

Privately held Terabeam also is planning to buy back shares from its 280 investors, some of whom have been pressuring the company to return cash to shareholders, and to refocus its efforts on the sale of its FSO equipment to big carriers instead of providing networking services.

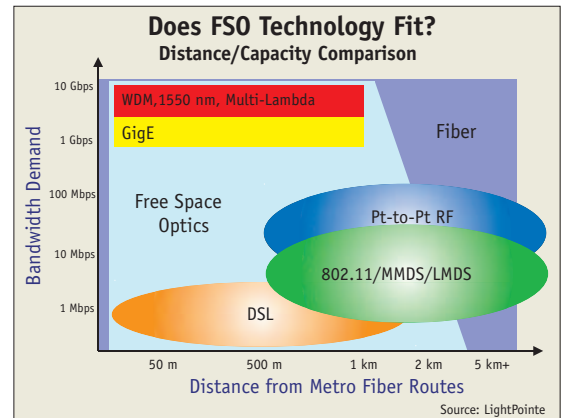
That could position Terabeam and others to take better advantage of what could be some up-and-coming applications for FSO.

Another burgeoning area is Wi-Fi hotspots. FSO firm fSONA Communications has been pleasantly surprised by how conducive FSO is to providing Wi-Fi backup. "Wi-Fi and FSO work well together because free space optics produces no interference," says Michael Corcoran, vice president of marketing

and sales and fSONA. "We are designing combination Wi-Fi, FSO systems to mitigate interference and improve hot spot performance."

Corcoran says the company is working with two large companies to roll out Wi-Fi/FSO networks in the United States and in Europe.

In addition, some FSO vendors are working with ADC to incorporate FSO



Source: LightPointe

though they get good prices on T1s, the operating expense never goes away whereas with FSO, in time the technology pays for itself," Hane says.

Hane admits that FSO isn't for every situation and can be used in conjunction with traditional microwave backhaul links. "This is complementary technology to microwave," Hane says. "Microwave is good with low bandwidth and FSO is more analogous to fiber."

This type of positioning is exactly what Schroth believes vendors need to do, as opposed to trying to make FSO into an all-encompassing transport solution. "I see FSO as more of an access product for carriers," Schroth says. "A good market for this technology is as a metro ring extension." But when it comes to wireless backhaul, Schroth has her reservations. "The problem comes with distance. The further you go the less reliable the link becomes. A lot of vendors will try to

tell you differently."

Hesse agrees that FSO isn't a solution for every situation, but says that as a veteran of the wireless carrier world (previously Hesse headed up AT&T Wireless), he believes operators never rely upon one solution; instead, they want to have a "number of tools in their toolbelt" and FSO is just one of many.



The orange arrows point to Terabeam's Elliptica gear mounted to the roof of a counterterrorism vehicle that the Army's National Automotive Center unveiled at last month's North American International Auto Show in Detroit.

with ADC's cell site extension technology. According to Hane, ADC has a product that allows carriers to increase their capacity in a certain cell site by creating a virtual cell site a short distance away and then using free space optics to transmit traffic between the two sites. This scenario calls for a high-bandwidth, short distance link, which Hane says makes FSO the perfect technology.

But what has all the FSO vendors especially encouraged is the recent interest in FSO from incumbent carriers such as AT&T, Verizon Communications, SBC Communications and others. AT&T is testing FSO systems as a fiber alternative technology to link local customers to the company's long-distance network. Hesse says all the major wireline players are evaluating FSO and he expects there to be a carrier/FSO contract this year. "I can't give you any guarantees, but I'd be very disappointed without a significant carrier contract in 2003.

Hesse says it is expensive for carriers to trial technologies. He believes if they are willing to invest in a trial, there's a strong likelihood they will purchase the technology.

Schroth remains skeptical. "It's a very specific technology and not something I see a major operator deploying in its entire network."

But such niche deployments could be all that FSO needs to keep beaming. **WW**

Not All Jumping On Unlicensed Broadband Bandwagon

BY MARK ROCKWELL

WASHINGTON—Recent legislative efforts to “jump start” the market for new broadband services through wireless technology have raised some eyebrows here.

A bill, S-159, introduced by Sens. Barbara Boxer, D-Calif., and George Allen, R-Va., would open up 255 MHz of unlicensed spectrum, centering that allocation in the 5 GHz band. The bill

is aimed at opening up space for the political flavor of the month, namely Wi-Fi wireless LAN technology.

As the 108th Congress convenes, Wi-Fi also is being mentioned in many legislative arenas, including recent Senate hearings on telecom competition and from other senators. For instance, Sen. Conrad Burns, R. Mont., chairman of the Senate Commerce Committee, recently said spectrum re-

form would top his legislative list for this session of Congress. Late last year, the FCC earmarked unlicensed spectrum as the future of wireless. And when you add the fact that Congress is increasingly frustrated by what it sees as a capsized Telecommunications Act, wireless broadband is becoming an increasingly attractive temptation for lawmakers these days.

But mobile wireless industry officials see things differently. While they applaud the new interest in Wi-Fi as an alternative to wired broadband solutions and see wireless bringing ever more competitive pressure to bear on a hide-bound wired market, they see some danger in Congress’ attention.

For example, the Boxer/Allen bill isn’t backed by any studies showing why 255 MHz is needed, why the allocation should be located in the 5GHz band. “I’m not opposing the effort” to

opening up more unlicensed spectrum or unleashing new wireless technology, says Steve Berry, CTIA’s senior vice president of government affairs.

But Berry wants Congress to delve a little deeper into the issue to see what

“I’m not opposing the effort.” However, “No one took me at my word when I asked for 90 MHz.”

the effects are before it moves on any legislation. “No one took me at my word when I asked for 90 MHz” of more spectrum, Berry says.

Senators Allen and Boxer were set to begin promoting the bill in press events in late January, according to a spokeswoman for Allen. The bill still is in the Commerce Committee, however, and isn’t expected to get any official Senate action anytime soon, she says. **WW**



Boxer



Allen

For Broadband Competition, Look At Jax

BY BILL MENEZES

A Florida port city that’s more South than South Beach is the site of some new broadband wireless deployments that could become an intriguing test bed for the rest of the industry.

Separate consumer-oriented and business-focused commercial deployments in Jacksonville, Fla., by service providers Clearwire Technologies and Data Wave show that two networks which couldn’t be more different are slicing off pieces of the broadband access business that so far is dominated by wireline incumbents.

Clearwire early last month launched its mass market-oriented Internet access service, initially targeting areas of about 1 million Jacksonville POPs it believes are underserved by cable and DSL providers. The company uses 2.5 GHz spectrum in the Instruction-

al Television Fixed Service band that it leases from local license holders and offers service plans with downstream

bandwidth up to 768 kilobits per second.

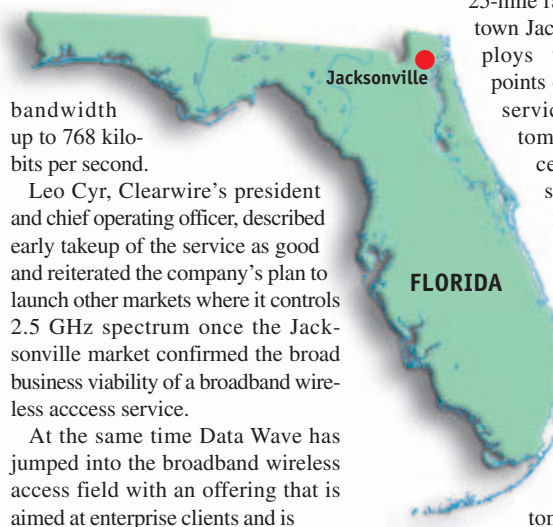
Leo Cyr, Clearwire’s president and chief operating officer, described early takeup of the service as good and reiterated the company’s plan to launch other markets where it controls 2.5 GHz spectrum once the Jacksonville market confirmed the broad business viability of a broadband wireless access service.

At the same time Data Wave has jumped into the broadband wireless access field with an offering that is aimed at enterprise clients and is

based on unlicensed 2.4 GHz spectrum using the 802.11a wireless LAN platform. The company covers a roughly

25-mile radius from downtown Jacksonville and deploys wireless access points only as needed to service specific customers; adjacent access points then serve as a sort of mesh network to expand coverage in a given area as more customers come on board.

Robert Dunlap, Data Wave’s president, says 11 commercial customers signed up in



the first two weeks following the product’s mid-January launch, taking bandwidth packages ranging from 1 megabit per second symmetrical data rates—available for \$275 per month—to 5 mbps for \$1,000.

Dunlap believes his company’s focus on the enterprise and its pricing relative to the T1s available from local telcos—T1 equivalent bandwidth from Data Wave costs \$350 per month vs. a telco or CLEC T1 costing in the range of \$800 to \$1,200—are critical differentiators.

He also draws a line between his Wi-Fi-based network technology and the lower-bandwidth 802.11b networks being thrown up by public “hot spot” operators.

“802.11b is where everybody is. As these companies grow and put in hot spots, they’re going to find everybody’s going to be tripping on top of them, including the Domino’s Pizza next door that might have a leaky microwave.” **WW**

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LNP Turning Into The Snit That Won't Quit

BY MARK ROCKWELL

WASHINGTON—While large wireless carriers link arms to fight what they say are unfair local number portability rules, they're also making plans to use that technology against one another in the coming months.

In a sort of "damned if you do, damned if you don't" approach to LNP, carriers such as Verizon Wireless, Sprint and AT&T Wireless quietly are making plans on how best to market number portability to their competitive advantage, while trying to fight a rear-guard action to change the rules that require them to use it.

Verizon, Sprint, AT&T and all larger wireless carriers are on track to meet the FCC's November deadline to implement local number portability capabilities that allow their customers to switch from one carrier to another

while keeping their telephone number with them. The FCC already has delayed the deadline four times at the carriers' request, with what most consider the final delay granted last summer by an increasingly impatient FCC.

Compliance is progressing with a lot of grumbling. LNP's costs are heavy and, according to wireless carriers and lobbying groups, unnecessary to further competition along in an already-competitive market like wireless. Industry officials have told the FCC that the commission would be better off trying

to impose fairer cross-market LNP capabilities on wireless and wireline carriers. A more level playing field between the networks would make it easier for a wireline carrier customer to change to wireless carriers, instead of imposing more stringent and separate LNP rules on wireless carriers, they say.

In press briefings, petitions and letters to the FCC in January, CTIA has pressed the issue at the commission. It's also raising the issue in public. CTIA President and CEO Tom Wheeler says his final year at CTIA will be the year "someone speaks up for the consumer" about inequities in wireless regulation, mostly in LNP.

Wheeler says the LNP issue will be highlighted and he wants to start regulators on the path to reconfiguring the whole regulatory landscape for LNP issues during his remaining 12 months at the organization's helm.

As things stand now, wireless LNP is "a fraud on consumers" and a regulatory "shell game," Wheeler says, because wireline carriers aren't required to port their numbers to wire-



BITS

■ **Infonxx** will provide **Western Wireless'** domestic subscribers with enhanced directory assistance services, including movie information, stock quotes, weather forecasts, traffic updates, sports scores, live driving directions and other services.

■ **Motorola** and **Corbis** created a new multimedia messaging service that gives wireless network operators the ability to extend their existing offering to include media products ranging from still digital imagery to motion video content.

■ **Wireless Networks** teamed with **Marketlink Technologies** to use Marketlink's nationwide sales coverage to market and sell WN's product line to distributors, value-added resellers and end-users in the United States.

■ One of the world's largest open-space public wireless networks, with more than 70 access points, is being rolled out in South Australia's capital city of Adelaide. The multi-cell network, named **StreetWise**, will involve the installation of **Cisco Aironet** Series of Wi-Fi products around the city, attached to roadside infrastructure.

less carriers unless there's a wireline switch located at the same "rate center" as a wireless switch. Wireless carriers have switches in only one of eight wireline rate centers; Wheeler contends that 90 percent of wireline customers who ask to take their telephone number with them to a new wireless account can't do so.

"The FCC has never done a cost/benefit analysis."

FCC officials are a little cool to that argument, though. "We'll certainly look at the issue. Their original approach was that they didn't want local number portability to apply to them. That seems to have shifted a bit to 'if it applies to us, we want to change it,'" says FCC wire-

less bureau chief Tom Sugrue.

For their part, wireless carriers aren't giving up on the position that LNP is wrong and unnecessary, but are forced into being pragmatists. They generally say they on are on board to have wireless LNP operational by the Nov. 24 deadline. "We're ready for LNP by year's end," says Dan Wilinsky, spokesman for Sprint PCS. "We think, though, that the money used to install LNP is better spent on network expansion and service improvement."

Verizon Wireless spokesman Jeffrey Nelson echoed those sentiments. "The FCC has never done a cost/benefit analysis" of wireless LNP, he says.

LNP is being lined up, however, as a competitive weapon. Some wireless carriers won't comment publicly about how LNP will be marketed to customers. But plans clearly are in the works to use it as a competitive tool, however grudgingly. "Everyone is doing business plans with this in mind," says one carrier official. "I won't comment on marketing. That's proprietary information," says another. **W**



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Carriers Fight MSS Over Spectrum Use

BY MARK ROCKWELL

WASHINGTON—The possibility of satellite companies providing wireless services is the first

test of the FCC's new spectrum policy, wireless carriers said on the eve of the FCC's MSS ruling.

The FCC has been considering letting

Mobile Satellite Service use an Ancillary Terrestrial Component that would let them provide wireless communications services similar to PCS services.

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Concerned carriers and organizations filed last-minute comments at the FCC saying out of band emissions from satellite/ATC transmitters would cause harmful interference to PCS handsets used by millions of terrestrial subscribers.

CTIA President and CEO Tom Wheeler said in a letter to FCC Chairman Michael Powell that MSS/ATC services would interfere with PCS services operating at 1990 MHz, primarily in handsets operating in that band. Additionally, PCS receivers operating in the 1990-2025 MHz band wouldn't be able to filter out such interference, he said.

Verizon Wireless concurred in another letter to Powell. The company suggested putting an emission limit on MSS terrestrial operations and not permitting such services below 2010 MHz.

But there also was a deeper, underlying tone to both letters, suggesting that the credibility of the FCC's new spectrum policy, with its emphasis on more flexible spectrum and closer monitoring of interference, was on the line.

"The unacceptable degradation... is not in keeping with the 'interference temperature' concept."

"In light of the Spectrum Task Force Report that relied so heavily on a lack of interference as the basis for policy decisions, we respectfully submit that the first decision by the commission in the wake of the report should not be to dramatically increase interference into existing licensed and operating bands via the grant of terrestrial usage permits to satellite licensees," Wheeler stated. "The unacceptable degradation of service to consumers of PCS services... is not in keeping with the 'interference temperature' concept so recently put forth in the Spectrum Task Force Report."

Said Richard Lynch, executive vice president at Verizon Wireless: "My company has already filed its objection to such an action on the grounds it would be inconsistent with the law and sound spectrum management policy."

CTIA proposes addressing the interference issue by imposing strict out of band emission limits on such transmitters and ensuring adequate frequency separation between MSS/ATC and PCS users. **WW**

Texas Outfit Aims For Sky With Airline Phone

BY KAREN BROWN

Using a system that calls for tapping the infamous Iridium satellite network, an unlikely alliance between a maverick Texas broadband outfit and a Belgian airline voice provider is trying to give U.S. airline passengers a cheaper, easier way to make phone calls from 33,000 feet.

Problem is, not only will the duo have to market a service against well-entrenched competitors, it also may have to dispel lingering doubts about

lines, defense and corporate clients that want to lease capacity from Iridium for wireless links anywhere in the world.

"If one looks at the size of the market for this type of product, and you consider that over the United States at any point in time in the middle of the day there are approximately 4,500 aircraft in the air, that would translate into possibly 10,000 or more worldwide," says H. Dean Cubley, Eagle's chairman and CEO. "The market for this type of product is enormous, and all

existing airline clients for the next three months and after that plans a public product launch, Cubley says.

"We are looking forward to a very good year going forward," he says. "We have already gotten good indications back from several of the major airlines that this is something they would be willing to at least try, if not implement, and we anticipate field trials with two or more airlines in this first quarter 2003."

With a maximum 9600 baud data speed, the new air phone system steps outside Eagle's usual broadband focus. But Cubley says it will improve airline communications. "The capacity to service 100 passengers on an airliner simultaneously with direct-dial telephone service is certainly an achievable objective in itself," he says.

Passengers would likely check the wireless Orb Phone handsets out from the airline before they boarded the plane. While pricing has yet to be determined, Cubley said cost per minute

to use it and the rapid growth of terrestrial wireless networks that effectively shrank the areas where Iridium had a competitive coverage advantage.

The system was bought by a consortium of private owners for a mere \$25 million. After landing a contract with the Pentagon to supply communications links to the Department of Defense, it re-launched in 2001 as Iridium Satellite LLC.

Late last year, the DOD renewed its airtime contract with Iridium for another year. The original \$72 million, two-year contract included options to extend the pact through 2005.

Cubley says Eagle is confident the system is viable for at least the next several years. Since the acquisition, the new ownership has launched satellites to fill coverage holes and provided backup satellites to offer worldwide coverage.

continued on page 14



the future of the Iridium constellation.

That is, if an agreement even is finalized to use Iridium's system. A spokesman at Iridium said the satellite company has been in discussions with Eagle Broadband about its plans, but has yet to sign anything definitive.

League City, Texas-based Eagle, which has businesses ranging from broadband RF gear to fiber-to-the-home residential broadband service, says it has completed field testing on satellite phone equipment developed in partnership with Belgian aeronautical communications provider Euro-GSM. The two companies hope to market the hardware, which uses standard Iridium interfaces, and service to air-

have the need for good communications. It is an area that has been greatly lacking in communication devices that will literally communicate from anywhere in the world."

Eagle has entered into a marketing agreement with Euro-GSM, giving its Belgian partner exclusive overseas marketing rights while sharing marketing efforts with Eagle in the United States. Eagle will be testing the equipment with some of Euro-GSM's

for calls will come in "at a fraction" of the current \$5 to \$6 per minute rate charged by the likes of Verizon Communications' Airfone.

Developing a product that relies on the Iridium satellite voice system might sound risky. Motorola developed and launched the \$5 billion system with 66 satellites in low earth orbit during 1997, but it foundered after just a couple of years due to its high embedded costs, the expensive clunky handsets needed

BITS

- **ArrayComm** and **LG Electronics** signed an agreement for LG to license the i-Burst Personal Broadband System. LG will manufacture and distribute the base stations and wireless modems, with commercial product availability expected in the second half of this year.
- **Wi-Fi** public access solutions provider **Gemtek Systems** and European wireless Internet service provider **NetCheckIn** announced a partnership that will help health and hospitality venues such as hotels, conference and medical centers add high-speed Wi-Fi public access equipment and services to their main business.
- **Emblaze Semiconductor** and **RFWaves** are working together to develop advanced wireless multimedia application platforms. The joint development includes a consumer application platform that enables system design houses to develop short-range wireless video monitoring applications such as video baby monitors, home security systems and other remote observation systems.
- **Linksys'** line of wired and wireless networking hardware is being used in the deployment of Home Networking from **Cox Communications**.

Eagle from page 13

For that reason, "it is a new Iridium we are talking about here," he notes.

"I believe if you look at the U.S. military's decision to move with it, they have come to the same conclusion," Cubley adds. "So we believe this is a good platform to build a product base off of, and we believe that the airline industry and military likewise have a need for an in-plane communications system that will support a large capacity, as opposed to the very limited



H. Dean Cubley, Eagle's chairman and CEO, sees a sizable market for airline communications via satellite.

system that has been developed over the last few years."

Eagle also is marketing the Orb Phone to military and other users for air and ground-based applications. That could include field communications for rapid military deployments, communications for those traveling to remote parts of the world or links to remote construction sites, Cubley said.

But others still cast doubts on the long-term viability of Iridium—or any business based on it. While the U.S. military contracts did bolster the reformed company, so the market for global satellite phone system for airlines or otherwise hasn't exactly skyrocketed, according to Patrick French, a Frost and Sullivan analyst who tracks the satellite industry.

"We haven't seen enormous growth in subscribers or minutes," he said. The DOD contract is "a good chunk of change, but that is never going to buy you satellites in the future."

Then there is the issue of the LEO

satellites, which tend to have shorter lifetimes than their higher-altitude, geostationary cousins. The company now believes its existing satellite mesh network will provide service through 2010 or longer, giving it time to develop a stronger revenue base to support future satellite replacement. But French questions whether that revenue base will be developed in time to start replacing satellites before they burn out.

"The problem is, what happens once their satellites start getting old?" French said. "We have reservation that they will be able to build up a big enough subscriber base or more importantly, a subscriber base that uses minutes regularly enough, to be able to have enough income to eventually replace their fleet when that time comes."

Additionally, Eagle doesn't have the only satellite sky service: The Boeing Co.'s Connexion service providing satellite-based broadband data service to airline passengers took off on its maiden voyage on Jan. 15, via a three-

month test aboard a regularly scheduled Lufthansa route between Washington's Dulles International Airport and Frankfurt. While Connexion is focused on data, not voice, a high-speed link to laptops and other broadband-enabled wired devices could prove competitive for the passenger dollar.

Meanwhile, within the next decade there will be growing competition from GPS/GPRS wireless phone services able to reach remote locations for ground-based clients, French adds.

"The same thing kind of applies to the current Iridium—they say 'just wait to give us time to develop this,' but what's going to happen to cell phones over the next seven or eight years?" French asks. "I can expect a lot more growth on that front and a lot more things happening there than on satellite. So again, the longer they put it out in the future, the drawback is what other technologies are going to come along and take away some of that potential future market." **WW**

On one hand, you should get this book for the 28,000 wireless products it contains.



Dumb And Dumber APs In Line For Wi-Fi

BY BRAD SMITH

Can the individual parts of a wireless network be too smart? That's a question that some Wi-Fi infrastructure providers are answering in the affirmative.

The theory is enterprises that deploy a wireless LAN with multiple access points run into problems such as central management, configuration, upgrading technologies and user authentication. The problems, these companies contend, are due to too much intelligence in the APs.

Symbol Technologies of San Jose, Calif., was the first to come out with a solution to this problem last year with its Mobius product line. Mobius is a Wi-Fi switch that sits in a WLAN and connects to dumb access ports, as well as an existing Ethernet switch.

Several new companies are getting into the smart switch-dumb port Wi-

Fi business, among them Aruba Wireless Networks, also of San Jose. Aruba came out of stealth mode in late January to demonstrate its hardware/software technologies. The company says its intelligent, centralized Wi-Fi switching system will be available about the middle of the year.

One of Aruba's founders, Pankaj Manglik, says the current crop of smart APs means that most enterprise WLAN deployments are limited to the department level. This means IT departments are losing control of their networks because it is so difficult to administer each of these separate islands, he says.

Aruba's planned technology combines Wi-Fi network access and an air monitoring system with high-speed gigabit Ethernet switching and packet processing technologies. This gives IT managers the ability to centrally control thousands of wireless users while reducing the cost of deployment, man-

Manglik says. "We're delivering all of this protection within a single system that centralizes control and simplifies upgrades."

When the time comes to upgrade a WLAN, an enterprise using the Aruba solution doesn't have to upgrade each access point because the job can be handled on the switch, the company says. Another feature of Aruba's system is it uses Power over Ethernet, which means power and data can be carried to each access port through a Category 5 Ethernet cable.

Aruba isn't the only one entering this field now that enterprises are becoming more interested in adopting WLAN technology. Two other companies eyeing the field are Black Storm, also of San Jose, and Trapeze, located in Pleasanton, Calif. Neither has made its plans public yet. Which may be a smart thing to do. **W**

"Wireless security is a multi-faceted problem that requires a holistic approach."

agement and upgrading WLANs.

Central management and monitoring also mean IT departments can automatically detect so-called rogue access points, the company says.

"Wireless security is a multi-faceted problem that requires a holistic approach that protects the network, the traffic and the air space together,"

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Warming Up To Sweden's Arctic Circle

BY MONICA ALLEVEN

KIRUNA, Sweden—One of the world's most remote inhabited regions happens to be one of the hippest when it comes to wireless communications.

In the northern part of Sweden—a country the size of California and Oregon put together—residents brave winter temperatures that typically are in the single digits and they see daylight for about three hours a day. Recreational activities consist of snowmobiling and ice fishing. Sounds sort of like Minnesota, doesn't it?

But even in a land of vast undeveloped areas between cities, residents can make a mobile phone call from back-country dog sleds and exchange photos via a mobile phone using MMS and Bluetooth, limited only by hands fumbling in the frigid air or the bulkiness of a down-filled glove.



Even during Arctic Circle trips such as this, Sweden's wireless coverage is no dog.

Invest In Sweden Agency, a government organization whose mission is to attract and facilitate direct foreign investment in Sweden, sponsored a tour for several major publications, including *Wireless Week*, in January—a perfect time to show off the region's icy shores.

The tour started with dog sled transportation to the original Icehotel, a hotel that literally freezes its guests for the thrill of it. (Believe it or not, one of the tour guides managed to hold a cell phone conversation while guiding a sled.) This year, the new thing in the village of Jukkasjarvi is the Ice Globe

Theater, which replicates Shakespeare's Globe Theater in London. In mid-January, workers hurriedly were loading blocks of ice to build the theater, situated next to the Icehotel, so it would be ready for the Jan. 23 premiere of "Hamlet."

The region's largest employer is a short drive away to the LKAB mine, which used automation to cut its workforce in half and maintain productivity without missing a beat over the past decade. For visitors from the United States, displacing workers with technology may sound like a recipe for worker unrest. Not so in Sweden,

where government officials in this social democracy frequently point out that workers embrace technology.

LKAB mine, which produces iron ore for use in steel structures, uses underground antennas and base stations to send video to personnel who remotely operate heavy equipment such as loaders from their desktop computers in control rooms. With help from Swedish wireless carrier Telia and technology provider Elektrobit, the miners have technology rivaling any above ground 3G system. But can you get cell phone coverage?

Of course, answers a project manager. For years, miners haven't had to think twice about making a cellular call far below the Earth's surface.

Such confidence in technology is common among Swedes. In the 1990s, the government helped employees obtain computers for home use, and PC sales rose. Wireless penetration is in the 84 percent range. And rather than staging expensive spectrum auctions like other parts of Europe, Sweden used a "beauty contest" approach. Applicants had to promise extensive investments in network infrastructure and coverage of 99.98 percent of the population by the end of 2003.

BITS

■ **Cramer Systems** announced that 3, the European 3G licensee backed by Hutchison, will use Cramer's network inventory solution for 3's Swedish network. 3 is using Cramer as part of an agreement with Telcel, which will install and integrate Cramer with other operations support systems.

■ **Samsung Electronics, Royal Philips Electronics** and **Datang Mobile Communications Equipment** have formed a joint venture to design and license core TD-SCDMA chipsets and reference designs for mobile terminals and end-user gear. The first commercial handsets using TD-SCDMA technology developed for the China market are expected next year.

■ **Lucent Technologies** and **T-Mobile** have launched a pilot project in the Nuremberg, Germany, region to test high-speed data services using UMTS technology.

■ **Telus Mobility** will begin offering **Research In Motion's** BlackBerry services and devices to enterprise clients served by Telus' CDMA2000 1XRTT network in Canada.

ISA Works To Bring U.S. Business To Sweden

Invest In Sweden Agency, a government organization whose mission is to attract and facilitate direct foreign investment in Sweden, is trying to lure U.S.-based companies and others to set up shop in the Scandinavian country.

ISA executives insist starting a business here is not difficult. Rather than targeting startups, ISA typically talks to established U.S. companies interested in locating R&D facilities in Sweden.

Why should wireless companies be interested in Sweden? "If you're in the U.S. and in the wireless applications business, you can go to Sweden and find out what's going on here," says Erik Enroth, ISA's representative in New York. "It's already established and you can pick up on ideas and ... the future of many wireless applications really starts here."

About 1,100 U.S. companies have offices in Sweden; ISA can claim credit for about one-third of those locations, with Sun Microsystems' R&D facility being one of the more recent. ISA representatives help answer questions and put companies in

contact with local officials in the region of interest.

Sweden's wireless penetration rate is fairly well-known in wireless circles, but working with U.S. businesses in general can be challenging because many people are not aware of Sweden's IT culture. And hearing Americans get Sweden mixed up with Switzerland has become an accepted part of life for many Swedes.

Yet Sweden is only one part of Scandinavia, and groups hawking Finland's Helsinki region and the U.K. markets of England, Wales, Scotland and Northern Ireland also were well represented on the floor of last month's Comdex Scandinavia.

Many mobile solutions are developed in Helsinki, and it offers a ready-made test market. "The proof of the pudding is eating it," quips Pentti Pitkanen, president of Helsinki Region Marketing.

And while Invest-UK works with ISA, isn't it competing for some of the same business as well? "We're talking to a lot of the same people worldwide," admits Aidan Liddle, project manager. But, he adds, "there's enough ... for everyone." —By Monica Allevan



Visitors to the Icehotel, which includes a chapel for weddings and christenings, can make mobile phone calls north of the Arctic Circle.

To demonstrate the northern region's technology, ISA arranged a snowmobile safari to a remote cabin near the Arctic Circle where Swe-Dish Satellite Systems staged a surprise conversation with Swedish wireless pioneer Östen Mäkitalo, now the senior vice president of mobile business at Telia Sonera, live via satellite. Swe-Dish supplies mobile satellite communications equipment and related services for broadband applications. Some themes emerge after a couple days with the locals. If you live here, you must have a strong will to survive and a tendency toward invention. Then there's the spirit of cooperation among businesses. Surviving harsh winters means knowing your neighbors very well and relying on one another. But there's also competition, especially between the Swedish and Finnish, and it goes beyond the Ericsson/Nokia battle, spanning sports, industry, brainpower and more.

For another look at how the wireless business is evolving in Sweden, go to page 19.

Cooperation is the impetus behind Lulea-based InternetBay, a group of about 110 member companies that started in 1999 when a lot of smaller companies were struggling to grow. The group's managing director, Tage Routuvaara, was born on the Swedish-Finnish border to a family of 10 children. "What I learned was that you fight, and cooperate," he quips.

InternetBay founders decided to pool their resources in hopes of positioning the region as a world leader in technology and products for mobile and fixed-network Internet markets. As one might expect, distance learning and mobility are important here,

where driving 50,000 miles a year is not uncommon.

Schlumberger Sema is one of the member companies. "I think it's good. It has led to business for us," says Magnes Falk of Schlumberger Sema. "I think most people living up here re-

ally enjoy it and do not want to move. There are difficulties up here. The people who are living here ... like this."

Though having a more temperate climate, the same may be said for other parts of Sweden. Leif Pagrotsky, Sweden's Minister for Industry and Trade,

told a group gathered at Comdex Scandinavia in Göteborg: "We have to fight hard. We have to stick our necks out, and we have to be daring ... but we need more. We need to encourage young people to study science and technology." **W**



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Shaking It Up With Burgers, Broadband

BY SUE MAREK

McDonald's—home of the fast burger, fast service and fast Internet connection? That's the case in Sidney, N.Y., where the local McDonald's restaurant hired 5G Wireless Communications to outfit the fast-food haven with a high-speed wireless connection.

Using traditional 802.11b technology in conjunction with direct sequence spread spectrum, 5G Wireless set up a Wi-Fi network in nearby Bainbridge, N.Y., and then provided surrounding business customers with broadband Internet connection speeds. "We operate within the standard of Wi-Fi but we have pushed it to some strong limits," says 5G Wireless President and CEO Jerry Dix. "Using our own technology, we are able to broadcast up to eight miles, if necessary."

5G's service initially appealed to

Richard Dombrowski, owner of the Sidney McDonald's restaurant, because it allowed the restaurant to transmit and receive e-mail messages from McDonald's corporate headquarters much more quickly than traditional dial-up service. However, there may be an opportunity to offer the service to McDonald's customers, similar to how Starbucks has used Wi-Fi to seek more revenue from its coffee-slurping patrons. "Now that we have high-speed Internet service, our plan is to offer it to our patrons as they dine with us," Dombrowski says.

Yet Dix says the company's business model isn't to become a hot spot provider but to be a last-mile service provider. The company selects an area where there are few broadband competitors, installs its Wi-Fi hybrid technology, connects to the public network and then resells that connection to area business or retail customers. "We take the connection off the public network access points and eliminate the local loop charges," Dix says. "We are the last mile."

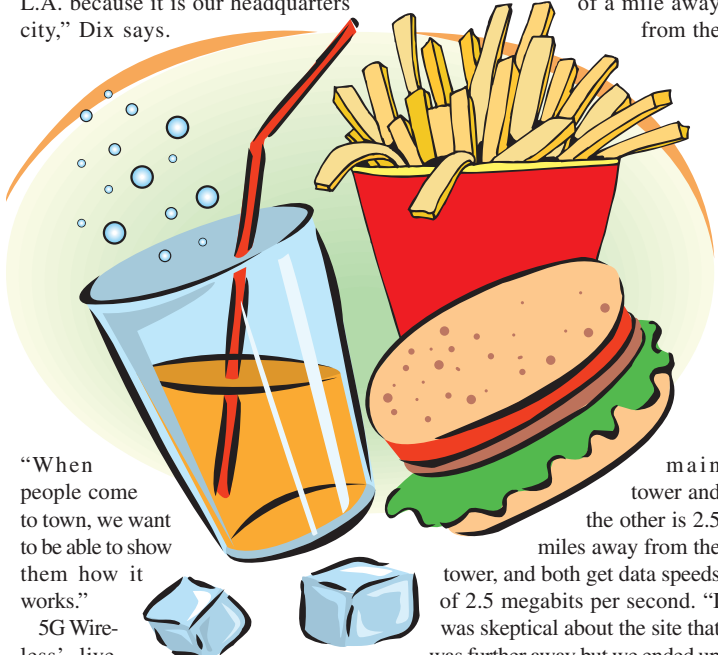
The Bainbridge hybrid Wi-Fi network is one of three that 5G Wireless has established. The company also has networks in Binghamton, N.Y., and Los Angeles. According to Dix, the company primarily is gearing its service to mid-size West Coast cities, those with populations of 250,000 or less. Dix says the system is profitable with about 300 subscribers per system but the technology can handle many more subscribers. With direct sequence spread spectrum technology, 5G uses three collocated radios, each of which are capable of supporting 250 clients for a total of 750 clients per facility. The company charges \$39.95 per month for service and provides a minimum guarantee of 512 kilobits per second of bandwidth.

The company has had early success with its Los Angeles system, where Dix says there are pockets that have no other

broadband service. In Los Angeles, the company distributed about 60 or 70 flyers detailing its service in mid-December and by early January it had received 22 calls from potential customers. "We set up a network in L.A. because it is our headquarters city," Dix says.

ence with another wireless company that made a lot of promises and never came through."

Kalil says 5G Wireless has outfitted two police substations with its Wi-Fi technology; one is about one-quarter of a mile away from the



"When people come to town, we want to be able to show them how it works."

5G Wireless' live demonstration helped to sell the city of Garden Grove, Calif., on the technology. The company just signed a deal with the city government to provide the police department substations with wireless broadband connectivity. "They had to show me this would work before I'd make a commitment," says Charles Kalil, information systems manager for the city of Garden Grove. "We had an experi-

main tower and the other is 2.5 miles away from the tower, and both get data speeds of 2.5 megabits per second. "I was skeptical about the site that was further away but we ended up with the same results," Kalil says. "Based upon that, we are going to proceed with the next phase and deploy seven more sites."

Garden Grove police will use the substation access points to download data and tap into the city's network. According to Kalil, the big draw of the 5G solution is the price. The alternative was to install T1 lines, which would have been more expensive than all the 5G Wireless equipment, plus the telephone company also would have charged a pricey monthly fee.

Once all police substations are outfitted with the Wi-Fi gear, Kalil says Garden Grove is considering installing 5G Wireless' Wi-Fi equipment in other city facilities such as the water treatment plant and fire stations.

Whether it's police officers or McDonald's restaurant patrons, 5G Wireless aims to use its unique Wi-Fi technology to bring affordable broadband connectivity to niche markets. **W**

BITS

■ Network components maker **RF Micro Devices** expects revenue and earnings to improve sequentially throughout the second half of this year, following a sharp decline in results for the quarter ended Dec. 31. RF Micro says its quarterly net loss was \$5.2 million, compared with a profit of \$3.5 million in the year-earlier quarter, while revenue jumped 45 percent to \$145.8 million.

■ Billing systems provider **Convergys** says its fourth-quarter net income dropped by 16 percent to 31 cents per share, while total revenue shrank to \$564.8 million from \$590.7 million.

■ Research firm **IDC** projects wireless and mobile network infrastructure spending will grow from \$38.3 billion last year to about \$49 billion in 2007. IDC notes the 2002 figure represented a 22 percent decline from the previous year.

■ A new report by **iGillottResearch** says the ability to remotely manage mobile devices and applications is a major concern for IT managers at corporations that have deployed wireless solutions. The firm predicts remote device and application management will become as crucial an issue for the mobile enterprise in 2003 as security was in 2002.



Police in Garden Grove, Calif., will use 5G Wireless' Wi-Fi technology to tap into the city's network.

Scandinavian Openwave Chases LBS Business

BY MONICA ALLEVEN

KISTA, Sweden—While Openwave Systems struggles with the rest of the industry during a tough market, some fruits of its acquisition deals made during better times are surfacing in this growing city just outside Stockholm.

As part of its May 2001 acquisition of SignalSoft, Openwave, based in Redwood City, Calif., acquired an office here as well as SignalSoft's Boulder, Colo., headquarters. Kista, often referred to as Europe's wireless capital, is home to startups such as NeoNode, which has developed a touch-screen handset it hopes will help make it the No. 3 handset maker by 2007. Other tenants include Ericsson, Nokia, Intel, Spirea, CellPoint, MobilePosition, Hewlett-Packard and IBM.

SignalSoft, one of the early developers of enhanced 911 applications, gave Openwave a foothold in the location-based services arena. Driving work in the LBS area is a European Union deadline for member countries to have in place by July 24 legislation that requires making caller location information available to authorities handling emergencies. While Europe is considered behind the United States in terms of mandating E911 capabilities, executives at Openwave's Scandinavian operation expect all or most of the countries will take the mandate seriously and will balk at any delays sought by operators, says Johan Othelius, area vice president of location services for Openwave and former managing director at SignalSoft.

Openwave is working closely with partner H-P in the European market to offer a solution that will help operators meet the EU directive. Openwave's solution includes its Location Studio and Location Gateway.

But the mandate is not the only driving force behind LBS. Providing ways for operators to boost average revenue per unit is the other side of the equation. Openwave has been working with service providers such as Sweden's Telia to launch new applications such as FriendFinder, DateFinder and ColleagueFinder. As one might expect, the applications use LBS to allow subscribers to find friends, dates or col-

league who have agreed beforehand to be found. In Telia's case, pricing for services is event-based.

As with other similar services, FriendFinder subscribers can designate a group, whereby pals who give their permission will pop onto the handset screen with their location. A search for a friend costs about 30 cents; the price goes up as more people are added. Members of the group also may make themselves "invisible" by turning off the search function for, say, a weekend if they don't want another member of the group to know they've left town.

Privacy is a critical element to Openwave's strategy. "In all location services, it is crucial that end-user's privacy is guaranteed," Othelius says.

One of the more popular Openwave services for Telia was tied to "Position X," a TV show in which the Hunters (Swedish film stars) try to catch the Fugitives. The wireless service, which was heavily marketed during the show's run last summer, may provide some clues as to how AT&T Wireless' SMS



The growing city of Kista is home to a science and technology center that courts innovative new businesses.


service will fare with FOX Broadcasting's "American Idol." Starting Feb. 4, AT&T Wireless customers will be able to vote for their favorite contestants

using SMS. Without a monthly message plan, each text message costs 10 cents. The carrier at presstime had not yet revealed its MMS plans for the show.

In Sweden, the reality show "Position X" ran during prime time each week-night, encouraging viewers to assist contestants using positioning with their mobile phones. If they spotted a Fugitive on the street, for example, they could send a message to the opposing team. Team members also had Sony Ericsson MMS phones and took photos of themselves. Each Friday evening live on TV, viewers would vote out a Fugitive couple.

"They were selling a lot of phones. I am not allowed to say how many, but it's a decent number," Othelius says. The show itself was No. 3 just two to three weeks into its run—ahead of No. 5 ranked "Jeopardy!"

Openwave's plans for LBS include refinements to its Location Gateway infrastructure and continuing to work with operators to launch new applications. And "Position X" for 2003? That chase is still under way. **W**



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Sendo: Still In Smart Phone Game

BY SUE MAREK

U.K.-based upstart mobile phone maker Sendo isn't letting a few ups and downs—like a last minute operating system shift and a lawsuit with Microsoft—get the best of it.

Sendo CEO Hugh Brogan says the company is working diligently to ready its smart phone for the market. Sendo also wants to assure wireless carriers that it's switch away from the Microsoft Stinger operating system to the Nokia Series 60 platform was the right move because Nokia was willing to give the company its platform's source code, something Microsoft refused to provide.

In the United States, Sendo is hoping to renew its relationship with Cingular Wireless. Last year Cingular announced it would be the first U.S. carrier to debut the Z100, Sendo's first smart phone and one of the first handsets to offer the Microsoft platform. The phones were sup-



Sendo's Z100 is no longer but the company is preparing to roll out a new smart phone with the Nokia Series 60 platform.

posed to hit the U.S. market last fall but never made it because of Sendo's operating system switch. Brogan wouldn't comment specifically on Sendo's current relationship with Cingular Wireless except to say that the company is "still busy working its way into the Cingular organization."

Exactly when Sendo will release its smart phone using the Nokia Series 60 platform is unclear; however, Brogan did say the phone is being tested for use in North America. "Our biggest issues are getting compatibility and interoperability on the AMR codec," Brogan says. "We are continuing to work on that. I'm not in a position to give you a precise date, but things are going well and we're nearing completion of the testing."

But getting the company's smart phone into consumer hands is only one of many challenges in the year ahead for Sendo. Late last year, the company filed a lawsuit against Microsoft accusing it of having a "secret plan" to steal Sendo's knowledge and expertise to gain entry into the mobile phone market and then, after driving the startup into bankruptcy, cut it out of the picture.

At presstime Microsoft had yet to respond to the Sendo litigation, but the lawsuit is not unlike other disputes the company has had with its technology partners, some of which have accused the company of unfair competition after gaining insight into their technology. And it's exactly Microsoft's reputation as a hardnosed competitor

that has some analysts questioning the logic of Sendo's involvement with the company in the first place.

According to Jane Zweig, CEO of the Shostek Group, Sendo accepted a dangerous clause in its agreement with Microsoft when it gave the company ownership of its smart phone intellectual property should Sendo go bankrupt. "This appears to be the key to Sendo's downfall. The clause essentially gave Microsoft an incentive to starve Sendo once the important software development was done—leaving Microsoft with a royalty-free license to the intellectual property," Zweig wrote in a recent Shostek Group briefing.

And Zweig isn't alone in her assertion that the road ahead for Sendo will be rocky. According to Andy Seybold, head of the Andrew Seybold Group, regardless of whether Sendo uses Microsoft's platform or Nokia's Series 60 operating system, Sendo will have difficulty succeeding in the smart phone arena because it has no brand awareness. "If you can't make phones and make money, then sue somebody and make money," Seybold says.

Documents filed by Sendo in the Microsoft lawsuit provide some insight into the company's somewhat perilous financial situation, which the company says was due to alleged actions by Microsoft, an investor in the company. However, Brogan says business is going well and growing. "We have grown 200 percent this month compared to this month last year." In particular, Brogan says the

company expects to announce several relationships with South American carriers in the coming weeks. "There's a lot of market segmentation in South America and that's why customization is important," Brogan says. And Sendo appeals to these carriers because it is willing to customize devices, something few manufacturers are doing for that market. Instead, Brogan insists other manufacturers just sell carriers the same models they sell in North American markets.

But Brogan admits that since Sendo's debut in the handset market a few years ago, many other device manufacturers have become more focused on customizing handsets for carriers. "Motorola is offering some degree of customization but not as full of a degree as we are," Brogan says. "Our particular recipe is working for us."

Not everyone agrees. According to Zweig, Sendo's differentiated approach isn't unique anymore. "Motorola is working with their operators on personalization of devices," Zweig says.

"There's a lot of market segmentation in South America and that's why customization is important."

In addition, Zweig believes Sendo will have a tough time getting a smart phone on the market without investing heavily in research and development. "The R&D required at this state of the game is going to be tough financially," Zweig says. "It's going to be challenging to survive this, considering where other vendors are in this."

Criticism aside, Brogan is optimistic about Sendo's future as a mobile phone maker. "We've been shipping phones for about a year and a half," Brogan says. "We've established our business. We're operating in 40 countries and we've produced a few million phones this year." **WW**



For updates to this story, visit www.wirelessweek.com.

BITS

■ **Motorola's** outlook for 2003 global handset sales—currently the main driver of its overall performance—is around 430 million to 440 million, up as much as 10 percent from the sluggish growth of 2002. Motorola's handset unit sales in the fourth quarter jumped 27 percent to 22 million, led by a surge in low-end models.

■ **Verizon Wireless** and **LG Mobile Phones** announced the availability of the new VX4400 handset for Verizon's "Get It Now" network. The VX4400 features a 65K-STN color internal LCD display, blue backlit keypad and LG's signature color-personalized caller ID with up to 10 different colors; users can choose red for a spouse, blue for friends and green for co-workers. The phone sells for \$200 with a two-year agreement.

■ Wireless chip developer **Skyworks Solutions** has unveiled its GSM/GPRS 900/1800 handset radio system, which combines all of the necessary circuitry into a single-chip package that the company says is about one-third the size of alternative solutions.


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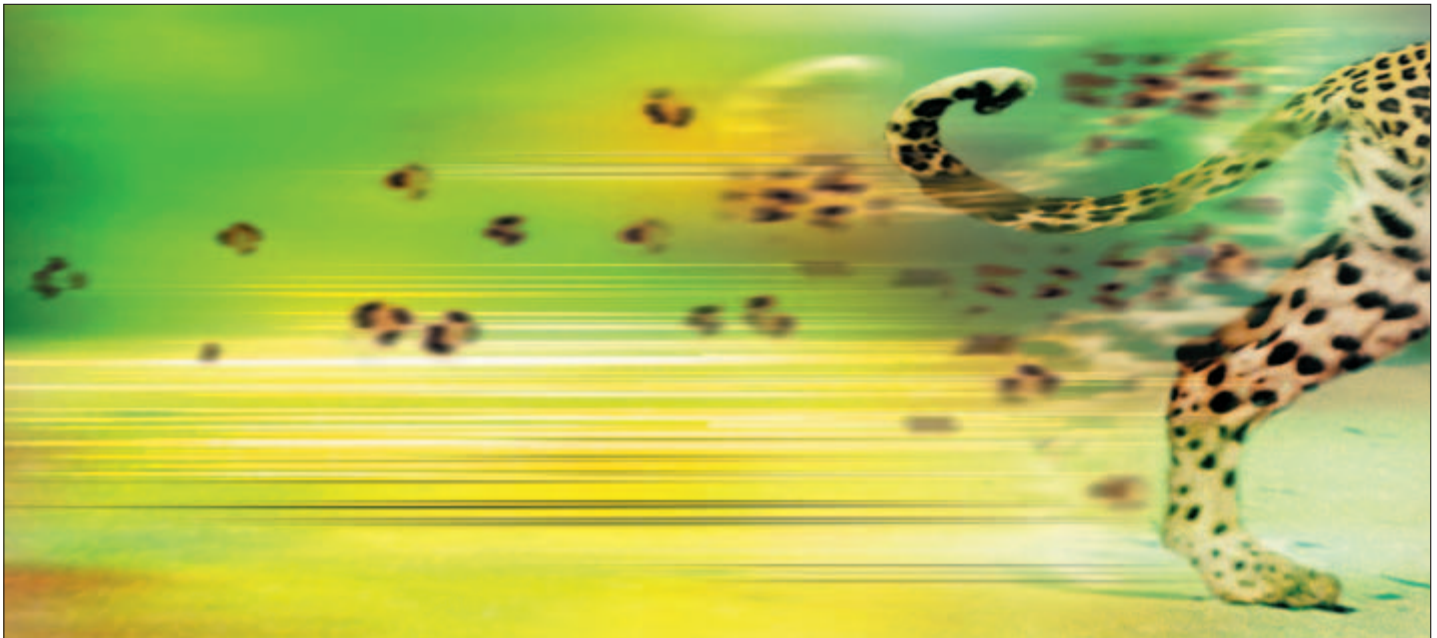
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SHORT TAKES

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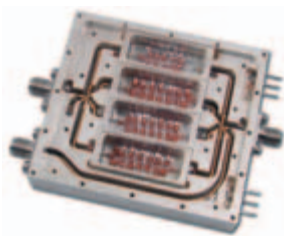
◆ **NTT DoCoMo** is marketing a new i-shot compatible handset, the F504iS with dual cameras. The F504iS is third in the 504iS series DoCoMo launched in November.

◆ **Radio Frequency Systems** announced the availability of its new SJD series coaxial cavity-ferite transmitter combiners operating in the 403-512 MHz band.

◆ **Roto-Router** service technicians will be easier to track down with the deployment of **Gearworks'** mobile workforce management software, etrace™, on **Nextel Communications'** i58sr phone, which has GPS functionality. The deployment of etrace makes Roto-Router the first enterprise customer to deploy a commercial application that uses Nextel's GPS and Java technology-enabled handsets.

◆ **Cigma Technologies** is introducing a new generation of RF pre-distortion linearizer products. The company says the products will allow manufacturers of wireless base stations and power amplifiers to build HPAs and MCPAs that are smaller and more cost-effective than other commercially available products.

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The mechanical housing includes SMA-female field replaceable connectors. The housing is machined out of aluminum to maintain a lightweight package that can be laser welded for a leak-proof seal. The digital control circuitry was designed with the use of standard TTL three-bit logic.

Standard return loss is 2.0:1. Insertion loss is better than 4 dB with amplitude ripple 0.3 dB. Isolation can be as high as 80 dB channel to channel.

The K-L modular switch filter bank was designed for military and industrial grade applications. The unit will meet environmental requirements such as gross leak, random vibration, sine vibration, thermal shock and a standard operating temperature of -40 to +85 deg. C. Typical applications for the product include receiver designs, synthesizers, radars and guidance systems.

K&L Microwave
www.klmicrowave.com

Buffalo Access Point, Adapter



- Four-port Ethernet switch
- Improved security
- Two-year warranty

Buffalo Technology is now shipping the AirStation G54 Broadband Router Access Point (model WBR-G54) and wireless CardBus Adapter (model WLI-CB-G54). Buffalo's G54 products are available through its exclusive distribution relationship with Tech Data.

Based on Broadcom's 54g chipset, the AirStation router AP contains a four-port Ethernet switch and incorporates improved security with Multi-Session VPN Passthrough support and upgradeable firewall features. The AirStation 54Mbps AP also will support 802.1x and WPA with TKIP and AES with a future firmware upgrade. Backed by a limited two-year warranty, the AirStation G54 Broadband Router Access Point is available at \$199 MSRP and Wireless CardBus adapter at \$99 MSRP. Resellers interested in Buffalo's WLAN solutions for their SMB customers should contact Tech Data's Wireless Solutions VPR by calling 800-237-8931 ext 82045.

Buffalo Technology
www.buffalotech.com/wireless

Atmel Transceiver Chipset

- ISM band
- Two-way remote sensing
- Update with ISP capabilities

Atmel announced the availability of a UHF RF wireless on/off key transceiver chipset based on Atmel's AT86RF401 Smart RF micro-transmitter and its T5744 receiver.

The microtransmitter's AVR-based core enables it to be paired with the T5744 receiver and supervise 2-way on/off keyed communications in the unlicensed ISM band (300MHz - 450MHz). Both chips minimize external component count; as a result, with +6 dB of output power on the microtransmitter and -110dB of input sensitivity on the receiver, a high performance, low-cost, two-way RF wireless system can be realized. These features make this chipset suited for low-cost, low-data rate, 2-way remote sensing applications, such as temperature, pressure and motion as well as remote control applications, such as home appliance and lighting, energy management and monitoring and security systems.

Atmel Corp.
www.atmel.com

AVX Shield Lock Connector



- One-piece connectors
- Access components under shield
- Tape-and-reel packaging

AVX Corporation announced a new family of SMT one-piece shield lock connectors to meet miniaturization standards in the portable equipment market. Designated the 8069 Series, the connector is designed to lock RF shielding cans to the printed circuit board. This new series extends the AVX connector range while addressing the needs of design and produc-

tion engineers who need to access components housed under a RF shield. Applications include cellular phones, notebook computers, PDAs and other portable electronic devices that require shielding.

The SMT shield clips are available in standard heights of 1.80mm and 3.00mm and will accept 0.20mm thick metal cans. The connectors are available in tape-and-reel packaging of 3,000 pieces per reel. Typical pricing for the 8069 Series is \$0.075 each at 500K with lead-times from stock to 10 weeks.

AVX Corporation
www.avx.com

Radio Waves' Discriminator



- Reduces interference
- Shaped reflector
- Three-year warranty

Radio Waves released a high performance antenna design dubbed the Discriminator series. The Discriminator is a one-foot diameter antenna that has first side lobes 23 dB down from the main beam. The performance reduces interference from other microwave transmitters when collocation is required. The new Discriminator series is available for the 10, 26, 28, 31, 32, 38 and 60 GHz bands.

The lightweight design uses a shaped reflector to optimize patterns and assure enhanced system performance. Like all Radio Waves antennas, the Discriminator series is backed by a three-year warranty. The model number for the new Discriminator series begins with HPCPE followed by the frequency range. Each comes with an adjustable antenna mount, and Radio Waves can supply other antenna system components.

Radio Waves
www.radiowavesinc.com

SHOWCASE

Andrew Window Antenna

- 2.3-2.7 GHz bands
- Weatherproof housing
- Internal, external mounting

Andrew Corporation introduced the Microceptor Window Mount Antenna, an antenna solution for Internet service providers deploying wireless solutions in the 2.3 to 2.7 GHz frequency bands.

The new antenna has an articulating mount for capturing peak RF signal strength in up or down tilt mode. The antenna also has a weatherproof housing

and is suitable for internal or external window or wall mounting. The new antennas may be used in homes, home offices or businesses and are designed to address the need for smaller and visually unobtrusive antennas while still providing high-speed Internet services to homes and businesses.

The Andrew Microceptor Window Mount antenna

comes with suction cup mounts for window mounting as well as detailed instructions for wall and mast mounting.

Andrew Corporation
www.andrew.com



Emerging E911: Using Position- Location Technologies

Enhanced 911 services over wireless platforms remains a contentious and lingering issue that providers continue to wrestle with, and E911 system technologies that operators potentially may adopt address the problem in a variety of ways.

Providers are being driven by consistent regulatory deadlines and varying amounts of industry pressure, and over the short-term, their objectives with regard to E911 have been primarily determined by cost. However, cost isn't the only consideration on the table with current E911 position-location technologies, as shown below.



Summary of Basic Characteristics of Position-Location Options

	TDOA	E-OTD	A-GPS
Accuracy	70-300m	50-250m*	50-150m
Speed of Response	10s	10s	1-20s
Legacy Handsets?	Yes	No	No
Handset Modifications	No	Software only	GPS handset req'd
Network Modifications	Yes	Yes	Yes
Standardized	No	Yes	Yes

*based on extensive carrier trials

Source: Telecom Trends International

Cost Of Doing Wireless Business Stays Steady

After a period of time late last year when operators were forced to slash their wireless service costs in an effort to stay competitive, January 2003 was a month where service costs remained relatively unchanged. Only three of the markets researcher Econ One looked at in its study saw any change at all—San Francisco (0.2%), Los Angeles (0.7%) and Minneapolis (0.9%).

Average Monthly Cost of Wireless Service Across Four Usage Levels *
Top 15 Markets

January 2003

	Jan 03		Dec 02		(%)Change
	Rank	(\$)	Rank	(\$)	
Boston	1.	\$36.69	1.	\$36.70	0.0%
New York	2.	36.24	2.	36.25	0.0
Philadelphia	2.	36.24	2.	36.25	0.0
Washington D.C.	2.	36.24	2.	36.25	0.0
Los Angeles	5.	35.99	5.	35.75	0.7
Minneapolis	6.	35.86	7.	35.54	0.9 H
San Francisco	7.	35.83	5.	35.75	0.2
Pittsburgh	8.	35.35	8.	35.36	0.0 L
Dallas	9.	35.24	9.	35.25	0.0
Houston	9.	35.24	9.	35.25	0.0
Miami	11.	35.20	11.	35.21	0.0
Detroit	12.	35.08	12.	35.09	0.0
St. Louis	12.	35.08	12.	35.09	0.0
Cleveland	14.	35.06	14.	35.07	0.0
Chicago	15.	34.11	15.	34.12	0.0
Average		\$35.57		\$35.53	0.1%

* 50, 200, 500, and 800 minutes of use per month, assuming 70 percent peak-time use.

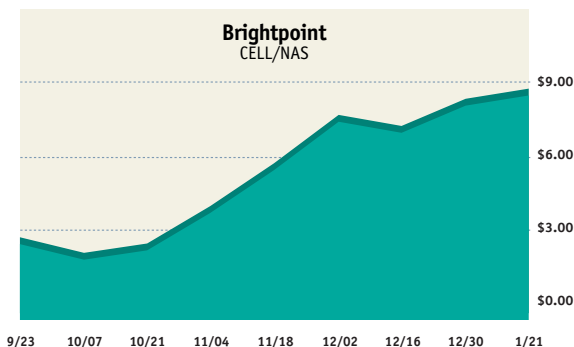
Note: "L" denotes market with largest monthly cost decline; "H" denotes market with largest cost increase.

Source: Econ One Research, Inc. and providers' Web sites as of January 6, 2003.



EconOne.com

STOCK SPOTLIGHT



If there's a potential proxy for the business prospects in wireless, let's hope it's the distributor channel. If so, the rally in Brightpoint shares over the past several months could be a leading indicator of better things to come.

Brightpoint has soared from its near-term lows of less than \$2 a share to a trading range periodically touching \$9 a share by late last month, more than tripling its rise from the lows.

Besides possibly pointing to a brighter 2003 for wireless sales, Brightpoint's performance also could be a reflection of the company's restructuring and the possibility of a strong fourth-quarter earnings report. Brightpoint last year streamlined and reorganized in a quest to return to profitability, as well as to bolster its balance sheet by retiring a convertible debt issue.

The fourth-quarter earnings will be out Feb. 6. Stay tuned.

Curbing Online Identity Theft And Fraud

The great ones have always said, "The best offense is a good defense." With consumer fears about fraud affecting online revenue opportunities, businesses are giving serious consideration to this cliché as they face one of today's greatest challenges—curbing e-commerce subscriber fraud.

Online commerce has become a major force for a number of global economic markets as customers shift their buying activities from an offline to online experience. But with every new technology advancement, compromise and risk lurks in the shadows for both buyers and sellers.

According to Gartner Group, one in 20 Internet consumers suffered from some form of credit card fraud in 2001, while one in 50 suffered from identity theft. And while convenience is driving consumers to the cyber world, confidence in this buying practice is fleeting and could cripple online commerce momentum.

As online technology continues to be-

come more pervasive, supporting PDAs, laptops, mobile phones and PCs, we are now beginning to see the tip of the iceberg for damage that cyber criminals can create. New mobile buying methods will cater to impulse and last-minute purchasers, as well as traditional buyers who will not only be buying goods but booking tickets and managing financial accounts and transactions. In the new world of online and mobile business, consumers need reassurance that their "faceless" transactions are secure and that these "faceless transactions" will be safe, quick and reliable.

Online fraud is not just a problem for consumers and government regulators. It crosses network operators, banks, department stores, credit card associations, manufacturers, resellers, etc., all the way down to the mom-and-pop offering vintage books over the Internet.

So what do we do?

To be prosperous and a trusted provider of online commerce transactions, businesses and carriers must identify high-



PAMELA REEVE

risk applicants by checking for invalid and inconsistent data, verifying each applicant's information and identity, and developing scoring models that work with validation and verification tools to produce a score indicating the likelihood that an applicant is fraudulent or risky.

We need solutions that deal with these risks by quickly and seamlessly assessing prospective sellers, buyers and transactions. This must be done so that threats to consumer confidence are handled at the right point in the process.

One way to screen for fraudulent use

is through online credit qualification and fraud screening. Prospective customers must be quickly identified as profitable and legitimate. Another way is to more thoroughly check a customer's identity to guard against identity theft. This often requires posing "out of wallet" questions.

For businesses, these services are just as important as any security measures implemented in our malls, banks, theaters, sporting events, etc. to ensure profitable and safe purchasing behavior. For customers and suppliers, these services are vital for providing a feeling of safety and confidence in the online transactions that are becoming more and more a part of everyday life.

Robust fraud and identity management solutions will not come from as single vendor, but through a growing list of complementary relationships that jointly deliver the essential solutions to combat this pervasive and enduring problem.

Pamela D. A. Reeve is CEO of Lightbridge, a global provider of online and mobile business solutions for communications providers.

A SECOND THOUGHT...

The Ultimate Communications Control

The "always-on" mantra in today's telecommunications market has created a mass of new avenues and devices enabling consumers to communicate. At work a user might be available on the office phone for voice calls, on a cell phone for both voice calls and text messages and on a desktop computer for e-mail and instant messages.

To many, the flow of communication has become overwhelming. In fact, the penetration rate of wireless phones is approaching astronomical numbers in some countries. For example a recent J.D. Power survey shows that 56 percent of U.S. households have a wireless phone, and the growth of broadband, packet-based networks for both wireline and wireless access continues to increase the reach of communications networks.

The industry has given users the "always on" option, but what if they want peace and quiet without missing an important communication?

Imagine the ability to limit access via a pager or home phone during dinnertime but routing critical calls to a cell phone and all business calls to a specified voice mail. With the advent of presence and availability management (PAM), carriers can now offer end users this luxury of control. PAM enables subscribers to manage their presence on communications networks in a way that protects their privacy and allows for total control.

The idea of presence management grew out of Instant Messaging, the immediate delivery of short text messages to available people on a user-maintained list. The key elements that made IM successful are the immediacy of the communication and the ability of the end user to manage their 'presence' in regard to others.

PAM takes the concept a step further, incorporating the IM concept of communications management into new devices and networks. In addition, users can consolidate their availability across multiple networks into one profile and



GEORGE HALLENBECK

redirect communication attempts from one network to another automatically. A buddy list can be expanded to include not only individuals but also content such as media and advertising, therefore expanding the revenue opportunities for an operator without developing backlash from the user.

In early 2000, the Presence and Availability Management Forum (www.pamforum.org) was formed to extend IM concepts into other forms of communication beyond that of simple text messaging.

The group needed a model for managing presence information and availability requests that would give the end user the ability to control applications that require availability while also allowing the operator to maintain that information for privacy and accessibility.

The PAM Forum has released its 1.0 version of the specification and is working toward a revision of those standards. The specifications developed within the PAM Forum represent a model for maintaining and distributing presence and availability information as well as securing and protecting access to the information.

Clearly, consumers are hungry for control over when, where, how and by whom they are communicated. Rather than keeping users "always on," PAM offers the flexibility to manage communications so a user is "always available," but not "always on."

George Hallenbeck is president and CEO of Evolving Systems, a provider of operations and enhanced services software to communications industry clients.

ON THE MOVE



THOMPSON / WIND RIVER

The San Diego Telecom Council announced its new executive team, including **Marco Thompson** of Wind River Services as chairman and **Martha Dennis** of Windword Ventures as president. **Jeffrey Belk**, senior vice president of marketing for Qualcomm, was named vice president of marketing and programs; **Lindsey Burroughs**, vice president/general manager for Cox Business Services, was named vice president of special projects; **Patti Lazard**, director of business development for KPMG, was named vice president of membership; and **Cathy Pucher**, director of Americas wireless communication sales for Texas Instruments, was named vice president of outreach.



BELK / QUALCOMM



SCHROCK / QUALCOMM

Donald Schrock plans to retire as executive vice president and group president of Qualcomm CDMA Technologies in August after a 35-year career in the semiconductor industry. **Sanjay Jha** was appointed president of Qualcomm CDMA Technologies.



GRAJSKI / SNAPTRACK

SnapTrack appointed **Kamil Grajski** to senior vice president and general manager of the Qualcomm subsidiary. He formerly held the position of vice president of engineering for SnapTrack. He replaces **Bret Sewell**, who resigned to pursue other opportunities.

Bjorn Kirchdorfer joined Navini Networks as executive vice president of commercial operations. He previously was a vice president with IP Wireless.

Les Hamilton joined Danger as senior vice president of worldwide operations and manufacturing. He joins Danger from GX Networks UK, formerly XO Communications Europe and Concentric Network, where he headed the Network Services Division, based in London.

Flying High With Personalized Audio

Even though he flies an antique bright-yellow airplane for fun, David Simpson doesn't think he has his head in the clouds when it comes to putting wireless technology to good use. He's on a mission he calls "personalized spoken audio."

Simpson, 45, has a telecom background with 20 years at Verizon Communications and its predecessor companies. He also has spent a lot of time behind the wheel of a car, where he thinks too much of the time is wasted. It was while he was at Verizon that he got the idea that "windshield time" could be more productive if drivers could receive personalized audio content, similar to books on tape but using a wireless network.

He went to work in business development for Audible Inc., a leading provider of downloadable spoken audio from the Internet, which wanted to expand into wireless and telematics delivery. The dream was



to deliver personally valuable content, such as breaking news stories about a company or issue the user was interested in.

"Carriers need to understand that they hold a franchise in wireless that is at least as important and very closely related to what the cable business and broadcasters had before in terms of delivery of information," he says. "My passion is to find ways for carriers to bring this service to their customers."

Campbell, who lives in Chatham, N.J., says people would be interested in receiving a wide swath of information through their wireless phone, including trav-

el, financial, retail and customer contacts. The key, he says, is to make it personalized, so that it is pointcast and not broadcast. Most people aren't interested in hearing all the news headlines, but find one or two to be personally relevant.

One company Campbell thinks is on the right track is a Pittsburgh, Pa., firm called Evoxis, which has a platform for customized, spoken information. Evoxis is an application service provider targeting business-to-business financial, health care and government. Campbell says the Evoxis service allows users to set profiles and alerts so that mobile sales workers get a phone call when there is a news announcement about a client company.

"When they walk in the door, they know what has happened," he says. "Clients and suppliers need to have a close relationship and this helps that."

Other users might get an audio message detailing a management change at a company the user owns stock in.

Unfortunately, Campbell doesn't get a lot of time now to evangelize about personalized audio. A downsizing at Audible led to his departure 18 months ago and he now is a partner in a consultancy called Morristown Three, which focuses on early and growth stage technology companies. None of his clients now offer personalized wireless audio, but Campbell still pleads his case whenever possible.

He also saves some time to fly a 1946 Piper Cub two-seater airplane, sometimes call the "plane that taught American to fly." Every year he tries to fly to a Piper Cub rally held in Lock Haven, Pa.

With luck, his ideas for wireless content will take wing too.

—By Brad Smith



OFFBEAT

Luggage Goes Wireless

Maybe it's that some business travelers want to emulate James Bond, or Maxwell Smart.

Whatever the reason, wireless technology has crept into luggage via a Bluetooth-enabled attaché case from Samsonite.

The company's Hardlite 625 model is under the final stages of development in Europe, where it

will debut commercially later this year. An embedded Bluetooth module enables users to perform such tasks as tracking the case. Other future apps might include the use of Bluetooth instead of paper or plastic luggage tags.

"Samsonite is a company that's always looking for the next step in travel," a spokeswoman says.

Can the shoe phone be far behind?



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