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WiMax.com Editor & President, Carl Townsend, offers his opinion on the state of the overall industry.

WiMAX Poised for Portable Broadband Success  
Bolstered by an improving economy and a more suitable marketing plan, global WiMAX subscriptions are expected to grow.

SEQUANS Silicon to Power New WiMAX CPE & Devices in 2010  
WiMax.com talks with SEQUANS’ Vice President of Business Development, Craig Miller, to discuss how the company is ready for the onslaught of 4G mobile Internet gadgets.

Voice to the MAX: Why VoIP is the Winning App  
While most operators focus on the broader residential voice market, there are opportunities for higher ARPU.

Getting Connected  
WiMAX Devices Current Outlook  
Greater personal productivity & expanded workgroup access are just a couple things adding value to the WiMAX end-user device market.

Taiwan WiMAX Manufacturers: Challenges & Opportunities in 2010  
Taiwanese manufacturers accounted for 55% of world-wide WiMAX CPE shipment volume, highlighting Taiwan’s importance in the global WiMAX industry. Five key issues face this group in 2010.
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WiMAX vs. LTE: Which Technology Will Win?

Okay, now that I have your attention….

While comparisons between the two technologies make for good headlines and undoubtedly help sell analyst reports, the on-going debate has been much overblown and increasingly less relevant. As with other standards “battles” such as HD-DVD vs. Blu-ray, much of the debate is politically charged - which each side trying to win influence based on the technology path has chosen or where a vendor has invested their IPR.

While the two standards share much of the same DNA from a technological perspective, that is where the similarities end. In fact for most operators, the decision on whether to choose WiMAX or LTE has already largely been made for them based on the type of spectrum owned, their respective business models, support for legacy systems, etc. And despite aggressive timelines announced by Verizon and others, most LTE networks will not be widely deployed until 2011.

But to really understand WiMAX, you must first examine the different ways the technology is being used. While broad generalizations are often made about WiMAX, there are actually several different flavors with regards to spectrum profiles, business models and devices. In its initial development, WiMAX was designed as a fixed wireless broadband technology and in that role has become the undisputed leader - providing wireless DSL type services without the prohibitive cost of digging up streets and putting in copper and fiber. WiMAX has become the technology of choice for backhauling traffic from Wi-Fi hotspots and for applications such as remote video surveillance and traffic monitoring. With its performance, availability and wide ecosystem of products and vendors, WiMAX has also featured prominently in the rural broadband stimulus programs in the US (see featured section).

While fixed type applications provide sizeable opportunities by themselves, the real excitement and tremendous growth potential is with portable and mobile applications - being able to take your broadband experience with you where ever you go. Thanks in large part to the iPhone and other smart phone devices, demand for mobile data is increasing exponentially and putting strains on operator’s current 3G data networks. In order to keep up with the tidal-wave

in mobile data, operators must move quickly to more spectrally efficient OFDM based, all IP technologies such as WiMAX and LTE.

So where is WiMAX today? Currently there are over 500 WiMAX deployments in 145 countries. US operator Clearwire is providing service in over 28 markets and plans to cover 120 million people in 2010 with the launch of additional markets including New York City, Los Angeles and the San Francisco Bay area. Other major WiMAX deployments include UQ Communications in Japan, Packet One in Malaysia and Imagine Broadband in Ireland. According the WiMAX Forum, WiMAX is on track to cover more than 800 million people by the end of 2010 and 1 billion by 2011.

On the device front, there are now over 180 devices that are WiMAX Forum™ certified and hundreds more that have been announced or are commercially available. Embedded WiMAX is now available on over 40 notebook and netbook computers. Intel has begun shipping its “Kilmer Peak” wireless chipsets that supports multiple WiMAX spectrum profiles in the 2.3GHz, 2.5GHz and 3.5GHz bands for notebook PCs and will provide the ability for Global roaming across different WiMAX networks.

While recent deployments are encouraging, there are significant challenges ahead, and the biggest continues to be access to spectrum. In India, after much delay, auctions for WIMAX/BWA spectrum are planned for May 2010. The regulatory environment continues to be a challenge in Asia, Latin American and Europe where strong cellular incumbents look to protect their interests.

But given global single digit broadband penetration, the opportunities are enormous and the impact of internet access to improve people’s lives has been well proven. With the global financial climate improving, the time to deploy is now… and for many that technology is WiMAX.

Best Regards,

Carl Townsend, President & Editor, WiMax.com

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WiMAX Poised for Portable Broadband Success

What happens when you take a strong wireless technology like WiMAX, introduce it with great fanfare and then slam it with a poor economy, slow spectrum licensing and incorrect positioning in the marketplace? Just exactly what happened to WiMAX worldwide over the past year or so.

Previously, Yankee Group forecast that in 2008, global WiMAX subscriptions would hit 3.8 million. In reality, that number was not reached until year-end 2009, primarily because WiMAX had been hit with a veritable tsunami of constraints. In addition to a deep, worldwide economic recession and the collapse of the credit markets, WiMAX last year faced slower-than-expected spectrum licensing, especially in areas with huge subscriber potential like India and Indonesia. And as if the economic crisis wasn’t enough to dry up investment dollars, WiMAX also saw a crisis in investor confidence due to its mismatched positioning against 3G and advanced 3G technologies like LTE, HSPA and HSPA+.

What’s Weighing WiMAX Down?

Flawed market positioning is the biggest gating factor for WiMAX, as providers and regulators continue to place WiMAX in the mobile broadband market versus the portable broadband market. Yankee Group defines “portable broadband” as a service that is available for stationary or pedestrian use within limited network coverage areas. “Mobile broadband” services, by contrast, are available over wide coverage areas and support continuous connectivity at vehicular speeds. For the most part, WiMAX and portable broadband are best suited to unserved and underserved markets, whereas 3G and advanced 3G technologies tend to flourish in the mobile broadband arena, where legacy technologies abound.

But when WiMAX first hit the scene in 2004, its primary aim was to disrupt the mobile broadband market, which had a less-than-stellar track record, especially in terms of price, performance and reliability. Since then, however, the mobile broadband industry has pulled its act together and accelerated the development of 3G, HSPA, HSPA+ and LTE. Now, with its 3G competitors in more of a position of strength technology-wise, WiMAX has less of a story to tell—and less of a compelling business opportunity—in the mobile broadband space.

The fact is WiMAX isn’t especially suited to mobile broadband. Its high-performance radio technology and end-to-end all-IP architecture does, however, shine in green-field fixed and portable broadband applications—a market it is just now beginning to address in earnest. While we assume the mobile broadband market will be dominated by technologies like HSPA, HSPA+ and LTE, the portable broadband market—an area of rapid growth especially in emerging EMEA markets like Central and Eastern Europe and Africa—is WiMAX’s for the taking.

Over the next few years, as the gating factors begin to ease, Yankee Group believes WiMAX is poised to take off. In fact, we forecast that WiMAX subscriptions will grow from 3.9 million today to 92.3 million in 2015, a CAGR of 69 percent (see Exhibit 1).

Some Like It Mobile

While the lion’s share of WiMAX’s predicted increases will happen in the portable broadband segment, there are notable exceptions to the rule. For example, service providers in the U.S. (in addition to Japan and Korea) are taking a relatively aggressive stance targeting...
WiMAX Poised for Portable Broadband Success

WiMAX toward mobile applications.

In North America, WiMAX activity is dominated by Clearwire, which aspires to deploy a nationwide WiMAX network in the U.S. in the 2.6 GHz frequency band and provide 4G services to its strategic partners, including Sprint and Comcast. Clearwire is in the process of upgrading from a proprietary technology to mobile WiMAX (802.16e), and to date, it offers commercialized mobile WiMAX service in many U.S. markets. Combine Clearwire with upstarts DigitalBridge Communications and Xanadoo, and the North American market is well-served by WiMAX players.

Another impetus for WiMAX growth in the U.S. market is the American Recovery and Reinvestment Act of 2009, which earmarks $7.2 billion to broadband-related projects. With these factors in mind, Yankee Group projects that WiMAX subscriptions in North America will increase from 1.0 million in 2009 to 13.4 million in 2015, a 53 percent CAGR (see Exhibit 2).

Slow Going in Asia-Pacific

In contrast with North America, the Asia-Pacific region is growing more slowly in terms of WiMAX subscriptions. While it presents tremendous opportunities for WiMAX, particularly in areas like India and Indonesia where there is low broadband penetration, licensing issues are a major stumbling block. For example, our forecast does not account for WiMAX subscriptions in the 2.6 GHz (BWA) band in India because of the continued delay in licensing. Plus, WiMAX has been incorrectly positioned to compete with technologies like HSPA and LTE in the region, resulting in heightened political antics and protracted timelines for spectrum licensing in many markets. In addition, it is unlikely WiMAX will see meaningful adoption in China, where the service providers have embraced TD-SCDMA and LTE TDD.

We do, however, expect that licensing of the 2.6 GHz band—which is most suited to WiMAX—will occur during the forecast period, freeing up WiMAX providers to address this burgeoning market. With that in mind, we project WiMAX subscriptions in Asia-Pacific to increase from 0.5 million to 40.4 million between 2009 and 2015, representing a CAGR of 102 percent over the forecast period (see Exhibit 3).

EMEA Leads the Way

While Asia-Pacific holds the most potential, the region of the globe set for the most dramatic WiMAX growth is EMEA. Our forecast predicts that WiMAX’s strongest adoption will occur in emerging markets in EMEA, particularly in Central and Eastern Europe and in Africa. Investments in Africa are accelerating, particularly with the implementation of several undersea cables and the freeing up of capital markets. We see slow progress for WiMAX in Western Europe, however, because most of the service providers are subscale with networks operating in the 3.5-3.8 GHz bands. We believe that this will remain the case until significant 2.6 GHz frequency bands are auctioned and future acquirers of TDD licenses in Western Europe are required to embrace WiMAX.

Taking these factors into consideration, Yankee Group projects WiMAX subscriptions in EMEA to increase from 2.1 million to 33.9 million between 2009 and 2015, at a CAGR of 59 percent (see Exhibit 4).
WiMAX Languishes in Latin America

Perhaps the best example of market positioning hobbling WiMAX adoption is found in Latin America. Not only is spectrum scarce—particularly in the optimum 2.6 GHz band—but in this 3G-heavy environment, many investors view WiMAX as a “dead” technology and are shying away from making necessary capital investments. In addition, many urban centers across the region already offer speeds in excess of 2 Mbps, leaving WiMAX with few ways to differentiate itself. As a result, WiMAX across Latin America tends to be relegated to rural regions that are of less priority to major service providers.

Even with such constraints, however, Yankee Group sees WiMAX subscriptions in Latin America increasing from 0.3 million to 4.7 million between 2009 and 2015, a CAGR of 59 percent (see Exhibit 5).

Getting There

The global WiMAX market is notoriously difficult to forecast, primarily because it relies on a range of interdependent factors, any one of which can work to stifle demand and service proliferation. To reach our forecast of 92.3 million worldwide WiMAX subscriptions by 2015, several economic, regulatory and technological barriers must be overcome. But we are already seeing signs of progress—particularly in terms of an improved economy and more savvy market positioning.

To gain widespread adoption, WiMAX must gain greater industry support—particularly from regulators and investors. We believe this support depends on WiMAX establishing itself as a compelling portable (as opposed to mobile) broadband solution, particularly in emerging markets. But as long as WiMAX continues to be erroneously pitted against 3G and emerging 3G technologies like HSPA, HSPA+ and LTE in the mobile broadband space, the mobile broadband community will create regulatory and technical roadblocks to stifle the success of WiMAX in the marketplace.

In addition to improved market positioning, regulatory easement in major markets such as India and improved investor sentiment in regions like Latin America are critical for WiMAX to gain meaningful market scale and sustained industry support.

And a little success trumpeting wouldn’t hurt either. In addition to appropriate market positioning for WiMAX, we believe it is contingent upon incumbent WiMAX operators to demonstrate and promote their market successes with the aim of improving confidence among regulators and investors.

WiMAX is a strong wireless technology with a compelling story to tell, especially in the portable broadband arena. Once it overcomes these few market barriers, the technology is indeed poised for global success.

Register as a guest of Yankee Group at www.yankeegroup.com/join to get a full copy of the 2009 global WiMAX forecast.

Philip Marshall, Ph.D., is a senior research fellow and technology strategist who conducts telecom technology research, arming clients with the knowledge and tools to capitalize on the global connectivity change. He is focused on the service providers’ and vendors’ perspectives to investigate market and service opportunities and trends for connectivity systems. Dr. Marshall joined Yankee Group in 2000, holding various roles including managing Yankee Group’s technology research.
By combining several silicon functional blocks on a single chip and using a “state of the art” 65nm semiconductor process, Sequans Communications Inc. has developed a family of WiMAX components that has the potential to enable a mass market for WiMAX CPE and mobile/ portable devices. It’s that mass market that semiconductor companies urgently need to become profitable. Selling huge volumes of chips increases economies of scale, which drives down manufacturing costs and bill of materials prices. This results in lower cost, higher performance end user products. If there is sufficient customer demand, a virtuous cycle takes hold. This trend is clearly evident in smart phones, notebook PCs, set top boxes and other electronic gizmos and gadgets. With good customer acceptance, more and more functions are packed into smaller and less expensive devices.

Earlier this year, we interviewed Sequans executives and moderated a panel session in which they participated (See References 1. and 2., respectively for those articles). In 2010, we expect to see the Sequans SQN 1200 family of silicon (described below) to be embedded in new types of multi-functional WiMAX CPE, portable WiFi hot spots with integrated WiMAX radios, netbooks and (at long last) smart phones with WiMAX based mobile Internet access. That’s a lot to look forward to, but there’s also promise and potential for a whole lot more.

In fact, many new and different mobile WiMAX devices are possible, including eReaders, smart meters, multi-user portable game players, video cameras and surveillance, and health monitoring instruments. If the components are low cost, highly integrated functionality, low power consumption and small size, then the ingredients for new such new devices are in place. However, the key to realizing a wide variety of devices will be a combination of several factors that are predominantly controlled by the network operator. Those include WiMAX coverage, pricing plans, and business models network operators adopt with content providers. For example, the mobile/ portable subscriber would like wide coverage, excellent availability, good performance, but only one bill from the network provider-independent of the number of wireless devices owned which use the WiMAX network. [See Reference 3. for more details on possible devices for mobile broadband networks.]

Sequans Silicon Solution for Mobile WiMAX CPE & Devices

Taking advantage of Moore’s Law (to realize ever higher silicon functional density), in house RF and mixed signal expertise, and the ever-popular ARM core, Sequans has pulled off a tri-fecta with its latest generation of WiMAX silicon.

The SQN 1220 integrates a baseband (IEEE 802.16e-2005 MAC and PHY) element, tri-band RF (2.3 – 2.4 GHz, 2.5 – 2.7 GHz, 3.3 – 3.8 GHz) module, and an (ARM based) applications processor - all on a single silicon die. To an old time data communications chip architect and microprocessor applications engineer (like this author), it’s an amazing feat! The mixed signal processing (digital and analog) capability is especially impressive. Additionally, the SQN1220 implements dual transmit channels, which

Sequans' SQN1220 system-on-chip (SOC) for Mobile WiMAX mobile stations is the second chip in Sequans' new 65nm single die chip SQN1200s family. In addition to the embedded WiMAX processor, it features an additional network processor to support voice/ data CPE and gateways.
enable **uplink MIMO** (as specified in Release 1.5 of the WiMAX Forum system profile). As pointed out in our first Sequans article (see Reference 1.) uplink MIMO results in significantly increased link budget, improved cell coverage, lower overall power consumption, and lower system cost.

The on-chip applications processor could be used for a variety of tasks, including: SIP for VoIP, IMS and FMC functions, IP routing over the WiMAX access network, residential gateway, diagnostics and test functions, smart meter or instrument reading and control, user interface for a LCD screen and/or keyboard, device commands and status indicators. Ultimately, it will be left to the ingenuity of the device maker to specify the software functions to be implemented on the on-chip processor.

The **SQN1210** is a single die, baseband - RF combo chip without the applications processor. It is designed for the smallest of mobile devices, such as mobile handsets, smart phones, MIDs, and netbooks. It may be used with notebook PCs through USB dongles or ExpressCards, or directly embedded in PCI Express MiniCards or Half MiniCards. Zyxel has announced their use of the SQN1210 in a USB dongle- the ZyXEL MAX-507 USB.

Care has been taken to reduce power consumption, which is a critical factor for all mobile devices. The SQN1200 family employs the state-of-the-art power reduction techniques to extend battery life. Smart software algorithms optimize resource management for additional power reduction improvements. The SQN1220 and SQN1210 consume less than 350 mW of power with fully loaded MIMO traffic and less than 0.5 mW in standby.

Sequans’ own connection manager, a supplicant engine for EAP authentication, a fully-fledged OMA-DM client, and a field diagnostic tool. S3MAX also provides a full simulation and verification environment, which can be easily customized to address specific device maker needs.

Sequans has sampled the SQN1210 and SQN1220 chips to more than a dozen device manufacturers who are currently developing next-generation products using that silicon. A wide variety of WiMAX products are now in design: USB dongles, embedded modules for notebooks/netbooks/CE devices, multimode cellular handsets, portable hotspots, and WiMAX CPE. Let’s now examine the functionality of a few of those new products.

In addition to the customers who are actively developing new products, there is another group of manufacturers evaluating the SQN1200 family chips. This number is more than a dozen also, and is increasing over time. Sequans expects that many of these will convert to the ‘active development’ category above once they recognize the value of the integration we’ve done, the performance, the small footprint, the low power consumption, the IOT maturity, other features and benefits.

In 2010, Sequans expects its silicon to be inside new WiMAX CPE and mobile devices, to be sold by many different WiMAX network operators. Those operators include: UQ Communications (Japan), Packet 1 (Malaysia), Yota and Scartel (Russia), Axtel (Mexico), Unwired (Australia), Korea Telecom (South Korea), Globe (Philippines), Clearwire and its MVNO partner companies (e.g. Sprint, Comcast, and TW). Let’s look at a few of the new WiMAX end point products expected next year.

**Multi-function WiMAX CPE**

Consider that most WiMAX deployments today are for fixed broadband access—effectively a DSL or cable modem replacement. The SQN 1220 can be exploited in **WiMAX CPE** for that application, which includes VoIP as well as a WiMAX modem with a USB or Ethernet interface to a desktop or notebook PC. Up until now, VoIP over WiMAX required multiple boxes and cables. With VoIP integrated into WiMAX CPE there is only one box you plug your phone and PC into.

Craig Miller, Sequans Business Development and Marketing Manager, says that there are “about a half dozen” customers working on this type of WiMAX CPE for 2010 commercial availability. Some of those products are currently being tested in certification labs at the WiMAX Forum and network operators, according to Mr. Miller. Sequans says their SQN1220 solution enables the WiMAX industry’s lowest cost WiMAX CPE.

Sequans has partnered with Hellosoft to provide a very compact and cost effective VOIP/ WiMAX capability for CPE. They have integrated the Hellosoft’s VOIP media engine into the SQN1220. According to Craig Miller, “It’s a proven set of high quality voice codecs available to customers developing VoIP CPE, and it is available as part of our development license – customers do not need to negotiate a separate license with Hellosoft. Our integration effort means that customers have less software integration and test effort to perform on their own. This should reduce their time to market and their development costs. And, since these codecs execute on the embedded application processor in the SQN1220, the VoIP solution is extremely low cost.”

Sequans CEO Georges Karam: “With Hellosoft’s VOIP media engine solution, we are reducing complexity for our customers by offering a pre-integrated, pre-validated VoIP and Mobile WiMAX total solution. Adding Hellosoft’s widely accepted and high quality voice capability to our already highly integrated chip underscores our commitment to providing the highest performance at the lowest cost, and to moving WiMAX toward mass market acceptance.”
Opinion: While Vonage offers a VoIP service over any broadband connection, it would be more attractive if the WiMAX network operator offered VoIP over (fixed) WiMAX service. We understand that Clearwire offers such a VoIP over (fixed) WiMAX service in all of the nation-wide markets that are deploying. We believe that VoIP will have huge growth outside the U.S. and that VoIP over WiMAX will be a very viable service if the CPE and the tariff are reasonably priced.

4G Personal WiFi Hot Spots

Best exemplified by Clearwire’s Clearspot (made by Cradle Point), a 4G personal hot spot is a battery powered WiFi AP/Router that fits in a briefcase. You can connect your notebook PC, iPOD touch, iPhone (or other WiFi equipped smart phone), and other WiFi enabled gadgets to this portable hot spot, as long as they are within 15 to 20 meters away.

Cisco has announced its intention to make such a unit this year. Sprint sells a MiFi hot spot that connects to its 3G-EVDO based network.

Currently, 4G personal hotspots use a USB connection to connect to an external WiMAX modem (AKA as a USB dongle or WiMAX dongle). But in 2010 we expect to see the WiMAX modem functionality integrated into the hotspot. Mr. Miller states, “Sequans has several customers developing integrated WiFi/WiMAX portable hot spots.” We think this is a great idea – for both portable and in-home use.

Smart Phones with embedded WiMAX

To date, the only commercially available WiMAX mobile phone we are aware of is an HTC device sold by Yota in Russia. That device uses an earlier generation of Sequans silicon (the SQN 1130). While no other WiMAX equipped smart phones have been announced, we believe that HTC and Samsung will introduce such devices in 2010. Sequans says that they have a couple of customers developing smart phones with their new generation of WiMAX chips. Obviously, they can’t disclose names or timeframes.

Opinion: This author independently concludes that the HTC phone will use the SQN 1210. We have tried to confirm this with HTC but were told that they don’t comment on unannounced products. We think the Sprint tri-mode phone scheduled for next year will be from Samsung, as that company already has produced the Mondi MID that works on CLEAR. Furthermore, we think that the mobile WiMAX enabled phones will use either GSM or CDMA for voice, rather than VoIP over WiMAX. This is because there are several problems with mobile VoIP, including QOS guarantees and handover/interworking with cellular voice and the PSTN (or other TDM based voice networks).

Summary

Sequans believes they’re leading the WiMAX industry in the direction of ‘mass market’ status, in the same way as WiFi ramped up when highly integrated components made low cost devices and embedded interfaces ubiquitous. The SQN1200 family is so highly integrated that it has the potential to remove cost as a barrier to growth and adoption by device manufacturers. This capability is perfectly timed now that WiMAX network operators are finally showing signs of the kind of broad coverage that could represent a very significant market opportunity for the device manufacturers. Sequans’ Craig Miller, “We believe that mass market WiMAX can be a real phenomenon now – all the pieces are in place.” And we can’t disagree.

We can only hope that WiMAX operators and device makers know how to exploit that technology to build a healthy business model and move mobile WiMAX forward toward mass-market status.

Dr. Alan Weissberger is a renowned researcher in the telecommunications field. Having consulted for telcos, equipment manufacturers, semiconductor companies, large end users (the EC), venture capitalists, and market research firms, it is good to have his critical eye examining new technologies. Alan J Weissberger specializes in telecommunications standards and their implementation and is a popular contributor for WiMax.com & WiMAX360.com.

Sequans Communications is the industry leader in fixed and mobile WiMAX semiconductor solutions based on IEEE standards, delivering unrivaled performance in coverage, capacity, functionality and power consumption.

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Voice to the Max:
Why VoIP is the Winning Application

Scott Bell
Alianza

In Aesop's fable, “The Tortoise and the Hare,” the hare comes upon a slow moving tortoise and mocks the tortoise for his lack of speed. In response, the slow-moving tortoise challenges the hare to a race. The hare soon leaves the tortoise far behind and, confident of winning, he decides to take a nap midway through the course. When he awakes, however, he finds that his competitor, crawling slowly but steadily, has already won the race. Much like Aesop’s fable, WiMAX operators are running a race in which, if they execute the wrong strategy, it may cost them the prize.

Like the hare, many operators are feeling a false sense of confidence by offering only data (single play) with hopes of penetrating the market quickly. The biggest risk to WiMAX operators who are only offering data is that they are allowing the “phone company” to maintain a relationship with the newly acquired broadband customer. With their foot still in the customer’s door, the competition is more likely to succeed in winning back the data services from the customer in the future.

It is absolutely true that deploying voice over WiMAX is not the fastest strategy. It increases operational processes and support burden, and it can also slow down the sales process. In addition, if the data network has weaknesses, a voice service will magnify those weaknesses. But if executed properly, investing the initial time and effort required to offer customers a quality bundled package of data+voice will force the operator’s biggest competitor out of the account. At the end of the race, the winning operators will be those that have the most loyal, and highest revenue producing customer bases.

While most operators focus on the broader residential voice market, there are other opportunities within the same coverage area that can provide higher ARPU, but they each have very different needs. For example, despite the fact that the typical margin for an enterprise (SIP trunk) is lower than either residential or SMB offerings, enterprise offerings are simpler to support. And, looking to the future, enterprise offerings position the service provider to up-sell customers to the latest hardware options. As antiquated hardware needs replacing, customers are looking for solutions from their current SIP trunk provider.

Because the SMB sector is relatively under-served by local telephone companies, the opportunity for expansion and the promise of reliable revenue streams can be significant. With this opportunity, however, come certain challenges. SMB voice offerings are not a “one size fits all” shoe. SMB’s demand a specialized feature set. Although there is considerable implementation effort to bring voice into the SMB arena, the return on network assets is considerably more than compared with that of residential services.

“Bundle and Save” is the rage in the residential sector. But the presentation of a bundling option for SMB’s and enterprise segments can be equally compelling. Bundling helps SMB’s and enterprise customers that are trying to cut costs increase efficiencies, and reduce the number of vendors to manage.

The chart below outlines the high level differences in the three main market segments.

### Voice Services - Market Segment Comparison

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<th>Residential VoIP Service</th>
<th>SMB Hosted PBX</th>
<th>Enterprise SIP Trunks</th>
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### Summary

Although WiMAX operators see immediate, short-term results by offering only data; in the long run this approach will turn out to be a stumbling block. To avoid ‘falling asleep’ during the race, it is imperative that operators execute a double-play strategy. Offering data+voice today requires a long-term perspective from management, but the long term dividends will more than make up for the short-term investment.

Scott Bell is CTO & Co-Founder of Alianza. Scott is the chairman of the VoIP Task Force of the WiMAX Forum™. He was recognized as one of the “Top 40 Entrepreneurs Under 40” by Utah Valley Magazine & in 2008 was named CTO of the Year by the Utah Technology Council. He has assembled a strong team that has successfully developed cutting-edge, enhanced telecom products utilizing IP telephony technology.
GETTING CONNECTED
WiMAX Devices Current Outlook

Paul Kaputska
Sidecut Reports

Greater personal productivity and expanded workgroup access were the hallmarks of the major new additions to the WiMAX end-user device market over the summer of 2009, while expanded availability and improvements to existing device types also increased the end-user connectivity options for users of WiMAX wireless services.

The formal debut of the Samsung "Mondi" mobile Internet device in late July ushered in a long-predicted era of handheld computing and communication devices in a small form factor that are designed to increase portability, while offering a bigger screen, wider keyboard and more processing power than the so-called "smartphones.” Samsung's Mondi, available for the Clearwire WiMAX networks in the U.S. as of Aug. 1, 2009, offers a 4.3-inch touchscreen and a slide-out keyboard, allowing for a wide range of application uses.

Priced at $449.99 and available directly from Samsung or from the Clear.com website, the Mondi uses the Windows Mobile operating system, and includes Outlook Mobile email to help users stay connected to their office email systems. The device also has Wi-Fi connectivity, as well as a 3.0 Megapixel camera/camcorder. Built-in GPS support makes the Mondi a good device for mobile professionals looking for a light yet powerful all-in-one computing tool to get real work done while on the move.

For business groups of more than one person, Sprint this summer announced two new versions of the mobile WiMAX/Wi-Fi router, with an added twist -- by using the Sprint hybrid 3G/4G USB card as the back-end connectivity, Sprint now supports the speed of 4G WiMAX where it is available, while also giving users connectivity to Sprint's 3G cellular network everywhere else.

The smaller of Sprint's mobile router offerings is called the Sprint Personal Hotspot PHS300S, and is available from Sprint in WiMAX-enabled markets for $159.99. Like the Clear Spot router sold earlier by Clearwire, the PHS300S is manufactured by mobile-router specialist Cradlepoint, and is about the size of a deck of playing cards. After connecting to a Clear network by plugging a standard WiMAX dongle (or the Sprint hybrid USB device) into the router's USB port, the router then becomes a mobile "hot spot," able to provide Wi-Fi connectivity up to Wi-Fi enabled devices in its vicinity.

The Sprint version supports four simultaneous Wi-Fi connections, making it a good choice for small workgroups or impromptu study or gaming sessions. (The price does not include the WiMAX USB modem or WiMAX service plan necessary for the back-end connection.)

For larger workgroups, Sprint introduced the CradlePoint MBR1000 Broadband Router, priced at $249.99. While not as portable as the smaller unit, the MBR1000 offers support for up to 32 simultaneous Wi-Fi connections from one 4G or 3G connection. The device also supports load balancing as well as wired-networking fallback, making it an excellent choice for small-office situations.

Mobile WiMAX/Wi-Fi routers were starting to emerge in markets outside the U.S. as well, with the introduction of the Yota Egg for the Russian provider's WiMAX services in Moscow and St. Petersburg. About the size of the Clear Spot router (albeit with rounded edges and a white finish), the Yota Egg works in a similar fashion, though it does not require a separate WiMAX antenna since WiMAX connectivity is already built in.

In terms of improving availability of already launched devices, the hybrid 3G/4G device, first offered by Sprint in the Clearwire Portland, Ore., market, is now also available directly from Clearwire itself, as well as from Clearwire reseller Comcast, allowing users to add the flexibility of 3G and 4G connectivity without having to sign separate contracts with Sprint, Clearwire or other service resellers.

Motorola, which shipped its 1 millionth WiMAX end-user device during the summer of 2009, also announced improvements to its flagship WiMAX desktop and USB end-user devices, improving the antennas to provide better reception and coverage. According to Motorola, its CPEi 725 desktop modem and its USBw 200 USB dongle both have two antennas, and will “automatically transmit on the antenna that is receiving the stronger signal, providing subscribers with a better connection to the network while allowing operators to reduce base station infrastructure requirements.” The new modems are expected out by the end of Q4 2009, Motorola said.

As editor, publisher and CEO of Sidecut Reports, Paul Kaputska continues a career trying to make literal sense out of complex computer and networking-related subject matter, a quest that began in earnest in 1991 when he joined Unix Today! as a networking beat reporter.
According to statistics of the WiMAX Forum, there were a total of 523 WiMAX networks in 147 countries around the world by the end of 2009. In 2009, 115 new networks were added, representing a growth rate of 28.2% and highlighting the aggressive network deployment of global WiMAX carriers in 2009. Africa had the highest number of networks, accounting for 21.4% of the total. The Asia-Pacific region led the world in terms of network coverage, with 205 million people covered by WiMAX networks.

According to statistics of MIC (Market Intelligence & Consulting Institute), the number of worldwide WiMAX users reached approximately six million at the end of 2009. The WiMAX Forum has set a target of 130 million worldwide users by 2013; if this target is to be achieved, annual growth will have to reach 100% to 120%. Therefore, it is expected that the number of worldwide WiMAX users could reach 12 to 13 million in 2010.

Worldwide WiMAX CPE shipment volume (including: indoor CPE, outdoor CPE, USB dongle, WiMAX module) reached 5.02 million units in 2009, and shipment value reached US$437.3 million. Taiwanese manufacturers accounted for 55% of worldwide WiMAX CPE shipment volume, highlighting Taiwan’s importance in the global WiMAX industry.

2009: A year of maturity for WiMAX manufacturers

With the help of relevant government policies, Taiwan has already established a mature WiMAX ecosystem, including component suppliers such as chipmakers, base station equipment manufacturers, testing companies, system integrators, and CPE manufacturers. Taiwan has become the most competitive WiMAX nation in the world.

After the global economy started to recover, Taiwanese WiMAX CPE shipment started to increase significantly in the second half of 2009. Full-year shipment volume of Taiwanese manufacturers exceeded 2.7 million units in 2009, representing 201.6% annual growth. Taiwanese manufacturers’ shipment value reached US$240.5 million.

Key issues in 2010

- **802.16m (WiMAX 2) Standard Expected to Be Finalized in Mid-2010**
  In October 2009, Samsung cooperated with Russian carriers for the first investment in 802.16m standard testing. Samsung has been the most aggressive company in this area. The US carrier Clearwire has stated that it will test 802.16m-related equipment in 2011, and that it will only begin large-scale commercial deployment in 2012. The IEEE stated in January 2010 that the 802.16m standard (also known as WiMAX 2.0) is expected to be officially finalized in mid-2010. Taiwanese WiMAX manufacturers will be aggressive in terms of 802.16m development in order to take advantage of 4G market opportunities.

- **CPE Products Expected to Be Sold through Retail Channels in 2010**
  In order to accelerate WiMAX penetration, the WiMAX Forum has started to draft relevant standards, in order to enable CPE used by carriers to be sold through retail channels after passing WFDCL certification. In this way, Taiwanese equipment manufacturers will not have to go through branded vendors or system integrators in the future, and will be able to directly ship their products to retail channels. Developments in this area will be closely watched in 2010.

- **WiMAX Equipment Manufacturers to Cooperate Closely with Partners**
  Currently, many large-sized carriers/system integrators are aggressively duplicating existing networks.
Taiwan WiMAX Manufacturers, Opportunities in 2010

• Chinese and Korean Manufacturers to Make Aggressive Push in WiMAX CPE Market

  Samsung outsources relatively few products to Taiwanese manufacturers. Huawei and ZTE have their own factories manufacturing WiMAX CPE; currently, only orders featuring high technology levels or small-volume orders that do not generate significant production efficiency are outsourced to Taiwanese manufacturers. Taiwanese manufacturers’ ability to increase their market share in the future will depend on whether there will be changes in the cooperation strategies of different companies.

• Taiwanese Manufacturers to Aggressively Enter the Base Station Market to Generate New Growth Momentum

  Currently, Taiwan does not yet have its own R&D capabilities for macro/micro base stations. The country only has R&D capabilities for pico base station R&D. With the support of the M-Taiwan project, Taiwanese companies have already achieved a high level of pico base station R&D. It is expected that the cooperation between Taiwanese pico base station companies and domestic Taiwanese carriers will deepen in 2010. Furthermore, after accumulating significant experience in IOT, companies will be able to sell base station equipment to small-sized overseas carriers.

Key Development Areas for 2010

Regarding emerging markets, India is currently a closely watched market. The Indian government has announced that it will start spectrum auctions at the end of February. Besides the well-known domestic carriers BSNL and MTNL, which have already obtained spectrum, Tata is also gradually releasing orders for WiMAX equipment, and Taiwanese manufacturers have already obtained some of these orders. In 2010, India is expected to launch WiMAX services. The industry will closely monitor whether user growth meets expectations. Other regions, such as other South Asian countries, Brazil, Indonesia, and Eastern Europe, will also be key shipment destinations for Taiwanese manufacturers. An important factor for the future shipments of Taiwanese manufacturers will be whether they will be able to expand cooperation with carriers and system integrators in these regions.

New application services are expected to be launched in mature markets, stimulating demand for equipment such as WiMAX mobile phones, PNDs, and e-books. For example, currently there are indications that the Taiwanese Smartphone vendor HTC will supply a Smartphone, codenamed A9292, to Sprint. Shipment levels of this model are expected to greatly exceed the shipments of a model the company supplied to Yota in 2009. The growth potential for WiMAX equipment in mature markets is thus very significant.

Other key WiMAX application services include smart grid, surveillance, location-based service, VoIP etc. These services take advantage of the large spectrum of WiMAX technology and its mobile features. These will be key areas in the WiMAX market in 2010.
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**Carrier and Service Providers,**
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WiMax.com asks industry thought-leaders to describe their position in the global 4G & WiMAX marketplace & offer insight on the strategic value add they provide to customers & prospects when introducing new solutions & revenue-generating services.

WiMax.com ▪ The WiMAX Guide ▪ 2010 edition

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**Company Background**

Phazar Antenna Corp. is a division of Antenna Products Corp. that focuses on commercial wireless antenna systems for use by 700 MHz, Cellular, AWS and PCS wireless service providers, wireless Internet and broadband communication system suppliers and other wireless applications. Phazar Antenna Corp. offers a broad line of antennas covering 144 MHz to 6 GHz in omni-directional (single and dual band) and directional antennas in sector, panel, waveguide and horn configurations. Distributed Antenna System (DAS) antennas have been developed to address coverage problems in metropolitan and urban areas that wireless carriers require for future advanced services.

**PCTEL’s Primary WiMAX Solutions**

The MSPDDBI244914NF sector panel antenna provides coverage of 2.4 GHz to 2.5 GHz and 4.9 GHz to 5.9 GHz frequencies in a single antenna housing.

The WISP4959018BMV sector panel antennas cover frequencies of 4.9-6.0 GHz and are designed for use in sectorized WISP applications using a single sector or multiple sector antennas and multiple radios. It offers a choice of 45°, 60°, 90° or 120° single beam-width sector. Multiple antennas can be utilized to cover several geographical sectors using additional radios. Great for use in place of an obstructed wall mounted omni.

The SP2327-17XPAB is designed to cover frequencies from 2300 to 2700 MHz with a VSWR of less than 1.5. Port-to-port isolation of typically > 25 dB. This panel provides field adjustable azimuth beamwidth of 60, 90 & 120.

The MMO24580608 base antenna provides coverage of 2.4-2.48 and 5.15-5.85 GHz frequencies and is housed in a rugged U.V. stable, plastic radome with an aluminum base. This antenna is ideal for indoor or outdoor applications.

**Phazar Antenna Corporation**

**Company Background**

Phazar Antenna Corp. has developed several new product lines of high performance base station antennas that enhance the performance of the latest WiMAX and WiFi broadband infrastructure and backhaul systems for both Fixed wireless and Mobile wireless applications. The new product lines offer high gain performance with superior null-fill beam-forming features that improve the coverage under the antenna horizon for base station sites.

**Phazar’s Primary WiMAX Solutions**

The antennas cover the entire 2.3 to 2.7 GHz frequency range, which allows the antenna to be used for either WCS/WiBro (2.3 to 2.4 GHz), WiFi (2.4 to 2.5 GHz) or BR/IMDS (2.5 to 2.7 GHz) systems. Antennas can be supplied in 65, 90 or 120 degree horizontal beam-widths with 5.5 or 7.5 degree vertical beam-widths, offering various gains and system coverage. Cross-Polarization is > 24 dB and null-fill is > 20 dB.

We have also developed new product ranges covering 2.0 to 2.3 GHz, 3.3 to 3.8 GHz and 5.125 to 5.850 GHz with the same high gain, null-fill performance in 65, 90 and 120 degree beam-widths. Omni-Directional, Dual Polarized and Omni-Directional antennas can also be offered for MIMO requirements or DAS (Distributed Antenna Systems) applications.

Our parent company, Antenna Products Corp. also offers self-healing, low latency Mesh Networking radios for 700 MHz, 2.3 GHz, 2.4 GHz, 3.5 GHz, 4.9 GHz and 5.8 GHz systems.

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Aradial Technologies provides top performance AAA Servers and OSS/BSS solutions for WiMAX, Internet Service Providers, VOIP and Mobile operators.

Aradial's AAA/RADIUS and billing solutions are servicing ISPs since 1997. Hi-Capacity Providers with millions of subscribers and Small providers can easily integrate Aradial Solutions into their IT and Network infrastructures. Aradial Solutions enable service providers to effectively compete in deploying next Generation solutions and services while supporting existing infrastructure and legacy systems. Using policy algorithms, Aradial can implement rule-based authentication giving a complete manageability of network resources. Aradial Technologies customers and partners include some of the world's largest corporations, institutions, telecommunications carriers, billing companies and internet service providers (ISPs).

Aradial solutions are deployed by carriers globally for converged services including ISP, WISP, Hotspot, Municipal Hotzones, Mobile, IPTV, VOIP retail and wholesale.

- Advanced user management for subscribers & prepaid cards management.
- Self ordering and provisioning (Activation and Hotlining).
- Packet Of Disconnect (PoD) and Change of Authorization (CoA).
- Redirection to activation portal at zero balance and purchasing plans through Spotngo portal.
- Multiple resources - allows the user to have multiple user ids on the same account (e.g. Multiple phone numbers, data services usernames, connected to the same account).
- Integration with external billing systems - Advanced APIs for external billing integration both for real-time events and provisioning.

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ZDA Communications

Aradial Technologies

Company Background

Aradial Technologies provides top performance AAA Servers and OSS/BSS solutions for WiMax, Internet Service Providers, VOIP and Mobile operators.

Aradial’s AAA/RADIUS and billing Solutions are servicing ISPs since 1997. Hi-Capacity Providers with millions of subscribers and Small providers can easily integrate Aradial Solutions into their IT and Network infrastructures. Aradial Solutions enable service providers to effectively compete in deploying next Generation solutions and services while supporting existing infrastructure and legacy systems. Using policy algorithms, Aradial can implement rule-based authentication giving a complete manageability of network resources. Aradial Technologies customers and partners include some of the world's largest corporations, institutions, telecommunications carriers, billing companies and internet service providers (ISPs).

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ZDA Communications

Company Background

ZDA Communications, located in Columbia, SC, specializes in the engineering and manufacturing of wireless communication antennas, cable assemblies, passive components, and other fine products.

Our extensive range of antennas, within the 144 MHz to 6 GHz spectrum, includes: Flat Panel, Sector, Omni-directional (single or dual band), Yagi (include multi-band), Mobile, Rubber Duck Antennas. The Broadband and Ultra Wide Band Antennas are ideal for the Wireless, Security, and Civil markets. Our standard antennas can be used for applications including: WiMAX, WLAN; Wi-Fi, Cellular, PCS, RFID, WISP, In-building-wireless coverage, Surveillance and Telemetry applications. Our client base includes WISPs, hotspot providers, in-building wireless coverage installers, WiMax integrators or operators, primarily in the U.S. and Canada. We provide full service sales, engineering, technical support and logistics for our key customers.

Continuing roll out of new products with advanced technologies, and a dedication to expanding our existing range of antennas and of designing custom made solutions ensure ZDA Communications US LLC continue to provide high quality, cost effective antennas of outstanding performance.

ZDA's Primary WiMAX Solutions

Specifically, for WiMAX applications, we have developed new product ranges covering, 700 MHZ both upper and lower band, 2.0 to 2.3 GHz, 3.3 to 3.8 GHz and 5.125 to 5.850 Yagi, omni and sector antennas, other antennas include sector and panel antennas can also be chosen. The added value is that we are extremely competitively priced as well as a 2 year warranty.

Please visit our website at http://www.zdacomm.com/ to know more about us and our other products.

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Company Background

FTS (LSE: FTS) is a leading provider of billing, customer care, CRM and policy control solutions for communication and content service providers. By analyzing events from a business standpoint rather than just billing them, FTS allows providers to better understand their customer base and leverage business value from every event and interaction. FTS deploys its full range of end-to-end, stand-alone and add-on solutions to customers in over 40 countries and has implemented solutions in wireless, WiMAX, wireline, cable, content and broadband markets including multiple cross-network installations.

FTS’ Primary WiMAX Solutions

FTS offers its FTS express™ for WiMAX – an extremely flexible billing appliance that can be adapted to the needs of every WiMAX operator, at a fraction of the cost of fully-fledged solutions. The appliance is designed for WiMAX infrastructure providers, resellers and systems integrators to quickly and easily solve WiMAX service providers’ back-office requirements.

FTS express for WiMAX is FTS’ field-proven, scalable and agile billing and customer care product wrapped into a small appliance. An all-in-one solution for online charging, billing and invoicing, AAA, balance management, customer management, voucher management, calling cards, policy control and an advanced integration with ASN gateways, FTS express offers unparalleled advantages:

- Affordable
- Flexible, easily configurable by each customer - no vendor intervention required
- Field upgradeable to a full-fledged, customized, billing & customer care solution
- Easy to deploy and maintain
- 50,000 subscribers ready with basic hardware configuration
- Grows as needs & demands change with expandable business & rating rules

Setup is simple, with an easy UI setup for localization (taxes, currency), rating plans and business rules. The solution requires minimal set-up for full operational mode, yet is fully expandable and scalable so it can grow with the service provider’s future needs and growth. Understanding that flexibility and scalability are key, FTS released FTS express in three packages: convergent prepaid/postpaid data; convergent prepaid/postpaid data and VoIP; and an advanced service provider package. Packages are incremental and extremely cost effective. Operators and service providers can start small with core modules for basic operation, and grow with additional components to an advanced IP implementation as their business grows.

FTS serves customers in developed and emerging markets with installations in the Americas, Asia-Pacific, Europe, Middle East and Africa.

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ARCchart Ltd.

Company Background

ARCchart is an independent research and consulting firm focusing on all aspects of the wireless communications sector. Based in London, ARCchart’s depth and breadth of analysis provides a global perspective on wireless technology and industry developments.

Combining original thinking with exceptional knowledge and experience, ARCchart assists clients in making sound commercial decisions about technologies, market strategies and competitive positions. With strong roots in the tracking of M&A activity across the communications space, ARCchart’s strategic advice covers all aspects of the wireless value chain – ranging from semiconductors and WLANs to network operators, handsets and mobile applications. ARCchart is an affiliate of London-based investment bank ARC Associates.

Global WiMAX Landscape Wallchart

ARCchart publishes the respected industry Global WiMAX Landscape wallchart. The chart covers over 200 WiMAX operators around the world and examines the spectrum employed, service launch dates and equipment vendors used. For more details on the wallchart, visit: http://www.arcchart.com/wallcharts/wimax.asp

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Company Background

Maravedis is a leading research and analysis firm focusing on broadband wireless technologies including WiMAX, LTE and other broadband wireless technologies and markets. Maravedis has established itself over the years as the most credible and reliable resource for market intelligence in the broadband wireless industry. Maravedis works with equipment vendors, service providers, regulators and the investment community to produce a sound market analysis based on hard primary data and an in-depth understanding of technology, market and regulation trends.

Maravedis has been covering the broadband wireless industry longer than any of its competitors. As a research pioneer in BWA, Maravedis has developed a unique knowledge of regulation, markets and technology worldwide. As a result, we produce highly sophisticated research and market forecasts based on hard data.

Maravedis’ Primary WiMAX Solutions

From WiMAX to LTE and emerging technologies, we offer more than just numbers. Maravedis develops and publishes quality reports and provides consulting services that are delivered into informed and rational opinions thanks to its renowned in-depth expertise of wireless technologies, regulations and market trends.

Maravedis helps you make strategic decisions that have direct effect on your revenue. Therefore, our extended service offering includes a custom consulting practice to meet your very specific research needs. Past successful mandates range from the analysis of CPE characteristics sought by carriers to the potential market of new power amplifier solutions for WiMAX base stations. More

4GCounts is a unique web-based service that tracks 4G operator deployments and provides detailed information on the worldwide 4G ecosystem. 4GCounts currently profiles over 200 operators across 92 countries.

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Rethink Technology Research

Company Background

Rethink Technology Research is a thought leader in quadruple play and emerging wireless technologies. It publishes weekly research notes, market forecasts, in-depth research papers and provide consulting under two service brands, Wireless Watch and Faultline.

The former focuses on every aspect of the wireless and mobile industry, in particular emerging standards and technologies, and how they support operator business models and vendor strategies. The latter analyzes the transition from analog to digital media, and the revolution in content delivery this has created. In particular, it provides research and consulting in triple and quad play models, broadband digital media and mobile TV.

Rethink Technology also collaborates with ArcChart to produce the daily online newsletter and web site, Rethink Wireless, which provides daily insights into the latest developments in the mobile and wireless markets.

Since its formation in 2002 Rethink has conducted consulting assignments for many of the largest technology companies in the world, as well as some of the newest and freshest start-ups. Clients include service providers, vendors and financial institutions all round the world.

Rethink’s Primary WiMAX Solutions

Rethink has been covering the WiMAX market in-depth since 2002, almost since the sector was born, and has become a well known name in providing news, research, forecasts, seminars and consulting to WiMAX operators, suppliers and investors. It has a unique database of over 400 service providers that are using or trialling WiMAX, which provides unparalleled intelligence about the business models that the technology supports.

In its published reports and customized consulting and research, Rethink focuses on WiMAX business cases, technology trends, pricing and puts the technology in the context of mobile broadband and quad play as a whole. It assesses WiMAX on a daily basis, as a market in its own right and in relation to other technologies like LTE, HSPA, Wi-Fi, CDMA2000 and wireline broadband.

As well as dedicated reports, Rethink produces the WiMAX Directions weekly research note on a key issue for the market, and its weekly analyst paper Wireless Watch also contains a special WiMAX section in every issue. Rethink’s research director and lead WiMAX/4G analyst, Caroline Gabriel, is also a contributor to publications like WiMAX Trends and a frequent speaker at 4G and broadband wireless conferences.

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Sidecut Reports

Company Background

Sidecut Reports, an independent editorial research firm, provides business professionals with deep background, up-to-the minute information, and decision-making analysis on pertinent topics that goes far beyond blogs at a price far less than that charged by traditional analyst operations. Led by longtime industry journalist Paul Kapustka, Sidecut Reports provides in-depth looks into topics at the intersection of telecommunications, the Internet and public policy.

“Sidecut Reports is designed to provide the in-depth coverage blogs don’t have the time for, at a price far less than traditional ‘industry analyst’ reports, which can costs thousands of dollars each,” said Kapustka, who was managing editor at the GigaOM blog network before starting Sidecut Reports in 2007.

Kapustka, who has covered networking and Internet industry topics since 1991, has held top editorial positions at a wide range of industry publications, including CMP Media’s Advanced IP Pipeline and Networking Pipeline websites, InformationWeek, InternetWeek, Communications Week, Light Reading, the (old) Red Herring, and Open Systems Today!

Sidecut’s Primary WiMAX Solutions

Sidecut Report’s CLEARWIRE NTK Reports - now available for purchase from the Sidecut Reports website is the October 2009 installment of our “Clearwire Need to Know”, or Clearwire NTK Research Series.

The NTK Series provides quarterly updates on all things related to Clearwire Corp’s nascent WiMAX services, including market launches, pricing schemes, WiMAX device availability and recent business deals from the company building a nationwide WiMAX network.

The Clearwire NTK reports are designed to give anyone interested in Clearwire the most thorough and up-to-date package of news, analysis and short-term outlooks available, in a format designed for easy reading. Much more comprehensive than short blog posts — and much more timely and economic than thousand-dollar traditional analyst reports — our Clearwire NTK reports are “right-sized research” for busy professionals who want to stay as current as possible on all things Clearwire. If you are interested in Clearwire, here is everything you NEED TO KNOW.

All NTK reports will be priced at just $4.95 — that’s no typo, but yes, Four dollars and ninety-five cents. So for less than the price of a beer at a Sprint Nextel NASCAR race, anyone interested in Clearwire — from investors to partners to resellers, competitors and most importantly, end users — can have the right information you need, right now, at the right price.

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Yankee Group

Company Background

The people of Yankee Group are the global connectivity experts—the leading source of insight and counsel trusted by builders, operators and users of connectivity solutions for nearly 40 years. We are uniquely focused on the evolution of Anywhere connectivity, and chart the pace of technology change and its effect on networks, consumers and enterprises.

Headquartered in Boston, Yankee Group has a global presence, including operations in Europe, the Middle East, Africa, Latin America and Asia-Pacific.

Visit www.yankeegroup.com to learn more.

Yankee Group’s Primary Solutions

Link Research forms the core of Yankee Group’s offerings, with qualitative analysis focused exclusively on the transformational effects of the connectivity revolution.

Link Data underpins Yankee Group’s research initiatives, delivering an unmatched database of global quantitative knowledge through Market Adoption Monitors and Forecast and Attitude and Behavior Surveys.

Link Interaction connects clients directly with Yankee Group analysts to get data, information or advice.

Link Consulting provides a custom, tailored experience using Yankee Group’s unique expertise.

Link Events, both live conferences and online webinars, offer attendees new insight, knowledge and expertise to better understand and overcome the obstacles to success in the Anywhere revolution.

Register as a guest to receive free access to select Yankee Group reports and data.

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Hutton Communications

Company Background

Hutton Communications, Inc. headquartered in Dallas Texas, is a distributor of commercial wireless communications and related equipment all throughout the United States and Canada. Hutton serves cellular and radio communications dealers, wireless communications carriers and self-maintained end users of communications systems. In addition, Hutton provides its customers with power systems solutions for emergency backup, alternative energy sources, or out-of-grid power requirements.

Hutton Communications, Inc adds value to the supply chain by providing specialized services such as

* Site Kitting
* Inventory Logistics Support
* Just In Time Delivery
* Cable Processing

Hutton’s Primary WiMAX Solutions

Hutton Communications works with many of the leading equipment vendors to support backhaul of WiMAX. WiMAX is creating a need for higher capacity, higher reliability backhaul solutions. Our lines of licensed and unlicensed Point – to - Point products meet this need perfectly. Product lines such as BridgeWave, Ceragon, Drag-onWave, Exalt, Motorola, Nera, RADWIN and more; provide the IP centric bandwidth that WiMAX installations need.

Slightly Different than the Usual Heard

With multiple sales and warehouse facilities, Hutton provides local sales support and fast delivery to your location. Hutton stocks the products you need for immediate shipment and fast, economical delivery. In addition to wireless bridges and antennas, you can order cables, towers, backhaul for WiMAX solutions, and thousands of other wireless communications products. Let Hutton be your wireless system supplier.

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TESSCO Technologies

Company Background

In the more than 25 years since TESSCO Technologies Incorporated (Nasdaq: TESS) was founded, the Company has proven its position as the vital link to wireless world®, as well as an industry leader in an ever-evolving global wireless marketplace. Today, TESSCO is helping to build the world’s wireless future by serving as a value-added provider of the critical solutions, products, services and training needed to design, build, run, maintain, and use everything wireless.

TESSCO’s Primary WiMAX Solutions

At the forefront of an increasingly competitive industry, the experts at TESSCO effectively offer the products, pricing and knowledge that give service providers and value-added resellers a competitive edge in system performance and cost. By offering more than 30,000 products from 300 world-class brands, we help you to expand your capabilities, and build profits. TESSCO’s experience and broad portfolio allow for custom tailored solutions, to almost any wireless network application. When you do business with TESSCO, you can rely on us to deliver what you need to succeed:

• The latest product & service solutions to get wireless right the first time
• Immediate availability of the largest selection of wireless networking solutions
• Leading wireless broadband and WLAN products and services covering the full range of applications, including the latest in wireless technology for ensuring the deployment of last-mile (including WiMax), middle-mile or backhaul networks.
• Latest solutions for remote monitoring and video surveillance, including the products and know-how you need to install, maintain, sell and support video surveillance.
• World-class knowledge to help you make the right wireless decisions, and comprehensive, hands-on sales & technical training customized to your specific requirements.

• The Wireless Bulletin for Security and Surveillance – a first-of-its-kind resource that allows you to design and deploy security and surveillance systems that meet the most stringent customer requirements.

To learn our extensive portfolio of solutions, visit us today at www.tessco.com/go/broadband or speak with one of our wireless experts at 800.472.7373.

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Airspan Networks, Inc.

Company Background

Airspan is a worldwide leader in broadband wireless with over 400 customers in more than 100 countries. As a founding member of the WiMAX forum, Airspan has led the way in WiMAX, being among the first wave of companies to achieve certification for its Base Station and End User Devices.

Airspan is also leading in the race to Mobile WiMAX. All of Airspan’s base station products support Mobile WiMAX. MiMAX, Airspan’s USB based Mobile WiMAX end user device, will be the first Wave 2 compatible unit for laptops.

Airspan’s Primary WiMAX Solutions

Airspan offers one of the most comprehensive portfolios of products and solutions in the wireless industry today.

Airspan’s WiMAX product range comprises HiperMAX, MacroMAX and MicroMAX Base Stations, mobile WiMAX user devices, indoor and outdoor CPEs that also integrate Wi-Fi and VoIP technologies. In addition, we have developed VoiceMAX, a unique and powerful solution essential for carrier-class VoIP delivery.

Our products have been developed with the future in mind. Thanks to the advance technologies built into our products, we will not only be able to software upgrade our HiperMAX base stations to Mobile WiMAX but we will also be able to run Mobile and Fixed WiMAX on the same platform.

MacroMAXe is a class-leading 2nd generation Mobile WiMAX base station which has been designed and optimized for the 2.3GHz and 2.5GHz Mobile WiMAX bands. It employs the software defined radio (SDR) technology first developed for HiperMAX, together with dual radio transceivers, antennas and GPS receiver all in a highly integrated, physically small and light, all outdoor package.

Airspan’s award winning MiMAX Q-Series USB device is a quad-band MIMO USB dongle for laptops and personal computers. Now certified by the WiMAX Forum for the 2.5GHz band, MiMAX also operates in nearly every applicable WiMAX frequency from 2GHz and up to 5GHz frequencies. Certification includes thorough assessment of the features required in the WiMAX Forum 2.5 GHz profile as well as rigorous testing of multi-vendor interoperability.

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Alvarion, Ltd.

Company Background

Alvarion (NASDAQ: ALVR) is the largest WiMAX pure-player with the most extensive WiMAX customer base and over 250 commercial deployments around the globe. Committed to growing the WiMAX market, the company offers solutions for a wide range of frequency bands supporting a variety of business cases.

Alvarion is leading the market to Open WiMAX solutions with the most extensive deployments and proven product portfolio in the industry covering the full range of frequency bands, with fixed, nomadic and mobile solutions. Alvarion’s products are designed to enable the delivery of personal mobile broadband, business and residential primary broadband access, corporate VPNs, toll quality telephony, mobile base station feeding, hotspot coverage extension, community interconnection and public safety communications.

Through its OPEN™ WiMAX strategy, superior IP and OFDMA know-how, and proven ability to deploy end-to-end turnkey WiMAX projects, Alvarion is shaping the new wireless broadband experience.

Alvarion’s Primary WiMAX Solutions

Alvarion® offers a complete portfolio of carrier class, field-proven and award-winning products for fixed, nomadic and mobile wireless access for licensed and license-exempt frequencies:

• 4Motion® - Alvarion’s all-IP 4Motion solution is the foundation of the company’s OPEN WiMAX ecosystem, combining BreezeMAX and other best-of-breed systems. Designed as an open standard with high interoperability, 4Motion provides a complete ecosystem at the network level, enabling operators to be most responsive to the latest consumer electronic devices, service offerings and new industry applications.

• BreezeMAX® 802.16e Mobile WiMAX wave II certified products for licensed frequencies (2.x GHz and 3.x GHz).

• BreezeACCESS® VL and BreezeNET® B for license-exempt frequencies (900 MHz, 4.9 and 5.x GHz)

• BreezeACCESS VL SU-Video for wireless video surveillance solutions optimized for the high performance needs of the video surveillance market.

• BreezeMAX/BreezeACCESS Wi² for Wi-Fi 802.11 as a Wi-Fi mesh solution extension to the WiMAX network.

• Star management suite for efficient management and monitoring.

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Cisco

Company Background
Cisco enables people to make powerful connections—whether in business, education, philanthropy, or creativity. Cisco hardware, software, and service offerings are used to create the Internet solutions that make networks possible—providing easy access to information anywhere, at any time.

Cisco’s Primary WiMAX Solutions
Cisco Broadband Wireless Access products for Mobile WiMAX feature advanced antenna systems and support adaptive beam-forming and multiple-input multiple-output (MIMO). They allow for multi-megabit service delivery, increased coverage, and greater indoor penetration for the following benefits:

- Subscribers experience high-quality wireless services
- Service providers get fewer service calls, faster time-to-market with new services, and improved cost efficiencies

This open-standards solution is compliant with the Mobile WiMAX specification and the Profile C Network Reference Model. It includes a full suite of base stations, antenna systems, access service network gateways, management systems, and customer premises equipment. Specific Products:

- Cisco BWX 2300 Series Broadband Wireless Access System
- Cisco BWX 200 Series Modems
- Cisco BWX 300 Series Modems
- Cisco BWX Element Management System

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Axxcelera Broadband Wireless

Company Background
Axxcelera Broadband Wireless is a data networking solutions company, developing technology to deploy networks for broadband wireless communications over the Internet—from the “first leap” to the last mile. Our ExcelMAX™ and AB-MAX™ fixed broadband wireless platforms bridge the last mile, with a point-to-multipoint solution that replaces the local loop for large corporate clients, small businesses, and other organizations.

Axxcelera’s Primary WiMAX Solutions
ExcelMAX™ Access Point is a Point to Multi-point (PMP) base station product designed to operate in the 3.3-3.8 GHz spectrum and supports 3 different Duplex architectures – Full Duplex FDD (Frequency Division Duplex), Half Duplex FDD, and TDD (Time Division Duplex).

AB-MAX™ consists of fixed broadband wireless access equipment (Access Point and CPE) for Internet, data, multimedia, video, voice, and other emerging IP based applications. Combining WiMAX with higher level network features, AB-MAX provides a robust, cost-effective alternative to wired alternatives such as T1/E1, DSL and cable modems. Deployments may use frequencies from the entire U-NII 5GHz ISM and ETSI spectrum. Select from various modulation options and antenna polarizations, all in an extremely low cost, easy to deploy product.

AB-Full Access II™ and ExcelFlex™ systems allow first leap high-capacity, point-to-point wireless data transmission, across terrain impediments, for customers who want to bypass wired networks or have no wired options.

AB-Full Access II™ consists of a Software Defined Indoor Unit (SDIDU) and Outdoor Unit (ODU). The AB-Full Access II™ radios are spectrum and data rate scalable, which enables service providers to have greater flexibility in network planning and future growth. AB-Full Access II™ delivers aggregate rates up to 210Mbps within the 5.7 - 5.8 GHz U-NII/ISM bands for distances of up to 20 miles. The integrated E1/T1 and Ethernet interfaces allow for any combination of TDM and Ethernet packet data to be combined up to the maximum throughput.

The ExcelFlex™ offers volume capacity and proven performance for applications worldwide. It represents a new generation of PDH-SDH radio-relay transmission equipment for 6-38 GHz frequencies. It is ideally suited for long distance, low and medium capacity communication solutions of up to 310Mbps in full duplex (620Mbps aggregate).

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Company Background

Green Packet Solutions, part of the Green Packet Berhad group of companies, is a leading developer of Next Generation Mobile Broadband and Networking Solutions. Our mission is to provide seamless and unified platforms for the delivery of user-centric multimedia communications services regardless of the nature and availability of backbone infrastructures. Founded in San Francisco’s Silicon Valley in 2000, Green Packet Solutions has expanded its global footprint to Kuala Lumpur (Headquarters), Singapore, Shanghai, Taiwan, Australia, Bahrain and Bangkok.

Green Packet Solutions empowers Operators to improve ARPU via leading edge carrier-grade solutions and interoperability-tested WiMAX Modems. Green Packet Solutions’ products offer best-in-class performance and are of the highest quality, ensuring our customers are ALWAYS BEST CONNECTED!

Green Packet offers a full range of award-winning, high performance WiMAX Modems that are compliant with the IEEE 802.16e-2005 standard. These WiMAX Modems are field proven with over 10 live deployments and 35 trial sites globally. We have completed successful interoperability tests and hold strong alliances with major WiMAX ecosystem players including Alcatel-Lucent, ZTE, Huawei, GCT, Mediatek, Beceem and Sequans.

WiMAX Indoor Modems (D Series)

The D Series enables WiMAX Operators to deliver high-speed wireless broadband to residential and enterprise users, providing a quick and easy way to get started with WiMAX. Selected models integrate VoIP services to provide quality IP-based voice transmission and 802.11b/g high speed wireless LAN access point that enables multiple WiFi-enabled devices to enjoy wireless WiMAX connectivity anytime within the indoor perimeters.

WiMAX Outdoor Modem (O Series)

Green Packet Solutions’ O Series are designed to be used in conditions where indoor penetration is difficult, for example, thick/insulated walls or due to the presence of obstructing objects such as trees or mountains.

Additionally, this modem may be deployed for users residing at WiMAX network fringes to ensure optimum coverage.

WiMAX USB Modem (U Series)

For users who are constantly on the move, the U Series is a perfect companion, providing instant WiMAX connectivity anytime, anywhere. It comes built-in with an intelligent connection manager that converges connection management, communication services and entertainment within a single client. As such subscribers enjoy a simple, unified access to various networks and applications from one user-friendly and trendy interface.
Proxim Wireless

Company Background

Proxim Wireless Corporation (OTCQX: PRXM) is a leading provider of end-to-end broadband wireless systems that deliver the quadruple play of data, voice, video and mobility to all organizations today. We are 100 percent focused on wireless technology, and that focus enables us to provide a complete portfolio of WLAN, Wi-Fi mesh, WiMAX (point-to-multipoint), and point-to-point technologies.

Regardless of the application, our end-to-end product portfolio enables partners to custom-build the wireless solution that fits customers’ specific needs. Our broadband wireless equipment is used by enterprises, service providers, carriers, government entities, educational institutions, healthcare organizations, municipalities, and other organizations that need high-performance, secure and scalable broadband wireless solutions.

Focus Applications - Using a combination of WLAN, Wi-Fi Mesh, WiMAX and Point-to-Point backhaul technologies, Proxim enables a wide variety of fixed and mobile applications, including:
- Cellular Data, Voice & Video Backhaul
- High-performance wireless point-to-point backhaul connections for carriers and wireless ISPs
- Last-Mile Connectivity - Wi-Fi and WiMAX access for both enterprises and consumers
- Security & Surveillance - Systems including video surveillance, gunshot location and perimeter security
- Enterprise WLAN - Wireless access and building-to-building campus connectivity
- Public Safety - In-field mobile data access for public safety officers, field service technicians and other mobile field workers

Customers - Proxim’s end-to-end broadband wireless solutions & services have helped more than 235,000 customers around the world enable new applications, increase productivity, decrease expenses, gain operational flexibility & create new business opportunities. To date, Proxim has more than 1.8 mil units deployed in the field worldwide.

Proxim Wireless Products and Technology - Proxim is the only vendor that provides secure, scalable and high-performance broadband wireless systems that can be centrally managed from end-to-end.

“WiMax.com Asks” Q&A with Proxim Wireless

How is Proxim Wireless positioned in the global 4G & WiMAX marketplace?
Proxim provides the complete end-to-end 4G wireless networks that help carriers and WISPs meet the demand caused by the explosion of video over wireless networks, the need for last mile access in emerging economies and the need for rural connectivity globally as governments invest in broadband to drive development beyond metro areas.

Describe the strategic value add that Proxim Wireless provides to customers & prospects in terms of introducing new solutions & revenue generating services.
As the only vendor that provides truly end-to-end broadband wireless networks that can be managed centrally, Proxim enables much faster time to market, greater ease of use and quicker return on investment (ROI) than the wired network alternatives. With both lower up-front CAPEX and lower OPEX (achieved by eliminating recurring leased line costs, etc.) than wired networks, with Proxim carriers and WISPs can deploy broadband networks that cost less and are profitable sooner.

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Proxim International: Please visit online to find the appropriate contact.

Redline Communications

Company Overview

Redline Communications is a leading provider of advanced broadband wireless access & backhaul solutions. Redline offers a full suite of WiMAX Forum Certified solutions based on the global IEEE 802.16-2004(16d) & 802.16e-2005(16e) standards for WiMAX. The Company also offers a complete line of Broadband Wireless Infrastructure (BWI) product that delivery high capacity, long-range wireless connectivity.

Redline is at the forefront of the development & marketing of WiMAX & other advanced broadband wireless access and backhaul technologies. The company’s RedMAX™ WiMAX solutions include the world’s first complete solution to receive the WiMAX Forum Certification™ mark, as well as the RedMAX 4C family of Mobile WiMAX products.

Redline’s Primary WiMAX Solutions

Redline’s BWI products include RedCONNEX point-to-point and RedACCESS point-to-multipoint solutions that operate in a range of frequency bands and are widely used to establish broadband networks to support critical communications for the utility sector (Smart Grid, Water Metering and Conservation), oil and gas, municipal, public safety, education, military, and other industries that require robust, secure connectivity.

Each of Redline’s WiMAX and BWI solutions incorporate its industry-leading OFDM technologies, and combine unmatched capacity and non-line-of-sight capabilities with proven performance, reliability and security. Ideal for a variety of access, backhaul and private network applications, and available in multiple frequency bands, Redline products are meeting the needs of carriers, service providers and enterprises worldwide.

Redline has built a strong global presence with professional sales services teams in over 16 countries. With more than 150,000 Redline wireless broadband systems deployed by operators in over 130 countries, including more than 70 commercial, revenue-generating WiMAX networks, Redline offers the regional experience carriers need to successfully plan and implement networks that meet their unique market requirements. Redline Communications products have received acceptance and Buy American status from the U.S. Department of Agriculture Rural Utility Services (USDA-RUS).

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Company Background

Established in 1988, Vecima Networks Inc. is a world-class designer and manufacturer of broadband wired and wireless equipment. Vecima offers value and performance for WiMAX technology. Vecima's VistaMAX® family follows a portfolio of successful wired and wireless products featuring QAM modulation, OFDM, wireless DOCSIS® and advanced software for network management.

Vecima's equipment helps Telecommunications companies, Wireless Internet Service Providers, and MSOs provide premium last-mile broadband connectivity. Vecima's wireless products include base stations, subscriber stations, backhaul, and sophisticated network management tools in the 600 MHz – 5.8 GHz frequency ranges.

Vecima's Primary WiMAX Solutions

The VistaMAX® product family enables exceptional last-mile broadband connectivity using integrated single box base stations and subscriber stations as the network elements. VistaMAX®, based on the IEEE 802.16-2004 standard and WiMAX Forum™ system profiles, allows Service Providers to achieve high performance, non-line of sight wireless connectivity. VistaMAX® products are available for 1.9, 3.5, 3.65 and 5 GHz.

VistaMAX 3.65 GHz is RUS-accepted

More Wireless Products by Vecima

BWIN employs the feature-rich DOCSIS® platform along with powerful RF technology to create a cost effective system for fixed broadband access. BWIN is available in 700 MHz, 850 MHz, 2.5 GHz, 3.5 GHz, and 5.8 GHz.

WaveRider features OFDM with adaptive modulation for the 900MHz, 4.9 GHz and 5.8 GHz license free bands.

“WiMax.com Asks” Q&A with Vecima Networks

How is Vecima positioned in the global 4G & WiMAX marketplace?
Vecima has remained focused on fixed WiMAX solutions, while other companies have moved on to mobile WiMAX, LTE or even cellular HSPA. We have focused on improving fixed solutions for a variety of different applications.

Describe the strategic value add that Vecima provides to customers & prospects in terms of introducing new solutions & revenue generating services.
Vecima is in constant communication with all of our customers, gathering information on their specific instances and networks. Based on that information we are able to add features and updates to our firmware and meet some of those unique requirements.
EDX Wireless LLC

Company Background

EDX Wireless was founded in 1985 as one of the first engineering software providers that offered PC-based planning and design tools for RF networks. Since that time, EDX has come to be known for its unsurpassed dedication to innovation, customer service and engineering integrity.

With a global ecosystem of distribution, integrated partner solutions, service and support, more and more carriers are turning to EDX for smart wireless network planning tools that meet the challenges of today’s broadband network designs. EDX offers wireless network planning tools for any system operating from 30 MHz to 100 GHz, including RAN and backhaul systems.

EDX’s Primary WiMAX Solutions

EDX® SignalPro® with the Network Design Module is a comprehensive, carrier-class RF planning tool for the design and deployment of wireless networks. With a focus on innovation in broadband wireless technologies:

- WiMAX, LTE and Wi-Fi network design features:
  - MIMO/Adaptive Antennas
  - Automatic Frequency Planning
  - Automatic Traffic Planning
  - Specialized studies and features for fixed and mobile systems

- Advanced propagation prediction models and methodologies
- Coverage/interference, point-to-multipoint, mesh, and link (backhaul) studies
- Outdoor, indoor, outdoor-to-indoor, urban, rural - any environment

- For service providers, equipment vendors, and technology consultants worldwide

Unleash the power of smart planning with EDX.

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GCT Semiconductor, Inc.

Company Background

Delivering highly integrated semiconductor solutions for wireless communications.

GCT Semiconductor is a leading fabless semiconductor company that produces innovative integrated circuit solutions for the wireless communications industry. With its proven radio frequency (RF) CMOS and system-on-a-chip (SOC) expertise, GCT provides state-of-the-art CMOS RF transceivers, single-chip mobile digital TV receivers and Mobile WiMAX solutions serving 3G and 4G mobile system manufacturers by reducing BOM cost, lowering power consumption and minimizing total solution size.

GCT WiMAXTM IC Advantages

- Lower power consumption
- Smaller form factor
- Lower BOM cost
- Co-existence with WiFi
- Market-Proven WiMAX solution
- Field-Proven WiMAX solution

Wireless Communications Innovation

GCT’s Primary WiMAX Solutions

Single-Chip Solutions

GDM7205 & GDM7213: The industry’s first Mobile WiMAX™ IEEE 802.16e Wave 2 compliant 2.x and 3.x GHz monolithic single-chip solutions, which include RF, MAC and PHY, all into one monolithic integrated circuit.

GDM7215: The industry’s first single-chip solution supporting both Mobile WiMAX IEEE 802.16e WAVE 2 and WiFi 802.11 b/g.

GDM7701: Highly integrated baseband system-on-chip (SOC) designed for Femto AP applications, offering a low BOM cost ideal for low-cost mobile WiMAX Femto AP applications.

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“WiMax.com Asks” Q&A with GCT Semiconductor

How is GCT Semiconductor positioned in the global 4G & WiMAX marketplace?

GCT Semiconductor plays a leading role in the WiMAX ecosystem, providing expertise to further make 4G broadband wireless a reality worldwide. Based on GCT Semiconductor’s industry-proven CMOS technology, GCT develops key components to further accelerate the deployment of WiMAX networks, including WiMAX single-chips that offer high performance, lower power consumption and small form factor. GCT offers innovative solutions optimized for mobile WiMAX implementation in mobile devices.

Describe the strategic value add that GCT Semiconductor provides to customers & prospects in terms of introducing new solutions & revenue generating services.

GCT provides state-of-the-art single-chip CMOS RF transceivers, mobile digital TV receivers and Mobile WiMAX solutions serving 3G and 4G mobile system manufacturers by reducing BOM cost, lowering power consumption and minimizing total solution size. GCT empowers mobile operators to further advance the WiMAX ecosystem, by providing mobile WiMAX single-chip expertise, WiMAX/WiFi dual-mode capability, a wide variety of WiMAX applications and strong partnerships with ODMs worldwide.
Company Background

Sequans is a leading global provider of WiMAX semiconductor solutions and has delivered high performing WiMAX silicon and software for each stage of WiMAX technology development since the industry’s inception. To date, Sequans has delivered ten WiMAX chips to market, including baseband and RF chips for both base stations and mobile stations for both fixed and Mobile WiMAX. Sequans’ key solutions are WiMAX Forum Certified™ and Sequans chips are powering major WiMAX networks around the world, including those in Russia, India, Pakistan, Malaysia, and USA.

Sequans’ newest generation of Mobile WiMAX solutions, the 1200 series, is the industry’s most advanced Mobile WiMAX chip technology. The chips integrate baseband and triple band RF in a single 65 nm die, delivering superior performance, ultra low power consumption, and low cost. Sequans’ focus on high integration and low cost is driving prices downward, leading to mass market acceptance of Mobile WiMAX devices.

SEQUANS’ Primary WiMAX Solutions

MOBILE STATION PRODUCTS - Sequans’ newest generation of Mobile WiMAX technology, the 1200 series of 65 nm single die chips, is the industry’s most advanced Mobile WiMAX chip technology. The chips integrate baseband and triple band RF in a single 65 nm die, delivering superior performance, ultra low power consumption, and low cost. Sequans’ focus on high integration and low cost is driving prices downward, leading to mass market acceptance of Mobile WiMAX devices.

SQN1210 MOBILE WiMAX SYSTEM-ON-CHIP FOR MOBILE DEVICES

Based on state-of-the-art 65 nm technology and four years of Sequans’ proven field experience, the new SQN1210 delivers dramatically reduced cost, power consumption, and size over previous generation technology in a tiny 10x10 package. The SQN1210 includes DRAM memory, and delivers maximum throughput of greater than 40 Mbps with extremely low power consumption of less than 350 mW with fully loaded MIMO traffic and less than 0.5 mW in standby. The integrated RF supports TDD as well as half duplex FDD and covers all three global WiMAX bands, 2.3, 2.5, and 3.5 GHz. The SQN1210 also supports 2 Tx, as specified in Release 1.5 of the WiMAX system profile, enabling uplink MIMO, a feature unique to Sequans that can nearly double cell coverage.

SQN1220 MOBILE WiMAX SYSTEM-ON-CHIP FOR VOICE AND DATA CPE

Sequans’ SQN1220 is based on state-of-the-art 65nm technology and four years of Sequans’ proven field experience. It delivers dramatically reduced power consumption, size, and cost over previous generation technology. It includes an embedded network processor for higher processing power as needed for VOIP and CPE applications. The SQN1220 features Sequans’ patent-pending mimoMAX™ technology that comprises dual transmit channels (2Tx), enabling uplink MIMO, and maximum likelihood MIMO performance for throughput of greater than 40 Mbps with extremely low power consumption. Uplink MIMO can nearly double cell coverage, and the SQN1220’s power consumption is the lowest in the industry at less than 350 mW with fully loaded MIMO traffic.

BASE STATION PRODUCTS

SQN2130 MOBILE WiMAX ASIC FOR PICO, MICRO AND MACRO BASE STATIONS

Sequans’ SQN2130 ASIC is WiMAX Forum Certified™ and is flexible and scalable solution, allowing the cost-effective manufacture Mobile WiMAX base stations of any size—femto, pico, micro, macro. The SQN2130 integrates PHY and MAC and delivers industry-leading high throughput, flexible TDD or FDD, standard interfaces to ASN gateways, and can serve thousands of simultaneous users. The SQN2130 operates at the full line rate, translating to throughput of more than 40 Mbps, even with small packet sizes.

SQN 2131 MOBILE WiMAX ASIC FOR FEMTO BASE STATIONS

The SQN2131 is specifically designed for femtocell base stations and can support up to 20 simultaneous users. Its high level of integration and built-in dynamic power optimization techniques are ideal for femto base stations with strong constraints on cost, power consumption and footprint. The SQN2131 can be used in association with the SQN1130 mobile station SOC to provide cell sniffing capability. The SQN2131 operates at the full line rate, translating to throughput of more than 40 Mbps, even with small packet sizes.
**Aptilo WiMAX Products & Solutions**

**Aptilo Networks** is the global leader in pre-integrated management solutions for control of billing, user services and access in WiMAX™ and Wi-Fi networks. Aptilo’s solutions have been deployed worldwide in more than 45 countries.

Leveraging Aptilo’s solid experience in the Wi-Fi and wireless mesh markets into the WiMAX arena, the company offers the award-winning **Aptilo WiMAX CSN System™** a multi-access (WiMAX / Wi-Fi) and cost-effective platform that can grow with the needs of our customers.

The system delivers a highly **flexible and versatile AAA** (authentication, authorization, accounting), **policy management** and service control solution for WiMAX and Wi-Fi network services.

Aptilo’s **built-in prepaid system** allows for advanced prepaid and voucher-based business models enabling pay-per-use services with flexible top-up and **customer self-care** functionality through **hotlining**. Aptilo’s hotlining portal automatically detects new devices and can redirect these to a provisioning portal with the user account attached. These advanced modules are also available separately for integration with any 3rd party AAA server.

Aptilo’s **QoS & Policy Engine (PCRF)** enforces QoS and service flow profile parameters for users, devices and services.

The **Change of Authorization (CoA)** support coupled with Aptilo’s **provisioning API** enables next-generation WiMAX services where an external application - such as video on demand systems - can trigger a change of authorization to temporarily e.g. increase the bandwidth for a user. Optimization through dynamic bandwidth throttling enables services where the bandwidth needs to be automatically throttled down as the data allowance is consumed.

The **Aptilo WiMAX CSN System** features a **built-in user policy database** for subscriber management.

Basic **post-paid billing** for data services is built-in, while more advanced billing needs are supported through integration with 3rd party billing systems.

The Aptilo WiMAX CSN System is an open WiMAX Forum® NWG standard-based system, which means that the operator is free to integrate with a dedicated subsystem when desired. For instance integration with an existing prepaid system or user database via one of Aptilo’s well defined APIs and native interfaces.

**Fast-track WiMAX deployments:**

Aptilo is devoted to delivering solutions that are rapid to deploy and easy to maintain. Our pre-integrated WiMAX CSN System is designed with the vision to help customers fast-track WiMAX installations. Learn more at our microsite [www.aptilo.com/fast-track](http://www.aptilo.com/fast-track). With our Managed Service™ (SaaS) option the deployment of the service management part of the WiMAX service can be done in just a few weeks.

Whether you choose to go with our fast-track offering or build your own solution with different building blocks around our **AAA+ core** with the standalone **Aptilo WiMAX AAA+ Server™**, few things speed up deployments more than choosing vendors with proven interoperability. Furthermore, WiMAX operators must be able to choose the best-in-class equipment for each occasion, reduce risk and drive down costs by implementing a multi-vendor strategy. This is why Aptilo is driving **interoperability testing** with other vendors in the WiMAX ecosystem. We have confirmed interworking through customer projects and partner testing with the **majority of WiMAX radio and ASN gateway vendors**.

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**“WiMax.com Asks” Q&A with Aptilo Networks**

**How is Aptilo positioned in the global 4G & WiMAX marketplace?**

Our pre-integrated WiMAX CSN solution with built-in prepaid system has gained great traction with operators needing to deploy quickly and cost effectively. We will bring this approach also to the LTE market in the future.

Describe the strategic value add that Aptilo provides to customers & prospects in terms of introducing new solutions & revenue generating services.

We are pushing the envelope in terms of advanced functionality and standards compliance to the latest WiMAX standards. This means that operators can implement new competitive business models and services to their customers.

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**Aptilo WiMAX Distinction 2009**

Aptilo’s award-winning WiMAX CSN System was selected by Harris Stratex to complement its end-to-end WiMAX network solution, offering service providers best-in-class prepaid billing, service management and access control.

Main Street Broadband chose Aptilo for its U.S. WiMAX network, one of the largest Rural Utilities Service (RUS)-funded projects in the country.

Aptilo and Xiocom Wireless forged a partnership to enhance Xiocom’s ability to cost efficiently operate and manage large-scale deployments.

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**Aptilo WiMAX Products & Solutions**

**Aptilo Networks** is the global leader in pre-integrated management solutions for control of billing, user services and access in WiMAX™ and Wi-Fi networks. Aptilo’s solutions have been deployed worldwide in more than 45 countries.

Leveraging Aptilo’s solid experience in the Wi-Fi and wireless mesh markets into the WiMAX arena, the company offers the award-winning **Aptilo WiMAX CSN System™** a multi-access (WiMAX / Wi-Fi) and cost-effective platform that can grow with the needs of our customers.

The system delivers a highly **flexible and versatile AAA** (authentication, authorization, accounting), **policy management** and service control solution for WiMAX and Wi-Fi network services.

Aptilo’s **built-in prepaid system** allows for advanced prepaid and voucher-based business models enabling pay-per-use services with flexible top-up and **customer self-care** functionality through **hotlining**. Aptilo’s hotlining portal automatically detects new devices and can redirect these to a provisioning portal with the user account attached. These advanced modules are also available separately for integration with any 3rd party AAA server.

Aptilo’s **QoS & Policy Engine (PCRF)** enforces QoS and service flow profile parameters for users, devices and services.

The **Change of Authorization (CoA)** support coupled with Aptilo’s **provisioning API** enables next-generation WiMAX services where an external application - such as video on demand systems - can trigger a change of authorization to temporarily e.g. increase the bandwidth for a user. Optimization through dynamic bandwidth throttling enables services where the bandwidth needs to be automatically throttled down as the data allowance is consumed.

The **Aptilo WiMAX CSN System** features a **built-in user policy database** for subscriber management.

Basic **post-paid billing** for data services is built-in, while more advanced billing needs are supported through integration with 3rd party billing systems.

The **Aptilo WiMAX CSN System** is an open WiMAX Forum® NWG standard-based system, which means that the operator is free to integrate with a dedicated subsystem when desired. For instance integration with an existing prepaid system or user database via one of Aptilo’s well defined APIs and native interfaces.

**Fast-track WiMAX deployments:**

Aptilo is devoted to delivering solutions that are rapid to deploy and easy to maintain. Our pre-integrated WiMAX CSN System is designed with the vision to help customers fast-track WiMAX installations. Learn more at our microsite [www.aptilo.com/fast-track](http://www.aptilo.com/fast-track). With our Managed Service™ (SaaS) option the deployment of the service management part of the WiMAX service can be done in just a few weeks.

Whether you choose to go with our fast-track offering or build your own solution with different building blocks around our **AAA+ core** with the standalone **Aptilo WiMAX AAA+ Server™**, few things speed up deployments more than choosing vendors with proven interoperability. Furthermore, WiMAX operators must be able to choose the best-in-class equipment for each occasion, reduce risk and drive down costs by implementing a multi-vendor strategy. This is why Aptilo is driving **interoperability testing** with other vendors in the WiMAX ecosystem. We have confirmed interworking through customer projects and partner testing with the **majority of WiMAX radio and ASN gateway vendors**.

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**WiMax.com Asks** Q&A with Aptilo Networks

**How is Aptilo positioned in the global 4G & WiMAX marketplace?**

Our pre-integrated WiMAX CSN solution with built-in prepaid system has gained great traction with operators needing to deploy quickly and cost effectively. We will bring this approach also to the LTE market in the future.

Describe the strategic value add that Aptilo provides to customers & prospects in terms of introducing new solutions & revenue generating services.

We are pushing the envelope in terms of advanced functionality and standards compliance to the latest WiMAX standards. This means that operators can implement new competitive business models and services to their customers.
WiMAX system ensures rapid, cost-effective service delivery, starting at 2,500 subscribers

Introducing the Bridgewater® ServiceMAX 500, a service control and subscriber data management system that enables small and mid-sized WiMAX operators to rapidly and cost effectively launch mobile broadband and Voice over IP services.

ServiceMAX 500

The ServiceMAX 500 bundles Bridgewater’s industry leading solutions – including AAA, subscriber data management, prepaid and more – to accelerate commercial WiMAX launch. All this is packaged in a server platform that allows impressive scaling up to 100,000 subscribers.

This pre-integrated system not only saves valuable time and effort during installation and integration, but also simplifies maintenance and support with a single vendor point of contact.

Company Background

Bridgewater Systems (TSX: BWC), the mobile personalization company, enables service providers to efficiently manage and profit from mobile data services, content and commerce. The company’s market leading mobile personalization portfolio provides a real-time, unified view of subscribers including entitlements, devices, networks, billing profiles, preferences and context. Anchored by Bridgewater’s Subscriber Data Broker™, the portfolio of carrier-grade and standards-based products includes the Bridgewater® Service Controller (AAA), the Bridgewater® Policy Controller (PCRF) and the Bridgewater® Home Subscriber Server (HSS). More than 150 leading service providers use Bridgewater’s solutions to rapidly deliver innovative mobile services to over 150 million subscribers.

The Bridgewater Service Controller (AAA), Policy Controller, and Subscriber Data Broker have been accepted into the US Federal Government Rural Utility Services program (RUS). This acceptance enables U.S. service providers to take advantage of RUS funding when deploying Bridgewater’s solutions for rural residential, business, and community broadband wireless services.

Bridgewater’s Primary WiMAX Solutions

Over 35 of the world’s leading WiMAX operators have chosen Bridgewater to be a key part of their WiMAX Connectivity Service Network (CSN) to support key subscriber and service management capabilities such as AAA (authentication, authorization, accounting), daypass and prepaid services, and lawful intercept. As a Principal Member of the WiMAX Forum, Bridgewater is lead contributor to current and upcoming AAA and policy standards and architectures for WiMAX networks. Vendor neutral and featuring extensive multi-vendor interoperability, Bridgewater offers a comprehensive solutions suite that helps WiMAX operators accelerate commercial launch and introduce new personalized services.

The Bridgewater Service Controller (AAA) is the leading AAA solution for more than 35 WiMAX operators including Sprint, Scarlet, and Tatung. It features extensive support for fixed and mobile WiMAX, including:

- Authentication – User and device level authentication with full EAP support.
- Authorization – Fully profile and policy based for flexible control.
- Accounting – Supports session and flow-based accounting for differentiated charging, as well as support for pre-paid and post-paid.
- Mobile IP – Roaming features such as RADIUS AAA proxy and Mobile IP key derivation.
- Hotlining – Redirect subscribers to prevent revenue leakage.
- Lawful intercept – Unique support in WiMAX to enable compliance with law enforcement and telecoms regulations.
- Pre-paid support – Supports multiple prepaid billing models including standards-based and pre-standards implementations. Helps accelerate subscriber acquisition.
- Accounting mediation – Reduces the load on backend billing systems and the need for custom mediation. Correlates, aggregates, filters, formats, and streams accounting records to billing system.

Subscriber Data Management

Bridgewater’s Subscriber Data Broker enables creation of advanced new services and revenue models by leveraging rich set of static, dynamic and usage data on a per-subscriber basis. It allows service providers to easily manage subscribers and services to accelerate commercial WiMAX launch.

Service Model Innovation

The Bridgewater Policy Controller provides dynamic network and application policy control to enable advanced service models including casual and flexible usage, on-demand access to applications, tiered services, and over-the-air-provisioning of devices and subscribers. Bridgewater also supports prepurchase services enabled through flexible time and volume based metering.

Bridgewater’s solutions stand at the leading edge of subscriber management. Please visit www.bridgewatersystems.com to see how we can help you get more from your network and your subscribers.
Company Background

Green Packet Solutions, part of the Green Packet Berhad group of companies, is a leading developer of Next Generation Mobile Broadband and Networking Solutions. Our mission is to provide seamless and unified platforms for the delivery of user-centric multimedia communications services regardless of the nature and availability of backbone infrastructures. Founded in San Francisco’s Silicon Valley in 2000, Green Packet Solutions has expanded its global footprint to Kuala Lumpur (Headquarters), Singapore, Shanghai, Taiwan, Australia, Bahrain and Bangkok.

Green Packet Solutions empowers Operators to improve ARPU via leading edge carrier-grade solutions and interoperability-tested WiMAX Modems. Green Packet Solutions’ products offer best-in-class performance and are of the highest quality, ensuring our customers are ALWAYS BEST CONNECTED!

Connection Management Platform

Intouch Connection Management Platform (ICMP) is an easy to use, single-client solution that is designed to converge connection management, communication services and infotainment.

**Seamless Mobility**

ICMP includes the Seamless Mobility feature that enables users to automatically switch from one network to another, without any interruption to their connectivity or application usage. In other words, a user need not worry which network to connect to; instead based on the current location, he will be automatically connected to best available network.

**Integration of Lifestyle Value via the Hosting of Value-added Services/Applications**

Aside from connectivity convenience for users, ICMP is able to integrate with Application Stores to offer applications and services that appeal to user’s respective lifestyle needs. Aside from additional revenue, this feature empowers Operators to differentiate from competitors.

**Data Offloading**

With the increase in broadband usage which translates to a steep surge in data traffic, network congestion is on the rise especially for congestion prone networks such as 3G and HSPA. With its Seamless Mobility advantage, ICMP doubles up as a cost-effective, hassle-free and immediate data offloading tool. Users connected to congestion-prone networks such 3G will be automatically transferred to a less congested network such as WiFi wherever possible.

AppHub

Infinit AppHub offers the ideal avenue for Operators to kick-start their very own Application Store. It is built to leverage on Operators' existing strengths to fast track their venture into the Application Store arena.

**Applications Marketing**

With thousands of applications available out there, an application marketing mechanism has to be developed to give all applications a favorable selling ground. Applications should have the opportunity to compete in its own space, ranging from popularity, rarity, uniqueness and pricing.

Infinit AppHub can be customized (by Operators) to ensure that applications are marketed in a manner deemed most effective to Content Developers.

**CRM Capabilities**

Infinit AppHub equipped with artificial intelligence integrates with the Operator’s CRM system to leverage on the wealth of subscribers’ behavioural information. Based on this information, Operators have the opportunity to make compelling recommendations to subscribers and meet their demands for personalized content.

**Ready Billing**

Infinit AppHub is built on an open platform that enables easy integration with Operator’s existing billing system. Operators can ride on their existing billing relationship as payment mechanism for the purchase of applications to provide subscribers with a consolidated account for voice, data and applications. Aside from convenience, this option ensures a more secure payment method for subscribers and allows Operators to manage billing from a single point of access.
Company Overview

Aricent is a global innovation, technology and services company focused exclusively on communications. Aricent is a strategic supplier to the world’s leading application, infrastructure and service providers, with operations in 19 countries worldwide.

The Aricent Difference

Aricent offers its customers a fundamentally unique combination of attributes. These include an exclusive focus on the communications industry, leading innovation capabilities, and a broad set of products, technology and services available via a scalable global delivery model. We believe these three ingredients are essential to co-creation with our customers, and that they are a key reason why Aricent has become a strategic supplier to the world’s leading communications equipment manufacturers and service providers. Aricent’s products and services span the entire communications ecosystem including user experience design and consulting, research, development and testing for devices and infrastructure, as well as operational and billing systems.

Milestones and Industry Firsts

- 7 of the top 10 Tier 1 Service Providers are Aricent customers;
- 9 of the top 10 Telecommunications Equipment Manufacturers are Aricent customers;
- 8 of the top 10 Mobile Device Manufacturers are Aricent customers;
- 400M+ devices ship with Aricent software;
- Aricent co-developed some of the world’s first Femtocell, WiMAX and In-flight broadband solutions;
- Aricent’s unique innovation / integration expertise has created breakthrough user experiences such as Celltop and Sprint’s OneClick

Using Aricent’s comprehensive suite of WiMAX products and frameworks, equipment manufacturers can develop custom solutions for a variety of deployment scenarios. With industry-proven interoperability and a very high price to performance ratio, Aricent’s WiMAX products and frameworks are tailored to help equipment manufacturers develop and deploy flexible and cost-effective WiMAX solutions.

Aricent’s WiMAX Solutions

- **WiMAX Integrated Gateway (WING™)** – A “Network-in-a-Box” collapsed Access Service Network (ASN) and Connectivity Service Network (CSN) solution comprising of an integrated Profile-C ASN Gateway, Authentication, Authorization, and Accounting (AAA) server and Home Agent. This solution serves the needs of rural, Tier 3, and enterprise deployments, and can run on any Commercial Off-The-Shelf (COTS) platform
- **eASN™** – A complete ASN gateway product supporting control plane, data plane and management plane functionalities. The product can scale to support up to 60,000 subscribers, and is ideal for medium to high density networks
- **sigASN™** – A control plane framework for Profile-C Macro/Micro/Enterprise ASN Gateway deployments. This framework can be used to develop ASN solutions for very high density networks
- **Base Station (BS) Framework** – A Release-6 compliant control plane BS Framework for all types of Macro/Pico/Femto Profile-C Base Station deployments

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<thead>
<tr>
<th>Key Features</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Scalability</strong></td>
<td>Aricent’s WiMAX product portfolio can scale to meet the requirements of a variety of end deployment scenarios – low, high, very high, and all terrain densities</td>
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<td><strong>Standards Compliance</strong></td>
<td>Aricent’s products are industry and standards compliant, with support for Network Working Group (NWG) R1.2 specifications. Our products are currently being migrated to R1.3 and R1.5 compliance</td>
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<tr>
<td><strong>Platform Independence</strong></td>
<td>Aricent’s WiMAX products also provide built-in support for any COTS-based platform, including Linux platforms</td>
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<tr>
<td><strong>Proven Interoperability</strong></td>
<td>Aricent’s products are interoperable with multiple leading third party peer node vendors, besides supporting open standards based R6/R3/R4 interfaces</td>
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<tr>
<td><strong>Reduced Complexity</strong></td>
<td>Aricent’s WING solution presents a ‘Network-in-a-Box’ solution which reduces the complexity of the network layout and offers an easy to manage device for equipment manufacturers</td>
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Gambit Communications

Company Background

Gambit Communications is a leader in network and SNMP simulation tools. Whether you are an enterprise planning to deploy, support or evaluate a WiMAX solution, or a vendor developing and testing a new wireless application, Gambit’s portfolio offers simulation software to meet your unique goals.


MIMIC Wireless Simulator
MIMIC provides an inexpensive way for enterprises, device vendors, management and software developers to evaluate, test, demonstrate, develop, train and certify WiMAX/Wireless management applications without purchasing equipment and maintaining labs for those functions. It simulates up to 20,000 devices like Switches, Routers, Hubs, Base stations, Gateways, Ethernet Demarcation Devices from any manufacturer. It fully supports SNMP (v1, v2, v3), IPv6, IPMI, DHCP, TFTP, RMON (1, 2) as well as Telnet/Cisco IOS/Juniper JunOS.

MIMIC’s recording tool can discover and record any WiMAX-based production network and simulate it in the lab. The virtual lab software easily constructs negative and pathological conditions like client load, traffic conditions, event storms, gateway down etc…, which are traditionally difficult to create in a physical lab.

For Enterprises:
By providing a duplicate (or replica) of your production network on your desktop, MIMIC makes it effortless to evaluate before a purchase, test, configure and train before the deployment, in support of the management application. It removes any worry about setting up, sharing and maintaining a physical lab.

For WiMAX hardware & software manufacturers:
MIMIC reduces the testing cost by 10-100 folds. It helps create a real world environment with thousands of diverse data sources in a lab and test all possible customer scenarios. The developers can implement their products quickly and test it reliably using MIMIC.

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WiMAX.com □ The WiMAX Guide □ 2010 edition
Company Background

For over 37 years, Berkeley Varitronics Systems has provided design and consulting services for the wireless telecommunications industry. Over the past 15 years, BVS has anticipated the wireless industry’s needs by developing more than 50 unique and portable field instruments for GSM, TDMA, CDMA and Wi-Fi site surveys. More recently, Berkeley has introduced a line of WiMAX and LTE testing tools and analysis software to meet the demand for network build out.

BVS is headquartered in Metuchen, NJ but has sales offices in the Northeastern, Southwestern and Southeastern regions in the United States as well as in Latin America and Switzerland. Internationally, BVS has wireless product distributors in over 40 countries spanning 6 continents for a true global presence.

Berkeley Varitronics’ Primary WiMAX Solutions

Handheld WiMAX Analyzers
The newly released YellowFin™ is a tablet PC analyzer for Mobile WiMAX spectrum analysis as well as packet measurements. Full spectrum analysis features include power triggers, peak hold / search, multiple waveform traces and markers. Packet analysis identifies RSSI, Cell ID and Segment data, multipath and CINR (carrier-to-interference-plus-noise-ratios) all on a preamble basis.

WiMAX Stimulus Transmitters
Tortoise™ is a dual-band, high power stimulus transmitter that contains an optional WiMAX modulator. Class A amplification, quad cooling fan system and lightweight (under 30 pounds) ensure that Tortoise will output the cleanest RF signal from a crane to a rooftop. The optional WiMAX OFDMA Modulator allows Tortoise to simulate WiMAX base stations and features adjustable step sizes, channel bandwidth and user settable Preamble number, Cell ID, Segment and frame lengths.

WiMAX Site Survey Software
DragNet™ PC software runs on a YellowFin™ receiver using a tablet PC for on-the-spot WiMAX site survey analysis. The internal GPS receiver provides geo-coded data for automatically time-stamped LAT and LON WiMAX measurements anywhere in the world. Survey data is then overlayed onto satellite viewed earth maps to provide a complete overview for coverage studies and network traffic analysis.

WiMAX Pre-Deployment
BVS has developed a pre-deployment test system specifically for WiMAX engineers and installers. The system is comprised of Class A stimulus transmitters (Gator™ or Tortoise™), highspeed, modular receivers (Coyote™ or Gazelle™) and drive-study mapping coverage software (Forecaster).

BVS Engineering
All Berkeley products are designed, built and tested at BVS headquarters in Metuchen, NJ. Our in-house approach allows for quick turnaround, first class technical support and custom engineering solutions that lead to the best wireless testing tools in the industry. BVS designs all of our own custom silicon for calibrated receivers such as the one used in our YellowFin WiMAX Analyzer. This handheld, high-speed 802.16e WiMAX Mobile receiver scans up to 40 samples per second measuring all 114 preambles. And since our design team developed the digital receiver, power system, DSP and GUI, we can provide a complete WiMAX solution to our customers including RF spectrum analysis, multipath, RF interference detection, direction finding and WiMAX packet demodulation on a preamble basis.

Berkeley manufacturing methods utilize automated surface mount (SMT) and through-hole printed circuit board assembly techniques that provide quick (sometimes in just 48 hours) delivery of prototype or small production runs. Because of our internal manufacturing experience, we are sensitive to costs, manufacturability, parts availability, test-ware and other critical elements. Hardware design and prototyping are expedited through the use of in-house CAD tools, including schematic capture, PC board layout, Bridgeport, mechanical and LSI gate array design and simulation.
Company Background

Combining years of pioneering experiences and expertise, WirelessLogix provides a full range of comprehensive and intelligent measurement solutions that allow wireless device manufacturers, network vendors and carriers to design, measure, troubleshoot, optimize, and manage their products and networks more quickly and efficiently. WirelessLogix’ engineering solutions support multiple wireless technologies including CDMA/EVDO, GSM/WCDMA/HSPA, WiMAX and LTE.

WirelessLogix’ advanced line of products and services are currently being used by many of the world’s largest manufacturers and carriers. Our test & measurement and optimization solutions enable these companies to be able to measure and enhance all aspects of their wireless network elements. In addition, these companies are able to maximize device and network efficiency by deploying solutions more quickly and easily than ever before, resulting in an accelerated return on investment.

Founded in 2003, WirelessLogix is headquartered in Plano, Texas, USA.

WirelessLogix’s Primary WiMAX Solutions

WirelessLogix provides a full-range of test & measurement and optimization solutions to support both field and lab testing of wireless networks, devices and chipsets. Our flagship product, XCAL, is the industry-leading drive test data collection tool.

- XCAL Diagnostic Monitoring Tool
- XCAP Post Processing Tool
- Support for CDMA/EVDO, GSM/WCDMA/HSPA, WiMAX and LTE
- RF Scanners supporting multiple bands and technologies
- Throughput testing via our UDP Server solution
- MOS Testing (PESQ, PEVQ)
- Multi-Device Testing via OPTis Benchmarking & OPTis • Multi-Call Generator products

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Alianza Corporation

Company Background

Alianza’s award-winning hosted voice platform enables WiMAX service providers to quickly add a feature rich voice offering to their broadband service - without any capital expenditure. Alianza offers both residential and business-class features. Core platform components are integrated into a single interface, providing a seamless back-office experience. Competitive products are cobbled together using disparate 3rd party components; Alianza’s proprietary technology, built from the ground up, provides a cost effective and customizable platform for each service provider.

WiMAX service providers are looking for long-term solutions for delivering a broad range of IP telephone and voice applications to their customers. Adding VoIP can double your Average Revenue Per User (ARPU), decrease churn and create customer loyalty. But finding the capital, taking the time, and hiring the right folks to build it from the ground up is a formidable task. Alianza removes that barrier with their hosted voice platform.

Alianza’s Primary WiMAX Solutions

The platform is flexible, featuring API’s that allow integration of back office administration and optimization of operational efficiencies. For example Alianza provides a single point of administrative interface. One click in the management portal propagates 17 different processes and remotely enables devices, eliminating process management issues that arise - saving time and money.

Another benefit is a fixed fee pricing model enabling service providers to deploy voice services without investing any up-front capital. Alianza’s aggressive pricing also reflects the fact that there are no built-in licensing fees for third party components, as often is the case with competitors. An additional benefit of a hosted solution is the ability to launch in a fraction of the time it would take to build a complex in-house solution. We invite you to learn more about Alianza’s technology by visiting www.alianza.com.

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