

# INCISOR™

for the short  
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environment

Video enabled  Issue 127

October 2008



## BLUETOOTH SIG ANSWERS BACK ON HACKING

### THIS ISSUE

MAKING STEREO HEADSETS A MASS MARKET PRODUCT  
A SMART HOME FOR THE 21ST CENTURY  
LESSER KNOWN WI-FI FAMILY MEMBERS

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# life goes on

What a strange time it is at the moment. As I write, the world's financial markets are in meltdown and so my stock-based pension and investments are in the toilet, it is pouring with rain, and I've just been told that my cherished 4x4 truck is dead.

And yet ...

Here we are, at the end of September, with the tech industry waking up again after the summer recess. I can tell that by the fact that the volume of press releases and phone calls from PRs is increasing. We have events to organise – the Wireless Symposium is coming round again, we are planning another Wireless in America tour/special feature and the messages relating to CES are also starting to pour in again – we will soon be announcing IncisorTV's most ambitious CES web-TV project yet.

So, there is lots and lots of work to do. And helping me with this work is Mike Knivett. Mike will become the commercial 'face' of Incisor and will assist with taking the www.incisor.tv web site onto a broader and more feature-packed platform. If you want to work with Incisor, Mike is the man to talk to. Email him at [mike@incisor.tv](mailto:mike@incisor.tv)



**Vince Holton**  
 Publisher & editor-in-chief, Incisor / IncisorTV

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**Robert Lacoste**  
 ALCIOM

# news



## SIG wins a Stevie Award

The Bluetooth Special Interest Group (SIG) works pretty hard to promote Bluetooth technology and everything that orbits around it, and it seems that this has been recognized. The SIG earned a Stevie Award for Most Innovative Company in Europe in the 2008 International Business Awards program.

With an entry "A Wireless Teenager Ready for the Future", the Bluetooth SIG highlighted the milestones and innovations of the last year including the 10th anniversary of the technology, development of Bluetooth low energy technology, Bluetooth high speed technology and the end-user focus of v2.1+EDR.

"Over the past year, Bluetooth technology has grown tremendously within the industry and with consumers. And we understand that the way to keep meeting the needs of the marketplace and be relevant in the future is to keep innovating," said Mike Foley, Executive Director of the Bluetooth SIG.

Organizations all over the world are eligible to compete in The International Business Awards, and can enter in any of more than 40 categories from Best Multinational Company and Best New Product to Best Corporate Social Responsibility Program and Best Executive.

"We are honored to have been selected as this year's most innovative company in Europe" said Anders Edlund, EMEA marketing director of the Bluetooth SIG, who received the award at the gala awards dinner in Dublin on September 8. "Over the past year we have been working very hard together with our member companies on innovative solutions that provide benefits to all businesses and consumers. It's impressive that we can have member companies from all over the world – many



who compete with each other – come together around a commitment to innovation and to make Bluetooth technology the standard for short range wireless connectivity."

## SiGe and CSR partner with RMI for mPND

RMI Corporation has added CSR and SiGe Semiconductor to its partner alliance members. They will work with RMI to deliver a low cost GPS implementation in RMI's media-enabled Personal Navigation Device (mPND) reference solution, which is based on RMI's Alchemy Au1250 and Au1210 media. RMI Alchemy Processors enable playback of video at full-frame-rate speeds and deliver DVD-quality video and dynamic audio without the need to transcode.

(If you aren't quite sure what an mPND device does, it combines mobile TV, navigation, and other multimedia functions!)

RMI claims that the mPND reference design implements the lowest cost alternatives to replace expensive GPS modules. The Au1250 media processor provides processing headroom to perform the baseband function in software, removing the need for external hardware. For its part, CSR is providing a highly optimised software GPS (E5000) application, where the baseband function is implemented in software, while SiGe Semiconductor is contributing the GPS radio solution to accompany the Au1250 processor in the software GPS implementation.

"We are excited to be working with RMI on this important solution which we believe will accelerate the adoption of GPS in media-based products," said Stuart Strickland, VP of CSR's Location Based Services Business Unit. "We chose to partner with RMI for the performance achieved by the Au1210/Au1250



Processors and because of the breadth of new features and video capability it enables in portable consumer products."

## IMS looks at Wireless Car

As the wireless market for wireless technologies evolves, consumers are starting to demand the associated use cases in their cars. A new report from IMS Research called 'The Wireless Car' provides a focused overview of the emerging market for wireless technologies in automotive applications. It looks at the major technologies, specification issues and market drivers/inhibitors. Statistical analysis and forecasts also provide a complete investigation of the potential for various wireless and the applications they enable within the automotive market.

The report looks at the worldwide markets for the following applications and wireless technologies:

- Hands-free Calling - Bluetooth technology
- Audio Streaming - A2DP, WLAN
- Video Streaming/Networking - High speed Bluetooth, Wireless USB, WLAN
- In-Car Internet - WiMAX, cdma, wcdma, LTE
- Wireless Automotive Sensors - Proprietary wireless sensors, Bluetooth low energy
- Wireless Tyre Pressure Monitors - Proprietary wireless sensors, Bluetooth low energy
- On-board Diagnostics - Bluetooth
- Remote Diagnostics - Cellular technologies
- Vehicle-to-Vehicle Communication
- Vehicle-to-Infrastructure Communication
- Electronic Toll Payments

The report is available now, and interested parties should contact IMS Research for further info.

# news



## Bluetooth to quickly become a critical MID feature

The market for Mobile Internet Devices – the new class of Internet-connected products offering “always-on” Web browsing, photography and video, navigation, games, social networking and voice communications – is forecast to grow at a spectacular compound annual growth rate (CAGR) of 167% over the next five years, says ABI Research senior analyst Douglas McEuen.

That impressive growth will be paralleled by the penetration of several wireless technologies that are integral to the MID's functions: Wi-Fi, Bluetooth, and eventually Ultra-wideband (UWB), “All Mobile Internet Devices will feature Wi-Fi from the start. That is the essential form of wireless connectivity that no MID will be without. But in addition, ABI Research expects to see Bluetooth reach a 95% penetration rate by the end of 2008.”

While many MIDs will include voice capabilities, they are larger than mobile phones, and for convenience some users will carry a low-cost phone as well. However many consumers still want an all-in-one device, and the handset/headset configuration enabled by Bluetooth will meet their needs. That will be one of the main rationales for its early adoption in MIDs.

More enhanced forms of connectivity are in the pipeline too. McEuen believes that the first to reach the market will be “Bluetooth over 802.11,” also known as AMP (Alternate MAC PHY). It involves a software addition that will allow the device's Bluetooth circuits to “piggyback” on its faster Wi-Fi connection when it is necessary to transmit large amounts of data.

McEuen predicts that by 2011, Ultra-wideband (UWB) will be added to the mix. “Ultra-wideband offers an ‘on steroids’ version of Bluetooth. Today it is just a wireless USB replacement, but the chips are getting smaller and more powerful and they



are aiming for the portable device market. In a few years, it can be really useful in the MID market.”

## Bluegiga targets high-end Bluetooth Stereo

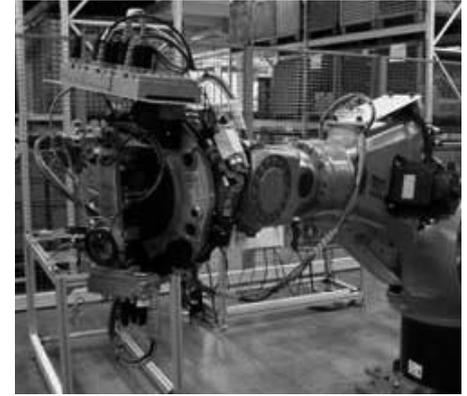
It was April 2007 when Incisor sat in on a meeting of the Bluetooth SIG's marketing committee, and it was agreed that stereo audio was the ‘next big thing’. Well, it seems to have taken a while, but we are finally seeing more action in this area, not only the growing number of products on retailer's shelves, but also increased focus and activity within the industry.

One of the players in this sector, audio processing technology specialist APT has signed a licensing partner agreement with Finland's Bluegiga, a provider of Bluetooth OEM modules.

Bluegiga will offer the apt-X audio codec technology developed by APT to maximize the streaming stereo performance of the Bluegiga WT32 Bluetooth Audio Module across a range of OEM applications, including high-end Bluetooth A2DP stereo headsets, wireless speaker systems and iPod speaker-dock wireless adapters, and Bluetooth-enabled portable media players and music phones.

Launched last year, the Bluegiga WT32 module is Bluetooth 2.1 + EDR compliant and combines with Bluegiga iWRAP firmware to facilitate wireless, secure and standard-based Bluetooth wireless connectivity.

Stephen Wray, VP Licensing, APT told Incisor, “The option to go with apt-X audio codec technology is exactly what Bluetooth integrators have been waiting for. Listening demonstrations confirm that Bluetooth stereo with apt-X realizes the theoretical maximum sonic performance of Advanced Audio Distribution Profile, whereas Bluetooth with entry-level Sub-band Codec technology struggles to impress. Apt-X is now available for Bluegiga's OEM modules, wireless stereo and streaming audio designers can move



quickly to offer the full advantages of Bluetooth.”

## connectBlue commits to enhancing wireless for industry

Together with the Austrian Academy of Sciences' Research Unit for Integrated Sensor Systems, connectBlue has committed itself to a three year project with the aim to make wireless technologies more suitable for industrial needs. The partnership will develop infrastructure for wireless automation on the factory floor.

Besides enhancing the existing industrial infrastructure for wireless integration, the goal of the project, which is called flexWare (Flexible Wireless Automation in Real-Time Environments) is to extend existing technologies to better comply with the tough requirements of industrial use - real-time, robustness, failure protection, etc.

“We have been involved in the wireless industrial automation business for eight years now,” said Rolf Nilsson, CEO of connectBlue. “So for us, it feels only natural to offer our experience to improvement developments of wireless integration on the factory floor.”

Mats Andersson, CTO of connectBlue added, “Compared to the situation today, flexWare will enable the possibility for inter-work between wireless nodes without restrictions in security and scalability. The concept will facilitate dynamic reconfiguration of the network which in turn will allow for a guaranteed real-time behavior which is a key component in industrial applications. flexWare will also make use of localization and advanced time synchronization functionality making the installation even more robust than today.”

Once the flexWare project is completed, connectBlue predicts that it will be possible to operate and control entire factories using wireless networks.

# news

## INCISOR TV Video presentations

When it comes to assessing what is really going on in the market, there is no substitute for seeing products in action and hearing 100% accurate information from the people at the sharp end. Incisor TV provides that insight.

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[WiMedia special - WiMedia and Bluetooth](#)

[WiMedia special - Updating the WiMedia roadmap](#)

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[Vince Holton introduces the High Speed Bluetooth Special Issue](#)

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[Robin Heydon, CSR - Bluetooth & UWB - The semiconductor company perspective](#)

[Motorola's Steve Deutscher examines High Speed Bluetooth mobile concepts](#)

[Motorola video - Jordan's morning](#)



## Forget hang-ups over which wireless tech

Recent decades have seen the widespread adoption of short-range wireless communications, including Bluetooth, wireless LANs (Wi-Fi), ultra-wideband (UWB), and RFID. All of these can be used as part of real-time location systems (RTLS). But according to ABI Research, a preoccupation with the technologies alone is misplaced: a more useful concept is "real-time intelligence visualization" (RTIV), in which the technology becomes the means to an end, not the end itself.

What is RTIV? According to ABI research director Michael Liard, "RTIV is not about the individual technologies. It is about the process and logic that end-users must embrace. That concept focuses on end-users seeing data (or the 'intelligence') and their tagged assets in new ways, with 'real-time eyes.'"

RTIV involves the capture of real-time data (regardless of the technology), and the processing and synchronization of that data with back-end systems through defined rules. This leads to the creation of actionable business intelligence that is accessible to the relevant systems and people. It involves the establishment of alerts, alarms, actions, decisions, and where required, audit trails and documentation. The result? Data that can provide a "smart enterprise-wide view" of tagged objects, assets, and personnel through wireless identification and location.

ABI told Incisor that these competitive, yet complementary wireless technologies, approaches, and solutions have historically been treated as independent silos, but they are now converging. In a growing number of end-user environments a combination of technologies is being used.

Whatever the technologies involved, Liard concluded, "The end (as well as the



beginning) of real-time intelligence visualization must be the value propositions and business problems challenging end-users.

## ROM-based Bluetooth with stereo DSP from CSR

Extending its already expansive Bluetooth portfolio, CSR has launched BlueTunes ROM, stating that this is the world's first ROM-based Bluetooth solution for stereo headsets with an integrated Digital Signal Processor (DSP). It is designed to provide end-users with the ability to switch seamlessly between wireless music playback and voice calls.

BlueTunes ROM is based on CSR's BlueCore5-Multimedia, which includes an integrated stereo CODEC providing 95dB SNR and supports both SBC and MP3 (license required) decoding for improved audio quality on music playback, together with a configurable 5 band equaliser. CSR claims over 10hrs of music playback from a 180mAh battery.

In addition, BlueTunes ROM integrates FastStream, a low latency high-quality music and voice CODEC and CSR's propriety Clear Voice Capture (CVC) technology that supports both single and dual microphone solutions, and AuriStream Voice codec, which boosts voice quality when on a call.

Anthony Murray, Senior Vice President of CSR's Wireless Audio Strategic Business Unit said, "BlueTunes ROM provides manufacturers with the opportunity to design smaller, lighter, more cost effective and feature rich Bluetooth stereo headsets."

CSR's BlueTunes ROM silicon and development kits are sampling now and start shipping in December.



## Picocells and Femtocells to be part of initial LTE Architecture

It is likely that femtocells and picocells will form an integrated part of the initial rollouts of LTE (Long Term Evolution) networks, say analysts at ABI Research.

These cellular mini-base stations, which offer improved wireless coverage indoors, have been generating considerable interest in mobile wireless markets and according to ABI analyst Nadine Manjaro, LTE deployment is expected to boost shipments and revenues. "In most parts of the world, LTE will be deployed using higher frequency bands. Higher frequencies penetrate structures less effectively than low frequencies, so femtocells and picocells offer an attractive way to compensate for lower indoor signal strength and provide LTE's touted bandwidth."

In Europe and other regions, LTE will operate in the 2.6 GHz band, although in the US it will largely be found in 700 MHz range, and in China TD-LTE will be most likely be deployed in the 1880-1920 MHz and 2010-2025 MHz bands, so the need for femtocells may be considered less pressing in those areas.

In contrast to other 3G technologies which preceded the introduction of femtocells, when LTE arrives these products will have been available for some time, and will be included in the original planned LTE architecture. "We will see some macro network deployment of LTE," said Manjaro, "but not to the same extent that we saw with previous technologies. I think a large portion of it will be deployed via femto and picocells alone, with macro deployments following later."

Some observers even suggest that all LTE deployments will initially use femtocells alone.



Many manufacturers such as Alcatel-Lucent and Motorola are supporting a new interface – "lu-h" – in the LTE architecture, which incorporates femtocells and femto gateways.

## T-Mobile embraces Android

Cellphone über-product the iPhone 3G now has another pretender to its throne. Although early comments have included "Sheesh - that is one clunky, gruesome piece of kit!" (not our words), T-Mobile is setting out its stall in the touch-screen phone market with its first Android-powered mobile phone, the G1. And, courtesy of its less than stellar design, the Android factor seems to be T-Mobile's principal USP. The partnership with Google means that the G1 features not only touch-screen functionality and a QWERTY keyboard, but also a mobile Web experience that includes Google products such as Google Maps Street View, Gmail, YouTube and others.

As you would expect, Google and T-Mobile are grabbing all the limelight they can: "With Android, we've opened the mobile Web not only for millions of users, but also to mobilize the developer community that understands the next most important platform in the world rests in the palm of our hand," said Andy Rubin, senior director of mobile platforms for Google. With support for T-Mobile's 3G and EDGE network as well as Wi-Fi, T-Mobile says that the G1 will connect to the best available high-speed data connection for surfing the Web and downloading information.

T-Mobile customers in the U.S. have the opportunity to pre-order the T-Mobile G1 now, for availability 'soon'. The device will be available at some T-Mobile retail stores and online in the U.S. beginning Oct. 22, for a price of \$179 with a two-year voice



and data agreement. The G1 will also be available in the UK beginning in November, and across Europe in the first quarter of 2009.

## US households turn to wireless

A new study from The Nielsen Company says that more than 20 million U.S. telephone households (17 percent) are wireless substitutors - homes without landlines that rely solely on a mobile phone for their home telecommunications. The new research suggests that one in five U.S. households could be wireless-only by the end of 2008.

As the U.S. economy tightens and consumers look for ways to cut household spending, many are eyeing that landline phone bill, which averages \$40 per month per landline household. In addition to the universe of U.S. wireless substitutors, Nielsen's study reports that U.S. cord cutters tend to have lower income-levels - 59 percent have household incomes of \$40,000 or less, and smaller households, with just one or two residents, are more likely to cut the cord than larger households. Apparently, moving or changing jobs are the biggest life events associated with cord cutting - 31 percent of cord cutters moved prior to cord cutting and 22 percent changed jobs.

Nielsen also observes that wireless substitutors tend to use their mobile phones more than their landline peers, 45 percent more per phone, but still save an average \$33 per month in a household of one subscriber, less \$6.69 for each additional wireless resident, when they cut the cord.

# new products



## Motorola adds silence

It seems that if you want to be running with the rat pack in the Bluetooth headset industry at the moment, you have to have embraced noise cancelling. Motorola doesn't want to be left out, and has added two more noise cancelling Bluetooth headsets to its portfolio. The Motopure H15 features a flip design and Motorola H780 Universal Bluetooth Headset is aimed at the style market. Both headsets allow users to silence external noise with Motorola's CrystalTalk technology.

Wayne White, corporate vice president and general manager of companion products for Motorola, told Incisor, "Today's mobile consumers demand a headset that delivers outstanding sound quality, particularly in the noisy environments they typically encounter every day. With superior audio quality to silence the noise, along with comfort and design, Motopure H15 and the H780 are the latest examples of Motorola's innovations that are exceeding consumer demands and driving its global leadership in the Bluetooth accessories market."

Both the Motopure H15 and the H780 use Motorola proprietary technology and include other key features such as multipoint technology that enables users to connect to both a compatible Bluetooth enabled personal and business phone simultaneously, and EasyPair technology that simplifies how users connect with a compatible cell phone.

The Motopure H15 and the H780 headsets are expected to be available at the beginning of Q4 2008.



## Sony Ericsson adds Bluetooth watches for women

For any hot chick who has been coveting their fella's Sony Ericsson Bluetooth watch, the longing can stop, as Sony Ericsson has now added the Bluetooth MBW-200 range of lady's Bluetooth watches. There are three different designs, going by the names Sparkling Allure, Contemporary Elegance and Evening Classic. All are expected to be available during Q4.

As with the previous watches, Sony Ericsson has partnered with Fossil. "The MBW-200 series is the next step in the development of Bluetooth wireless technology," said Karmen Mandic, product business manager, at Sony Ericsson. "We're all looking for products that make our lives more convenient. With a glance at your watch you can see who is calling, what the time is and with a push of a button you can change your music or use it as a music remote control when your phone is on the other side of the room- all in one stylish device."

The MBW-150 Classic has a brown leather strap and white face and will be available early next year in selected markets.



## Chat-tastic speakerphone from Sony Ericsson

Staying with Sony Ericsson, it has introduced just the thing for those people you know that talk and talk and talk. And then talk some more. Sony Ericsson claims that its new HCB-108 Bluetooth Car Speakerphone offers 25 hours talk time and a standby time of up to one month. It has what is described as 'a sleek Nordic design' and, like most of the current generation of these devices, can be easily moved around as it just clips onto the car visor with no wires, no fuss and no hassle. This way it can be swapped between the company and family cars, or used outside the car as a conference speakerphone.

A bit surprisingly, bearing in mind its market-leading performance and premium feel and up-market design, Sony Ericsson told Incisor that the HCB108 is the most affordable (i.e. cheap) speakerphone in its range. As it is DSP-based, it also offers true duplex audio quality with echo reduction and noise cancellation.

The HCB-108 will be available in selected markets from early Q4.



# Making stereo headsets a mass-market product

By Paul Wilson, CSR

**With more and more music phones becoming available, Bluetooth technology presents an extremely attractive implementation platform for OEMs/ODMs to attack the wireless stereo headphone opportunity.**

The low cost of Bluetooth devices, combined with the standardised SBC mechanism for streaming stereo, certainly provides the basis for an economic solution. However, the ultimate economy of designs has been held back by the absence of the same kind of ROM-based solutions that underpin today's mass-market mono headset products.

CSR has now applied the established 'multimedia' variant of its BlueCore Bluetooth device family to this application, with a ROM variant called BlueTunes ROM. This combines Bluetooth, RISC and DSP processors, a stereo CODEC and battery charger, with ROM containing powerful application software. The highly integrated nature of this device provides a single-chip solution to the application, making high-end headphone performance available to a very broad market.

## Flexibility is key

Although the bill of materials is critical, today's OEMs/ODMs also look for versatility of application. CSR has provided an example design for stereo headphones that provides this as well.

In its music-playing role, a BlueTunes ROM based wireless headphones design can, for example, be equipped with both SBC and MP3 decoding (the latter providing improved audio quality plus reduced power consumption). A configurable 5-band equaliser function is also available to improve end-user experience.

However, listening to digital music is only one aspect of today's potential audio market. The mobile video/TV application also has to be considered. Streaming stereo over a wireless link adds a finite delay compared with direct wired connections,



*The BlueTunes ROM headphones design (both sides of example design, and the development board shown) exploits the ROM-equipped variant of CSR's highly integrated BlueCore5-Multimedia device. Based on an 8x8 mm QFN packaged device and just a few additional components, the design offers significant component savings compared with previous Flash-based solutions.*

which can give rise to audio/video synchronisation issues. To eliminate this, CSR's design implements the company's FastStream CODEC — a technology developed initially to support the demanding gaming market. FastStream reduces latency to just 28-34 ms if CSR devices are at both ends of the link.

## Elevating headset quality

The headphones incorporate standard Bluetooth headset functionality (with seamless switching between wireless music playback and voice calls). In this application, CSR has also added technology that allows developers to produce more flexible headphone products, or a range of products targeted at different user groups. The onchip Kalimba DSP core can be used for high-end noise suppression for example, and CSR has bundled its CVC (Clear Voice Capture) echo and noise cancellation technology into the design to allow users to be heard clearly in noisy environments. The standard algorithm works with a single

microphone, but a dual-microphone variant is optionally available. This can provide over 30 dB of noise reduction.

One further aspect of the design's versatility is built-in support for CSR's optional AuriStream Bluetooth CODEC, in addition to the standard Bluetooth CVSD coding scheme.

AuriStream is a proprietary ADPCM voice CODEC. With a compatible CSR device at the other end of the link (and CSR is the largest player in Bluetooth solutions for mobile phones), AuriStream can be employed to either reduce power consumption, or increase voice quality to 'toll' levels. This link provides comparison sound samples: [AuriStream Samples](#)

*More information:* [BlueTunes ROM](#)

*Paul Wilson is a Product Marketing Manager with CSR.*

# Bluetooth SIG answers back on hacking accusations



Joel Linsky speaks out against Bluetooth hacking accusations.

In last month's issue we reported that a security expert – Andrew Lindell, Chief Cryptographer at Aladdin Systems – was stating that Bluetooth 2.1, which is designed to be more secure than previous versions, is actually more vulnerable. Lindell suggested that it is easy for an attacker to obtain a password when he or she eavesdrops on a user pairing up two Bluetooth devices.

Was he right, or was he wrong? Were we getting all the facts or was this a security consultant trying to build a name for himself and his company?

Incisor invited the Bluetooth community to respond, and we are pleased to say that we were contacted by Joel Linsky, Principal Engineer at Qualcomm, and with his high-profile job at the Bluetooth SIG, a well-known face in the Bluetooth industry. As you will see from his introduction, Joel is extremely well qualified to comment.

Joel's response clarifies matters and quells concerns. We would like to thank him for responding, both quickly and comprehensively.

Mr Lindell will have to find something else to question!

Hi Mr. Holton,

*I chair the Bluetooth SIG's Core Specification Working Group (CSWG). This working group is the one responsible for delivering each new Core specification (v1.1, v1.2, v2.0+EDR, v2.1+EDR, etc) and was the working group where the Secure Simple Pairing feature was developed.*

*Mr. Lindell's analysis is based on the assumption that Secure Simple Pairing uses a concept of "passwords" where the user enters the same password on both devices. While this is possible in some niche applications where both devices only have a simple keyboard and no output capabilities, it is not one of the normal usage models.*

*Bluetooth Secure Simple Pairing has four association models: Just Works, Numerical Comparison, Passkey Entry and Out of Band. To summarize, Just Works is used when one device has a very limited UI (for example, a headset) and the user only has to confirm the pairing. In Numerical Comparison, the user is shown two 6 digit values and is asked to compare that they are the same. The out-of-band mechanism utilizes something like NFC. In Passkey Entry (and this is the only association model that Mr. Lindell is describing an attack on), the device with a rich UI (e.g., a laptop or mobile phone) displays a 6 digit randomly generated value and the user enters this value in the device that only has input capabilities (e.g. a keyboard). All of these association models are described in Volume 1, Part A, Section 5.4 of the Bluetooth Core Specification v2.1 + EDR.*

*Mr. Lindell's analysis is based on the assumption that Secure Simple Pairing uses a concept of "passwords" where the user enters the same password on both devices. While this is possible in some niche applications where both devices only have a keyboard and no output capabilities, it is not a normal usage model. He also assumes that the passkey can remain static for multiple pairing attempts and that the remote device would allow up to 20 failed pairing attempts. These assumptions are not correct and Mr. Lindell's paper acknowledges that his attack does not work if the 6 digit value is randomly generated each pairing attempt as would be the case between a keyboard and computer.*

*Mr. Lindell's "attack" is not something that affects the actual security of Bluetooth 2.1 + EDR devices that are out in the field.*

Best Regards,

Joel Linsky  
Qualcomm

# artemis

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# Practice makes Perfect: The Lesser Known Wi-Fi Family Members



by Dean Anthony Gratton

**Amidst a small family, one child could easily go unnoticed. But then in such a very large family as Wi-Fi, a number of children should be able to attain some kind of limelight or a modicum of stardom? However, in a long line of Baldwins what happened to Stephen (The US Celebrity Apprentice, 2008)? It's clear, if you're in doubt about the future prospects of an acting career, you can always become a born-again Christian and enjoy the monotheisticism of reality TV! On the other hand, the Institute of Electrical and Electronics Engineers (IEEE) have spawned an inspirational number of offspring for generations and we can only assume that practice makes perfect!**

And certainly the 802 proponent of the IEEE family generation is relevant to the Local Area Network (LAN) and the Metropolitan Area Network (MAN) spaces. Its family has bestowed an era of fixed connectivity through 802.3, Ethernet – Carrier Sense Multiple Access with Carrier Detect (CSMA/CD), evidently a standard that simply rolls off the tongue! In an attempt to put humour aside however, this technology, or standard, has singularly spawned multiple careers for thousands of engineers alone. Admittedly, you have to ask yourself: what genius came along and decided to take away the cable and make wireless possible? We could conjecture the possibility that Marconi was pivotal in the foundation of wireless technology, or we could suggest that Jeff, whilst in his back garden shed, inadvertently spilt a bottle of turpentine onto some old copper coiled cable that came into contact with some left over piezoelectric material which was further plugged into the mains power supply when he began to hear the voice of Fern Cotton from BBC Radio One.

More relevant nowadays to the IEEE family spawn is 802.11, a generation whose technology has shaped the way we now work in and away from the office and home. A brethren of members that are seemingly ordained with a letter of the alphabet – such an odd quandary of names. Nevertheless, it seems to have worked and incredibly most ordinary folk are able to recall the family members by name, for example 802.11g, 802.11b, 802.11n and so on. What does it all mean? In fact, these family members have enjoyed a sustained career, some lasting ten years or so and alas, there are some lesser known Wi-Fi members that need an introduction, as it is foretold that the limelight is already powered-up and ready to shine on them.

Don't forget, Wi-Fi is an umbrella name given to the collection of family members that the IEEE has produced over a decade or so. Okay, let's look at the family members more closely. Hands up, who can recall the first 802.11 offering? Anyway if you can you're too old – bring your hand down quickly (God damn it man, where's your Brit-spirit, see Piers Morgan also US Celebrity Apprentice)! Moving on... Who is aware of 802.11a, 802.11b, 802.11g and more hitherto, 802.11n? Good, you shouldn't feel so embarrassed now – these technologies have redefined the notion of wireless connectivity, along with a host of other short-range technologies, such as Bluetooth, Ultra-wideband, NFC and so on. However, we do know that 802.11 (with no letters) brought about Wi-Fi's inception – the IEEE's first sibling in this genre supported a modest data rate of up to 1Mb/s.

Likewise, we should already be familiar with 802.11i – this member quickly

emerged after Wired Equivalent Privacy (WEP) was seen to be an inadequate security mechanism. 802.11i now forms the ratified Wi-Fi Protected Set-up (or WPA2) revision of the IEEE specification offering enhanced security and encryption for server- and client-enabled products. On the other hand, 802.11e also emerged following the huge uptake of 802.11b/g products. Consumers in their masses openly adopted the 802.11b/g-enabled products in addition to a string of laptop manufacturers integrating the .11 technology – in short, what we know as Wi-Fi became an instant success. What's more, with the prevalence of audio- and video-specific applications, the IEEE wanted to assure a certain quality of service (QoS) over their wireless LAN technologies and introduced .11e as a mechanism that saw some modest modifications being made to its Media Access Control (MAC) layer.

The IEEE has grandiose expectations of its siblings – and rightly so. The siblings are expected to pervade a new generation of products offering a varied number of extensions, amendments and enhancements to an existing wireless technology-base. The IEEE maintains a vision that remains incredibly insightful and will undoubtedly ensure the longevity of the technology. As such, the technology will become increasingly prevalent whilst permeating most consumer electronic products crossing the home, office and mobile-centric spaces. The IEEE supports their insight with numerous standards, which appear to address some of Wi-Fi's initial shortcomings – in particular, the IEEE tackles issues with low-power products and likewise and is focusing on more demanding and varied applications, such as video and audio. In an attempt





to ensure absolute success, new power schemes for low-powered devices have been architected through Wi-Fi Multimedia Power Save (WMM), which is a subset of the IEEE 802.11e offering. It has offered new power schemes with WMM Power mode in an attempt to reach a market suitable for integration into low energy devices – you only have to look at the Apple iPhone and other smart phone products, such as the HTC Touch Diamond and the Nokia N96, as a few examples.

Similarly, the next generation of 802.11 wireless LAN (WLAN) technologies is, of course, 802.11n. Here we see the IEEE delivering a new family member among a group of other successful siblings. In this instance 802.11n is expected to (or rather is) supporting applications that are clearly data hungry. Actually, to keep the momentum and interest within the industry, the IEEE has pushed through a draft-n revision and its certification for the premature .11n specification, which seemingly has caused some confusion for a minority of consumers. We all know that “walking on water and developing software from a specification are easy if both are frozen” (Edward V. Berard). Nonetheless, it is expected that the final

specification for 802.11n is to be ratified during the third quarter next year (or knowing the IEEE, possibly later!). More significantly, the 802.11n will be backward compatible across all existing WLAN technologies, namely 802.11a/b/g. So, in a legacy mixed mode environment, 802.11n will downgrade gracefully to support .11a/b/g clients whilst in a Greenfield mode the technology will ideally interoperate with pure n-enabled products (see 802.11n: Coming of Age in Incisor’s November 2007 issue).

Another intriguing family member is 802.11s, yes that’s right the IEEE has spawned a solution for mesh networking. We have seen mesh networking popularised within home automation – technologies such as ZigBee and Z-Wave (Zensys.com) are two such examples (see What Lies Beneath: At Home with DLNA, also in this month’s issue). The premise of mesh networking is the ability of a data payload traversing a series of nodes within a network topology to reach a distance greater than that advertised by the radio range of the node (typically from 10m to 50m). It has been touted as WiMesh where the technology instigated an Alliance of its own, namely The Wi-Mesh Alliance (wi-mesh.org), although the

interest in the Alliance seems a little muted and lacklustre, as the website hasn’t been updated for some time. We can only assume that everyone hasn’t left the building, as we should witness a reinvention of the Wi-Fi access point with reduced complexity as a repeater and a smaller form factor making it easier to install for the home consumer and business.

The IEEE has made every attempt to invade most commercial products, but incredibly with its 802.11p offering or Wireless Access for the Vehicular Environment (WAVE) the car soon will be Wi-Fi-enabled. But surely, the prospect of Wi-Fi in our vehicles has to be an exciting opportunity where undoubtedly it can sustain a creative range of applications? The first that comes to mind is the provision of a daily playlist within your car. A small number of vehicle manufacturers already support integral connectivity for the iPod or iPhone within their vehicles and, likewise, retrofitting the technology is equally commonplace. To have a Wi-Fi-enabled vehicle sitting in your drive may allow you to sync your vehicle with the home computer – setting up your daily playlist list will be just as easy as it is syncing your iPhone. More →

obvious applications would be to support toll charges at bridges and to offer payment transactions for car parks and the like. We already know that Near Field Communications (NFC) supports such an application-base.

The range of letters is not limited to what we have already discussed – in fact, many other letters (albeit limited to twenty-six!) have been attributed to a range of specifications that offer the 802.11 technology-base rudimentary abilities and

improved features, which enhance the overall usability of the technology: 802.11d International Roaming Extension; 802.11m Maintenance of the Standard and 802.11v Wireless Network Management are some other lesser known, but important family members. Since the IEEE's initial 802.11 offering they have continued to spawn a variety of technology-specific families that have crossed generations and technology genres. The family members have naturally complemented the growth of technologies that have surreptitiously supported a

generation of technology products – that we have all taken for granted. It's like the genius who decided to take away the cable and form wireless, it seemingly was a thankless act, but did anyone think of providing him with a deserved pat on the back, "Well done, Jeff"? Nevertheless, with the IEEE's Dorian-like eternal youthful grace and stealthy physique he will undoubtedly assure his continued success with the ladies sustaining a DNA-technology-base for the foreseeable future.

Table 1: Some of our favourite collection of Wi-Fi family members.

	DESCRIPTION	EXPECTED
802.11a	The Wi-Fi 5GHz standard operating at 54Mb/s	Available
802.11b	Improvement to 802.11 (now supports 1Mb/s, 5.5Mb/s and 11Mb/s)	Available
802.11d	International (country-to-country) roaming extensions	Available
802.11e	Quality of Service Enhancements	Available
802.11g	The Wi-Fi 2.4GHz standard operating at 54Mb/s	Available
802.11i	Security Enhancements (or WPA2)	Available
802.11m	Maintenance, corrections and improvements to the 802.11 family	Ongoing
802.11n	Wi-Fi High Throughput	Q3 2009
802.11p	Wireless Access for the Vehicular Environment	Q1 2010
802.11s	Mesh Networking	Q2 2010
802.11v	Wireless Network Management	Q3 2010

(public source: [http://www.ieee802.org/11/Reports/802.11\\_Timelines.htm](http://www.ieee802.org/11/Reports/802.11_Timelines.htm))

## Snippets

### 200 Million Ultra-mobile Devices to Ship in 2013

From a virtual "standing start" of just 10 million units in 2008, shipments of ultra-mobile devices (UMDs – the umbrella term for ultra-mobile PCs, netbooks and Mobile Internet Devices) are expected to exceed 200 million in 2013, according to ABI Research. Principal analyst Philip Solis commented that the UMD market will still be small compared to the wireless handset market, but with a forecast revenue of nearly US\$27 billion in 2013, it will certainly be significant.

### Icron in Fast 50

Icron Technologies, the Canadian company that developed ExtremeUSB, has been ranked #44 among the 2008 Deloitte Technology Fast 50. ExtremeUSB is an USB extension and bridging technology, the

wireless element of which Incisor has covered a number of times. The Fast 50 is a ranking of the 50 fastest growing Canadian technology companies, based on the percentage of revenue growth over five years.

Robert Eisses, Icron President & CEO commented "Icron's USB bridging technology over Cat 5, wireless, coax, and Powerline enables full PC functionality on any TV in the home."

### connectBlue sales grow in USA

The market demand for the Bluetooth, Wireless LAN and IEEE 802.15.4/ZigBee modules seems to be increasing rapidly in the North American region. In the year and a half since connectBlue opened its US office in Chicago, its US sales have increased more than 50 percent. To service this demand, connectBlue has signed an agreement with

Digi-Key to distribute the full range of connectBlue wireless products and services in North America.

### Sensor demand grows despite car sales slide

The new Strategy Analytics study, "Automotive Sensor Demand Forecast 2006 to 2015," predicts that despite the fact that car sales are currently in freefall, the market for automotive sensors will reach \$12.7 billion in 2008, a year-on-year growth of 6.5%. The analysis shows that planned vehicle safety, performance and feature enhancements will drive automotive sensor shipments to 3.9 billion units and be worth \$18.1 billion in 2015, as carmakers respond to tightening environmental, fuel mileage and safety legislation as well as consumer expectations, by introducing electronically controlled innovations for enhanced performance, comfort and convenience.

# wi-fi / wlan news



## IEEE proposing Super-Wi-Fi, threatening UWB

Our readers must be getting bored by now of Incisor questioning the practice of companies building Wi-Fi products to the IEEE 802.11n standard - it is still only a draft specification. Our bleating seems to be having little effect as .11n products are everywhere today. The latest word is that .11n standard will be ratified and published eventually, but we understand that at the moment the best estimate is that that won't now happen until November 2009.

So, you would think this was time for a lot of consolidation, interoperability testing, general settling down etc. But no, we now learn that the IEEE is planning to move the goalposts again, and is lining up two possible technologies which could blow .11n aside and take Wi-Fi into Gigabit speed territory by 2012.

The IEEE's Very High Throughput (VHT) study group is lobbying to get work started on a faster wireless LAN standard, and believes that Gigabit Wi-Fi is a viable proposition. Now, this territory is currently the direction that the UWB companies wagon's are heading in. The WiMedia companies that are promoting UWB already have one battle on their hands, which is to fend off Wi-Fi in the High Speed Bluetooth sector, and so there are probably groans of despair at the thought that they will have to defend another attack, and in a sector they probably thought was fairly safe.

The VHT study group is looking to get the IEEE's permission to develop one of two possible standards for Gigabit Wi-Fi. The first of these uses frequencies below 6GHz, where current Wi-Fi networks operate, and the other is above 60GHz, where a lot of unlicensed short range radio spectrum is available. Whichever option is selected, it has been suggested that it would likely be 2011 before any products appeared.



But .... The Wi-Fi companies are pretty aggressive and don't tend to let little things like a lack of a spec/standard hold them back. Incisor is expecting to see prototype draft-spec Super Wi-Fi products any time now, with retail availability in time for Christmas.

## Broadcom's shows multimode residential gateway

Broadcom has announced the BCM6368 – a single-chip multimode residential gateway that supports ADSL2+ or VDSL2. The new chip features PhyR; Broadcom's newly released impulse noise protection technology, multi-port Ethernet switching for video over DSL services, non-blocking 802.11n and multi-line VoIP capabilities. This integrated access device (IAD) solution incorporates a MIPS-based applications processor with hardware-assisted wirespeed bridging and routing, as well as hardware-assisted IPsec acceleration for virtual private network (VPN) termination, and support for USB 2.0 host and devices. With its ADSL2+ fallback capability, the BCM6368 enables carriers to deploy products in an ADSL2+ capacity and then remotely upgrade them to VDSL2 as their infrastructures allow.

The BCM6368 combines a VDSL2/ADSL2+ transceiver and analog front end (AFE) with a multi-core MIPS32(R) CPU, ATM/PTM hardware SAR, hardware packet processing accelerator, Gigabit Ethernet switch core with four 10/100 Ethernet physical layer (PHY) devices and dual GMII interfaces, and support for dual USB host/device connections.

Broadcom is now sampling the single-chip BCM6368 multimode residential gateway to early access customers.

## Snippets

### CSR and Rx Networks partner on eGPS and predicted GPS

CSR and Rx Networks, which is a mobile positioning technology and global services company have announced a GPS solution that combines their respective eGPS (enhanced Global Positioning System) and GPStream technologies. The joint solution combines GPS fine time and frequency aiding with synthetic assistance to yield mobile positioning performance that exceeds standard Assisted-GPS in unsynchronized GSM and W-CDMA networks or in synchronized CDMA networks. With the partnership, fine time, frequency aiding, and ephemeris assistance are all generated locally in the device and available at all times without the need for real time communication with a server.

## Bluetooth

### Christmas already?

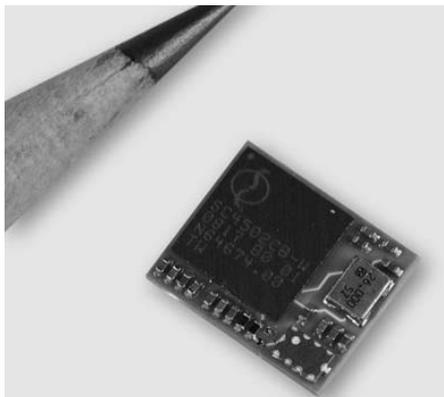
Let Incisor be the first to wish you Happy Christmas, as we learn that the Bluetooth Special Interest Group has launched its Christmas Gift Guide featuring the latest products in the Bluetooth wireless world. You can download the file on the link given below:

<http://www.porternovelli.be/client/bluetooth/public>

### Iqua solves Bluetooth battery life challenge

After announcing a solar-powered Bluetooth headset, Iqua has unveiled its next solar-powered creation: the Iqua Vizor SUN - a Bluetooth solar-powered handsfree kit for cars. The Iqua Vizor SUN recharges itself through the windshield of the car, using the sun's energy – even while driving.

# uwb / wireless usb news



## Staccato increases UWB push with single-chip Ripcord2

In any one of the short-range wireless sectors, a handful of companies stand out. In the world of Ultra-wideband (UWB), Staccato Communications is such a company, and was one of the first UWB companies that Incisor ever tracked. Its Ripcord product portfolio has been one of the benchmark silicon solutions in this sector, and has underpinned much early UWB-based product development. Roberto Aiello, founder and currently CTO at Staccato has been one of the primary movers in the UWB industry and is on the record as having built the first UWB network back in 1996 while he was at Paul Allen's research laboratory – Interval Research. These guys know UWB.

Incisor now learns that Staccato is shipping the Ripcord2 family of single-chip, all-CMOS solutions, which is targeted for WiMedia UWB and Wireless USB applications. Staccato tells us that this second-generation family is the industry's first implementation utilizing 65nm CMOS process technology, and that it offers big improvements in power consumption, size and integration over existing solutions.

Ripcord2 supports multiple protocols, including Wireless USB, High-Speed Bluetooth, Wireless IP and Wireless Audio/Video. In addition, several features were added to Ripcord2 including support for WiMedia Band Groups 1, 3 and 6, as well as the capability for detection and avoidance (DAA). This means that Ripcord2 is a worldwide compatible solution in a single device.

Staccato has already shipped samples and development kits (DVKs) to key

customers and is currently developing several reference designs to be released in the coming months. For developers, the Ripcord2 DVK provides an integrated development environment for Wireless USB device and high-speed Bluetooth designs, as well as generic WiMedia UWB applications.

"As history has shown with Bluetooth and Wi-Fi, only aggressive single-chip implementations, which meet the strict requirements of PC, CE and handset vendors, will allow the market to meet the expectations of the technology," said Marty Colombatto, CEO for Staccato Communications. "Our Ripcord2 solution is a market enabler. By leveraging our single-chip expertise and the inherent advantages afforded by 65nm CMOS technology, Staccato will enable the inclusion of UWB into high volume, mainstream products."

## Samsung links with Alereon for W-USB for Digital Cameras

Samsung Techwin, the division of the Korean giant that looks after digital camera technology, has teamed up with UWB company Alereon to put together a wireless connectivity solution for connecting Samsung digital still cameras to a PC.

Samsung calls the product NaBee (no, we don't know either), and this allows for a high-speed wireless communication between a digital still camera and PC. However, as neither device is yet supporting native wireless USB, it is a bit of a halfway house solution. To make the high speed wireless connection work, you are going to need to plug a miniature dongle into the camera USB connector,

and its matching dongle into the PC. The press release detailing the announcement said that "it connects just like a standard USB cable". Yes, guys, it does, and undoubtedly this will allow you to move around a little more freely as the two devices are not physically connected, but frankly, rather than connecting these chunky and probably quite expensive dongles, a lot of people are going to stick with the cheap and cheerful cable. We're not being naysayers here – this is the traditional early stage solution with wireless connectivity - but it will be better when the technology migrates into the camera and the PC. Patience, patience .....

The Alereon AL5000 chipset that the solution is built around transmits and receives WiMedia band groups one through six, which span frequencies of 3.1 to 10.6 GHz respectively. Some bandgroup one or bandgroup three solutions offer as little as a single channel in non-US applications, but this way consumers in Europe, Japan, Korea, China and New Zealand have as many as 19 additional channels to play with. This means that a single product or SKU can be designed and sold worldwide with a software modification to meet local regulatory requirements.

Whether it is the ultimate Wireless USB solution or not, the pictures suggest that Samsung and Alereon have done a decent job with NaBee, which, we are told, will be available from major catalog and online resellers, as well as selected retail outlets in December 2008.

# uwb / wireless usb news



## Belkin pushes Wireless HD

Belkin has earned a name for itself for fast-tracking new wireless technologies out to market – it blazed trails for Wi-Fi and Wireless USB, for example. Despite the pain inflicted on the retail environment by the cursed credit crunch, Belkin is continuing to present shiny new gadgets for us to spend our savings on. The latest gizmo is FlyWire, a wireless transmitter that delivers uncompressed 1080p True Cinema HD content. Belkin says that this makes home theater and commercial installations quicker and easier and allows professional integrators to install the equipment in a much wider variety of locations. The benefits of wireless systems, eh!

So what is under the bonnet? Well, we don't know too much at the moment. Belkin's press release, which seemed to be principally written with consumer publications in mind, simply tells us that FlyWire wirelessly connects devices—such as Blu-ray players, receivers, video-game consoles, and set-top boxes to HDTVs and projectors, transmitting high-definition 1080p True Cinema picture resolution with 'broad-home range'. We are also told that set-up is simple (we'll see!) and that the system is made up of an HD transmitter, receiver, remote control, and IR repeater.

The only bit of techy explanation we get is a statement saying that FlyWire 'operates in the open 5GHz band' and that it 'intelligently manages its own connection, adjusting both frequency and power to avoid interference and overcome impedances'. That explains why they are not writing WirelessHD (note the difference?), as that is 60GHz stuff. Apparently, FlyWire doesn't compress video, and so it transmits video content with no latency. Belkin claims that even the most demanding AV applications, like video games, will not be impaired by the wireless

transmission. There is an SD-card slot to allow for upgrade and expansion options.

So - sketchy details at the moment. Incisor has contacted Belkin and we hope to have a better understanding of the wireless solution by the time our next issue is published. The technology must be fairly international, though as FlyWire is scheduled to hit retail shelves in the US, Canada, Europe and Asia during November 2008.

Will anybody have any money to buy it? That is the question.

### **As Incisor went to press, Belkin came back and told us:**

*"The wireless technology used in FlyWire is WHDI (Wireless High Definition Interface) developed by Amimon, which we feel is the only viable solution which provides a robust connection, while being able to penetrate walls and AV cabinets. WHDI provides long range coverage, up to 100 ft with no latency and a resolution of 1080p (24p) which is True Cinema quality."*

## WiMedia Alliance partners with WALTER

The WiMedia Alliance is partnering with the Wireless Alliance for Testing Experiment and Research (WALTER – don't laugh) to focus on furthering European development of technology required for measurement, calibration and testing of UWB radio products. This collaboration, called the WALTER project (still don't laugh), includes several partners worldwide and aims to create a pan-European interconnected test bed, and to boost the European innovation potential to develop new applications and services based on extremely high capacity networks.

Researchers with the WALTER project will have direct access to members of the

WiMedia Alliance who are involved in the development of the specifications providing them with instantaneous access to test specifications. WiMedia will have access to WALTER regulatory tests and to three WALTER independent testing labs located in Europe and China, helping drive international acceptance and adoption of WiMedia standards.

"This relationship is another example of our commitment to rapid deployment of WiMedia UWB standards on an international basis and to have the support in place that is needed for adoption," said Roberto Aiello, chairman, WiMedia Certification Review Board. "Our participation with the Walter project goes hand-in-hand with our partnerships with other global efforts including our existing partnerships with the European Telecommunications Standards Institute (ETSI) and Ecma International, an international standards organization."

## Wireless USB hard drive uses WiQuest

Now this does sound handy. Imation will use WiQuest's complete Wireless USB solution for its new Apollo Pro WX external hard drive – a wireless personal area storage device.

The Apollo Pro WX comes equipped with incremental backup software that allows consumers to automatically backup their notebook PC. As the notebook PC comes "into range" of the Wireless USB hard drive, the software can either perform an immediate backup upon wireless connection or perform the backup at the next scheduled time.

The Apollo Pro WX will utilize WiQuest's Wireless USB solution and will be available in Q4 this year. We are already seeing Wireless USB enabled laptops in the market, and this does seem like one of the key and most useful applications for the UWB-based wireless connectivity solution.

We want one!

# A Smart-home for the 21st Century

by Dean Anthony Gratton

**Some may mistake their refrigerators for keen conversationalists – however, they would be advised to seek psychiatric assistance from a qualified therapist. Alas, there is also a minority who receive texts from their ovens and, regrettably, there are a few that may reply. In a nutshell, a true definition of smart-home technology still remains elusive and misunderstood. It seems we are still grappling with a notion that has travelled several decades and something that has crossed a century. What's more, the mass exploitation of smart-home technology has apparently escaped both the majority of homeowners and the home construction industry.**

Nowadays, 'Home Automation' or 'Domotics,' as smart-home alternatives seem more commonplace. In fact, the former reference is something we noted in Incisor's August 2008 issue with Zensys: Veni, Vidi, Vici where home automation was a concept used by Zensys, perhaps to strategically steer away from the tainted notion of a smart-home? But Home Automation and Domotics are references which seem to conjure up different images of home technology. Somewhat arguably, the notion of smart-home technology has been, to a large extent, a misnomer – it eagerly encapsulated an ideal that has failed miserably to both fulfill the expectations of the consumer and the home construction industry. Fundamentally, in the very early days - and to an extent even amongst today's tech-savvy consumer group - the lack of smart-home technologies being readily embraced by the industry was a contributing factor, along with an insufficient number of products entering mainstream low- and mid-end homes, all of which may have compounded its overall success. Likewise, the perception of the technology in the greater number of homes was largely seen merely as 'gadgets for men'. What may shift our perception of smart-home technology is to develop a concept that incorporates a range of technologies that are more digestible

and believable – perhaps a fragmentation of the technology into manageable segments, feeding specific home technology components, may form an holistic and workable solution?

The all new reference that is home automation and Domotics is presumably an attempt to steer away from the clichéd smart-home genre of has-been/would-be products. Instead, the notion of home automation now swings our attention to an aspect of home technology as a more realistic and measurable need within the home. Its motivation is supportive and unobtrusive, if you like, a supplement to an existing 'home' technology-base. In other words, rather than reinventing our products, the focus of home automation becomes complementary. And, with technologies such as Z-Wave (from Zensys), ZigBee, EnOcean and Bluetooth low energy wireless all vying for home and commercial application spaces, it places the smart-home ethos into a more pragmatic position that can realistically become ingested by the home and commercial spaces.

The low energy wireless race might be in full momentum and evidently we are unclear as to whom will take the low energy trophy, but a number of products are already available, serving specific applications across the home and commercial industries. The low-powered devices may include sensors, controllers and actuators, all of which may positively influence the well-being of the home in some way. These, in turn, may enable applications such as, mood lighting for the home; security, for detection of intruders; the detection of a fire or a gas leak within the home and telehealth, the ability to alert emergency services if an individual in the home needs urgent assistance. In fact, home automation for the infirm or elderly is an industry which is witnessing some incredible success in terms of technological ingenuity, as the British National Health Service (NHS) continues to decline.

More subtly, other integral technologies

may provide a supportive mechanism, such as Power Line Communications (or PLC). HomePlug (homeplug.org) is an industry group that has over fifty members collectively supporting the future of PLC. PLC is capable of permeating a presence within the home electrical system – in one such example, your broadband connection can be, if you like, transmitted over the home electrical system using a PLC sender. In turn, a PLC receiver, which can then be plugged into any electrical socket within the home, will give you the ability to make an Ethernet connection where you can connect a desktop, laptop or indeed a Wi-Fi access point to access the network or Internet. Likewise, PLC is also capable of sustaining a network allowing all of your devices to remain connected.

Meanwhile, the Digital Living Network Alliance (DLNA.org) has addressed a very different need within the home – they have architected a framework which not only harnesses existing products that we would ordinarily use on a day-to-day basis, but moreover gives these products the ability to interoperate – surely, we've heard this already? It is clear that the low energy sector is wirelessly-enabling a core application space that is vital to the fundamental operation of our home, but the DLNA has avoided the need to reinvent every consumer product and instead has afforded a framework that can be adopted by an existing range of product manufacturers. Incidentally, many consumer electronics products are already DLNA-enabled – you simply have to seek them in your retail outlets.

In light of low energy wireless, HomePlug and DLNA, we may have to rethink the notion of smart-home technology and offer a more positive spin; maybe we now have to stop this incessant berating. With low-energy wireless along with HomePlug and DLNA we now have the ability to confidently reuse the label, as we congregate home automation and digital living under the smart-home umbrella – yes, smart-home technology



now has a new home. Home automation lends itself to specific applications using technologies such as Z-Wave, EnOcean, ZigBee and Bluetooth low energy wireless as home technology enablers. Lighting, security and home control neatly fit under the home automation roof while digital living carefully manages many of our TV, DVD players, MP3 players, our mobile phones and a host of other consumer electronic products. Digital living enables a diverse range of consumer electronic products affording them the ability to interoperate with one another. We realistically have today the ability to stream video content from our mobile phones to our TVs and, likewise, we can also stream music from our iPods to our entertainment system.

The DLNA is an international organisation, which has its promoters and contributors spread across multiple industry sectors encompassing a fusion of products from consumer electronics, personal computers and mobile computing. The standard has avoided a need to reinvent the wheel and, as such, utilises technologies that a majority of consumers can already identify with. In particular, the underlying transport enabling communications between DLNA-enabled devices is Wi-Fi along with Universal Plug and Play (UPnP). These essential building blocks are significant in the success of DLNA, as any manufacturer seeking the DLNA certification logo will also need to be Wi-Fi and UPnP certified – some fundamental technologies that the majority of consumers can already identify with.

It's normal to have competing standards within most technology domains and, of course, DLNA is not alone. Very much akin to the low energy wireless story where individually each will reach out to singularly hold proud the accolade as 'the' dominant technology. The High-Definition Audio Video Network Alliance (HANA) offers a comparable notion of interconnectivity of HD-enabled devices within the home, although arguably HANA purports that it is much more focused on enabling HD-only-specific devices whereas the DLNA standard is embarking upon its ambition to ensure that a host of consumer electronic, personal computer and mobile devices all interoperate. Like DLNA, HANA is an industry group that has a specific media focus; it was established in 2005 and gives DLNA (established in 2003) a two-year head start. A common theme that naturally threads most standards, is the customary declaration "we are

complementary," by the industry groups that found them, but on closer inspection it pretty much comes down to the same thing.

We are constantly witnessing new standards and technologies each striving to lead the smart-home domain. Individually, they may strive for single dominance, but collectively they may define a formidable number of applications that can unleash a realistic vision of smart-home technology for the 21st century. Let's hope we can regenerate the tainted smart-home perspective with the new success of low energy wireless, DLNA, HomePlug and HANA, combined with a host of other supportive technologies – all-in-all, a new generation of technologies that will afford down-to-earth solutions for useful applications within the home.

We should aggressively banish any thoughts of talking refrigerators and ovens that text you to let you know your food is ready, along with the ability to remotely turn on a light from your mobile phone. Perhaps, an impractical use of smart-home technology, as you would always need a webcam to ensure that the light indeed came on! Nevertheless, innovators will need to keep their feet firmly on the ground when defining smart-home technology for the 21st century; otherwise, we will only continue to perpetuate the 'gadgets for men' ethos.



# low energy wireless news



## Lead-Off NFC Service Charges of \$17.4 Billion nearer reality

According to IMS Research, future service charges of \$17.4 billion took a step closer to reality following the release of results from the latest NFC trial in London. IMS also claimed that the results reinforced the findings of its report entitled "The Mobile Wallet: How, What, Where & When?"

Involving 500 users over six months, the trial was designed to assess the viability and attractiveness to users of a number of new services. Headline grabbing results included the news that 89% of users wanted the contactless Oyster travelcard built into their phones and 78% were interested in general in contactless mobile services. Most interestingly for the handset vendors, 87% said that the availability of NFC would influence their choice of mobile phone in the future.

The partners, who included Nokia and Barclaycard as well as O2, overwhelmingly claimed the results as successful; however, some within the industry and media were not so enthusiastic. Some press reports highlighted that only 41% of users preferred using their phone for low value purchases in place of cash. IMS Research Director John Devlin commented, "Realistically such mass market services are still two years away from launch and the typical consumer mindset is still very much cash-orientated for low value purchases. Contactless cards are only just being introduced (in London) and the move to contactless payments with a mobile phone is still very alien to the average person. If anything, the fact that approaching half of users did prefer contactless mobile to cash payments this far ahead of launch could be construed as a positive result."

Devlin added that these results are in line with IMS Research's own forecasts, which highlighted stronger early adoption of services that fit with local mindsets and cultural preferences. Typically this includes mass transit systems in metropolitan areas, particularly in Western Europe and parts of Asia, and payment for fast food and convenience stores in North America. "In these instances consumers will find an instant purpose and benefit in NFC and contactless mobile services," observed Devlin. "This is important for it to be successful and will lead to the introduction and adoption of further services."

However, on a cautionary note he added, "Operators are well positioned to take a lead in the introduction of NFC and they will be among the long term beneficiaries. Additional future services promise high potential revenue for them although if they only focus on the lead off services, i.e. ticketing and payments, then there could be problems. In an ideal world the network operators will be involved and can play a central role in the launch of NFC. However, there are other routes to market. Companies such as Tyfone offer full NFC capability via a removable memory card, which means that potential partners can go straight to their customers with NFC services."

## New ZigBee tools from Ember

Looking after the ZigBee development community (we have been told that there is one), Ember has introduced new versions of its ZigBee development tools.

The new Ember InSight Desktop 2.0, xIDE 2.0 Development Environment and AppBuilder tools sport new features that aid development of ZigBee PRO applications,

such as ZigBee Smart Energy (SE)-based devices that include ECC Security for device authentication, Energy Services Portal functions and in-the-field bootloading.

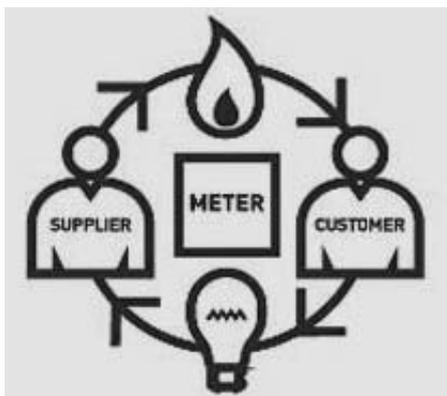
Ember claims that this toolset - together with EmberZNet PRO networking software - make the Ember EM250 the only true system-on-chip platform supporting the ZigBee PRO Feature Set that can accommodate even the largest, highest performing ZigBee applications.

InSight Desktop 2.0 is a Windows-based network development and debug tool that delivers a powerful, network-wide view of ZigBee device operations, while the xIDE 2.0 is an integrated development environment for building EM250 applications.

The new toolset also includes an enhanced version of AppBuilder, a graphical tool for building products that earn official "ZigBee Certified Product" designation. The new version enhances support for ZigBee-certifiable Smart Energy applications. The recently ratified ZigBee SE Profile defines the standard behaviours of secure, easy-to-use, Home Area Network (HAN) devices, which are critical components of the utility industry's emerging Advanced Metering Infrastructure (AMI) and "smart grid" deployments.

Bob Gohn, Ember's vice president of marketing commented, "One of the biggest challenges facing ZigBee system designers is balancing the requirements for ever more powerful, feature-rich, device applications that fit within the tight footprint of low-power chips. Ember's new tools and the EM250 SoC platform give customers a better way to develop and debug ZigBee applications for even large, complex devices. It is the only platform today to support ZigBee PRO on a true, fully-integrated system-on-chip."

# low energy wireless news



## Partners look to front-end modules for ZigBee Apps

Skyworks Solutions and Ember are partnering to develop a portfolio of ZigBee front-end modules (FEM) targeting applications such as smart meters in energy management, home area networks (HAN), and industrial automation.

“Skyworks’ partnership with Ember accelerates our efforts in the energy management industry by more than doubling our addressable market for front-end modules,” said Stan Swearingen, Skyworks’ vice president and general manager of Linear Products. “By integrating our front-end modules with Ember’s ZigBee silicon, we are offering our customers a high performance plug-and-play solution that is truly unmatched worldwide.”

Bob Gohn, Ember’s vice president of marketing added, “Ember and Skyworks are teaming together to create the industry’s first ZigBee FEM that dramatically reduces component size, cost and power consumption. We are making it easier than ever for our customers to deliver exceptional performance in their products across a wide range of ZigBee-based applications.”

West Technology Research Solutions (WTRS) is forecasting the ZigBee/IEEE 802.15.4 market to grow at an annual rate of over 117 percent – from approximately 8.4 million units shipped in 2007 to as many as 516 million in 2012.

## ZigBee / Wireless M-Bus collaboration

Norwegian company Radiocrafts has teamed with Paris, France-based Wavecom to launch a GSM/GPRS/EDGE gateway for smart metering that embeds Wireless M-Bus and ZigBee. The Wireless M-Bus standard (EN

13757-4:2005) specifies the communication between water, gas, heat and electricity meters and concentrators, while ZigBee looks after monitoring and control applications using low power radio networking.

The solution is based on Wavecom’s Fastrack Supreme, a programmable application processor with GSM/GPRS/EDGE modem capabilities. The Fastrack Supreme comes with an open-standard interface which allows developers to add supplementary I/O connectivity and features in the form of expansion cards. Radiocrafts has developed a unique expansion card for smart metering which adds Wireless M-Bus or ZigBee to the GSM/GPRS/EDGE communications function.

The expansion card embeds Wireless M-Bus (868 MHz) or ZigBee (2.4 GHz, including high power) on interchangeable PCBs. Both versions of the card connect via a UART serial interface to the RTOS driven host controller in the Fastrack Supreme.

Customers can either purchase a ready-to-use expansion card from Radiocrafts, or buy only the Wireless M-Bus or ZigBee module and create their own card.

## Study shows RFID is optimal for asset tracking technology

Odin technologies, which is in the business of developing RFID solutions and automation software and research, has released some market research that evaluates the value of passive RFID technology focused on IT asset tracking. According to the report - IT Asset Tracking Benchmark - passive RFID technology, including recently released components, shows ‘breakthrough performance’ on IT devices like servers, laptops, blades, and other high-value IT assets. The apparently vendor-neutral study concluded that passive RFID is ready to meet

IT asset inventory needs with superior operational efficiency.

Odin concludes that passive RFID saves time, improves accuracy and is more cost effective than barcodes or expensive active RFID solutions, and provides a selection of references various results to support this. These include inventorying a rack of 40 servers in 12 seconds or identifying all IT equipment within a typical cubicle five times faster than manual methods with 100% accurate data entry.

It always makes you smile when companies developing tech solutions publish scientific reports that provide findings that, coincidentally but fortuitously, happen to support that company’s messages and product portfolio.

## India kicks off RFID-based ePassport program

Gemalto has been selected to supply its Sealys eTravel solution to India’s National security printer, India Security Press. This solution will be used to start India’s electronic passport rollout for Indian officials and diplomats. The Indian Government’s Ministry of External Affairs, India Security Press and the National Informatics Centre aim to improve immigration processing at airports and border control points as well as bolstering national security.

The Sealys solution, which uses RFID tags, forms the integral security and contactless communications component of the electronic passports that will be manufactured by the India Security Press. It includes the secure operating system and microprocessor that stores and protects the holder’s digital identity as well as the communications antenna. The passports have been launched for Indian diplomats and government officials initially and in a second stage, the Indian government intends to deploy it for the general public.

# events



DATE	EVENT	LOCATION	NOTES	LINK
Oct 6 - 10 2008	Bluetooth UnPlugFest 31	Budapest, Hungary	-	<a href="https://www.bluetooth.org/Events/sig_events.htm">https://www.bluetooth.org/Events/sig_events.htm</a>
Oct 12 - 14 2008	Wireless & Mobile Computing, Networking & Communications (WiMob 2008)	International Conference Centre, Avignon, France	-	<a href="http://www.lia.univ-avignon.fr/wimob2008">http://www.lia.univ-avignon.fr/wimob2008</a>
Oct 21 - 23 2008	Bluetooth Evolution Conference	Hilton London Paddington Hotel, London, England	Co-Hosted with the Bluetooth Special Interest Group	<a href="http://www.imsconferences.com/bluetoothevolution/">http://www.imsconferences.com/bluetoothevolution/</a>
Oct 22 2008	WiMedia Alliance Open House	JW Marriott Hotel, Seoul, South Korea	-	<a href="http://www.wimedia.org/en/events/openhouse.asp?id=events">http://www.wimedia.org/en/events/openhouse.asp?id=events</a>
Oct 28 2008	WiMedia China Summit	Beijing, China	-	<a href="http://www.wimedia.org/en/events/events.asp?id=events">http://www.wimedia.org/en/events/events.asp?id=events</a>
Nov 4 - 6 2008	Bluetooth Developers Conference	COEX Convention & Exhibition Centre, Seoul, Korea	-	<a href="https://www.bluetooth.org/Events/sig_events.htm">https://www.bluetooth.org/Events/sig_events.htm</a>
Nov 18 - 20 2008	ID WORLD International Congress	MilanoFiori Congress Centre, Milan, Italy	RFID, biometrics and smart card technologies	<a href="http://www.idworldonline.com/index.php?id=about">http://www.idworldonline.com/index.php?id=about</a>
Dec 9 -10 2008	Wireless Coexistence Summit	Hilton Santa Clara, California USA	Facing the challenges of combining multiple wireless technologies	<a href="http://www.imsconferences.com/wcs08/">http://www.imsconferences.com/wcs08/</a>
<b>2009</b>				
Jan 8 - 11 2009	International Consumer Electronics Show	Las Vegas, Nevada, USA	-	<a href="http://www.cesweb.org">www.cesweb.org</a>
Feb 16 - 19 2009	Mobile World Congress	Fira de Barcelona, Spain	-	<a href="http://www.mobileworldcongress.com">www.mobileworldcongress.com</a>
April 1 - 3 2009	CTIA Wireless 2009	Las Vegas Convention Centre, Las Vegas, Nevada, USA	-	<a href="http://www.ctiawireless.com">www.ctiawireless.com</a>
Oct 7 - 9 2009	CTIA Wireless I.T. & Entertainment 2009	San Diego Convention Centre, San Diego, California, USA	-	<a href="http://www.ctiawireless.com">www.ctiawireless.com</a>

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