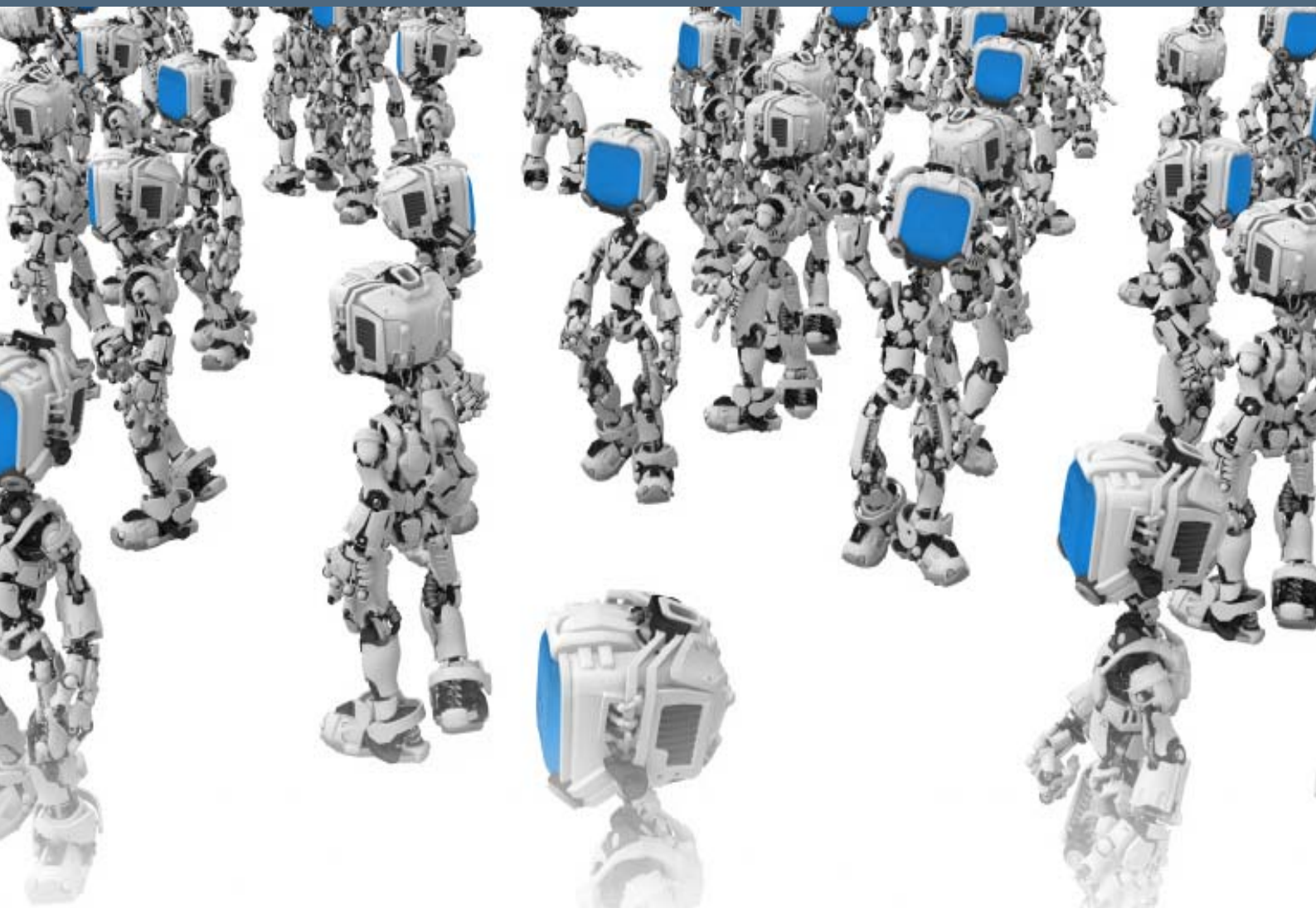


# INCISOR™

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Video enabled  Issue 148

August 2010



## BLUETOOTH 4.0 COMES OF AGE

### THIS ISSUE

LOW ENERGY STANDARD ADOPTED, CERTIFICATION STARTS  
HIGHLY EFFICIENT DSP DEVELOPMENT  
THE DEMISE OF THE WRIST WATCH. OR NOT, ACTUALLY

# bluetooth 4.0 kills zigbee ... err ...

As I'm sure all Incisor readers will be aware, July was a big month in the Bluetooth world, as the SIG announced the formal adoption of Bluetooth Core Specification Version 4.0. This also means that the Bluetooth SIG Qualification Program is now open for qualification of all Bluetooth product types to the Version 4.0 Specification.

Now, as we also all know, the 'hallmark' feature of Bluetooth 4.0 is low energy technology. This really does seem to be a big deal. As Dean Gratton comments in his feature in this issue, West Technology Research Solutions is forecasting that Bluetooth low energy will dominate the wireless sensor networking market, and that come 2015, half of all silicon shipments in this sector will be Bluetooth low energy. Dean goes on to remark that 'manufacturers have already come prepared to synchronise with the recent adoption and qualification opportunity'.

I don't disagree with any of this. I think Bluetooth 4.0 will be a big deal. I said so on LinkedIn at the [Incisor.TV WPAN World group](#). What happened then surprised me. As often happens with these discussions, it went completely off track and metamorphosed into a 'Bluetooth low energy will kill ZigBee / it can't kill ZigBee because ZigBee is already dead' discussion. You can read the discussion [here](#), and maybe add your own comments.

It would be good if we could get some enthusiastic promoters of ZigBee to speak up. We are completely open to this. And having some kick-back from the ZigBee world would make it less of an easy target for the wireless raptors.

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

## INCISORTV FOCUS THIS MONTH:



As Bluetooth 4.0 with low energy comes of age, Incisor.TV looks back at the movie we made for the Bluetooth SIG to mark the occasion when Wibree was officially merged into the Bluetooth specification. It's June 2007 all over again.



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## Bluetooth SIG formally adopts Bluetooth core spec V4.0

During July the Bluetooth Special Interest Group (SIG) announced the formal adoption of Bluetooth Core Specification Version 4.0, with its hallmark feature, low energy technology. The Bluetooth SIG Qualification Program is now open for qualification of all Bluetooth product types to the Version 4.0 Specification.

“The finalization of Bluetooth low energy wireless technology within the Core Specification is a monumental achievement,” said Mike Foley, executive director, Bluetooth SIG. “Bluetooth wireless technology can now, with the hard work of our members and our world-class qualification program, really do it all.”

In a recent report from West Technology Research Solutions, the opportunity for Bluetooth low energy was said to be considerable. Kirsten West, principal analyst with WTRS commented: “Bluetooth low energy will be a significant contributor to the overall Wireless Sensor Network market, representing nearly half of all shipments in 2015. The advantage of this new protocol is that it is totally optimized for low power battery operation.” The SIG believes that many markets such as health care, sports and fitness, security, and home entertainment will be enhanced with the availability of small coin-cell battery powered wireless products and sensors now enabled by Bluetooth wireless technology.

The SIG lists the key features of Bluetooth low energy as:

- Ultra-low peak, average and idle mode power consumption
- Ability to run for years on standard coin-cell batteries
- Low cost
- Multi-vendor interoperability
- Enhanced range

The SIG’s 37th testing event, UnPlugFest (UPF) 37, is scheduled for the 4th – 8th October in

Barcelona, Spain and is set to be the first occasion on which Bluetooth SIG members will perform interoperability testing utilizing the adopted Bluetooth Core Specification.

See Incisor’s Bluetooth 4.0 feature in this issue.

## Texas Instruments qualifies Bluetooth low energy

We’ve not heard much from them recently, but on the same day that the Bluetooth Special Interest Group (SIG) announced the formal adoption of Bluetooth low energy technology, Texas Instruments (TI) announced full qualification of its Bluetooth low energy stack supporting the BlueLink and WiLink connectivity combo solutions. TI also achieved Bluetooth v4.0 controller qualification on the CC2540 low-power, single-mode system-on-chip (SoC) running both protocol stack and application software.

TI told Incisor that it has now certified the full set of components, including ATT, GATT, GAP and SMP that encompass Bluetooth protocol implementation.

“Inclusion of the Bluetooth low energy specification is a foundational step in extending manufacturer and consumer connection capabilities in markets like mobile health and wellness,” said Rick Cnossen, president and board chair, Continua Health Alliance. “We selected Bluetooth low energy for our Continua Version Two Design Guidelines as a result of the promise behind this technology, and believe TI’s Bluetooth low energy solutions will deliver exciting use cases within Continua’s ecosystem.”

TI’s Bluetooth low energy dual-mode devices are available now. TI’s CC2540 single-mode Bluetooth low energy technology solution will be available in fall 2010. TI believes that Bluetooth v4.0-based products are expected to debut in the first half of 2011.

## Wicentric announces Bluetooth Low Energy Protocol Stack

Wicentric, which is a provider of Bluetooth software solutions, has announced exactLE, a protocol stack for Bluetooth low energy devices. Wicentric’s exactLE stack has been qualified to the recently adopted Bluetooth Core Specification Version 4.0.

The exactLE protocol stack is designed specifically for Bluetooth low energy single-mode products such as sports/fitness sensors, mobile phone accessories, and healthcare devices. Wicentric claims that with its small code size, easy-to-use APIs, and portable architecture, exactLE is a superior solution for companies looking to develop Bluetooth low energy products while reducing time-to-market.

“With the launch of exactLE, we are ready to turn the vision of Bluetooth low energy technology into reality,” said Jason Hillyard, founder and CEO of Wicentric.

Wicentric told Incisor that the key features of the exactLE protocol stack were: that it was designed from the ground up for battery-powered, resource-constrained devices, the code size can be as small as 10kbytes, the Wicentric Software Foundation (WSF) layer enables easy porting to any microcontroller or operating system, a flexible HCI layer supports both single-chip SoC solutions and dual-chip solutions (separate microcontroller and Bluetooth controller) and that the solution has been proven on embedded processors like the ARM Cortex-M3 and other popular processors.

Earlier this year at the Bluetooth All Hands Meeting, Wicentric demonstrated a proximity and alerting application using a Bluetooth low energy single-mode system-on-chip from a leading chip maker (you can see this demo as part of the IncisorTV AHM review – [click this link](#) – 05min:47). Now Wicentric is also demonstrating the same application using the exactLE stack running on the EFM32 Gecko microcontroller from Energy Micro along with the EM9301 Bluetooth low energy controller from EM Microelectronic.

Wicentric’s exactLE protocol stack is available now under license agreement.

# news



## CSR launches single mode Bluetooth low energy chip

CSR has launched its first single-mode, single-chip Bluetooth low energy platform, CSR  $\mu$ Energy. The CSR  $\mu$ Energy platform will provide everything required to create a Bluetooth low energy product with RF, baseband, microcontroller, qualified Bluetooth v4.0 stack, and customer application running on a single chip.

“The CSR  $\mu$ Energy platform unlocks the potential of the Bluetooth low energy standard and is a huge step forward in consumer wireless technology. Bluetooth low energy technology is an alternative to the fractured market of proprietary and poorly adopted standards and can be deployed in a variety of everyday devices, changing the way that we interact with our local environment,” commented Anthony Murray, Senior Vice President of the Audio and Consumer Business Unit at CSR, “The ultra low power consumption of CSR’s  $\mu$ Energy platform enables a new range of accessories to connect to the mobile phone, TV, PC, media player or tablet, enabling consumers to experience the power of these services in the home or products that they carry. Bluetooth low energy sensors in consumer products will enable their behaviour to be customised to the needs of the user, and tags will enable consumers to search and locate products and services around them.”

Analysts predict that Bluetooth low energy will enable new markets for wireless accessories or wireless-enabled products. Fiona Thomson of IMS Research said, “The technology will bring wireless connectivity to a whole new class of devices that have never used it before. The industry is at a key turning point with this technology right now and with the launch of the  $\mu$ Energy platform of products, CSR

is in a great position to drive this market forwards.”

The CSR  $\mu$ Energy platform has been optimised to support only Bluetooth low energy features, allowing products to be tiny, cost-effective and power-efficient. CSR told Incisor that its chips can run for years on a single coin cell battery, and may be used in simple sensors such as a step counting foot pods, heart rate monitors or car keyfobs, as well as in more complex low power devices such as a watch that can control and display information from a mobile phone.

CSR’s  $\mu$ Energy chips are apparently available to lead customers now.

### ... qualifies dual- and single-mode Bluetooth LE

CSR has also qualified its Bluetooth v4.0 host stack software. This enables a complete CSR solution for both dual-mode and single-mode Bluetooth low energy products.

## CSR buys APT apt-x audio compression technology

It has been a busy time at CSR! The company has acquired 100% of the share capital of Belfast-based APT Licensing Ltd (APT), following a three year collaboration under the CSR eXtension Partner Programme. CSR’s press release states that assuming a neutral net debt position for APT, it would lead to the cash consideration payable being \$7.25m, which includes \$3m of milestone-based deferred consideration. On the same day, CSR also announced its Q2 2010 results, which saw first half revenue growth of 44% with a six point improvement in gross margin. This didn’t stop the CSR share

price falling by more than 13% on the morning of the announcement.

CSR says that the acquisition is intended to enable a tighter integration of the apt-x low latency audio compression CODECs with CSR’s next generation audio products, and to enable CSR to substantially strengthen its offering in the growing real-time streaming audio market for mobile and wireless consumer applications and support its expansion into broader audio markets.

APT is renowned for non-destructive, transparent, audio compression solutions, which retain the integrity of the original digital audio and are optimised for instant real-time audio streaming. The apt-x suite of audio compression algorithms has earned a reputation for some of the highest audio quality, combined with extremely low latency and strong resilience to bit errors, having been proven in wireless, broadcast and professional live performance applications. To read Incisor’s opinion on how APT (or APTX as we’ve been calling them up until now) has been dominating the Bluetooth audio market, see Incisor’s news report in this issue.

APT joins CSR with existing IP licensing agreements in place with industry-leading consumer and technology brands, including Altec Lansing, Creative, Jaybird, and Sennheiser.

CSR’s CEO Joep van Beurden commented, “In acquiring APT, CSR is buying one of the industry’s strongest audio IP portfolios and a 20 year heritage in audio expertise. The closer integration of APT’s IP with our own technologies will expand the market for its technology to more mainstream consumers and enable us to realise benefits that neither party could achieve independently.”

Click [this link](#) to watch APT CEO Noel McKenna talking to IncisorTV earlier this year.



## APT-X continues to plunder Bluetooth audio market

For the past few months it seemed that not a week went by when we didn't receive a press release from APTX telling us of another successful design win for the company's apt-X audio coding technology – obviously CSR noticed too! This time it was Chord Electronics Ltd, the renowned British manufacturer of high-end audio equipment, which has included apt-X in every Stereo Bluetooth enabled module in the company's recently launched Chordette range of compact Hi-Fi components

Available under license agreement to consumer electronics OEMs and mobile computer OS developers, apt-X audio coding ensures that the performance of wireless audio systems, most commonly Bluetooth-enabled in the cases we hear about, enable the precision reproduction of the full spectrum of audio frequencies (20Hz – 22kHz) required for a genuine Hi-Fi sound experience.

Chord is implementing apt-X in four of nine new Chordette modules – PEACH, GEM, MAXX and TOUCAN BLUE – to guarantee both the stereo quality and signal integrity of wireless audio content streaming from Bluetooth A2DP enabled media players such as Apple iPod, iPhone and Mac, as well as PCs, mobile phones and gaming consoles. Hi-Fi users typically prefer listening to music archived in high-definition uncompressed and “lossless” formats (eg, FLAC) rather than highly-compressed “lossy” formats (MP3, AAC).

Commenting on the deployment of apt-X in Chordette modules, John Franks, CEO of Chord Electronics said: “The PEACH – the next-generation DAC module in the Chordette range – is designed to interface Hi-Fi systems to digital audio sources streaming high-quality stereo audio via Bluetooth A2DP. For true Hi-Fi sound, stereo Bluetooth really needs apt-X.”

APT-X' CEO, Noel McKenna, added: “These are extraordinary times for apt-X in several respects. First, there's the healthy uptake of apt-X by more and more consumer audio brands, both the mass-

market types and niche pro-audio high-ends like Chord. Second, there's the up-lift in brand awareness of apt-X thanks the growing number of CE products carrying the apt-X logo now selling via major electronics retailers like Amazon and Apple Store. Third, and not least, there's the turnaround in industry respect for Stereo Bluetooth as the go-to wireless technology for streaming high-quality audio.” Back in January, APTX, together with Creative, won the “Best of CES” Bluetooth SIG award at the Consumer Electronics Show in Las Vegas for the Inspire S2, a wireless 2.1 speaker system featuring apt-X. This event was filmed by IncisorTV, and you can [view the movie here](#), and watch an [interview with Noel McKenna here](#).

## TRaC opens largest test facility in NW England

TRaC, the testing, certification and validation company, is celebrating a major expansion of its operations in the North West of England. The company has opened a new 15,000 sq. ft. centre of excellence in Up Holland, Lancashire, making it the largest commercial facility in the North. TRaC is already the biggest British test and certification company and the new facility complements the existing Hull facility that is the largest in the North East.

TRaC provides testing and certification services for compliance with EMC (Electromagnetic Compatibility) regulations; wireless, radio and telecoms standards; and environmental and safety requirements, and holds a range of accreditations to issue product approvals to national and international standards: through a combination of its own facilities and worldwide partnerships, the company offers global reach.

“With intense competition and an economic environment that remains challenging, our customers are under intense pressure to reduce the time to test and certify their products,” said Mark Heaven, TRaC's Chief Executive. “By providing facilities across the country TRaC can work closely with our customers in the design, test and certification stages of a project, removing the hassle of dealing with remote test facilities, reducing the

risk of products failing certification and helping customers get their products to market sooner.”

The Up Holland site offers extensive EMC facilities in five absorber-lined shielded enclosures, or ALSEs – that house the full range of radiated and conducted testing regimes. Additionally, the site carries out environmental and safety testing to certify compliance to standards such as the Low Voltage Directive (LVD), or to DSEAR/ATEX requirements for dangerous and explosive materials.

## Marketers should wake up to the potential of mobile

It's not a tsunami. But the first waves of what could become a marketing “perfect storm” are already lapping at the feet of marketing departments in many parts of the world, and according to ABI Research practice director for mobile marketing strategies Neil Strother, it's time for marketing professionals to take note.

“The trend starts with smartphones, which have reached critical mass among US mobile subscribers,” he says. “These powerful devices, coupled with affordable data plans, enable people to search, browse, and watch video in ways and in volumes that have become more and more attractive to marketers.”

A February, 2010 ABI Research consumer survey revealed that only about 15% of the mobile phone subscribers who accessed the Internet at least occasionally had never used their phone's search engine, used a mobile yellow pages, or clicked on a mobile web advertisement.

Marketing messages can reach mobile users in a variety of ways: text messaging, search advertising, ads within applications, and video (streaming and on-demand). This range of options means that marketers can tailor the delivery medium to each particular kind of branding message or call-to-action.

“Consumers appear consistently receptive to location-based promotions,” adds Strother, “as long as they are not used in an invasive or abusive manner.”

# news

## DLNA / UPnP boost in-home media networking with Windows 7

Support for DLNA in Windows 7 will spark significant growth in Universal Plug and Play (UPnP) and Digital Living Network Alliance (DLNA) technology, which is used to make in-home media sharing easier, reports market research company In-Stat. Shipments of DLNA-enabled devices will surpass a billion units by 2014, up from several hundred million in 2009. Attached rates for UPnP are also growing and will slightly exceed those of DLNA.

UPnP enables devices from multiple vendors to communicate with one another. DLNA builds upon UPnP to provide interoperability of media across devices.

"While UPnP and DLNA are seeing increased adoption and unit shipments, it may take several years before large numbers of consumers use the technology" says Norm Bogen, In-Stat analyst. "The number of consumers who realize they have this functionality and understand its implications continues to be very low."

Recent research by In-Stat found the following:

- Handsets, PCs, and digital televisions will account for 74% of the DLNA market.
- Over 85 million DLNA-enabled Blu-Ray Players/Recorders will ship in 2014.
- Digital media controllers make up the smallest volume of UPnP shipments compared to Digital media servers and Digital media players, however, accounts for the largest growth area.

In-Stat's research, "UPnP and DLNA – Standardizing the Networked Home" covers the worldwide market for UPnP and DLNA.

## Successful first CAT-iq 2.0 interoperability tests

The DECT Forum tells us that the first IOP Plugtest (Interoperability Test) for CAT-iq 2.0, which was carried out in cooperation with ETSI (European Telecommunications Standards Institute), was a success. This means that the way is clear for certification of CAT-iq 2.0 products to begin in September 2010.

At the official Plugtest event for CAT-iq 2.0 in Sophia Antipolis (France), silicon manufacturers,

system vendors, OEMs, and carriers tested the interoperability of their CAT-iq 2.0 implementations against other devices and systems. The event brought together Cetecom, Dosch&Amand, DSP Group, Lantiq, RTX, Technicolor, and VTech. With all participants testing against each other, the implementations benefitted from real life test scenarios. The positive result of the IOP Plugtests allowed the DECT Forum and ETSI to conclude that the current raft of CAT-iq implementations are stable and interoperable. The DECT Forum and ETSI will schedule a second Plugtests event in early September.

"This successful Interoperability Test is an important milestone for the DECT Forum and the entire value chain of the DECT and CAT-iq industry. This means that the official CAT-iq 2.0 Certification Program can begin in September 2010", said Daniel Hartnett, Chairman of the CAT-iq Working Group within the DECT Forum. "With this the market launch of first CAT-iq devices will happen before the end of 2010."

For anyone not yet up to speed with CAT-iq, which is the next generation of DECT technology, then you can watch the [Incisor.TV movie here](#).

## Industry leaders use **INCISOR.TV** web video

Incisor.TV creates high-quality web TV content for companies in the technology sector. Here are examples of recent Incisor.TV movies. These are now showing on the web sites of Bluetooth headset company Jabra, and the energy harvesting technologists at the EnOcean Alliance.

Click on the images to view the movies at the Jabra and EnOcean web sites.

If you wish to include high-quality Internet TV content on your web site, and whether it is a two minute commercial, a CEO blog or a full company profile, Incisor.TV can deliver.

Our turn-key service includes concept, scripting, filming, editing, output to your spec and all pre- and post-production. Anywhere in the world, at an extraordinarily low cost.

Click [here](#) to see other examples, and contact [Vince Holton](#) for more information.





# New Bluetooth Version 4.0 Specification kicks off race to create low energy devices

by John Swenson, Bluetooth Special Interest Group

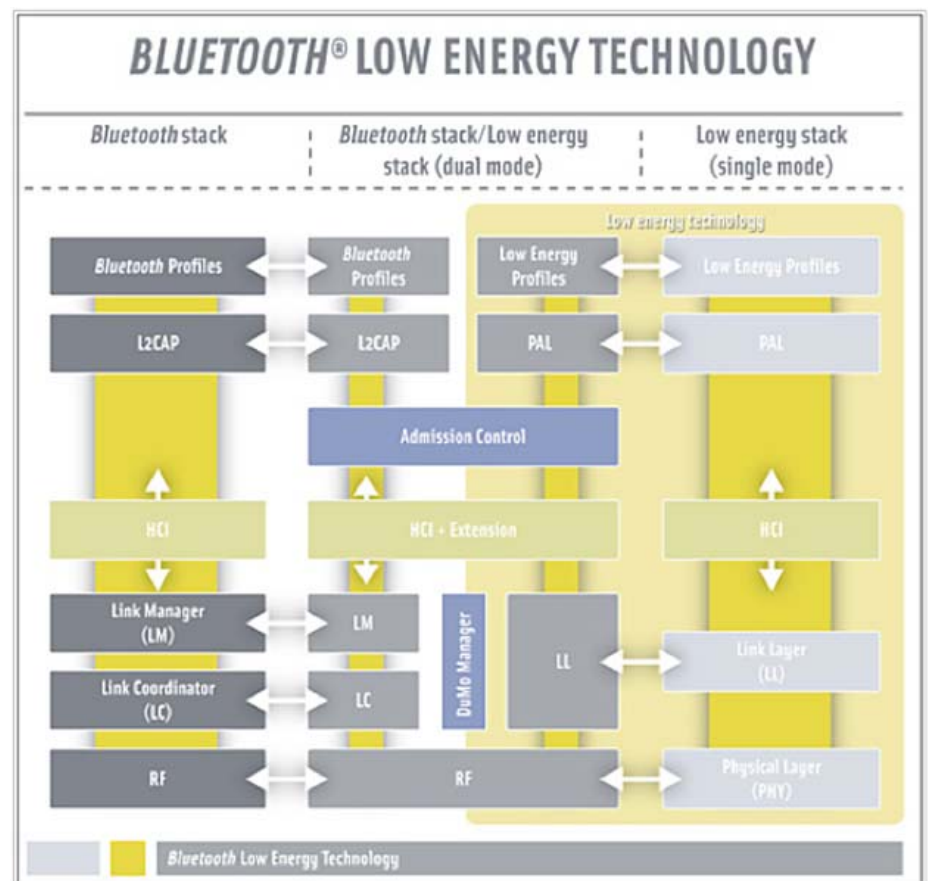
The Bluetooth SIG has announced the approval of its long-awaited Bluetooth Core Specification Version 4.0 with the hallmark feature, Bluetooth low energy technology, clearing the way for the development of a new generation of wireless devices. The groundbreaking announcement was years in the making, as SIG members worked tirelessly to finish the comprehensive, new 2,300-page enhancement to the Specification.

With both the host and controller of the new Bluetooth v4.0 in hand, engineers at the more than 13,000 Bluetooth SIG member companies worldwide can now start designing, developing, and building a wide range of Bluetooth enabled devices that require very little power. Not just learning about this new technology and providing feedback on the Specification, but also creating many products, the first of which are expected to reach the market this fall.

Some of these new low energy devices will be able to operate for years on just a tiny, button-sized battery. The ability to run on such a miniscule amount of power - as little as 10 percent of the energy used by Classic Bluetooth devices - will enable a host of new uses for wireless products in everything from sports and fitness to healthcare and home entertainment.

## New uses of wireless technology

Although Classic Bluetooth technology is already found in many fitness and health care devices, low energy technology will enable great enhancements for this market. These new low energy products will allow people to collect and use information in completely new ways. For example, there are health sensors now that can collect information about your health, such as pulse, blood pressure, temperature, and blood-glucose level.



The BLUETOOTH v4.0 Specification provides all the technical details on BLUETOOTH low energy technology

Think how much better it will be when someone just discharged from the hospital can go home to complete their recovery in familiar, comfortable surroundings and continue to have all their critical information automatically collected, saved and sent to their health care provider for analysis.

Small sensors on their body could send information wirelessly to a device that in turns sends that information over the Internet to their doctor or other health-

care provider. The patient could be at home, resuming their daily routine or even at their office working when their doctor checks to see how they're doing, without them even being interrupted or having to return to the hospital for a check-up. Low energy technology will allow sensors and devices to keep working for long periods of time before someone has to take them off to charge them or change the battery.

Similar scenarios will happen with Bluetooth low energy enabled fitness





devices. You could come back from a bike ride or run and have your time, pace, heart rate, distance, and other workout information automatically uploaded to your PC, as soon as you walk in the door. Then you could analyze your workouts to your heart's content, or make the data available over the Internet for your personal trainer or friends. Some of this is possible today, but Bluetooth low energy devices promise to make it all more convenient, hassle-free, and affordable.

One of the key benefits of low energy devices will be this ability to help you collect valuable data, save it and distribute it to others who care about it, whether that's your doctor, friends, personal trainer, or even just making it available online to yourself.

#### **Early adopters of low energy technology**

Some of the first companies working on Bluetooth low energy are Bluetooth SIG members that provide the building blocks that other companies will use to create low energy devices. These early adopters include CSR, Texas Instruments, Broadcom and Wicentric, which each announced the qualification of their own low energy host stack software.

**CSR:** "Bluetooth low energy technology has the potential to create a whole new ecosystem of connected devices that can significantly enhance the lives of billions of people worldwide," says Kanwar Chadha, chief marketing officer for CSR. "As mobile handsets, personal computers and consumer electronics products deploy the new Bluetooth v4.0 standard, it creates an opportunity for linking these platforms to billions of connections powered by

Bluetooth low energy technology in devices as varied as remote controls, watches, toys, medical instruments, home automation and smart energy controls."

CSR says its new Bluetooth v4.0 host stack software has allowed it to create a complete solution for both dual-mode and single-mode Bluetooth low energy products.

**Texas Instruments:** TI says it has achieved both controller and host stack certification under the new Bluetooth v4.0 Specification. The company has qualified a low-power, single-mode system-on-chip running both protocol stack and application software. TI says this fulfilled its promise "to drive single- and dual-mode Bluetooth low energy technology support – bridging the gap between the mobile and sensor worlds."

**Broadcom:** The company has certified both its core Bluetooth stack and Bluetooth system-on-a-chip solutions for Bluetooth v4.0, achieving Bluetooth v4.0 controller and host stack certification.

"With the introduction of Bluetooth low energy technology, Bluetooth technology is now expanding into new classes of devices," says Craig Ochikubo, General Manager for Broadcom's Wireless Personal Area Networking. He predicts the Bluetooth v4.0 Specification will lead to new and innovative uses of wireless technology in PCs, mobile handsets and consumer electronic devices, as well as new classes of wireless devices.

**Wicentric:** The company has certified a new protocol stack designed specifically for Bluetooth low energy single-mode

products such as sports and fitness sensors, mobile phone accessories, and healthcare devices. Wicentric's stack is designed from the ground up for battery-powered, resource-constrained devices, and has a code size as small as 10 kilobytes.

#### **Key facts about Bluetooth low energy technology**

Hallmark features of Bluetooth v4.0 low energy technology are:

- Ultra-low peak, average and idle mode power consumption
- Ability to run for years on standard, coin-cell batteries
- Low cost
- Multi-vendor interoperability
- Enhanced range

Bluetooth low energy is an enhancement to the Bluetooth Core Specification that enables both single-mode and dual-mode implementations. In dual-mode implementations, Bluetooth low energy functionality is integrated into an existing Classic Bluetooth controller, enhancing the development of Classic Bluetooth enabled devices with new capabilities. The resulting architecture shares much of the existing radio technology and functionality, resulting in a minimal cost increase compared to Classic Bluetooth technology. This type of implementation also provides opportunity for a 3-in-1 implementation incorporating Classic, high speed and low energy versions of Bluetooth technology, expanding opportunities for a wide range of wireless implementations.

Single-mode chips support only Bluetooth low energy. This type of implementation will enable highly integrated and compact devices with the benefits of advanced power-save functionality and secure encrypted connections at the lowest possible cost. With a lightweight Link Layer, single-mode chips provide ultra-low power idle mode operation, simple device discovery and reliable point-to-multipoint data transfer.

Dual-mode devices, which will include mobile phones and PCs may support both low energy and Classic Bluetooth technologies via a dual-mode radio feature and will be compatible with Classic Bluetooth devices. However, single-mode Bluetooth low energy devices will not interoperate with existing Bluetooth devices. Current Bluetooth enabled products will not be able to add low energy technology with a software upgrade. Bluetooth low energy technology will require new hardware.

The first Bluetooth low energy devices should start arriving in mid-2010, with many more expected in 2011.

## ANALYSING BLUETOOTH LOW ENERGY

# Bluetooth 4.0, from those that know ....

**Vince Holton talks to Paul Williamson, product marketing manager at CSR, in order to discuss the real potential of Bluetooth 4.0, and to drill down behind some of the statements in CSR's Bluetooth low energy single mode chip announcement. Incisor has also pulled in the views of two other companies to whom Bluetooth low energy is an important addition to the portfolio – wristwatch company Fossil, and test and certification company TRaC.**

**VH:** The WPAN community is abuzz at the moment with the topic of Bluetooth low energy. Could you clarify one or two points in the CSR press release? For example, you mention that Bluetooth low energy (BLE) sensors in consumer products will enable their behaviour to be customised to the needs of the user, and tags will enable consumers to search and locate products and services around them. I think I understand this, but could you expand?

**PW:** This comment refers to the concept of machines or services customizing their behavior based on the identity of the person that is using the system. In automotive the common example is a luxury vehicle that adjusts the seat position settings to match the key fob as you approach the car.



With Bluetooth low energy this customisation can be expanded to other consumer experiences.

For example, in the home, when controlling the TV it shows you're favourite channels and widgets first. Likewise the display of your BLE watch could change from time only to heart rate, phone call control, or audio control, depending on the local accessories.

In the longer term, your BLE enabled phone or watch could be used to enhance your experience of other services. Product or service offers could be locally advertised to an app on your phone.

**VH:** Amongst the applications that you list for BLE, you include the remote

control. This is hot territory at the moment, and a number of wireless technologies, notably ZigBee, are gunning to replace infra red as the RF alternative of choice. Will ZigBee prevail, or are there good reasons why BLE – or another technology for that matter – stands a better chance?

**PW:** Well, with RF4CE, the ZigBee community has been chasing the remote control market for about three years, and I don't see an abundance of ZigBee-based remote controls yet. It's true that there are a number that use the 802.15.4 radio, but they then use proprietary technology on top of that, not ZigBee.

The key here is that in the remote control application it is likely that manufacturers will use dual-mode Bluetooth. This is because of the fact that in addition to the simple functions of existing remote controls, Bluetooth-enabled devices will be able to communicate with and control other devices in the room. We're aware that levels of connectivity between devices are increasing, and that applications are appearing that allow us to use the Internet on our TV's, tablet computers, smartphones etc. Bluetooth is already in billions of these devices, and by simply adding a dual-mode Bluetooth device, consumer electronics companies will be able to open up a world of connectivity in addition to providing the basic remote control function. This will be great for consumers.

**VH:** Automotive keyless entry is another 'key' application (sorry ...). Why are the car companies taking so long to implement Bluetooth in these devices?

**PW:** Well, put simply, Classic Bluetooth was not suitable for key fob applications, due to the power consumption. Bluetooth has been widely adopted for car companies for handsfree and infotainment systems, and so this is another area where dual-mode Bluetooth is the perfect system, managing existing in-car systems, and with BLE managing the basic, low-power keyless entry requirement.

**VH:** You also mention the watch application, and this is another one that

seems to be taking a long time to gain traction. Sony Ericsson has been selling Bluetooth-enabled watches developed by Fossil, using a 'Classic' Bluetooth solution for about three years now. David Rosales of Fossil is writing about the watch application in this issue of Incisor. In my experience it works well, and when I show it to people, they think it is great – although nobody ever knew these Bluetooth watches existed! Apart from a lack of awareness, why has this application not taken off more quickly, why have other manufacturers not entered the market, and will BLE accelerate the process?

**PW:** In my view this was really all about power consumption. The watch companies seem to have been unsure that consumers would be prepared to re-charge their watches on a regular basis (*note from Vince: I wear a second-generation Sony Ericsson Bluetooth watch and I only have to charge it about every three months – that's fine for me. Also see the side-bar comments from Fossil's David Rosales, overleaf*). There's no doubt that the extended battery life provided by BLE will accelerate the acceptance of Bluetooth-enabled watches, and in turn, increased consumer confidence will promote take-up by the watch industry.

**VH:** Your release also mentions BLE's application in lighting control systems. Is there a future in lighting control/other building automation for any tech that requires batteries? Surely, energy harvesting technologies such as EnOcean are the way forward?

**PW:** EnOcean's batteryless technology does make a lot of sense in lighting control and building automation. Despite the fact that an RF-based system does away with the need to hard-wire systems in new buildings, there are new complications arising from the need to create self-supporting and repairing networks. There have been attempts to promote technologies such as ZigBee into this type of environment, and it has been far from plain sailing. Bluetooth low energy is really about point to point communication, rather than large scale automation of lighting and control systems. BLE will be used for lighting



control, but it will be in home automation systems, within rooms, where a Bluetooth-enabled smartphone or tablet is being used to control a media centre, PC, lighting, security or door-entry systems.

**VH:** This question is curiosity based, and results from watching CSR's practices over more than 10 years. When the Bluetooth SIG ratifies a new standard, I'm used to CSR announcing a product qualified to the new standard on the same day. This time, CSR's announcement of its single mode chip came some time after the Bluetooth SIG's announcement of formal adoption of

Bluetooth 4.0. Is there any particular reason for the delay?

**PW:** There's nothing sinister! We did announce qualifications at the time of the SIG's press statement, but delaying the announcement of the single-mode  $\mu$ Energy product was a conscious decision. We've been very keen to not only be sure that the product was completely market ready, but also that we should avoid any over-hyping of Bluetooth low energy.

We put a great deal of time and energy into assessing the market for BLE, and we are sure that the potential is huge. As far

as CSR sees it, it is the gateway application that creates the biggest opportunity for BLE. Bluetooth is already present in hundreds of millions of devices that provide a gateway to the Internet for mobile devices such as handsets. A dual-mode Bluetooth solution extends that connectivity beyond the handset, PC etc, and not only into the well-documented new application areas such as healthcare, sports and fitness and home automation, but we also see that there is a potentially huge market for applications that embrace proximity-based advertising, local services location, etc, all of which can be enabled by BLE sensor technology. This is genuinely new, and very exciting.



## From 'Mr Watch' – David Rosales, director of watch technology, Fossil

You're asking me why the connected watch category has not taken off since we first launched in 2006. We have been working on connected wearables for a long time, and I think there are three big reasons:

1. Consumer education regarding what watches and phones can do together is still very early. There will be progress here, but it will take time.
2. It is difficult and expensive to develop these watch systems. The barrier to entry for developing these low-power, embedded wireless systems is quite high. Look for an announcement from us later this year to help address this issue.
3. Until very recently, the smartphone has not been a major player in mobile. We are now seeing a major shift towards smartphones and we are witnessing the

beginning of the mobile Internet age. The growth of smartphones and the many connected services that smartphones provide will create a demand for more simplicity in this experience. Watches can help to provide that simplicity.



## "Bluetooth low energy set to enhance existing industries" says Joe Lomako, Business development manager, TRaC

Bluetooth V4.0, also known as Bluetooth Low Energy is upon us, and TRaC is seeing an increasing number of enquiries from companies who are looking to employ this fascinating new flavour of Bluetooth.

It is interesting to note that the expectation for this technology is so high that months before its final release it had been ear-marked by many high profile companies and alliances as a preferred technology.

This is particularly so in the medical industry; TRaC has been assisting medical device manufacturers

throughout their development process for many years and has seen many of these manufacturers increasingly employing low power wireless technology in the primary function. It is not surprising therefore, that Bluetooth Low Energy is now one of those low power wireless technologies that is automatically considered as a transport.

In addition to the medical device industry there are also many other applications which will benefit from the low energy technology. Applications such as Home Automation, Smart Energy, Automotive and Health are all examples of industry sectors which will see improved versatility particularly when used in

combination with other similar low power technologies.

Of course the Bluetooth Qualification process for Bluetooth V4.0 has differences and additions from what is already required, but TRaC is prepared to provide its existing and new customers with the usual expedient service they are used to. This, combined with TRaC's existing portfolio of services, provides the Bluetooth product manufacturer with a seamless route to market, allowing them to get on with the most important work - coming up with new ideas for ways that the technology can be used.

Read the lively Bluetooth 4.0 related discussion at the Incisor.TV WPAN World group on



[Click here](#) to read all comments.

# A case of déjà blue: Bluetooth low energy hits the headlines!

by Dean Anthony Gratton

It's finally been adopted! The Bluetooth Special Interest Group (SIG) made the announcement in July 2010 – the all new Bluetooth low energy specification is now available and has been formally adopted, following the initial adoption of the low energy technology back in December 2009. Likewise, the Bluetooth SIG Qualification Program is now open, enabling the qualification of Bluetooth v4.0 prototypes. And it seems that some manufacturers have already come prepared to synchronise with the recent adoption and qualification opportunity. For example, Cambridge Silicon Radio (CSR.com) recently released information regarding a new Bluetooth single-mode chip low energy platform, which they have coined **μEnergy (CSR1000 and CSR1001)**. Call me a sceptic, but I have to voice some initial concerns, as I feel definite 'déjà Blue' vibes here with the hype that surrounded the original Bluetooth technology back in 1999 ringing out once again.

## Baby steps ...

Okay, so I'm going to take a look at my iTunes collection while I collect my thoughts. I have recently purchased the debut album from Eliza Doolittle and I'm going to listen to that whilst I tackle this column. It's a Saturday afternoon, the sun is shining (for a change), ducks swim by on the river outside my window and, as usual, I'm accompanied by my trusty glass of red.

I have seen several features and comments surrounding Bluetooth low energy, all of which predict the inevitable success of the technology. However, I'm just a little concerned to see such feedback, as it reminds me of the hype that surrounded Bluetooth's first generation technology. CSR is, as usual, ahead of the pack in offering a single-mode chip platform, but the majority of the low energy market has been secured by technologies such as, EnOcean, Z-Wave, ANT Wireless and ZigBee. Don't get me wrong! I'm not saying Bluetooth low

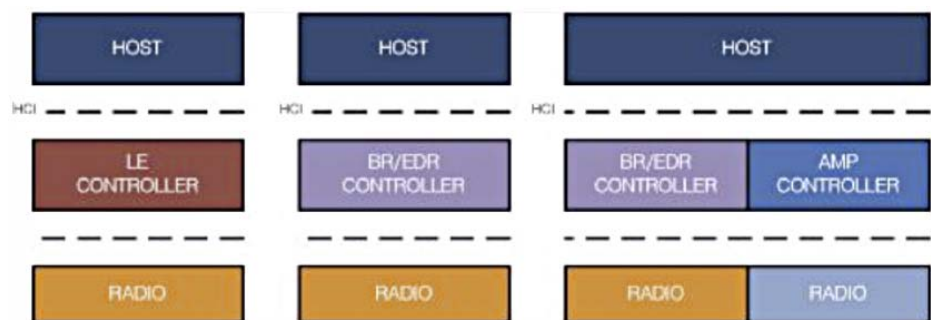


Figure 1: The new possible combinations for low energy, basic and enhanced data rates, and the combination of BR/EDR controllers alongside the alternative MAC/PHY.

energy won't succeed; on the contrary, I really do see a glittering future ahead. However, this cannot and should not be an assumed foregone conclusion until the necessary hard work has been undertaken. And I don't think I'm speaking out of turn here; I'm sure that the advocates of Bluetooth low energy themselves have the wisdom of experience and, dare I say, hindsight to guide them. They indeed have some hard work ahead to establish the technology as a viable low energy alternative and baby steps are needed prior to any premature celebrations.

## A whole new beginning

The new Bluetooth low energy specification has been architected from the ground-up. It has a brand new radio (specific to low energy) and yet still contains the typical software building blocks that we've already seen with classic Bluetooth. The Bluetooth low energy protocol also has some new introductions, but I'll pick this up in a moment. In essence, the new specification provides know-how relating to the operation of Basic Rate (BR), Enhanced Data Rate (EDR), Alternative MAC/PHY (AMP) and low energy (LE) using the typical host and host controller topology, as shown in Figure 1. The illustration shows the new possible combinations following the adoption of v4.0.

The low energy radio still operates in the unlicensed 2.4GHz Industrial Scientific and

Medical (ISM) band, which employs a frequency hopping scheme to overcome coexistence and interference from other similarly-enabled products. The low energy specification offers two multiple access schemes, namely Frequency Division Multiple Access (FDMA) and Time Division Multiple Access (TDMA). To briefly explain, in the FDMA context there are forty physical channels that are separated at 2MHz. Of the forty channels, three channels are reserved for advertising and the remaining 37 are used as data channels. In the TDMA scenario a polling scheme is used. More specifically, a low energy device will transmit a data packet at a predefined interval and likewise, the corresponding low energy device will also respond at a predefined interval. Whilst the physical medium largely remains the same, there is a new way-of-working and some additional terminologies need to be understood. Naturally the master/slave principal is still used, but there are now expanded roles and responsibilities for broadcasting and listening devices. And this is where I provide an overview of some of the fundamental differences when compared with previous versions of the Bluetooth specifications:

## So, what's new

In the new v4.0 specification, the Bluetooth SIG has made a number of changes, especially when compared with v3.0 +HS. In particular, the physical and low energy link layers are most notable –



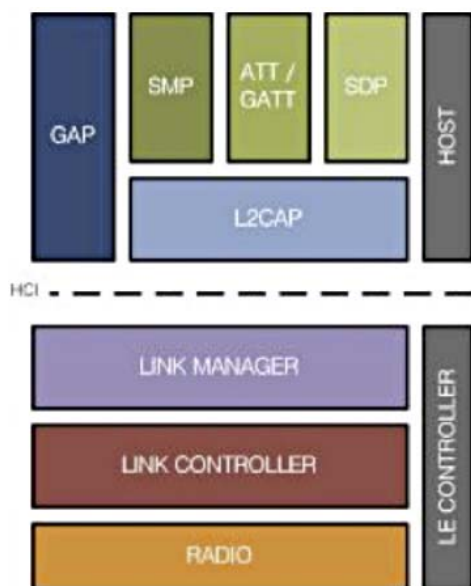


Figure 2: The new v4.0 specification still includes the classic building blocks along with a few new introductions.

ultimately these building blocks have been optimised for low energy. Additional enhancements have also been made to the Host Controller Interface (HCI) to accommodate the low energy expectations, as well as changes to L2CAP and the Generic Access Profile (GAP). Moreover, there is a new protocol, namely the Attribute Protocol (ATT) and a Generic Attribute Profile (GATT), which are shown in context in Figure 2. Finally, the low energy protocol includes a Security Manager and again I illustrate its placement within the low energy stack in Figure 2.

I'll be perfectly honest with you; I have only touched the tip of the colossal iceberg of the Bluetooth v4.0 specification – in fact, if you're interested, there are 2302 pages to wade through. Evidently, its contributors (a diverse collection of companies across the industry) have put in a great deal of hard work to ultimately ensure Bluetooth low energy's success. So, what about the market potential? Where does Bluetooth low energy see itself?

### Industry feedback and analysis

I'm sure many of you have already seen the number of user scenarios and potential

integration opportunities that have been touted for the technology. It may also come as no surprise that the market for Bluetooth low energy is indeed similar to the market already shared by the low energy sensor sector. Undoubtedly, sports, fitness, well-being, health, home automation and so on are targeted by Bluetooth low energy. But what amazes me are some of the (in my opinion) outlandish comments that have been shared among some micro-blog websites, such as LinkedIn. I saw one thread that claimed ANT Wireless was running scared, as the 'déjà blue' brigade predicted that Bluetooth low energy was undoubtedly going to tumble ANT's success. ANT may have a market share of 10 million chipsets (or thereabouts), but it's still 10 million more than Bluetooth low energy! Likewise, I have seen other threads that claim Bluetooth low energy will place a final nail in ZigBee's coffin, but then I've already seen the coroner's report: ZigBee was dead on arrival! Nevertheless, market research seems to suggest that Bluetooth low energy will indeed succeed in the long-term.

A market report offered by West Technology Research Solutions (via [researchandmarkets.com](http://researchandmarkets.com)) and also used in CSR's  $\mu$ Energy platform promotion seems to suggest that Bluetooth low energy will dominate the wireless sensor networking market, where the report claims that, come 2015, half of all silicon shipments will be Bluetooth low energy. The report analyses the usual low energy suspects to include 802.15.4, EnOcean, ZigBee, low power Wi-Fi and, of course, Bluetooth low energy, where a five-year forecast is provided. The report includes contributions from across the entire industry – I sincerely hope that the research purported stands its ground and, as I've already stated, I'm sure that, with the right hard work and a measured sense of reality, Bluetooth low energy will succeed.

### Until next month ...

I was digging around the Bluetooth product directory (as you do!) and, since CSR is dominating the low energy

sector, I was curious about what other products they had to offer. I accidentally stumbled upon a 'CSR Full Wireless desktop' offering that's publicly available on the official Bluetooth qualification product directory website ([click here](#) for more information). In the description provided, a little piece of the information aroused my curiosity and, I dare say, I had to pinch myself several times. In particular, I came across this reference in the product description: "a WiMedia certified 6GHz OFDM AMP". Call me crazy, but this suspiciously looks like Bluetooth over Ultra-wideband using the AMP interface. I'm sure most of you already know that, before the IP-licensing issues which ensued with the WiMedia Alliance members, AMP was originally architected to accommodate Ultra-wideband, but for now it's used with Wi-Fi. I would sincerely welcome the opportunity to discuss this a little further – so, guys please drop me or Vince an email with further information.

I haven't forgotten DASH7 by the way (sorry Pat). I've been a little busy with my new book, which should have been finished a long time ago and I will revisit DASH7 again at some point. So, this is where Dr G signs off this month and I look forward to hearing more from CSR regarding that Ultra-wideband product.

### About the Author

Dr Dean Anthony Gratton is a bestselling author and columnist. He has authored several patents, contentious articles and a number of bestselling books on wireless technology. He has worked within the telecommunications industry for over sixteen years and provides consultancy to a number of high profile companies.



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## Snippets

### Nokia Siemens Networks spends \$1.2 billion at Motorola

Nokia Siemens Networks and Motorola have announced that they have entered into an agreement under which Nokia Siemens Networks will acquire the majority

of Motorola's wireless network infrastructure assets for USD 1.2 billion in cash. The companies expect to complete closing activities by the end of 2010, subject to customary closing conditions including regulatory approvals. Nokia Siemens Networks says it is targeting to

gain incumbent relationships with more than 50 operators and strengthen relationships with others. Meanwhile, Motorola retains the iDEN business, substantially all the patents related to its wireless network infrastructure business, and other selected assets.



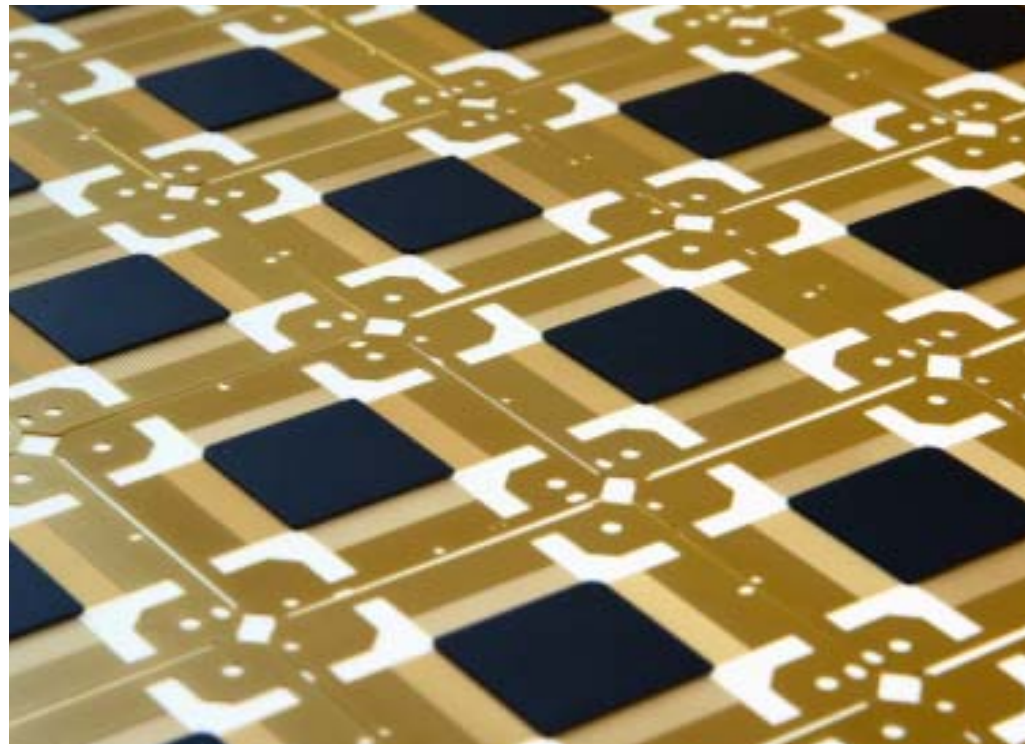
Monty Barlow,  
DSP Group Leader,  
Wireless,  
Cambridge  
Consultants

# Highly efficient wireless DSP development

By Monty Barlow,  
DSP Group, Wireless, Cambridge Consultants

The role of Digital Signal Processing (DSP) within wireless has increased in importance dramatically over the last two decades. DSP has been a critical enabler in the drive to use spectrum in ever more advanced and efficient ways. For a long time radio technology was differentiated by its radio-frequency (RF) analogue hardware; its transmit power, channel bandwidths, operating frequency, receiver sensitivity and blocking performance. However, today many different standards co-exist in the same frequency bands, with the greatest difference being in the form (or waveform) of the signals that they transmit and receive across the Ether. It is the demands and characteristics of these 'waveforms' that deliver the specific advantages and characteristics of each radio system. It is therefore the evolution of Digital Signal Processing (DSP) techniques over the last twenty years that has enabled the rich variety of wireless standards that exist today, from Bluetooth, Wi-Fi and UWB through to GSM, WCDMA/HSPA, WiMAX and LTE.

With one of the largest independent wireless development teams in the world, Cambridge Consultants has seen a massive surge in demand for advanced wireless DSP development services and it is easy to see why. We are helping more and more companies with the DSP technology that is now essential to anything from mobile phones to Wi-Fi access points. In response to this heightened need we have invested in a wide range of development processes and tools that provide highly deterministic and rapid DSP development. In this edition of Incisor, we examine the role of DSP in shaping the wireless landscape today, sharing our experience in efficient DSP implementation.



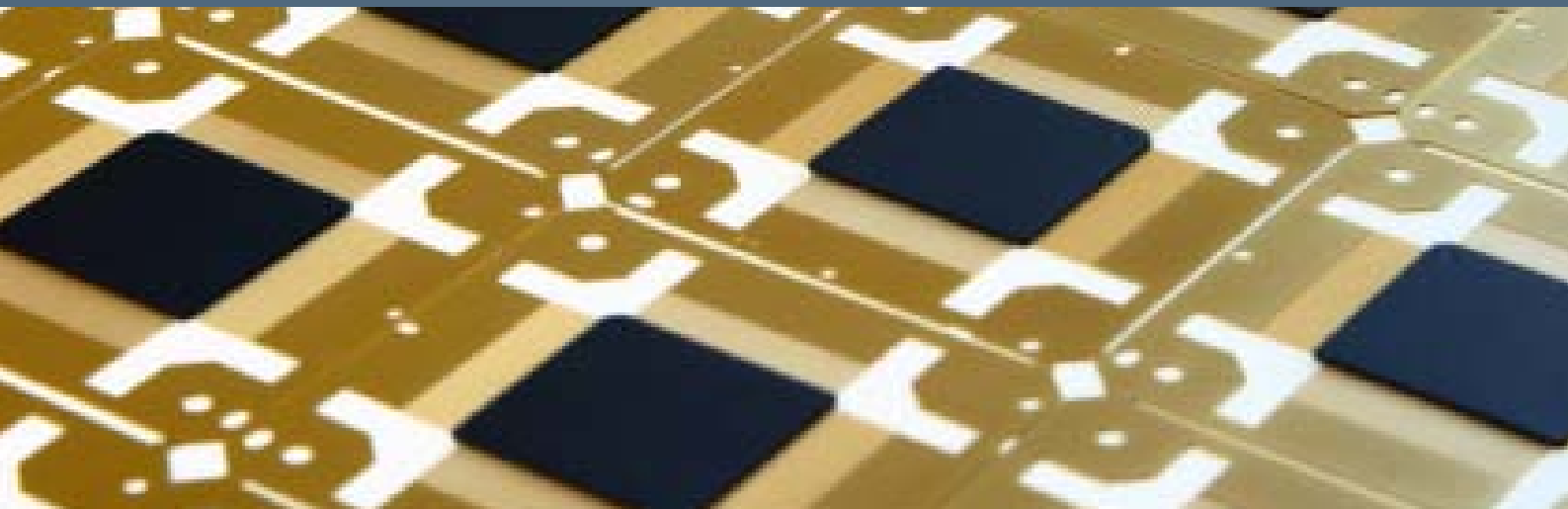
To many people DSP brings to mind the modes in an MP3 player or TV that simulate the sound of different venues. However, hidden inside every modern wireless product is crucial signal processing that creates and interprets radio signals as a stream of mathematical symbols. The advantages of DSP are stark; performance that is unachievable with analogue techniques, the consistency between products that digital approaches deliver, the potential for in-the-field upgrades and product differentiation to name but a few. However for any company embarking on development of a DSP-enabled product, there are some specific pitfalls lurking.

The first rears its head early on. DSP is abstract, and harnessing creative and

abstract mathematical thinking is difficult. How can the design be communicated to the whole team? How can a project manager assess the strengths or risks of an approach? All too often companies end up with "back-room boffins" dictating to management what is, and what is not, possible. Few have the domain knowledge required to challenge this false authority.

Secondly, there are no established development methodologies to help. DSP software is a strange beast, sitting on the fence between pure hardware and pure software. Treat it as embedded software and the machine-like number crunching functions will never work efficiently. Apply good practice from hardware development and DSP software's





dynamic behaviour will render testing ineffective. Failure to understand the unique pressures on wireless DSP development leads to bloated designs, poor reliability and ultimately overspend. A third pitfall arises because DSP is often deployed on cutting-edge silicon. The desire for high product performance at low cost leads companies to use the smallest versions of the latest DSP devices. As such, companies fail to accurately assess DSP resource footprint early in a development. Desperate code-squashing activity ensues, with program cost and timescales escalating whilst the quality of the software base goes down.

At Cambridge Consultants our clients demand rigorous product developments that deliver on time. Program schedule is invariably a critical requirement. For this reason we continually invest in maximising the efficiency and determinism of design processes that represent the critical or higher risk paths. Within the DSP environment we have embraced this

approach fully, tackling these issues head on by creating a unique DSP development process called the SDR Framework™. At its core are methods for rigorously capturing mathematical thinking in a tangible model, allowing a team to reach a collective understanding of the design and to predict resource usage as early as possible. The model is used throughout development to test each DSP component on completion, and to assess continuously the integrity of the DSP during integration and verification.

SDR Framework has been highly valuable to our clients by minimising program risk and schedule for products with DSP components. As a result, this has delivered a stream of success stories. We have developed several cutting-edge physical (PHY) layers for wireless products in a fraction of typical industry timescales, allowing clients to change from being late entrants in their market to being the first with certified product.

We have also developed our own Wireless DSP Core: SAPPHYRE™. SAPPHYRE is a flexible DSP core targeted at ASICs. It provides the combination of Digital Signal Processor flexibility with the efficiency of a customised hardware solution. By using SAPPHYRE in custom silicon, we recently were able to reduce the cost of DSP in one client's product from \$20 to 20¢.

These are two examples of how enhanced DSP tools and process can greatly benefit wireless product development. As the wireless product development market evolves further it will also be necessary to evolve this approach. With the advent of cognitive radios that access spectrum in new ways, a further set of challenges will be presented. Without doubt, DSP will be a critical part of the solution.

[www.cambridgeconsultants.com](http://www.cambridgeconsultants.com)

## Snippets

### **802.11n device unit shipments forecast to grow by 85% year on year**

Although unit shipments in 1Q10 for the Worldwide WLAN market decreased by

9.4% quarter-over-quarter, it increased by 4.8% year-over-year, according to In-Stat. That increase was fuelled primarily by migration to 802.11n technology. Shipments of 802.11n devices grew 85% in 1Q10 compared to 1Q09.

"Total WLAN revenue decreased 7.2% quarter-over-quarter to \$1.1 billion in 1Q10 versus 4Q09," says Vahid Dejwakh, Industry Analyst, In-Stat. "Revenue for 802.11n products was nearly 40% of the total WLAN market in 1Q10."

### **Bluetooth headset for active lifestyles**

APT-X and JayBird, a provider of audio accessories for consumers, have collaborated over Sportsband, a range of colour-coordinating Bluetooth headphones.

Designed for personal stereo entertainment during work-outs, extreme sports, fitness training, leisure activities, and outdoor pursuits, the Sportsband also integrates a microphone for calls with mobile phones such as the new iPhone 4. The two

companies say that the inclusion of apt-X audio coding within the Bluetooth advanced audio distribution profile is essential to the intrinsic capability of Sportsband to deliver "wired-quality audio without the wires."

# The reports of our death are greatly exaggerated



By David Rosales  
Director of Watch Technology, Fossil

I PARAPHRASE SAMUEL CLEMENS IN THE TITLE TO DIRECTLY ADDRESS A QUESTION I COMMONLY HEAR AND READ: IS THE WRISTWATCH DOOMED TO THE FATE OF THE BUGGY WHIP? EVERY FEW WEEKS, ANOTHER ARTICLE IS WRITTEN ABOUT "THE DEMISE OF THE WRISTWATCH" OR SOME SIMILARLY THEMED PREDICTION OR PRONOUNCEMENT.



The demise is almost routinely attributed to the ubiquity of the mobile phone. To me, these opinions are a bit short-sighted, but I think I understand the point of view. The questions are fair: What functional contribution does a wristwatch make to the modern Internet connected society? What relevance does a wristwatch have to everyday life besides as a fashion accessory or a status symbol? On the surface, it is easy to come to the conclusion that the wristwatch's days are numbered.

I do not believe that the watch itself is irrelevant. Watches have been around for

over 100 years and I would argue that they are probably the world's most successful example of wearable technology. There is no better hands-free, wearable, glanceable interface in the world. Instead, it is my belief that the primary service that watches traditionally provide has lost relevance and become redundant: time.

Our relationship with time has changed quickly. Time is used and consumed differently now that it ever has been in the last 100 years.

First, timekeeping has become a commodity. There are clocks and

timepieces everywhere in modern life, computers, phones, televisions, microwave ovens, not to mention cars. Most of these timepieces are part of the background noise throughout the day. You use whichever clock is most convenient when you need it.

Second, the mobile phone has given us a new portable way of keeping time, and network connected mobile phones are more accurate than traditional watches. Phones are ubiquitous enough and used often enough that the passage of time can be noted with sufficient frequency to satisfy most needs.





Third, rigid time keeping is not as important as it used to be. Communications and social interactions are more fluid than ever before. When you make a phone call, you call a person directly, not a location, so both minor and major course corrections for any rendezvous are very simple now.

While watches are still great fashion accessories, I think they are no longer appreciated as much as timepieces. You can see evidence of this at the watch sales counter in your local department store. Watches will be sorted by brand, price, and color, but they are not sorted by function, nor is it easy to find a specific function. This complements how people make purchasing decisions for watches today -- almost solely based on aesthetics.

So is the conclusion that a watch is no longer a vital, functional part of everyday life for most of us? Perhaps, but I think this is true only if the primary service a watch provides is time. What if the primary service provided by a watch was not time, but instead relevant information? Information such as Facebook status updates, Tweets, and SMS? Would a watch be more relevant then?

It is easy to fall into the trap of thinking that telling time is all watches can do, after all, watches have not changed terribly much in the last 50 years. The disruptive technology cycles for watches are decades long. There's a joke in the watch industry regarding the slow technology cycle: "In 100 years watches have gone from telling time, to telling time and date".

I am here to tell you that watches are imminently due for their 50 year upgrade. Advances in technology, miniaturization of components, decrease in power consumption and the ubiquity of Bluetooth® wireless technology have made it possible for watches to become connected devices that participate in the mobile phone's personal area network while retaining the visual and aesthetic appeal of a fashion accessory.

How could a mobile user experience be greatly enhanced by a watch? Here are some examples:

- Your phone rings and, whether you use a Bluetooth headset or not, you struggle to retrieve the phone from a pocket or bag. When retrieved, you check who is calling and judge the importance of the call against current activities (this becomes much more difficult if you do not have any free hands).
- Your phone ringer was left on in an embarrassing social situation, at an embarrassing volume (with an even more embarrassing ring tone).
- Your flight is delayed and a notification is sent to the phone, however, the message goes unnoticed because the train you were on was loud and crowded.
- You are using your phone to navigate from your hotel to a dinner location a short walk away. You feel an uneasy sense of self-consciousness as you walk the city streets with your phone in your hand, referencing the glowing map at every turn.

- You receive an SMS message requesting you to come home from work early. However, this request is buried under the 100 other push notifications, emails, and messages that you didn't have time to review. It turns out you actually missed several important messages...

A watch can help in all of these situations by becoming the glanceable, wearable display for the mobile phone. All of the use cases above and many more can be quickly and elegantly handled with a simple vibration, followed by a glance at your wrist and if action is required, a button press. Glancing at your wrist more than 100 times a day is easy, pulling your phone out of your pocket more than 100 times per day is hard. In fact, this is exactly why the watch jumped out of the pocket and onto the wrist over 100 years ago – for glanceable, hands-free, convenience.

The true limit to the convenience of the mobile phone is the fact that we carry it and because of this, some alerts, calls and messages will go unnoticed. This problem will quickly get magnified as there are now many more applications/services providing notifications and more of these notifications have a time-sensitive importance to them. Many important and time sensitive notifications will go unnoticed until much later when the information is much less valuable. A watch can both be a great looking fashion accessory and a productive member of the mobile internet by helping us to regain control and convenience.

**David Rosales**  
**Director of Watch Technology, Fossil**  
**davero@gmail.com / @davidro**

# Everything you need to know about wireless in 13 chapters

by Nick Hunn, wireless entrepreneur

With the growing number of wireless standards vying for attention, each promoting their unique claim for world domination, it's easy to forget that they often have much in common. Having made the choice of which one to use, (and that's an art in its own right), the engineer is generally faced with the same problems. These include how to balance range, throughput and power consumption; then working out what to connect to and how to make the connection secure. You need to look at strategies to cope with interference and ensure that the antenna is matched, doesn't detune and works as well in the real world as on the bench. Having done that, there's the practical issues of production test, IP licensing, export controls and making the product simple enough for a user to set up.

Over the last twenty years I've worked with hundreds of companies, trying to help them add wireless to their products. Their products have ranged from sex toys to snow ploughs, and the wireless standards have included most of the ones that are out there today, proprietary radio solutions and a few standards that history has since consigned to the waste bin. Last year I was approached by Cambridge University Press who asked if I could try and distil some of that experience into a practical book in their Essentials of Wireless Series, covering short range wireless standards.

Wireless can be liberating for a product designer. It overcomes the two major limitations of a cable, providing the ability to connect to multiple devices – often at the same time, and freedom of movement without the restraint of a tethered link. Mobile phones, Bluetooth headsets and Wi-Fi have brought those advantages to the consumer. Designers are now grasping the wider concept of what wireless can do for product design. Over the next decade there's a good chance that it will become endemic within the devices we own and carry around with us, whether that's a medical device, a piece of sports equipment, or

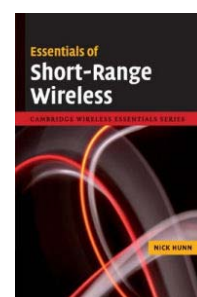


just a fashion accessory. If that's going to happen we need to remove some of the complexity and black magic associated with wireless design.

When you give up a cable, you gain freedom, but you also give up a lot of advantages that a cable possesses, which is something designers rarely think about. Cables are great at many things. They have almost infinite bandwidth, excellent throughput and negligible latency. They generally have pretty low power consumption. If you want to extend range, you just connect a few more metres of cable. You always know what you're connecting to, as you physically plug it in, and the connection's secure. Wireless standards universally fail to match this perfect combination. Each one is a compromise that attempts to provide an optimum mix of features for a specific set of applications and topology, along with a promise of interoperability.

There are plenty of books around explaining the different wireless

standards, but few on how to choose and use them. Although it may be useful to understand the standard, it doesn't make the practicality of wireless any easier. In writing this book I've covered the basics of Bluetooth, Wi-Fi, 802.15.4, ZigBee and Bluetooth low energy, concentrating on the process of choosing the most appropriate one; then explaining how to get the best performance from it. I hope it will help designers to make the right choice for their products and allow them to get their wireless products to market with fewer pitfalls along the way.



Essentials of Short Range Wireless is published by Cambridge University Press, ISBN: 978-0521760690, or visit [www.wireless-book.com](http://www.wireless-book.com)

# high speed wireless news



## Atheros and Wilocity build tri-band Wi-Fi and WiGig solutions

Wilocity, which is one of the developers of 60 GHz multi-gigabit wireless chipsets for the mobile computing, consumer electronics and peripheral markets, and Wi-Fi specialist Atheros Communications, are collaborating to build tri-band wireless solutions that combine Wi-Fi with Wireless Gigabit (WiGig) Alliance's 60 GHz technology.

The two new buddy companies explain that many devices and networks use dual-band 802.11n, which operates in the 2.4 GHz and 5 GHz bands, to share broadband connections, videos, music, photos and other content throughout a home or enterprise. If you then bolt on Wilocity's 60 GHz technology you get multi-gigabit speeds to complement existing Wi-Fi capabilities. Tri-band devices that leverage all three bands will, we're told, also maintain compatibility with the hundreds of millions of Wi-Fi products in use today, ensuring a seamless and simple user experience.

Atheros and Wilocity are jointly developing tri-band solutions based on both the IEEE 802.11n standard and the new WiGig multi-gigabit wireless specification. By integrating and optimizing Wi-Fi and WiGig solutions, the two companies aim to accelerate the design of tri-band wireless products and enable the next-generation wireless ecosystem.

"Next-generation networks will employ a variety of technologies and devices to support the explosive demand for digital media, cloud services and constant connectivity," said Gary Szilagyi, vice president of Atheros' Computing and Consumer Business Unit. "Wilocity's 60 GHz technology is a game-changer for the wireless industry, and is a natural complement to our existing Wi-Fi portfolio. We are collaborating with them to quickly deliver solutions that combine best-in-class technologies and extend our leadership in this burgeoning market."

Atheros and Wilocity are participating in the IEEE, the WiGig Alliance and the Wi-Fi Alliance. Atheros serves on the board of directors for both the WiGig

Alliance and Wi-Fi Alliance; Wilocity serves on the WiGig board and chairs its Marketing Work Group.

## More than 80M USB wireless modems to ship in 2010

Wireless modem devices come in a variety of form factors including USB modems, PC cards, embedded modules, and wireless routers. Among the external devices, USB modems have become the most popular products – so popular that ABI Research forecasts shipments of nearly 81 million this year.

Today, the majority of wireless broadband subscribers enjoying portable connectivity use USB ports. The alternative, the PC Card slot, has rapidly been displaced since USB's introduction in 2006. "The main reason for USB modem popularity is versatility at a low price," says Jeff Orr, principal analyst, mobile devices at ABI Research.

According to ABI Research's Cellular Modem Product Tracking Database, more than 50% of the modem models now available in the market utilize the ubiquitous USB interface. Adds Orr, "USB dongles connect the subscriber to a specific network rapidly and without installing drivers. As new networks using the latest 3G or 4G protocols emerge, the USB modem is ready to update the installed base of portable and mobile computers."

The question remains whether embedded modem modules in new computers or the recent interest in personal hotspot routers connecting multiple Wi-Fi devices to a single wireless WAN connection can overtake the popularity of USB dongles. Research associate Khin Sandi Lynn points out that, "In the long run, more devices are looking for a network to connect to. The wireless modem market can solve this in many ways – different form-factors, air interface protocols, and increased attention to style and cultural interests."

The mobile broadband modems available in the market today support a variety of air interface

technologies. According to ABI Research's database, approximately 50% of the wireless modems in the market support GSM, GPRS, EDGE or HSDPA.

## Wi-Fi to bring mobile TV to the masses

A new report published by Juniper Research has found that a surge in applications which can take advantage of the increasing availability of free Wi-Fi services are set to boost a mobile TV industry with anticipated revenues of nearly \$7 billion by 2015.

According to the report, mobile TV traffic over Wi-Fi is expected to increase by 25x over the 2010-2015 period as streamed service penetration and usage levels – also fuelled by consumer smartphone adoption – rise sharply. However, the report notes that despite the capacity relief that Wi-Fi offers to cellular networks, greater mobile TV usage will still place the 3G and 3.5G networks under stress.

As report author Dr Windsor Holden pointed out, "Cellular networks are finding it increasingly difficult to deliver high quality mobile TV services at times of peak usage: thus, the World Cup has posed particular problems with large spikes in viewing figures. Wi-Fi can ameliorate this in the short term, but this is only a partial remedy."

The report suggests that while the deployment of LTE networks should reduce congestion, the use of unpaired spectrum – as in the forthcoming IMB trials by Vodafone, Orange and O2 – might be an alternative or complementary solution.

However, Juniper is less sanguine about the prospects for dedicated mobile broadcast technologies such as DVB-H, citing the availability of handsets capable of receiving analogue or digital terrestrial signals, the economic downturn and changing consumer viewing habits among the reasons why such networks are widely perceived as being financially unviable.

# high speed wireless news



## Smarter Network Access Control from Ruckus Wireless and Bradford Networks

Ruckus Wireless has teamed with Bradford Networks to combine Adaptive Network Security (ANS) capabilities with Ruckus ZoneFlex "Smart Wi-Fi" products and technology. Additionally, Bradford has joined the Ruckus Interoperability and Open Testing (RIOT) program, a joint development and interoperability program.

The combined solution is intended to allow enterprise customers to better protect their wireless LANs (WLANs) by setting policies for how different user groups such as employees, students and guests, are provided network access.

Bradford claims that its ANS goes beyond traditional Network Access Control (NAC) tools, and that it adapts to changing security needs by responding and securely provisioning network resources automatically. As part of this joint partnership, Ruckus ZoneFlex Smart Wi-Fi products have completed extensive interoperability testing with Bradford's Network Sentry. "With Bradford, we're now bringing a complete set of user authentication, device compliance and secure access policy enforcement to an entirely new generation of smarter Wi-Fi systems," said Bart Burstein, vice president of product management and business development for Ruckus Wireless. "The combination of our technologies gives enterprises greater control and peace of mind when it comes to granting network access to guests and other users, and keeping critical information secure."

The Ruckus ZoneFlex WLAN systems are built with Ruckus' patented dynamic beamforming, a development in 802.11 technology that constantly forms and directs Wi-Fi signals over the best performing signal path, continually steering signals around obstacles and

interference that can degrade performance. Dynamic beamforming uses constant client feedback built into the standard 802.11 protocol to ensure the fastest performing path is selected for each data packet.

## 802.11n device unit shipments grow by 85% year on year

Although unit shipments in 1Q10 for the Worldwide WLAN market decreased by 9.4% quarter-over-quarter, it increased by 4.8% year-over-year, according to In-Stat. That increase was fuelled primarily by migration to 802.11n technology. Shipments of 802.11n devices grew 85% in 1Q10 compared to 1Q09.

"Total WLAN revenue decreased 7.2% quarter-over-quarter to \$1.1 billion in 1Q10 versus 4Q09," says Vahid Dejwakh, and industry analyst at In-Stat. "Revenue for 802.11n products was nearly 40% of the total WLAN market in 1Q10."

In-Stat also concluded that:

- Netgear is the leader in total "n" devices shipped, shipping in 1Q10 over 2 million "n" devices which include SOHO routers, residential gateways, network adapters and access points.
- D-Link is the leader in total WLAN devices shipped (regardless of whether it is "a," "b," "g," or "n" technology), shipping in 1Q10 over 3.9 million WLAN devices. D-Link also saw the strongest share gain year-over-year.
- SOHO Routers demonstrated the most significant growth, as shipments grew 92% 1Q10 over 1Q09 and 12% 1Q10 over 4Q09.
- 802.11g declined quarter-over-quarter by 18% and by 19% year-over-year

Recent In-Stat research "1Q10 Wireless LAN Tracker" examines the WLAN market for 1Q10 by technology, category, and vendor. Market shares for enterprise and SOHO/consumer vendors are provided, based on unit shipments and manufacturers' revenue for the quarter.

## Wi-Fi adoption in healthcare growing at 60%

According to ABI Research, the uptake of Wi-Fi within healthcare has grown at more than 60% over the past 12 months in both wireless local area network and Wi-Fi RTLS (Real-Time Locations Systems) deployments, and high double-digit growth is expected to continue for at least the medium term.

Other wireless technologies being adopted and deployed in healthcare including cellular M2M and wearable wireless sensors have also seen significant growth over the past 12 months.

Wireless communications continue to be adopted in healthcare applications ranging from Wi-Fi networks to wearable sensors that wirelessly transmit a patient's condition to monitoring applications.

"Wi-Fi adoption has helped overcome initial concerns about complexity and reliability of wireless within healthcare," says ABI principal analyst Jonathan Collins. "The growing number of wireless technologies and wireless applications being developed, piloted and deployed within healthcare further underline the level of interest in using wireless to improve the flexibility and efficiency of healthcare services around the world."

The technologies tracked by ABI Research's Wireless Healthcare Research Service included Wi-Fi, Bluetooth, Low-Energy Bluetooth, ZigBee, 802.15.4 and proprietary low power RF offerings across applications such as WLAN, personal monitoring, disease management, assisted living and telepresence.

# The emerging quad play platform

## - Anticipating opportunities / requirements

by Stephen Wood

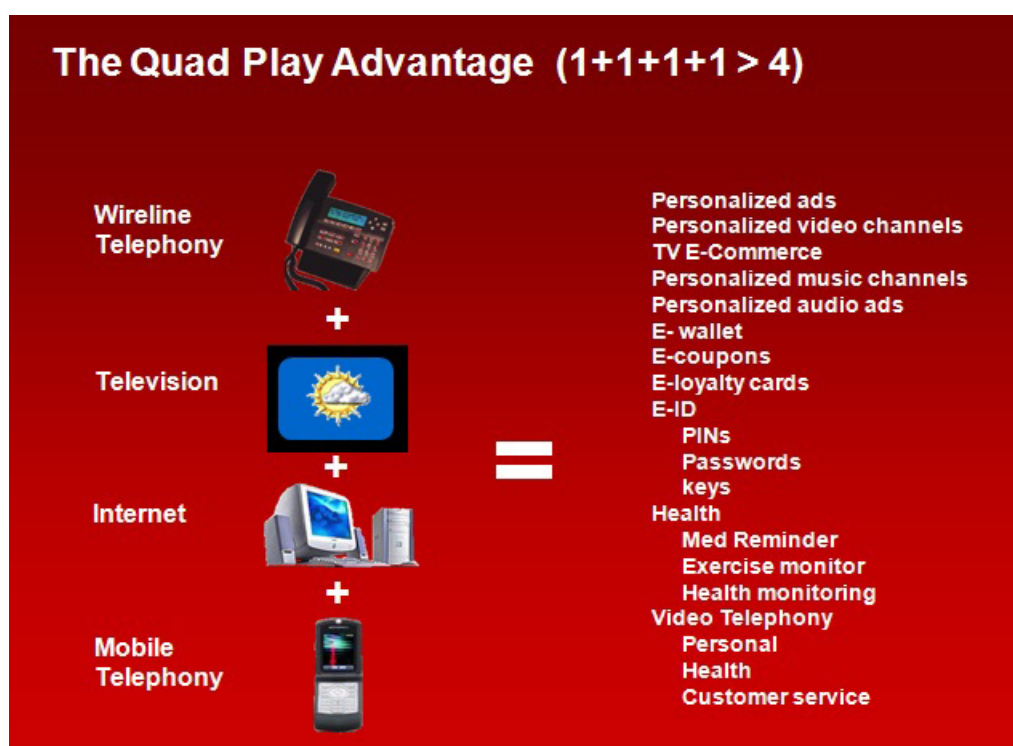
This is an extract from a white paper that has been created by Stephen Wood, formerly a technology strategist at Intel and President of the WiMedia Alliance.

Companies which are participating in quad play markets (television, mobile telephony, wired telephony and Internet) are on the cusp of an accelerated period of change similar to the change which occurred during emergence of the Internet and the PC. These change cycles occur due to the deployment of a new platform. In this case, the new platform is the quad play network, inclusive of its principal connected devices, the physical network, the core content and the principle applications.

The paper that you can download takes advantage of newly developed analysis techniques to characterize the quad play platform applications and capabilities. The analysis process takes knowledge obtained from the nested motivations which drive the market and couples this with insights derived from models of emergence, convergence, linear evolution and platforms. Using these tools, it is possible to map the evolutionary direction of individual applications that run on the platform. It is then possible to decompose these applications into component capabilities needed in the network and the hardware to enable the applications. Those capabilities which are universally required become a required part of the platform. Those capabilities which have limited use will become options.

Some of the more novel applications which are described include:

- One button purchases through the television, PC or mobile phone which position the network operator as a lending institution.
- The tablet acting as a quad play device to deliver magazines, newspapers and school fliers.
- The expansion of the set top box into a server class device to integrate adjacent businesses and to create multiple new revenue streams.
- The creation of desktop cinema to inexpensively produce animation driven video to fill the need for new, inexpensive content.



When these applications have been taken apart into their components, it is possible to identify the common elements which are needed to enable the platform. These new capabilities include: voluntary identification mechanisms, device integrity verification, data shuttle protocols, personalization protocols, e-commerce protocols, ad placement/verification protocols, privacy mechanism management, and malware suppression mechanisms.

Conventional methods of market analysis lack a fundamental understanding of the nested motivations which drive market development and of the structures which the markets use to advance. Without an understanding of these factors, forecasting efforts have little potential for success. When success is achieved by insightful analysis of trend lines, it is applicable over a narrow market scope and over a very limited time period. However, when these factors are understood, data is present

which allows one to anticipate future markets with significant accuracy and repeatability.

The description of the quad play platform, its contributing trends and motivations and a range of novel opportunities resulting from its development are offered as an example of what can be accomplished with improved analytical methods. The reader should be aware of a couple of points. These analytical methods can be used at a higher level to generate information useful for government policy work and at a lower level for specific business opportunity justification. Additionally, these methods should be applicable for almost any area of high tech development including medicine, computation, communications, robotics, etc. The scope of this paper is intentionally limited to minimize length.

To download the complete white paper, use this [link](#)

# 4g / LTE / WiMAX news

## LTE trials pick up speed, en route to 4G

ABI Research believes that 2011 will be the year when LTE goes live in a big way, citing Verizon in the United States and DoCoMo in Japan's decisions to begin wide-scale roll-outs by the end of 2010. ABI analyst Bhavya Khanna reports, "132 networks have reported trials or plans to launch LTE commercially, 32 more than the end of 2009. Verizon has also hinted at the availability of LTE-based handsets by May 2009."

"However," Khanna cautions, "don't expect WiMAX to bow out just yet. Despite setbacks including Russia's Yota switching to LTE, 188 WiMAX networks are now in trial or commercial operation worldwide. With India's wireless broadband spectrum auction recently concluded, expect that number to grow in 2011."

The threat that WiMAX will face will come from TD-LTE, an alternative technology

championed by China and Qualcomm that can operate on the same bandwidth as existing WiMAX networks.

## Sagem Wireless and ST-Ericsson to partner on LTE

Sagem Wireless and ST-Ericsson will co-develop multimode LTE/HSPA+ reference designs, devices and modules, collaborating on a multimode platform, which can connect to LTE, HSPA+, 3G and GSM networks, to develop a mobile broadband modem to be launched before the end of 2010.

Claiming downlink speeds of up to 100 Mbps via LTE and 21 Mbps via HSPA+, Sagem Wireless suggests that the dongle modems will enable Internet Gateways to offer ultra high speed wireless access. These modems will also enable laptops to get online wherever there is mobile coverage.

There are now 61 live commercial HSPA+ networks in 34 countries and 80 mobile operators, spanning 33 countries, are committed to deploying LTE, according to the GSM Association. Sagem Wireless also plans to use the multimode platform to produce versatile modules that can bring high-speed mobile connectivity to laptops, netbooks, tablet computers, machine-to-machine (M2M) applications and other devices.

## HIS BOOKS GET AROUND...



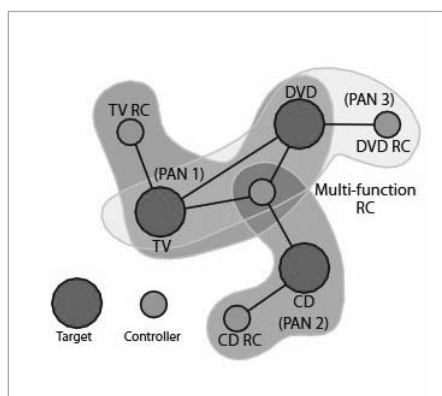
AVAILABLE AT AMAZON, WATERSTONES, BARNES & NOBLE AND ALL MAJOR BOOKSTORES

## DR DEAN ANTHONY GRATTON

"If you read any book on wireless technology, read his!"

COMING IN 2010: THE HANDBOOK OF PERSONAL AREA NETWORKING TECHNOLOGIES AND PROTOCOLS  
Cambridge University Press

# low energy wireless news



## Can LG and Tosh help ZigBee RF4CE dominate?

LG Electronics and Toshiba have joined Philips, Freescale Semiconductor, Texas Instruments, Samsung and Sony on the ZigBee Alliance's RF4CE Steering Committee, which is focused on driving ZigBee RF4CE standardized solutions into the consumer electronics industry. The ZigBee Alliance is promoting this as an indication that ZigBee is the technology of choice for the remote control market, but we're not so sure.

"We view ZigBee RF4CE as an industry-changing solution that dramatically improves upon the old infrared remote control user experience that is very limited in coverage, direction and data reliability," said Ho Jun Nam, principle research engineer at LG Electronics. "As new functionalities are being added to TV sets every day, we believe that ZigBee RF4CE will enable us to design low power interface devices that offer bi-directional communications, with agile response times and flexible human interface design to accommodate these new functionalities."

First announced in March 2009, ZigBee RF4CE is a standardized specification for radio-frequency communications that is claimed to provide faster, more reliable and greater flexibility for devices to operate from larger distances. As with any radio-based remote control, there's no arguing with the fact that it removes the line-of-sight and field-of-vision barriers in today's IR (infrared) remotes. In common with other technologies competing in the RF remote control market, such as Bluetooth low energy, ZigBee RF4CE has two-way communication, which opens the door to a whole new set of capabilities and consumer experiences.

"Consumers are constantly looking for new product features in their electronic devices that will take their user experience to the next level," said Shigenori Tokumitsu, technology executive, Visual Products Company at Toshiba Corporation. "Today, Toshiba uses ZigBee RF4CE-based remotes for selected televisions in certain markets. We believe ZigBee RF4CE is a critical building block upon which we can develop new, reliable and interactive solutions that will continue to excite consumers in the future."

Meanwhile, Bob Heile, long-suffering (our words - ☺) chairman of the ZigBee Alliance added: "ZigBee RF4CE is helping CE manufacturers create products that not only work better, but also have features that bring a unique and new user experience to their consumer audience. The addition of LG Electronics and Toshiba to the steering committee is a testament to the growing influence that the ZigBee RF4CE standard is making on the CE industry."

Will RF4CE win the race to dominate the remote control market? With an increasing number of technologies competing for this market, and with the recently added force that is Bluetooth low energy, which has massively greater global levels of both awareness and adoption, this is far from certain. Samsung and Toshiba are both fans of Bluetooth and many other SRW technologies too, let's not forget.

## Nordic Semiconductor goes R/C racing

Nordic Semiconductor has released what it calls the nRFready R/C Racing. This is a low cost, 2.4GHz wireless reference design for advanced remote controlled racing toys such as cars, that enables toy manufacturers to bring complex game-play features to mass-market toys.

These features include racing with multiple friends, setting up free-form racing tracks using waypoints, feeling crashes through controller vibration, and the ability to collect, see and share racing data.

The nRFready R/C Racing reference design includes a pair of cars and controllers, four waypoints, a USB dongle, the nRFready Racing Studio PC application, as well as all required source code and hardware design files. The cars, controllers and waypoints are all based on Nordic's single chip nRF24LE1 2.4GHz RF System-on-Chip (SoC) solution. This provides both a development platform with flash, and a migration path to Nordic's lower-cost OTP (one time programmable) variants for mass production.

The cars in the nRFready R/C Racing reference design feature continuous steering and throttle control, crash sensors, plus blinker lights and headlights that can be switched on and off from the controller. In addition, the controllers include LEDs for car battery status and force (vibration) feedback to indicate crashes. Cars can also detect when they are in close proximity to a waypoint and wirelessly send race statistics such as lap times, speed and number of crashes to the nRFready Racing Studio PC application through the supplied USB dongle.

"We see an increasing interest in our 2.4GHz technology from the toy industry," says Thomas Embla Bonnerud, Product Manager with Nordic Semiconductor. "This reference design enables innovative toy manufacturers to very easily take advantage of our 2.4GHz technology to take their remote controlled toys to the next level by adding features not possible with the 27/49MHz technologies typically employed today, and at a price point consumers around the world will find appealing."

The nRFready R/C Racing is available to innovative toy manufacturers from today.

# low energy wireless news



## NXP buys Jennic, but at what price to ZigBee?

NXP Semiconductors is acquiring Jennic, the British developer of low power RF solutions for wireless applications in smart energy, environment, logistics and consumer markets. The acquisition will see Jennic's portfolio of 802.15.4 and ZigBee low power RF solutions integrated across a range of NXP's High Performance Mixed Signal products. NXP's press release says that the acquisition provides NXP with a comprehensive wireless semiconductor platform for emerging technologies including eMetering, smart lighting, building automation, asset tracking and device remote controls.

NXP paid approximately \$12.2 million to acquire 100% ownership of Jennic shares, plus up to \$7.8 million in additional consideration over the next two years if Jennic meets certain performance targets. Approximately 50 UK-based employees will transfer to NXP.

"Innovation in low-power wireless RF technology is driving significant demand for exciting new applications and usage models across a broad range of industries," said Rick Clemmer, President and CEO, NXP Semiconductors. "The low power RF solutions for wireless applications which Jennic has developed have set a benchmark for driving down power performance. These also represent a great example of High Performance Mixed Signal technology, which together will enable us to jointly target attractive growth markets and offer a complete range of wireless semiconductor solutions."

Hmmm ... this is all very well, but the Jennic founders must have been hoping for more. When TI bought that other well-known ZigBee trail-blazer, Chipcon, in 2005 it paid US\$200 million. Bearing in mind that we are led to believe that ZigBee is finally gaining traction in some markets (OK in smart metering, anyway), a sale price of just \$12 million for

Jennic is pretty paltry. Was Jennic's management desperate to cash out now before the price fell any lower?

How does this value ZigBee overall? A good question. The investment community is going to be rather unimpressed, we would imagine. Ember is now the one sizeable remaining standalone ZigBee supplier, and its investors, who have pumped \$89 million into the company so far, must be feeling nervous, to say the least.

## Updated standard for wireless sensor networks from DASH7 Alliance

The DASH7 Alliance, which is the industry consortium that promotes the use of the ISO 18000-7 standard for wireless sensor networking, has announced the release of an updated specification for the ISO 18000-7 standard for wireless sensor networking that enables tag-to-tag communications, improved location precision, over-the-air configuration, and higher data rates.

The Mode 2 specification was submitted as a new work item to the ISO 18000-7 standards committee following approval by the DASH7 Alliance, which apparently includes more than 50 participants from 23 countries. The full Mode 2 spec is available now to DASH7 Alliance members and will be available to the public in ISO in mid-2011.

"DASH7 Mode 2 is an exciting achievement in wireless technology since we've not only improved on existing DASH7 strengths such as range and battery life, but we added new capabilities that make it easier for developers to deliver features required for many new markets and applications," said Patrick Burns, President of the DASH7 Alliance. "Unless you are streaming video or audio over your wireless sensor network, there is simply

no reason to use another wireless technology other than DASH7."

Incisor's Dean Gratton has had a look at DASH7 and is currently unconvinced about the long-term potential. He started a discussion at our WPAN World group on LinkedIn – [you can find it here](#) – and then started to have his doubts. If you have thoughts on DASH7, why not add them to Dean's original discussion thread.

## NXP / Toppan Forms' put NFC in Lenovo laptops

NXP Semiconductors and Toppan Forms, which is an Information Management solution provider, have announced that their jointly developed Near Field Communication (NFC) reader / writer module "TN33MUE002L" has been adopted by Lenovo in three ThinkPad laptop models for the global market. When built into a PC or a peripheral device, the module solution supports a variety of security and convenience features enabling transactions such as online banking, E-commerce, E-government online access and secure log-in for PCs.

The NFC reader / writer module is based on NXP Semiconductors' PN533 NFC IC and Toppan Forms' experience in hardware module and software driver packaging. The module solution is compatible with MIFARE and FeliCa, the contactless card system widely used in Japan for transportation and electronic payment applications. The module solution is also compatible with open standard (ISO 14443 types A and B) cards, which are used worldwide in many banking, government and public deployments, such as e-Passports and Japanese drivers licenses.

The module utilizes a PC/SC conformant driver and is compatible with existing PC/SC applications, allowing it to integrate with existing security and payment applications. The module driver is available through Toppan Forms' NFC Software Development Kit for PC/SC.

## events



DATE	EVENT	LOCATION	NOTES	LINK
Aug 5 - 9 2010	Taipei Computer Applications Show	Taipei, Taiwan	-	<a href="http://www.biztradeshows.com/trade-events/taipei-computer-applications.html">http://www.biztradeshows.com/trade-events/taipei-computer-applications.html</a>
Sept 13 - 15 2010	Intel Developer Forum	San Francisco, CA, USA	-	<a href="http://www.intel.com/idf/">http://www.intel.com/idf/</a>
Oct 4 - 8 2010	Bluetooth SIG UnPlugFest 37	Barcelona, Spain	-	<a href="http://www.bluetooth.org">www.bluetooth.org</a>
Oct 19 - 20 2010	CAT-iq Developers Conference	Eindhoven The Netherlands	-	<a href="http://www.cat-iqconference.com/">www.cat-iqconference.com/</a>
Nov 10 - 12 2010	China Electronics Fair	Shanghai New International Expo Centre, China	-	<a href="http://www.icef.com.cn/fall_eng/index.shtml">http://www.icef.com.cn/fall_eng/index.shtml</a>
Jan 6 - 9 2011	International Consumer Electronics Show (CES)	Las Vegas, Nevada, USA	-	<a href="http://www.cesweb.org/">www.cesweb.org/</a>

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