INCISOR™

for the short range connectivity environment

Video enabled Issue 118 February 2008

INCISOR.TV VISITS CES 2008

THIS ISSUE

10 YEARS OF BLUETOOTH

CES GOES VERY WIRELESS

ALSO: INTRODUCING BODY AREA NETWORKS

is it really 10 years?

I have recently returned from Las Vegas, where, once again, Incisor – amongst other things - co-operated with the Bluetooth Special Interest Group to produce a video record of events and announcements at the Consumer Electronics Show. You can see the movie we created on page 3.

The hinge-pin of the SIG's messages this year was the number 10. It featured in all of their key messages – the addition of the SIG's 10,000th member company, the shipment of 1 billion Bluetooth devices (there is a '1' and a '0' in there!) and, perhaps most important of all, it has been 10 years since Bluetooth took off. 1998 was the year when the Bluetooth Special Interest Group was incorporated, and the year that the world first started to hear about this oddly-named technology.

So much has happened in those 10 years, and Bluetooth has so firmly cemented its place in the wireless world that it is hard to believe that it is only 10 years. There are plenty of other technologies that have gotten less far, in more time.

Within the walls of this office, January 2008 marked another reason to celebrate the number 10, for Incisor shares it's 10th birthday with Bluetooth. It's true – the first issue of Incisor was published in January 1998. Check it out if you want to smile – there is a link with the image below.

In last month's end-of-year issue I thanked you all for your support in 2007. I'd like to add to that – thank you to all of our subscribers and sponsors, the Incisor team (our writers and our long-suffering designer Sean King) and particularly the Bluetooth SIG, with whom we continue to enjoy an excellent relationship.

The last ten years have been a blast!

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

INCISOR ISSUE ONE

Click on the image below to read the first issue of Incisor, from the time when Bluetooth was first emerging.


INCISOR

WELCOME TO INCISOR!

WHAT IS BLUETOOTH?

A truly global standard

Voice and Data

IPR Free

Hot re-branding The Wired

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Bluetooth SIG celebrates the power of 10

Bluetooth technology turned 10-years-old during January, and marked its birthday appropriately at CES in Las Vegas. For the second year running, IncisorTV co-operated with the Bluetooth SIG to create a video feature covering the SIG's CES celebrations, and this can be viewed below.

While the idea of Bluetooth technology was born over a decade ago, the first products didn't appear commercially until the year 2000. In that short time – a span of eight years – 1.5 billion Bluetooth enabled devices have been shipped, and the organization behind the technology, the Bluetooth Special Interest Group (SIG), has grown from a handful of companies to 10,000 members. Incisor has been tracking Bluetooth from the earliest days – the first issue of Incisor was also published ten years ago, in January 1998. We should probably have made more of a big deal out of this, but, there you go. January is a busy month!

"The first ten years of Bluetooth development has been amazing to watch," commented Mike Foley, executive director, the Bluetooth SIG. "From prototypes in 1998 to more than 1.5 billion devices on the market today, no other consumer technology has grown as fast in such a short period of time."

Adds 10,000th member

As part of a process that has been admired, respected and – okay – directly copied by other SIGs/industry alliances, the Bluetooth SIG qualifies Bluetooth products to a set of strict criteria to carry the Bluetooth brand. Since 2000, when products became commercially available, the Bluetooth SIG has seen a 13-fold increase in the number of products qualified each year. The manufacturer, JayBird Gear LLC, which builds Bluetooth stereo headsets, was honored at the Bluetooth SIG 10-year celebration party as the organization's 10,000th member.

At the member party, Mike Foley spent some time reminiscing, and showed some 'ancient history' from the early days, including one of CSR's first Bluetooth chips, a Digianswer (remember them?) development kit and two guys that were in on developments at the start – Intel engineer and first chairman of the Bluetooth SIG, Jim Kardach, and former Ericsson luminary Orjan Johansson, who took over the chairmanship from Jim (see main pic). We're sure these guys won't mind being referred to as ancient history.

Best Bluetooth of CES

You will see when you view the IncisorTV movie that at the member party, the SIG announced the winners of its third Best of CES Contest, an event held each year to

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CELEBRATING 10 YEARS OF BLUETOOTH / BEST OF CES 2008

Incisor TV covers the third annual Best Bluetooth of CES contest on behalf of the Bluetooth Special Interest Group, and this year's extra celebrations to mark 10 years of the technology, and 10,000 members.

Bluetooth SIG executive director Mike Foley looks back on the last 10 years, remarks on the success of the technology and the unstinting support of the member companies, and spends a few moments looking forward too.

CLICK THE SCREEN OPPOSITE TO WATCH THIS PRESENTATION.

highlight the hottest, most innovative and consumer friendly Bluetooth enabled products.

Forty-eight new Bluetooth products were submitted for the contest in categories focusing on what consumers can do with the technology – talk on a headset, input information, listen to music, transfer information, or use in an industrial or other vertical environment. The SIG tested each product and judged them on a variety of criteria, including compliance with its qualification standards, ease-of-use, look and feel and overall usability of the product as expected by the average consumer.

Bonus points were given to products complying with Experience Icon requirements. These were created by the SIG to make it simple to understand what a Bluetooth enabled device can do and how it will work with other devices for file transfers, printing, listening to music, talking on a headset or inputting information. Manufacturers are encouraged to use the icons on packaging of certified Bluetooth enabled products. The idea is that consumers can match Experience Icons to ensure their gadgets will work together.

Winners of the Bluetooth SIG Best of CES contest were (category finalists are shown in parentheses):

- **Overall winner – Samsung P2 Widescreen Music Player**
- Headset – Plantronics Voyager 855 Bluetooth Stereo Headset [finalist: Motorola MotoPURE H12]
- Input – Logitech Cordless Desktop MX5500 Revolution Keyboard [finalist: Newton Peripherals MoGo Mouse X54 Pro]
- Music – Parrot DS1120 Bluetooth Speakers [finalist: Samsung P2 Widescreen Music Player; honorable mention Motorola RAZR2 V9]
- Transfer – Motorola T815 [finalist: Samsung SGH-i617 Blackjack II]
- Vertical – Ford SYNC, powered by Microsoft Auto [finalist: Baracoda ScanWear; honorable mention Motorola MotoROKR T505]

At the end of what had been a lively and entertaining event (those slides!), Mike Foley summed up on behalf of the SIG: “As we celebrate the 10th year of Bluetooth technology at the 40th annual CES, we continue to see a growing number of new Bluetooth devices, particularly in the home entertainment as well as sports and fitness arenas. Throughout this year and next, our organization will be hard at work providing the tools for manufacturers to continue to innovate in these and other areas with high speed and ultra low power Bluetooth specifications, making Bluetooth technology the only wireless technology consumers need.”

So, CES is over for another year. We are sure that the Bluetooth SIG and many other organizations are already thinking about CES 2009.

We know we are.

Snippets

Sony Ericsson ships 30.8 million handsets in Q4

Sony Ericsson fourth-quarter shipments increased 18% year-over-year to 30.8 million units, although the average selling price of its handsets dipped slightly. The popularity of the Cyber-shot handsets and W series Walkman pushed the company's wireless-handset market share to 9%.

Provision gets funded to develop wireless video

Bristol, UK-based ProVision Communications, which specialises in digital wireless video technology, has secured £750,000 in venture capital funding from the YFM Group-managed South West Venture Fund, Finance South West Growth Fund and NESTA Investments.

ProVision Communications, a spin-out from the University of Bristol, develops wireless video solutions for global clients, ranging from in-home media gateways to wireless video systems for sports and other spectator events. The company says that its expertise covers most wireless standards, including WiFi, WiMAX and DVB-T.

ULP Bluetooth / UWB report from IMS

IMS Research is about to release two new reports: "The World Market for UWB - 2008 Edition, UWB Systems: Opportunities, Barriers & Alternatives", which provides forecasts for UWB technology and examines the opportunities, barriers and alternatives, and “Ultra Low Power Bluetooth Technology Market – 2008”, which examines topics such as how large will the market for ULP Bluetooth be in five years time and what major factors will influence the adoption of the technology?

Contact IMS for more info.

INCISOR TV Video presentations

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

Click on the links below to watch recent Incisor TV presentations

Introducing Incisor

2007 Wireless Symposium

Bluetooth / Wibree launch event (full version)

Incisor TV overview: the Bluetooth SIG / Wibree Forum merge

Best Bluetooth of CES 2007

Incisor profile: Icron Technologies and Extreme USB

Wireless USB special - Introducing Wireless USB

Wireless USB special - Wireless USB in use

Wireless USB Special - Regulatory, approvals and interoperability

Wireless USB special - The future for Wireless USB and UWB

Wireless USB special - Wireless USB at CES 2007

Vince Holton introduces the High Speed Bluetooth Special Issue

Anders Edlund of the Bluetooth SIG - Bluetooth and UWB combined

Robin Heydon, CSR - Bluetooth & UWB - The semiconductor company perspective

Motorola's Steve Deutscher examines High Speed Bluetooth mobile concepts

Motorola video - Jordan's morning

CES 2008 show report

CES Goes Very Wireless

By Mads Oelholm

Wireless exploded at CES this year. Not only were lots of chipsets prevalent, but also lots of consumer gear and there were many exciting applications on the show floor.

The most exciting stuff happening at CES was probably going on in the South Hall on the second floor, where the **WiMedia Alliance** had its booth. Among the exciting news was a completely integrated chip called Wireless UWB Link 3480 from Intel supporting both band group 1 and 3 making it suitable for use in most of the world – including Europe, where UWB solutions until now have been few and far between.

On the show floor was also Stephen Wood, spokesperson for WiMedia. He was happy to report that UWB has now been almost universally accepted. Only Canada and China still have some outstanding issues, but the rest of the world is ready to go. The future for WiMedia is all about Discover and Avoid – a very technical term for making sure that UWB only uses the allowed band groups when it is deployed.

The WiMedia booth was a bit quiet, which is not surprising considering that WiMeda is not know to the general public – and should not be. WiMedia is simply providing the lower layers on which Wireless USB high speed Bluetooth etc are built. Wood also pointed out that UWB is not the only technology that WiMedia is looking at. In the search for ever faster transfer speeds WiMedia will also start looking at the spectrum around 60 GHz in cooperation with ECMA (see **60 GHz around the corner below**).

Wireless USB solutions were abundant with a major change from last year. CES 2007 showed many interesting solutions, but they were all suffering from very low speed – around 50 Mbps, which disappointed a lot of consumers and journalists. This year a lot of native implementations were on display – giving a much needed speed boost to around 150 Mbps. This is still a far cry from the 480 Mbps offered by wired USB, and even further from the upcoming USB 3.0 offering around 5 Gbps.

Silex showed off its own interesting Wireless USB solution that has been on the market for a short while. The solution uses IEEE 802.11b/g instead of UWB. The result is a wider range, but a slower connection. On the other hand customers can use their existing wireless connection and just need to install additional drivers. The major drawback is that the solutions do not support isochronous traffic such as audio and video, but for storage applications it is just fine. Icron Technologies is is another company that has been promoting an 802.11-based Wireless USB solution.

Alereon was showing applications running on its AL5000 chip set, supporting both bands - below 5 GHz and above 6 GHz. WiLinx was showing a prototype of its all CMOS solution giving speeds of up to 480 Mbps when combined with Wireless USB. In general where earlier shows have primarily focused on technology demos, CES 2008 was showing off real applications – also using other platforms than just 2 laptops wirelessly connected using USB dongles.

Radiient Technologies showed off a different use of UWB with its Roomcaster system. Roomcaster is essentially a wireless loudspeaker system using 5.1 surround-sound. According to Radiient the main advantages of using UWB is that delays are kept to below 20 ms, thereby assuring that there is no lip sync problem – a problem usually associated with wireless loudspeakers.

ZigBee was of course also present at CES. Although not as prevalent as Wi-Fi, ZigBee has already shipped in the tens of millions and proposes to reach hundreds of millions by 2010 according to VP of marketing and business development Brent Hodges. On display at the booth was an application allowing power companies to throttle up and down the thermostat in a house. The application is already in use round the US and gives a rebate to customers that use it. A California bill proposes that all new buildings – private and commercial – should be equipped with this, and the power companies will be allowed to regulate the thermostats – also without prior consent. We have yet to see the passing of this particular piece of legislation.

ZigBee is ideal for these kinds of applications as it is designed for low data rate applications, where Wi-Fi and Bluetooth either consume too much power or have too low a range.

The **Bluetooth SIG** itself did not make much of a public show, restricting itself mainly to media and SIG member activity, but

→

considering that this is now a mature technology, this is hardly surprising to anyone.

Not everyone was nailing their colours to a particular wireless technology standard. Some still go their own way. Sony, for example, showed off TransferJet – a proprietary wireless solution – with a range of about 3 cm. The maximum speed is 560 Mbps, and is obviously set to compete with products from WiMedia.

It has not been possible to get an official comment from Sony as to why it chose a proprietary solution, but we understand that it plans to use the solution for transfer of very large files such as photos and videos. TransferJet automatically reduces the speed, if conditions deteriorate and then increases the speed again when conditions improve. Sony showed an application where photos from a camera are automatically displayed on a television, if the camera just touches the television.

It was also interesting to see that a remote control with a colour touch screen from Niles won the Innovations Design and Engineering Award that recognises the most innovative consumer electronic products in the industry.

On the Wi-Fi front, the IEEE has still not ratified the 802.11n standard and the question starts looming as to whether IEEE will ever get its act together. Numerous products showed up supporting the draft standard and there seem to be very few problems with interoperability. The main question therefore is: should IEEE get involved in future wireless standards, as it only seems to cause significant delays?

60 GHz around the corner

While most of CES this year focused on existing technology and existing products it is worth noting, that 60 GHz is starting to make noise.

A consortium – WirelessHD – was founded in late 2006 and includes such notable names as Intel, Panasonic, Sony and Toshiba. The goal is to deliver a radio with a speed of at least 4 Gbps. There is a clear rationale behind the speed. To be able to deliver uncompressed video delivering 1080p – the best HDTV resolution available. While we have yet to see the first silicon, several companies were touting WirelessHD at CES.

WirelessHD differs from the existing UPnP in that it uses a different method of discovery. As you may know, the UPnP consortium is headed by Microsoft. After evaluating UPnP the WirelessHD consortium decided that there was a better way to do device discovery and device control. WirelessHD has bad-mouthed AVC, which is primarily focused on providing discovery and control of point-to-point-connections - rather than a whole network, as is the case with UPnP.

There is, however, a lot more going on in the 60 GHz space. The IEEE has formed the 802.15.3c working group that is looking at defining a common standard for the lower layers of the protocol stack. This will ensure that multiple standards using the same spectrum can co-exist peacefully.

While consumer products using 60 GHz are still a couple of years away, SiBeam said at CES that it should be ready with first silicon in a short while. Once this comes out, testing can begin. And when we have 2 more vendors, it will be time to start testing interoperability.

The testing will surely be aided by the fact that the WiMedia Alliance is also looking at the 60 GHz spectrum. This should ensure that we get working products to market the first time around – and not have the same problems that we have seen with some of the preliminary wireless standards.

And in summary .... peace reigns

All in all CES was very wireless this year. All standards seem to coexist peacefully and only compete marginally. Gone are most of the proprietary solutions that hamper the growth of the wireless markets. The most interesting was UWB that seems to be the future for short range wireless. Next year promises even more excitement as we should expect to see wireless products in the 60 GHz range!

news

Parrot shows multimedia connectivity module for OEMs

At CES, Parrot was showing a 3rd-generation integrated solution designed for audio and navigation equipment manufacturers,. The CK5050+ combines Bluetooth, USB & Voice recognition and is based on Parrot's P5+ ASIC.

The CK5050+ combines both Bluetooth and USB and is designed to be integrated into car audio and navigation equipment. It provides multimedia connectivity features such as Bluetooth hands free telephony, phone book synchronization (all profiles), audio streaming, MP3 player and iPod connectivity via USB and 'independent voice recognition'.

Incisor spoke to Eric Riyahi, Parrot OEM Executive Director during CES, and learned that the CK5050+ is intended to enhance the current CK5050 features already used by Parrot's audio manufacturer customers. "The multimedia connectivity integration is a necessary step adopted by major audio and navigation equipment manufacturers to reduce the overall system cost. The global phone compatibility and Parrot connectivity solutions are key decision factors for more and more major players in the car audio equipment business worldwide," commented Riyahi.

The CK505+ is based on 0.13µm CMOS technology, and in addition to its connectivity options, includes a DSP to handle functions such as full duplex operation, voice recognition hardware accelerator, echo cancellation, noise reduction and beamforming.

The CK5050+ module is scheduled for launch during 2008.

INCISOR.TV MEETS PARROT: CES INTERVIEW

Click image to view

news

CSR and Motorola to form EGPS Forum

CSR and Motorola intend to create an open industry forum to evaluate and foster enhanced Global Positioning System (EGPS) technologies. Incisor understands that the EGPS FLA (four letter abbreviation …) will start to appear soon as a marketing device.

The partnership explained that when used on a mobile device, EGPS technologies augment GPS to provide position-based information, and not just where the device can get an easy fix on satellites. The EGPS Forum is expected to advocate improvement to location technologies in mobile devices and the two founders say they are 'committed to meeting consumer and regulatory needs for precise and consistent levels of location information'.

They went on to comment that current commercialised location technologies meet the basic needs of consumers and minimum regulatory requirements for widespread use in mobile phones – however, high value commercial services require location technologies that provide prompt, consistent and reliable position information, even indoors, within the limited power budget of a portable device. Emergency services also require accurate indoor positioning. The intended goal of the EGPS Forum will apparently be to ensure that technologies which enhance GPS are put in place to meet these advanced requirements.

The EGPS Forum will be open to a broad array of participants from the telecommunications industry including handset manufacturers, location technology companies, network infrastructure providers and mobile network carriers. Initial activities of the Forum will focus on evaluating hybrid technologies that enhance GPS by combining satellite measurements with timing measurements taken from cellular networks and on establishing the underlying infrastructure to ensure full interoperability of this technology.

CSR's Location Business Unit Vice President, Stuart Strickland explained, "CSR is committed to delivering embedded location technologies that meet the needs of consumers and portable device makers. By working as part of the EGPS Forum with industry leaders such as Motorola, we expect to be able to extract the full potential out of our own enhanced GPS technologies."

"Motorola has been bringing innovative location based technologies to our mobile devices for years. As interest in mobile location services accelerates in 2008, we look forward to working with CSR and other industry leaders to drive this technology forward," added Kevin Cole, Vice President, Device Technology Engineering, Mobile Devices business, Motorola.

CSR and Motorola expect the procedure for EGPS field trials and performance testing to be in place in the first half of 2008.

TTPCom Four form new communications licensing venture

The four founders of TTPCom, which long-term Incisor readers will remember as an early provider of Bluetooth IP, have joined with Professor Rick Hillum to form Camitri, a new venture that will market intellectual property from world leading universities and research institutes to the communications industry. Camitri is backed by Imprimatur Capital, a principal investment business focussed on early stage IP.

Gordon Aspin, Mark Collins, Richard Fry and Tony Milbourn were the executive team that started TTPCom in 1987, and developed it over 19 years into a business licensing technology globally into the cellular industry, with a $120m turnover and 700 staff. The team ultimately sold it to Motorola in June 2006 for $192 million. Rick Hillum brings to the venture communications IP that he has already built up within ICIPR, his existing company which is merged into the new venture. Tony Milbourn has been appointed CEO.

Milbourn told Incisor, "Universities are renowned for their creativity and have been the prime movers for many of the world's most innovative start-ups. However, there is a wealth of innovation that is most effectively exploited by licensing to existing companies rather than creating new ones. This is the market that Camitri will address."

And here is another name that will be familiar to Incisor regulars - Maria Khorsand – formerly president of the disbanded Ericsson Bluetooth Technology Licensing business unit and currently CEO of SP Technical Research Institute of Sweden. Now also installed as the Non-Executive Chairman of Camitri, Khorsand commented, "I believe we have an exceptional team here that has the right contacts and knowledge of both the commercial and the academic world to take our business model to a new level. We have the insight to recognise marketable technology, the commercial and technical understanding to package that technology in a useable form, and the experience to know where the value of that technology can be fully recognised."

news

Cost of GPS modules slashed

CSR tells Incisor that it has halved the cost of embedded GPS solutions through a collaboration with Samsung Electro-Mechanics Company. The resulting products are based on CSR's GPS software and Samsung's module hardware, and are claimed to bring best in class location-based services to mobile phones, media players and personal navigation devices.

According to ABI Research, the market for GPS enabled handsets alone is set to generate $50bn in revenues in 2008, with that figure set to rise to $100bn by 2012. CSR's software approach eliminates the need for a dedicated GPS baseband, this reduces the cost of the module to less than half of what competitors are able to offer, and offers manufacturers a low cost route to take advantage of this high growth market.

The 9.8x9.8x2.15 mm Samsung module is based on the SiGe Semiconductor SE4120S GPS RF IC and is a complete GPS RF subsystem, including voltage regulation, RTC and TCXO, SAW filter and LNA. When combined with a typical applications processor, the system achieves tracking sensitivity of -159 dBm and has a cold start acquisition time of under 40 seconds.

Dr. Stuart Strickland, Vice President of CSR's Location Based Services Business Unit, commented, "Our software architecture already allows the lowest cost design for embedding GPS in high volume applications and we've seen strong interest from tier one mobile handset and consumer electronics companies. By partnering with Samsung, we are now able to completely eliminate a complex, risk-laden, and time-consuming step in the product design and integration process, thus making this lower cost alternative available to a much broader range of customers."

NFC flagged as a Top 5 Tech by the Beeb

BBC TV's flagship technology program, "Click" has chosen NFC as one of its five top technologies for 2008. BBC News selected the five technologies from the products and technologies on display at CES.

"The 'Click' program's selection of NFC says a great deal about both the maturity of NFC technology and the growing demand for it among consumers," Gerhard Romen, NFC Forum vice-chairman commented. "At this year's CES, NFC Forum members showcased a broad range of commercial applications that take the convenience of NFC in a number of exciting new directions."

NFC demos at CES 2008 included using a phone as a payment or travel card, making mobile proximity purchases using an NFC-enabled device, transmitting digital pictures over a secure Bluetooth connection, redeeming mobile phone-based coupons at point of sale, using an USB-NFC reader to enable card-to-PC communications, collecting and displaying information from smart posters using NFC phones, NFC-enabled products for the car, home and office and connecting Bluetooth devices simply by waving a mobile phone over an NFC reader/writer.

new products

Nokia N95 8GB, the first DLNA certified mobile

Nokia tells us that its N95 8GB handset has the distinction of being the first ever mobile phone to receive Digital Living Network Alliance (DLNA) certification. If you are unfamiliar with DLNA - a body advocating the interoperability of wired and wireless consumer devices - see Incisor issue 109 – "DLNA goes global". For the consumer, Nokia - which describes itself as an active member of the DLNA - says that the accolade translates into convenient and intuitive connectivity between your DLNA Certified home electronics devices, personal computers, and your Nokia N95 8GB.

DLNA has certified the Nokia N95 8GB as a Mobile Digital Media Server, commenting that the extensive connectivity and cutting-edge media capabilities of the Nokia N95 8GB are ideal for enjoying content, such as music, photos or videos, wirelessly on other devices in the home environment.

"We are thrilled to receive this tribute from the DLNA. The Nokia N95 8GB is truly a masterpiece of a multimedia computer, and a prime example of the direction mobility is taking - it's personal, powerful and fits seamlessly into your life inside and outside the home," said Anssi Vanjoki, executive vice president, Markets, Nokia.

DLNA has already certified over 1800 products in the personal computer and consumer electronic categories, but says that this is the first time the stringent guidelines for interoperability set by the DLNA have been met by a mobile phone. Mobile devices were included in the DLNA Networked Device Interoperability Guidelines that were published in early 2006, and are now part of the recently launched DLNA certification program. The Nokia N95 8GB passed DLNA's testing process to receive the green DLNA Certified logo.

GN goes urban

GN, the company behind the well-known Jabra headset brand, seems to be responding to the 'un-cool' jibes aimed at the majority of Bluetooth headsets. Whether you agree with those jibes, or not, and whether it is fair – or not - to say that all Bluetooth headsets (mono, we're talking about now) are un-cool, it is a reality that many people still feel enormously self-conscious about walking around wearing a Bluetooth headset. Sadly, this doesn't include those people who also think it is OK to walk around in shiny leisure suits or wear strange hats.

GN is tackling the issue – for the youth community predominantly, in our assessment - with the launch of the Jabra BT3030 stereo headset. This allows you to drive all your tunes direct from a "dog-tag" style remote control and keep your phone or music player safely in your pocket. The headset supports the A2DP profile for stereo streaming, and AVRCP for call/track handling. So, as per the norm, when you're listening to music and a call comes in, the sounds will automatically be paused, then resumed.

The BT3030 achieves what GN calls the 'slick street-style' of its dog-tag design with laser cut metal and LEDs on the face so you can tell the status of the headset and check out the battery level at a glance. The user can choose his or her own style, wearing it around the neck on the metal chain included, or can adapt the look with a choice of lanyard. They can also clip the headset directly to a jacket, belt or a bag. The Jabra BT3030 comes complete with wired headphones, and a standard jack so that any other standard headphones can be plugged in.

Other features include up to 8 hours of talk time, 7 hours of music playing, mini USB charging plus Auto- and Multi-Point pairing so that the BT3030 can be paired with more than one Bluetooth device at the same time.

Priced at £39.99, the BT3030 was available on a month's exclusive at T-Mobile during January, and at other retailers from February 2008.

connectBlue releases Bluetooth I²C bus adapter

Swedish wireless industrial automation specialist connectBlue has released a Bluetooth based I²C (Inter-Integrated Circuit) OEM adapter to connect devices such as displays, sensors and signal converters.

I²C is a multi-master serial computer bus that is used to attach devices to, for instance, an embedded system. By connecting the new Bluetooth I²C Bus Adapter from connectBlue to the I²C bus, the customer does not have to connect the I²C master device directly to the I²C bus. Instead, the new adapter implements the master side of the I²C bus interface and via Bluetooth functionality makes it possible to wirelessly enable a number of slaves on an I²C bus. The "original" I²C master implements a simple I²C look-alike protocol based on the Bluetooth serial port profile (SPP). The master device can then access all I²C slaves available on the I²C bus over Bluetooth wireless technology.

"The advantage of a bus connection is how it logically can connect multiple devices over the same set of wires; and via our new Bluetooth I²C Bus Adapter, it can now make this connection wirelessly," said Rolf Nilsson, President of connectBlue. "Thus, when you connect mobile or temporary devices or when you want to overcome complicated and costly installations of displays and sensors, the Bluetooth I²C Bus Adapter provides an efficient and easy-to-use solution."

connectBlue tells Incisor that - with a few additions - the Bluetooth I²C Bus Adapter is configured using the same AT commands as the connectBlue standard Serial Port Adapters. Typically, the adapter is pre-configured using a toolbox or AT commands, and then mounted and used for reading and writing data to and from the slaves on the I²C bus. It is apparently also possible to use the Bluetooth I²C Bus Adapter more dynamically and/or to re-configure it over air.

Intelligent integration of GPS into mobile handsets

by Martin Reidevall,
CSR's Location Based Services Business Unit

The type of GPS technologies consumers know today are systems that were designed for in-car personal navigation devices and other similar applications less power conscious than mobile handsets, so as GPS migrates into the cellphone there is a need rethink how the technology is integrated and where GPS should be located. Getting this wrong not only causes potential design headaches, but it has a negative impact on both performance and power consumption.

The mobile handset has three key 'value centres': the cellular bearer subsystem, the applications processor, and wireless connectivity. These all have fundamentally different design and product life cycles, technological constraints, as well as differing market and regulatory pressures. In revising how GPS is designed into a handset, it is important for the designer to be conscious of this delicate handset ecosystem.

The bearer subsystem (cellular modem) has relatively long design cycles and regulatory requirements which result in a vanilla approach - minimising the options that differentiate one product from another to allow many different products to be generated from one standard platform.

The applications processor subsystem is a flexible, minimally defined, general purpose resource driven by Moore's Law towards ever smaller process geometries, more processing power, and lower power consumption – all of which depend upon keeping out the mixed signal functionality that would weigh it down.

The wireless connectivity subsystem is a feature-orientated, multi-standard, fast moving and complex mixed signal environment, with many opportunities for supporting hybrid radio combinations. New wireless connectivity technologies are often introduced as a system on chip (SoC) for fast and low risk integration.

Migrating analogue and digital components in a single piece of silicon, as CSR did with Bluetooth, makes sense if the design was created from the ground up. If not, the results are simply too power hungry, too big, and not intelligently enough integrated to survive the demands of the cell phone environment. This has been the problem with GPS SoC designs.

There is inevitably pressure for tighter and more cell-phone-specific integration as attach rates rise. The question is where to integrate. Qualcomm has been reasonably successful in integrating GPS into its cellular modems, but it did so at a time when performance expectations for GPS were relatively low and when location technologies were thought unlikely to change regularly - as with the cellular modem. But that's no longer the case.

There are powerful reasons for integrating these new technologies in the wireless connectivity subsystem. As the wireless subsystem falls under more pressure to move to smaller process geometries and because of the relatively high analogue content here, it is only economical to do this by combining multiple radio technologies. Because the adjacent applications processors also offer generic resources that are becoming greater and more efficient with every iteration it makes sense that at least some of the new features whose specific radio hardware is located in the wireless connectivity subsystem are defined in software running on the applications processor.

The GPS SoC approach is unsuitable for high volume cellular applications, and the more powerful and ultimately more successful integration comes from combining feature-driven radio technologies in the wireless connectivity subsystem and driving these from software that can run on the increasingly powerful and efficient applications processor subsystem. For systems that don't contain a sufficiently powerful application processor, an embedded processor can be integrated into the wireless connectivity subsystem. This processor could either be used for single duty or for multipurpose (e.g. audio processing as well as GPS).

GPS must be integrated more intelligently into the architecture of the phone. But the phone architecture is not homogeneous and the appropriate point of integration is not in the cellular baseband, but in the wireless connectivity subsystem and in such a way that makes greatest possible use of the forces that are driving the applications processor subsystem.

A Fantastic Voyage: Introducing Body Area Networks

by Dean Anthony Gratton

In 1966 we may have witnessed a revelation that would change medicine forever. Imagine the scene: the plight of scientist Jan Benes requires immediate and urgent attention after he suffered a serious head injury, which has subsequently caused a brain clot. The solution seemed a little far fetched at the time. Nevertheless - ingeniously - a group of scientists combined in the US and the Soviet Union has mastered a technique to successfully miniaturise a medical crew, a vessel and its equipment. After successful miniaturisation the crew and its equipment would be injected into the scientist's blood stream where the crew could steer the vessel to the brain and alleviate Benes of his ailment. Inescapably, time is of the essence – it just goes without saying. The US and the Soviet Union Government agencies become privy to the knowledge that Benes had successfully mastered a technique which rendered the miniaturising permanent; the challenge and discovery ensues. However, until he regains consciousness the secret will escape them forever. In a nerve tingling, nail biting, toe knurling hour, the crew would suffer dire consequences along with the inevitable death of the scientist – how will the world survive?

Never mind, grab that glass of beer; reach for that glass of wine – anything, just make sure it's alcohol and we'll continue.

The crew were undoubtedly aware that if the mission failed, not only would the scientist snuff it, but they would gradually return to their original size causing the body's natural immune system to attack the alien vessel. The cheese keeps on piling, the heartache keeps on pounding and the death toll keeps on rising for all those involved – it seems such a waste. Perhaps, the content of a science fiction movie? Yes, definitely!

Evidently (for some), we refer to the film Fantastic Voyage, with a more recent take in 1987 with The Innerspace offering starring Dennis Quaid. Both films appear to offer us a fantastical perspective along with a cheesy tongue-in-cheek narrative of what may become the future; however, it seems we are in fact not a million miles away from such a reality. Although, having said that, we should be a little more specific here as the intention is not to miniaturise a medical crew or its vessel. Hot dang - imagine the fun we could have had! Moreover, the ingenious solution here for a more realistic 21st Century solution, is the provision of a Wireless Body Area Network (WBAN) and the miniaturisation of wireless sensor electronics. Now we have to pause for a moment as we allow the somewhat tired electric organ to screech out "dum, dummm, dummmmm".

A WBAN: the pomp of a science fiction movie? No, not in this instance. Members of the IEEE have banded together to form a working group committee to debate the prospective notion of what they have coined the (wireless) Body Area Network (or WBAN). Under the 802.15.6 banner, the committee will ultimately decide whether or not the technology has any viability or sustenance, along with the final resolution of some of the most technological challenges facing the wireless and medical community.

The notion of a Wireless BAN and its associated technology have been bantered around for some time. It's not new. The majority of us are certain that a Wireless Personal Area Network (WPAN) forms the collective technologies that connect us not only personally to our computer, phone, mouse, keyboard and so on, but to the wider-area context through Wi-Fi or Femtocells. The premise of WBAN is the personable collection of technologies that may be upon us at a given time away from the WPAN. For example, the use of an MP3 player along with its wireless stereo headset already forms our BAN community of devices. Equally, the various ranges of health, fitness and sporting devices offer us real-time data regarding our fitness at a given time and are also considered the WBAN collective. However, let's not forget that electronic devices have been integrated into a lot of sports clothing – for example, jackets with MP3-enabled pockets allowing you to connect directly to integrated headsets. Some even connect to your player via Bluetooth. Likewise, some clothing already has heart monitors and other fitness and sports electronics all

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ready for you to use. In essence the distinction can be made that, your MP3 player, stereo headset and the range of health and fitness devices whilst jogging on a Sunday morning, form your WBAN. Similarly, if the same devices were in proximity to your WPAN then equally data can be exchanged between the two topologies where you can download new music to your MP3 player whilst learning of how well you've done at jogging; calories lost, perspiration, heart rate and so on. You can extend these parallels endlessly.

The IEEE in this instance has not only considered the above paradigms in its long-term perspective of use cases, but has toyed with the notion that wireless-enabled devices can indeed be instrumental in the future of our health care. Do not be alarmed. In one such use case, the opportunity to ingest a wireless camera to avail the gastro-inferno of your stomach and its intestines can only be marvelled at. This is the stuff of science fiction, but incredibly it is a reality – this technology is already here, just take a look at ZarLink Semiconductors (www.zarlink.com) and the Sayaka capsule endoscope (www.rfamerica.com/sayaka).

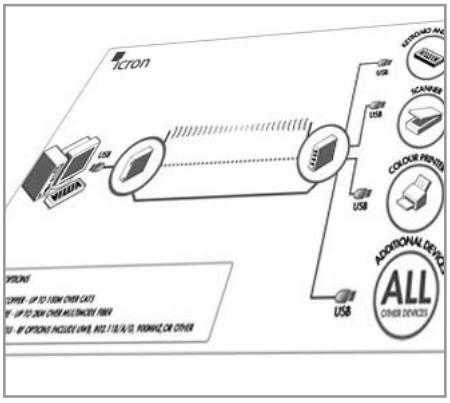
Unbelievably, allowing this technology to be ingested by a patient will require a leap of faith; it would have to remain void of a Stephen Hawking-like voice communicator "You're doing just fine". And certainly, seeking a three-finger salute (that is, CTRL-ALT-DEL) when things go wrong, isn't going to necessarily reset the untoward alien vessel and blitz it into some foreign material which would ultimately be destroyed by our immune system. Launching or indeed implanting this into a human will require its presence to be one of unity and to ultimately render it as a waste product (if ingested). The IEEE and other researchers have invested time and money investigating the real possibilities of implanting wireless devices into the brain. For example, with diseases such as Parkinson's, Deep Brain Stimulation (DBS) may alleviate affected regions of the brain helping to treat sufferers of the disease. Additionally, retinal implants can be provided to aid visually impaired patients and to help them restore some vision. A wireless sensor here could be monitored remotely ensuing effective quality of service and consistently good performance. Similarly, cochlear implants can be provided to the hearing impaired through stimulation of auditory nerves in the hope of restoring some hearing. You could probably compare this with the experiences of Jaime Sommers (Michele Ryan), 2007 as the Bionic Woman – again, the subject matter of science fiction increasingly creeping into reality.

A spokesman for one of the industry majors, who wished to remain anonymous at this early stage, told Incisor, "It's a hot topic for us at the moment" and revealed to us the incredible and varied wealth of research that had already been undertaken. The source revealed that the challenges of implanting such devices will inevitably have an impact upon the choices surrounding the types of antennas, batteries and the actual material used for such devices. The source added, typically, larger antennas are required for low frequency devices, which obviously wouldn't be suitable for some implants. The batteries used within implanted devices would have to be energy efficient, as well as using a variety of smart data transmission techniques to sustain battery life over at least five or so years. In selecting materials we have to be aware that choices for non-corrosive, as well as biologically compatible materials are carefully considered. And, of course, the pimply pubescent (see The Wireless Hackers' Club) may have some fun with a number of pacemakers if strong authentication and encryption schemes are not employed. Our source reminded us that the impact of implanting devices into the human body requires detailed research into RF behaviour – "You simply can't drop it in and not understand the potential consequences," the source said. For example, the source highlighted that research needed to be undertaken to study the impact of absorption of RF energy by human tissue and, of course, selecting the frequency used for a device within or external to the body has to be carefully measured. In fact, the Medical Implant Communication Service (MICS) is the name given to a frequency used specifically for medical implants (402 to 405 MHz). These devices are capable of bi-directional communication perhaps exchanging data with other implanted devices within the BAN. Again, the Wireless Medical Telemetry Service (WMTS) is a name provided to the frequency used for the wireless monitoring of devices within a BAN, and to other external recording equipment. At the other end of the wireless spectrum the Industrial, Scientific and Medical (ISM) band, namely 2.4GHz (Bluetooth, 802.11b/g) and 5GHz (802.11a) are predominately used with consumer electronic devices.

In all seriousness, the IEEE and other researchers have considered the above factors with a sense of due diligence. The provision of consumer electronics within the BAN have been available for some time, however it's the next step in the BAN's evolution where we really need to gulp hard and brace ourselves for science fiction becoming a reality. If we get this far with this new technological revolution, we indeed have to cross our "Ts" and dot our "Is", as the health system can no longer endure a continued berating of lawsuits that render the organisation worthless and futile. Furthermore the dichotomy of belief is not limited to the surgeons and other health professionals, but is primarily extended to the patient. Let's imagine your drug allowance is now dispensed by "Vera," who sits at her desk and disingenuously pushes a button wirelessly dispensing your Diazepam and ponders aimlessly at the ceiling asking, "How many times do I have to press that button?" Crikey, even worse, she may solely be responsible for keeping a patient's heart beating. As she files her nails, she pauses, chewing her gum with her mouth slightly ajar wondering what that high-pitched monotone sound is – let's ensure we avoid these horror stories. It's hard to believe that an industry would dispense completely with human contact or indeed employ Vera. But, perhaps we are missing the objective here, as more importantly the technology would ensure that drugs are indeed administered on time and that any real-time issues with patients are managed immediately. The prospective technology bestows a somewhat here and now perspective, as no longer would we have to await six weeks to learn of the results of a biopsy and more importantly we would need to avoid the mistakes that seem to overwhelm young professionals.

The notion of WBAN offering us a number of consumer electronic products well, that's already here. The notion of WBAN offering us a premonition of a medical future, does indeed look wholesomely healthy, but equally could become an ethical Pandora's Box.

uwb/w-usb news



Icron results back up ExtremeUSB theories

Icron Technologies Corporation, the Canadian company that developed ExtremeUSB technology (See IncisorTV video profile; Icron Technologies and ExtremeUSB) continues to flourish, announcing healthy financial results for the third quarter ending September 30, 2007.

Highlights included posting record Q3 2007 revenues of $2,412,917, representing a 49.8% increase over Q3 2006, 2007 year-to-date revenues at a record $6,631,150, representing a 47.1% increase over the same nine-month period in 2006 and recording its fourth consecutive profitable quarter posting a profit of $2,344 in Q3 2007 as compared to a loss of $293,029 in the same period of 2006.

Icron tells Incisor that it has increased R&D spending to accelerate the evolution of its ExtremeUSB IP Core, for use in its own ASIC program, alternate FPGAs implementations and other core licensing opportunities.

"As Icron continues to execute on our plan of making its ExtremeUSB platform more portable, flexible and cost effective, we continue to see solid growth in our legacy markets," commented Robert Eisses, President & CEO, "The introduction of our wireless USB 2.0 solution helped our growth, but at the same time the company was again negatively affected by the US Dollar devaluation this quarter. However, net effect was continued positive growth and we are very happy with the results."

Eisses added that the continued growth of USB 2.0 connectivity in the market has helped Icron's continued growth and the company sees it continuing as it becomes more prevalent in all application areas including home connectivity, medical, industrial, commercial and transportation/automotive applications.

Wisair doubles the speed and halves the price of Wireless USB

Immediately prior to CES, UWB-company Wisair announced a new Wireless USB host and device dongle set aimed at the OEM market. Describing the new products as 'a compelling Wireless USB upgrade kit to end users', Wisair claims to be offering superior performance, lower cost, and improved ease of use compared to existing Wireless USB alternatives in the market today.

To accelerate OEMs and ODMs time to market (oh, for a buck for every time those words appear in a press release ....) , the dongle reference design will be delivered as a production-ready solution, pre certified by WiMedia, USB-IF, FCC, and TELEC.

How does it get to be better than other wireless USB solutions out there? Because, says Wisair, it is based on its WSR601 CMOS single-die chip, and this incorporates Wisair's UltraSpeed technology, which is said to enhance Wireless USB throughput, while remaining fully compliant to Certified Wireless USB. Wisair explained that UltraSpeed uses several acceleration schemes to optimize data processing and enables throughput in the range of 70-100 Mbps when connected to a Host Wire Adapter, and up to 200 Mbps when connected to a Wireless USB native host. Additionally, the dongle set provides a standard Wireless USB association, eliminating the need for cables for initial association (pairing).

"The new Wisair Wireless USB dongle set, with its extremely competitive price/performance combination, offers half the price and double the throughput compared to other solutions," said David Yaish, CEO at Wisair.

First fully integrated Wireless HDTV?

Amongst the ranks of the CES trailblazers, Westinghouse Digital Electronics, a US LCD manufacturer, and UWB company Pulse-Link introduced what the two companies are claiming is the world's first fully integrated wireless HDTV. A High Definition LCD TV, which featured Pulse-Link's integrated CWave UWB Wireless HDMI technology, was on display at the Las Vegas show.

John Araki, vice president and general manager of the commercial business unit at Westinghouse commented, "Our focus at Westinghouse Digital has been centred around delivering the best HD has to offer. HDMI digital transport provides the full HD resolution our customers expect and we are extremely impressed with the performance and capabilities of Pulse-Link's Wireless HDMI solution. The fact that it is fully integrated into our HDTV display is unprecedented in the industry and will certainly raise expectations for high quality ready-to-mount wall display products in the marketplace."

Pulse-Link added that CWave HDMI products offer real-time visually lossless wireless streaming of high quality audio and video content between entertainment source devices and HDTV displays. Video data is encoded using the JPEG2000 video codec, the same codec used by movie theatres for "Digital Cinema".

The Westinghouse Digital Wireless HDMI HDTV is planned for initial commercial release to the B2B digital signage market in Q2 2008.

The Wireless Hackers' Club

by Dean Anthony Gratton

In a dark room along with a scattered collection of empty pizza boxes, the glow of a computer monitor illuminates the face of a spotty young pubescent. As he intensely eyeballs the screen, he picks his nose whilst using the same finger to tap at the keyboard. In his other hand he can be seen fumbling with his mouse navigating his way around the screen: he's obviously trying to crack a new challenge-response scheme. He uses a number of wireless-enabled devices in his personal-area network, although his social life is limited to the wide-area network where his peers congregate in a virtual space sharing new ideas and techniques. Perhaps, a stereotypical image of a teen hacker? Most definitely. Moreover, there are specialist companies that are employed to crack such encryption schemes; companies that offer guidance and support for the wireless developer community. We should mention here that academics and researchers are not to be confused with pimply juveniles. The stereotypical image seems to be limited to pubescent wannabes whose clearly destructive stance only damages the already frail image associated with wireless security. Nowadays, the range of specialist companies and the eclectic number of researchers pride themselves on ensuring that our nubile wireless environment remains secure.

The press have sensationalised several stories deeming security within wireless technology inadequate. Bluetooth-Jacking/Snarfing/Phishing (just delete as applicable) have all dominated the headlines – the 'BlueBug' was prevalent at a time when Bluetooth was becoming increasingly popular with mobile devices. The anecdotes include the ability to hijack a mobile phone or other device that uses Bluetooth technology. For example, the hijacker could use the Dial-up Networking (DUN) profile to slyly make GSM-calls from the hijackee's mobile phone, in turn, the hijacker has called long distance at your expense. Other Bluetooth-nightmares include the ability to download contact information or other personal data. Presumably, the hijacker would be seeking something a little more sensitive such as a four-digit PIN along with your bank account details, as opposed to making a call to your mother-in-law. But, the most notorious and somewhat unexpected wireless hack was with Wi-Fi and its Wired Equivalent Privacy (WEP) encryption technique. It clearly demonstrates that despite our best efforts, there is always someone out there with a lot of time on their hands.

Seriously though, the actual revelation set Wi-Fi back several years and it took some time to assure consumers that indeed Wi-Fi was as secure as connecting an Ethernet cable. Soon after, we became privy to hearing stories about hackers and their "Wireless Hackers' Club." Further tales were portrayed with images of sullen individuals sitting in their cars armed with a laptop and a powerful antenna. Inconspicuously, they would park their cars adjacent to a building with their laptop to determine which IT administrator hadn't secured their company's wireless infrastructure. With an egotistic flair, these same individuals would use war-chalking to allude to other hackers that a particular access point was available. Through the use of symbols, which are derived from hoboism, a hacker could indicate if an access point was open, closed, or WEP-enabled; these symbols also displayed information regarding the SSID and bandwidth. War-walking/war-driving/war-storming (again delete as applicable) are popular terms that were used to depict the various security attacks on Wi-Fi technology.

It was all in a vain hope that they would download information, which would be particularly sensitive and revealing about the company. It seems somewhat redundant that such an elaborate setup with covert surveillance, accompanied with its basic equipment, would go to such an alarming waste. After all, we no longer need to park cars adjacent to buildings in the hope to attain such sensitive information. It is now traditional to simply

expect the incompetence of several UK Government agencies to disclose the sensitive data of thousands of British citizens conveniently on a CD. In recent news (the latter part of 2007), the UK has witnessed a spate of embarrassing headlines that has revealed to the British public that Her Majesty's Revenue & Customs (a Government department responsible for the collection of taxes), along with the Driver and Vehicle Licensing Agency (DVLA) have inadvertently lost huge tranches of personal information (including banking data), which emphatically demonstrates that you don't necessarily need to go to the extent of skulking the radio waves for sensitive information. How technology moves on!

Over-reliance on out-of-box settings

The encryption scheme used within Bluetooth technology remains inherently secure, although some reports suggest that it isn't necessarily watertight. In particular, two researchers, namely Wool and Shaked, 2005 demonstrated that it was possible to retrieve the PIN (or passkey) used in the initial exchange at the Bluetooth user interface level in their paper, titled "Cracking the Bluetooth PIN ". Evidently, the Bluetooth PIN was cracked within laboratory conditions and, as we know, the possibility of being in the right place, at the right time, in the real-world, decreases the probability of successfully retrieving any PIN. In light of the difficulty associated with capturing the PIN, it would therefore seem difficult to eavesdrop on an ensuing Bluetooth connection. Alas, without the PIN or Bluetooth passkey the hacker would ultimately remain deaf to the conversation, although we should remember that encryption in some profiles still remains optional. In a devil's advocate perspective, we could argue that most PIN settings for the majority of Bluetooth-enabled devices remain at the default setting, for example "0000" or "1234". What's more, in any interaction, two or more users of a Bluetooth device will typically ad-hoc agree a mutual PIN exchange to successfully pair the device. Typically, most consumers would conveniently suggest a single digit, normally a "0" or "1", although in this equation, from a hacker's perspective, we have to add the mobility of the device and the spontaneity of the consumer. Naturally, this further supports the argument for the "someone, somewhere" theory, see "Enabling Intuitive Connectivity using NFC" (Incisor, January 2008) where the probability of the consumer and the combination of the right variables being successfully assembled in a real-world context at a moment in time remains proportional to the metrological success rate of an engineer unequivocally capturing and reverse engineering the payload (… and breath).

Above all, security remains the responsibility of both the consumer and the manufacture. Manufactures should ensure safe default settings whilst consumers should be aware of the dangers of leaving their Bluetooth product unprotected and perhaps, should also consider varying PIN combinations and size. If you like, it's about adopting a common sense approach to wireless security. In short, we haven't seen any new revealing headlines within the press regarding Bluetooth security. Of course, we are still faced with issues surrounding consumers enabling their Bluetooth-enabled devices correctly and, as the technology itself becomes more popular with consumers, we can rest assured that the majority are increasingly becoming Bluetooth-savvy when it comes to enabling security features.

The gift that keeps on giving

Wi-Fi, on the other hand, continues to sustain pervasive security attacks: an access point along with its consumer remains fairly static in a given environment. On reflection, the "someone, somewhere" theory doesn't necessarily apply here; this is evident with our previous anecdote of cars parking adjacent to buildings. Wi-Fi suffered a successful breach of its initial security offering with the WEP algorithm, as we have already mentioned. The introduction of WEP was to afford consumers confidence with data integrity and security. In using a combination of cryptography (stream cipher RC4) and a Cyclic Redundancy Check (CRC), also known as the Integrity Check Value (ICV), the WEP algorithm enabled encrypted and reliable communication, respectively. However, its downfall was in the manner it used to prefix a value onto the ciphertext, namely the Initialisation Vector (or IV) – we'll come back to this in a moment. Just for clarification, ciphertext is plaintext (unprotected data) that has been subjected to an encryption algorithm to ensure it remains unreadable by unauthorised parties.

The CRC value is used to ensure that data transmitted over the air interface is received correctly by the destination device. The CRC is calculated using a probabilistically (or hashing) method, which is an algorithm used to predict the data sequence in a packet. Naturally, the destination device will verify the integrity of the data received whilst ensuring there have been no changes. If the destination device detects any changes to the payload it will typically ask the source device to resend it. However, with time sensitive applications, such as audio and video, this will not be the case. The assignment of the CRC within the payload is appended to the end of the plaintext prior to encryption. The essential ingredient that defines the WEP algorithm is the ability to generate a pseudo-random stream of bits, which is also known as a keystream. Now we can turn our attention back to the IV. In combining a 40-bit WEP key with the 24-bit IV (a value that facilitates in the generation of a stream cipher) we, in turn, generate the RC4 key, which is then thrown into a Pseudo-Random Number Generator (PRNG) encapsulating what becomes our keystream. Not to be content, the keystream is additionally subjected to an eXlusive OR (XOR) operation with the plaintext (our unprotected data) and the CRC; this final operation, in turn, produces our ciphertext. In what we know now as a crucial faux pas, the IV value is now prefixed as plaintext data to the ciphertext prior to transmission. As such, the WEP algorithm sustained key recovery attacks where hackers could more or less make educated guesses about the WEP key based on successfully deriving the IV. And then, along came Wi-Fi Protected Access (WPA).

It is evident that consumers and businesses alike had invested heavily in Wi-Fi and the Wi-Fi Alliance had to propose an alternative solution that would support the existing community of consumers whilst not affecting existing hardware. The Wi-Fi Alliance introduced a new protocol that would ultimately replace WEP, namely the Temporal Key Integrity Protocol (TKIP). The TKIP, still retaining the RC4 key scheme, employed a strategy involving the ability to uniquely encrypt (using a different encryption key) every payload transmitted; the differences between WEP and WPA was the ability to 'key mix' along with using a Message Integrity Code (MIC) and Media Access Control (MAC) address (for all parties involved), which alleviated the possibility of tampering the initial pre-authentication. To date, the Wi-Fi Alliance has succeeded in providing a solution that would only require a software upgrade, which is pretty impressive. WPA soon emerged after WEP's initial shortcomings. Historically, WPA was ratified in 2004 by the IEEE where WPA2 is the ratified revision of the

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802.11i specification. WPA now supersedes WEP, although some products still support WEP in a mixed-mode environment supporting backward compatibility for the already large consumer-base of products. WPA2 now accommodates two modes of operation, namely Enterprise and the Home or Small Office/Home Office (SOHO), also respectively known as WPA2-Enterprise and WPA2-Personal. Further use cases are also provided for Wi-Fi access in public places, such as Wireless Internet Service Providers (WISPs). The enterprise use case permits authentication to the Wireless Local Area Network (WLAN), which is supported with 802.1X User Authentication and Extensible Authentication Protocol, in conjunction with a RADIUS server. A RADIUS will typically contain a repository of credentials of users who are permitted to use the WLAN. Essentially, access control and management is supported with 802.1X and EAP where we can now verify the credentials of prospective users of the WLAN. The EAP over LAN (EAPOL) ensures that the initial communication between client and server remains secure, as typically initial parameters are exchanged in preparation for the data transfer. Once the initial pre-authentication stage is completed, a four-way handshake ensues, which builds up to the authenticated and encrypted session. During the four-way exchange all handshakes are made in plaintext, but sanity check parameters, such as the MIC, MAC address and a sequence reference are used to ensure the handshake remains tamper proof.

Moving on to our personal (or SOHO) use case, the configuration doesn't require the use of a RADIUS server. Alternatively, a Pre-Shared Key (PSK) is used to verify the incoming user. In other words, the PSK is akin to a password or passphrase (from eight to 64 hexadecimal digits), which can be obtained at the application level. The PSK, in turn, becomes a master key used within the WPA2 implementation, which instigates the TKIP process. Naturally, if both keys match, then the user is authorised to access the WLAN service. Typically, personal users of Wi-Fi technology may use smaller passphrases, which are subject to further attacks and users are recommended to use longer passphrases. However, Wi-Fi is still overcoming issues surrounding complexity of setup and configuration, although with the Wi-Fi Protected Setup (WPS) scheme this should be become simpler.

Let battle commence ...

The WiMedia Alliance and the Near Field Communications (NFC) Forum have to brace themselves for the onslaught of wannabes hacking the living daylights our of these newbie technologies. We can only hope that these very new WPAN members have heeded the experience from Wi-Fi and Bluetooth. Moreover, what we have learned and come to understand is that there are a significant number of consumers who have steadily increased their confidence with the use of wireless-enabled products and its associated security. Alas, the press have sustained perhaps an unwanted perspective of security pitfalls, but naturally we unavoidably need to be aware of our vulnerabilities; something that is often supported by the range of professional companies that offer us paramount guidance. In a combination of manufactures' insight accompanied with the right quantity of educational material, consumers will become conscious of the subtleties that make their journey into the wireless domain that much safer. Therefore, as a consequence of enhanced encryption schemes and adopting a common sense approach to wireless security, the Wireless Hackers' Club has become disbanded, excepting a few remaining odd ball, die-hard members.

The spotty young pubescent still collects his pizza boxes, but more curiously he seems to be eyeballing the screen for very different reasons. Let's just say, that he might still be picking his nose, but his other hand isn't necessarily fumbling or navigating his mouse.

Snippets

Strategy Analytics promotes wireless analyst

Strategy Analytics has promoted Chris Ambrosio to Executive Director, Wireless Practice. Ambrosio has worked with device manufacturers, global handset suppliers, service providers, semiconductor vendors and software suppliers in areas of cellular product planning and enabling technologies issues.

"Chris Ambrosio has played a key role in growing the Strategy Analytics Wireless Device Strategies Service into a leading, globally recognized source for opinions and analysis," commented David Kerr, Vice President of the Wireless Practice at Strategy Analytics.

Bluetooth

Sernam equips its drivers with Baracoda RoadRunners

Baracoda, which has been featured a number of times in Incisor, says that is has improved the technical features of its Bluetooth barcode scanner, RoadRunners, so that it is better suited to the transport and logistics environment.

French company Sernam, which is a European multi-product, multi-mode transport and logistics operator and involved in long distance industrial express services, has selected Baracoda's scanner to equip 1300 drivers and delivery men with a traceability solution combining a Blackberry mobile terminal and Y-Trace software from Prylos. This solution provides Sernam with a traceability system facilitating information flow in real time.

ZigBee

Ember achieves ZigBee PRO Golden Unit certification

Ember's EmberZNet PRO 3.1 networking software platform has achieved ZigBee PRO Golden Unit certification from the ZigBee Alliance. Golden Units are reference points for ZigBee Compliant Platform (ZCP) testing going forward. ZigBee PRO is the recently ratified professional-grade version of the ZigBee standard designed to support larger, more sophisticated sensor and control networks.

EmberZNet PRO 3.1 augments the increased scalability, security and resilience of the standard ZigBee PRO Feature Set with compatible Ember-specific innovations for denser networks, "sleepier" (i.e. power saving) nodes and mobile nodes.

Is iPhone Wi-Fi Location Better than GPS? Yes or No?

Is GPS as we know it to become all-pervasive, or might other technology solutions have a look in? In IMS Research's report package, "Worldwide Market for GPS in Cellular", a focused report is provided on the major complementary/competitive location solutions to GPS, for cellular implementation. This covers a number of technologies, including Wi-Fi, Bluetooth, WiMAX, UWB, U-TDOA and TV signals, outlining uptake over the forecast period.

Patrick Connolly, a Senior Research Analyst at IMS, shared his thoughts with Incisor.

"During January, Steve Jobs announced that the iPhone will feature Skyhook Wireless' Wi-Fi location technology in a joint development with Google. It is easy to write this off as a stop gap solution for GPS, but for me, this is a first step towards the next generation of cellular location technology. While GPS is a more accurate technology, when you start moving into inner city urban canyons and indoors, just getting a fix with GPS becomes the issue, not accuracy, as anyone with autonomous GPS will reluctantly admit. GPS fundamentally struggles in these environments, as it was not initially designed for this use case. This isn't a major problem for sat-nav applications, but as LBS develops, it limits services and deteriorates the user experience."

"Well implemented Wi-Fi offers the best of both worlds in this environment. Provided there are enough Wi-Fi access points in range, this will not only give you a fix, but comparable accuracy too, at sub 50m. However, it is not all conquering, as Wi-Fi access points are required. This largely limits the technology to urban areas, where Skyhook has a database of access points in place, hence the Google partnership."

"This brings me to the title. Really it is a trick question as the answer is C, both. But what is really interesting about this, and other alternative location technologies, is that it is neither a stop gap measure nor competitive to GPS in the long term. Wi-Fi location can be combined with GPS to offer high accuracy in all environments, and in some cases enhance GPS performance outdoors. I can think of one or two GPS/Wi-Fi enabled handsets that are already positioned to benefit from such a technology. IMS Research expects a minimum of one other handset vendor to launch a GPS/Wi-Fi hybrid solution before the end of the year."

"Skyhook is very well positioned to benefit, having already established a large access point database and partnerships with the likes of SiRF, Navteq and Intel. However, it is not the only company developing this technology. One of its biggest competitors is Mexens Technology's Navizon. This is based on a similar concept, however, the Wi-Fi database is user generated, offering rewards to end-users to map access points. There are already 310,000 users signed up to this service, some of which are iPhone users!"

"Looking beyond Wi-Fi, there are a number of other compelling technologies out there, capable of solving this problem. IMS Research's report compares these solutions under key parameters, outlining future uptake in cellular handsets. Looking longer term, as GPS handsets proliferate, mapping content grows and LBS moves to pedestrian navigation and urban-based services, these technologies will become a must for a robust user experience and more importantly, ARPU."

Patrick Connolly, IMS Research

wi-fi / wlan news

Wi-Fi photo frame with internet radio

Telechips' Wi-Fi enabled digital photo frame platform features wireless connectivity using CSR's UniFi single-chip Wi-Fi technology. Users will be able to send their favourite photos directly to an 8-inch LCD display and also to connect via Wi-Fi access points to provide wireless streaming of internet radio. The two companies believe that the platform, which was scheduled to be available by the end of January 2008, will drastically reduce the time to market for ODMs.

Based around CSR's UniFi and the TCC8300 media processor from Telechips, the platform runs on the most common operating system for multimedia devices. CSR says that UniFi is the lowest power Wi-Fi solution in the market and features an exceptionally small chip scale package (CSP) that measures just 5.8 x 6.4mm.

Telechips' platform will use CSR's UniFi to allow users to stream internet radio via Wi-Fi and supports music subscription services such as Rhapsody, ShoutCast, WM Audio and vTuner. Users will be able to display images held on their memory card or communicate via Wi-Fi with Flickr and other photo sharing websites such as Picasa to view online photo albums. The platform will also support RSS feeds from sources including Yahoo, MSN, CNN, BBC as well as displaying currency rates and traffic information.

Tracy Hopkins, Vice President of CSR's Consumer Business Unit, commented, "Wi-Fi enabled digital photo frames based on this platform use CSR's UniFi technology to deliver the highest performance and functionality not only for the photo frame function but also to provide high quality streaming internet radio."

New Wi-Fi front-end modules from SiGe

SiGe Semiconductor has two new radio frequency (RF) front- end modules aimed at wireless multimedia services in client access applications including game consoles, desktop and laptop computers, and home access points.

The SE2547A and SE2548A are complete 802.11a/b/g/n WLAN RF front-end modules providing all the functionality required between the transceiver and the antenna in dual-band Wi-Fi systems. The devices each include the necessary power amplifiers, filtering, power detector, diversity switch, diplexers and associated matching circuitry in a fully tested module that measures just 25 mm2 – which SiGe claims is about one-third of the size of previous front-end modules on the market.

SiGe also claims that the high integration makes the new RF front-end modules ideal for portable and consumer applications including mini-cards for personal computing, and that two devices can now be integrated into the footprint previously occupied by one.

"Customers have confirmed that the SE2547A and the SE2548A are the leading devices currently sampling with this level of integration. We are working with these customers on designs that will be on store shelves in Q3 2008," said Jose Harrison, director product marketing, computer and consumer at SiGe Semiconductor.

The SE2547A and SE2548A are in production now.

Need .11n in your hotel? That'll be the Oriental Bangkok

Cisco claims that the Oriental Bangkok Hotel is the world's first deployment of it's next-generation wireless 802.11n technology in the hospitality industry. Cisco Aironet 1250 Series Access Points have been installed throughout the hotel, allowing guests and staff to stay connected even as they move from floor to floor.

Mr. Paul Jones, hotel manager, at the Oriental Bangkok, said, "The Oriental is recognised as one of the world's foremost luxury and legendary hotels. In terms of technology, in today's world, this means offering the latest advancements to make a guest's stay as comfortable and convenient as possible. Today's business travellers demand more than simple connectivity: They value voice, video and data options which are efficient, convenient, highly secure and most importantly can be accessed anytime, anywhere in the hotel," he added.

"The Cisco Aironet 1250 Series Access Point was the first enterprise-class access point to be Wi-Fi certified to support the IEEE 802.11n draft 2.0 standard. It is a modular, dual-band access point with a choice of 2.4-GHz and 5-GHz IEEE 802.11n draft 2.0 radio modules.," said Tatchapol Poshyanonda, managing director of Cisco Thailand.

wi-fi / wlan news

CSR Wi-Fi in Intempo internet radio

CSR's RadioPro example design has been selected by Intempo Digital for its Daisy internet radio. Intempo's internet radio offers access to thousands of internet and FM radio stations, providing wireless streaming of internet radio via Wi-Fi without the need for a PC. DAB radio specialist Radioscape provided Intempo with the FM functions for the Daisy.

Intempo's Daisy radio has been designed around RadioPro, CSR's Wi-Fi internet radio example design. In partnership with Radioscape, CSR jointly developed the combined internet and FM radio.

RadioPro is based on two low power chips from CSR, namely UniFi and its Multimedia Application Processor (MAP), a highly integrated chip with a RISC processor, a DSP and a stereo codec. The low power design of RadioPro has allowed Intempo's internet radio to deliver 20 hours of continuous music streaming.

Tracy Hopkins Vice President of CSR's Consumer Business Unit, commented, "CSR is committed to making the adoption and integration of wireless technology easier for designers and manufacturers. CSR's RadioPro was designed with the intention of enabling OEMs such as Intempo to quickly produce internet radio devices for the mass market."

The Intempo internet radio will be in production by April 2008 with a price tag of £149.

Cetecom offers DFS testing to Wi-Fi customers

Cetecom Inc. has added Dynamic Frequency Selection (DFS) testing to its comprehensive service portfolio. This benefits WLAN manufacturers who are now able to utilize Wi-Fi Alliance Certification and DFS test services at one facility.

Dynamic Frequency Selection was designed to instruct "master" devices to monitor radar interference within selected frequencies in the 5GHz band. When interference such as a radar signal is detected, the channel is vacated for use and instructions are provided from the master to the "client" device to switch to another channel.

The European Union was one of the first to recognize Dynamic Frequency Selection with its ETSI standard EN 301 893. Since July 2007, DFS testing has been required in the US for devices operating in the 5.25-5.35 GHz and 5.47-5.725 GHz frequencies according to FCC PART 15 subpart E.

zigbee/802.15.4 news

Intelligent home security from AlertMe

AlertMe.com, which describes itself as a provider of people-friendly home security, has teamed up with Ember to make it easy for people, wherever they may be, to keep a close eye on their homes by combining ZigBee wireless technology, the Internet and mobile phone networks.

U.K.-based AlertMe.com is launching an intelligent home security service based on Ember's ZigBee technology that lets people protect, control and monitor their homes from around the world via the Internet or a mobile device. The direct alert system immediately notifies people via text, or email, about problems at home, including fire and burglary. Offering much more than traditional burglar alarms, AlertMe can also notify people when smoke or carbon monoxide alarms go off or when people enter or leave the home. AlertMe claims that this increased functionality is provided at a significantly lower cost compared to the installation and monitoring fees of conventional alarm systems.

Self-install is described as easy, with no wiring or drilling required. The homeowner can also personalize the security and monitoring system to suit their unique needs, whether they need to accommodate pets, visitors or a house cleaner. AlertMe's direct alert system means that homeowners no longer have to rely on security company call centres or noisy sirens. Friends, neighbours and family can also receive alerts for incidents as added support.

The AlertMe kit consists of a compact hub which serves as a gateway to the Internet, and a selection of sensors which are sufficient to cover a typical home. Included are door and window sensors, motion sensors and alarm detectors which listen for existing smoke or carbon monoxide alarms and forward on alerts.

Using Ember's EM250 ZigBee "system-on-chip" and EM260 ZigBee network co-processor with its EmberZNet PRO wireless mesh networking software, the AlertMe system self organizes to provide coverage of the home. The hub is also equipped with battery backup and a GPRS modem so that in the event of a power outage it can always deliver the alert.

AlertMe.com looked at a range of wireless technologies, such as Z-Wave, and chose ZigBee because it offered the best combination of low-power, security and scalability, according to Laura James, AlertMe.com's vice president of engineering. "Ember came highly recommended by many happy customers, and we felt that they offered an advanced and reliable ZigBee software stack and the ability to do over-the-air upgrading of our products."

The AlertMe solution was due to become available in the UK during January 2008 and is priced at £399 for a complete kit, plus £11.75 per month for the service that includes 24/7 monitoring, alerts, mobile SIM card for backup communications, automatic software updates, battery replacement alerts and customer support. AlertMe.com plans to launch the product in the United States later in the year.

events

DATE	EVENT	LOCATION	NOTES	LINK
Feb 11 - 14 2008	3GSM World Congress	Barcelona, Spain	-	http://www.mobileworldcongress.com/
Feb 11 - 15 2008	Bluetooth SIG UnPlugFest 29	Las Vegas, Nevada, USA	-	www.bluetooth.org
March 31 2008	Pheonix, Arizona, USA	Bluetooth SIG All Hands meeting	-	www.bluetooth.org
April 1 - 3 2008	CTIA Wireless 2008	Las Vegas Convention Centre, Las Vegas, Nevada, USA	-	www.ctiawireless.com
April 16 - 17 2008	Comms Solutions	Wembley Stadium, London, England	-	www.comms-solutions.com
May 13 - 15 2008	EURO ID 2008	EXPO XXI, Cologne, Germany	Application options for RFID and barcode systems	http://www.euro-id-messe.de

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