

INCISOR™

NEWS FROM THE BLUETOOTH™ AND SHORT RANGE RF ENVIRONMENT

ISSUE 85

IN INCISOR THIS MONTH

Welcome to the August 2005 issue of Incisor magazine.

It is a busy, busy time for Incisor at the moment. Not only do we continue to work flat out to keep our finger on the pulse of the Bluetooth, UWB/W-USB, ZigBee, RFID, NFC and WiMax industries, but we are also rushing towards our second annual revue of wireless activity in the USA (see page 11 for details). Yes, its time to visit leading American companies again, but this time we are not limiting ourselves to just Californian companies. We are entering into talks with wireless innovators all across the USA, will visit them during August and will feature them in our Wireless in America special issue. This is combined with our WiCon Americas 2005 preview issue, to be published on the 5th of October. A very important issue, then, for any company operating from, or selling into the US market.

Plus – Incisor has made an important new addition to its monthly content. At the back of the magazine we have added a 'Connection section', which will be a meeting point for company's looking to advertise vacancies, for employment agencies seeking staff and for any company or individual looking to provide products or services to the wireless industry. Incisor is more deeply embedded in the wireless industry than any other publication. Make this your market of choice!

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CSR on acquisition trail again - Acquires UbiNetics' software business for \$48 million

As Incisor went to press at the very end of July, CSR announced that it had entered into an agreement with UbiNetics Holdings Limited to acquire UbiNetics' software business for a cash consideration of \$48 million. UbiNetics is based in Cambridge UK and specialises in communication protocol software for mobile phone manufacturers. This was no share swap deal either, as the acquisition will be financed entirely from CSR's existing cash resources. In March this year CSR acquired Clarity Technologies for its Clear Voice Capture (CVC) technology that enhances the audio performance of any voice-based product or system.

A statement from CSR said that the acquisition will provide it (CSR) with a strong R&D team to accelerate its existing software developments in Bluetooth, Wi-Fi and UWB (Ultra Wide Band). UbiNetics' team will also give CSR the capacity to extend its software offering to mobile handset customers. UbiNetics has 170 engineers located in Bangalore India and Shenzhen China, in addition to its Cambridge UK headquarters. In May 2005, UbiNetics Holdings Limited sold its test and measurement business which accounted for the majority of revenues and assets. The remaining business which is being acquired by CSR had gross assets of £3.6m and incurred an operating loss of £11.1m for the year ended 31 December 2004.

UbiNetics has been developing protocol stacks for GSM, GPRS, EDGE, WCDMA (UMTS) and HSDPA since. CSR plans to use this existing intellectual

property to provide multimode software to handset makers and to "bundle" UbiNetics' cellular multimode and HSDPA stacks with CSR's existing wireless protocol and DSP software.

The CSR Board believes that the acquisition will provide significant additional research and development engineering talent. CSR expects that this additional resource will increase R&D expenditure by approximately \$4.5 million a quarter. UbiNetics currently has limited ongoing revenues.

Completion of the acquisition is conditional inter alia on an agreed pre-sale reorganisation taking place within the UbiNetics group.

James Collier, Technical Director and Co-founder of CSR commented, "In the mobile phone market we see both call hand-off between cellular and local area networks and high speed data handling as key drivers for the widespread deployment of PAN and LAN. Together with UbiNetics, we will have all the experience, skills, track record and staff required to design the software for Universal Mobile Access and fixed-mobile converged phones. Looking ahead, we plan to extend the range of our products in order to simplify the complex integration task of the mixed hardware/software and multi-standard system that a cellular phone has become."

John Hodgson, CEO of CSR added, "There is great synergy here, the UbiNetics team will join CSR to give us a world leading wireless software capability that will help sustain our clear competitive advantage."

CSR gives Nissan wireless CARWINGS

It seems that the much talked about application of Bluetooth to in-car telematics is finally happening. CSR has confirmed that its BlueCore Bluetooth is incorporated in Nissan's advanced telematics system, christened 'CARWINGS'. The system, which offers enhanced GPS and entertainment features as well as integrated handsfree, is provided by Xanavi Informatics Corporation, an established partner of Nissan and CSR. Currently, Nissan models featuring the integrated CARWINGS service include the new Nissan Fuga luxury sedan, the Lafesta minivan, the Tiida Latio compact sedan and the Tiida and Note compact hatchbacks. From the unfamiliar names, Incisor assumes that these are cars for Nissan's domestic (Japanese) market, and that CARWINGS will be rolled out in other territories in time.

The CARWINGS system aims to improve usability of in-car navigation. In addition to the in-car telematics / infotainment system which includes GPS navigation and TV in selected models, CARWINGS also offers a 24 hour telephone operator assistance for traffic information, vehicle location and journey planning



Nissan's increasingly interesting range now gets wireless boost from CSR

The Bluetooth connectivity allows Bluetooth-enabled mobile handsets to connect wirelessly to the in-car system, making use of the handsfree capability and transferring downloaded applications and user information to the car unit. Users can also synchronise personal information including ID details, telephone directories and other contact information between a home computer, mobile handset and car system.

Anthony Murray, automotive product marketing manager, CSR commented, "The Japanese automotive market has recognised the

convenience which Bluetooth brings to the vehicle. Early adopters like Nissan have leveraged this technology to add value to the in-car telematics and infotainment systems which extend the ubiquitous personal network for which the mobile phone increasingly holds the key." He added, "Bluetooth adds the flexibility for telematics and infotainment designers to remove the wired connections while ensuring compatibility with a maximum number of mobile phones and easy integration into new car models."

Ficosa acquires JV fractal antenna business from Fractus

Incisor met with Spanish company Fractus during July. Fractus' main business is the design and manufacture of miniature and multi-band antennas for wireless applications. We were educated about the space-filling and multi-level properties of fractals, and how Fractus antennas are used in mobile phones, wireless consumer electronics using Bluetooth, WLAN and UWB, and base stations. During our meeting, Fractus unveiled a technology demonstration that genuinely impressed, and which Incisor feels has the potential to shake up the wireless semiconductor industry. This development will be made public in the coming months.

Now, though, Fractus has announced that it has negotiated an agreement with Ficosa

International, a multinational automotive systems and components company, in which Ficosa has become sole proprietor of Advanced Automotive Antennas (A3), a joint venture company created by Ficosa and Fractus in 2002 to develop fractal-based antennas for the automotive sector.

Fractal antenna technology allows significant reductions in traditional antenna sizes and replaces the traditional exterior vehicle antenna with a multi-use internal antenna inside wing mirrors, rear vision mirrors or other vehicle components. The technology also allows a single, optimized antenna to deliver a range of telematics services such as radio, GPS and telephone.

The agreement includes an exclusive license to Ficosa for Fractus' fractal antenna technology

in the automotive sector worldwide. Ficosa says that the acquisition of Fractus' 50% share of A3 allows it to integrate the business into its corporate structure, increase its product portfolio and more effectively build on the penetration of Fractus' antenna technology already achieved in the international automotive sector.

The A3 joint venture has already introduced fractal-based antenna products in vehicles from Fiat and the French group PSA (Peugeot-Citroën). In early 2005, A3 also signed a worldwide technology licensing agreement with Japanese-based Nippon Antenna to develop and produce antennas for its clients Nissan and Mazda.

BLIP Systems rocks Bluetooth

Who would have thought that amongst the beer tents and mud slides of the average outdoor rock festival there was room for technology? But there is, or so says Bluetooth solutions company BLIP Systems, which heralds the Roskilde Festival, the largest North European outdoor concert and held recently in Denmark, as a huge success in more ways than one. BLIP claims that this years Festival showed the innovative side of Denmark, as the visitors of the Festival were able to interact with the live action via Bluetooth.

ONMOB, which started as a University student project, offered - among other things - downloads of live music in MP3 format from the festival directly to festival goers' mobile phones.

At this years Festival, ONMOB had approx. 7000 registered users, who could visit the ONMOB Tent on the concert field and choose Live recorded tracks from a Menu-card. Afterwards, the MP3 file was sent to their mobiles by BLIP Systems' Bluetooth solutions. BLIP Systems delivered the infrastructure to the experience.

'It was the first time that the Roskilde Festival had integrated Bluetooth technology to enhance the concert experience. The technology proved that future scenarios with Bluetooth on all the concert stages with downloads of live recordings are definitely a realistic progress' commented Kristian Ridley, who managed the ONMOB project



Must be Danish bagpipes ...

with help from Rasmus Knippel & Kristian Ridley. ONMOB began as a University development assignment by the four students Riem ZouZou, Nils Rydh (both ITU), Hans-Ulrik Grunth & Sofie Widding (Both from Syddansk University).

BLIP Systems is a wireless technology company, based in Denmark, which began in 2003 after a Management Buy-out of all Danish Ericsson's Bluetooth activities.

Handset manufacturers see fortunes improve

Vendors in the wireless sector are always interested to know how the cellphone companies are performing, as handsets sales directly influence everyone from the semiconductor companies to Bluetooth headset and other accessory manufacturers. All of whom should currently be feeling a little encouraged.

Nokia' second-quarter earnings increased 15 percent and its handset sales grew in most markets except North America. The company reported second-quarter net profit of 799 million, up from 695 million last year. Sales rose 25 percent to 8.06 billion, up from 6.46 billion in

the second quarter of 2004. Nokia said its global market share had inched up to 33 percent, up from 32 percent in the first quarter this year and that second-quarter growth came mostly from developing markets, with low-priced devices leading the company's sales. The company sold 60.8 million phone units in the second quarter, up from 45.4 million a year ago. Sales in China grew 76 percent while North America remained Nokia's weakest market, with sales dropping 22 percent to 6 million units.

As usual, the rosy picture painted by a company delivering its results concealed some underlying issues. Nokia's reported second quarter 2005

profits were below market projections. Despite declaring a 34% rise in shipments of wireless phones, the average selling price declined. The Finnish firm attributes these shortcomings to strong competition from LG Electronics and Samsung.

Motorola is another cellphone company celebrating a good second quarter. But, while both Nokia and rival Motorola posted impressive second-quarter results, it seems that Nokia is stuck selling more lower-end handsets while Motorola is cashing in on its popular high-end Razr line of phones.

Main rival Sony Ericsson also recently reported its

results for Q2 '05. Units shipped in the quarter reached 11.8 million, a 14% increase compared to the same period last year and a 26% increase sequentially. Sales for the quarter were Euro 1,614 million, representing a year-on-year increase of 7%. Income before taxes was down though, at Euro 87 million and net income was Euro 75 million, which represents a year-on-year decrease of Euro 26 million and Euro 14 million respectively. Sony

Ericsson's explanation was that this reflected 'continued investment in R&D'. According to Sony Ericsson's statement, the higher unit shipments reflected the broadening of the product portfolio to appeal to a wider range of price segments in the market. Average Selling Price (ASP) remained stable in line with expectation. The company believes that the global handset market grew faster than expected during the quarter, primarily because of

increased demand in the lower price segments in both mature and emerging markets. Those will be the segments that Nokia is servicing, then...

Independent researchers support these numbers, with forecasts of continuing growth. According to research firm Gartner, global sales of wireless phones are expected to reach approximately 800 million in 2005, and will surpass 1 billion in 2009.

Infineon introduces chip platform for sub-\$20 mobile

It would be a foolish handset manufacturer that ignored the low-cost market. Semiconductor company Infineon is doing its bit to facilitate development of cheap cellphones, citing research that around 3.5 billion people now living in areas with mobile phone coverage cannot afford their own mobile phone, and predicts that this could soon change. With a

new chip platform for ultra low-cost handsets, Infineon says it is laying the foundation for mass production of very low-cost mobile phones. The production costs for such mobile phones could be cut by nearly one half in future, from the current figure of around US \$35 to below US \$20. These costs include the complete mobile phone with its keypad, display and charging

system, software for ensuring ease of use with the SMS and phone functions, packaging and documentation. Infineon's platform is ready to release to handset manufacturers now as a "reference platform" for new product designs, which means that ultra low-cost handsets could be planned for volume production in the first half of 2006

RFI launches Bluetooth EDR test capability

UK test company RFI Global Services launched its Bluetooth Enhanced Data Rate (EDR) test capability during July. RFI says it has worked closely with semiconductor supplier CSR and that it has developed a test system that utilises CSR test scripts and a range of hardware. RFI is the UK's only Bluetooth Qualification Test Facility.

In line with most market watchers, RFI predicts that the market for EDR will grow rapidly as product manufacturers migrate more of their products to benefit from the 3 times higher data rates and lower power consumption figures (key for the battery life of mobile handsets).

RFI plans to further extend its Bluetooth EDR test capability to include products that incorporate EDR

technology based on other chipset manufacturers' technology. It is predicted that by the year-end all Bluetooth chipsets will support EDR.

RFI has two Bluetooth Qualification Bodies (BQB) and is able to provide test services for Bluetooth V1 and V1.2, profile conformance, protocol conformance, full interoperability service, full global regulatory services and consultancy.

Strong first half results from CSR

At the very last moment before Incisor closed this issue, we received details of CSR's Q2/first half accounts for the period ending 1st July 2005. No room here for a full analysis, so bear with us if we simply provide the highlights.

CSR SECOND QUARTER 2005 HIGHLIGHTS

- Revenue increased by 61% to \$94.8 million (Q2 2004: \$58.9 million)
- Gross margin of 46.9% (Q2 2004: 46.7%)
- Operating profit increased by 29% to \$18.9 million (Q2 2004: \$14.7 million)

- Operating margin of 19.9% (Q2 2004: 25.0%)
- Profit before tax increased by 33% to \$19.4 million (Q2 2004: \$14.6 million)
- Diluted earnings per share of \$0.11 (Q2 2004: \$0.11)
- Operating cash inflow of \$17.3 million (Q2 2004: \$13.9 million)
- 56% unit market share (Q2 2004: 42%)

FIRST HALF 2005 HIGHLIGHTS

- Revenue increased by 68% to \$161.1 million (H1 2004: \$95.7 million)

- Gross margin of 46.8% (H1 2004: 47.3%)
- Operating profit increased by 33% to \$29.1 million (H1 2004: \$21.8 million)
- Operating margin of 18.1% (H1 2004: 22.7%)
- Profit before tax increased by 38% to \$30.3 million (H1 2004: \$22.0 million)
- Diluted earnings per share of \$0.17 (H1 2004: \$0.18)

CSR brings Bluetooth to stereo headphones for iPod DSP-based designs

CSR seems to have grabbed the iPod stereo headset market by the horns, announcing that its BlueCore silicon is now inside iPod compatible stereo headphones from three companies: iTech, WiGear and Airlogic. All three companies now use BlueCore for Bluetooth stereo headphones (and plug-in adaptors) that have been designed to work with Apple's iPod as well as other MP3 players. Three other tier-one cellular OEMs, existing CSR customers, apparently use BlueCore for stereo headsets designed for use with mobile phones.

Incisor has reported previously on the superiority of Digital Signal Processing (DSP)-based headset designs, and CSR says that the DSP architecture built into BlueCore means it offers the only Bluetooth silicon with native support for MP3. This results in better design functionality and up to twice the battery life.

The DSP inside CSR's BlueCore IC is optimised to run audio CODECs including the basic SBC (Sub Band CODEC). More importantly, CSR says, the DSP architecture has the processor throughput to support MP3, AAC and other proprietary CODECs, with power consumption figures low enough for battery powered applications. CSR suggests that competing solutions only offer support for SBC and consume twice as much power as it's 95mW,



iTech's Bluetooth stereo headset one of a number now using CSR Blue Core.

making them unsuitable for such applications.

CSR states that BlueCore is the world's first and only Bluetooth silicon to support and integrate MP3 and other highly compressive CODECs. Customer benefits include enhanced audio quality and improved wireless operating range compared to those using first generation designs that support only SBC.

John Hodgson, CEO of CSR commented, "There are already tens of millions of people who own iPods or other MP3 players and these people will now be able to benefit from much more convenient wireless headphones". Hodgson continued, "CSR is the leader in each and every Bluetooth market sector -- that includes both mono and stereo headsets. In

2004, CSR's BlueCore was designed into 85 percent of Bluetooth headsets."

Glenn Collinson, Co-founder and Sales Director added, "CSR offers customers native support for MP3 and twice the battery life offered by the competition. It is clear why headset makers continue to choose to design in BlueCore."

According to CSR's announcement, only Bluetooth headsets designed using BlueCore can wirelessly connect to a Bluetooth mobile phone and a music player simultaneously. When the user receives a phone call the device will automatically mute the sound and connect to the mobile phone. At the end of the call the original music connection will resume automatically.

Cost reduced ref. design for Bluetooth stereo headsets from CSR

CSR has also announced the availability of a new reference design for Bluetooth stereo headphones that it claims offers the lowest ever total bill of materials (BOM) cost for this type of product. The new design exploits several features in CSR's BlueCore3-Multimedia chip, including an internal codec, minimal

external components and smaller PCB footprint, to achieve the breakthrough BOM. By using BC3-MM's internal CODEC alone, the bill of materials is reduced by around 20%.

Luke D'Arcy, product marketing manager, CSR commented, "The new reference design offers great sounding audio at a great price. It's fully

tested and production ready, allowing stereo headset designers to get to market fast" He continued, "Many handset manufactures are now shipping Bluetooth mobile phones with stereo streaming capability. The new platform will help designers to take hold of this enormous opportunity."

Nokia introduces new mobile phones

While Bluetooth-enabled phones are not rare these days, we know that most Incisor readers are interested in handset developments, so when one of the majors introduces new models, we will continue to provide details. After all, it wouldn't do to be seen at wireless events without the latest handset.

This month it is Nokia's turn. The company has unveiled seven new handsets, and four of these are Bluetooth enabled. A common, sliding case form-factor allows us to print just one photo for our readers to know what any of them look like. Main features are as follows.

NOKIA 6280

A 3G slide phone (WCDMA 2100 and GSM 900/1800/1900), the 6280 comes with a range of 3G multimedia features. Equipped with both a 2-megapixel and a VGA camera, Nokia describes the 6280 as a platform for 3G services such as real time video sharing and two way video calls – it can announce incoming calls with video ring tones, for example.

With a QVGA, 262,144 colour display (320x240 pixels) and dedicated camera and zoom buttons the 6280 has plenty of the photographic capability that people want these days, and provides a conventional camera experience by operating the photography function in a horizontal landscape mode. Photos and videos taken with the 6280 can be viewed directly on the screen and then shared with others via MMS, email or directly printed to compatible printers. Pictures and videos can be stored on the 6280's miniSD memory card. Bluetooth provides wireless connection to printers, PCs and other accessories such as headsets.

The 6280 is expected to begin shipping in the fourth quarter of 2005, at an estimated retail price (ETR) of 375 EUR before subsidies or taxes.

NOKIA 6270

The 6270 also has a 2-megapixel camera with flash and landscape mode. Mobile email is at hand as the 6270 phone comes with an integrated email client that supports



attachments. The major difference between this and the 6280 is that 3g comes out and music comes in. The 6270's built-in music player supports a variety of digital sound formats such as MP3 and AAC, stereo speakers support 3D sound effects and a visual radio client rounds out the audio capabilities. The 6270 is a world travel-friendly quadband GSM 850/900/1800/1900 handset, has an ETR of 300 EUR before subsidies or taxes and is expected to begin shipping in the fourth quarter of 2005.

NOKIA 6111

The 6111 phone is a slightly feature-reduced version of the 6280/6270. It comes with a 1-megapixel camera and flash, and a 6x digital zoom. The screen (128x160 pixels) supports up to 262,144 colours and displays pictures in either portrait or landscape mode. The 6111 does offer a number of new messaging options. Push to talk functionality connects to groups or individuals at a push of a button, while Nokia Xpress audio messaging enables sharing of voice clips and greetings. Pictures can be shared via MMS, Bluetooth or email.

The GSM 900/1800/1900 Nokia 6111 has an ETR of 270 EUR before subsidies or taxes, and is

expected to begin shipping in the fourth quarter of 2005.

NOKIA 6265

Nokia claims the 6265 is its most feature-rich CDMA phone to date, with its extra-large 240 x 320 pixel display, 2 megapixel camera with LED flash (effective resolution 1.92 megapixels), digital music player, Bluetooth and miniSD card support in a sliding design that is just 22 mm thin. The 6265 includes 24MB of on board memory, and supports all available sizes of miniSD cards, including 512MB and 1GB versions that can store hundreds of 2 megapixel images or digital music files. The 6265 also includes a built in FM radio and digital music player which supports MP3, AAC and eAAC+ files. The Nokia 6265 supports other forms of entertainment content, including 15 frames per second streaming video and downloadable BREW 3.1 or Java 3D applications.

The Nokia 6265 is expected to begin shipping in the fourth quarter of 2005. No ETR was quoted.

Bluetooth printing app available for BlackBerry

Research In Motion (RIM) has teamed with mobile printing software company ThinPrint to provide a wireless printing solution for the BlackBerry.

Content Beamer for BlackBerry offers users of Bluetooth-capable BlackBerry devices a way to print emails and attachments in original format on Bluetooth printers and can also print emails and attachments on network printers, as well as directly print unformatted mail texts using HP compatible and Bluetooth-enabled printers. All print functions can be selected with the "print" command, which is integrated directly into the BlackBerry menu.

"We did not anticipate the incredible response to our initial announcement in April," reports ThinPrint Managing Director Carsten Mickleit.



"By adding network and direct print functions, we want to ensure that Content Beamer truly represents all aspects of printing and meets the needs of BlackBerry users with one easy-to-find 'print' option in the BlackBerry menu."

For security, the ThinPrint solution uses the security features of BlackBerry Enterprise Server. Print jobs are created from the server component of the Content Beamer for BlackBerry and sent via BlackBerry Enterprise Server to the mobile device. Both servers are behind a firewall. Also with security in mind, the only accepted Bluetooth printers are those to which the BlackBerry user has previously explicitly established a connection. (Ed. - paired, in more familiar language). Content Beamer for BlackBerry supports all conventional print languages, like PCL, PostScript, etc. Bluetooth communication is sent either via the built-in Bluetooth interface or a small Bluetooth adapter.

Jabra now shipping SP500 Bluetooth speakerphone

Jabra, which, over the last 12 months or so has made a name for itself as a fast growing supplier of hands-free communication products for the mobile consumer market, has announced the shipment of the Jabra SP500 Bluetooth speakerphone. The wireless portable Bluetooth speakerphone works with Bluetooth enabled mobile phones and devices, requires no installation and is said to be easy to use. Incorporating a DSP (digital signal processing) solution, the SP500 automatically adjusts the speaker's



volume level and reduces background noise. Incisor has reviewed Jabra headsets using this same DSP technology with, it must be

said, impressive results. Jabra's BT800 remains Incisor's reference headset.

The speakerphone comes complete with a wall charger, vehicle power adapter, a visor clip and suction mounts for in-car mounting. Talk time is 20 hours and standby time 480 hours, and the SP500 supports Bluetooth 1.2 headset and hands-free profiles.

The Jabra SP500 will be available at select retail outlets across Europe, the Middle East and Africa, North America and Asia Pacific. RRP: £69.99.

Snippets

Snippets

Mobile phone becomes 'state ID' for Finns

In an initiative led by the Finnish Population Register (VRK), a department of the Finnish Ministry of the Interior, SmartTrust is helping mobile users in Finland to securely identify themselves and sign for goods and services across a range of public and private sector providers using just their mobile phone. Since

1999, VRK has been responsible for issuing State Citizen Certificates to Finns, a national ID card driven by the Finnish Government and seen as an important means of identification within an electronic information society. Now, the security functionality contained within these cards (based on the EU Directive for electronic signatures) has been incorporated into the SIM card by

SmartTrust, turning the mobile phone into a personal trusted device able to remotely authenticate an individual, protect identities and create a legally binding digital 'signature'. SmartTrust has signed agreements with three Finnish operators, including Elisa, who will issue new SIM cards - containing the State Certificate - to subscribers.



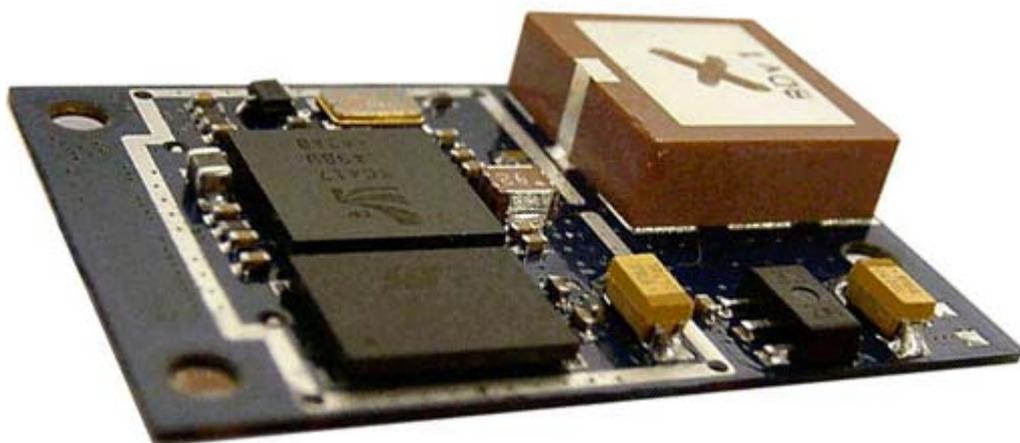
Bluetooth expands into non-consumer markets

By Simon Finch, CSR

To say that Bluetooth has taken off in consumer markets is a slight understatement. Production of Bluetooth-enabled products is estimated to now be running at more than 20 million units per month, with mobile phones accounting for the bulk of this number. CSR, for example, which supplies Bluetooth chips for nearly 70% of the world market, announced in May this year that it had shipped over 100 million chips since the company was founded. Last month saw the company celebrate its 1000th design-in.

Most of the Bluetooth chips that CSR produces are used in battery-powered consumer products such as mobile phones, mono headsets and PDAs. The latest application areas include in-car infotainment systems, gaming consoles and stereo music headphones. But Bluetooth is now a mature wireless technology, and its inherent low cost and low current consumption advantages are beginning to be recognised by other industry sectors, where it is proving ideal for replacing cables in many serial data transfer and voice communication applications.

Two non-consumer markets that are set to grow significantly are the medical and industrial sectors. The wireless communication links provided by CSR's BlueCore single-chip radio systems offer a robust and secure means of transferring data at speeds up to 3Mbps, and are suitable for all manner of short range telemetry type applications in these sectors. In the medical sector, for example, the technology is particularly suitable for low-cost monitoring devices intended to be worn by patients. These small battery-powered units are designed to free people from the encumbrance of cables, enabling vital data such as heart rate to be fed via short range wireless links to medical monitoring, recording and diagnostic equipment. They can be used in the home and work environments – where patients previously



Ezurio's latest blu2i Bluetooth module provides a drop-in V2.0 compliant solution for embedded applications in industrial, medical and commercial markets

had to wear the data recorder as well as the sensor – as well as in ambulances and hospitals.

CSR's BlueCore radios are well suited to use in such diverse operating environments. They are specifically designed to provide reliable wireless links in the presence of 'domestic' sources of interference such as microwave ovens, GSM phones and WiFi. Furthermore, the radios' absence of spurious out-of-band signals, combined with Bluetooth's low radiated power levels, means that they can be used in hospitals without upsetting sensitive electronic equipment.

The industrial sector has similar requirements in terms of low power consumption, data integrity, range and freedom from interference. Typical applications include factory and warehouse automation, where remote wireless devices offer a much more flexible and cost-effective alternative to fixed cable installations. For I/O intensive applications such as these, the Bluetooth system also needs to be easy to integrate with external sensors and control

devices – a key advantage of CSR's BlueCore products, which feature extensive on-chip PIO and ADC facilities. Designers who wish to process data from external sensors prior to transmission are likely to be particularly attracted to CSR's BlueCore3-Multimedia chip, which features a powerful 24-bit embedded DSP core.

In a move to help increase and accelerate Bluetooth's penetration of these non-consumer markets, CSR is collaborating with Ezurio Ltd, a specialist manufacturer of wireless connectivity products. Formed in September 2004 following a management spinout from TDK Systems Europe, Ezurio focuses much of its development effort on creating pre-approved standalone and embedded Bluetooth modules for the industrial, medical and commercial markets.

Ezurio's blu2i range of industrial products exemplifies how Bluetooth can now be applied to areas outside the consumer sector. All the products are based on CSR's BlueCore single-chip solutions, incorporate firmware-based Bluetooth protocol stacks and Profiles, and are

continued ▶

supplied as pre-qualified ready-to-run packages, complete with integrated antenna. The range includes a number of high performance Bluetooth modules for embedded applications, together with standalone Bluetooth adaptors for USB, PCMCIA card and RS-232 ports. The adaptors are all 'plug and work' devices that appear to the host system as standard serial peripherals, to provide Bluetooth wireless connectivity with minimal set-up.

Ezurio's latest product is a second-generation intelligent Bluetooth serial module based on CSR's BlueCore4-external chip. The new modules take full advantage of Bluetooth's more advanced features – including those introduced by the v2.0 compliant BlueCore04 chips – to

provide superior performance. They offer reduced power consumption, employ AFH (adaptive frequency hopping) for much better interference rejection and coexistence with WiFi networks, and use eSCO (extended Synchronous Connection Oriented) error-checking channels for improved voice communication quality. The modules also feature an optimised RF front end coupled to a special high gain ceramic patch antenna, which increases communication range to an industry-leading 250 metres.

During the modules' development, Ezurio worked closely with CSR to resolve design-in issues as soon as they arose, and provided valuable feedback about the use of the Bluetooth stack for industrial and medical

applications. The company has implemented an innovative application interface layer inside the virtual machine of the BlueCore4 chipset, which abstracts the complexity of Bluetooth to a set of simple AT style commands, similar to those used with a PSTN modem.

The effect on design integration time is dramatic – OEMs can now incorporate a complete application-optimised Bluetooth radio system in a matter of hours, rather than months.

Simon Finch is VP of Strategic Marketing for CSR. He can be reached via Simon.Finch@csr.com

Sponsored contribution

A7 quashes Bluetooth security attack

San Diego company A7 Engineering (profiled by Incisor in the Wireless in California special focus in issue 73) runs a Bluetooth Embedded Weblog (<http://blogs.fullthrottle.com/EmbeddedBlue/>). On the 3rd of June, A7 CTO Bryan Hall posted a response to a story in New Scientist, which reported on Avishai Wool and

Yaniv Shaked of Tel Aviv University in Israel, who claimed to have worked out how to force Bluetooth devices to pair whenever they want. "Our attack makes it possible to crack every communication between two Bluetooth devices, and not only if it is the first communication between those devices," says Shaked.

Hall was clearly unimpressed, and it's to be expected that anyone who understands Bluetooth would be too. Incisor has decided to publish Hall's response to New Scientist's sensation-based article. Everyone wants their 15 minutes of fame, but, Messrs. Wool and Shaked, it makes sense to get your facts right, and to use them in context.

THE EMBEDDED BLUETOOTH WEBLOG

AN INSIDE LOOK AT A7 ENGINEERING'S EMBEDDED BLE PRODUCTS AND THEIR USE IN
EMBEDDED SYSTEMS

FRIDAY JUNE 03, 2005

New hack cracks 'secure' Bluetooth devices...yeah right

NewScientist.com posted an article today titled "[New hack cracks 'secure' Bluetooth devices](#)" (Ed. - click link to read original story) and while their articles are generally quite good, this one is misleading. I know that hyping security concerns is a way to get attention these days, but let's make sure the facts are correct before saying that the sky is falling. Here is the opening paragraph.

Cryptographers have discovered a way to hack Bluetooth-enabled devices even when security features are switched on. The discovery may make it even easier for hackers to eavesdrop on conversations and charge their own calls to someone else's cellphone.

The problem with this statement is that it implies that a properly

implemented Bluetooth device is vulnerable to attack and this is simply not true. All of the historical attacks such as bluejacking, bluebugging, and bluesnarfing take advantage of implementation issues on a specific platform and are not the result of a weakness in the Bluetooth specification. This is an important distinction and articles like this one incorrectly give the impression that Bluetooth is inherently vulnerable. Is my safe faulty because I put my valuables inside and did not lock the door?

Before two Bluetooth devices can communicate they must establish a secret key via this pairing process. But as long as the two devices paired up in a private place there was no risk of attack, explains Chris McNab of the UK security firm TrustMatta.

This is one of the major tenets of Bluetooth security. Pairing should be performed in a safe environment so that eavesdropping

continued ▶

of the initial security exchange is not possible. The vulnerable portion of the pairing process only needs to be performed the first time that two devices connect. Use of Bluetooth communications between the devices is then secure.

The vulnerability that the article goes on to describe is based on forcing devices to pair in a hostile environment without the owners consent.

Now Avishai Wool and Yaniv Shaked of Tel Aviv University in Israel have worked out how to force devices to pair whenever they want. "Our attack makes it possible to crack every communication between two Bluetooth devices, and not only if it is the first communication between those devices," says Shaked.

This attack relies on both an implementation flaw and a usage flaw to be successful, but there is no mention of this in the article. Specifically the attack relies upon the target Bluetooth device to have a poor implementation of the pairing process. The Bluetooth SIG recommends that devices normally refuse all pairing requests including those for devices that have 'forgotten the link key'. On a device with a proper security implementation pairing is only possible when specifically enabled by the user.

The second thing that this attack requires to be successful is a short pin code. Specifically they are referring to numeric only pin codes of four digits so that the search space is small enough to work out the link keys. This issue is a bit tougher because the user is involved, but again the Bluetooth SIG recommends an alphanumeric code of at least eight digits.

They show that once an attacker has forced two devices to pair, they can work out the link key in just 0.06 seconds on a Pentium IV-enabled computer, and 0.3 seconds on a Pentium-III. "This is not just a theoretical break, it's practical," says Schneier.

Well let's see how practical this actually is. First let's see how long it would take to crack a four digit alphanumeric code at the speeds quoted above. At four digits a case insensitive alphanumeric password would take the link key search space from 10000 numbers (10^4) to 1,679,616 alphanumeric combinations (36^4).

$$(0.06 * ((36^4) / 10000)) = 10 \text{ seconds}$$

Simply making the pin code case sensitive would increase the search space to 14,776,336 alphanumeric combinations (62^4).

$$(0.06 * ((62^4) / 10000)) = 89 \text{ seconds}$$

At eighty nine seconds this is still doable, but remember this is only a four digit code. How long would it take to crack a code as recommended by the SIG? An eight digit, case sensitive, alphanumeric code has 218,340,105,584,896 combinations (62^8)

$$(0.06 * ((62^8) / 10000)) = 1310040633 \text{ seconds} = 41.54 \text{ years}$$

How is more than forty years "practical"?



Bryan Hall, A7 Engineering

Wireless industry intelligence - UWB/W-USB

Wisair releases UWB chipset solution for Wireless USB

Wisair has introduced a WiMedia standard UWB chipset solution, with the release of its 531 UWB Baseband chip. Wisair provides UWB and Wireless USB chipset solutions for consumer electronics, mobile devices, and PC peripherals.

The new 531 chip, Wisair's 2nd generation Multiband OFDM compliant CMOS-based MAC/Baseband System-on-a-Chip, is ready for use in Wireless USB (WUSB) and Wireless Ethernet/IP applications, and includes the 2nd generation 502 RF chip, launched last quarter. Designed to support short-range connectivity with up to 480 Mbps, Wisair claims its solution offers the fastest commercial wireless chipset to date to conform to WiMedia industry standards.

"This is a large step towards providing mature wireless USB products that meet market



Mini DVK from Wisair

demands and go beyond prototypes and lab demos," said David Yaish, Wisair President and CEO. "Our new chipsets, to be demonstrated in Wireless Japan 2005 with small form factor reference designs, exemplify our technological leadership and commitment to delivering complete, industry-accepted products to the Wireless USB market."

Replacing Wisair's first generation 530 chip,

the 531 chip has been integrated with the 502 RF chip into Wisair's reference designs and Development Kit (DVK), which has shipped to more than 40 customers. The new 531 chip is based on the WiMedia-MBOA PHY layer specification, and supports a large range of interfaces including Ethernet/IP, MPEG and Parallel high bit rate data interface. The Wisair solution includes integrated filtering providing interference immunity and co-existence with Bluetooth and 802.11 a/b/g.

Small is all in this sector, and the 225-ball TFBGA package of Wisair's 531 chip, together with the 48-leadless QFN package of the 502 RF chip are part of the small form factor and minimal BOM reference design for Wireless USB, Wireless IP and Wireless video applications.



Incisor regional focus programme

Wireless in the USA!

Publicity opportunity for wireless industry companies in North America

Since 1998 Incisor magazine has been dedicated to the short-range wireless market. Today, Incisor provides high quality and accurate news and features on developments in the Bluetooth, Wireless USB/Ultra Wideband, WLAN/WiFi, ZigBee, RFID, NFC and WIMAX markets.

Incisor is the only magazine that is 100% dedicated to short-range wireless technology and is read by people all over the world who are interested in wireless products and services. These include representatives of all of the major silicon manufacturers, cellphone companies, network operators, computer and consumer electronics companies, system designers and system integrators.

SPECIAL FOCUS ISSUES: During 2004, Incisor started a programme of regional focus special issues, and visited the USA and Scandinavia*.

Now it is time for Incisor's second visit to the USA. Rather than focusing only on California as we did last year, this year we throw the door wide open, and want to talk to wireless companies across the USA - timetables and schedules permitting! Remember that this can include US-companies, or companies with important centres of activity in the USA.

The time is right - the pace of activity in the wireless industry is heating up. Bluetooth is teaming with UWB to deliver ultra-fast WPAN solutions. ZigBee and RFID are becoming here and now technologies. And Wi-Fi is finding its way into cellphones and other consumer electronic devices. The time for greater co-operation between wireless industry technologies is upon us. Our readers' 'need to know' about wireless is greater than ever, and this is the perfect opportunity to make sure that your company's messages are hitting the right audience.

WHEN: Incisor will travel to the USA in August 2005 to talk to leading companies who wish to be profiled in our Wireless in the USA special. This will appear on the 5th of October in the November issue, combining with our WiCon Americas preview.

WHAT IS INCLUDED: The 600 word, paid-for profile that we offer - which you will have the opportunity to approve - will include:

- Executive interview, to create
- Description of your company, including your products / services offered by category
- Details of how the company's products / services are marketed / distributed
- Company logo
- Contact details including links from the magazine profile to the your company's web site

COST: Please enquire.

This is a perfect opportunity for you to promote your company's products and services to the global audience of interested customers.

HOW TO PROCEED: To make sure that your company is included in the Wireless in the USA special issue, please contact Vince Holton as soon as possible. The sooner we know you wish to participate, the sooner we can set a schedule that will guarantee that we can visit you.

Vince Holton - Publisher/Editor-in-chief, Incisor
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E-Mail vholton@click.co.uk

INCISOR™

***If you wish to see a copy of the 2004 Wireless in California or Wireless in Scandinavia special issues, please email Vince Holton (details above).**

Chinese whispers over mystery of early launch of consumer UWB product



Where will first UWB be?

Regular Incisor readers will remember that in last month's issue we included a story 'Consumer TV with UWB from Haier and Freescale - First UWB product to launch in China, not USA' (Incisor issue 84, p13).

In this story, we reported that Freescale and Chinese company Haier seemed to have won the race to show the first UWB-enabled consumer product – an LCD high definition TV (HDTV) and digital media server, based around Freescale's DS-UWB silicon.

One of the most interesting aspects of this story was that the Freescale/Haier press release told us that the product would be launched first on the Chinese market, before the end of 2005, and then in the US. That was particularly interesting as the USA is the only country so far to have granted regulatory approval for products that are UWB-enabled. How, we speculated, could this Haier product be brought to market first in China, rather than the US, when the

process of approving UWB had not been completed? And what were the implications? Is Haier flaunting regulatory controls? Is the Chinese government providing a loophole to allow early sales, and a Chinese company to gain an early lead on international competitors?

We approached both Freescale and Haier to provide further comment.

Martin Rofheart, the normally unstoppable vocal director of UWB operations at Freescale, chose not to respond this time, and Incisor was left with a basic statement from company spokesperson Regina Cirmonova: 'Freescale has received FCC certification for its UWB chipset. However, in order for a consumer product to be sold in the US, the consumer electronics manufacturer would have to submit the product for final testing as there are many more components to the device that would emit power than our UWB chip. As for China, Haier would be able to provide more insight and

comment on the regulatory approvals they are receiving for their end products.'

Ms Cirmonova kindly supplied contact details for Haier's PR spokesperson Mr. Chi Yong Xin. This very polite gentleman stated: 'In China, the establishment of (UWB) related laws is in progress, in fact, it (the Chinese government) may take our products for reference. We are now cooperating with some government departments in establishing these regulations. Based on the present achievements, I am optimistic to complete this work, and even to be permitted to put product into the market by this year-end. As an important project for Haier Group, R&D work and end products are in progress as we planned, but the market plan of our products will be adjusted according to different countries' regulations.'

Now, if Incisor is to understand correctly, and if we apply a generous interpretation to Haier's response (and ignore Freescale's unwillingness

to provide specific comment), this sounds like a situation where the Chinese government is co-operating with a company (Haier – supported by Freescale) that is expert in the area of UWB, and is allowing Haier's work to help it to establish a basis for regulatory approval of UWB technology. This sort of 'helpful' attitude is not unprecedented, and could very well enable UWB products to be marketed in China sooner than in other territories. Oh, and a Chinese company would be well positioned to attack other markets too.

So, at this point we don't know which party is playing the chicken, which is the egg, and which came first? Will UWB regulatory approval in China be driven by the authorities, or by commercial interest? Would something like this be allowed to happen in the US or Europe? Probably not. We're too hung up with maintaining the regulatory status quo to let national commercial interests drive approvals matters. Aren't we?

Incisor sought the opinion of Dr Robert Aiello, co-founder and CTO of Staccato Communications, one of the leading companies in the UWB world's opposing WiMedia Alliance (we are confident enough at this at this stage that Incisor readers are sufficiently aware that there is a standards battle going on within UWB between the Wi-Media and DS-UWB camps not to need to go over this ground again). Aiello is a recognized leader in the UWB community and is actively involved in regulatory and standards-setting committee, has contributed to the spectrum regulations since 1996, and his efforts were instrumental in getting UWB spectrum allocated in the United States. Recently, his attention to has been turned to worldwide regulations. He is a founding member of several standard committees, such as the UWB Working Group, the MultiBand Coalition, the MultiBand OFDM Alliance (MBOA) and now serves on the

WiMedia's Board of Directors. He is also the author of more than 20 patents on UWB technology, and so Incisor felt pretty confident that he would know which way was up.



Robert Aiello, Staccato Communications/WiMedia Alliance

'I was surprised to read the announcement,' Aiello commented, continuing: 'I checked with my sources at MII/SRRC and they confirmed that the Chinese government hasn't yet made any decision on UWB spectrum allocation. As a consequence it is extremely optimistic for Freescale to predict that there will be UWB regulations by the end of the year. Given that one of the stated key objectives of radio regulations in China is to advance the social and economic development of China and to do so in an economical and effective way, and that all spectrum allocated to 3G services is at different frequencies than the ones required by UWB, I am optimistic that China will allocate UWB spectrum with a mask very similar to the US. However, the regulators need to go through the due process before the decision is made. The WiMedia Alliance is committed to support and educate the Chinese government to help make the right decision that will be beneficial to the local economy.'

And in case there was any doubt, Aiello finished by saying; 'I also think that it is very

unlikely that a proprietary product like Freescale will be chosen as a reference product, as stated in the quote, when WiMedia UWB has been selected by all the leading PC, CE, and mobile companies as the preferred choice and it is also the standard for Wireless USB products.'

Here at Incisor we believe that Aiello's views must be a fair reflection of real world circumstances. Yes, he heads a WiMedia - not DS-UWB - company, but in the past Staccato has been ready to substantiate any claims it makes and we haven't found any holes in its arguments so far. In an ideal world Incisor would be able to provide its readers with equally lucid views from Freescale, which, as the driving force behind the DS-UWB Forum, must know as much about international regulatory approvals as does the WiMedia Alliance. This time, as on a number of previous occasions, it has not been possible to publish counter-point views as Freescale chooses not to respond. We will continue to provide Freescale opportunities to comment on UWB industry issues, but while it opts not to do so, our readers must be left to draw their own conclusions.

In conclusion, the Haier/Freescale product – the first consumer product to be UWB-enabled – may launch in China before the end of 2005. Or it may not. If it does, it will have been instrumental in helping create China's regulatory approval system for UWB. Or maybe not. Maybe it will be launched unapproved. Only time will tell.

Any Incisor reader in a position to shed more light on this topic is more than welcome to comment.

Snippets

UWB

US military to adopt extra secure UWB system

Scientists at the Sandia National Laboratories have combined UWB radio signals with advanced encryption techniques to

develop a secure sensor and communications network for the US military. This secure UWB communication system holds the promise of better protection of troops in the field by enabling better detection of enemy positions

and by making it much harder for adversaries to eavesdrop or jam military communications.

Snippets

Paxar uses air to solve RFID problem

According to RFID specialist Paxar, liquids and metals can interfere seriously with the marking of merchandise using RFID. The company has now developed a label for pallets and cases that solves what Paxar describes as a notorious problem of RFID technology – with air.

While the marking of merchandise with RFID is rapidly being adapted by retail corporations like the METRO Group or WalMart, one problem has called for a solution: radio signals in the conventional UHF 866/868 Megahertz frequency range that carry the non-contact data traffic between RFID chip and reader can suffer considerable interference due to liquids or

metals in the direct vicinity of the RFID label. Containers of metallic or liquid contents were in the past thus considered unsuitable or at least critical for RFID labeling.

Paxar has now come up with what it describes as a simple and practical solution for pallet labeling: air as a spacer. Paxar has called this innovation SpaceTag and applied for a patent. A 3 to 8 mm layer of water-free special foam is sandwiched between the RFID adhesive label and the shipping unit. This material fixes the air. The air-padded RFID label can either be applied to the goods before or after the shrink wrapping process, and so is also ideal for use on pickup or sandwich pallets. The elastic SpaceTag gives

when transport and warehousing processes get tight. It resumes its original shape thereafter.

SpaceTag is affixed to the pallet in two steps: first a Paxar RFID printer produces a regular RFID adhesive label with barcode in a single process. The label is then attached to the foam layer either manually or using a labeler, and then to the shipping unit.

German company SRD Maschinenbau GmbH has developed a automatic labeler for the SpaceTag. Together with Paxar it has applied for patent protection of the unit. The on-demand design of the labeler accommodates SpaceTags, regular RFID labels or barcode labels without RFID tags.

Sokymat supplying RFID tags to TrenStar for beer keg tracking

RFID-related press releases are arriving at Incisor more and more frequently. This one was from Sokymat, which supplies RFID transponders, announcing that it is supplying RFID tags to mobile asset management company TrenStar to track beer kegs for clients in the U.K., including Coors. TrenStar is a big player in this market - the percentage of kegs owned and managed by TrenStar in the U.K. is now close to 70 percent. The initial order is for

1,200,000 tags - pretty impressive, by any standards.

TrenStar's RFID-enabled container management system, TrenStarCM, tracks the location of each beer keg and collects information including usage data, enabling better control, visibility and asset utilization for the sake of securing the distribution channel and making it transparent to the customer. Trenstar says that an efficient keg management system enables a brewery to ensure the timely and

effective delivery of its product while remaining competitive on the side of costs.

Sokymat developed a special transponder for TrenStar's beer keg tracking application which operates effectively even in metallic environments. Sokymat and TrenStar developed a customized packaging solution that protects the electronic component from the massive mechanical stress to which it is subjected throughout the keg's lifecycle, in particular during washing and filling operations.

UPM Rafsec provides total RFID solutions in China

UPM Rafsec, an RFID tag manufacturer and member of UPM Group, has announced that it has partnered with three new system integrators in China on a non-exclusive basis. The goal is to provide better service to the partnership's end user customers. The three new partners are Ubhitech, Vision Electronics and Best Technology. Located in Shanghai, Beijing and Guangzhou respectively, each system integrator is already involved in this sector, with more than eight years of

experience in the RFID industry. Each will provide total RFID solutions based on UPM Rafsec's range of RFID tags.

A company spokesperson commented: 'Thanks to the expertise of Ubhitech, Vision Electronics and Best Technology in the field of RFID technology and their in-depth knowledge of the local market, UPM Rafsec and its partners can deliver turnkey solutions to Chinese businesses that include the most suitable tags, hardware and software at the best price.' According to UPM Rafsec, with the

Chinese RFID market rapidly developing, the company must establish strong strategic alliances with reliable partners for long-term collaboration.

RFID already seems to be on a roll. This seems to be a case of a simple and relatively inexpensive wireless technology that is proving straightforward to implement, and which is just doing the job it sets out to do. With the huge manufacturing capacity of the Chinese market also adopting RFID, it seems we will all be hearing plenty more about the technology in the coming months and years.

SDK for Nokia RFID application developers

Mentioned several times previously in this magazine, the Nokia Field Force Solution is specifically designed for a variety of industry sectors such as security, services, utilities, health care, and government branches. Nokia is addressing the needs of companies within these areas that are looking for new ways to mobilize and automate their field operations with RFID. The field operations can be automated, for example, in asset management, maintenance, repair, manufacturing, item tracking, delivery scheduling, customer billing data collection, and work order management.

The information exchange starts by touching the RFID tag placed on objects, such as assets, billboards, meters or other equipment, with the Nokia RFID or Nokia NFC (Near Field Communications) enabled mobile phone. Additionally, data can be received from the back-end system and then displayed to the user on the phone and/or written to a tag.

"The Nokia NFC and RFID Software Development Kit (SDK) enables the development, running, and testing of Java applications, that allow mobile workers to interact, report, and get support in their field work. Being part of Nokia Field Force Solution,

the SDK lets the application developers take advantage of RFID read and write capabilities on mobile phones," said Gerhard Romen, head of market development, Nokia Ventures Organization.

The Nokia Field Force Solution consists of the J2EE-based software product, the Nokia Local Interactions Server and client software, which works together with the specific RFID or NFC enabled Nokia 5140, Nokia 5140i and Nokia 3220 phones and RFID tags.

Any company wanting to use the Nokia NFC and RFID SDK also needs a Nokia Local Interactions Server license.

Motorola accelerates development of WiMAX solutions

Intel isn't the only semiconductor giant to be putting its weight behind WiMAX. Motorola says it has expanded its strategic focus to quickly bring WiMAX (802.16e) solutions to market to fulfil the rapidly growing demand for fixed and mobile wireless broadband solutions. The initiative includes a combination of increased R&D, resources, and technology relationships; and the introduction of the MOTOWi⁴ product portfolio that will take operators to the 4th generation of mobile wireless networks.

"Motorola has aligned our Networks business to support a companywide initiative to develop WiMAX and other mobile broadband wireless solutions that provide an effective means for carriers to give their customers broadband services when and where they

want them at an affordable cost," said Dan Coombes, senior vice president, general manager of Wireless Broadband Networks, and chief technology officer for Motorola Networks. "With our longstanding history as a top provider of both broadband wireless access systems and cellular networks, a portfolio of technology innovations from all businesses, and the focused efforts of our engineering teams, Motorola is well on the way to delivering WiMAX solutions."

According to Maravedis, a research and analysis firm focusing on broadband wireless access technologies, the global market for fixed and mobile broadband (including WiMAX) is expected to reach up to \$1 billion in 2007, and to potentially hit \$4 billion by 2010. Motorola plans to build on its Canopy wireless broadband business and experience in the underlying

technologies - Orthogonal Frequency Division Multiplexing (OFDM); IP internetworking; its all-IP based, flat Carrier Access Point (CAP) architecture; and IP-enabled handsets - to develop fixed, nomadic, and mobile solutions.

Motorola's MOTOWi⁴ portfolio of WiMAX solutions includes a "light infrastructure" solution for rural areas and developing countries that aims to offer very low cost of deployment and ownership, and a carrier-class solution.

Motorola recently announced a major joint technology development agreement with Sprint for wireless broadband WiMAX 802.16e technology testing and equipment trials. The agreement spans lab testing of the MOTOWi⁴ portfolio of WiMAX base stations, smart antenna technology and multimedia handsets.

BLUETOOTH

Bluetooth shipments climb to 5M per week

So says the Bluetooth SIG in its latest analyst newsletter. To put this figure in perspective, every time you blink an eye, ten more Bluetooth

products see the world. If you combine the range of five million Bluetooth devices (10 meters each), you could more than circle the globe. If you combined the range of a year's worth of Bluetooth

devices, you could go to the moon six times. A stack of five million Bluetooth chips (average of 1mm in width) would reach higher than the 12 tallest buildings in the world combined.

WiMAX Forum showcases equipment and applications, opens test lab

WiMAX technology put its head above the parapet during July in Vancouver, BC, and Malaga, Spain. During the WiMAX Forum quarterly members' meeting in Canada, several application demos – ranging from Xbox wireless console gaming over WiMAX to WiMAX-based streaming media – were showcased. In Spain, the WiMAX Forum Certification test lab at Cetecom opened and began testing some of the same equipment in use at the members' meeting in Canada.

"We're excited by the opportunity to show off the capabilities of WiMAX technology in Vancouver and prove that WiMAX is real," said Ron Resnick, president of the WiMAX Forum. "At the same time, the fact that much of the equipment running successfully in Canada is the same equipment going through certification in Spain is extremely encouraging and bodes well for the future of WiMAX and the advent of true personal broadband."

More than 400 participants from WiMAX Forum member companies attended the event in Vancouver, where there have been keynote speeches from Nortel and KT (Korea Telecom).

Also at the event, demonstrations from Nortel, Microsoft, Disney, Logitech, Cisco, AT&T, AudioCodes, Kencast, Ixia and Skype ran on a variety of WiMAX technology vendor systems from companies including Alvarion, Proxim, Redline and Wavesat. The demos represented the five key WiMAX application types: VoIP, streaming media, interactive gaming, Web browsing and file transfer/media download. The WiMAX Forum claimed that the success of the demos indicated that WiMAX systems are efficient at running multiple classes of applications simultaneously.

Nortel provided wired and wireless LAN connections and IP phones to attendees at the Vancouver event and also presented its findings on the business potential of 802.16e in a keynote speech on July 12.

"Participating in the WiMAX Forum event in Vancouver is an ideal opportunity to share our knowledge and expertise of advanced wireless broadband technology with leading business organizations from across the globe," said John Hoadley, vice president, next generation wireless access, Nortel. "The successful

demonstrations at the WiMAX Forum event further exemplify the strength and viability of this technology and its role in the future evolution of wireless broadband networks."

Another leading event supporter, KT, presented a keynote speech concerning its vision for wireless broadband service and mobile WiMAX, known as "WiBRO" in Korea. "KT is committed to the mobile future of WiMAX technology, not just in Korea, but all over the world," said Dr. Hong, Won-Pyo of KT's Mobile Internet Business Group. "The WiMAX Forum event in Vancouver gave us an ideal opportunity to offer our insight on the advances in mobile WiMAX and the business case for the technology, enabling us to drive greater understanding of the goals of mobile WiMAX and helping us to increase interest in the success of the technology."

WiMAX Forum Certification testing will continue at Cetecom labs in Spain, and the first WiMAX Forum Certified products – those that are certified as conformant to the standard and interoperable with other vendors' products – are expected to be available in the November/December timeframe.

Terabeam Wireless buys Proxim out of bankruptcy court

Terabeam Wireless has acquired all of Proxim's assets for \$28 million. Terabeam was the highest bidder in Proxim's court-approved auction held in connection with the company's Chapter 11 bankruptcy filing. Proxim backed out of a mid-June \$21 million deal with Moseley Associates. Its new agreement with Terabeam is expected to be

approved by the US Bankruptcy Court for the District of Delaware by July 29. Under the deal, Terabeam will pay \$28 million for Proxim's assets and will provide debtor-in-possession financing. No proceeds from the sale of assets will be given to Proxim stockholders due to Proxim's creditor obligations.

Terabeam says the company will continue to do product development in WiMAX. Proxim previously announced some pre-WiMAX gear, as early as November 2004, as part of its Tsunami line of long-distance wireless equipment. Last summer, Proxim said it would work with chip giant Intel on WiMAX/802.16 products.

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Intel premieres WiMAX potential at the Sundance Film Festival

Sundance Film Festival is widely regarded as the showcase for US and international independent film and the place to hear about innovations in film technology. Intel, along with Alvarion and Mountain Wireless, saw an opportunity to partner to showcase a new technology that all industries can benefit from - WiMAX.

The centerpiece of these experiences was the first ever wireless Internet streaming of a feature-length film. The premiere of the documentary film, RIZE, was held at a remote



ski lodge at 9,000 feet utilizing market-available hardware and straightforward installations. The resulting image quality was indistinguishable from customary commercial theatre showings.

Intel CEO Craig Barrett noted that WiMAX could bring greater opportunities for the entertainment industry to

create and distribute film in new ways while providing more choice and convenience to consumers. "WiMAX will be the technology that envelops all other networks into one digital cloud," Barrett said. "Wherever you are, the network and all the entertainment and information it carries will be there, too."

Z-Com selects Texas Instruments embedded WLAN and VoIP solutions

Texas Instruments (TI) has announced that Z-Com, a global wireless broadband ODM, has selected TI's Wireless LAN (WLAN) and Voice over IP (VoIP) products for its universal serial bus (USB) adapter and residential gateway (RG) module product lines, the goal being to enable consumers to benefit from integrated broadband data, wireless and voice applications.

Z-Com has developed the XG-750 USB adapter, which plugs into the computer's USB port to enable seamless wireless connectivity. The product is based on TI's TNETW1450 WLAN solution which, in addition to the desired compact design, features high security and quality of service (QoS) standards. In addition, Z-Com's RG module incorporates TI's TNETW1350A solution, which features industry-leading output power enabling extended range operation. Z-Com has also selected TI's TNETV1060 VoIP solution for its P-1050 VoIP gateway, the company's first product targeting the VoIP market. A highly integrated software and silicon system-on-a-chip, TI's solution is

designed to address the requirements of residential and small office/home office (SOHO) gateways.

"TI is pleased to support Z-Com's next generation products with industry leading WLAN and VOIP technology. Z-Com is now shipping a highly differentiated bundled solution to enable seamless connectivity throughout the home," said Dennis Rauschmayer, director of marketing for TI's Residential Gateway and Embedded Systems group.

Earlier this year TI introduced two members of its family of application-specific WLAN solutions. The IEEE 802.11 a/b/g compatible TNETW1450 media access controller (MAC) and baseband (BB) processor which enable manufacturers to add wireless functionality to devices with USB 2.0 interfaces. This compact system solution provides a significant reduction in board size over TI's previous solutions and meets the highest level of industry standards, including Wi-Fi Protected Access 2 (WPA2) and WHQL, Wi-Fi and USB-IF certification. TI also introduced the 802.11 a/b/g compatible

TNETW1350A MAC and BB processor, which provides on-chip power conversion and regulation, without external filters, reducing component count and bill of materials (BOM) by 50 percent. In addition, the latest solutions feature TI's 125Mbps equivalent G++ Mode, enabling throughput up to 36Mbps.

Z-Com's XG-750 USB adapter and the P-1050 are being shipped to leading RG manufacturers worldwide as of Q2 2005. Z-Com's RG module will be available in Q3 2005.

EU Commission enables faster wireless access to the internet

According to the European Commission's Information Society (a 'Thematic Portal' apparently), wireless access to the Internet will become faster and more widespread thanks to a decision adopted by the Commission during July. This decision makes available a substantial amount of radio spectrum throughout the European Union for wireless local area networks (WLANs) used to provide access on the move to the Internet and private networks.

The Commission decision, which is to be implemented by Member States by 31 October 2005, makes two specific frequency bands (5150-5350 MHz and 5470-5725 MHz) available in all Member States for wireless access systems. The decision also introduces what are described as 'innovative' spectrum management approaches, by requiring the application of "intelligent" techniques to protect other radio spectrum users against harmful

interference, such as military radar and satellite services.

"High-speed electronic communication networks are essential to Europe's competitiveness. A supportive regulatory environment is a key factor in their take-up," commented Information Society and Media Commissioner Viviane Reding. "The Commission decision will help industry to create innovative services, such as wireless Voice over IP, for a single European market."

This decision, part of the i2010 initiative to foster growth and jobs in the digital economy, aims to pave the way for an open and competitive single market for wireless access systems. EU wisdom suggests that access to this spectrum with common rules will make equipment cheaper and alleviate the growing overloading of spectrum already used for this purpose, and that it will facilitate the take-up of wireless systems for private as well as public

access, from corporate networks to hotspots in areas such as airports, train stations, shopping malls and hotels.

The Commission quotes market analysts suggesting that there will be an explosion of WiFi users over the next 3 years, predicting that today's 120 million Wi-Fi users world-wide (25 million in Western Europe) may grow to 500 million and more over the next 3 years, putting wireless local area networks in the same league as cellular mobile in terms of consumer appeal. The Commission concedes that economically speaking differences will remain as Wi-Fi customer revenue is substantially lower as Wi-Fi is offered at much lower cost and quite often for free.

Revenues from deployment of wireless LAN in Education set to double

The education sector is a clear revenue growth opportunity for wireless LAN (WLAN) vendors, according to a study just published by market analyst Datamonitor. The study highlights how educational institutions, via the deployment of WLANs, can introduce a number of specific process improvements typically relating to increases in class efficiency and student productivity. "Universities are certain to deploy the technology in a bid to attract the best students while schools are likely to implement the technology in classrooms to improve the learning experience," says Tim Gower, enterprise communications analyst at Datamonitor and author of the study. Datamonitor predicts combined spend by the education sector in Europe, the Middle East and Africa (EMEA) on WLAN deployment to reach \$126 million by 2008, more than double that of 2004.

WLANS CAN BRING ECONOMIC AND EDUCATIONAL BENEFITS

According to Datamonitor, there are a number of top-level economic and educational benefits that are positively impacting the deployment of WLANs in the education sector. These include avoiding wiring issues, reducing networking costs, saving on the costs of continual PC upgrades, making better use of educational facilities and encouraging enrolment by making learning easier and more exciting. Indeed, schools and universities may view the existence of WLAN access as a competitive advantage.

Educational benefits, on the other hand, include meeting students' expectations, improving classroom communication, improving teaching practices, extending the reach of the network into new areas and providing scope for new and improved teaching practices.

"The deployment of WLANs on educational

campuses can significantly change teaching practices and student activity," said Gower. "These include improved information access and communication due to the ubiquitous nature of the Internet, the high availability of applications from anywhere on site, inherent mobility for students and teachers on campus, the ability for teachers to reconfigure and control the classroom environment, as well as a variety of teaching opportunities."

Positive outlook for growth in EMEA, with lowering price points encouraging demand

Although budgets for ICT in schools and universities are tight, and WLAN revenues derived from the EMEA education sector currently lag behind North America, Datamonitor expects the market to catch up in the coming three years and predicts revenues from the WLAN deployment in the EMEA education sector to grow at a compound annual growth rate of

21% from \$58 million in 2004 to \$126 million in 2008.

Datamonitor expects a renewed focus in the coming months on networking expenditure, and WLANs will invariably feature as part of institutions' plans in this regard.

"In the past, the biggest inhibitor to WLAN

deployment in the EMEA education sector has been equipment cost, though lowering price points (particularly in laptops) are certain to encourage demand," said Gower. "Together with this, 802.11 technology will feature as part of institutions' renewed focus on networking expenditure in the coming three years thus

creating a healthy market opportunity for both WLAN equipment vendors and systems integrators."

Datamonitor's report - 'WLANs in education: improving classroom efficiency and productivity' is available now.

Snippets

Snippets

BLUETOOTH

BLIP Bluetooth comes to Blighty

BLIP Systems of Demark and Ubiquitous Systems Ltd (Ubisys) today announced a distribution agreement for the UK. The agreement appoints Ubisys as the sole UK and Ireland Distributor for BlipNodes where

they are used with digital pen and paper. BLIP Systems provides devices that allow an organisation to effectively flood a building or campus with secure Bluetooth. The BlipNodes are also connected to the main network of the organisation giving instant high speed access

from devices such as PDAs, mobile computers and digital pens to data sources and corporate information such as databases, email and the internet/intranet.

Bluetooth Phones Get Another Perk

Movie fans in New York, Los Angeles and San Francisco will soon have another use for their Bluetooth equipped wireless phones. In

June, 20th Century Fox and Loews Cineplex Entertainment signed a deal to distribute movie trailers, ringtones and pictures through kiosks at theatres. Anyone with a Bluetooth equipped

wireless phone can download promotional material at no charge from the phone's service provider.

CSR centric to Bluetooth stereo headphones

CSR has announced its BlueCore silicon is now inside iPod compatible stereo headphones from three companies: iTech, WiGear and Airlogic. All three companies now

use BlueCore for Bluetooth stereo headphones (and plug-in adaptors) that have been designed to work with Apple's iPod as well as other MP3 players. Three other tier-one cellular OEMs, existing CSR customers, use BlueCore for stereo headsets designed for use with mobile phones.

The Digital Signal Processing (DSP) architecture built into CSR's BlueCore technology means CSR offers the only Bluetooth silicon with native support for MP3. This results in better design functionality and up to twice the battery life.

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www.click.co.uk

Connection Section

Since its launch in 1998 Incisor has consolidated its position as the only magazine 100% dedicated to the short range wireless industry. Every issue of the magazine is read by members of the wireless industrycommunity at thousands of companies around the world. This section of Incisor is designed to put people together, including:-

- companies recruiting for staff
- individuals looking for new jobs in the wireless industry
- companies seeking representation
- manufacturers representatives seeking new clients
- companies, agencies or individuals offering products and services

There is no better place to advertise jobs, products or services. To place situations vacant or classified advertising in this section of Incisor,

email **connectionsection@click.co.uk**, or telephone +44 (0)1730 891330.

Connection Section



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is tested and proven. And our success means our customers will benefit from the best performance at the lowest cost, in the smallest form factor.

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A Top 5 Silicon Valley recruiting firm, Management Recruiters of San Jose-Metro has provided high-level placement and recruiting services to high tech job seekers and employers for over 25 years, and we deliver our services with the utmost discretion and professionalism.

Semiconductor Industry

Management Recruiters of San Jose-Metro works with both established semiconductor companies and hot new startups to fill positions in areas including ASIC, custom RF wireless, optical networking and DSP. Listed below is a sampling of the positions in which we regularly place candidates.

- CMOS-VLSI architect
- CMOS-VLSI design engineer (circuit/logic)
- ASIC design engineer
- Applications engineer
- Systems engineer
- Process integration specialist
- Process engineer
- Product marketing engineer
- Product planning specialist
- R&D engineer
- Manager, director or vice-president engineering
- Manager, director or vice president of marketing
- Manager, director or vice president of sales
- Market analyst/specialist
- Consultant
- Sales engineer

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BRIDGES for GROWTH IN COOPERATION

Centro de Tecnología de las Comunicaciones S.A. (CETECOMSpain) is a leading company in testing solutions for the wireless and cellular industries. CETECOM develops test solutions for Bluetooth, 2G/3G, RFID, WiMAX and other wireless technologies and provides testing and consultancy services for compliance with international standards. CETECOM is looking for dedicated engineers willing to take the challenges of wireless communications testing and join our development and compliance teams. Currently, there are several positions:

DSP/L1 and/or Protocols Development Engineer (GSM & WCDMA) (Ref 1)

Job description

The Base Band Processing Group is responsible for design, implementation and maintenance of the physical layer and higher layers of different Cetecom wireless products. As a physical layer development engineer you will analyse, design and develop functionality for wireless technology, primarily WCDMA and GSM. Experience of C programming in real-time environment is required.

Competence

Qualification: MSc in Telecommunications or Electronic Engineering or equivalent

Minimum required:

- Experience in Wireless Technologies (WCDMA, GSM, GPRS)
- Experience in Software Radio Design and development
- Experience in C programming for embedded systems
- Layer 2 and Layer 3 knowledge
- Experience in Communication Protocols development with SDL
- Experience in Linux OS and TCP/IP networking programming
- Used to analytical work
- Ability to work independently and in teams

Testing engineer for the WiMAX and GSM/GPRS/UMTS laboratories (Ref 2)

Job description:

In CETECOM's testing laboratory, engineers perform testing to wireless devices according to international standards. As a testing engineer, you will undertake testing, report writing and consulting tasks. Besides, you will have the duties of set-up, installation, calibration and maintenance of specialized test equipment as well as provide assistance to maintain the quality system and accreditation requirements.

Competence

Qualification: MSc in Telecommunications or Electronic Engineering or equivalent

Minimum required:

- 2+ years experience in wireless testing field
- Experience in Wireless Technologies (WiMAX, GSM, WCDMA)
- Ability to work in front of customers
- IT and organisational skills



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Connection Section

INCISOR

Incisor seeks:

Business development executive

Incisor continues to consolidate its position as the only magazine that is completely focused on the short range wireless sector – and nothing else.

Incisor now covers the Bluetooth, UWB, ZigBee, WLAN/Wi-Fi, RFID, NFC and WiMAX industries. As Incisor's circulation continues to grow, and as the breadth of companies that Incisor addresses increases, we need to improve our ability to work with wireless companies across the globe in order to maximise the commercial potential of the Incisor product, and the services that Incisor publisher Click I.T. Ltd provides to support and enhance the Incisor brand.

We seek an individual (or individuals) that are experienced in the wireless sector, and who can assist us in promoting sponsorship, advertising and e-marketing in Incisor magazine. You must be able to approach senior industry marketeers with confidence, and have the determination to succeed in growing Incisor's revenues with wireless industry companies – from start-ups to the major players.

Location is unimportant. This is an electronic business and provided you have a phone and access to the Internet and email you will be able to be part of the Incisor team.

This is initially a commission-only position. This will be reviewed later, subject to performance.

If you are interested to discuss this position, contact Vince Holton by email.

Email: vholton@click.co.uk

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Wireless industry calendar of events

DATE	EVENT	LOCATION	NOTES	LINK
Sept 13-14 2005	Wireless VoIP	San Jose Marriott, San Jose, California	-	www.wvoip.com
Sept 21 2005	IDC Mobile Enterprise Forum	Millenium Broadway Hotel, New York, USA	-	http://www.idc.com/getdoc.jsp?containerId=IDC_P10241
Sept 26-30 2005	3GSM World Congress Asia	Suntec Int. Convention Centre, Singapore	-	www.3gsmasia.com
Oct 20-21 2005	RFID Europe	Frankfurt Sheraton Hotel, Germany	Manufacturing & Supply Chain Solutions Conference	www.scievents.com/rfideu05
Nov 15 - 16 2005	Wireless Connectivity Americas	Santa Clara Convention Centre, Santa Clara, USA	-	www.wiconamericas.com

Further wireless industry events will be added to the calendar as soon as they are announced. See notes below regarding editorial submissions.

Incisor publishing schedule

Each month we will publish the main themes of the next four issues of Incisor magazine to assist companies in the wireless industry when planning PR and marketing activity.

Issue 86 - September

Positioning wireless – annual review of the status of all wireless standards
Copy Deadline: 24th August Date of Publication: 31st August

Issue 87 – October

Plus WLAN / Wi-Fi focus issue – developments in the 802.11 world
Copy Deadline: 14th September Date of Publication: 21st September

Issue 88 - November

Wireless in the Americas – 2nd annual review/WiCon Americas preview
Copy Deadline: 29th September Date of Publication: 5th October

Issue 89 - December

WiCon Americas review/Fabless semicon companies – can you build a successful business without a fab?
Copy Deadline: 18th November Date of Publication: 25th November

For further information regarding any issue of Incisor, contact Vince Holton (see below).

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Incisor provides commercial and promotional opportunities in the Bluetooth and short range RF sector. Sponsorship, advertising and e-marketing enquiries should be directed to Vince Holton (see below)

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This newsletter is distributed on a monthly basis to companies and individuals with an interest in Bluetooth, WLAN, ZigBee, UWB, RFID, NFC and other RF technologies.

Should you wish to stop receiving Incisor, then please contact Click I.T. Ltd using the contact details shown.

Editorial contributions are welcomed. Companies should send press releases to the editorial contact across.

Individuals are invited to express their views as to the content and style of Incisor.

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