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TechNews is a technology, news and analysis service aimed at those in the education sector keen to stay informed about technology developments, trends and issues. Please navigate the newsletter by clicking on items within the table of contents below.

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Networking and wireless

Analysis: WiMAX

WiMAX (Worldwide Interoperability for Microwave Access) is an emerging wireless broadband technology based on IEEE 802.16 standards. It is intended to provide high speed wireless access over a large area. The WiMAX roadmap is for fixed versions of the technology to be rolled out from the end of 2005, followed by portable devices (laptop cards) and finally a mobile version (802.16e) in around two year's time.

802.16-2004 was ratified by the IEEE last July and is the basis for fixed versions of the technology. It allows for use of frequencies between 2 and 11 GHz and channel sizes between 1.5 and 20 MHz. The standard includes both line of sight (LOS) and non line of sight (NLOS) environments. It can be used for point to point and point to multipoint implementations, has built in quality of service (QoS) and security. The mobile version is expected to be ratified by the IEEE later this year, but products are unlikely to appear until 2007. WiMAX has been likened to fast Wi-Fi, but this analogy can be misleading as WiMAX will only be available as a service from third party providers in the medium term.

WiMAX has received a great deal of attention over the last two years and its performance has been hyped beyond what will actually be delivered. Articles on WiMAX often quote maximum data rates of 75Mbps and a range of 45 Km. Whilst theoretically true, the reality is somewhat different. A range of 45 Km is only achievable in line of site (LOS) deployments and not the non line of sight (NLOS) expected to be used by most providers to cover large areas. These urban WiMAX cells may only be 3 Km wide for indoor antenna versions. 75Mbps data rates are only possible with 20 MHz channels. The initial WiMAX profiles will use 3.5 MHz channels and consequently the performance will be lower. Also, it is important to remember that the available bandwidth is shared between all users of a particular WiMAX base station. Intel, one of the major backers of the technology, see 40Mbps maximum for fixed wireless installations and end users are likely to receive data rates similar to DSL.

WiMAX has several advantages over other wireless broadband technologies. Current wireless broadband solutions are proprietary, which has hindered their adoption. A worldwide, standardised, interoperable technology would allow for a mass market, economies of scale and competition leading to cheaper products. There would also be less risk involved as users and suppliers would not be tied in to a particular vendor. However, wireless alternatives like UMTS TDD already support mobile access and have been adopted by operators in countries such as the Czech Republic.

WiMAX is the marketing, equipment certification and testing body and 802.16x the actual technology standard. This is a similar situation to Wi-Fi and IEEE 802.11x. The WiMAX Forum is currently testing the WiMAX equipment and the first certified products are expected in late 2005. Consequently, no true WiMAX services yet exist, but over 80 service providers in around 30 countries are using "pre-WiMAX" systems. The first certified equipment is likely to be relatively expensive and require an engineer install. Self-install equipment should appear within 18 months, but indoor antennas in these systems will reduce the range.

WiMAX has several potential uses. The fixed version is likely to be used to provide broadband access to residential areas and organisations. It may initially be used in rural areas where DSL internet access is unavailable. BT is looking at WiMAX to extend broadband coverage in Scotland and Northern Ireland in areas without ADSL enabled exchanges. Developing countries without a widespread fixed line infrastructure may also benefit. WiMAX will also allow internet providers to bypass the "last mile", which is often controlled by traditional telecom companies. Several providers around the world are offering or planning urban WiMAX services, which benefit from population density. Brighton council, for example, are using pre-WiMAX to provide internet access to schools and the wider community. However, WiMAX will have strong competition from existing wired broadband providers, who have reduced prices and raised access speeds. WiMAX may also be used for "campus" wide coverage of large business sites, hospitals and educational institutions. Telabria are working with Kent University to provide campus and city wide wireless access. Telabria are also developing WiMAX as a backhaul solution for Wi-Fi networks, which is another potential use of the technology.

There are a range of issues affecting the likely success of WiMAX. Firstly, it will have competition from other existing and emerging technologies such as 3G, Wi-Fi, UMTS TDD, IPWireless and Flash OFDM. One of the major barriers to creating a worldwide, interoperable standard is the spectrum regulations in each country. Initial WiMAX profiles are being tested for 3.5 GHz. 5.8 GHz and 2.5 GHz are other likely frequencies for WiMAX. The key debate is whether WiMAX should work in licensed or unlicensed spectrum. WiMAX performs better at lower frequencies, but in the UK 2.5 GHz is currently reserved for 3G and 3.5 GHz is licensed to a single company. Higher frequencies would require more base stations to cover the same area, increasing costs. Another issue that may slow adoption by operators is the unclear roadmap to the mobile version of WiMAX. The WiMAX Forum has now incorporated the Korean Wi-Bro standard into 802.16e, which could mean that the mobile version will not be backwards compatible with fixed WiMAX.

It is the mobile version of WiMAX which is seen by analysts as having the most potential, but several technical issues, especially power usage need to be addressed. Providing high speed internet access over a large area could mean WiMAX was competing with 3G and future upgrades such as HSDPA (see TechNews May 05). It remains unclear whether regulators in different countries will allow WiMAX to be used for mobile applications, particularly voice. Most analysts now agree that WiMAX will be complementary to other technologies and this is supported by the fact that a variety of operators from the mobile and fixed line industries are now exploring the use of WiMAX.

<http://www.wimaxforum.org>

<http://networks.silicon.com/mobile/0,39024665,39130641,00.htm>

<http://www.ieee.org/portal/site>

Networking and wireless news

802.11n fast Wi-Fi moves closer

The next IEEE standard for Wi-Fi networks (802.11n), which is intended to provide real world data rates of 100 Mbps+, now looks to be closer to completion. The two industry groups vying for their specifications to be adopted as the standard have agreed to submit a joint proposal to the next IEEE 802.11n meeting in July. Until now, neither the TGN Sync nor WWiSE groups have been able to obtain an adequate majority leaving the standards process deadlocked. Both proposed solutions use MIMO (multiple input multiple output) technology. Some manufacturers have released pre-standard equipment using MIMO, but these devices may not conform to the IEEE standard once ratified.

<http://www.techworld.com/networking/news/index.cfm?newsid=3975&email>

<http://www.ieee.org/>

Wireless USB 1.0 specification completed; UWB developments

The Wireless USB Promoter Group has completed the first specification for Wireless USB connections based on Ultra Wideband (UWB) technology (see TechNews Jan 05). The first wireless USB products are expected towards the end of the year. Intel, one of the members of the group, has created a lab to test products for compliance and interoperability. Wireless USB should offer speeds similar to wired USB 2 over short distances. It will be used for cable replacement between consumer devices, computers and peripherals. Currently two industry groups are developing different versions of UWB. Wireless USB is based on the WiMedia Alliance implementation, which has the widest industry support.

Meanwhile Freescale Semiconductors and Icron Technologies have developed ExtremeUSB wireless based on DS-UWB which is backed by the UWB Forum. ExtremeUSB dongles will plug into existing USB ports on computers and act the same as a wired USB connection.

Some analysts are predicting that Bluetooth could be overtaken by emerging wireless standards such as UWB and Near Field Communications (NFC). However, the Bluetooth SIG has announced that it will develop a version of Bluetooth that uses the faster UWB technologies.

UWB has not yet been approved for use in the UK, but the EU is discussing regulations for the technology.

<http://www.usb.org/developers/wusb/>

http://www.icron.com/products/usb/wireless_usb.php

First ZigBee devices demonstrated

The first ZigBee devices based on the ZigBee specification 1.0, published last December, have been demonstrated at the recent Wireless Connectivity World exhibition. ZigBee is an emerging wireless network technology based on the IEEE 802.15.4 standard for low powered Personal Area Networks (PANs). It is aimed at control, monitoring, building automation, consumer electronics and sensor networks (see TechNews Feb 05). Analysts In-Stat expect the 802.15.4 market to grow 200% by 2009. However, ZigBee prices will initially be higher than other existing proprietary solutions and Bluetooth.

<http://www.zigbee.org/en/press/index.asp>

200Mbps powerline networking

The HomePlug Powerline Alliance will shortly release its new AV specification for home networking over mains power cables. It will have maximum data rates of 200Mbps compared to the existing specification's 14Mbps. Sony has also joined the alliance, which may help raise the profile of the technology. Using existing electricity cables to network devices in the home is expected to be increasingly popular as consumers set up media hubs to transmit video and audio around a building. The higher data rates and ease of use of the new standard may give it an advantage over wireless technologies, but ultimately the two networking methods are likely to be complementary.

<http://www.homeplug.org>

xMax may improve wireless battery life

A new technology called xMax promises to reduce the power requirements of devices sending data over long distances via emerging wireless technologies such as 3G and WiMAX. The technology uses efficient modulation and signals split over multiple sub-1GHz channels. It is still far too early to judge whether the technology works as claimed and whether it will be commercially successful. However, it could improve the viability of mobile devices using wireless broadband technologies, which are not expected to appear until 2007 at the earliest.

<http://www.xgtechnology.com/>

Carrier Ethernet testing

The Metro Ethernet Forum (MEF) has announced plans to start testing next generation network equipment for Carrier Ethernet standard compliance. Carrier Ethernet is a new standard overseen by the MEF industry body. Carrier Ethernet should bring the advantages of Ethernet such as flexibility and cost savings to Wide Area Networks (WANs). It should offer speeds in the tens of Gbps. Analysts expect strong growth in the Carrier Ethernet market.

<http://www.metroethernetforum.org/>

<http://www.vnunet.com/news/1162419>

EU backs Broadband over Power Lines

The EU is encouraging member states to remove restrictions on using the electricity grid to provide broadband connectivity. Broadband over Power Line, also known as Power Line Communications (PLC), would introduce more competition into the market and could provide connectivity to users currently unable to access DSL broadband. There are currently few services in Europe, but there is increasing interest in the technology with several trials in progress. In the US, Google has just invested in a company developing the technology and IBM is linking up with Powerline Energy to trial services.

<http://networks.silicon.com/broadband/0,39024661,39129435,00.htm>

Ofcom Spectrum Review published

The UK telecommunication regulator Ofcom has completed its Spectrum Framework Review. As expected the regulator will free up more radio spectrum, allow spectrum trading and become technology neutral allowing companies to decide what services frequencies are used for. Ofcom will retain control of critical frequencies or those needed to meet international obligations. Greater

freedom in the market may help emerging wireless technologies like WiMAX, although 3G operators who paid over £22 billion for their licences are expected to receive some initial protection.

<http://www.ofcom.org.uk/consult/condocs/sfr/>

VoIP to see strong growth

Voice over IP (VoIP) is expected to continue to see strong growth in organisations and the home. VoIP breaks voice into packets that can be sent over data networks and the internet. It enables cost saving and added functionality, such as presence and unified messaging. A recent study by Analysys predicts that VoIP will be used by a quarter of households in Europe by 2010. The increase in broadband connectivity is driving the technology, which is being helped by the introduction of consumer friendly services that can be used without a computer. Adoption by business is even stronger. Although many large educational institutions are beginning to deploy VoIP, smaller organisations and schools should look at the true costs and benefits involved in replacing existing equipment. A recent study of VoIP services in the US found that quality and reliability still need to improve.

<http://www.analysys.com/>

<http://www.techworld.com/networking/news/index.cfm?NewsID=3974&email>

<http://www.itworld.com/Net/3303/050713voipquality/index.html>

Using mobile phones in rural areas could increase health risks

A study by University Hospital Orebro in Sweden, published in the Occupational and Environmental Medicine Journal, has suggested that using mobile phones in rural areas increases the risk of developing tumours by three times compared with urban users. This may be because cells in rural areas tend to cover large distances and therefore phones use more power and higher emissions. Contradictory research has emerged on the safety of mobile phones. In 2000, the Government's Independent Expert Group on mobile phones concluded that there was no conclusive evidence of a health risk from mobile phones, but that further research was needed. All mobile phones sold in the UK meet international guidelines on RF radiation. However, current advice is that children limit their use of mobile phones.

<http://oem.bmjournals.com/cgi/content/short/62/6/390>

Multimedia

Analysis: Digital living room

The growth of broadband connectivity, digital content (video, TV, music and photos) and the need to store and share this content with a variety of devices, both fixed and mobile, has led to the emergence of the "digital living room" concept. This space has traditionally been dominated by the consumer electronics (CE) industry, but the computer industry is now looking to move into this area attracted by a growth market with high margins. Intel, for example, has recently created a Digital Home Division. The cross over between consumer electronics and computers has many interesting possibilities, including the opportunity to deliver educational content to non-PC devices, which could help tackle the digital divide and make information available in new ways.

The "digital living room" concept is often seen as a central media server storing and distributing content to other devices around the home, although several other interpretations are possible. The media server environment depends on reliable home networks and fast internet connections to download content. In-Stat/MDR estimate that home networks will grow 30% year on year to 2009. In the EU, 47% of homes are expected to have networks by 2008. Much of this growth is in Wi-Fi networks that currently cannot support high resolution video. Some analysts predict that using the mains cabling to provide networking to fixed devices may be an increasingly popular method. Ultra Wideband may be used as a complementary technology to wirelessly link mobile devices and peripherals. The emergence of faster Wi-Fi with the IEEE 802.11n standard may resolve the wireless data rate issues. Networking capability is increasingly being built in to audio and visual devices and there are also a growing number of add-on systems to network the large base of legacy analogue equipment.

Computers are only present in about half of homes and sales to new users are slowing. Many manufacturers have recognised that although computers are powerful tools for storing, managing and editing content, they do not provide the best viewing or listening experience. Although, some manufacturers are making computers that look more like home entertainment equipment, the image remains that of noisy, beige boxes that are slow to boot, complicated and unreliable. This coupled with high prices, is why solutions like Microsoft's Media Centre operating system have seen relatively limited sales. A recent survey by Accenture emphasises that most consumers see the "digital home" as too expensive and complicated. Consumers have limited budgets that they are prepared to use on widescreen flat panel TVs, but the added value of computer solutions in the living room remains to be proved to them. The "lean forward" culture of the PC does not always translate to the "lean back culture" of the living room, despite operating systems that can be navigated with a remote control.

Broadband appliances, devices other than computers that connect directly to a high-speed internet service, may provide an alternative. For example, broadband enabled set top boxes (STBs) can provide digital television as well as internet access and a host of other services. The RegenTV project in Newham provides access to e-government services, interactive advice channels, community channels and ICT virtual learning programmes. These kinds of services are seen as one way of tackling the digital divide. Internet applications could make the dedicated computer less relevant as they can run on a variety of devices.

The next generation of games consoles could also be well placed to become the hub of the digital living room. The PlayStation 3 from Sony due next year and Microsoft's Xbox 360 to be released in time for Christmas, are looking increasingly like multi-task entertainment hubs than mere games consoles. Xbox 360 will include a DVD player, hard disk, broadband, network connectivity and be able to act as an extender to Media Centre PCs. Sony openly talks about the PS3 as a hybrid machine and has suggested it may come with a hard disk loaded with Linux. The Cell processor to be used in the PS3 will also find its way into a variety of electronic devices. Games consoles costing £200 or less are more likely to see high sales than media PCs.

Consumer electronics companies remain in a strong position to dominate the living room. Digital video recorders (DVRs), which record to hard disks, are seeing strong growth. InStat expect digital STBs with built in hard disks to be a major trend. Services such as TiVo in the USA and Sky+ in the UK combine the hard disk recorder with an Electronic Programme Guide (EPG), allowing intelligent recording. For example, a user can record an entire series with a few clicks. The TiVo service can actually "learn" the types of programmes a user likes and records them automatically. Features such as the ability to pause live TV if interrupted and then continue watching from where you left off are used to sell these devices. However, it is the fact that DVRs change the dynamic of TV that is most interesting. DVRs undermine the concept of watching TV as a live broadcast at a particular time. Although media centre PCs can offer similar functionality, they cannot offer the ease of use or price of dedicated solutions. By adding networking, DVRs could well become the home media hub of the future. In Japan, for example, Sony has launched a networked 1TB DVR with 7 tuners.

Connectivity and digital rights management (DRM) are key issues for computer and CE manufacturers. Consumers expect devices from different suppliers to be able to connect easily straight from the box without the need to understand IP addresses or other technical details. The Digital Living Network Alliance (DLNA) is an industry body made up of computer and CE companies to set specifications for connectivity using existing standards such as IP, http, UPnP and Wi-Fi. The DLNA hopes to have industry wide interoperability standards in place by 2007. DRM also needs to be considered and various models are emerging for protecting digital content, defining how it can be used and what devices it will play on.

More homes should get faster broadband connections enabling "triple play" services of phone, internet and TV/video to be delivered over the same pipe. This is likely to erode the separation of internet/computer tasks and home entertainment, with many activities, including learning, no longer always being delivered through a traditional computer.

<http://www.dlna.org/home>
<http://www.theinquirer.net/?article=23878>

Multimedia news

Digital camera growth to slow

A recent report from IDC suggests that the stand-alone digital camera market that has seen massive growth over the last few years is reaching maturity and will soon begin to slow. Although growth is expected to continue through to 2007, the diversity of devices with digital camera functionality will help slow adoption of dedicated cameras. Also, digital cameras have so far tended to be sold on features and performance rather than ease of use and value for money that would attract the wider market.

http://news.com.com/Digital+camera+market+peaked+too+soon/2100-1041_3-5688981.html?tag=nefd.top

VESA display connection standard

The Video Electronics Standards Association (VESA) has announced that it is developing a new digital display connection specification called DisplayPort. Several manufacturers are working on the specifications which VESA may decide to turn into a standard later in the year. It will offer higher video specifications than DVI and will have optional content protection technology.

<http://www.vesa.org/press/displayportpr.htm>

Hi-tech bullying

Recent reports in the media have highlighted the growing problem of hi-tech bullying such as “happy slapping”, where attacks by teenagers are recorded using mobile phone cameras and even uploaded to the internet. Research from the National Children’s Home (NCH) has found that 10% of children have suffered from threatening or inappropriate use of cameraphones. The NCH survey also found that 20% of children had been bullied via text messaging, email or chat rooms. The full report can be downloaded here: <http://www.nch.org.uk/information/index.php?i=237>.

An advice and guidance website on digital bullying is available here: <http://www.stoptextbully.com/>

New lens could transform cameraphones

Canadian researchers at Laval University have developed a new, extremely thin camera lens that could help improve the quality of digital cameras in mobile devices such as phones. The electrically tuneable polymer stabilised liquid crystal lens could allow for clear zoom photography from a tiny embedded camera. The lens is still some way from being commercialised. Researchers in France and at Philips are also working on new small lens technology based on liquids.

http://www.sci-tech-today.com/story.xhtml?story_id=35494

Disposable digital video cameras

A US start up company called Pure Digital Technologies has developed a single use digital video camera. The \$30 device can record up to 20 minutes of video to a built in memory chip. Video can be deleted, but the camera needs to be returned to the shop to have its contents burned to DVD. Single use film cameras continue to be popular and form a significant part of high street developers business. As users are becoming more confident with video content, a single use video device may prove attractive. It could also be used in situations where there may be concerns over using more expensive, desirable and easily damaged dedicated video equipment. However, as the ubiquitous mobile phone adds better video/photo capabilities and more storage, the need for such devices may decrease.

<http://www.imaging-resource.com/NEWS/1118158996.html>

Dual graphics cards

Both ATI and Nvidia, the two major graphics card manufacturers, have released dual card systems. ATI’s technology has two graphics cards linked with a high speed SLI connector and then to the computer via PCIe. The cards can either render alternate frames or split the rendering of individual frames between them. ATI’s Crossfire does a similar job, but only one of the video cards needs to support the technology. Both systems will need suitable motherboards. The systems are currently

aimed at high end gamers, but the technology could become more mainstream as the graphics requirements of applications increase.

<http://mirror.ati.com/products/crossfire/index.html>

http://www.slizone.com/page/slizone_learn.html

LED backlit LCD displays

The idea of using LED backlights for TFT-LCD displays is not new, but cost and technical issues have prevented the technology being widely available. Several manufacturers are now launching LED lit displays aimed at image/graphics professionals. Despite improvements in the CCFL backlights found in most TFT-LCD screens, many image professionals still use CRT monitors as they have a wider colour gamut and better saturation. With the disappearance of CRTs from the market, LED lit displays could be an alternative. Initially LED monitors will be expensive niche products, but competition and economy of scale could eventually see them move towards the wider market. Cost, heat production, power consumption and life spans are all issues that need addressing.

http://www.tomshardware.com/hardnews/20050523_140107.html

<http://www.digitalvideoediting.com/articles/viewarticle.jsp?id=33128>

Mobile TV developments

Live digital television on mobile telephones is a concept being pursued by companies around the world (see TechNews Autumn 04). In Korea, the first broadcast service to mobile phones was launched in May using digital multimedia broadcasting (DMB), which is based on the same technology as DAB digital radio. Both satellite and terrestrial services are available. In Europe DVB-H is the most supported technology, with Nokia in particular backing the technology. O2 and NTL are running trials of the technology this summer. Virgin mobile, on the other hand, is trialling DAB radio/TV to mobiles in London. Orange has a TV service in France, which is provided over its 3G network. This is expected to appear in the UK along with a similar service from Vodafone. However, it is not considered an efficient use of 3G spectrum. The potential for interactive mobile video to provide a new experience for educational content exists, but this new media form has not been fully explored. Initially short news and sports clips and conventional TV are likely to dominate. Most surveys still show limited interest in mobile video from consumers and even less desire to pay for it.

<http://networks.silicon.com/mobile/0,39024665,39130299,00.htm>

Touch screens to get force feedback

At the recent Information Display Conference Immersion said that they would add their 'Touchsense' Force Feed Back technology to touch screen displays. Force feed back is best known in joysticks and other games controllers and gives the impression of resistance making the interface more realistic. By placing a controllable overlay over a touchscreen display, the illusion of physical buttons can be created. This would give more user feedback and more natural experience. The first devices to use the technology could be available within a year.

<http://immr.client.shareholder.com/ReleaseDetail.cfm?ReleaseID=164236>

Longhorn to support RAW photo format

The next Windows operating system, codenamed Longhorn, will support RAW photo formats. The RAW format is favoured by serious digital photographers as it captures all the information recorded by a camera's imaging chip. However, individual camera manufacturers have different implementations of the RAW format meaning interoperability between camera formats is poor and photo manipulation applications offer limited support. Microsoft is working with several camera manufacturers on the implementation. Microsoft has also released a RAW thumbnail viewer for XP that supports Canon and Nikon RAW formats. Adobe has already developed a Digital Negative (DNG) format that it hopes will become an industry standard.

<http://www.microsoft.com/downloads/details.aspx?FamilyID=d48e808e-b10d-4ce4-a141-5866fd4a3286&displaylang=en>

Hardware

Analysis: Converged GSM/Wi-Fi phones

The concept of Wi-Fi enabled mobile phones has had some momentum recently with manufacturers announcing models and several operators trialling the technology. These phones should allow users to seamlessly switch between GSM mobile networks and Wi-Fi networks in the home, work or leisure space. ABI Research expects there to be 100 million Wi-Fi mobiles by 2009 and In-Stat predicts 296 million by 2010. Surveys put interest in the idea at 85% of respondents, yet actual handsets and services have been slow to appear. This is partly due to the need to perfect the technology, but the tension between the needs of the different groups involved is also a major factor in the delay.

Wireless Local Area Networks (WLANs) have quickly become a mainstream technology in both organisations and the home. The growth in broadband connections has also increased the use of VoIP (Voice over IP) services. These break voice data into packets that can be sent over IP networks and the internet for free or much reduced rates. Organisations are beginning to move to converged data and (IP) phone networks and Voice over WLAN is a natural next step. Indeed, some of the first converged phones are tied in with dedicated IP PBX solutions letting the operators retain some control over the use of such devices. Some operators are also looking to link access to their own Wi-Fi hotspot networks.

However, organisations and users are looking for dual mode mobile phones that can seamlessly switch between GSM and any Wi-Fi access point without dropping the voice or data connection. This would enable cheaper and faster connections when a Wi-Fi access point is available and potentially avoid the need for a fixed phone at all. This is the model that would be most attractive to education enabling students to access networks via their mobile phones and possibly reducing staff call costs.

The concept of unmediated Wi-Fi access is unattractive to many network operators, as it is likely to reduce their call revenues. Despite this, some operators believe that dual mode phones could increase use of 3G services and encourage fixed mobile substitution. This is where mobiles replace fixed line telephones completely. Conversely, fixed line operators who are losing out to mobile operators, are looking to fixed mobile convergence (FMC). FMC allows the use of mobile phones to make fixed line calls through a Wi-Fi/Bluetooth access point. This has the attraction to the user of one phone for all services and solves the problem of poor indoor mobile reception.

Both groups of operators are looking to control the Wi-Fi link before launching widespread services. Unlicensed Mobile Access (UMA) is an industry group that was set up to develop standards for roaming and handover between Wi-Fi and GSM. BT has just announced a limited launch of its 'Fusion' service that uses UMA for fixed mobile convergence. UMA allows operators to make use of Wi-Fi, or in Fusion's case Bluetooth, to route calls that are still completed and therefore charged, through the mobile network. However, UMA is likely to be overtaken by alternative SIP based technologies (eg MobileIgnite), IP Multimedia Subsystem (IMS) and eventually full end to end IP systems.

Wi-Fi enabled mobile phones and softphone PDAs are slowly beginning to appear from manufacturers such as NEC (900i), Motorola (CN620), Nokia (N91), HP (iPaq 65000 and Calypso). Devices that can seamlessly switch between access technologies will not arrive in numbers until late 2005 to early 2006 and many may be restricted to enterprise level IP PBXs. However, as users become more familiar with the benefits of VoIP and start experimenting with services such as mobile Skype, the demand for open Wi-Fi access via mobile phones will increase. As most students own a mobile phone, and as the devices become more powerful with built in hard drives and high resolution displays, the ability to access educational networks over Wi-Fi could potentially turn the mobile phone into the first ubiquitous networked device. Managing such a situation with adequate security and protection is another challenge.

<http://www.techworld.com/mobility/news/index.cfm?NewsID=3897&email>

<http://www.btfusion.bt.com/>

Hardware news

New support tool for school technicians

An online tool to support the recruitment, retention and training of ICT technicians who work in schools has been launched on the Becta website. The technicians' competencies framework provides tools, advice and guidance for school leaders and technicians. School leaders can access advice on the recruitment of technicians and analyse the technical support already received, while technicians can access a self assessment tool which enables them to analyse current skills and identify training requirements.

<http://www.becta.org.uk/ntss/index.cfm>

Tablet PC developments

Lenovo, who recently bought IBM's PC business, has launched a Tablet PC under the Thinkpad brand. The X41 is an ultraportable aimed at business users. The fact that another major manufacturer has developed a Tablet could help improve sales of the format that so far have been poor due to high prices and lower specifications than equivalent laptops. The future of Tablet PCs had been unclear until Bill Gates (CEO Microsoft) recently reconfirmed his belief in the platform. Other manufacturers, such as Motion Computing, HP and Fujitsu have also developed new generation machines. The next generation of Windows due late in 2006, is now expected to provide improved support and integration for Tablet PCs. Some technology websites have also reported that Apple has patented a design for a device with pen input. However, it is too early to judge whether it will be developed. Becta has recently published two reports on the use of Tablet PCs in UK schools.

<http://www.becta.org.uk/research/research.cfm?section=1&id=3357>

<http://www.pc.ibm.com/us/thinkpad/xseries/tablet/>

Apple switches to Intel

Apple Computer has announced its intention to move from IBM PowerPC to Intel processors. The first Apple models using Intel chips are expected in mid-2006 with the switch over complete by the end of 2007. The surprise move is seen by analysts as Apple wanting to gain access to Intel's technologies, performance, supply and economies of scale. Apple still intends producing its own hardware and has said it will not licence OS X to run on any x86 based machines. Intel may see Apple as a valuable partner to showcase its technologies, especially in the design oriented digital home segment. It does however open the possibility of running Windows on Apple hardware. Initial surveys suggest that potential Apple buyers may put off purchasing products that risk becoming obsolete. Apple have a binary code translator to port software across to the new Intel platforms, but OS 8 and 9 software may no longer be supported.

<http://www.apple.com/pr/library/2005/jun/06intel.html>

PC market

The average price of PCs in Europe is continuing to fall according to market research from Context. Almost a third of PCs sold sell for less than 500 Euros, with sales of more expensive machines declining. These figures support the trend of PCs becoming more like commodity devices. Analysts IDC predict slow growth of 4% in the European PC market. This contrasts with consumer oriented devices which are expected to see strong sales.

<http://www.contextworld.com/Default.aspx?LocID=0eynew02s.RefLocID=0ey00y.htm>

www.idc.com

Shift towards widescreen laptops

Falling prices and consumer demand are expected to significantly increase the number of widescreen laptops on the market. With most major manufacturers increasing the number of widescreen models produced, they are expected to make up over 80% of the market by the middle of next year. Currently widescreen panels are more expensive than traditional 4:3 ratio screens and only make up 30-40% of the market.

<http://www.digitimes.com/news/a20050511A1001.html>

Flash hard drives

Samsung has announced plans that could change the current hard disk market. At the recent WinHEC conference Samsung showed a hybrid hard drive with a large cache of Flash memory that would significantly improve performance and battery life of notebook computers. It has also stated that it will launch Solid State Disks (SSDs) based entirely on Flash, suitable for notebooks and Tablet PCs. The 1.8" 16 GB SSD NAND Flash drives will be launched in August. Flash drives consume about 5% the power of traditional hard drives, offer much faster performance, better reliability, shock resistance and quiet operation. Specialist Flash drives have been available for some time, but remain expensive. Samsung, the world's largest producer of Flash, believes that falling process for NAND Flash will enable such drives to become mainstream.

http://www.samsung.com/PressCenter/PressRelease/PressRelease.asp?seq=20050523_0000123980

Perpendicular Recording hard drives

Several hard drive manufacturers have announced plans to use perpendicular recording (PR) technology to increase hard disk drive densities. In perpendicular disk drives the data particles stand at 90 degrees to the surface instead of the longitudinally arranged data on traditional hard drives. This allows for more data to be packed into the same area. Toshiba has already produced drives using the technology and Hitachi, Fujitsu, Seagate and others are all working on PR drives.

http://www.hitachigst.com/hdd/research/recording_head/pr/PerpendicularAnimation.html

Intel moves towards common architecture

At the recent Japan Intel Developer Forum, Intel confirmed a full family of next generation dual core chips due in late 2006 to early 2007. The desktop, mobile and server chips are codenamed Conroe, Merom and Woodcrest respectively. A common architecture for the different lines of chips could improve the manageability of the different kinds of PC. Both Intel and AMD have launched dual core chips this year. Dual core chips are essentially two processors on a single die (silicon wafer). They can give better performance at lower clock speeds than single core chips, when running optimised software. This allows for less power consumption and cooler operation. Dual core processors can run two threads simultaneously. This parallelism enables calculations to be divided between the two cores to increase efficiency. Alternatively, each core can handle a different application allowing true multitasking.

http://news.com.com/Intel+highlights+its+next-gen+dual-core+chips/2100-1006_3-5697088.html?tag=nefd.top

Intelligent calculator

A new calculator interface that recognises handwritten calculations could make maths easier. Conventional calculators require the user to be aware of the correct order to perform calculations. The prototype device is much more intuitive to use as it recognises standard written calculations and equations. The interface, developed at Swansea University, could be used with PDAs or interactive whiteboards. It is not yet clear whether the technology will be produced commercially. Some maths software for Tablet PCs is also capable of recognising hand written calculations.

<http://www.newscientist.com/channel/info-tech/dn7583>

New Futurelab publication

NESTA Futurelab has recently produced a new magazine that is free to the education and ICT/technology communities called Vision which looks at the future of education. Issue one is now available and includes a mix of lengthy articles and short features on, among others, gaming in education, education for 14-19 year olds and mobile technology in education.

<http://www.nestafuturelab.org/viewpoint/index.htm>

Software and internet

Analysis: Creative Commons

Originally the idea of Lawrence Lessig, a law professor at Stanford University, Creative Commons is a non-profit organisation set up in 2001 by academics, lawyers and content creators to develop alternatives to existing copyright laws. The organisation has established Creative Commons (CC) licences that allow a content creator to decide how published work can be copied, modified and distributed. The CC licences for content have been likened to Open Source software GPL licences.

The licences allow the publisher fine control of their work. Licences range from the restrictive that just allow free non-commercial distribution of work as long as it is attributed, to licences that allow others to freely modify and redistribute work for commercial gain. They are intended for written work, photos, video, artwork and audio. The organisation is also developing other licences such as the Sampling Licence, which allows parts of a work to be incorporated into a new work. The Developing World Licence allows free use of work in poorer countries while retaining commercial rights elsewhere. Creative Commons was a US based solution, but localised licences that take account of the laws in individual countries around the world have been developed. Creative Commons licences for England and Wales and for Scotland have recently been made available.

The Creative Commons website makes it easy to licence and distribute work on the internet. Work is tagged and a search facility and directory allows users to quickly find CC pieces. Yahoo [<http://search.yahoo.com/cc>] and other third party sites also have CC search engines.

Creative Commons licences are mainly aimed at non-commercial users such as individuals, education, academics, libraries, researchers and other public sector organisations. In most cases the content creator, rights holder and publisher are the same person. The UK is seen as forward looking in this area. The BBC has announced its Creative Archive which uses an adapted version of Creative Commons to make the BBC back catalogue available online. Ofcom has proposed using Creative Commons to licence material produced by its proposed Public Service content provider.

Although Creative Commons is intended to be complementary to traditional copyright laws, at its heart lies a debate about control of content and the ownership of information and ideas. There is a tension between freedom of information and commercial exploitation of content. One view is that the free exchange of information and ideas creates a vibrant, dynamic society. The opposite view is that protecting content with copyright gives an incentive to innovate and create. Digital content, social networking and ease of distribution via the internet has created a culture of sharing. At the recent O'Reilly Emerging Technology Conference in San Diego, Lawrence Lessig presented his fears that laws were not keeping up with technological changes and that modern digital rights management (DRM) could severely restrict the available use of digital content far beyond that of traditional media such as books.

Publishers are divided on the issue of Creative Commons. According to a recent report from Zentelligence, some see CC as a possible solution for non-commercial publishing, but many fear any move towards CC as undermining existing copyright laws. Lawmakers have recognised that the internet has increasingly made national laws irrelevant. The EU Copyright Directive of 2003 attempts to harmonise copyright law, which is moving towards a World Intellectual Property Organisation (WIPO) international model.

Creative Commons could provide a viable solution for the publishing of some educational content, particularly that created by practitioners. Lesson plans, text books and other content is already available under CC licences. The Common Information Environment (CIE), a group of public sector bodies, including Becta and JISC, is working to enhance access to online resources for educational users. It has recently commissioned a study on the use of Creative Commons to encourage the use and reuse of digital content. The report is due in late summer 2005.

<http://creativecommons.org/>

Software and internet news

Office 12 due next year will be XML based

The next version of Microsoft's office productivity suite is due for launch in 2006. Office 12 will use the XML format by default, which will enable new back office features as well as improving interoperability with different office productivity suites and other applications. Although XML based formats are used in existing Office products, the move to make them default coupled with the royalty free publishing of the new formats, is significant.

<http://www.microsoft.com/office/preview/fileoverview.msp>

Podcasting to grow

A new study from The Diffusion Group predicts that podcasting is set to see major growth over the next 5 years, with users in the US alone reaching 60 million, up from 4.5 million this year. Podcasts are audio shows distributed over the web. Users can subscribe to RSS feeds to automatically download new podcasts for later listening. Aggregator websites make this process very easy. The file can be synchronised to digital audio players or saved on a computer. Many amateurs, including schools (eg Musselburgh Grammar School) are using the technology and professional organisations such as the BBC are following suit. The latest version of Apple's iTunes contains a directory of podcasts. Search provider Blinkx has developed a podcast search tool using speech recognition software that allows users to search the actual contents of the audio files.

<http://www.tdgresearch.com/>

<http://en.wikipedia.org/wiki/Podcast>

<http://www.mgsonline.org.uk/>

<http://www.blinkx.com>

Mobile web content domain approved

The Internet Corporation for Assigned Names and Numbers (ICANN) has approved the .mobi top level domain for websites with content designed for display on mobile phones and PDAs. Recently the World Wide Web Consortium (W3C) set up a working group to develop standards for all websites intended for display on the small screens of mobile phones and other devices. Research has shown the potential of mobile phones in motivating some students to learn. Mobile phone companies are increasingly moving away from their "walled garden" approach to the internet to offering full access to the web.

<http://www.icann.org/>

<http://www.w3.org/>

Microsoft tool for schools

Microsoft is developing a computer management tool aimed at shared computers as used by most schools. The Shared Computer Toolkit is aimed at non-technical staff and will allow them to restore computers to a clean state after users log-off, delete downloaded software and remove user information. It also enables computers to be locked down so that system level changes cannot be made. The tool works on Windows XP SP2. A beta version and more information are available from: www.microsoft.com/sharedaccess. Other third party software offering similar lock-down and management functionality has been available for some time.

UK internet penetration slowing

Recent survey results released by the Oxford Internet Institute show how internet take-up and usage is changing in the UK. A report on the survey compares the figures with those obtained in 2003. Internet penetration seems to be slowing with only a 3% increase since 2003. However, broadband usage has increased by 40% and mobile internet access is also growing. The internet still seems to be a valuable source for information and education. 2 in 5 respondents used it for school work and 78% to generally check facts. There still remains a significant proportion of non-internet users and the percentage of lapsed users has increased. The full report and results are available here:

http://www.oii.ox.ac.uk/research/oxis/OxIS_2005_Internet_Survey.pdf

Open Source testing lab for public sector

The National Computing Centre has opened a new facility called the Open Source Laboratory intended to test and develop Open Source Software and configurations for public sector organisations without the risk of affecting live systems. The laboratory is supported by the Office of the Deputy Prime Minister through the Open Source Academy.

http://www.ncc.co.uk/aboutncc/press_rel/testlab.cfm

Open Source use increases in public sector

A recent survey of Local Authorities by SocITM found that 39% of organisations are using Open Source Software (OSS) for infrastructure, and 34% for applications. 60% of respondents are likely to increase OSS use. Only 8% use Open Source on the desktop. Respondents gave the advantages of Open Source as cost, flexibility, no vendor lock-in, ease of customisation and better security. Issues included support, training, hidden costs, integration and compatibility.

http://www.theregister.co.uk/2005/05/09/publicbodies_love_linux/

<http://www.socitm.gov.uk/public/>

Microsoft develops "slim client" XP

Microsoft is developing a slim version of XP codenamed Eiger that is capable of running on older specification PCs. Eiger is based on Windows XP, and is designed to run on server centric architectures. However, it is not a true thin client as some applications such as Internet Explorer and Media Player will run locally. The operating system will run on Pentium class PCs with 64MB Ram. It is hoped that Eiger may encourage organisations to upgrade from older versions of Windows without having to buy new PCs. It is particularly aimed at the public sector, but those considering it as an inexpensive way to upgrade should factor in the added server, terminal services and management costs. The product is expected to be released later this year.

<http://news.cnet.co.uk/storage/0,39029696,39189231,00.htm>

Peer to peer developments

Peer to peer (P2P) file sharing networks have mainly been associated with illegal copying of music, video and other content. Although legitimate sites now exist, a campaign by the music industry and Hollywood, has led to a ruling in the USA that file sharing network Grokster is responsible for copyright infringement that takes place on its network. This could have implications for technology development more generally. Technologies such as the video recorder have relied on previous rulings that they have significant non-copyright infringing uses. This has allowed the development of recordable CDs, DVDs and digital audio devices. In fact, P2P is increasingly being used as an efficient method of distributing large files on the internet, particularly using swarmcasting technologies such as BitTorrent. The BBC is planning on using P2P to distribute video content via its interactive Media Player. Skype also uses the principle in its free VoIP internet telephony service. Microsoft Research in Cambridge is developing a P2P system called Avalanche that it claims is more efficient than other systems and could interest Hollywood due to the inclusion of copyright protection.

<http://www.research.microsoft.com/~pablo/avalanche.aspx>

http://news.com.com/Supreme+Court+rules+against+file+swapping/2100-1030_3-5764135.html?tag=nl

UK website archive

The UK Web Archiving Consortium (UKWAC) has begun a two year project to archive UK websites and make them available online. UKWAC consists of The British Library, Joint Information Systems Committee of the Higher and Further Education Councils (JISC), The National Archives, The National Library of Wales, the National Library of Scotland and the Wellcome Trust. Each member will concentrate on archiving sites in their area of expertise. The online archive is aimed at the UK research community, education and others. It is an attempt to capture "social, historic and culturally significant web-based material", which often disappears very quickly. The project will also seek to research the best digital preservation methods for such material.

<http://www.webarchive.org.uk/>

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