Miscellennium news ››

Clive Akass gives a personal view of IT at the cusp of the millennium

The millennium revolution

The millennium has been associated with apocalyptic change since John of Patmos wrote the *Book of Revelations* some 1,900 years ago. But for millennia, change happened very slowly, as human discovery followed a classic exponential curve. The simple stone tools of our precursors were much the same for several hundred thousands of years.

Some 50,000 years ago they began to get more refined, clearly made by people very close to us in skill and intelligence. In historic times technology changed fairly steadily until about 300 years ago, when the pace began to quicken. It has been accelerating ever since.

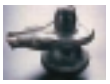
The news pages this month, particularly those about Fall Comdex, present a snapshot of an industry that is pushing the pace faster than ever. No-one is quite sure where it is heading, which makes it all the more exciting.

You can still find people dismissing the Internet as so much hype, but they simply do not understand what is going on. You may argue about how quickly it will happen, and what we may lose and gain, and whether you really want to shop at a virtual Tesco rather than walk to your corner shop. And certainly, the Internet will not be the only medium of interactivity.

People across the world are connecting in a way they could never do before. Human interaction is changing. Trade is changing. Work and living patterns are changing. This may not be the apocalypse of the prophets, but the world as we know it is passing. Nothing will ever be the same again.

Er, I think the apocalypse may have been hit by the millennium bug

Image of the millennia

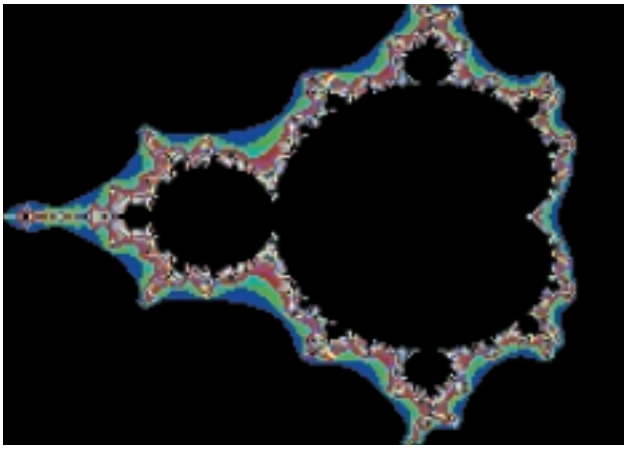


This is a Shiva lingham, which has roots way back into prehistory and can be seen in any number of shrines across India. The channel in its yoni, the circular surround, represents the river of life, springing from the play of dualities: masculine and feminine, being and nothingness, nought and one.

The image has a near literal truth in digital computing: everything that can be expressed is expressed as ones and zeros. Of course 0 and 1, the mother and father of all numbers, have a deep Freudian resonance; which may be why one of the oldest images in the world encompasses so precisely one of the most modern of technologies.

IT icon of the millennium

The image of the Mandelbrot Set was one of the first, and most spectacular, examples of computers showing us what had never been seen before. Discovered by Benoit Mandelbrot, who invented the word fractal, it is generated by iteration – when you loop a calculation by using one result as the input for the next. Iteration is an old idea but only with computers could enough calculations be made for it to be useful. More important than pretty pictures was the discovery of the complexity that can arise from simple mathematical processes. Iteration models many natural processes, and has helped us understand why life looks like it does.



IT prediction of the millennium

Speech and handwriting recognition have reached useful accuracy but will never match the precision of a keyboard. The result is that small devices make poor input devices (see page 30); or put another way: for serious work, computers have to be at least the size of usable keyboards.

This problem will be turned on its head: rather than getting a machine to read our handwriting (which we can hardly do ourselves) we will use a script that can be read unambiguously by machines. It will require fewer symbols because a machine reads *how* they are written: an up stroke is different from a down. It will be read by software hardly more complex than a keyboard interpreter. And it will sprout a shorthand.

This prediction could be wrong. A less efficient system may evolve from near-standard handwriting like the Palm Pilot's Graffiti. Whatever: the human-machine interface is a major bottleneck, and it deserves far more attention than it gets.

Bug of the millennium

You are leaving it a bit late if you haven't given your machine a Y2K check by the time this edition hits the newsstands. Console yourself with the thought that the bug actually kicked in months ago at the start of the financial year and the world is still spinning round.

Send your news and views to news@pcw.co.uk

news

edited by Clive Akass

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BT responds to criticism with Surftime fixed-fee web access

British Telecom, under pressure to lower the cost and raise the speed of Internet access, is to offer a fixed-fee unmetered service from next month. It has also made a new cut-rate offer for minimal ADSL access.

BT has been told to open its home lines to competitors by July 2001(see below), providing an open market in fast ADSL access which is certain to bring prices down.

There are three basic monthly tariffs for the new BT Surftime service: £6.99 for unlimited week-day off peak access, £14.99 all week off peak, and £34.99 any time.

This last price compares with the £35 a month, plus a £150 connection fee BT is charging independent service providers per subscriber for a minimal ADSL service: 500Kbits/sec upstream and 256Kbits/sec down.

Estimated charges in BT's initial ADSL announcements were between £40 and £150 a month per subscriber. The cut in price may be more apparent than real as the contention ratio, the number of people sharing an access channel, is higher under the new offer.

BT Surftime could cause turmoil in the access market as the new charges apply only to BT lines or those of BT partners. Many free ISPs use rival phone companies and take a cut of line charges.

BT chairman Sir Iain Vallance last month said watchdog Oftel's tight limits on line rental increases had 'left BT with little option but to increase local charges'.

Vallance said the delay of four years after BT's first ADSL trial was due to high costs, the lack of a common standard and robust technology, insufficient demand, and the prospect of rival broadband technologies such as third-generation mobile.

Local loop unbundling

Rival companies will have the right to install equipment in BT exchanges following the 'unbundling of the local loop', announced by Oftel last month.

The local loop – the line between exchange and subscriber – was a slow on-ramp to BT's data highways. ADSL changed that by piggy-backing a fast RF signal onto the voice line. Operators installing equipment at both ends of the loop means the use of a wider range of technologies and devices.

Bill Cockburn, group MD of BT in the UK, said it would strive to meet the 1 July 2001 deadline.

Michael Butler, UK MD of MCI Worldcom, said 'with hard work' it may be possible to bring the deadline forward.

UUnet, a WorldCom company, is starting a test ADSL service in the new year.

Barclay Knapp, chief executive of NTL, said unbundling will be 'devilishly impossible'. NTL is trialling ADSL on its own home lines, which were laid with its cable links. These are often twin lines, meaning companies could offer fast links in both directions. But cable companies are rolling out cable modems in their own areas; unbundling will let them extend coverage to other parts of the country.

Martyn Hart, chairman of the Telecom Managers' Association, said operators could just pick lucrative areas.

CLIVE AKASS AND ANDREW CRAIG

Speed issue for wireless links

Wireless links could be faster than fixed links if telcos don't get a move-on. Orange has announced an HSCSD service with data rates comparable with a 56K modem. It got into trouble saying General Packet Radio Services (GPRS) won't be ready next year as planned by several firms, including its parent Mannesmann.

Meanwhile, Ericsson's £480 Psion-designed MC-218 handheld has gone on sale prepared for the wireless world. It has a WAP-enabled browser and can link to the web via an infrared link to an Ericsson phone.

Digital camcorders look set for random-access storage. Sony unveiled its MD Discam DCM-M1 at Comdex. It records 20 minutes of MPEG2 video or 4,500 stills on a new 650MB MD-View MiniDiscs. Hitachi showed a prototype MPEG 2 model packing DVD-RAM. *DCM-M1 picture – page 35.*

Bluetooth technology got a major boost when Microsoft, 3Com, Lucent and Motorola joined a consortium founded by Ericsson, IBM and others. *Bluetooth at Comdex – page 36.*

COMDEX 1999
Las Vegas Convention Center

Where else could you see the president of a company give a keynote set among the pyramids?

The wonderful world of Comdex...

Movement is everything in cheap TV dramas. Never let your characters stay still. If they are to address a meeting, don't let them sit and wait for their moment: have them burst in and command attention. If they have to talk head to head, have them walk as they talk, preferably in some exotic location. This is not real life, after all; this is TV.

So there I was at one of the biggest casinos in Las Vegas, striding past the glamour girls, the hoi polloi at the tinkling slot machines, the huddles of punters around the gaming tables... there I was, trying to keep pace with a man rich enough to buy the lot. Balding, portly Steve Ballmer, sporting a crumpled woollen pullover, looked like a man who had come to mend the boiler; but the billionaire president of Microsoft fielded questions like a pro.

I could hear snatches of his answers as other journalists asked him about the recent court ruling that Microsoft had been anti-competitive. 'We have always believed we have acted in the best interests of consumers ... It's naive to think there has been a shortgage of innovation. There's more venture capital going into innovation than ever before ... I just want us to be one of the companies that's allowed to innovate.'

I thrust a microphone at him. 'Mr Ballmer ... what do you say to speculation that Microsoft will be broken up?'

'I think it is very premature to assess this,' he said. 'We are at the beginning of the legal process. We will remain one company, focussed on consumers' interests.'

It was the real-life, near-contradictory answer of a man thinking on his feet, but there in the brash casino it all seemed surreal. It is like this every year. There is no show quite like Fall Comdex. Cebit, held in Hanover each spring, is bigger but it is just an exhibition. Comdex is a performance.

LINUS TORVALDS (LEFT) AND BILL GATES: ONE HAS FANS, THE OTHER HAS CUSTOMERS

American presidents, whether of a company or a country, are expected to perform. The Comdex keynote speeches provide the heads of the giant US IT companies with a stage: some play the salesman; some the prophet; some tear their rivals to shreds.

The star is always Bill Gates, though all his talks are sales talks, slick but never inspiring. You need to remind yourself this is the richest man in the world.

Each year there is some pretender to his throne, some challenger to the might of the Microsoft-Intel axis. One year it was Apple and IBM with their PowerPC initiative; another time it was Sun's Scott McNealy and Java; then Larry Ellison strutted his stuff.

McNealy was at it again this year, devoting half his keynote to anti-Microsoft invective and giving away copies of his free multi-platform Star office suite, which he hopes will rival Microsoft Office.

Yet McNealy was not the big challenger, or not the only one. Computing is no longer a case of Wintel and the minnows. The PC may still rule the desktop, but the desktop no longer rules computing. Power has shifted to the network – particularly to the Internet – which does not care what manner of machine it talks to.

It has allowed all those pretenders of yesteryear – the Power Macs, Java boxes, network computers – to eat away at the PC's power base. This year the talk was of 'beyond the PC' and Gates devoted some of his keynote to access devices he called web companions (see page 41). The ones he showed ran on Windows CE, and it was a sign of the times that some considered him optimistic.

Linux is not the only operating system to challenge Windows (see page 24), but it is the most fashionable. One-in-three web servers now use open-source software, and such is the interest in Linux that it had an entire Comdex hall to itself and its guiding light, Linus Torvalds, gave a keynote.

While Gates has customers, Torvalds has fans. He needs them because they write the code. Microsoft builds by closed process; Linux grows organically by being free to the world: if you can make it better, go ahead. It's parallel processing, nature's way. That's the theory, and it's carried Linux a long way.

Torvalds denies he is out to destroy Windows, but his fans have no such qualms, booing any mention of Microsoft and cheering any hint of its demise.

Comdex has seen it all before – the knockabout comedy-drama, set in one of the most extravagantly over-the-top cities imaginable. Much of the time I hate Las Vegas: its garishness, its vulgarity, its cruel obsession with money. But its buildings are awesome – follies so enormous that, like the mountains beyond them, they seem close enough for a walk. Don't be fooled by their kitsch fantasies of ancient Egypt and Rome: these Caesars' palaces are for real, playgrounds for people who, for better or worse, are shaping our world.

CLIVE AKASS

COMDEX 1999

short stories

EASY IPAQ HOT TO SWAP

Compaq's new-look iPaq eschews ISA and PCI slots and relies on hot-swappable USB devices for expansion. A basic $499 (£312) model, without monitor, comes with a 500MHz Celeron processor, 4.3GB hard disk and 64MB of RAM. A PIII option is also available. IBM and HP have announced similar devices.

www.compaq.com

GETTING AN EYEFUL

Never mind the colour, feel the width... these machines from Biostar should be on sale in PC World stores soon – perhaps by the time you read this.

They are built to AMD's EasyPC reference design, which uses K6-II or K6-III processors. They have five USB ports instead of the usual PC array and boot straight to Windows without going through a BIOS or DOS screen.

CAPABLE CAPSULE

The Qbe 'personal computing tablet' was a finalist in one US magazine's Best of Show listings and boasts: built-in video camera, voice navigation, and a 1,024 x 768 13.3in active matrix touch screen. You can even connect to the Internet while on the move. All for $3,495 (£2,184).

www.qbenet.com

NEW LOOK PCs

Slow death by removing parts

No one believes the PC is about to go away – or if it is, as Sun guru Bill Joy said, it will be a slow death of a thousand cuts. But your new office machine could soon look like the IT equivalant of the Model T Ford.

AMD and Compaq, following Intel's recent lead, offered radically different case designs (see left) with 'legacy-free' architecture, doing away with the old ISA bus, and replacing the mouse, keyboard, joystick, serial and parallel ports with five or more USB ports.

This does away with the mass of wires at the back of machines (for one thing, some USB sockets sit at the front) and looks like a growing trend. There are also motherboard implications: fewer, if any, expansion slots.

There is little sign of the modular Device Bay architecture taking off: most peripherals, instead of slotting into bays, will be daisy chained outside the system box using plug-and-play USB or 1394.

A number of companies showed WebPads and other devices based around NatSemi's Geode system-on-a-chip. A market for these could be the 'web companions' plugged by Bill Gates. These are designed to plug straight in to Microsoft's MSN web service and provide a business model for ISPs to draw in new customers by giving away or heavily subsidising access boxes.

Among companies making them are Acer and Turkey-based Vestel, which claims to be Europe's number two TV maker – most of its models are rebranded.

Just how cheap the new appliances can get is shown by these neat Vtech email terminals, all based on Geode chips. The one on the right, basically a PDA built round a 56K modem, costs $79 (about £50) in the US, the one in the centre, with a fixed screen, costs $110 (£69); and a detachable palmtop organiser provides the screen in the $149 (£94) model on the left. Vtech has yet to decide whether to sell in the UK. Vtech 07000 488 324

OPERATING SYSTEMS

Corel lines up with Linux

Corel launched its new distribution of Linux, aimed at making the operating system into a mass-market desktop product. In the short term Linux is more likely to find a home in special-purpose machines such as web servers and access boxes.

NatSemi announced a Linux port to its Geode-driven WebPad (see above) and Boca Research was one of several companies showing thin clients using the OS.

Linux is not the only OS in the picture. The Be OS has also ported to the WebPad and the developers are co-operating with NatSemi on a series of devices.

Be was launched in the belief that multimedia users would find it worthwhile to load an operating system tailored to the kind of applications they use. Loading the operating system onto task-specific devices is taking the idea a step further and it could succeed.

Be showed a couple of its own reference designs, including a web-access box. Designer Chris Sanders, who helped tweak the Be desktop for the designs, said: 'We are getting to the point where we can run on 16MB of Flash ROM and we support all the major web plug-ins like Java and Flash. Most of the web is nicely cross-platform.'

One idea is a home video editing appliance that might sit on top of a TV.

www.beeurope.com
www.bocaresearch.com

PROCESSORS

Rivals exploit Intel vacancy

Intel avoided Comdex this year, opening the field to its increasingly confident rivals AMD and Taiwan-based Via – both of which announced aggressive processor rollouts.

Via's profile was raised this year when Intel's 820 chipset, supporting the next-generation RAMBUS memory, was found to have a bug. An 820 has now been released, hobbled to two RAMBUS modules, but the hiccup gave a huge boost to Via's non-RAMBUS chipset.

Via is set to launch into the processor business, following its purchase of Cyrix's MII and IDT's Winchip technology and design teams. Early in 2000 it will launch a PIII-class Celeron clone, codenamed Joshua, using the old socket 370, a 133MHz front-side bus and 256KB on-chip Level 2 cache. Initial speeds will be 433MHz and 466MHz.

Richard Brown, marketing director, said: 'Intel artificially limited the performance of the Celeron to avoid competing with the PIII.'

The autumn will see a processor, codenamed Samuel, built around a Winchip core. Via is also working with S3 to pack its Savage graphics processor into a chipset.

Both AMD (see box) and Via back Double Data Rate DRAM against RAMBUS for the immediate future. Brown claims DDR is good for 'at least three years' of increasing processor speeds, and that RAMBUS is difficult and expensive to implement for little or no performance gain.

AMD power-saving chips

AMD, which launched a 750MHz Athlon as Comdex closed, will incorporate radical power-saving technology called Gemini into its processors.

Gemini, like Intel's Geyserville, uses both voltage-dropping and clock switching to reduce power consumption. On mobiles it is triggered when you switch to battery power.

Intel is expected to launch its first Geyserville chips early in the new year, targeted at mobiles. AMD will launch Gemini-equipped 0.18micron K6-2+ and K6-3+ mobile chips early next year and spread the technology to all its products over the years. Gemini requires extra pins on the K6 to control the voltage.

Its application to desktop machines will be seen as eco-friendly and will help cut power bills.

On the road map for next year are 0.18micron Athlons with on-die cache and using a new Socket A, based on the Slot A used by current Athlons.

Palm puts CE in the shade

Windows CE seems to be losing ground, judging from the exhibits and the devices used by people on the floor, and Palm-like organisers are taking centre stage.

Everex said it is pulling out of CE devices, Nokia and Sony said they are licensing the Palm OS, Philips has dropped the CE-driven Nino, and Compaq is considering using other operating systems for its web-access boxes. New CE devices were scarce.

Nokia is part of the Symbian alliance pushing the Epoc32 operating system and its Palm deal confused some. But Symbian chairman David Potter told a Comdex seminar: 'Nokia will be using the Palm user interface on top of Epoc.'

Office for hire, upkeep included

Microsoft showed the new version of Office, designed to be hired out over a network – where application service providers (ASPs) will run and maintain software for you on their servers.

Microsoft will itself be an ASP, seeing this as a way of maintaining revenues as the upgrade market slows. The demo worked flawlessly over a local network but is also viable on a slow web link – only key presses and screen updates are transmitted.

GraphOn (www.graphon.com) showed Winbridge, which will allow Java-enabled browsers to run Windows applications. WinBridge, also targeted at ASPs, is seen as a way of running Windows apps on Linux boxes.

short stories

PC/TV PACKS PUNCH

UK-based Densitron showed what it described as a personal computational centre.

Called the Cassius, it is basically a multi-media PC/TV the size and shape of a thick LCD panel. It packs stereo sound, DVD, FM radio and comes with a wireless keyboard and mouse. A 433MHz Celeron-based model will cost just under £2,000 inc VAT

WORTH A CLOSER LOOK

This $99 Intel computer microscope didn't make it to Europe in time for Christmas but it looks fun. Anything you put under it appears on your computer screen, and the device detaches from its stand so that, should you wish to, you could minutely examine the underside of your left toe. No date yet for UK shipping. www.intelplay.com

SPLITTING IMAGE

The oddest exhibit had to be Sanyo's projector, which provides 3D images without the need for special glasses. The source image contains two images in successive adjacent pixels. An image splitter delivers one to each eye, giving an impression of depth. The splitter is controlled by a computer which is fed data from a sensor tracking movements of the viewer's head. Applications are expected to be displays for pilots and surgeons. www.sanyo.co.jp

COMDEX 1999

INPUT DEVICES

Upwardly mobile, yes, but the new appliances have yet to crack the problem of entering data.

Let your fingers do the struggling

The least addressed problem of current mobiles is the fact that they make poor input devices. The best in this respect are still Psion's keyboard-driven Series 5 and its new smaller sibling Revo, although both were getting scant attention on the company's stand at Comdex.

Handwriting recognition is in, even though on the ubiquitous Palms and their lookalikes it is just about good enough for the odd note – certainly nothing the size of this report, much of which I did on a Series 5.

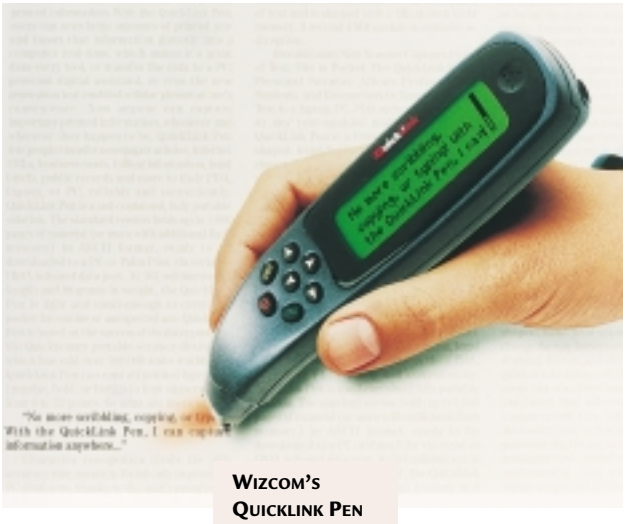
Hence the popularity of keyboards into which Palm-like devices can plug. The neatest I saw was the collapsible one pictured below, but it is difficult to say how well this would stand up to being used in earnest.

Whoever finally cracks this input problem stands to make a fortune, because it will transform the use of mobiles. Regular readers know my views (see millennium prediction, p21).

A related problem is that of getting information from the page to the computer. Optical character recognition (OCR) is easily good enough for routine office use but there are problems with its use in mobiles.

These are showing up in the first generation of smart pens, which pack organiser facilities with the ability to scan and OCR text line by line and store it for pumping into a computer.

Reputedly the best of the bunch is the C-Pen, which I raved about at Cebit earlier this year; this was not showing at Comdex and I have not had a chance to try it out. Uniquely, it also attempts to read your handwriting.



WIZCOM'S QUICKLINK PEN IS DUE FOR UK RELEASE SOON

Seimens was showing its cheaper PocketReader, costing just over £100 in the UK. See http://at.pocketreader.com/en/index.htm.

Israeli company Wizcom (www.wizcomtech.com) was showing a similar device called the QuickLink pen, which it plans to launch shortly in the UK. I was able to try it out but, sadly, I could not get the PC link to work with the old Windows 95 laptop I was using (my sample was a beta version, so this does not mean the final model won't work).

But I did discover a problem: even 95 per cent correct OCR, which is possible, is not good enough for this kind of device, because if you get one digit wrong in a phone number, you have the whole number wrong. Even if you discover the mistake when you are in a position to change it, the input problem rears its ugly head again: correction can take far longer than writing it by hand.

Hewlett-Packard's CapShare is easily the best mobile paper interface to date, leaving aside barcode readers. It is basically a battery-driven scanner with memory and some clever software that stitches together a full image from a single wiggly pass. HP was showing its CapShare 920, which includes automatic straightening and lets you crop the image on its built-in LCD – it will hold up to 50 pages before you pump them into a PC via 4Mbit infrared or a standard serial port.

This information is not subject to the caprices of an OCR engine: you can still OCR it on your PC but you retain the nearest thing to a hard copy as a fallback.

The CapShare has so far been too expensive to make it a big seller, but HP was offering it for $299 at Comdex – $200 under the list price. If that is a permanent price drop, HP will have a big seller. I bought one. www.capshare.hp.com

CA

This $99 (£62) Stowaway keyboard from Think Outside can be used with the Palm Pilot, but is seen here with the Visor from Handspring. This is a Palm-compatible mobile from the people who designed the original Pilot. On the back of the Visor is what the company calls a Springboard slot where expansion devices can be fitted. One prototype provides Bluetooth connectivity (see also p36). More info at handspring.com and www.thinkoutside.com.

STORAGE

DVD variety adds to buyer confusion

The rival camps in low-cost rewritable DVD both announced they will ship 4.7GB drives in a move that will do nothing to ease confusion for buyers.

Hitachi showed its new GF-2000 4.7GB DVD-RAM drive, which is due to ship early 2000. It can also read and write current-generation 2.6GB disks. Hitachi also showed a DVD-ROM drive reading the disks, but this is its own make and they cannot be read by most current makes. Panasonic and Toshiba also support DVD-RAM.

The DVD+RW drives, backed by Philips, Hewlett-Packard and Sony will come out later in the year; these too are said to have compatibility problems with existing DVD-ROM and DVD-Video drives.

Philips, however, showed its drive working with several makes. Adri Baan, vice-president of Philips Consumer Electronics, said compatibility was the main reason the company decided to go with DVD-RW. He said it will ship a 4.7GB DVD+RW late next year – by which time he expected 10 million compatible DVD video players to have been sold.

The capacity of existing +RW drives, such as HP's DVD Writer 3100I, is 3GB – enough for 100 minutes of high-quality video.

For more specialised use there was a new 4.7GB DVD-R drive from Pioneer. The $5,400 (£3,375) DVS-R4700, designed for DVD authoring and long-term archiving, uses write-once media, which can be an advantage when you don't want something overwritten. The disks are read by most DVD drives.

Sanyo gets the iD with rewritable optical drive

A rewritable magneto-optical drive packing 730MB onto 5mm disks was previewed by Sanyo. The iD drive, developed jointly with Olympus and Sanyo, is designed to go into devices like digital cameras.

This will put it up against IBM's smaller MicroDrive, which packs just 340MB per disk, but fits a standard Compact Flash II slot and is interchangeable with CFII flash memory. MicroDrives with 780MB and 1GB-plus capacities are in the pipeline, but no shipping date has been set.

Sanyo says the capacities of its new drive will increase fivefold and they allow data to rewritten at 20Mbits/sec more than one million times. Again, shipping dates are unknown.

www.castlewood.com
www.sanyo.com

New Jornada packs talking book

Just about every booth in Comdex appeared to have some form of MP3 player or software to go with it, a trend encouraged by the fact that MP3 has overtaken sex as the most searched-for word on the web. But Hewlett-Packard has realised that music is not the only form of audio: taped books and other spoken material are becoming increasingly popular, particularly for drivers.

It has packed its new 430se Jornada palmtop with software to access more than 17,000 hours of spoken audio at www.audible.com.

It looks like an idea that is set to spread (perhaps even to the BBC).

The CE 2.11-based 430se, which uses a 133MHz 32bit Hitachi SH7709a with 16MB of RAM and 8MB of ROM, packs a speaker and mike and an audio headphone jack and also plays MP3 music.

Future looks clear for electronic books

Microsoft is to introduce a free Reader module designed to promote the idea of the electronic book. It uses ClearType technology – first announced last year at Comdex – and is claimed to make on-screen text more readable; it capitalises on the fact that single RGB components of an LCD display can be addressed individually. It uses peculiarities of the way we perceive type, Microsoft says, but it is not revealing details until patents are settled.

ClearType does not work on CRT displays, because they cannot be addressed at the sub-pixel level. Microsoft says type is difficult to read on screen, as large pixels cannot show its subtleties – in the same way on-screen type seems bolder with larger sizes.

Demos on Microsoft's stand appeared to give a considerable improvement to readability, with type as small as 7pt. The technology could make handheld electronic books more usable; devices like the Palm Pilot and Apple Newton are already being used as ebooks, with several sites offering content.

A company called Rocket eBook showed a $199 (£124) portable electronic book that can hold 41,000 pages. Try it on your PC by downloading an emulator from www.rocket-estore.com.

INPUT/OUTPUT

1394 is the lucky number

Rumours of the death of fast 1394 PC links are exaggerated – but there are mutterings about Intel trying to kill them off in favour of an accelerated USB. Microsoft endorsed the technology by hosting the 1394 Trade Association's booth.

1394 was developed by Apple (calling it FireWire) and is supported by Sony (which calls it i.link). It runs at 400Mbits/sec. 800Mbits/sec silicon is under trial; 1.6Gbits and 3.2Gbits implementations are on the way.

One likely use is in set-top boxes: at least one company is investigating the feasibility of implementing 1394-based copy control which would let a content provider dictate whether a programme or film can be copied – and if so, how many times the copy can be played.

This would curb piracy of high-quality digital content and let copyright owners charge for repeats – but 1394 experts we spoke to doubted the system would be foolproof.

STRANGELY, SONY CHOSE NOT TO USE I.LINK IN ITS NEW DCM-M1 DIGITAL CAMCORDER. INSTEAD IT HAS AN OPTIONAL ETHERNET LINK

Plans for a new USB 2.0 to support data rates up to 240Mbits/sec, possibly 480Mbits/sec, prompted speculation that Intel planned to displace 1394. However USB 2.0, fundamentally Intel technology, is itself under fire (see below) and 1394 has a lot of momentum – it has already shipped, for instance, in seven million camcorders.

James Snider, head of the 1394 Trade Association, said: 'Unless USB 2.0 runs at four times the 240Mbits/sec it's due to reach in 2001, it won't catch up.'

The future of Device Bay, the use of slot-in peripherals fitting standard bays linked by both USB and 1394, looks far from certain.

Bob Wede, sales manager of Granite Microsystems, which was showing a Device Bay stack, said there was a lot of interest. But the only other Device Bay (also made by Granite) was on the Lucky Goldstar booth, on a monitor (see left).

www.1394ta.org
www.1394showcase.com

LUCKY GOLDSTAR'S 19IN STUDIOWORKS 915XU HAS TWO DEVICE BAYS

Some 1394 products

- UK-based Oxford Semiconductors showed a chip allowing manufacturers to transform IDE into FireWire drives.
- VST showed a series of 1394 drives with capacities up to 14GB and supporting hot-plugging.
- Dolby showed 1394-driven speakers.

www.oxsemi.com
www.dolby.com
www.vstech.com

USB is round the U-bend

USB 2.0 proposals have been criticised as trying to stretch a cheap, slow technology beyond its natural limits.

Critics say that the mix of slow and fast devices on the bus mean it could never reach its projected 480Mbits/sec. This is because juggling with its three speed modes – 1.2Mbits/sec, 12Mbits/sec and 480Mbits/sec – leads to either wasted bandwidth or to one device hogging the pipe. Even on USB 1.1 the bus rarely approaches its theoretical capacity.

USB was designed to eliminate PCs' multiplicity of ports, some of them ludicrously outdated (the RS232 port has 25 pins for a serial link requiring two).

US analyst Maurie Wright described updating USB as like 'polishing a turd'.

COMDEX 1999

BLUETOOTH

Avoiding teething problems

Demonstrations of Bluetooth devices talking to each other are getting tedious in the absence of actual products, that will not ship until next year. But the short-range wireless technology had its own pavilion at Comdex and a new (and rather good) buzz phrase to describe it – personal area networking.

I was told that much of the US-branded Bluetooth technology on show had come from companies around Cambridge, though Denmark-based Digianswer had a presence. Vendors are determined that Bluetooth will not go the way of infrared links, the reputation of which has yet to recover from early teething problems.

Glenn Collinson, marketing director of Cambridge Silicon Radio, said the first of a series of plugfests was being held in Europe even as we spoke to test how products from different manufacturers worked together.

I pointed out that plugfests were held to demonstrate the interoperability of early PC Card slots and cards, but these too were plagued with teething problems. 'That is true,' said Collinson, who was promoting CSR's one-chip Bluetooth modem. 'But each Bluetooth device will have to go through a certification process before launch.'

(CSR's technical director James Collier, who attended the plugfest in Europe, said back in Britain there had been a 'great spirit' between the rivals to ensure that Bluetooth succeeds. 'We all know we have to get it right,' he said.)

Compaq's TaShana Jett, consumer mobile product marketing manager, said work is under way on a Bluetooth and SWAP (see below) home-networking chip, offering short and medium-range links. 'They are similar technologies. It would cost $2 per chip to add Bluetooth,' she said.

● London-based TDK showed a Bluetooth PC Card to ship in the second half of next year.

www.digianswer.com
www.cambridgesiliconradio.com/

CLIVE AKASS

It'll be all the rage this season

It seems that no Comdex can be without a display of wearable PCs, though as a fashion accessory this one from Xbernaut leaves a lot to be desired. However elegant your dress, it is hard to look cool when you are squinting at a mini-display.

www.xbernaut.com

Home is where the network is

A battle is brewing over home networking, which is expected to boom with the advent of broadband links. Standard Ethernet cards and cable remain the cheapest option, but HomePNA networking, which uses phone cable, should beat them on price.

Netgear showed off a HomePNA 2.0 range at Comdex, boosting data rates to 10Mbits/sec. Prices for a PCI or USB node start at $80 (£50), including software. Actiontec showed 1Mbits/sec Home PNA 1.0 cards at $69.

Preferable, but more expensive, is wireless RF with a choice of 11Mbits/sec 802.11 (wireless Ethernet) and the HomeRF's Shared Wireless Access Protocol (SWAP), a 1.6Mbits/sec version that includes DECT voice links and is cheaper.

Proxim, whose Symphony range uses a proprietary protocol, said it will launch its first SWAP products next year, bundled with Compaq home PCs at $100 a node. Compaq sells 802.11 to its corporate customers at £200 a node. But Apple's Airport cards are only £79 inc VAT in the UK, and £239 inc VAT for the base station.

Intel backs HomePNA and SWAP. 3Com was backing two camps, with PCI and USB versions of its HomePNA HomeConnect kit, and the latest 11Mbits 802.11-based AirConnect wireless kit.

www.netgearinc.com
www.actiontec.com

comdex shorts

THE TIME THE PLACE
You'll never get lost wearing a wristwatch, not if it is a Pathfinder from Casio. It uses satellite positioning to tell you the latitude and longitude of your position, how fast you are going, and the distance to your destination. Oh, and it also tells you the time. No prices or UK release date were available.
www.casio.com

MOBILE DOCKING
Mobility Solutions showed its EasiDock range of 32bit Cardbus PC Card-based universal docking stations, offering transfer rates a claimed 100-times faster than USB-based products. They will sell in Britain for £229 ex VAT with the usual PC ports; top of the range includes drive bays and PCI slots. Also shipping will be a £110 ex VAT USB hub with all legacy ports – £30 more with an Ethernet link. Contact Mobility Electronics on 01189 840400.
www.easidock.com

SECURITY CONSCIOUS
Israel-based IRLan was plugging modules for diffuse infrared networks operating at up to 10Mbits/sec. They are useful where security is a priority, as unlike radio, IR does not pass through walls.
www.irlan.co.il

IMAGES ON DEMAND
A camera with a built-in modem that can link to a remote PC and capture images on demand was shown by Taiwan-based 3Jtech.
www.a3J.com.tw

TALKING NET
Philips is giving away a plug-in for Navigator and Explorer browsers which will allow you to surf the net by voice commands.
www.myspeech.com

COMDEX 1999

Not handhelds but handholders – Internet appliances are your future guides to the web.

Plug and surf the friendly way

There has been a lot of discussion on what is being called the Post-PC era and a shift towards information appliances. I tend to believe that it is rather the PC-plus era.

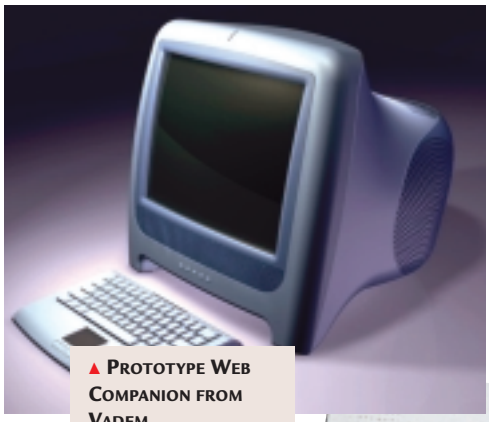
PCs are not going away any time soon. They will remain the most versatile tool for media processing, although their function will shift from mainstream productivity. They will be used as a digital studio to handle still and motion video, as well as integrate these media into all types of multimedia and information related content.

The slow rollout of high-speed bandwidth will delay the uptake of information appliances, although these have a great deal of merit. Some, such as web phones, will be application specific.

But information appliances in general are starting to fall into two key categories. The first is what is called the Internet PC, based on the Intel/Microsoft Easy PC specification; they are also known as legacy-free PCs (see page 24).

The other category that is emerging is known as web companions. Microsoft is championing this concept and specifically tying it to a new program it launched at Comdex, along with partners Vestel, Philips, Thomsen and Compaq.

Web companions are actually hardware devices that use Windows CE as the core OS, but boot up directly to Microsoft's MSN web-access service. The device itself will cost anywhere from $199 to $499 (£124 to £312) but there is a monthly fee for using it on MSN. Think of it as Bill Gates' way to get around any DoJ moves to force him to unbundle IE from the OS.



▲ PROTOTYPE WEB COMPANION FROM VADEM
▶ ACER'S I-STATION

Now, instead of giving Bill Gates his $50 one-time fee for a licence to Windows, users would now give him a monthly usage fee of $24.95 – of which the hardware makers will get a slice. This is a big win-win for Microsoft and partners, but because these devices can use any processor that Windows CE runs on, it is a potentially big loss for Intel.

The other big direct competitor to Microsoft in this space will be AOL. It is working on hardware devices that boot directly to its service in the same way, but it plans to OEM a single device for use as a direct Internet companion or front-end to a TV.

By far, Microsoft's enlisting of mainstream hardware players to support its effort makes it the better bet in this space. Of course, other web companions will be going for the same market. One such effort is coming from Austin-based NetPliance, and its simple iOpener terminal is an interesting independent model. It's basically a keyboard and a flat panel DSTN screen on a box running the MBX OS. It is tied to NetPliance's own dedicated ISP and web interface.

The charge is again $24.95 per month, complete with an environment that is very easy to use and navigate.

Games systems such as Sony's PlayStation II, which comes to market in Japan this spring and the US next fall, is also an Internet appliance. It uses a DVD-ROM drive to deliver the games, but since it is based on DVD, it can play movies as well as audio CDs.

However, it has two USB slots, two PC card slots, a flash card slot and a video-out port. This means that third party vendors can add, via the USB ports, external hard drives, modems, and who knows what else to let it become a serious Internet appliance in its own right.

This area of Internet appliances is so hot that IDC has predicted that while we will sell 15.7 million PCs this year, we will sell over 18.5 million Internet appliances in 2002, which will represent about $15.3bn in revenue above and beyond PC sales in the same year.

If Comdex's Internet showcases are anything to go by, we are going to see a multitude of innovative products under this Internet Appliance heading, that will let people all over the world connect to the Internet easily and inexpensively.

TIM BAJARIN

ONLINE BUSINESS

Clive Akass asks why the FT and others are encouraging free access rather than charging fees.

Free information makes a comeback

The web entrepreneur has become such a figure of our times that it's easy to forget that in the early days of the web there was considerable opposition to opening the Internet up to business. Proponents argued that if people could not sell good content, there would be no incentive for them to post it.

This was seen as a good point, even by the wackiest of Internet pioneers. Yet the web has confounded expectations and we have seen a drift back to free information.

Perhaps the best-known example is *Encyclopedia Britannica*'s announcement that its site (www.eb.com) was dropping its subscription fee – prompting so many hits that it was overwhelmed for days.

Most newspaper and magazine sites (including our own) are still free. You can access not only a selection of current news but also archives, a facility that would have cost you a fortune five years ago. In many cases publications are trying to build online readership ready for the day when charges can be imposed.

You may have seen the *Financial Times*' adverts offering free access both to its site and its extremely valuable archives. The impression given is that this is a temporary offer, but we understand that it is indefinite.

If you take myself as an example reader, the *FT*'s strategy seems self-defeating at first glance. It is one of several papers I scan for technology news – I pick out the bits relevant to my work but have little time to read the rest. Recently the *FT* took to emailing me items that my profile shows I am interested in – it has done my scanning for me and there is little point in my buying the paper.

Peter Martin, editorial director of the *FT*'s Internet activities, points out that the availability of real-time stock prices online has not stopped people reading the *FT*'s day-old paper listings. If the *FT* has to become an online publication, he says, so be it.

Financial papers are in a special position, as so much business news is of global interest. The *FT*, which flourishes on a small but powerful readership, has increased its international profile considerably since it set up a presence on the web. Martin says it only needs to boost its readership marginally among the movers and shakers of Washington, for instance, to increase its influence.

The paper is certainly taking the Internet very seriously: it has hired 100 staff for its online operation, at a time when some quite large papers are still making do with one man and his dog.

Both the *FT* and the *Encyclopedia Britannica* anticipate revenues from targeted advertising: if you search for 'lesser spotted widgets' you may get, next to your results, adverts from firms selling them. In principle it is no different from IT advertisers targeting *PCW* because of our readers' interest in IT.

The distinction between an advert and a shop is less clear on the web, however, and further revenues may be obtained from transactions that come from a particular page.

Some sites will undoubtedly charge in future for content that is currently free. One factor holding them back is the lack of a globally accepted method of performing small transactions: you could buy a tank more easily than a box of matches on the web.

But we will soon routinely chuck in a few virtual pennies to buy an ezine, or some other form of cheap content. Sites such as http://fatbrain.com, where authors can post writing for sale, are already preparing for the day. Again, this could affect the finances of traditional publications and force a rethink of online business models.

The biggest change will come when web ergonomics mature: paper is far more convenient to read than any display; but it has little competition in today's slow and unwieldy access devices.

Crunch time for traditional print will come when you can read your web-delivered news or mail on a paper-thin device in the bath.

Web winners

The winners of the third annual *Financial Times* Business Website of the Year awards, co-sponsored by UUNET and PricewaterhouseCoopers, were:

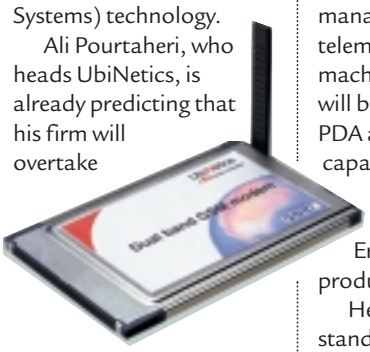
- **Website of the decade:** Yahoo for its MyYahoo.com site
- **Large organisation:** IBM
- **Finance sector:** Terra Nova, online insurance products
- **Small-to-medium enterprise:** ComponentSource's shop for software components
- **Site to watch:** beenz.com, a web currency for online transactions
- **Public sector:** BBC Natural History Unit, online picture library service

Bond meets mobiles

THERE was time when the high-tech gadgetry of the latest James Bond movie seemed the stuff of fantasy. The reality gap is closing fast, spurred on by developments in mobile telephony.

An emerging force is UbiNetics, which was set up a year ago by PA Consulting to capitalise on its work in both GSM and third-generation (3G) UMTS (Universal Mobile Telecommunications Systems) technology.

Ali Pourtaheri, who heads UbiNetics, is already predicting that his firm will overtake



ARM (another Cambridge prodigy, currently worth £4bn) by 2005. 'UbiNetics will be the future British Ericsson,' he boasted.

Big words for a company that launched with just 15 people and now employs 100, predicted to rise to 350 by December 2000. Product ideas being evaluated include a wrist-borne video-telephone – controlled by a finger mouse – that will also transmit and receive email. Mobile phone users in Japan may be among the first to use it – for viewing partners at a dating agency.

Another idea involves spectacles that operate as a video viewer, via a wrist-strap receiver. First off the production line, however, will be the credit-card-sized engines that will bring audio, video, and Internet data to the next generation of mobile phones.

UbiNetics designs and develops its products as part of an alliance with Texas Instruments and software consultancy Condat, a leading supplier of GSM protocol software.

'At the moment our GSM focus is on data-centric applications and specialist voice terminals, for use in anything from car management systems and telematics to vending machines. In the future it will be everything in the PDA area and voice-capable handsets,' said Pourtaheri, who was responsible for Ericsson's global GSM product-line management.

He believes calls for a standard for 3G mobile phones could be irrelevant following UbiNetics' development of products covering 85 per cent of existing technologies. It has developed a 3G test mobile that works on a variety of 3G networks worldwide.

'Our test mobile gives network manufacturers the ability to do practical trials on 3G networks,' said Pourtaheri. 'It will give them the evidence they need to invest in 3G and to work together without a global 3G standard.'

He added: 'We are signed up with a number of leading manufacturers. We are ahead of the competition because of our technological lead in the third generation of mobile telephony.'

www.ubinetics.com

Caroline Swift  ***reports from Silicon Fen***

Hacking his way to celebrity status, Kevin Poulsen highlighted security issues at ComSec 99.

On the straight and narrow – not

If you were called upon to cast Kevin Poulsen, you'd have to choose someone like Dustin Hoffman in *Midnight Cowboy* mode: thin, streetwise and sharp – but not so sharp as to stay out of trouble.

Poulsen's version of his story sounds like something from a comic book. He was arrested, but not charged, at the age of 17 in 1982 for gaining unauthorised access to ArpaNet, the precursor of the Internet.

He dabbled in phone phreaking and in 1986 the FBI claimed he had been delving into government computers and slapped an espionage charge on him – which meant he would have to stay in jail while they figured out how to make it stick. 'The way I saw it, they were going to get me and there was no way I was going to stop them. So I went underground,' he said.

While on the run he supported himself by cheating in radio phone-in competitions – by hacking the phones. He won a Porsche 944-S2 Cabriolet and a holiday in Hawaii. 'I sold them because I had to. To me this was a job.'

The FBI caught up with him in 1991 and he spent five years in jail before a judge threw out the espionage charge. 'They gave me five years on other charges – stuff, like winning the Porsche, that I'd done to survive when I went underground. I'd already done that time so they let me out.'

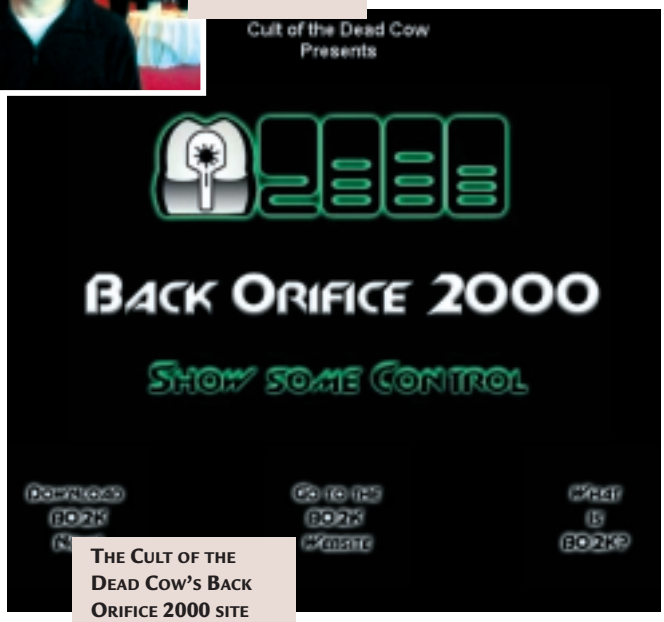
He added drily: 'Now I have hit rock bottom. I'm in the gutter. I'm a journalist.'

That some people have a rather different view of his career can be gauged by the title of Jon Littman's book on the subject: *The Watchman – the twisted life and crimes of serial-hacker Kevin Poulsen*.

Poulsen was one of two celebrity hackers at London's ComSec 99 conference on computer security; even in a suit he contrived to look a trifle louche. Perhaps it was the wisp of a goatee, the earring, and the gravity-defying kiss curl.

Poulsen at a seminar in London – after changing his suit

With him on the platform was the Cult of the Dead Cow's Sir Dystic, author of the Back Orifice (BO) suite, which will give you the run of an NT network if you can find one dumb enough to allow you to install it. (A more powerful Back Orifice 2000 has just been released).



The Cult of the Dead Cow's Back Orifice 2000 site

He too gave a robust account of himself. BO was written not to intrude on networks but to expose their weaknesses, he said. 'Microsoft is basically run by the marketing department. So Microsoft programs feature what the marketing department says people want. I've spoken to programmers there and they have told me. They had a priority list of things to do, and security was down there at something like number 17. Do you think they would have got round to it before we made security an issue?'

This song of injured innocence went a little off-key later when he got heated about people who send junk mail, as if this were somehow worse than handing out potentially devastating code to Internet delinquents.

But this was very much par for what was a very odd occasion. The celebrity hackers, you were forced to remind yourself, were talking to the men whose job it was to stop them. True, both were now on the side of the angels (Sir Dystic was there working for a security firm) but they had a remarkably sympathetic audience. One of them told Poulsen: 'A lot of people thought you were being hounded.'

Others came close to thanking the hackers for keeping them in work and making their lives easier by highlighting security gaps. Try that excuse next time you are caught robbing a bank.

The celebrity hackers, it has to be stressed, were against vulgar thefts and indeed were scornful of the criminal potential of their skills, though both had been approached by criminals.

Sir Dystic said he believed more than 90 per cent of hacking was done by kids scanning IP addresses for a vulnerability. He told me: 'When someone calls a server it sends all kinds of information about what software it is using. There are lists of vulnerabilities in each piece of software. All the hacker needs to do is look them up and exploit them.'

Both said the biggest vulnerabilities were in people: the easiest way to rob a bank is to bribe a bank worker. What's the point of trying to hack credit-card details when you can get them from bills scattered on the floor of almost any supermarket?

Poulsen said: 'You can get into practically any system if you really want to. But it would not be economically viable.'

● Threat to email – see page 58

Clive Akass

SECURITY

Raw email 'no longer safe'

The fond belief that no-frills email is safe may no longer be true, according to a security expert. The danger usually lies in attachments, which can contain executable code such as the Melissa macro virus, a new variety of which was found last month. Anti-virus programs now scan for these routinely.

But PCs can be vulnerable if they use Microsoft Outlook with HTML viewing enabled, anti-virus freeware author Padgett Peterson said at the ComSec 99 security conference in London.

'The HTML can contain an embedded script which calls up code from a remote computer,' he said. It might even be possible, with some versions of the software, to penetrate a company's firewall to do this.

A worm exploiting a similar idea was reported only days later by Norman Defense Systems. It relies on an ActiveX control, incorrectly labelled as safe; when the email is opened, it drops a file into the Windows start-up directory which, on the next boot-up, sends the worm to every address listed in Outlook.

The worm is not yet in the wild but Microsoft has created a patch, the company said. Details are at www.normanuk.com.

Pure text seems to be peril-free. Of course, HTML is pure text and if you send it as such Outlook does not execute it; if you send it as flagged HTML from within Word, Outlook treats it as HTML.

But there is no way of telling the difference on your email listing. HTML mail will execute when you click it without the usual warning box; attachments have to be launched separately, although macro viruses can auto-execute when you open an attached document in an unprotected system.

One in every thousand emails carries a virus according to a study by Worldtalk Corp.

Chiefs ignore own advice

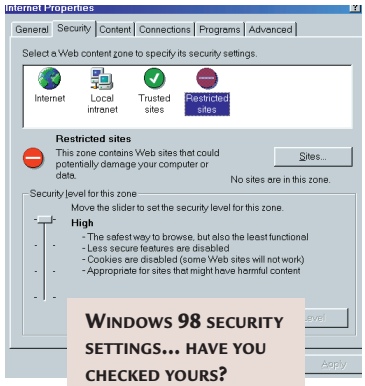
Security chiefs admitted last month that they didn't take even the simplest precautions to stop attacks on their own machines.

Consultant David Aubrey-Jones asked ComSec 99 delegates, most of them responsible for security at major firms, two questions: whether they had downloaded the latest patches from Microsoft ; and whether they had checked the default Internet security settings on Windows. In each case only a minority of hands went up.

Aubrey-Jones said it was vital not to let your guard drop at a time when hackers worldwide shared the latest tools and vulnerabilities. He listed the various forms of attack that browser and email clients can face and said some measure of protection could be gained by setting the security levels right in the Internet control box .

Cookies, which allow one page to pass information to another, are less of a danger than ActiveX or Java, but they can constitute an invasion of privacy, he said. Cookies sent by DoubleClick servers, for instance, give your machine an ID that is returned to any other DClick site and helps target ads by compiling a list of which pages you look at.

There is no satistactory answer, unless you buy software such as IEClean or NSClean to sweep out cookie files, Aubrey-Jones said. If you turn cookies off, sites may not work and cookie prompts can become irritating.



WINDOWS 98 SECURITY SETTINGS... HAVE YOU CHECKED YOURS?

Linux lags on security

Linux does not yet match Unix on security and its distributors need a common standard to ensure users get basic protection, a security expert said.

Stan Dormer, of Stan Dormer Associates, looked at security in boxed distributions from Red Hat, Caldera, and SuSE.

He said access permissions varied and he could find only conflicting, indigestible information on recommended permission sets. He asked: 'Why on earth can't more software distributors agree on a common standard for their packaged operating systems yielding a known level of security?'

He said savings on the software were offset by the 'administrative overhead needed to make the system secure'.

The fact that Linux code can be modified casts further doubt on its security. 'Changes are implemented on a more ad hoc basis than the cumulative fix-pack mentalities of the mainstream software vendors. New components... can be downloaded freely from the Internet with various degrees of provenance and reliability,' he said.

He concluded that by comparison with Unix, AIX or NT, Linux 'can at best be seen as a looser and less trustworthy assembly'.

Full-cover

Problem: A bug in Microsoft's Java Virtual Machine under Explorer 4.0 and 5.0 lets Java applets out of their 'sandbox'.

Solution: There's a patch at www.microsoft.com/java/vm/dl_vm32.htm

Problem: Bug in Netscape and Microsoft email readers caused a buffer overflow allowing hackers to insert code.

Solutions: www. netscape.com/products/security/resources/bugs/1on and www.microsoft.com/jie/security/?/ie/security/oelong.htm.