

Screams at Screaming.net

Screaming.net, which offers off-peak web access free of phone charges, lived up to its name last month. Users screamed about choked lines and dropped services.

High Street chain Tempo launched the service with telco Localtel, which also offers a 10 percent cut in phone bills if customers transfer from BT.

Tempo blamed its logjam on BT delays in processing of these transfers, and asked watchdog Ofcom to investigate.

In an apology issued as PCW went to press, Tempo said BT had processed only one in ten. It promised 'major upgrades' over the next few days and added: '[We are] committed to making the service the best.'

● Letters — page 66

Security scares mar launch of the wired new world

Seismic changes signalled for UK comms will bring fast links to offices and homes early in the millennium. But a series of security scares have highlighted the perils of the rush to the new wired world:

- A particularly vicious virus hit email [see page 29].
- Our own labs showed how easy it is to get into some web servers [see page 29].
- The anarchic Cult of the Dead Cow issued Back Orifice 2000, essentially a hacker's kit packing the functions of a remote net monitoring tool. It would

allow users to steal data and passwords, reconfigure machines, and delete files.

First they need to trick someone into launching it. Specialist, Internet Security Systems (ISS), warned:

DON'T open email attachments, unless trusted.

DON'T accept files from chat systems.

DON'T enable network file sharing while online.

The scares coincided with a string of major industry moves. The ITU standards body endorsed G-Lite, a cheap way to piggyback fast DSL

links on to old phone lines.

BT announced a £5b rollout of faster but more expensive ADSL, though no timetable has been set.

Ofcom set a deadline of July 1, 2001, for the unbundling of the local loop, ending BT's monopoly on wire to the home. This should lead to a free market in fast DSL links.

The government said it will free more of the wireless spectrum for fast net links.

And there was more talk of Britain's big three cable companies merging to fight BT competition. CLIVE AKASS

System-on-chip could usher in free PCs

A new system-on-a-chip could bring in **PC compatibles at cheap TV prices** — even free.

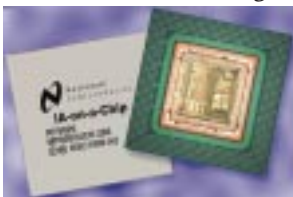
The NatSemi chip was the third challenge in as many weeks to Intel domination. AMD launched its long-awaited K7, renamed the Athlon, running at up to 600MHz and challenging Intel's top processors on performance [page 122].

And Samsung launched a 750MHz Alpha using a Slot B board capable of using low-cost PC components [below].

Prices are already in freefall in the consumer market.

Dixons says it will soon sell sub-£200 400MHz-plus PC-based web-access boxes.

Distributor CHS and Trigem



of Korea jointly launched The PC Way company to sell 400 MHz-plus PCs at 'exceptional sub-£400 prices.'

CompuServe and MSN are offering cut-price computers in the US to new sign-ups. Companies like Philips are

working on access devices cheap enough to be given away with UK sign-ups.

This is the market targeted by NatSemi with what it cheekily calls its IA-on-a-chip. The IA means Information Appliance, but aptly also stands for Intel Architecture.

It packs MPEG 2 decoding and is optimised for set-top boxes; NatSemi plans a range optimised for different uses such as games or handhelds.

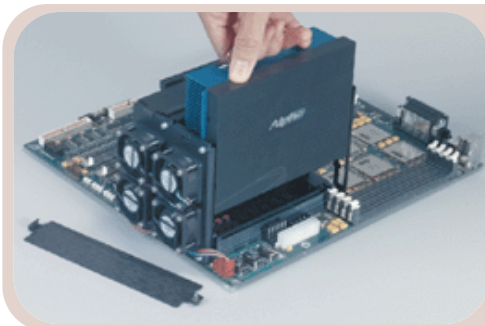
All descend from Cyrix's highly-integrated MediaGX, used in low-cost systems like its vaunted Web Pad.

NatSemi has sold Cyrix's

high-end business, including the M11 chip, to boardmaker Via. Its IA chips do with x86 cores what the likes of ARM and MIPS and their clients do with RISC cores, surrounding them with task-specific silicon.

These sell on their low power drain. But NatSemi's Graham Jackson, applications manager for Europe, says the new chip is battery friendly too, as it needs no peripheral chips.

'There is some advantage in retaining the x86 architecture, especially for web access where many of the plug-ins have been designed for PCs,' he said.



This new dual-processor UP2000 board from Samsung-owned Alpha Processor Inc (API) will give Intel a thing or two to think about. It takes API's new 750MHz Slot B Alpha and was shown at PC Expo in New York running a 1GHz Alpha.

It uses an extended ATX form factor and packs six PCI slots (two of them 64-bit), two USB ports, Ultra2 SCSI, and up to 2Gb RAM — all compatible with low-cost PC components. Alphas

will run Windows 2000 native, and unlike Intel's 64-bit chips will be available when the OS launches.

Ian Loman, general manager of distributor First Hardware, reckons he will be offering 'white box' (for rebadging by the vendor) servers for half the price of equivalent Compaqs. Samsung has a licence to develop the Alpha chip, developed by Digital before its purchase by Compaq.

www.firsthardware.co.uk

Orange unpeels videophone

Orange has launched the first phase of a **mobile comms rollout** that will see your mobile phone outpace your audio modem.

It announced that it will launch a high-speed circuit-switched data (HSCSD) service in summer, offering rates of between 28.8Kbit/sec and a theoretical 64Kbit/sec — though a spokesman said about 57K is likely to be the practical maximum.

And it unveiled a combined organiser and videophone

[right] which is expected to ship early next year. Orange is also launching a web-access service, and is setting up various information feeds for its new device.

This uses a protocol called H.Orange, rather than ISDN's H.320 video standard or IP-based H.323, which are said to be poor at low speeds. It also uses a proprietary compression developed with Strathclyde University.

Video will therefore be available only between Orange

devices, and the company is thinking of selling them in pairs.

The videophone, costing around £500, will boast a 10cm colour screen offering up to 12 frames a second.

It runs on Windows CE 3.0, rather than phone-friendly Epoc Release 5.0.

The high speeds of HSCSD are obtained by 'aggregating' channels: in effect, you are making two or more calls at once. But, surprisingly, there will be no extra charge for the higher bandwidth. Orange



claims to be nine months ahead of rivals on HSCSD, which is just the first stage of a rollout that will see 2Mbit links within five years.

www.orange.co.uk

● See Briefing, page 55

The display that is bigger than its boots

A tiny screen-on-a-chip coupled to optics gives handhelds a display equivalent to a 19in SVGA screen, the makers claim. Pictured right is a prototype of the display from Silicon Valley start-up, inViso. It is to be used in a WinCE handheld, but the maker and shipping date have yet to be revealed. It is expected to go on sale in Europe, however. The 11mm chip [left] at its



heart packs a 800x600 array of transistors driving a liquid crystal layer placed directly above them. Colour is obtained by backlighting in red, white and blue in rapid sync with the corresponding components of the image data. Jamie Odell, inViso's director of marketing, claims the display uses less than 100mW — a fiftieth of the power drain of a typical laptop screen.

The display is expected to cost around £100 when made in volume, and will be used in devices costing less than £200. www.inViso.com



Quick change apps

Companies should be prepared to change some applications as rapidly as once every three months as e-commerce develops, says Intel chief Craig Barrett.

Conditions are changing so fast that agility overrides efficiency as a primary concern, he said.

'You really need your IT organisation coupled very tightly to your business organisation so that you can introduce new applications almost instantly.'

Modern programming

interfaces made transition easy because you can swap-in new applications without changing the underlying architecture, Barrett told the *Wall Street Journal* CEO Summit on converging technologies.

He said: 'You may want to change your ERP, your [electronic] resource planning application, only every one or two years. But you may need to change your internet business application once every three months.'

The Curse of the WSJ



'A trapdoor job, by God! They might have topped him before he got to the platform'

The *Wall Street Journal* seems to have caught a variant of the curse of *Hello!*, said to condemn to bitter divorce couples who are featured in the magazine as paragons of married bliss.

Two speakers billed to appear at the WSJ's 'CEO Summit on Convergence' lost their jobs. Andreas Barth, Compaq VP for Europe, fell on his sword before making it to the platform, and Ericsson boss Sven-Christer Nilsson was ousted shortly after speaking.

More conference reports...page 52



If you think printers and plotters are just for putting ink on paper, take a look at these two. Mutoh's Junior 24 plotter packs a cutter instead of a pen and takes 650mm rolls or sheets. Nice, but it won't leave you much change out of £2000.

Lighter on the pocket is the Seiko Precision CDP-2000, a colour inkjet which prints on paper and acetates. But by using a special platter, it will print full colour directly on to CDs at a rate of four a minute. It costs £299 inc VAT.

Seiko 01628 587400; www.mutoh.be



MP3 vendor downplays piracy

Adaptec has launched a new software that facilitates the creation of CDs from easily-pirated MP3 music files — but said it backs moves to **fight copyright abuse**.

Easy CD Creator 4.0 Deluxe decodes downloaded MP3 files and writes them to a CD as audio tracks that can be played on any audio CD player.

Petter Nordwall, Adaptec's software marketing manager for Europe, said the company supported the Secure Digital Music Initiative (SDMI), which has just specified a vendor-friendly format it hopes will replace MP3.

Called the Portable Device Specification 1.0, it is meant for use by both software and hardware developers. It will roll out in two stages:

● **In Phase I**, when the specification goes through ratification, conforming



devices will play music in all formats, including MP3.

● **Phase II** will incorporate 'screening technology' to filter out pirated music.

Critics maintain that SDMI is less about piracy and more about the music industry trying to retain its monopoly on music distribution.

But Adaptec is not the only company apparently facing both ways on the issue. Philips, an SDMI member, is only one of several manufacturers believed to be planning to launch MP3 players this year.

There are conflicting views

on how online distribution of music will affect the industry. Only three percent of music purchased in 2003 will be downloaded, says a report by Jupiter Communications.

But Nordwall cited a prediction of 15 percent by 2002. And he said piracy levels are insignificant.

'It's true that you can get an MP3 version of just about any music you want on the web. But you'll have a hell of a job finding it.

'You might get a few students downloading MP3, but the effort is too much for most people. It's far easier to get the stuff legally.'

Easy CD Creator 4.0 ships in the Autumn for £49 inc VAT. It records CD-ROMs as well as audio CDs, and packs a backup utility.

Additional reporting VNU Newswire

Adaptec 01276 854500

POINT OF VIEW

The need for speed

The cheapest entry-level PC now has more than enough power for all but the most demanding office task (games always push systems to the limit). So can there be a mass market for the next generation of fast chips? If Intel plays its cards and its prices right, I think so.

I can report, after using the racy Hi-Grade Ultis PV3 featured in our August group test, that clocking 550MHz on top of 128Mb RAM makes a huge difference even on everyday tasks. Web access is speeded up, with instant rendering of richly-formatted pages, and you can run applications back to back with no appreciable hit.

It has allowed me to try English Tracker Pro, an interesting information finder/manager which ran so slow on my 166MHz PC that I had to uninstall it. For some reason, English ignores two of my drives, but it's been useful even so. I'll tell you how I get on with it.

For Intel, which uses revenue from one chip generation to finance the next,

the crucial point is whether demand will keep in phase with its road map.

Intel CEO Craig Barrett seemed a little complacent on the point when I raised it during his London visit [see page 52]. Intel has backed every horse in the race, so he may have cause. But he should still heed his mentor Andy Grove's watchword: Only the paranoid survive.

Handwriting and speech recognition would certainly sell fast chips, if speed could make these technologies truly effective. Long-time readers may know that I believe we need to reinvent handwriting, because we could easily design an unambiguous script that could be read by the simplest of software — if only people were prepared to learn it.

I will change my mind when I am shown a keyboard-accurate recognition engine.

Riyad Emeran, our new deputy editor,

advised me to try the Calligrapher engine in Philips' new Nino 500 [below] which astonished him with its accuracy.

Recognition is indeed impressive, not least because, with no training, you can use your usual joined-up script. You can also write anywhere on screen. Like the pioneering Palm Pilot, the Nino can undoubtedly be pen-driven if all you need to do is enter figures, names and addresses. But keyboard precise, Calligrapher isn't.

I'll persevere over the next couple of weeks and write more about the Nino in our Reviews section next month. I'm much taken with the device, but the better Calligrapher works, the more convinced I am of the need for a new script. It would be so easy to do and would put a Psion or a Nino on a par with a desktop PC for basic tasks. What would that do to Intel's roadmap?



Clive Akass



on the joy of fast chips and the power of the pen

Post-modern worm gets nasty by email

Many companies were rethinking their email policies last month after a new type of worm **destroyed thousands of files** and closed parts of the mail systems at Intel and Microsoft.

Worm.Explore.Zip came hot on the heels of Melissa, the fastest-spreading virus to date. It's not quite so fast-moving as Melissa, which hit the top-ten list within days, but it's far nastier.

Melissa, a macro virus, sent itself to the first 50 names in the Outlook address book of its victims. But beyond clean-up hassle and clogged email servers, it caused no damage.

Explore.Zip's ways are more subtle. It is classified as a worm because it 'worms' its way into a position to cause damage, without infecting existing files like a standard virus.

It propagates by sending a reply in the victim's name to

The big unanswered question about rogue code is: how much of it is sitting on disks, quietly creaming off digital cash or sending off trade secrets?

Viruses get noticed rapidly. But an industrial spy is not about to alert you that he or she has wormed rogue code onto your disk, and which is regularly sending off

any unanswered mail in his or her inbox. The reply says: 'Hi [name]. I received your email and I shall send you a reply ASAP. Till then, take a look at the attached zipped docs.'

Clicking the attachment releases the worm, which seeks out any .xls, .doc, .ppt, .h, .c, .cpp, or .asm file and sets the length to zero.

This is worse than deleting a file, which can often be undeleted. Paul Ducklin, head of research at virus specialist

Hot mail, hot peril

copies of all new files.

Sophos research head Paul Ducklin believes most rogue code does get detected. But he says that IT managers are fretting about browser-based email services like Hotmail, which provide untraceable storage for illicit mailings.

Sophos, explained: 'Imagine what will happen when a backup program comes along. It will see that these are new versions and back them up, overwriting the old ones. So even your backup version might be destroyed.'

A couple of days after the outbreak, Explore.Zip was found to have a second way of getting around, crossing company nets

by inserting a 'launch' line in win.ini files held in shared directories.

Ducklin was speaking at the Networks 99 show, where companies selling firewalls and scanning software reported extra interest.

Some companies have gone so far as to ban all but authorised staff from sending email outside their firewalls.

Explore.Zip was written in Inprise's Delphi, and its target files led to conjecture that the writer had a grudge against C programmers and Microsoft Office users.

CLIVE AKASS

Bug turns server into door

A bug in Microsoft's Internet Information Server (IIS) software can give almost anyone the run of web servers using it, tests by VNU Best Access Testlabs show.

The bug was reported recently by a small US security team called Eeye. They got past firewalls by entering a URL requesting a .HTR file, which NT uses to allow people to change a password. Most firewalls accept this request.

By including a request with exactly 1140 letter A's, the team managed to force an overflow of the command buffer. This crashes the web server software but not the operating system. Astonishingly, any code tagged onto the request is pumped into RAM and executed.

Eeye installed a telnet server which gave free access to the machine. Scripts enabling the hack have been doing the rounds of the internet.

Jan Guldentop, of VNU Labs, tried the hack on NT 4.0 servers with all the latest updates and found it worked first time.

Even more worrying, he said, was that

there was no trace of the intrusion.

'Once the web server crashes, it doesn't log anything.'

The lab used the same method to gain access to two operational web servers after obtaining permission from the administrators.

IIS runs on some 1.3m servers globally. Among companies using it in Britain are Intel and Dell. It is also used on intranet servers, making internal machines vulnerable.

Microsoft took a week to admit the problem, which will take time to fix. Meanwhile, you are advised to block .HTR requests.

Or change your software.

● A full account of the bug, written by Jan Guldentop, with advice on fixes, is available on VNU Newswire at www.vnu.co.uk

Star turn

She may look like an extra out of Star Wars, but this robotic Rachel is actually IBM's way of demonstrating its Wearable PC. The device, shown at last month's Tomorrow's World Live show, is the size of a pocket stereo, weighs half a kilo, and fits onto a belt. It's not on sale yet, and neither is the robot.



RISC OS outlives Acorn

RISC OS, the eleven-year-old operating system created for the ARM-based Archimedes, lives on despite the demise of its creator, Acorn Computers.

Acorn entrusted it to Riscos Ltd, an independent company created by the Acorn community, which has launched a **new, faster version 4.0**, the first major revision since 1994



when the Acorn Risc PC was launched.

RISC OS 4 supports larger disk sizes and partitions, has a fresh new desktop look, supports long filenames and costs £120 (inc VAT). It comes on four 1Mb ROMs and a CD-ROM. It will run on a slightly modified twelve-year-old 4Mb Archimedes, or on the latest new breed of RISC OS compatibles announced by various developers.

The story behind its survival is tortuous. Some remnants of Acorn

were acquired by set-top-box maker Pace; other parts went through a management buyout to a company called Element 14 which will make high-performance solutions for the digital TV market. Neither Pace, which now ultimately owns the RISC OS rights, nor E14, seems interested in using RISC OS.

This leaves Riscos Ltd to nurture what is an advanced, modular, easy to use, compact, multi-tasking operating system with an enviable graphical user interface. No less than five vendors are in various stages of producing computers using the OS. They include CTL (which owns rights to the old Acorn brands), Microdigital, RiscStation and Interconnex, which is developing a RISC OS laptop.

Lastly, there is Millipede, which uses RISC OS computers for broadcast TV graphics. Its new RISC OS baby will boost the performance of the current fastest RISC PC up to six-fold. A German manufacturer has expressed an interest in developing a RISC OS compatible, and a powerful multi-processor option has been revealed by another company.

Acorn has all but gone, but its spirit lives on in RISC OS thanks to the determination of its fans.

IAN BURLEY

Searching questions

The amount of information on the web is outpacing the ability to index it, researchers report. In February there were 2.8 million web servers holding 800 million publicly indexable pages, comprising 6 trillion bytes of textual information and 3 trillion bytes of images, NEC researchers Steve Lawrence and C. Lee Giles report in *Nature*.

But the best search engine keeps track of only 16 percent, and the top 11 search tools together index only 42 percent. In short, most pages are not indexed, a fact well known to net entrepreneurs. So search engines are controlling information access. Lawrence said: 'There's no evidence [they] abuse that power. But there are issues that come about just by how they work.'

Simply putting up a page is no guarantee it will ever make it into any engine's database. Many engines limit the number of pages indexed in a domain, and so give up on free hosting services like Geocities, with its reported 34 million pages.

So, sites with their own domains are more likely to be indexed. 'The forgotten masses are people who don't bother registering with search engines at all,' says Lawrence. 'It's a good idea to register. But even if you do, that's no guarantee.'

Non-US sites and educational sites are less likely to be indexed.

If you think the net is crowded now, just wait. By 2003, there will be 350 million users worldwide, says a study from analyst eMarketer. Bill Gates has predicted that we'll have a billion connected devices by 2010. Let's hope the infrastructure keeps pace, so we don't end up with a bigger version of the world wide crawl.

A rather plain new device known as a personal video recorder (PVR) has got TV executives jumpy. It is in essence a PC with a big hard drive capable of storing up to 30 hours of TV and recording many shows at the same time. Some people, not least ReplayTV and Tivo, two companies pushing the technology, believe PVRs could end TV as we know it. Give the PVR a modem and a real-time operating system with a browser, and you could have the much predicted Trojan Horse that will bring the couch potato into the digital revolution.



Tim Bajarin
letter from Silicon Valley

Sign on for a free global drive

A new, free service at www.xdrive.com claims to allow you to work with remotely stored files as easily as if they are local. Xdrive looks and functions just like any other drive on your computer: you can drag-and-drop files, and even edit them.

The files can be accessed via a browser, and there is no record locally of where they are kept (a feature, it has to be said, that may be useful to criminals needing a safe place to store dodgy documents). You get 25Mb of personal space to organise, edit, store,



and share any type of file, including documents, pictures, and videos.

The file-management system is thanks to what is called Internet Hard Drive technology, and the Xdrive site is the first to use it.

TIM BAJARIN

● Application server boom — see page 48

short stories

COMPACT MODEM
PCP is shipping what it claims is Britain's first modem to fit the new Compact Flash II slot, which takes devices as well as memory cards. Xircor has already shipped a CFII Ethernet adapter. Both devices come with an adapter so that they can be used in a PCMCIA slot.
PPCP 0181 893 2277

FIND THAT PRODUCT
A searchable database of 5500 UK software companies, 12000 products and 3700 IT services providers is available on CD for £375, or £470 with online access to updates. All-year online access to the database also costs £470. All prices exclude VAT.
Learned Information 01865 736354

MAGNETIC PAPER
This new paper for use in any inkjet is magnetic, and so will stick on metal surfaces like fridge doors and magnetic



planning boards. It will be sold in A4 packs at specialist dealers or will be available in boxes or 24in rolls for use by design studios and printers.
Anchor Magnets 0114 244 1171

DIAMOND RIGHT
Graphics chip specialist S3 has bought Diamond Multimedia for £180 million. Diamond produces internet connectivity kits and S3-based graphics accelerators

ROYALTY CHECK
A collection of 25000 royalty-free images has been launched by Hemera. Photo Objects 25000 premium image collection costs £49.95 including VAT.
Mediagold 0171 372 9733

1Gb chip threat to Rambus

There were conflicting signals last month over which kind of memory is likely to be used most in next-generation PCs. Intel has backed Rambus technology to provide memory fast enough for the emerging 600MHz-plus processors. It is expected to launch supporting chipsets this Autumn.

Rambus is far more expensive than standard SDRAM, not least because **manufacturers have to pay royalties** to the Rambus company — and SDRAM prices have been falling.

Moreover, there have been shortages of Rambus chips. And Double Data Rate (DDR) technology has extended the speeds at which SDRAM can operate.

Dell announced that it will ship a workstation with twin-channel Rambus memory delivering data at 3.2Gb/sec. But in London, Intel CEO Craig Barrett said Intel would

use DDR SDRAM if Rambus could not deliver in quantity at the right price.

And the US CPUReview website quoted AMD executive Drew Prarie as saying DDR RAM 'seems to make more sense' than Rambus, leading to speculation that the company may support it.

Samsung announced that it will ship sample quantities of a new 1Gb DDR SDRAM by the end of this year, *Yvan Cohen writes from Bangkok*. The new chips are the first to use 0.13 micron technology and can clock 350MHz. They are said to be up to 40 percent smaller than rival prototypes and run at a low-drain 1.8V.

Samsung says that it expects the chips to be used initially in high-end servers and supercomputers.

www.cpureview.com



The new James Bond shows off M's latest gadget, which allows 007 to skewer his enemies through a wall with a tiny dart fired through a fibre cable. OK, that's a lie. This pistol-like tool from Ericsson Cables is used to inject optical cable into homes via existing conduits. The company says it opens the way for home networks.

Hard times for floppy drive?

Panasonic is staking its claim on the future of the floppy disk with the release of a double-speed version of its SuperDisk drive, also known as the LS-120. The new drive actually **triples access speeds** on standard 3.5in floppies, and doubles them on 120Mb SuperDisk media. Access speeds were a major criticism of early LS-120 drives. The industry remains undecided on the floppy



drive, which many believe is on its way out. The issue was highlighted by the launch of Apple's iMac, which dispensed with one altogether — although many users add an external one.

The major use of floppies as a data exchange medium is challenged on the one hand by the falling cost of CD writers and disks, and on the other by the growing ease and speed of datacoms.

The EasyPC Initiative skips the issue entirely.

Panasonic's latest SD120S drive will sell as an upgrade pack for £65 plus VAT, but it will be much cheaper to PC makers wishing to fit it instead of a standard floppy.

Panasonic 0800 444220

Visio therapy for dimension jumping

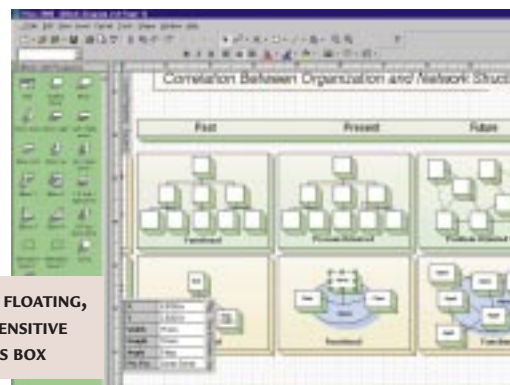
Hot on the heels of its rival Autodesk's Actrix release comes Visio 2000, with a revamped engine and a **claimed tenfold speed boost**. The original Visio drawing package pioneered the concept of drag-and-resize Smartshapes. This helped it achieve huge sales at the low end of a market that was dominated by Autodesk's expensive and demanding AutoCAD. Smartshapes were later hooked into Visual Basic for Applications, enabling automated drawing.

AutoDesk hit back with Actrix, which offers similar features and boasts better AutoCAD compatibility.

I love Visio, but always found it more

awkward to use than it promised. One irritation was a cumbersome way of viewing and altering dimensions, and an excellent addition to Visio 2000 is a floating, context-sensitive dimensions box. However, Actrix has also adopted this.

The Standard version of Visio 2000, covering mainly office tasks such as charting, launches mid-August, with the technical version to follow three weeks later.



► THE NEW FLOATING, CONTEXT-SENSITIVE DIMENSIONS BOX

Visio 0800 834859;
Autodesk 01483 462600

CLIVE AKASS

● See group test, page 162

The keys to online financial success

The combined talents of two Cambridge brothers have brought increased security and speed to online transactions. Their nCipher company became only the second to win **US government approval for encryption technology**. It also put Alex and Dr Nicko van Someren in last year's *Sunday Times* Who will be Who in the Millennium list.

Their embedded cryptographic keys won FIPS (Federal Information Processing Standard) certification — usually reserved for military products — from the US National Institute for Standards and Technology.

Equifax Secure, one of the world's largest credit agencies, uses nCipher's top-grade nFast/CA security product for its digital ID certificates. The technology differs from nCipher's first-generation nFast/KM, which speeded up secure web transactions, by having improved tamper-evident security in which the electronics are protected by epoxy plastic.

'Our CA product, because it is embedded in the epoxy, adds physical security against the hackers of this world,' explained Alex van Someren. 'In finance, people demand the highest service, and we submitted the product through the US certification process, which enables us to sell it there.'

The nFast/CA generates keys using

hardware-based random number generation, with keys stored in a highly-secure encrypted format within the nFast device. 'We can now secure people's digital certificates to the uppermost standard of security, and produce the greatest volume of customer transactions. Websites can be made very secure and very responsive,' said van Someren.

Equifax built its new commercial operation around nCipher's product, with Netscape software on Sun servers.

The United States, where nCipher has a New York office, accounts for 80 percent of nCipher's sales. Financial services customers include Donaldson, Lufkin, and Jenrette, whose DLJ Direct is rolling out in Europe. Work is also being carried out for Barclays Endorse, a Finnish bank, Eqonline, and nCipher has also partnered with Brokat, the German software vendor.

Processing a digital signature — used as ID in a digital certificate — needs a lot of computing power. Typically, nFast makes processing 25 times faster, enabling more customers to be served.

Van Someren cites an unnamed customer whose processing capacity jumped from four to 70 users a second by using nCipher's products 'with only

one per cent of processor load'. The market is growing in leaps and bounds, following disruptions caused by heavy trading at live brokerages such as E*Trade — now an nCipher customer in the US — and Schroders. nCipher completed \$2.1m of sales in the US in the year up to April; it sold \$1.5m in the following six weeks alone.

The brothers' widest sales come from their key management product. Adi Shamir of the applied maths department at Israel's Weizmann Institute of Science, and Dr Nicko van Someren, highlighted the vulnerability of cryptographic keys held on hard drives. In an academic paper, *Playing Hide and Seek with Stored Keys*, they pointed out that hackers can penetrate websites and steal digital certificates more easily than originally thought. An algebraic attack, which can locate secret keys, can be done by a hardened hacker in just a few minutes.

The problem is the key itself: what makes it good is what makes it so easy to find. It's an issue that is not widely understood, which is why nCipher's product moves the digital certificates off the hard disk and into a box where no amount of hacking can get at it.

www.ncipher.com

Caroline Swift



continues her reports from *Silicon Fen*

Your mobile phone is about to outpace your old steam

Dancing to the WAP bam boom

Within two years mobile communications will transform the way we work. Forget the 9.6Kb/sec that you can squeeze through today's mobile phones: by early next year, mobiles could offer 400Kb/sec, increasing within a year or two to 2Mb/sec, and to as much as 155Mb/sec in the near future.

Now consider this: in Europe there are currently 40 million fixed-line internet connections, but **200 million mobile phone users**. The number of users worldwide is expected to reach one billion by 2003. It is believed that mobile links will consistently outnumber fixed links by four

to one. So mobiles are seen as key elements of future e-commerce and information delivery.

Mobile phones are obviously very different from desktop PCs. Typically they have slower processors, less memory, smaller displays, limited power resources and different input methods. Wireless networks suffer from variable availability and stability, higher latency (time lag), and for the moment, narrower bandwidth. Clearly, concessions and modifications are needed to make them useful as net-access devices.

Crucial are the new

Wireless Application Protocol (WAP), designed to deliver information securely under variable conditions; and Wireless Markup Language (WML), which describes the content of WAP traffic rather as HTML describes web pages delivered via TCP/IP [see panel, below].

WML won't offer colour, audio or video for a few years, but will provide useful information and interaction to mobile users. Its smallest unit of delivery is the deck of cards, each card representing a single user interaction such as the confirmation of an option. This most basic system is sufficient for online booking, or delivery of headlines.

CNN and Reuters have announced plans to deliver region-specific content to WAP-enabled GSM mobiles in Europe. Forthcoming services could include maps and directories. Until content providers begin to encode services in WML, there'll be good business to be had converting complex HTML

The key utility on WAP devices will be the micro-browser capable of displaying WML pages. Nokia and Ericsson have written their own micro-browsers; more than 20 other vendors license the UP.Browser developed by Phone.com (formerly Unwired Planet).

Much of the impetus in this area has been refreshingly European, with Symbian's EPOC OS expected to run smart-phones. But Microsoft recently joined the WAP Forum. Perhaps the future will see another browser war.



WML is a specialised form of XML (Extended Markup Language), which seems likely to supersede HTML. All three have a common parent in Standard General Markup Language (SGML), used to format complex documents.

XML can include meta-data, data about data, which allows it to describe the content of databases and facilitates formatting of data according to type. It is particularly useful for publishing the same information in a variety of formats — for example print, PC screens, mobiles, or TV screens. Each device allocates its own format for each data type.

The original analogue mobile networks were first-generation; Europe's digital GSM is a second-generation system; **third-generation (3G) systems** are being defined by the ITU standards body in a set of goals called IMT-2000 (which refers cunningly both to the bands around 2GHz set for 3G use, and to the new millennium).

The original GSM standard used frequencies at 900MHz (Cellnet and Vodafone in the UK). Later extensions operate at 1.8GHz (one2one and Orange in the UK) and in parts of North America at 1.9GHz. Multiple GSM frequencies have driven the demand for dual- or even triple-band phones.

Bands around 2GHz fit neatly into the available airwaves of Europe, and most of the rest of the world apart from North America. It's hoped that 3G standards currently being finalised for Europe and Japan will be able to squeeze into the

Search for a standard

limited bandwidth available in North America, allowing relatively simple mobiles to be used worldwide.

Carrier frequencies are only half of the story in making this possible. Also crucial are the way you divvie them up, and the air interface.

Europe's 3G Universal Mobile Telephone System (UMTS) is expected to launch in 2002. Japan will launch its version as soon as 2000. This uses the same air interface, which makes the most of the available paired and unpaired bands set by IMT-2000.

This interface is known as WCDMA (Wideband Code Division Multiplex Access) and operates in two modes, each using 5MHz carriers. The first mode uses paired bands, one for the uplink and the other for the down. It

chops up its 5MHz carrier pairs using frequency duplex division (FDD). The second mode chops an unpaired 5MHz carrier into time slots to carry both uplink and downlink data, using time duplex division (TDD).

North America complicates matters by deploying three 2G systems, GSM 1900, IS-136 and IS-95 (also known as cdmaOne). Each has its own path to 3G. The one to watch is cdmaOne, which has a 3G specification called cdma2000 that divides its spectrum using a Multi Carrier (MC) mode.

The independent Operators Harmonisation Group (OHG) suggests unifying all three modes (FDD, TDD and MC) in a global standard called Wide CDMA. All confusing stuff, on which the ITU will rule this October.

modem. GORDON LAING charts how computing is taking to the air — fast

Getting up to speed

The 3G bandwidth of up to 2Mb/sec is easily enough for multimedia like videophones or high-quality audio. Mobiles will also in effect be always on, charged only for data transmitted.

Imagine **instant access** to your intranet and immediate email delivery without tedious dialups, all while avoiding time-based call charges.

The key to these services is packet switching. An ISDN line and 2G mobile networks like current GSM are circuit switched: a fixed line size is opened and used exclusively by you until hanging up.

This is fine for constant downloads but uneconomical for web browsing where a link is idle for 95 percent of the time. In such bursty traffic, sending data in individually addressed packets allows many more users to share a network, saving bandwidth.

In the new year, a packet-switched layer will be added to many European GSM networks. Called the General Packet Radio Service (GPRS) it will in itself boost

data rates to 'only' 21Kb/sec, but will lead to bigger things. Expected by the end of this year is High Speed Circuit Switched Data (HSCSD) which boosts the air interface to push 14.4Kb/sec through a single time slot and allows aggregation of adjacent slots,



giving 28.8Kb/sec on two, and so on. GPRS on aggregated slots could achieve up to 100Kb/sec, without hogging precious resources.

An enhancement known as EDGE (Enhanced Data rates for GSM Evolution) will arrive within two years. This boosts single time-slot rates for HSCSD and GPRS to 38.4Kb/sec and 60Kb/sec respectively, by improving modulation; it can achieve up to 400Kb/sec using multiple GPRS time slots.

It is expected that HSCSD, GPRS and EDGE, together known as 2.5G systems, will indicate regional demand for 3G and may be sufficient for some areas. 3G may be deployed only in areas like city centres where the highest data rates and largest user capacities are required. Many experts predict 'islands' of 3G in a sea of 2G and 2.5G systems; future phones will be able to roam seamlessly between them.

2.5G may be all that a mobile operator can afford, or even be granted. In the UK, five UMTS licences have been granted, for which our existing four 2G networks are expected to bid. Other bidders are thought to be Deutsche Telekom, Virgin and maybe even BT (which may wish to run a service independently of Cellnet).

There's another reason we may get 'islands' of 3G performance: 3G macro, micro and pico-cells suffer from lower coverage than their GSM counterparts, with ranges of only 1000, 400 and 75 metres from their



Using planes instead of satellites as relay stations may seem pie in the sky. But Missouri-based Angel Technology has produced this prototype of a suitable plane. It can beam 10Gb/sec over a 75-mile footprint. One suggestion is for robot planes to stay aloft for as long as six months

respective base stations.

Data rates of 2Mb/sec will be available only to people standing still or wandering slowly around pico- or quiet micro-cells. But people driving through large macro-cells should still enjoy up to 400Kb/sec.

This also suggests applications for privately owned pico-cells providing the infrastructure for a corporate wireless network. Shopping centres might fit pico-cells, attracting 3G users with cheaper rates and bombarding them with multimedia advertising and services. Why not incorporate smart-cards into 3G mobiles for e-commerce applications? Enhancements to pico-cells could even see them delivering up to 155Mb/sec in the future.

Beyond macro-cells, satellites will take over your call, although most operators are hazy about how this may work and the troubles of operator Iridium have raised questions about at least some satellite operations. Some visionaries have suggested that a network of

high-altitude aircraft [see picture, above] could be a far more economical proposition. One criticised global satellite coverage as 'broadband for penguins'.

Nearer the ground, packet-based 3G networks are the future. AT&T, BT, Ericsson, Lucent, Nokia, Nortel and others recently formed a 3G.IP focus group to develop an entirely IP-based 3G architecture. Could voice over IP herald the end of circuit-switched networks? Will the ITU agree on the OHG's unified WCDMA standard? Could WAP users be charged by units of data and not time? All these questions remain unresolved, but the future is closer than you may think. Check out Nokia's soon-to-be-released 7110, supporting HSCSD and WAP) and Ericsson's R380, which flips open to boast a much bigger display.

WAP forum: www.wapforum.org
Phone.com (formerly Unwired Planet): www.phone.com
www.ericsson.com
www.umts-forum.org
www.itu.int
www.nokia.com

Microsoft will reign despite ruling

Microsoft may have to seriously consider **splitting up** to retain supremacy, predicts Tim Bajarin.

The public phase of the government anti-trust suit against Microsoft has finished after six months. Judge Penfield Jackson is slated to render his verdict later this year.

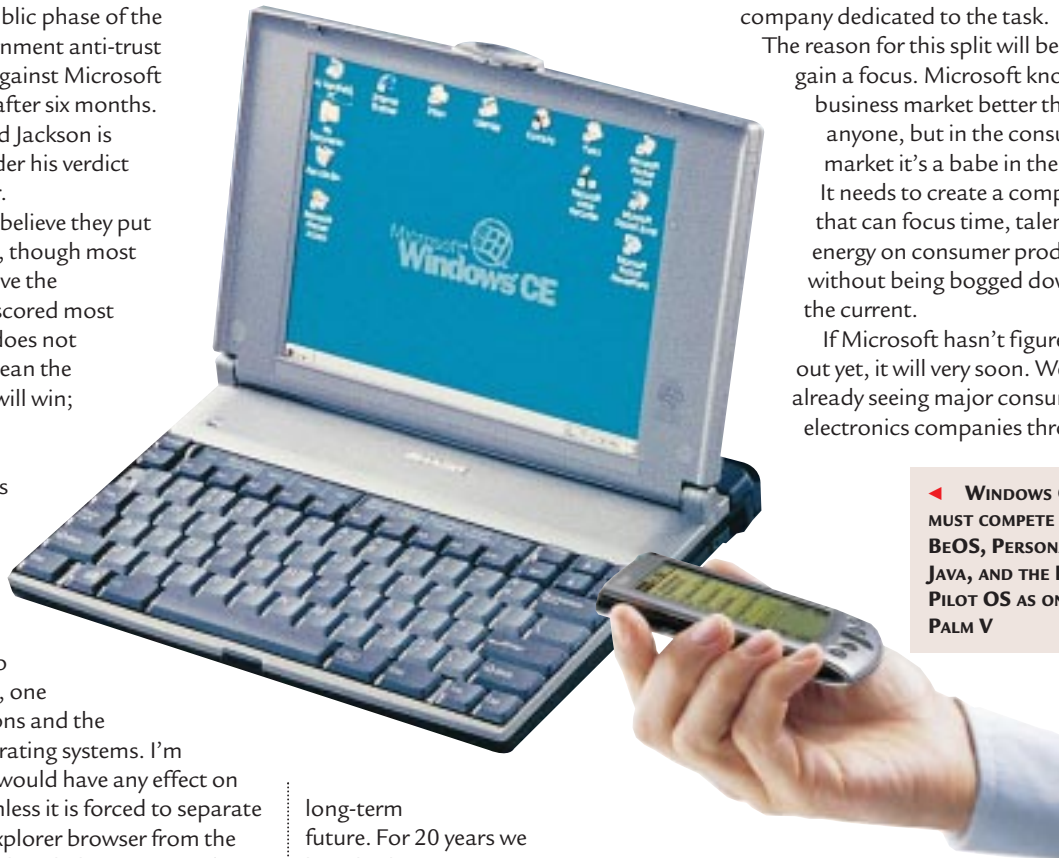
Both sides believe they put a strong case, though most analysts believe the government scored most points. This does not necessarily mean the government will win; and even if it does, the consequences remain unclear.

Some suggest splitting the company into two divisions, one for applications and the other for operating systems. I'm not sure this would have any effect on Microsoft, unless it is forced to separate its Internet Explorer browser from the OS. Most analysts believe Microsoft could get around even that unlikely edict, by coupling the browser to next-generation applications and driving it through them.

The merger of AOL and Netscape took much of the bite out of the original suit, which claimed Microsoft competed unfairly with Netscape's Navigator browser. Ironically, I believe Microsoft will hardly be impacted by Judge Jackson's decision whatever he rules. Windows NT, or Windows 2000 as it will become with the next release, will rule the business market for the next five years.

There are doubts about NT's scalability, and Linux and Java remain threats. But most recent tests show NT outperforms Linux, and according to recent surveys, the majority of Fortune 1000 companies favour the Win2K client for use in desktop PCs.

This is the good news for Microsoft. The bad news is the challenge mass-market digital devices present to its



◀ **WINDOWS CE**
MUST COMPETE WITH
BeOS, PERSONAL
JAVA, AND THE PALM
PILOT OS AS ON THIS
PALM V

long-term future. For 20 years we have had a very strong technology market, in which we are now selling about 100 million PCs a year — mostly to business users. But we have not even scratched the surface of the mass market: many analysts believe we could be selling a billion consumer digital appliances within the next 10 years.

Microsoft is vulnerable in this area. Windows 2000 will play a big role in connecting information appliances to networks, but nobody owns the market for appliance operating systems.

Microsoft's own Windows CE is a strong contender, but so are Personal Java, 3Com's Palm Pilot OS and even BeOS. CE has a lot of support, but Personal Java boasts a horde of Java programmers who are ready and willing to support this consumer OS.

Microsoft's biggest challenge is to become software technology leader in this area, and whatever Judge Jackson's verdict, I expect Microsoft to spin off a

company dedicated to the task.

The reason for this split will be to gain a focus. Microsoft knows the business market better than anyone, but in the consumer market it's a babe in the woods. It needs to create a company that can focus time, talent and energy on consumer products without being bogged down by the current.

If Microsoft hasn't figured this out yet, it will very soon. We are already seeing major consumer electronics companies throwing

their hats into the information appliance ring, and looking for software solutions and partners to help them take a foothold in the emerging marketplace.

Today, Microsoft is trying to address its needs by just creating a consumer division within the company. But very soon it will find out that this is not enough. If the company plans to be successful in extending its franchise to digital consumers, it is going to have to make it a full-time effort, not one that is just an extension of its traditional business program.

That is why I predict that Microsoft will be broken up, not in the way the pundits suggest, but in a way that best serves the company's needs. It will take its current market dominance and focus dedicated efforts to make sure it gets the lion's share of the digital information appliance market — a market that could be five times larger than the one it has today.

WEB LAW

Demon won't fight for 'free speech'

Demon Internet will continue to fight the libel case brought by lecturer Laurence Godfrey, but not a pre-trial ruling that was seen by many to be a threat to net free speech, the company says.

A High Court judge caused an outcry in March by declaring that Demon could not plead a defence of 'innocent distribution' in the case.

Many in the industry understood this to mean that service providers were equivalent to publishers, and were responsible in law for anything posted on their sites.

Demon last month allowed the deadline for an appeal to lapse, which means that the libel trial will go ahead.

David Furniss, director of internet services at Scottish Telecom, owner

of Demon, said that the company would fight the case on its specifics rather than on the issue of free speech.

Demon now believes the libel liability for service providers will be defined by the new Ecommerce Bill. It will urge the government to draft EU legislation to protect 'intermediaries' from liability.

ANGELA SOANE



Bravo, the TV channel, is boasting that it has three new hosts at its Dolls House at www.bravo.co.uk. Elizabeth, Nicola and Chantel will bring 'fresh faces, fresh looks and fresh gossip', according to the blurb. So fresh, apparently, that the girls don't run to surnames.

Affordable apps for all

Small companies will be able to afford the benefits of a fully-fledged messaging server under a scheme launched by UK web pioneer, Netstore.

It plans to offer Lotus Notes and Microsoft Exchange via the internet on a pay-per-use basis by the end of the year. Netstore is best known for offering secure remote backup over the internet, but offers a range of other services.

Netstore was the first European vendor to join the Application Service Provider (ASP) Industry Consortium, formed in the US last month. Other members include Microsoft, Lucent and Sun Microsystems.

Rent-an-app services are seen by many as an emerging growth area. IBM has launched an online enterprise resource-

planning (ERP) service, which is said to give smaller companies the advantages of scale without multi-million dollar investments.

Internal company networks are also employing application servers, a trend which provides the cornerstone of the next-generation IT infrastructures, according to a report from industry analyst, Ovum.

The initial adoption will be driven by the 'webification' of existing applications. It will prove popular with users, vendors and IT departments alike, according to Ovum's Gary Barnett, co-author of the report *Application Servers: Creating the Web-enabled Enterprise*.

www.netstore.com; www.ovum.com

short stories



HOT TIP
Psion founder David Potter named this site last month as one which

exploits the unique advantages of web commerce. It offers bargains and suggestions on everything from holidays to birthday presents. www.lastminute.com

CARS CRASH ONTO THE NET
Internet sales will account for one



in two cars bought in the US by the end of this year, according to one estimate. Currently the

figure is about 15 percent.

A new site called Autohit.com is claiming to be the ultimate one-stop shop for buying a car, with details of models, dealers and finance. Another, Autobytel, claims to have received 10 million hits in its first month.

www.Autohit.com; www.autobytel.co.uk

Millions 2000 lottery loss

A web-lottery company has lost its High Court challenge to Camelot's monopoly on lottery promotion.

Millions 2000 hoped to overturn a ban on using British-based media to advertise overseas lotteries — a right enjoyed only by the organiser of the National Lottery.

But the judge said the company, which aims to create 2000 new millionaires by

the millennium, can continue to promote itself on the web.

David Vanrenen, chairman of promotor Earthport.com, said he took the verdict as a victory because it 'took some issues off our plate.' But, the firm believes the ruling goes against the Treaty of Rome by prohibiting free trade.

ANGELA SOANE

Two major conferences last month examined the

Intel calls users to arms

Intel chief Craig Barrett called last month for users to lobby governments to get **low-cost, high-bandwidth links** to homes and small businesses.

His comments, made at the *Wall Street Journal* (WSJ) chief executive officers' summit on converging technologies, came only days after Liberal Democrat MP Steve Webb called in the Commons for increased government action to promote cheap, fast links.

Barrett's talk in London was a thinly disguised sales pitch (Intel believes high bandwidth will boost sales of high-priced fast processors) but the case was closely argued.

He said that everyone except large companies, which can afford to pay for

large pipes, is starved of local bandwidth. 'This is a legacy of the monopoly position of telecom operators around the world, whether they are regulated or not. They have been relatively slow to provide high bandwidth to the small business and home user,' he said.

'... Countries that are aggressive in eliminating this choke point... will be at an advantage all over the world because their population will be more effective at accessing information and able to do commerce over the internet.'

In the near future, all business will be e-business, he claimed. 'Bandwidth, or bits, will become the oil of e-commerce, at both a local and a national level.'

Barrett demonstrated this Blackberry organiser, from the Canadian company Research in Motion (RIM).

At its simplest, it's a wireless pager, but it can also pick up email and link to your PC via a cradle [pictured] to synchronise your contacts and appointments. The

Blackberry uses an old 386 processor and runs off one AA battery. The company has no immediate plans to market it in Europe. Barrett also showed Intel's experimental Web Pad, which allows you to roam the home or office while connected to the web. www.blackberry.com



Caught on video – my big mistake

Intel got into PC-based video-conferencing too early, CEO Craig Barrett [pictured, above] admitted. 'Everyone has made the mistake of developing a technology in search of an application. We have all squandered our hundreds of millions of dollars chasing that, and we know it doesn't work,' he told company chiefs at the WSJ conference.

Intel's video-conferencing was 'wonderful technology' but it was the company's biggest mistake because it required more bandwidth than was currently available. He predicted: 'It will still happen. It was just a little too early in the product definition and creation cycle.'

My pipe is bigger than yours – or is it?

Far be it from me to pull up the head of Intel on a technical point. But if Craig Barrett didn't make a mistake in his WSJ address, he was being economical with the truth over a chart showing international bandwidths.

This showed Britain well in the lead at the end of 1998 with a 1514Mbit/sec pipe, compared with Sweden's 776Mbit/sec, Holland's 600Mbit/sec, France's 245Mbit/sec, and Germany's 215Mbit/sec. Intel's was shown for comparison at 650Mbit/sec.

Britain's bandwidth could help it become the internet hub of Europe, Barrett said. He also implied that Intel's pipe has more than three times the

capacity of Germany's. Every report I've seen of the conference took this information at face value, and I have made the same mistake myself.

Karl Meyer, of UUNet, put me straight recently when I remarked on the (to me) surprising narrowness of backbone bandwidths. He pointed out that I was confusing bandwidth with capacity.

This is a natural take on the situation when you are used to sitting on a single pipe, when the bandwidth is roughly a measure of capacity. But (and this is so obvious when you think about it) backbones don't consist of single lines. They are actually bundles of pipes.

Meyer gave the analogy of a bank of

escalators. The capacity of each individual escalator depends on its speed, and the total capacity depends on both the speed and the number of escalators. The speed is a measure of how quickly one person gets up one escalator (or one data packet travels down a line). Presumably, with enough pipes and using them in parallel, Germany could make its 'slow' lines both fatter and faster in practice than Intel's.

Which begs the question of why service and backbone providers usually quote only bandwidth. And just what is the capacity of Britain's international pipes — and of Intel's? If anyone can tell me, I'd like to hear from them.

rapid evolution of IT and its impact on trade. Clive Akass reports.

Microsoft can't stop us, says Symbian

Symbian has about three years to establish its Epoc operating system – and there is little that Microsoft can do about it, the alliance's co-founder David Potter told the WSJ conference.

'Symbian has a window of opportunity to develop Epoc as a standard, or at least used very widely,' said Potter, who also founded Psion, which carried out the first work on Epoc.

'I think it would be difficult for Microsoft to impact on that in the short

run. They have the muscle of huge amounts of money. They will undoubtedly, as we saw with the Apple wars and the IBM wars, use PR in many clever ways – perhaps not quite accurate ways in many cases – to undermine one's position. But that is part of the game. I think the ball is really in Symbian's court to achieve a certain market penetration in say two to three years from now.'

Potter said: 'Bill [Gates] can use his money. He can use his PR. He can subvert people like the network

operators. But in the end we can say that the ball is in our court for the next couple of years.'

He spoke shortly after Matsushita announced that it was joining the Symbian consortium, formed in a joint venture with Nokia, Ericsson and Motorola to develop Epoc for the emerging market in mobile connected devices. Epoc Release 5 has just been launched, and drives the new Psion Series 5mx palmtop.

● News analysis – Page 55

Intel ARMed for mobile conflict



Intel will push the StrongARM chip for all its worth if the market swings towards mobile computing, CEO Craig Barrett told the conference. However, he did not believe that mobile systems would displace PCs as the main internet access device for some years.

But he said StrongARM, based on a core from UK-based ARM and purchased last year from Digital, was ideal for mobile devices because it combines high processing power with low power drain.

So if the market swings from PCs to mobiles, Intel will swing too. 'Our job is to make sure that if it's not [an] Intel [x86 processor] inside, then it's StrongARM inside. Our job is to sell the building blocks. It is not to compete with the people making the devices.'

Ellison backtracks on NCs

Oracle chief Larry Ellison's keynote speech to an *Economist* conference on future directions sounded very much like a reframing of the ideas in his famous 1995 speech, where he advocated network computers as the antidote to all PC ills.

He admitted he was wrong in believing that non-PC devices would dominate the internet by 2000. 'I was focused on my own industry,' he said, echoing many critics of his speech at the time. '...It was an Oracle-oriented view of the world.'

The internet, as he had predicted, had moved applications and data from the desktop and on to servers. People buying from e-commerce companies like Dell and eBay did not need special apps on their PCs because all that was necessary was on the web servers.

What he didn't realise, Ellison said, was that the internet would change not only IT but businesses themselves. Currently, purchasing is done with 'stunning inefficiency,' he said.

'But the way that an e-commerce company buys a thousand computers is to specify on the web what it wants, then all the vendors in the world can make a bid.'

The web also allows complexity to be centralised, with huge savings. Oracle once had 70 separate human-resources departments in different countries. It now has one, cutting its costs by a fifth. It was also reducing the number of its email servers from 300 to four.

'Cost savings are astounding, but that is not the biggest saving because we now have much better information,' he said.

Ellison, a man given to sweeping statements, said there were no applications worth having on a PC. All it needed was a browser, to access all the apps and data it needed on the servers.

The importance of the operating system is overrated, he claimed. 'Most people don't even know what it does.'

He added: 'Windows is like a lousy library with all the best books.'

Mobiles are the future of the net

Mobiles will supplant desktops as the main internet access devices within a few years, the heads of cellphone pioneers Nokia and Ericsson told the conference.

'This is a social change,' Ericsson's

Sven-Christer Nilsson told the delegates before outlining the planned rollout of 2Mbit cellphone networks over the next five years.

Nokia's Jorma Ollila said: 'WAP [see pages 38-39] will do for mobile communications what HTML did for the web. Symbian's Epoc will power smart mobile devices, making them a lot easier to use and providing an open platform for developers.'

Dynasty plans announced in Denver

Microsoft claims CE 'breakthrough' but is not ready for mobile phones. Terence Green reports

Windows CE is coming to a mobile phone near you. But not yet.

Speaking at the fourth Windows CE developers' conference in Denver on 7th June, Harel Kodesh, vice president for productivity appliances at Microsoft, said that Windows CE-powered mobile phones are still 'a year to eighteen months away.'

Screenphones top Microsoft's list of priorities for Windows CE, but the operating system won't be in a position to power mobile phones until the release of the next major version, codenamed Cedar, according to Kodesh.

The most pressing issue is that Windows CE can't provide the hard real-time support required by handset manufacturers. A Windows CE phone could be produced now, but it would need one CPU for phone services and another for the Windows CE functions.

The support needed to produce a single-CPU phone solution will be built into Cedar, said Kodesh, but that work is still in progress and the longer development cycles of mobile phones will delay the appearance of Windows CE-powered phones.

However, Microsoft has developed an operating system-independent micro browser that utilises the limited memory and displays of mobile phones. Provided free to handset developers, the micro browser supports a subset of HTML 3 and will support XML in later releases.

Microsoft also plans to add support for the Wireless Application Protocol (WAP) [see pages 38-39] to Cedar, having joined the WAP Forum, a consortium developing common standards for wireless-enabled applications.

Microsoft was slow to acknowledge WAP due to concerns over support for XML which have now been addressed, and has since adopted XML as the best way to separate content and presentation, thus enabling developers to create web-based applications which



◀ **NEW ADDITIONS
HAVE GIVEN HAREL
KODESH PLENTY TO
SMILE ABOUT**

Networking. ActiveSync 3.0 does away with most of the hassles of the

current solution, automatically detecting and setting serial ports during installation, and even providing diagnostic feedback when synchronisation fails to work.

Kodesh showed CE-powered petrol pumps, bar-code readers and robot arms which extended use of the OS beyond established Palm-sized and handheld devices. He said that Microsoft was modularising the operating system and the development platform to speed up the introduction of new devices.

Windows CE Platform Builder 2.12 will allow developers to create customised software development

target any device, from a WebTV to a PC.

As wireless connectivity is key to the future of Windows CE devices, Microsoft will join the Bluetooth wireless connectivity consortium, said Kodesh. In a related development, Bob Muglia, senior VP for the Business Productivity group, said that Microsoft has started wireless-enabling the entire Microsoft campus as a proving ground.

■ **New and revised development tools** were announced by Microsoft for the developers and designers of embedded systems and business appliances based on Windows CE. Bob Muglia previewed Microsoft SQL Server 7.0 for Windows CE and a new Global Data Access architecture for Windows CE. Global Data Access is an open specification based on ActiveX Data Objects and OLE DB, enabling third-party developers to create database tools for Windows CE.

The announcement of SQL Server for Windows CE means Microsoft now offers a common data engine on all its platforms, from Palm-sized to Windows NT-powered servers.

Kodesh announced that ActiveSync 3.0 technology is to replace the current synchronisation agent which relies, not always successfully, on Dial-Up

kits for Windows CE appliances by simply dragging and dropping Windows CE support modules into the platform window. Platform Builder 2.12 now includes support for Internet Explorer 4.0, enabling embedded Windows CE devices to be accessed via a web browser.

■ **Kodesh also announced a 'breakthrough technology'**, the Common Executable Format (CEF), that enables developers to target all processors supported by Windows CE with a single executable. CEF can be translated into native code for a processor either at compile time or at run time on any CD device via a 200Kb translator. The performance hit for CEF is just 20 percent against native code.

Although Microsoft has switched its main Windows CE focus away from consumer devices towards business applications, the consumer interface continues to be refined. Multimedia support in Windows CE now has DirectX support and Windows Media Player.

The new audio and video playback capabilities which have been derived from Microsoft's work with Sega for the Dreamcast console were demonstrated on the new Casio E-100 and on a television set top box.

GAMES NEWS

The Powers be with you

Rumours on the net are that one of the Star Wars games under development will be released in October.

Star Wars: Force Commander is a real-time strategy game based around the first three films, allowing you to direct your forces either as a leader in the Rebel Alliance or the Galactic Empire. Set on various worlds including Tatooine, Yavin 4 and Corellia, over 100 Star Wars characters are expected to feature.

Jester Interactive is developing **Music 2000** for the PC, a follow-up to the company's Playstation original. Released in November and accompanied by a large advertising campaign, distributor Codemasters hopes it will be a big Christmas hit.

Early reports suggest that it is in the same vein as the eJay series of programs. A simple, easy-to-use interface is promised, with 24-track technology and MIDI compatibility for those who want to do more than just mess around. Keep an eye on www.codemasters.com for details.

Sierra has produced a new game to tie in with the much hyped upcoming film, *Austin Powers: The Spy Who Shagged Me*. **Austin Powers: Operation**



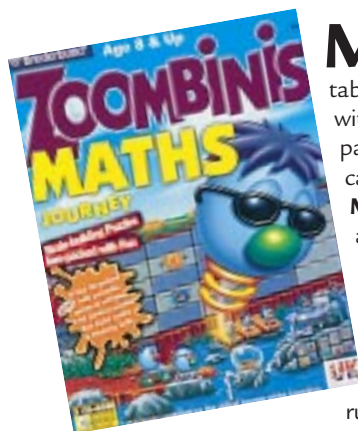
Trivia tests your pop trivia knowledge from the sixties to the nineties using psychedelic graphics as the background to the questions.

Have a look at the Macromedia demo on www.operationtrivia.com. The full version is to be released around the same time as the film.

Finally, Macmillan has published a Linux version of **Quake** and **Quake II** in the first in a series of 'classic' games for this operating system. Details at www.macmillansoftware.com.

JASON JENKINS

Maths learning through play



Maths teaching for the very young has come a long way since the ritual chanting of the seven-times table (not that there is anything particularly wrong with that). CD-ROMs are helping teachers and parents to make a game of what for many children can be an ordeal. The two CDs in **Zoombinis Maths Journey** are packed with brainteasers aimed at helping kids through the UK National Curriculum. They involve algebraic thinking, graphing, logic, theory testing and problem solving, all pitched at children from the age of eight upwards. The titles, from Broderbund <www.broderbund.com> cost £19.99 and run on Windows 3x, Windows 9x, and the Mac.

Top 10 products Last month

Windows software

1	Office 2000 Premium	Microsoft	1
2	Norton Anti-Virus v5 std	Symantec	5
3	MS Works v4.5	Microsoft	8
4	Office Pro 2000 CD	Microsoft	-
5	MS Pro 97+books	Microsoft	4
6	Windows 98 CD	Microsoft	6
7	MS 97 std v/comp	Microsoft	7
8	Windows 98 v2.0	Microsoft	-
9	UsScan v4 Classic	Net. Ass.	10
10	McAfee Office	Net. Ass.	-

DOS software

1	Turbo Pascal v7DOS edu.	Borland	1
2	MS DoOS v6.22	Microsoft	-
3	PC DosOS 2000 v1 CD	IBM	2
4	Novell 3.12-4.2, 5-user	Novell	-
5	LapLink v5	Traveling	3
6	NetWare 3.2, 5-user	Novell	-
7	Netware 3.2, 5-user	Novell	-
8	Novell support monthly	Novell	-
9	MS.mail PC remote 3.2	Microsoft	-
10	Groupwise 5.5, 5-user	Novell	-

Peripherals

1	32Mb 8x32 60ns EDO 72pin	GSI	4
2	16Mb 4x32 60ns EDO 72pin	GSI	2
3	Delta 44x int EIDE CD-ROM	Delta	-
4	64Mb 100MHz SDRAM	GSI	7
5	Stylus Photo color 750	Epson	6
6	Stylus Color 640 1440dpi	Epson	9
7	Stylus Color 740	Epson	-
8	32Mb SDRAM 168pin	GSI	-
9	HP Deskjet 420 colour	Hewlett	-
10	128Mb 100MHz SDRAM	GSI	10

CD-ROMs

1	StarwarsInsiders Guide	LucasArt	1
2	Dance EJ2	Fast Trak	-
3	Music Makers Three	Magics	1
4	Music Studio	Magics	-
5	Simpsons Virtual Springfield	Fox Interact	-
6	South Park Screen Saver	Telstar	4
7	Simpsons Cartoon Studio	Fox Interact	-
8	Austin Powers	Cendent	-
9	X-Files Interactive Guide	Fox Interact	-
10	Dance EJ2 Sample Kit	Fast Trak	-

Games

1	Alien vs Predator	Elect. Arts	-
2	Kingpin	Activision	-
3	Dungeon Keeper Two	Elect. Arts	3
4	Hidden and Dangerous	Take 2	2
5	Discworld Noir	G.T.Int.	-
6	Championship Manager 3	Eidos	5
7	Total Annihilations	G.T.Int.	4
8	Star Trek: Birth of the Fed.	Hasbro	6
9	Outcast	Interplay	-
10	Rainbow Six: Gold Edition	Take 2	8

Games and CD-ROM figures supplied by HMV. Others from Software Warehouse.