

Roll out the MIDI

The trouble with pipe organs is that they are big, so you have a limited choice if you fancy a touch of the Toccata and Fugues. This splendid 1.2 x 1.66m model could be the answer. It replaces big bass pipes by sampled sounds, so it's just about small enough to take around. It's MIDI controlled from twin keyboards and costs £14,000.

Artifice 01273 600634



PRIVACY

Microsoft under fire over secret logging of PC IDs

Microsoft was on the defensive last month after revelations about a **secret number identifying PCs.**

The company admitted that the Windows 98 registration wizard sent the ID, derived from a machine's network card, even if the user asked for it not to be sent.

David Weeks, UK Windows product manager, echoed the company line by claiming: 'This was due to a bug in the Windows 98 registration procedure.'

The man who raised the alarm, Richard Smith, head of Phar Lap Software, said the same number is also stamped into files created by Microsoft Office programs like Word, Excel and Powerpoint.

A statement on the Microsoft web site said the company was taking steps to address what it described as 'privacy concerns'. It said that the Win98 registration wizard would be updated, all records of the ID would be purged,

and a downloadable patch would remove the ID from the Windows registry.

The statement refers to 'rumours' that the ID is related to numbers appearing in Office files which are used to 'identify a document in a distributed network environment.' It said there was no way to trace the origin without an intimate knowledge of the host network.

But Smith insisted there was no question that the machine ID appeared in Office documents, although he did not accuse Microsoft of relating the two numbers.

'My own belief is that Microsoft logged the ID number in Win98 because it wants to crack down on piracy. Some PC vendors here sell machines using one copy of Windows 98. Microsoft can spot this by matching the product number with the machine number.'

Intel was embroiled in a similar dispute over IDs in PIII chips. But Smith was not arguing about the principle of the ID: 'Having your software on your PC is like being in someone's house. You should treat it with respect.'

CLIVE AKASS

• Point of view — see page 30

Oftel holds fire as free web access booms

Fears that a review of line charges might threaten free web access services have proved unfounded. BT asked phone watchdog Oftel to look at charges for Number Translation Services (NTS) which provide nationwide links at local call rates.

The NTS system was established to help firms set up UK-wide services such as help lines. Call lengths were typically only a few minutes and companies generating them were given a cut of the charges. But NTS began to be used for web links lasting hours and the provider's cut was used to finance free access.

An Oftel report, launched as we went to press, agreed that BT's share should change, but it called for more

flexible charging for the different services. Oftel director, David Edmonds, said: 'Enabling the huge growth in the use of the internet has been a key factor in my consideration.'

Indeed, net use in Britain looks finally to be hitting a classic exponential leap thanks to free access, the fact that new PCs have modems

by default, and emerging TV-based access.

Mike Hughes, peripherals product manager at Gateway, which has just launched a free service, said: 'Oftel has recognised the importance of the new, free ISPs.'

Richard Wood, of UUNet, which hosts the service, said the Oftel review meant some ISPs may have

to alter their business model, but he doubted if any would go under. He welcomed the call for different pricing for a range of services.

Interested parties have until 7th April to reply to the review.

Gateway sign-on: www.gw2k.co.uk

SEE PAGES 52-53 FOR
OUR SPECIAL REPORT
ON FREE WEB ACCESS

So what about free browsers?

Fears over the Oftel report reflect the fact that decisions by consumer watchdogs are not necessarily welcomed by the consumer. One claim in the current anti-Trust case against Microsoft is that it acted uncompetitively in giving away its browser. A possible outcome might therefore be for Microsoft to be forced to charge for Internet Explorer. The case has been adjourned for six weeks.



'Uh-oh...looks like we're going to have to pay for breathing'

NEW COMMS

Mobile data to hit video speeds

Mobile phone companies are gearing up to offer **data rates of up to 2Mbit/sec** — fast enough for portable video phones. The technology will also be used for web browsing using portable computers.

Three licences for the so-called Third Generation Mobile (3G) systems are due to be auctioned this autumn, though this may now be delayed until next Spring.

Orange, One-to-One and Vodafone are trialling services using the Universal

Mobile Telecoms System (UMTS) specification, which is the successor to GSM.

Cellnet has announced no plans, but majority shareholder BT is working on UMTS at its Martlesham labs.

Sadly, UMTS is universal more in name than fact, and the international ITU standards body is trying to forge it into a standard called IMT-2000.

This involves intellectual property claimed by both Ericsson and Qualcomm. The ITU says work on the technical specification will go on while the two companies battle it out. Tony Milbourne,

of mobile comms specialist The Technology Partnership, says 3G services are unlikely to appear before 2002.

Data rates will vary, up from 64Kbit/sec, the same as a single ISDN channel. Typical rates for a moving user will be 384Kbit/sec.

TTP, based near Cambridge, is one of many companies developing the technology. The service will be used initially by large companies but will move to a wider market as prices fall.

CLIVE AKASS & ANDREW CRAIG

TTP 01763 266266



WebPad hits the DECT

Chipmaker Cyrix, which is now owned by National Semiconductor, showed off this mobile browser (left) at Comdex last year and was due to demonstrate it at Germany's Cebit show in late March. This one is equipped with wireless comms using the DECT standard which is coming into use in home-based portable phones. The Web Pad is also available with a 2.4GHz wireless modem. It uses a lower-power version of the Cyrix Media GX processor and boasts 16Mb RAM, 8Mb ROM, speakers, and USB ports for connecting a keyboard and mouse if required.

• See www.vnu.co.uk for the latest Cebit news

Office 2K ships

Office 2000, the latest version of Microsoft's office suite, will ship in June, Microsoft says.

It is a major rewrite but, unusually, its document files can be read by Office 97. Microsoft has been heavily criticised for incompatibility between versions.

Office 2000 treats HTML as a native format and includes features to allow collaboration on complex files across a network using only a browser.



Husky voice needs no line

This is perhaps the first military spec rugged PDA, the $f \in \chi^{21}$ (field explorer 21) running WinCE 3.0A. Husky has expanded the functionality with a full keyboard, separate number pad and a transfective colour LCD display. It claims the first colour-screen battery life of over eight hours, and has multiple PC Card support and wireless voice comms with no need for a mobile phone. The Open Book Design will sell for around £1,100 - £1,250.

www.wpihusky.com, 01203 604040

short stories



BOARD CONVERTER

The wonder is that no-one has done this before. Virtual Ink is selling this gadget which digitises any whiteboard up to 4 x 8ft in size. All-electronic whiteboards used, among other things, for remote collaboration can cost thousands. This one, called the Mimio, will cost a little over £300. It folds small enough to fit into a notebook case and sticks to any board using suckers. You draw on the board using standard coloured pens in a special sheath.

Details 0171 349 2200

HAYES EUROPE LIVES

Networking specialist Zoom Telephonics has bought the European division of US comms pioneer Hayes, whose assets were sold by auction last month after it failed to come out of Chapter 11 protection. Founder Denis Hayes was the originator of the Hayes command set, still used by most modems.

HEXAGON SINKS

Hexagon Information Technology, operating as Atlantic Direct, has been placed in administrative receivership. Enquiries should in the first instance be directed to BDO Stoy Hayward at 3rd Floor, Peter House, St. Peters Square, Manchester, M1 5AB.

AMD MOBILE CHIP

A new 350MHz K6-2P clocks the fastest of any mobile processor available, AMD says.

AMD 01276 803100

Faster processors 'will kill off the keyboard'

Intel is pushing speech recognition as a reason people will want faster processors.

The technology will get so good with increasing processor power that keyboard-less PCs will start to appear within five years, Intel marketing director Gordon Graylish said at the PIII launch. He predicted: 'Keyboards will be around for

some time after that, just as some people still use pen and paper. But they will gradually die out.'

Tom Ruiter, regional director of speech input specialist Dragon Systems, said much the same thing during a visit to PCW Towers. He reckoned that with 550MHz processors, the time to train software to

recognise your voice will fall from the current half an hour or more to just eight seconds.

He claimed all necessary algorithms are in place. I remain sceptical on that one, but I propose to try Dragon's latest product (see review next month) on the fastest PC I can get my paws on

and I'll tell you how I get on.

● Launch prices of the 450 MHz and 500MHz PIII with 512Kb cache in bulk were £435 and £310 respectively.

CLIVE AKASS



Visual inspiration

Computers have yet to match the proverbial back of the fag packet for sketching out ideas. But a company called Inspiration Resources reckons it has an answer in its £205 (inc VAT) product, Visual Concepts. It allows you to manipulate ideas by attaching notes to icons which can be colour coded.

www.cmcsite.com/concept; 01729 830322

En route for mapping riches

Route planners are another software genre which is likely to boom as processors get faster and storage gets cheaper. The current generation has hardly begun to explore the possibilities of geographical information systems (GIS), the linking of data to maps. Microsoft is pouring a fortune into it, and it is not the only company to do so.

A Dutch company called Route 66 has released £49.95 routers for both Britain and Europe to coincide with the launch of Microsoft's AutoRoute Express 2000 (reviewed, February) at the same price. Both products show an



unprecedented level of detail, down to street level and further. AutoRoute shows nearby historic sites, pubs, petrol stations and other details, updated by a full-time team at Microsoft. The team is based in the US, which may not be a good idea. Our random selection of March, Cambs, showed Tesco and the Griffin Inn in the wrong places.

● Route 66 review next month.



If you'd told me ten years ago that every other high street in Britain would be scanned by a TV camera, I'd have been horrified. Now, I have to admit, I find the sight of one of those TV eyes reassuring. This is not to say they are a Good Thing. Nor that I'd feel the same if under threat of persecution. They show how hard it can be to strike a proper balance between privacy and security.

My ambivalence extends to civil liberty groups. I don't always agree with what they say, but I am damned glad they are saying it. As someone in the nuclear industry told me once when I was questioning one of its more dishonest attempts at public relations: 'We need hecklers.'

Scientists can get carried away like anyone else, pushing technologies into use before their time. Freedoms can be eroded unnoticed. So privacy groups were right to question use of a machine-readable ID number on the new PIII. They were right to keep up their pressure even after Intel said it would provide a utility that prevents the number being read by a remote computer. But, in the

POINT OF VIEW

Identity crisis

substance of their complaint, they were surely going over the top.

The ID number, like TV surveillance, is both useful and intrusive. Intel says the main reason for it is to help network administrators address and audit PCs. But other users will also benefit.

You could, for instance, specify which machines can make a valid transaction with your credit-card number. This may limit your own freedom of action but it would also curb fraud. The ID could also let you prove a message is from where you say it is, which could have legal uses.

It could also, it is true, be used to track your movements round the muckier back alleys of the web. But you have the option to switch it off.

It seems now that Microsoft has been up to similar tricks with Windows 98. It seems Windows 98 has been sending a

machine ID to Microsoft without users' knowledge. Office files are also stamped with an ID (see page 28). There is an issue here that goes beyond that of privacy.

Security is the big unresolved problem on the web. When we are all permanently online, as we shall be, our virtual front doors will be ever open. The more stuff we allow in, especially Microsoft files with powerful embedded routines, the greater the risk of intrusion or worse.

Microsoft's answer is that you should accept files only from trusted sites. Like Microsoft's. But here it is, grubbing around our files without a by-your-leave. Microsoft's excuse of a bug in Windows 98 is somewhat implausible; but even if we accept it as true, this is a mistake that should not have been made. If you enter someone's home, you don't start rifling their drawers.

Clive Akass



on trusting Microsoft and other jokes

SUPERCOMPUTING

Desktop HAL thrashes Big Blue

A Silicon Valley startup has launched what it claims is the fastest and most versatile supercomputer yet — and it sits on a desktop.

Star Bridge Systems (SBS) says its HAL-4rW1 'hypercomputer', nicknamed Hal, can do 12.84 trillion calculations per second (12.84 TeraOPs).

This is 60,000 times more than you can get from a 350 MHz PC and more than three times more than from IBM's Blue Pacific supercomputer.

The Blue Pacific uses 5,856 PowerPC 604 processors and draws 3.8 Megawatts of power; a HAL uses 280 FPGA chips (see 'How it works') and draws just 1600 watts, about the same as a two-bar fire. It can be plugged into the mains.

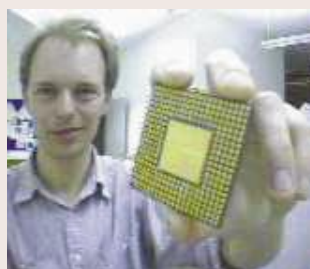
SBS president Alfred DiMora said: 'There is

How it works

The SBS hypercomputer dispenses with conventional processors in favour of what is called Field Programmable Gate Array (FPGA) chips made by a company called Xilinx. These contain up to 1 million logic gates that can perform any of the basic

logical operations. Which they perform is dictated by a register of bits, which can be changed very rapidly. Sussex University researcher Adrian Thompson is pictured above with a simpler FPGA. This was used with genetic algorithms, using the same principle as natural selection, to produce what was in effect a self-programming computer which evolves a solution to a task (see *Futures*, PCW April 1998).

www.xilinx.com



nothing in the world like it.'

SBS is developing it for use with Hal software called Viva, a combination of operating system, GUI, object-orientated programming language and toolset.

Applications being consi-

dered include comms, search engines, voiceover IP and video compression. But don't rush for your cheque books unless you're very rich: prices start at \$2m.

FROM JOHN GERALDS IN
SILICON VALLEY

IBM claims system-on-a-chip breakthrough

IBM has developed a new way to combine logic and memory on a single chip, the company says.

The method uses a 'trench cell' structure with memory cells placed underneath the logic circuitry. IBM says the new technique will avoid the trade-off between logic and memory in chip design.

It will first be used in specialist Application Specific Integrated Circuit (ASIC) chips using IBM's copper connects. These are likely to

turn up next year in products such as routers and switches. But eventually the technique will be used to create a 'system on a chip' boasting more than 100Mb of on-chip memory, an IBM spokesman said.

An ASIC with trench-cell memory will cost about a fifth more than a traditional ASIC and separate memory, but it would offer faster memory transactions and a simpler system design, the spokesman said.

DOMINIQUE DECKMYN

short stories

MONEY FROM THIN AIR
More than 1,000 people in Leeds are getting money from thin air. They are taking part in the world's first trial of mobile cash machines, which has been launched by Barclaycard and Cellnet. It is part of a 60,000-user field test of Visa Cash cards, which can store up to £50 for small-change purchases.

The new trial uses adapted Motorola StarTAC mobile phones to top-up cash cards via Cellnet's GSM network using a PIN number, as with a normal cash dispenser.

Cellnet's managing director, Peter Erskine, said: 'Withdrawing e-cash over your mobile may sound futuristic but within five years it will be commonplace.'



MAC MODEM
Pace Micro has launched the 56 Solo self-memory modem for Macs which can store up to 30 minutes of speech or 30 fax pages while your computer is switched off.

Pace 0990 561001



Microsoft plugs NT security hole

A fix will be posted shortly for a security hole in NT (versions 3.5, 3.51 and 4.0) that allows unauthorised access to critical files on a

network, Microsoft says. Nicholas McGrath, Windows product marketing manager, said: 'The chances of it affecting customers are

very slim, but we take all security issues very seriously.'

The hole involves replacing cached access-control dynamic link libraries. 'You really would have to be a very clever C programmer to do something,' said McGrath.

Microsoft has posted an article on its web site explaining how the registry can be tweaked to avoid the problem. JAN HOWELLS

For epistles to the non-Romans

Standard keyboards are boring and can be confusing if you happen to be typing in a language that does not use the Roman alphabet. Stevenage-based Contech says it will create keycaps of any colour and title.

Contech 01438 325757

Digicams hit two-megapixel 'ceiling' as prices drop



Two-megapixel cameras are starting to appear from the likes of **Olympus and Nikon** (see our *digital cameras group test*, p198).

Nancy Carr, general manager of Nikon's consumer products group, said at Comdex last year that two megapixels is likely to be the ceiling for non-professional cameras, partly because it is considered sufficient for most people's needs. Also, the processing power and memory requirements are prohibitive, at least for the current generation of silicon, Carr said.

The new Nikon Coolpix 950 (shown here) and the simpler 700 both boast 2.11 megapixels, can shoot 1.5 frames per second



and are due to ship before summer. Meanwhile, the cost of megapixel digital cameras continues to fall, with **Kodak** introducing its DC200 Plus at £250. It is an enhanced version of the DC 200, offering a longer battery life, TV output and a 4Mb Compact Flash card. Kodak also introduced the 1.6 megapixel DC265 (shown, top) which is an enhanced DC260. New features include a faster power-up and image processing, and triple the burst speed at up to 24 images per second. It costs £750.

Kodak 01442 61122
Nikon 0181 541 4440

Videocam swings both ways on Hi8

A new range of Sony digital video recorders takes Hi8 tapes used on analogue models but offering the same sound and video quality as its miniDV range. The TRV110, TRV310 and TRV510 have LCD screens and can play back analogue Hi8 tapes.

JVC has introduced two mini models: the GR-DVL9500 and the 9600 with a high-speed mode



which is said to capture video at twice the usual speed.

Canon has launched a new digital camcorder called the DM-MV20, which features a 12X optical zoom and image stabiliser.

Sony 01932 816000
Canon 0181 669 6000

Local networks head for 10Gbit per second

A standard allowing local network backbones to run at 10Gbit/sec has begun a formal approvals process which is expected to take at least a year.

A 1Gbit Ethernet standard was agreed just a year ago. Most office

networks run at ten or 100Mbit/sec at desktop level but faster pipes are needed to link them.

Vendors jumped the gun on that standard and are expected to go with 10Gb, by releasing products before the standard is finalised.

Palm wins with Italian cool

The new Palm V strikes me as style over substance and there's a reason for this. With colour models coming from rivals Hewlett-Packard and Philips, **Palm owner 3Com ordered research** which showed that people wanted lighter and sleeker designs.

It went to famous industrial designer IDEO to help create something out of Italy and use new technology that provides a crisp display. Just a week after its release, the Palm V was the hottest seller in Silicon Valley.

The colour on the new CE models is a big plus because it does increase a screen's readability, but there are big problems with the CE graphical user interface which can take days to learn. The fact remains that it is ridiculous to put a Windows-like GUI on something this small.

Microsoft should give it a complete overhaul but it is far more likely to try to get away with simplifying the menu structure. One of the appeals of the PalmPilot is its intuitive, transparent interface.

Some 20 CE vendors are vying to create Pilot-beaters, but without a rethink by Microsoft, I don't see any threat to 3Com's dominance this year.

Speaking of which, it looks as if the **Palm VII**, which is equipped with a wireless modem, won't ship before summer. It is much larger than the Palm V but looks like a winner.

Products at **Demo 99** included Hypercosm's OMAR (Object-oriented Modelling And Rendering) technology which lets you **interact with 3D models** on the net. Hypercosm president, K. Kivolowitz, who won an award for the work he did with his former company, Elastic Reality, won the biggest round of applause following an eight-minute demonstration.

ActiveTouch showed an interesting way to share documents over the web. The **Webex Meeting Centre** lets users collaborate on documents using only a web browser. The software is free, as ActiveTouch plans to get its reward from subscription services.

InfraCom, an Israeli company, received a lot of attention with its **omni-directional infra-red technology** which lets you link devices which are not in line of sight.

Tim Bajarin
letter from **Silicon Valley**



Linux shorts

MERCED PORT

VA Research is to head efforts to port Linux to Intel's forthcoming IA-64 processor, codenamed Merced. Intel is taking an unspecified stake in the company as part of the deal. The port is expected to be ready by mid next year when the processor is due to ship. But you can be first to see a picture of the new Merced on page 47 of this issue.

HP SUPPORT

Hewlett-Packard (HP) has set up a new organisation to coordinate its Linux strategy, which involves increasing support for Linux across its product line. 'We see [open source software] as an important business model to explore,' said Wayne Caccamo, head of the new Open Source Solutions Operation (OSSO). HP will also back an independent effort by The Puffin Group to port Linux to servers based on its PA-Risc processors.

NETSCAPE LINK

Netscape says its directory software, messaging service software and delegated administrator software now support Linux.

DESKTOP DOUBT

Linux is growing fast as a server platform, especially among web service providers, but is unlikely to make inroads on to the desktop, said Pat Gelsinger, Intel's senior vice president of desktop products. This was because of a lack of applications and the fact that there was still no agreed interface to match Windows' ease of use, he said at the Intel Developers Conference.

ABIWORD UP

Abisources is to launch an open source word processor for Linux, called Abiword. It will be available for free download, or as a package for a small fee.

Dominique Deckmyn reports from Linux World in San José

Gnome gives Linux friendly face

A facility that is aimed at encouraging mainstream use of the open-source operating system, Linux, was introduced last month.

The **Gnome Desktop Environment** can be customised to look like a familiar Windows or Mac desktop and is already being shipped by the Free Software Foundation.

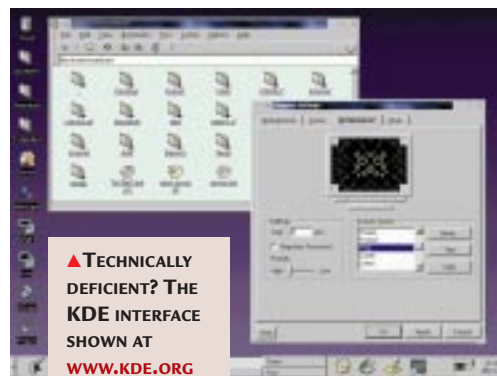
Gnome, introduced at last month's Linux World show in San José, provides an advanced toolkit for customising graphical user interfaces. It will also become the standard GUI for Red Hat Linux, the most popular Linux implementation.

Some 250 programmers have been working on the project for the last 18

months, most of them in their free time, but it has also been supported by a number of full-time Red Hat developers. Miguel De Icaza, 26-year-old leader of the Gnome initiative, says it will help Linux to break out of its techie circle and appeal to consumers.

Linux does not have a standard GUI of its own, but provides a range of GUI libraries for developers to use. The most popular Linux GUI to date is the K Desktop Environment (KDE).

But De Icaza said: 'KDE



has technical deficiencies, and not only uses up too much memory, but also does not include many features that developers want.'

However, Ransom Love, president of Linux vendor Caldera, said: 'There's a lot of momentum behind KDE.'

But he said Caldera may support Gnome as an option.

Battle against fragmentation

A three-pronged plan is under way to prevent Linux being fragmented like its parent, Unix. The **Linux Standard Base (LSB)** has to ensure compatibility between Linux versions without stifling innovation, project leader Daniel Quinlan said.

He spoke shortly after Corel announced it is shipping its own version (see box, right).

The development of the Linux kernel is tightly controlled by its author, Linus Torvalds. But the commercial and non-commercial Linux distributions have considerable freedom. This means that applications written for one version will not always run unmodified on another.

Quinlan said applications

written to LSB will run on all supporting Linux versions. He would also like to make Linux distributions look and behave more alike.

'We don't want to tread on the distributions. We want them to be unique,' said Quinlan. 'It's good that there are five or six major distributions which are each good at different things.'

The three prongs of the project are: first, to define basic Linux functionality; second, to create suites to test applications and distributions for compliance;

and third, to deliver a sample implementation.

LSB is at an early stage but is supported by most Linux vendors.

Corel, which has posted a free Linux-based WordPerfect, is to ship its own version of the operating system, its chief executive Michael Cowpland (pictured) said in a keynote speech. The version, aimed at increasing Linux use at desktop level, will feature a simplified setup procedure and automatic hardware detection. It will also come with a Java virtual machine. Corel Desktop for Linux, set to launch in November, will probably come with a suite of Corel applications for about \$50; it may be available alone or preinstalled.



Adobe dishes up dynamic design

Adobe has unveiled what it claims is a revolutionary new page design technology, with the first showing of an early beta version.

InDesign, codenamed K2, can open and edit Portable Document Format (PDF) files, as used in Adobe's Acrobat, although its native file format is a database of collected objects. And it will output directly in PDF, bypassing the PostScript stage, resulting in exceptionally clean Acrobat documents.

It is actually little more than a very small plug-in handler, but Adobe is quick to point out that it is entirely customisable. Upgrading will

be a simple matter of swapping one plug-in for another, avoiding major rewrites, and it can be set to update itself automatically.

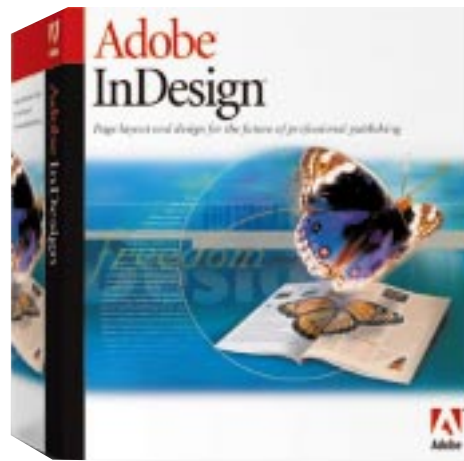
Innovations include frames that can be reshaped along bezier curves, frames defined by clipping paths, and text that dynamically resizes to retain proportions as the user resizes a text box.

InDesign is expected to ship this summer for both Windows and Mac.

Adobe also announced **PressReady**, for colour proofing with inkjets and ICC (International Colour Consortium) profiles rather than expensive printing

presses. Inkjets have been renowned for inaccurate results. PressReady includes Acrobat Distiller, with which proofs can be sent for approval as PDF files.

Other launches slated for 1999 include FrameMaker 6.0, the technical document generator, PageMaker 6.5 Plus, positioned to rival Microsoft's Publisher, and Adobe GoLive 4.0 (known to



Mac users as CyberStudio) for handling graphically rich web sites of 100 pages or more.

NIK RAWLINSON

From little Acorns, Element 14 grows

Silicon, element 14 in the periodic table, is the building block of IT. Not surprising, then, that **Element 14** is the new name chosen for the company that was Acorn.

Its 100 or so engineers, still under the Acorn Group umbrella, will focus on the next generation silicon and software intellectual property (IP) for multimedia devices, initially in the digital TV market — including its Active range of interactive set-top boxes.

Three years ago, Oracle chose Acorn to make reference designs for its set-top box. It sounded too good to be true, and it was. The company has also turned from an early focus on Video on Demand systems for which a business case did not exist, says sales director Andy Mee.

Element 14 is now working with Canadian digital TV specialist ImagicTV, an affiliate of both NBTel and Newbridge Networks, to provide 10,000 Active Digital Video Receiving Devices in the first commercial roll-out of broadcast TV over standard phone wires.

ImagicTV technology allows service providers to deliver digital broadcast television to residential

subscribers over Internet Protocol networks, Mee said. 'Their business software sits on our RISC software. We can integrate all the required multimedia services into their software and provide a user interface to the [telephone company's] end customers.'

It sounds like a cash cow. But can Element 14 stay ahead of competitors? Element 14 claims to be the only company selling a system that can be used down an ordinary phone line. 'We have specifically chosen telcos as it is the area set to explode,' says Mee. 'Satellite and terrestrial is pretty much a done deal from the technological perspective.'

At the time of going to press a European telco had signed up and two more had pens poised. Element 14's second focus will be on media processors, which Mee says are the 'cutting edge of future technology.'

In January Element 14 took on a team of people who were previously at ST Micro Electronics in Bristol. 'This is a crack silicon implementation team

working alongside our site to create a new, licensable IP (Intellectual Property) for the media processors of the future. That way, we will continue to build set-top boxes — which will be the shop window for silicon IP — and look to integrate set-top boxes into home control units.'

The interactive set top box is intelligent and will extend its reach into home-based wireless communications as network infrastructure increases. 'As the pipes get fatter, we can send more multimedia and internet entertainment and better quality pictures down the line,' says Mee.

'In the next 10 years it will be possible that when the front door bell of your house rings, from your mobile phone you will be able to view the person standing there, from wherever you are, and then communicate with them direct. This will be possible because every appliance with a chip in it will be linked up through a home controller unit — and at the heart of that will be our set-top box.'

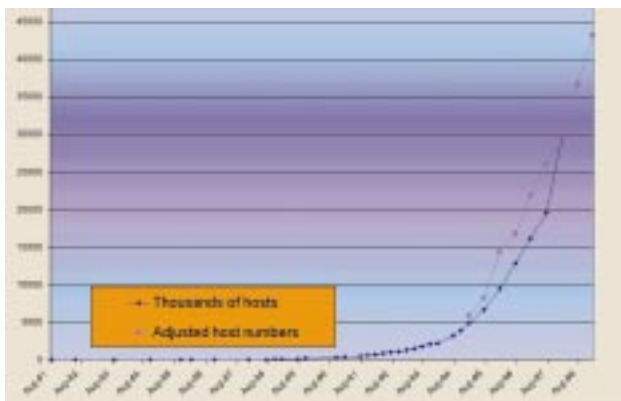
www.e-14.com

Caroline Swift



continues her reports from Silicon Fen

Internet tops 43 million



◀ **NET GROWTH SINCE 1981: A TIME WHEN THE NET TOOK SOME FIVE YEARS TO GROW FROM 231 TO 5,000 MACHINES**

The top domain is predictably .com, which grew by 18 percent to reach

There were at least **43 million machines connected to the internet** at the start of this year and the number is growing at an annual rate of 46 percent, according to a twice-yearly survey by consultancy Network Wizards.

The estimate, based on a crawl around domain servers, is regarded as a minimum figure because

some networks will not divulge details of linked machines. The figure for this time last year was 29,670,000 machines. Only about one in five machines are active at a time, according to a mass ping of listed addresses.

The survey is taken seriously by the industry as it is based on figures as opposed to forecasts.

12,140,747 hosts. The domains .edu and .net saw growth rates of 13 and 26 percent, taking second and third positions.

Although the above three still have the most hosts, the highest growth rates were actually in international domains, topped by Taiwan with the domain .tw.

JAN HOWELLS



Want a picture to brighten your newsletter? Or perhaps you're a media pro looking for an instant source of images? Kodak has set up an online library of royalty-free images at www.photodisc.com/uk which lets you search on keywords. The picture (left) was one of scores offered for 'bathing'.

A bug's eye view



A special lecture delivered by entomologists from The Natural History Museum celebrated the release of the film *A Bug's Life* as part of Internet Month and in support of the Government's Year of Reading initiative. Many pupils across the country have been set coursework tasks based on the Disney animation in the hope of helping children to gain a better understanding of different cultures and their natural surroundings. Information can be found at www.bugslife.co.uk.

ETELKA CLARK

Trainloads of profit as Virgin puts its booking system online

Virgin launched a web train-booking service last month as part of a £50m investment in the internet. The service, which can also be used to plan journeys, covers any train operator and shows the kind of money big operators may reap when the web goes mainstream.

Virgin stands to make up to 9 percent commission on bookings made for rival lines, and it reckons already to be selling up to one in five tickets by phone — sales which could easily translate to the web.

Chairman Richard Branson hopes to match the success of American airlines, which are selling 17 percent of tickets online.

Virgin reckons that there is nothing to match its

train booking service in Britain, though other companies are bound to follow suit. The interface, at www.thetrainline.com, has a couple of rough edges but is easy to use.

The company has just made its access via Virgin.Net free (see pp58-59) in a bid to draw users to its home site. 'You will be able to hit Virgin.com and go into Trainline and a mass of other services, including financial services. Anything anybody needs,' Branson said at the Trainline launch.

He expected Virgin to be a major player on the net because the brand is known worldwide. 'I think brands will be more important in a virtual world anywhere else,'



▲ ON THE RIGHT LINES: VIRGIN'S ONLINE TRAIN BOOKING SYSTEM IS SET TO BE A HUGE MONEY-EARNER FOR BRANSON AND CO

he said. 'If you tap into a brand you have never heard of, are you going to trust them with your money?' He predicted that e-commerce will take off with the availability of easy access via TV set-top boxes. 'They

avoid the complications that people of my age, the over-forties, have with the technology.'

CLIVE AKASS

● Branson interview: see www.pcw.co.uk

short stories

INTERNET EXPLORER 5.0 — THE FINAL CHAPTER

As we went to press, Microsoft was due to post the final release of Internet Explorer 5.0 at its web site. It was also available by pre-order on CD-ROM and will be available on our cover disk as soon as possible — perhaps next month. IE 5.0 includes improved search, navigation and organisational capabilities and for the first time will be released simultaneously in Windows 98, 95, NT 3.51, NT 4.0 and Windows 3.1 versions. Other versions for Sun Solaris and HP-UX will also be made available.

JAN HOWELLS



DISNEY UK

Disney has launched a UK site offering games, interactive stories, activities and educational features tailored for British kids. Attractions include Disney sounds and wallpaper, and drawing lessons. www.Disney.co.uk

BOL BOOKS

Bertelsmann has launched online bookstores in England, France and Germany. The UK site will later sell CDs and videos. Bertelsmann Online (BOL) hopes to woo customers from Amazon with a localised service rather than heavy discounts. www.bol.com



Open source boost for Web 3D

Platinum Technology has placed the source code to its Virtual Reality Modelling Language (VRML) software in the public domain, in a move which may boost the market for 3D web products (reports Dominique Deckmyn from Silicon Valley).

The code of its VRML browsers and authoring tools will be handed to the Web3D Consortium, an industry group which includes Microsoft.

The Consortium, formerly named the VRML Consortium, will decide within a couple of months how and when the code will be made available to

developers. Neil Trevett, president of the Web3D Consortium, said: 'Open source is definitely the way to go. It allows technology to be developed and deployed much faster.'

Platinum has been a driving force behind 3D web technology and standards. Last year it acquired two key companies in the shape of Intervista, which developed the World View VRML browser, and Cosmo, a former Silicon Graphics unit.

Platinum recently cut 1,000 jobs, or 15 percent of its workforce.

short stories



VIDEO STAR

Belfast-based Blackstar claims that it is the United Kingdom's biggest video store, and that it is all set to become to videos what Amazon is to books. Selling over 50,000 tape and DVD titles — obscure in addition to mainstream — it will help you track down rare and deleted titles. UK delivery is free within two days and the company claims to be cheaper than high-street stores. For the time being, all titles are PAL format or Region 2 DVD. www.blackstar.co.uk, 01232 463636

FIXED ABODE

You can buy a web and mail address that will last a lifetime, whoever your service provider, under a scheme launched by NetBenefit. All mail and web hits at the address are redirected to your chosen account under the I-Dress scheme. NetBenefit 0800 592755



MAKING ITS MARK

The Patent Office is now publishing on the internet all its decisions on patents, trademarks and designs. www.patent.gov.uk

Net over the mains, plugged

Trials of a system of gaining internet access via mains power supplies are continuing despite problems with electrical noise.

The Digital Powerline (DPL) system, developed jointly by United Utilities which owns Norweb and North West Water, and networking giant Nortel, offers data rates up to 1Mbit/sec.

It links a PC via a 'user terminal' through the mains to the nearest substation

from where it is sent by optical fibre to a service provider. The link, as with ADSL and cable modems, is always on.

Norweb has a DPL trial running in Manchester; and Citytel, telecomms arm of Milan power utility AEM, says it is pleased with the speed and download quality of a DPL trial last month involving Italy's Cariplo Bank.

Italy's national electrical company **ENEL** began

testing digital transmission in Rome four years ago. Users have yet to be offered an internet connection but they can access their electricity accounts through television links.

But Wind, a division of ENEL, recently abandoned an internet-via-DPL trial after deciding it was not commercially viable. Analysts say problems include line noise and the fact that many homes would need rewiring.

JAN HOWELLS



An udder dealer's site

PG Wodehouse fans will be aware that antique cow creamers loomed large in the lives of Bertie Wooster and his butler, Jeeves.

Cow creamers, believe it or not, do exist and are still doing the rounds of dealers. You can trace them, and any other antique, via a newly enhanced site for collectors

at www.icollector.com. Moreover it uses the Empower intelligent agent engine from Cambridge-based firm, Muscat, to keep track of new objects of interest which appear on the market. Muscat <www.muscat.com> says the technology has a wide variety of e-trade applications.

No-copy law may jam net

Labout Euro MP Christine Oddy is trying to overturn a proposal that threatens to **bring the web to a standstill**.

Euro MPs voted to ban the unauthorised copying of material as it is being transmitted over the internet. But the measure, part of a proposed directive on electronic commerce, would have outlawed the caching of popular material on local servers to speed access and minimise network traffic.

Oddy is to table an amendment to get around the problem. The move was welcomed by the European Internet Service Providers Association.

A spokesman said: 'I'm pretty sure that Euro MPs did not really know what they were doing. A definition of caching could undo some of the damage done in the vote on copyright.'

Oddy also plans an amendment to restrict junk email.

KIM BENJAMIN, BRUSSELS

Holiday trip help

Off to the delights of the Dordogne this year? You can plan your route anywhere in Europe at the French site www.iti.fr. And there's no need to dust off that GCSE *parlez-vous* just yet, as the site has an English option.

Merced meets the press

Mike Magee gets a preview of Intel's long-awaited 64-bit processors.

Intel's IA-64 Merced processor is now far more of a reality than it seemed only one year ago. At the Intel Developer Forum, a bi-annual event held in Palm Springs, California, in February, we were able to quiz Stephen Smith, the Merced programme manager, who allowed us not only to photograph the package, but was also prepared to discuss the markets and applications Merced will be made for.

Smith said that Intel has so far booted seven operating systems on Merced, including Linux and Win64, and although the cartridge design he showed us included no silicon, he said that his development team was still on target to ship samples in June of this year.

When those samples are shipped to selected Intel PC vendors, the processor will go through rigorous testing before it is finally released as a product in June 2000.

The cartridge design, which Smith said is the size of a standard American index card (5in x 3in), weighs around 150g and is about one third of an inch thick. Level 2 cache is on a small card which slots into the packaging, with the interface between the CPU and the L2 cache running at full clock speed. Intel is using its own custom designed SRAMs for this card.

This card slides into what is called the Pin Array Cartridge (PAC), which has approximately 600 ball connectors soldered directly to a motherboard. The base (actually the top) of the cartridge is an alloy two or three millimetres thick. A heatsink will be bolted to each Merced processor.

On the side of the package are clip sockets. Initial systems are likely to be four-way, with two cartridges clipped to the underside of the motherboard, and two clipped to the top. Smith said: 'We're driven by the electricals. We deliver the power to Merced through an edge connector. Next to the microprocessor will be a DC-to-DC power pod, feeding the cartridge through a copper connector.'

The cartridge design is practically complete and he said there will be only

'minor' modifications from this point on.

Smith was reluctant to discuss clock speeds at this early stage; but a separate presentation by an Intel executive only two days before, included information on what seemed likely to be a model for Intel's SRAM on the cartridge. A slide showed 16Mbit SRAM using six metal layers and 21 masks, with over 100 million transistors, a 207 square millimetre die size, and running at 900MHz. As Intel has demonstrated processors running at 1GHz, 900MHz is likely to be the base speed of Merced when it arrives.

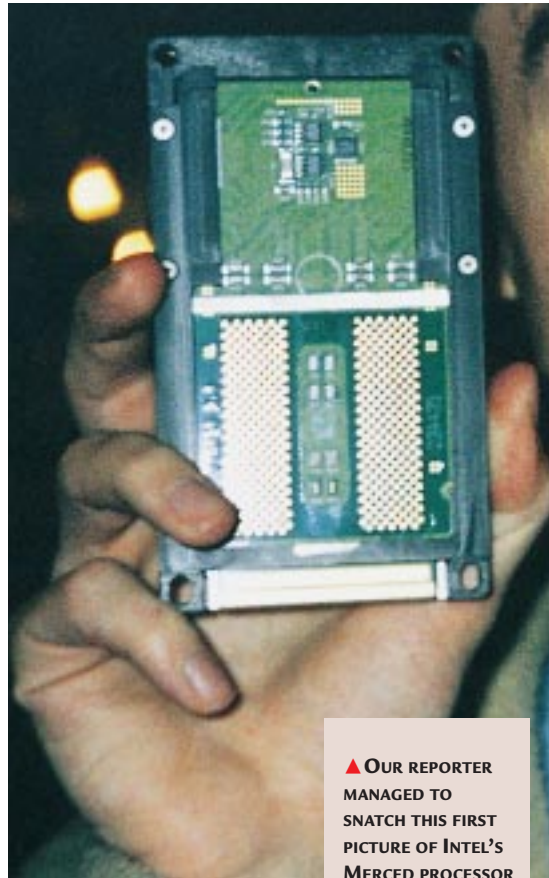
The chips will use .18 micron process technology and Intel is currently in the process of converting suitable fabrication plants from .25 micron to the faster and smaller technology. It will therefore not use copper interconnects, which do not arrive until .13 micron technology becomes available, probably in the next 64-bit processor, codenamed McKinley. Smith said: 'Everything is there, apart from the silicon. This is a prototype of the cartridge, with connectors similar to the pin grid array.'

Intel is currently testing silicon using a large number of

workstations and Smith said that it is has already managed to boot an OS at a gate level. The simulations are run on hundreds of workstations, he said.

The company is cooperating with Hitachi, NEC and Siemens to produce a four-way server chipset. Independently, HP, which helped Intel produce the EPIC software for Merced, will announce its own chipset next month.

Fewer computer manufacturers are cooperating with Intel on the Merced design than were involved in IA-32



▲ OUR REPORTER MANAGED TO SNATCH THIS FIRST PICTURE OF INTEL'S MERCED PROCESSOR

development, the reason being that IA-64 is aimed primarily at specialist machines running several processors in parallel. That means that in the early days, supply of the processors will be limited and the market for high-end servers will be comparatively small, compared to IA-32 architecture.

Merced is backwards compatible with practically all IA-32 based applications, using a hardware emulation mode built into the processor. Those applications will be unable to take advantage of additional registers, parallel functional units, new IA-64 instructions, new floating point instructions, new MMX instructions or the branch prediction capabilities Merced will have. That is likely to mean end-users will not see a boost to existing application software. Instead, applications aimed for the platform will need to be ported to 64-bit and run on a 64-bit OS, such as Win64.

The simulations are run on hundreds of workstations

Lotus slips up as Notes R5 is delayed

The long awaited release of Notes and Domino Release 5.0 has been delayed yet again, this time until the end of March.

Lotus promised back in January that the product would ship in February. But as the deadline approached, CEO Jeff Papows (pictured, right) posted a statement apologising 'for attempting to predict a precise completion date during the last stages of a software development project.' He said no major new problem had emerged, but Lotus needed 'a few more weeks to wind down the final-stage development and build cycle.'

Analyst Clive Longbottom, of Strategy Partners, said Lotus had



dropped a 'massive goolie' which meant anyone implementing R5 would be expected to do so in the crucial months

leading up to the new millennium.

He thought organisations might now wait until the (even more delayed) release of next versions of NT and Exchange, Microsoft's messaging product which comes closest to offering the co-operative working features of Lotus Notes.

'R5 is good — and is critical to Lotus' survival. This extra one month delay will not go down well,' said Longbottom.

Analyst Simon Hayward, at Gartner Group, agreed: 'Every day of delay costs Lotus more revenue in 1999, and a greater risk that companies could delay implementation until 2000.'

JO PETTITT



Portable Add-ons is offering a £160 upgrade to its 33.3K and 56K FreeSpirit PCMCIA modems that will enable them to connect using ISDN on BT Highway at up to 128Kbits/sec. The FreeSpirit modems cost £159 ex VAT.

TDK is offering the Global Pro multifunction card, which can connect using ISDN or a 56K modem connection, for £229 (ex VAT).

TDK 0118 921 6230; Portable Add-ons 01256 361 333, sales@portable.co.uk

USB NET LINK

3Com is offering a link which allows mobile users to plug



directly into an Ethernet net via a USB port. It is expected to sell for around £43.

3Com 0118 927 8200

Fujitsu penpad goes vintage for ruggedness

Offering a 166MHz Pentium-based laptop for £2,049 (ex VAT) seems a little like fitting a Model T Ford engine to a modern car and trying to flog it for £15,000. But this is just what Fujitsu Personal Systems is offering with its pen-driven Point 1600 mobile.

Companies who buy these machines for niche tasks like accident reports or mapping updates are more concerned with reliability than performance and they get big discounts on bulk purchases, says FPS's international marketing director, Louis Jouanny.

'The use of the 166MHz Pentium keeps down the heat and prolongs battery life to four hours. These machines come with a three-year warranty, which you wouldn't get with a

normal notebook,' said Jouanny.

In addition to twin PCMCIA slots, USB and other standard ports, the 1600 has a ruggedised 4.1Gb hard drive and docking space for a wireless-LAN module (as above) or a custom add-on. FPS also offers the 233MMX Pentium-based Sylistic 2300, with a dual mode 8.4in colour screen which uses natural light for illumination outside and backlight for indoor viewing, at £3,398 ex VAT.

Standard laptops do have a poor reliability record: IT managers say as many as one in three fail each year. The issue was raised early this year in a US report criticising Compaq notebooks. Peter Orre, European business unit manager for commercial portables, denied last month that Compaqs have a particular problem. He admitted that historically portables had been 'plagued with customer satisfaction problems'. He claimed Compaq had improved its models a lot and that complaints may stem from 'legacy issues'.



◀ **Rugged notebooks**, once the domain of specialist companies like Husky and FPS, went mainstream last year with Panasonic's ToughBook line. The new Toughbook 27 uses a 266MHz MMX Pentium. Prices start at £3,199, ex VAT, including a three-year return-to-base warranty.

Panasonic 0500 40441;

www.panasonic.co.uk/toughbook

Hack attack

John Leyden reports on the Government's response to the threat of cyber-terrorism.

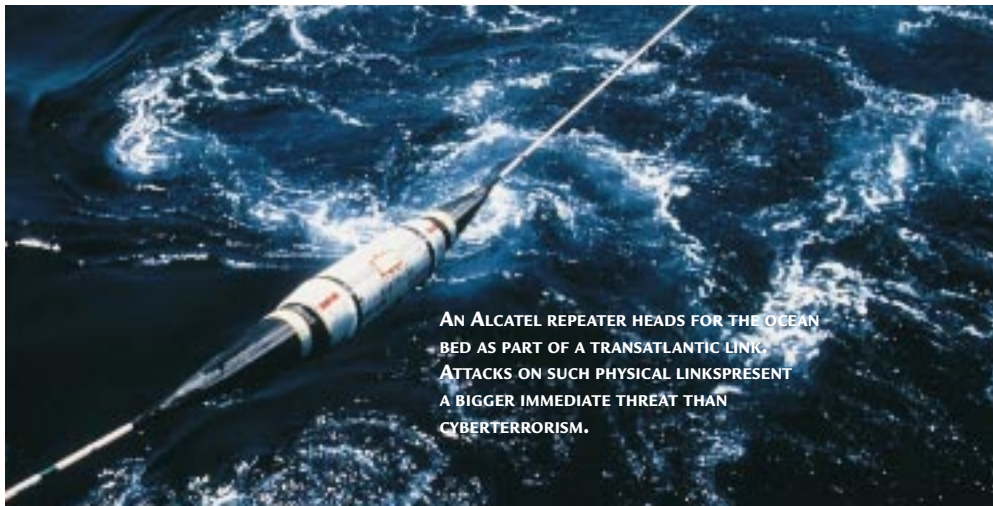
The Government has recognised that it needs businesses to help tackle the growing threat of cyber attacks against Britain's infrastructure. Classified MI5 documents indicate that the threat, long the stuff of James Bond films, is real. The PC can now be as much a part of the terrorist's arsenal as the bullet or the bomb.

The security service's last Unified Incident Report and Alerting System study showed incidents of unauthorised and criminal hacking had increased by a staggering 300 percent. Margaret Beckett, Leader of the Commons, has launched a campaign to protect Britain's information systems from attack.

She told a London conference called Protecting the National Information Structure that utilities and telecommunications were the sectors of the economy most at risk. 'I don't want to exaggerate the danger of a malicious attack on the infrastructure, but it is real,' said Beckett. 'There is a need for everyone involved to share information as openly as possible, despite the acknowledged sensitivities.'

She outlined a plan to bring together Government agencies like GCHQ and the private sector to promote best practice, as specified in the information security management standard BS7799.

The Government also pledged to work with the private sector to develop new techniques and technology to protect information assets, detect intruders and track criminals across the



AN ALCATEL REPEATER HEADS FOR THE OCEAN BED AS PART OF A TRANSATLANTIC LINK. ATTACKS ON SUCH PHYSICAL LINKS PRESENT A BIGGER IMMEDIATE THREAT THAN CYBERTERRORISM.

internet. It also promised to act as an 'honest broker' to promote the open sharing of information.

The initiative parallels one launched by the Clinton administration, which in January pledged \$1.46bn to combat cyberterrorism in the US. No extra cash has been promised in Britain.

Julian Whitehead, senior consultant with security firm PCSL, said the consequences of an attack could be dire, though the risk of one is low.

GCHQ's Communications Electronics Security Group (CESG) organised the conference, the largest ever meeting between government and private data-security chiefs. The CESG is working with key companies to carry out net health checks and test for vulnerabilities, a senior official said. 'We hope very much to do it by cooperation and careful private conversations.'

But the main threat still comes from conventional terrorism. A bomb at London's Telehouse comms centre poses a greater risk than any logic bomb or cyber attack yet seen. Whitehead said: 'Cyber attacks would not provide ... the same satisfaction of revenge through bloodshed, but could achieve other important terrorist objectives.'

TERROR BY KEYBOARD

A war game conducted by the US National Security Agency showed that hackers could disable the US Pacific command and shut down the national grid.

Hackers have boasted in US Senate testimony that they can bring down the national phone network by interfering with high-speed switches that link carriers' networks.

And last year an Israeli teenage cracker, known as Analyzer, claimed to have high-level access to as many as 400 unclassified government and military computer systems. A clearer case of cyberterrorism, defined as a politically motivated attack on information systems, occurred this year when the web servers of Connect Ireland, which hosts the East Timorese web domain, were brought down after a concerted, long-running attack.

The Irish service provider believes it may have been targeted by the Indonesian Government because it gave the annexed island of East Timor a degree of virtual sovereignty. Still more alarming was a claim by a group called MiliwOrm that it broke into the network of India's Bhabha Atomic Research Centre and stole details of nuclear weapons and testing programmes.

It exploited a well known loophole in Unix Sendmail to gain access via BARC's web site, and covered its tracks by using a series of intermediaries. The group said: 'The world is lucky we're so nice.'

Key move on encryption

Best security practice will not deflect the Government from an encryption policy which involves copies of scrambling keys being concentrated in central locations which invite attack.

Under a long awaited e-commerce Bill, licensed

bodies would place copies of keys with bodies called Trusted Third Parties.

These 'escrowed' spare keys will be available under warrant for covert use by police and security agencies. A consultation paper was due to be issued in time for the Bill to go

through its first stages before Easter, senior DTI officials said.

This seemed optimistic, given that policy has moved forward little in the past year and that the Bill's greatest backer, Peter Mandelson, has resigned.

Power struggle

Everyone wants the power of the **Pentium III**; but when? Soon, says Tim Bajarin.

Everyone is excited about the new level of power the Pentium III chip brings. But business and home users alike are struggling with the issue of when to buy.

The problem has been around since 1992, when Intel introduced the original Pentium and users tried to anticipate future demand and balance it with current needs.

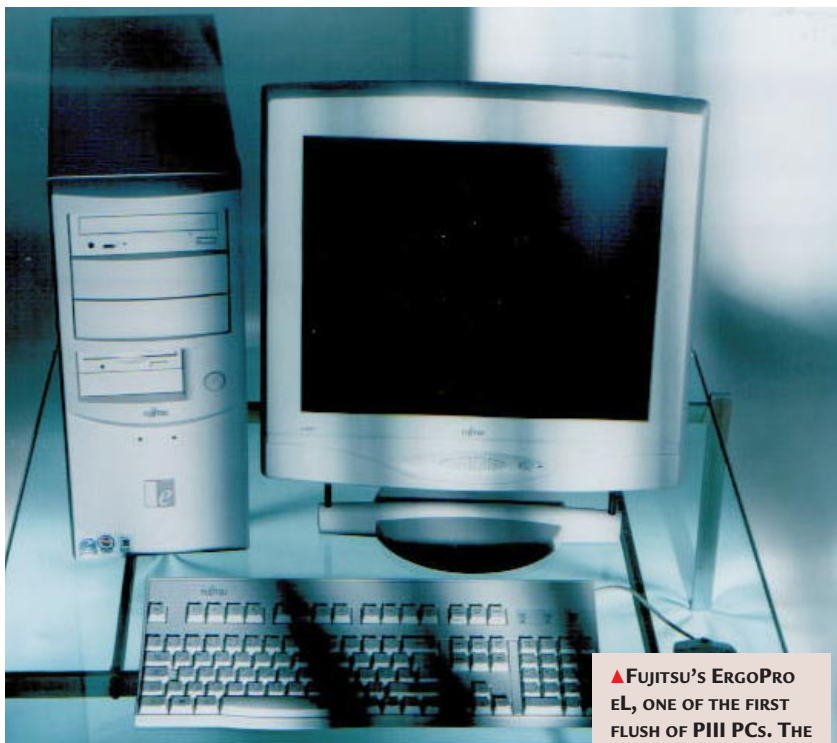
The decision is especially tricky now that PC prices have dropped while performance continues to rise. We can use Moore's law as a rough measure of how fast processors will get. Gordon Moore, a co-founder of Intel, reckoned that processor power doubles every 18 months; this means that PIIIs introduced today at 550MHz should give way to 1.1GHz designs by 2001.

Moore told me a year ago that his law would hold good until the end of this decade; but he reckoned so many bright engineers are working on semiconductor design that beyond 2001 processor speeds could start tripling every 18 months. That may be a bit optimistic, but there is no question that this power curve upward will continue for some time. That leaves users in a very interesting predicament and Intel with a serious marketing challenge.

The camp led by Sun, Oracle and the Java world believes adding more processing power to the desktop is ridiculous. It is trying to move users to the thin client model, putting all the applications on the network. The approach is gaining some steam, but is hampered by the fact that few as yet enjoy high-bandwidth networks.

The irony is that this same lack of bandwidth is making the PIII hard to push. In the thin client model, all the processing speed you need for current and future applications will be on the server: you just dial in to the application and run it off the network. In the desktop client model, you place the processing burden on the desktop and use the network to deliver the video, stereo audio and 3D animations needed for any program you run.

I see benefits from both approaches. However, after being a full-time observer of this market for close to



▲ **FUJITSU'S ERGOPRO EL, ONE OF THE FIRST FLUSH OF PIII PCs. THE 450MHz MODEL COSTS £1368 EX VAT**

20 years, I have become a realist as well. Sure, there are still billions of users who have never touched a PC and would be ripe for the thin client model. But it's my belief that the way people learn how to use a PC is by watching the way people use them today and then emulate that usage themselves.

So, until cheap, high, data speeds become universally available, the desktop approach will drive PCs into new users' homes and businesses. This doesn't mean that the approach of Sun and Oracle will not dominate some day, but if they think it will be adopted quickly they are deluding themselves.

In the meantime, Intel's challenge is to convince the mainstream market that a move to PIII is worth the cost. In this arena, Intel has two major problems to overcome. While early adopters in both business and consumer markets will buy PIIIs when they come out and are still expensive, they must move mainstream users over to the PIII platform quickly if they want to continue their leadership and growth in the PC market.

The first big challenge will be to get the prices of the PIII chips down

quickly. Intel will probably do this in two ways. First, it will bring out PIII Celerons at 450MHz speeds by summer and push them into sub-\$1000 PCs by Christmas. And, the company will work with current vendors to get true PIIIs into consumer-priced PCs as fast as possible.

We hear that at least two vendors will have sub \$2000 450MHz PIIIs by May. But the second big challenge is convincing business and consumer users that they need this much power at the desktop when high-speed bandwidth is not widely available and few applications today are optimised for the PIII.

At the PIII launch in San José in mid February, Intel did show as many as 125 applications that are being PIII optimised, but most will not be on the market until summer or early autumn. This alone could keep the PIII from fast adoption in 1999.

However, people buy speedier processors in anticipation of future applications. So although the PIII may get off to a slow start, it could be a runaway bestseller by Christmas and dominate the market by early 2000.

GAMES NEWS

Madness reigns as racers take Chicago



▲ SCARY MONSTERS AND SOME SUPER GRAPHICS FEATURE IN THE NEW **QUAKE**, OUT SOON

We've had Tomb Raider III, and now we're **awaiting the release of Quake III** in the hopefully not-so-distant future.

The third instalment will feature a completely new graphics engine that is optimised to take advantage of the latest advancements in high-end, 3D graphics acceleration. There are new realistic environments along with phenomenal single-player action. We'll bring you updates as we get them.

Microsoft has gone all out to extend its thrill barriers. Gone are the days of racing bikes or cars on tracks or open, hilly landscapes. You can now race competitively in the heart of downtown Chicago. Due for release in June, **Midtown Madness** will apparently feature city detail that will amaze you. Over 80 city landmarks will be included, along with hundreds of interactive objects such as parking meters and working bridges. Drivers will have to navigate shortcuts through

alleys and buildings, and avoid all manner of obstacles, including pedestrians. Chicago is complete with changing weather patterns, traffic jams, and police — a serious nuisance. Look for an update in *Screenplay* soon.

Gremlin has launched a new addition to its Actua Sports range.

Pool Shark is a realistic pool simulation that creates 10 fully 3D polygonal poolroom environments including a gentleman's club, a surf shack and a casino. The game also has a full 3D physics engine so that all your ball movements are as true to life as possible. Out soon, Pool Shark will be priced at £39.99. Watch out for a review in *Screenplay* next month.

Fancy straining your eyes and giving yourself a blinding headache? If your answer is yes, try SimCity for the Psion Series 5, out now.

ETELKA CLARK

Top 10 products Last month

Peripherals

1	Dynamode 56K PCI Modem	DYNA	1
2	3COM 56KV90 Voice/FX Ext	3COM	4
3	SoundBlaster Live! Value PCI	Creative	7
4	Astra 1220U USB scanner	Creative	-
5	SoundBlaster PC128 PCI	Sony	6
6	Typhoon Gold Wave 3D ISA	Typhoon	20
7	SoundBlaster Live PCI	Creative	21
8	56K Message ModemX	3Com	-
9	Dynanet 56K Ext Modem	Dyna	-
10	Sidewinder gamepad	Microsoft	-

Windows software

1	Windows 98 UG CD	Microsoft	4
2	Office Pro 97 + Books UG	Microsoft	8
3	AutoRoute GB 2000	Microsoft	-
4	Office 97 Stand V/Comp	Microsoft	11
5	Encarta RefSuite 99	Microsoft	13
6	Norton System Works V1	Symantec	12
7	Paintshop Pro v5 FP CD	JASC	15
8	Office 97 C/V UG MLP	Microsoft	-
9	Partition Magic 4.0	POW	18
10	Norton Anti-Virus v5	Symantec	10

DOS software

1	Turbo Pascal v7 DOS Educ	Inprise	1
2	Turbo Pascal v7	Inprise	2
3	NetWare 3.2 five-user	Novell	-
4	NetWare 3.2 ten-user	Novell	14
5	NetWare 3.12-3.2, 10-25 us.	Novell	-
6	NetWare 5 U/G Server 25 us.	Novell	-
7	NetWare 3.2 5-user U/G	Novell	-
8	LapLink v5	Traveling	-
9	SuperCalc v5.5	CA	6
10	Intran'ware 25-user add-on	Novell	-

CD-ROMs

1)	Simpsons: Cartoon Studio	Fox Int.	4
2)	South Park Screensaver & Utilities	Telstar	1
3)	Dancing Baby Screensaver	Guildhall	5
4)	Star Wars: Behind The Magic	Activision	6
5)	James Camerons Titanic Explorer	Fox Int.	5
6)	Dancing Baby CD Player	Guildhall	7
7)	Rave Ejay	Fasttrak	9
8)	Dance Ejay	Fasttrak	8
9)	Hip Hop Ejay	Fasttrak	10
10)	Encarta 99 Deluxe	Microsoft	-

Games

1	Alpha Centauri	EA	-
2	SimCity 3000	Maxis/E.A.	-
3	Simpsons: Virtual Springfield	Fox Int.	5
4	Delta Force	Nova Logic	-
5	Half Life	Sierra	6
6	Baldurs Gate	Interplay	2
7	Simpsons: Cartoon Studio	Fox Int.	-
8	Grand Theft Auto	Take 2	7
9	Rainbow Six	Red Storm	-
10	Starcraft: Brood Wars	Havas Int.	4

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

Free access: what's the catch?

Well, there isn't one ... yet, conclude PCW writers who tried **six free services**. Clive Akass reports.

X-stream, Britain's first fee-free web access service, celebrated its first anniversary in March by offering its nearly 200 thousand subscribers an evening's surfing via a freephone number. The service, at www.x-stream.com, depends on advertising for its revenues.

Launched around the same time was a similar service from Telinco (see opposite), one of many companies that have taken advantage of measures to break BT's hold over the UK phone market. These allow it to take a cut of charges for phone calls that it generates.

The two services exemplify the two main ways fee-free access is financed at present. A third revenue source is the sale of goods and services: e-commerce. This will be slower in developing but promises to be so big that companies are willing to treat web access almost as a loss leader to draw in users. Virgin is taking this long-term view (see page 40).

So what are the snags? You get more adverts on free pages, pushing up load times and thus your phone bill, so the link isn't truly free. But much web content is financed by ads, so this is nothing new.

Cornwall reader Chris Hudson-Rose reported a snag with services which need Caller Line Identification (CLI) switched on for accounting purposes. Hotel extensions and some small exchanges do not support CLI, so you may not be able to

Web access packages are notorious for irrevocably overwriting older configurations.

PC users have two ways round this. One is to create a new user profile (see Help under the Start menu for instructions) before signing on for a new service.

How to set up more than one account

More convenient, though trickier for the uninitiated, is to use Dial Up Networking (DUN).

Click the My Computer icon, then the DUN icon, then Make a new Connection, and fill in the dialogue

boxes. Some services do this automatically, or help you fill in details.

An icon for the new service will appear in the DUN box and you can create a short cut by right-clicking the icon

pick up email on the move. Harder to gauge is ease of access. This can fluctuate wildly by the hour even on a paid-for service; and companies cannot always install capacity fast enough to keep up with rapidly increasing user numbers.

Yet no service has grown as rapidly as Freeserve, which claims a million active (as opposed to signed-up) users, and relatively few readers have complained to PCW about access or adverts: we've had more in the past about paid-for access.

Readers have reported slowdowns and email problems, but we had no major hiccups in our trial of six services, reported opposite. But these are early days, with a phenomenal 10,900 new users signing up a day in Britain alone, according to a National Opinion Poll survey.

It remains to be seen if this boom will cause slowdowns and excessive advertising. But free services are not immune to competition: if you aren't satisfied, you can freely go elsewhere. Many people seem already to be signing on to more than one

service to see which is best (see above).

Multiple ISPs may become the norm, according to Richard Wood at UUNet, part of giant MCI World Com, which offers a package called UUDial VIP that lets companies offer free access under their own brand. This is the service Gateway is bundling with its PCs.

'UUDial allows companies to create a special relationship with users,' Wood says. 'It also provides an extra level of security if transactions are involved. We may reach a point where you go through Gateway's service for anything to do with PCs, or via a bank-provided service to deal with your account.'

'Different members of the family may use different accounts. Dad might use his bank service, for instance, while little Johnny goes through arsenal.com because he likes to use that as an email address.'

If Wood is right, we may be moving to a situation where much web access works on a freephone number, paid for by the business accessed.

AOL claims eight to ten thousand new users join it each week in Britain. How many of these are trial sign-ups, and how many are leaving, is unclear.

What is certain is that there has been a drift to the free services, but that many fee-payers are sticking by their providers. This may be from inertia, or a feeling that paid-for *must* be better.

AOL also generates a sense of community and targets users who need a friendly way to use the net, says its spokeswoman, Rachel O'Neill.



Why it may still pay you to pay

Businesses are more likely to be swayed by the quality and variety of services on offer. Travelling staff need to be sure they can access vital information on the move, either in Britain or abroad.

Companies may want email forwarding, or copious web space and e-trade facilities. And if something goes wrong, they need to be able to call on someone to put it right. And the overhead is not high if you can claim it against tax.

The web is being woven increasingly into the fabric of

businesses, and not simply by providing a front window. It can extend a company's reach by acting as what is called a virtual private network (VPN).

A VPN is seen by staff and client companies simply as an extension to a company's internal network, though it is actually using a web link.

For this you need to be sure of a good link. UUNet business development manager, Karl Meyer, will guarantee line availability and response times.

'We can go anywhere in Europe and back in 80ms on

our own lines,' he said. 'Obviously, we cannot guarantee the response from a company using a line not

provided by UUNet. Neither do we have control over the speed of the server you are linked to.'

UUNet wins whoever pays for a link, because its pipes are used in any case.

Users who want a web link mainly for email have nothing to lose by trying the free services. But if your business depends on the web, you have little choice but to pay.



two-page report on the proliferation of free internet access services



LINEONE

LineOne is a joint venture between BT, News International, and United News and

Media. News is a strong point, as you get online versions of *The Times*, *The Sun* and *The Express*. Singing on via a CD was straightforward. Access was trouble free and speedy. The home page is easy to use with a choice of 12 content zones; it can be personalised. The Help page may avoid a call to technical support. Ads were unobtrusive.

Sign up: Via an 0800 number or the LineOne web site (see below). CDs are available.

ALANA JUMAN BLINCOE



BT CLICKFREE

Double-clicking the ClickFree icon, you go straight to a customised Excite search engine. Advertising is minimal, but BT does

use CLI (caller line identification) to check who is logging on. If you use CLI, you will have to switch it off before using.

Sign up: download a 6Mb executable, from www.btclickfree.com. You will not be asked for any information but are just dynamically allocated an IP number. Sign up for email access separately on the talk21 site.

ADELE DYER



VIRGIN

Virgin goes free from 1st April, so I couldn't judge how the dropping of

charges affected service. Access is generally reliable, however, and this is unlikely to change much. You can opt to

There are scores of free access sites, too many to test. Prominent among them are: GATEWAY <www.gateway.com> is bundling a UUDial service (see opposite) with new PCs. CABLE & WIRELESS <www.cwcom.net> offers a Web Lister pack for £10 but

pay £5.99 a month; all you appear to get for this is free technical support. Free loaders get full access to areas including travel and music. Virgin is pumping £50m into its online services starting with a train booking system (see page 40); offerings will include everything from record sales to financial services.

This may mean that Virgin will be less dependent on ads to be viable.

Sign up: Call (see below) for disk. Plans are afoot to make CDs available in Virgin outlets. Also bundled with iMacs and other machines.

CLIVE AKASS



TESCO

The Tesco CD installs Internet Explorer 4.01 SP1 over any previous version and takes you into a fuss-free registration. For technical support I was referred to an unobtainable number. The only stumbling block was the unconfigured email for which you might need the 50p-a-minute technical assistance. The site is friendly for the uninitiated, and a first-time user's guide includes the basics of creating your own web pages.

Sign up: Get a ClubCard and 50p connection pack from your local Tesco.

IAN ROBSON

And all the others...

access is free thereafter. Call 0800 0923013. Other services are offered by banks and football clubs. There's a list at www.freeaccess.bigwig.net/maintext.htm



FREESERVE

In a couple of months of testing we encountered only one engaged tone. There are no obtrusive ads appended to either incoming or outgoing emails, and those on the home page are discrete. The home page itself is comprehensive, providing an up-to-date news service and various lifestyle features. It's a useful springboard for internet beginners.

Sign up: Pick up a free disk from PC World, Dixons, Currys and The Link.

NIK RAWLINSON



TELINCO

A licensed phone operator

specialising in internet access. There is no fee for using the service; all they require in return for unlimited email aliases, 5Mb of web space and access to newsgroups is your home address and telephone number. There isn't even a catch with the technical support.

It's open 24 hours a day and charged at local rates. Connection was easy at most times of the day and at others I only needed to make two or three attempts.

Sign up: through the web site or call for a free CD-ROM.

ETELKA CLARK

	Line One	BT ClickFree	Virgin	Tesco	Freemove	Telinco
Sign up fee	None	None	None	50p starter kit to holders of (free) clubcard	None	None
Email*	POP3/SMTP via Webmail	Talk21 Browser based	POP3/SMTP Five addresses	POP3/SMTP	POP3/SMTP	POP3/SMTP
Newsgroup access	✓	x	x	✓	✓	✓
Support/minute	50p Free by email	50p	£1 or £5.99 per month	50p	50p	Local rate
Web space	10Mb	0Mb	10Mb	10Mb	15Mb	
Contact number	0800 111 210	0906 802 0240	0500 558800	0906 602 0111	0990 500049	0800 542 0800
Speed**	56K	56K/64K	56K	56K/64K	56K	56K
Web address	www.lineone.net	www.btclickfree.com	www.virgin.net	www.tesco.net	www.freemove.net	www.telinco.co.uk

* Note that POP3/SMTP means you can use common email clients like Outlook Express. ** 64K = single ISDN channel