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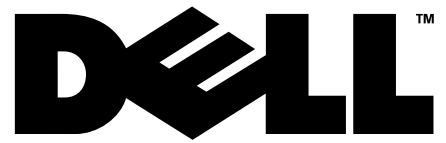
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E-W22

Editorial



kelvyn.taylor@incisivemedia.com

Return of the Mac clone

Suspicious are raised over one company's claims of creating cheap OSX-compatible computers and the £99 PCW PC is born

As I write this at the beginning of May, peering out at the drizzle from the tail-end of another miserable Atlantic depression, there's a different kind of storm brewing on the (presumably sunnier) shores of Florida.

A company called Psystar has guaranteed itself instant notoriety and press coverage by claiming that it's building and selling cheap Apple Mac clones, starting at \$555 (about £280) for a model without a monitor. As this is something that would put the company in breach of Apple's OSX licensing terms, and thus invite a shower of fire and brimstone from Steve Jobs' legal henchmen, suspicions have been raised and many denounced it as a simple phishing scam.

To date, only a couple of these so-called Open Computers have been seen in the US, and the whiff of scammers still fills the air, even though the

stop to all that nonsense and bring the hardware back under the sole control of Apple, by buying out the company and getting its licence back.

Apple's PC sales are growing nicely in the US, with its market share up from 4.9 per cent in the first quarter of 2007 to 7.1 per cent in the same period in 2008. Yet there's no denying that Macs are expensive compared to a similarly-specified Windows PC. But with no competition, if you want to sample the delights of OSX, you've no other choice but to give your money to Mr Jobs.

So perhaps the only surprising thing about Psystar is that it's taken so long for someone to test the waters in this way. Of course, the wackier conspiracy theorists are already claiming that Psystar is a covert Apple operation, since if it wasn't it would already have been shut down. But what's certain is that around £400 for a dual-core Mac with a monitor certainly looks a lot more attractive than the £799 you need to fork out for the cheapest iMac. It's going to be interesting to see how this story pans out, even if it does seem a bit like gawking at a traffic accident.

If Apple ever does see the light and open up its OS to system builders, we'd be happy to have a go at building one, but for the time being we're very proud to present our very own penny-pinching £99 PC project. On page 33 you can read how we've made generous use of the 'Sort by price – ascending' button on some websites to put together the cheapest PC we've ever built.

It was great fun and it turned out to be quite an eye-opener, showing that you don't need vast amounts of power (processing or electrical) or cash to do most day-to-day computing tasks. The fact that we actually got Vista running on it was an unexpected bonus, although it was much happier in its intended role as a Linux or XP box. **PCW**

'If you want to sample OSX, you've no choice but to give your money to Mr Jobs'

company insists that all orders are being shipped.

According to the website (www.psystar.com) the business is built around the OSx86 Project, a collaborative hacking project which, since the launch of Intel-based Macs, has worked out ways to install OSX on commodity PC hardware. The results are often called Hackintoshes or Frankenmacs, and apparently they're not particularly easy to put together, hence the rationale behind Psystar.

Of course, Apple clones are nothing new – for example, the ill-fated US company Power Computing had a genuine licence from Apple to manufacture PowerPC-based Macs in the mid-1990s. Unfortunately for them, when Steve Jobs returned to Apple in 1997, one of his first tasks was to put a

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Two protocol tweaks could solve web traffic jams and give you all the downloads you want, says BT internet guru. But it would involve something akin to a congestion charge.

Keep up to date with the news, reviews and competitions in our weekly newsletter. To subscribe go to www.vnuservices.co.uk/pcw

iPlayer highlights gridlock fears

The launch of the BBC iPlayer, which allows computer users to catch up on TV programmes, has sparked a debate about the fair use of broadband lines and who should pay for infrastructure improvements needed to meet increasing demands.

Internet service providers (ISPs) report a surge in the demand for bandwidth since the introduction of the iPlayer, and this is before high-definition content distribution becomes widespread. The BBC is also considering making TV programmes available on the web as they are broadcast, though this could be done by web-friendlier, one-to-many multicasting.

Broadcasters are closely watching a new service called Zattoo.com already offering 'linear streaming' (www.pcw.co.uk/2215570).

Tiscali chief strategist Simon Gunter said the BBC should contribute towards the cost of upgrades needed to carry its services. But Ofcom chief executive Ed Richards told a Commons committee hearing he believed the money should come from users and ISPs (www.pcw.co.uk/2215252).

In a later speech on the future of broadband Richards said the "shibboleth of net neutrality" – the principle that all internet data must be treated as equal – should not be allowed to block investment. This appeared to back Virgin Media chief



London-style congestion charging could do away with download caps – see pages 18 and 19. Right: Robot designed to take fibre down sewers

Neil Berkett, who described net neutrality as "a load of b*****s".

Berkett also hinted, in an interview with *Television* magazine, that some content providers might be charged for delivery. The story caused some of his subscribers to cancel (www.pcw.co.uk/2214505).

Virgin Media said later it supported the principle that the web is open to all. It went on: "We have not called for content providers to pay for distribution. However, we recognise as more customers turn to



the web for content... it is legitimate to question how this demand will be managed. We welcome an informed debate."

The most interesting suggestion came from BT Internet guru Bob Briscoe, who said many of the current capacity problems could be solved by a couple of tweaks to internet protocols – and something which in an interview with *PCW* he tried to avoid calling a congestion charge, though that is what it appears to be. His arguments (pages 18 and 19) show the issue of equal access is far from straightforward.

One of many predicting trouble ahead is Jim Cicconi, vice president of legislative affairs at AT&T. He told a Westminster eForum in London that the internet will seize up by 2010 without investment.

Ofcom last month issued a consultation document on the options for delivering 100Mbps/sec links to new homes, including the idea of passing fibre through sewers, though it says nothing about the vexed question of internal home data links (see Test Bed at <http://tinyurl.com/589hho>).

Clive Akass

● See page 40 for our IPTV feature.

New home networking forum

Four leading global technology companies have formed a forum to promote a single standard for using home phone extensions, mains cable, or TV coax cable, to carry data.

Intel, Infineon, Panasonic and Texas Instruments say the Homegrid Forum will act as a "companion" to an International Telecommunications Union committee, the ITU-Ghn, which

is examining home networking. The forum will aim to develop quickly a consensus around one standard.

It is likely to be viewed with some suspicion in some quarters as all the members own intellectual property covering home networking. Panasonic, for instance, has its own data-over-mains technology rivaling that of the dominant Homeplug group.

Mac clones

US company Psystar is selling Mac clones for \$400 (£202) with the latest Leopard operating system.

The machines seem to break Apple licensing terms, which insist the company's software should go only on its machines. However, Apple's move to the Intel platform with multiple sources of low-cost components has long made it ripe for unauthorised cloning. Despite some calling it a scam, some buyers are quoted in US reports as being happy with their purchases.

Jitters as Windows sales fall

Vista and Microsoft Office sales do not appear to be keeping pace with PC sales, judging from poor Microsoft results for the first three months of this year.

Profits fell 11 per cent and revenues in the company's client division, which includes its desktop operating systems, fell to \$4.03bn (£2.04bn) – 24 per cent down on the same period last year.

Even taking into account distortions caused by pre-purchases of Vista, this still represented a two per cent drop.

Microsoft's business division, which sells its Office products, also saw a two per cent decline in revenues to £2.4bn. And analyst Gartner reckons global PC sales have actually risen 14 per cent.

Much of the growth is in growing economies such as India, China and South America where Linux and other open-source (and piracy) are popular and systems are not so locked into Microsoft.

Microsoft has slashed the price of consumer editions of Office, perhaps to stave off competition from Openoffice. Falling sales may also be due to the fact that people are simply using older copies of Office when they upgrade their PCs.

Another cause for Microsoft jitters is the continuing 'Save XP' campaign. Chief executive Steve Ballmer was moved to hint the 30 June 2008 deadline on XP sales will be deferred, though this was later denied. But manufacturers are finding ways round this to satisfy

customers who want to stick with XP (see www.pcw.co.uk/2215389).

Two Gartner analysts at a Las Vegas conference warned Microsoft risks being left behind unless it sharpens its act, according to a Computerworld report.

Michael Silver and Neil MacDonald said the company is so weighed down by two decades of legacy code that it can't make radical changes, so that Vista could only offer incremental improvements.

They said Microsoft is being beaten on innovation, is not answering the need for a compact frugal operating system, and will have trouble competing with emerging web-based applications. And they concluded: "Windows as we know it must be replaced."

Chip-firm purchase fuels Apple rumours

Apple's purchase of a Silicon Valley chip designer last month sparked a flurry of speculation about whether it was going to turn its back on Intel and revert to the Power processors used by classic Macs.

PA Semi's flagship 64-bit Power based PWRefficient processors are used in lots of military applications.

Apple was typically holding its cards close to its chest but as the dust settled on the \$278m (£140m purchase, a flight from Intel seemed unlikely because it would cost the company the economies of scale it gains from the PC market.

The other question was whether Apple planned to move from ARM-based processors for next generation iPods and other mobile devices. But the PA Semi chips are designed for larger devices and apparently cannot compete with ARM on power drain.

ARM and PA Semi are similar in that both design chips made by other companies. And Apple was an early investor in ARM.

PA Semi has ARM expertise. Founder Dan Dobberpuhl

developed StrongARM, Digital's take on the ARM architecture which was later acquired by Intel.

Intel developed it into its xScale chips but sold the technology on. It is about to launch its Atom platform for ultra-mobile and handheld devices, competing with ARM. The most exciting application for a PA Semi chip

would be an ultra-mobile, a format Apple has avoided to date. But an Atom chip would be more likely.

The best guess seems to be that Apple will use PA Semi expertise to design custom peripheral chips to give its machines an edge over standard PC designs. And we will have to keep waiting for that Mac ultra-mobile.



Apple has unveiled improved all-in-one iMac systems running Intel Core 2 Duo processors clocking between 2.4GHz and 2.8GHz, up to 2GB Ram as standard, and a faster graphics card. It will also offer a new 3GHz Intel chip as an option for built-to-order 24in iMac systems. Prices range from \$1,199 (£600) 20in to £900 24in iMac. Visit www.pcw.co.uk/2215409 to read our review of the previous iMac

In brief

Service pack delays

Microsoft delayed the latest service-pack updates for Windows Vista and XP as we went to press. Vista SP1 and XP SP3 were pulled from the Windows Update utility and the Microsoft Download Center until a fix could be found for a compatibility issue with Microsoft's Dynamics RMS software. For an update see www.pcw.co.uk.

Mobile Skype

Skype has released a beta client allowing Java-enabled handsets to make voice-over-IP calls. It offers features including group chat, presence and receiving calls through Skypein. Skype-to-Skype and Skypeout calls are initially supported only in some countries, including the UK.

Safety batteries

German researchers have unveiled details of a lithium-ion battery based on one that does not catch fire like those that have caused a number of laptop explosions. The new design uses a non-flammable polymer electrolyte rather than the liquid one in conventional designs.

→ www.pcw.co.uk/2214222

'Jail data-loss bosses'

Security experts have got it in for the bosses of companies that lose customer data, according to a new survey. One in four of those questioned said the chief executive, or the board member responsible, should be jailed.

→ www.pcw.co.uk/2213798

Smile detector

A Japanese healthcare company has developed software that it claims can detect genuine smiles.

→ www.pcw.co.uk/2214300

Hardwired trouble

Scientists have shown how malware can be hardwired into a processor, making it undetectable by security software.

→ www.pcw.co.uk/2215654

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In brief

Media server

HP has unveiled a Linux-based home media server at half the price of its Microsoft-based Mediasmart model. The £199 (inc Vat) mv5020 Media Vault Pro, ships with 500GB and offers some of the features found in HP's Mediasmart Server. Home Server roundup – page 107.
→ www.pcw.co.uk/2214568



Acer projector

Acer says its H5350 projector, capable of 720p high-definition resolution, can create an instant home theatre. It has an HDMI interface and a 2000:1 contrast ratio. The price £589 includes Vat and a two-year warranty.
→ www.acer.com

Universal docker

Lenovo has used Cambridge-based Displaylink to make a port replicator capable of docking or undocking with any notebook via a USB2 link in seconds. The Enhanced USB costs around £100.
→ <http://tinyurl.com/5qh86z>

O2 data

O2 has launched a mobile web access service for laptop users via 3G or Wifi. It is being offered to customers for £20 per month with a 3GB data cap and unlimited use of The Cloud's 7,500 UK Wifi hotspots. O2 Mobile Broadband will be offered on a rolling monthly contract, plus £119.99 for the modem, or 18-month contract with free modem.
→ www.pcw.co.uk/2214647

Survey winner

Thanks to everyone who completed our recent website survey, giving us great insights into your views on www.pcw.co.uk. Congratulations to Mr Wong, of Southampton, who wins a Canon Powershot A560 digital camera.

Confusion over Freesat TV kit

There was confusion last month about what equipment will be needed to receive broadcasts from a new free satellite TV service.

Freesat, a co-operative venture between BBC and ITV, denied a claim by Hauppauge that its £79.99 Nova-S USB2 box will be able to access the programmes, including some in HD.

But Hauppauge replied: "We are already receiving the channels."

Freesat, not to be confused with the Freesat from Sky subscription service, was due to launch with some 80 channels on May 6. You will need to spend around £150, including the cost of a dish, to access the service.

Some existing aerials will work and if you have one Freesat recommends trying it out with a receiver before buying a new one.

Hauppauge says many of the



Already receiving... the Nova-S USB2

channels are already viewable. But Freesat said: "[We] would like to clarify the Hauppauge free-to-air USB2 satellite tuner is not a Freesat licensed product and as such will not receive Freesat services.

"Freesat licensed products can be identified by the Freesat logo and are subject to a stringent test and conformance regime."

Freesat would not confirm that this meant BBC licence payers will

be unable to access the broadcasts on unapproved equipment.

Yehia Oweiss, vice-president of sales for Hauppauge Europe, said: "Our products are not endorsed by Freesat, nor would we wish to imply they are."

He added: "Our customers have been enjoying a wide range of unencrypted free-to-air satellite and terrestrial channels in Europe for years, including BBC HD."

Deal aims to speed up 4G LTE rollout

Mobile equipment makers have agreed a deal to enable the rapid developing of Long Term Evolution (LTE), likely to become the leading technology for 4G mobile links.

They committed to a licensing framework ensuring LTE royalties will not exceed 10 per cent of the device cost, or \$10 on a laptop.

LTE promises data rates of between 60Mbps/sec and 120Mbps/sec, depending on channel width – how much wireless bandwidth is assigned to a call.

These are the data rates per base-station and so are shared between users of public systems. LTE-enabled femtocell home base stations could offer the full speed, but real data rates could then be constrained by the user's fixed broadband link.

LTE deployment has been given added impetus by the emergence of Wimax technology. Intel notebooks will support mobile Wimax by default from later this year but it would be relatively

simple for modules to support LTE too. That, however, would entail paying two sets of royalties.

Signatories include Nokia, Ericsson, NEC, Nextwave Wireless, Nokia Siemens Networks and Sony Ericsson. Absent is Qualcomm, which is pushing a technology called Ultra Mobile Broadband.

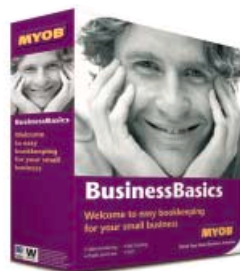
Ericsson senior vice-president Håkan Eriksson said the deal "will reassure operators of the early widespread adoption" of LTE.

→ www.pcw.co.uk/2214378

MYOB buyer pledges continued software support

Norwegian software maker Mamut has pledged support for accounting software from MYOB, following its purchase of the UK business division.

The £1.7m deal includes Dosh, a company MYOB bought two years ago. Mamut will continue to use the MYOB and Dosh brands.



Existing code will be used as the basis of future MYOB products in the UK. The Australian and New Zealand arms of MYOB retain their right to the code in those countries.

MYOB users in the UK will be offered free migration to a software-with-services product.

The accounting division of MYOB UK and some specialist software was bought by Wolters Kluwer Law & Business but most of the product line goes to Mamut.

Alan Moody, head of Mamut UK, said he was pleased with the MYOB deal: "It will put us among the top five in the country and will put us in a better position to serve our customers."

→ www.pcw.co.uk/2215173

Cheaper LCDs, dearer Dram

Dram prices are likely to rise over the coming months and LCD notebook screens will get cheaper, according to market analysts.

Isuppli said the balance of memory supply and demand is starting to favour manufacturers after a period of bloated inventories, which means prices are likely to rise by around two per cent in the coming three months.

But Dram prices dropped by 17 per cent in the first three months of

this year and by 31 per cent in the final quarter of 2007.

Analysts Meko claim a market slowdown means the price of notebook and flat panel displays could fall late this year. Shipments to shops fell by 13 per cent in the first three months of this year, compared with the same period in 2007.

Research director Pete Gamby agreed that some of the fall is caused by the fact the market driven by people replacing

cathode-ray monitors for flat screens is drying up.

"Manufacturers never learn that if you sell people LCD monitors, and tell them they will last longer, they are not going to buy new ones for years," he said.

Figures for the first three months of this year are still tentative, as data is still coming in. Gamby said if LCD TV sales are less than expected, manufacturers will move production to notebook and flat-panels, pushing down prices.



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LEDs lead the way on backlighting

Light-emitting diodes (LEDs) will supersede cold-cathode fluorescent (CCFL) backlighting in notebook LCD screens over the next four years, according to analyst Isuppli.

LEDs are thinner and use less power than cold-cathode units and

they do not use environmentally damaging mercury. Currently they are a lot more expensive but they are likely to get cheaper.

Isuppli predicts by 2012 nine in 10 screens with diagonals of 10in or more will have LED backlights.

This compares with just 4.7 per cent late last year.

But it says the demand for CCFL products will not slacken because of their use in TV sets and other monitors.

→ www.pcw.co.uk/2215129

Flush-fit USB



PCW often wonders whether device designers may start to recess USB ports so users can avoid having dongles poking out of the side. Newton Peripherals' £18.95 thumbnail-sized USB2 Mogo Bluetooth dongle hardly needs a recess, if the blurb is to be believed, because it fits almost flush. It supports extended data rate (EDR) too, at up to 3Mbits/sec.
→ www.expansys.com

More 'economic' Kodak inkjets

Kodak launched two new inkjets last month, a year after announcing two models it claimed would print photos at between a third and half the cost of rival systems.

The ESP 5 and ESP 3 both use the same low-cost ink used by those first models. The £129.99 ESP 5 is an all-in-one model, which means it also functions as a scanner and copier. A large 3in display, card slot and USB ports allow pictures to

be viewed, edited and printed without a computer.

The £79.99 ESP 3 lacks the scan and copy features. The printers take a £6.99 black cartridge and a £9.99 five-colour cartridge.

Enrico Bradamante, Kodak's director of inkjet systems, said the company was delivering on its promise to end ink profiteering. "We are focusing on delivering easy-to-use products that provide superb-quality and save up to 50 per cent on everything you print compared to similar consumer inkjet printers."

Details of the company's cut-price claims are at www.kodak.com/go/inkdata



Kodak claims its new printers will save users 50 per cent in costs compared with similar rival models

In brief

Threat of Tornado

A web-based attack tool called Tornado exploits up to 14 browser vulnerabilities and installs malware.

Tornado is commonly installed on a server by an administrator that offers accounts to attackers. They use rogue code on other web pages to direct people to the Tornado server so that machines can be compromised.

Symantec researcher Liam O'Murchu said: "Using this model, the creators of the pack can sell it to a few trusted customers at a higher price, rather than selling it to many untrustworthy customers and risking the code being released in the underground."

→ www.pcw.co.uk/2214938

Phishing upgraded

A software kit known as Rock Phish, which is behind half of global phishing attacks, has been upgraded, security firm RSA has warned.

Rock Phish has been used in phishing attacks on more than 40 European and US financial institutions using innovations that include the generation of unique URLs to defeat blacklists.

Phishing pages the software produces now include a Trojan dubbed Zeus, which harvests financial data and allows the computer under attack to be controlled remotely.

→ www.pcw.co.uk/2214973

New and secure

Security software developer McAfee unveiled its new Total Protection for Network suite at the recent Infosec Europe 2008 security show in London.

The suite, which McAfee claims is the fastest in its class, includes the McAfee M-8000 Network Security Platform, formerly known as Intrushield, as well as the McAfee Content Security Blade Server.

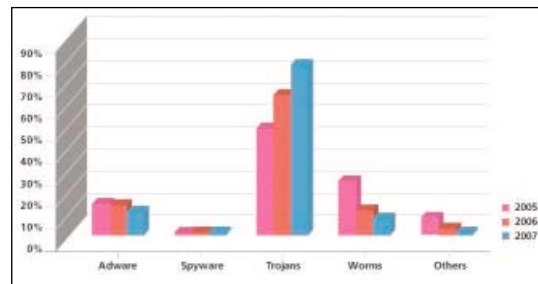
→ www.pcw.co.uk/2214930

'1 in 4 home PCs infected'

Nearly three in four companies are infected with some form of malware – including those with up-to-date security software installed, according to a survey by anti-virus specialist Panda Security.

And almost one in four home PCs are similarly infected, according to the analysis of more than 1.5 million machines. The number of malware variants is increasing exponentially as criminal authors seek to bypass security software, the company said.

Most infections are through websites and most are trojans that can be used to pull in other code, such as spyware or spam launchers, which can make money for the authors. Often the code is targeted



Evolving threat... how the proportion of different types of malware has altered over the past three years

only at a few machines and new variants are produced each day.

Standard methods of containing the problem, such as downloading signature files, can't keep up – and even if they did, they'd eventually require tens or hundreds of megabytes of data on each user's machine, according to Panda's chief

technology officer Iñaki Urzay.

He said a new Panda system called Collective Intelligence draws real-time information on new variants using existing industry notification channels and its customers' machines as virus sensors. A tiny client on each PC notifies Panda of suspicious code, which is analysed on the company's servers rather than the infected machine. Panda then blocks the operation of the malware, which is usually fairly easy with Trojans.

To prove its point, Panda has challenged users and companies to check their machines at a site called Infected or Not? (<http://tinyurl.com/5c5p4t>). Home users who find they are infected are entered into a lottery with a prize of one iPod Nano a week.

Any infection-free company gets a chance to win £5,000 for a charity of its choice. The closing date for both is mid-July.

Pandalabs technical director Luis Corrons said Russian criminals are the leading malware distributors and openly offer their services for sale on the web.

● A free beta version of Panda's Managed Office Protection is available at <http://tinyurl.com/6y7vpa>.

'Lost kit is bigger risk to security'

Lost equipment now accounts for 58 per cent of security breaches and intrusions by hackers are falling, according to a Microsoft security report, which paints a far rosier picture of malware infection rates than Panda (see above).

Microsoft created a map of its users globally, which showed, on average, how many computers need to be scanned to find one piece of malware. One in 144 of the seven million computers scanned in the UK had unwanted malicious software, compared with one in 112 in the US and one in 123 worldwide. In Japan the figure was one in 685.

One point of agreement with Panda was that the UK saw a huge spike in the number of Trojan downloaders. Panda said many of these are not being detected. Just 13 per cent of breaches in the final six months of last year were a result of hacking, down from an average of 23 per cent for previous years, according to the survey, which was released at the Infosec Europe 2008 show in London.

"We all have smartphones and laptops, and it is losing these that is a major problem," said Vinny Gullotto, general manager for Microsoft's Malware Protection Agency.

Company blocks ignore porn and gambling sites

Travel, social networking and webmail sites are more likely to be blocked on office networks than those offering porn or gambling, according to a new report. The reason is that socially stigmatised activities tend to be subject to 'self-policing,' according to Neil Hammerton, European vice-president at security software developer Webroot, which commissioned the research.

Companies that block sites are more worried about security than about time-wasting by staff.

More than half of those questioned felt that visiting social networking sites can compromise security; webmail sites such as Hotmail are also seen as a risk. An estimated 38 per cent of UK companies block some sites from their employees. *Iain Thomson*
→ www.pcw.co.uk/2214873



Gambling and pornography websites are often unblocked

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Delayed Barcelona quads ship

AMD has announced the availability of eight quad-core Opterons, codenamed Barcelona, six months after their formal launch.

Production was cut back shortly after launch because of problems with the Translation Lookaside Buffer (TLB) in the Level 3 cache shared by the four cores.

AMD's quad-core Phenom desktop processor launch was

delayed until last month because of a similar problem, which in rare cases could cause system crashes.

Untweaked processors have been in limited use and there have been no reports of problems, according to Randy Allen, vice-president of AMD's server and workstation division.

The Barcelona design is ahead of Intel in that it's a true quad-core processor, not two dual-cores on

the same die. But Intel is ahead in offering 45nm-scale miniaturisation, and chips using its Nehalem architecture, due this year, will ape one of the major advantages of AMD's designs by pulling the memory controller into the central processor, removing a bottleneck.

AMD has demonstrated 45nm processors but the Barcelonas are 65nm-scale, clocking 2.0GHz and 2.4GHz; 2.4GHz and 2.5GHz versions are expected on sale later this year.

AMD also launched two dual-core Athlon processors drawing 30 per cent less energy than the previous generation 'without compromising on performance'. The 45W AthlonX2 4450e and 4050e are designed for mainstream and enthusiast power users who need to run intensive applications on multiple processors, according to AMD.

In brief



Shades of sound

You may fault these shades on their 'thug chic' style, but there's also an MP3 player built into the frame. Oakley's Split Thump sunglasses use tiny, detachable speakers rather than earphones, which should appeal to those worried about their hearing. They cost £164.99 (1GB version) or £235 (2GB).

→ www.ineyewear.com

Pet project

A £6.6m EU-funded project to give robots personalities in a bid to make them easier to work with, will include studies of how humans interact with pets. The project, called Living with Robots and Interactive Companions (Lirec), is being co-ordinated by professor Peter McOwan of Queen Mary's Department of Computer Science.

→ www.pcw.co.uk/2214233

Quantum web

Researchers at Northwestern University in the US have created a quantum 'controlled NOT' logic gate within an optical fibre that could lead to a 'automatically secure quantum internet'. A quantum gate can perform the signal-boosting role in an optical network that a repeater does in an electronic one.

→ www.pcw.co.uk/2214301

Screaming laptop

A device that causes a laptop to scream if it is disturbed has been developed by Chao Liu. Lapsafe Netelok, which costs £39.95, fits into a USB port and monitors any movement or tampering. See our Test Bed comment at

<http://tinyurl.com/6be6bx>.

Glimmer of hope for AMD

AMD's problems did not prevent it achieving a slight turnaround in the last three months of 2007, according to market analyst Isuppli, which reckoned AMD's share of the global microprocessor market grew by 0.3 per cent over the previous quarter. However, it lost a 1.5 per cent share compared with the last quarter of 2006, while Intel's grew 3.1 per cent. Matthew Wilkins, principal analyst for Isuppli, said global shipments of PCs in the same period rose by 14.2 per cent, which helped sustain prices.

→ www.pcw.co.uk/2214968

Zip goes £107m as EMC buys Iomega

Storage specialist Iomega has been bought by information management giant EMC in a deal worth \$213m (£107m).

The deal, which is subject to regulatory approval, will enable EMC to expand into the growing consumer and small-business markets, according to its chief executive Joe Tucci. Jonathan Huberman, Tucci's opposite

number at Iomega, will lead a new EMC division for consumer and small-business products.

Iomega has been bundling EMC Retrospect backup software with its external disk drives for the past four years.

The company made a spectacular entry into the consumer market in 1994 when it used its high-end storage expertise to

design and launch the Zip drive, using 100MB removable disks.

Zips became an instant bestseller at a time when few disk drives could hold more than a couple of hundred megabytes. But they became outmoded as capacities increased, and Iomega never managed to match their success.

→ www.pcw.co.uk/2213921

Canon shoots at portability

Canon describes its Pixma iP90v printer as portable, but it is hardly lightweight at 2kg – you certainly wouldn't want to lug it far if you were carrying a notebook as well.

However, it does not compromise on features. It has a five-colour ink system and can link to a notebook via a USB2 port or infra-red – not that you see IR much on consumer

notebooks these days. There's also a Bluetooth option.

The iP90v should be available by the time you read this, priced at £199, or £249 with a battery pack that can print around 250 pages per charge. Full specs can be found at <http://tinyurl.com/5h9278>.

The Pixma iP90v is small but hardly lightweight



Money for jams

BT's top internet man believes the web needs something like a congestion charge. But before you protest, consider it could mean faster browsing and an end to data caps, writes Clive Akass

Bob Briscoe talks about the internet with the world-weary air of a man who has spent years banging his head against a brick wall. The web is clogging up with the increasing use of bandwidth-hungry applications, and there are calls for content providers like the BBC to contribute to the cost of boosting capacity (see page 8). Internet service providers (ISPs) try to answer the problem by imposing download caps and throttling heavy users.

Briscoe believes that much of this is unnecessary and barely effective. A couple of tweaks to internet protocols would make access 'blisteringly fast' for light users while heavy users downloading as much as they do now would be hardly affected.

But it would also involve a congestion charge reminiscent of that imposed on motorists who enter central London at peak times, though Briscoe objects strongly to the use of the term (see box right).

Briscoe has to be taken seriously: he heads the team charged by BT to redesign the internet, along with

others across the world. Somehow they all have to agree. And Briscoe is trying to get them to jettison one of the internet's basic principles: equal flow rates for each data stream.

The story goes back to late 1986 when the internet underwent a series of 'congestion collapses'. In mid-1987 Van Jacobson, of Lawrence Berkeley Laboratory, introduced a solution that has served the internet ever since.

It conformed to the internet's founding principle that traffic control is done by the 'edge' computers (your PC and a web server, say) using the Transport Control Protocol (TCP), while equipment on the intervening network does the routing using the Internet Protocol (IP).

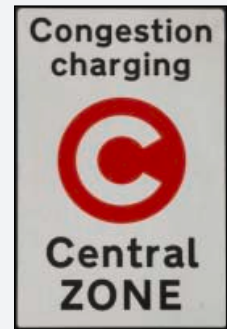
If data arrives too fast for a router to handle, it starts to drop packets, causing the destination machine to request retransmission. Jacobson's idea was that a source machine should halve its data rate when this happens, and then build up speed until packets start dropping off again.

This algorithm, applied as a

Charge or limit?

Briscoe fears the term 'congestion charge' has been tainted by its imposition on central London traffic, and will give people the feeling that they have no control on their Internet costs. He prefers 'congestion limit', because people have a choice whether they exceed it. But as they will have to pay to extend the limit, it is likely to get called a congestion charge whether he likes it or not.

There are similarities between road and network traffic. Briscoe's proposals are based on some elegant mathematical analysis done in 1997 by Professor Frank Kelly, who was chief adviser to the Department of Transport when the London congestion charge was brought in. It has more support in the city than Briscoe, who is based at BT Adastral Park research centre in Suffolk, perhaps realises because it has worked.



Warning sign at London's congestion-charge zone

TCP patch to the mere 30,000 machines then on the Net, was phenomenally successful, speeding everything up as well as relieving congestion, and its effect initially was to give each user of a channel a roughly equal share of capacity.

That it is still functioning at all,

20 years later, is testament to its strength – a billion machines share internet resources by making between 10 and 100 rate adjustments a second.

It was fair enough for the kind of bursty traffic generated by older web activity, such as email and

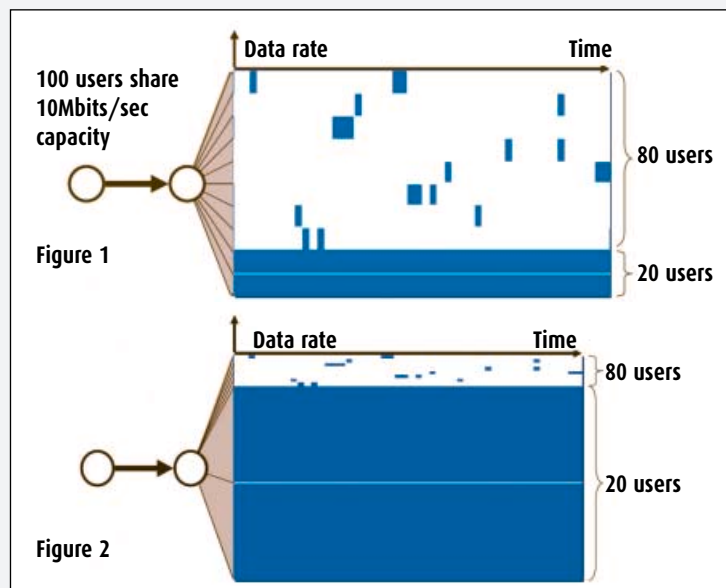
How 'equality' can squeeze polite users to dial-up speeds

Both these diagrams depict 100 users with access rated at 2Mbits/sec sharing a 10Mbit line. The blue portions show the times at which they are using the line – that is, contending for capacity. If all users were engaged in traditional 'bursty' web tasks, each would be using the link for only five per cent of the time and would get something close to their full 2Mbits/sec.

If 20 of them, each using a single TCP stream, begin continuous downloads (Figure 1) they are still entitled to the same share at any point as a light user even though they are using the channel 20 times as much (100 per cent compared with five per cent).

P2P, and other applications generating heavy traffic, make things worse by use multiple TCP streams to speed their data flows. If the 20 heavy users from Figure 1 each grabs 25 streams (Figure 2), each is using the channel 500 times more often (20x25) than a light user politely taking a single stream once in a while.

This could drag a light user's speed down to 20Kbits/sec – slower than dial-up unless the service provider takes counter-measures.



browsing. But recent applications, such as peer-to-peer (P2P) file-sharing, transfer data more or less continuously, perhaps 24 hours a day. Yet each P2P stream, under the 'equality' principle, has exactly the same right to a channel at any instant as a light user who is using a channel in very short snatches at a time (Figure 1).

Applications such as P2P make things far worse by sending data in multiple TCP streams, each with the same claim on capacity as one person using a single stream (Figure 2).

Throwing bandwidth at the problem is similar to "throwing water uphill" because TCP allocates the same measly share of the new capacity, says Briscoe. A costly quadrupling of the capacity of the 10Mbps/sec link in Figure 2 would boost the transfer rate of light users from 20Kbits/sec to just 80Kbits/sec.

Data rates are not so bad in practice because some service providers themselves prioritise some traffic and throttle heavy users. But this is patching over the cracks of a flawed architecture, in Briscoe's view, and throttling only marginally improves speeds for light users while punishing heavy users. Briscoe has nothing against these. "We want them to use the internet. That is what it is there for," he says.

Briscoe's proposals shift the focus from data volume to congestion volume, measured by the number of dropped packets you cause. They involve two protocol tweaks. One is 'weighted TCP', a refinement of the protocol to allow application programmers to give internet traffic different priority weights.

Typical bursty traffic would be heavily weighted to get a greater share of capacity if it hits a bottleneck, yet heavy, near-continuous traffic would be barely affected. To see why, imagine you are approaching a ticket barrier with two school parties in front of you. If the teachers in charge tell the kids to step aside for you, you would get straight through yet the children have hardly been slowed down at all.

So what is to stop programmers giving all their traffic high weight? This is where the congestion charging comes in, and so does

some tricky reasoning. Service providers would still offer flat-rate access, but instead of download caps they would have a congestion allowance. If your congestion volume exceeds your limit you could still transfer all you wish along uncongested routes – or you can pay for a greater allowance.

Your software would give light, bursty traffic high weight because it will have little effect on your congestion volume; but big downloads would be set low to minimise your congestion hit. Big users, including businesses, could buy higher congestion limits. But if you played your weightings right you could download as much as you liked with little or no congestion charge.

Similarly, network operators could be charged more for sending traffic through congested routes of other networks. They compete to sell capacity, so it would still pay them to keep their own infrastructure clear, but they would have an incentive to seek out clear routes.

Oddly, because traffic is controlled from the edge, operators cannot see congestion outside their own network. Briscoe's answer is a second protocol tweak, this time to the Internet Protocol standard, to enable a mechanism called re-feedback, which flags how much congestion your packets will be allowed to cause.

"There's one spare bit in IP and that's all we need," he said.

A bonus is that the system could scupper Denial of Service attacks. It would require no hardware changes at the user level, and no infrastructure changes except at the access gateways. But getting changes approved is perhaps the biggest problem of all.

Jacobson's algorithm and TCP equality, however illusory, have achieved the status of Holy Writ. Briscoe, by his own admission, blew his top in frustration at a 2006 meeting of the Internet Engineering Task Force (IETF) after trying for a year to explain his ideas.

There are signs that people are taking his ideas more seriously, but don't expect changes to come in very soon.

"From past experience at the IETF I reckon it could take me five years to get it through," Briscoe said.

The supercomputer inside your PC

Low-cost graphics processors can give you the equivalent of a supercomputer at your desk, Nvidia chief scientist David Kirk told academics at London's Imperial College recently. They can be used in scientific and financial modelling and geographical information systems.

Kirk described how the graphics processor (GPU) had evolved from the simple VGA controller to a massively-parallel array of floating-point processors capable of drawing hundreds of millions of pixels a second.

A central processor (CPU) might have between one and four general purpose cores; an Nvidia GPU has up to 128 special purpose cores and it can stream data from memory up to 10 times faster.

"Now you can use that hardware to do something else," said Kirk. "We built a parallel floating-point engine that is potentially hundreds of times more powerful than a microprocessor... purely by accident."

The GPU acts as a co-processor to which the central processor (CPU) offloads tasks – usually graphics, but not necessarily. It can accelerate suitable non-graphics applications up to a hundredfold, the equivalent of 15 years of development of conventional processors by the standards of Moore's Law.

"You take your computational task and break it into a sequence of steps, and for each step there will be some parts that have to run on the CPU, and some you'll run on the GPU... and return the result to the CPU," Kirk said.

The PCI Express version 2.0 interface enables this by providing a link between the two processors capable of passing 6Gbytes/sec each way.

Early attempts at non-graphics GPU use involved tortuous tricks with graphics processes. But Nvidia has made component modules in its recent GPUs directly programmable, allowed them to



Nvidia's chief scientist David Kirk says low-cost graphics processors can give us all supercomputers

access all memory, and developed a version of the C programming language called CUDA to facilitate their use as a non-graphics floating point parallel processor.

Kirk was at Imperial to persuade academics to teach CUDA.

He said: "The computing model for the GPU is straightforward. You write a single thread programming in C that will be replicated many many times to run on the parallel processors.

"One application is the classic n-body problem in astronomy, modelling the behaviour of an arbitrary number of objects that all affect each other.

"A CPU has trouble sustaining a gigaflop on this calculation... We can deliver more than 300 gigaflops on a Geforce 8800. This is a tremendous rate. It is actually faster than a custom supercomputer that was built in Japan, the GRAPE-6Af, on the same application."

The beauty is that the system can be used on a variety of machines, from notebooks to server clusters.

It can also be used to help programs make good use of multi-core CPUs. But Kirk stressed it is not the Holy Grail of current computing... a way of getting single-core code to run efficiently on multi-core CPUs. *Clive Akass*



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We want you to help decide the nation's favourite technology products – cast your vote now for a chance to win some great prizes!

At *PCW* we're passionate about technology and it's with great pride that we'd like to announce our partnership with the British Technology Awards 2008, one of the technology highlights of the year. The first stage of the online voting process is now under way and waiting for nominations from *PCW* readers, who we know are some of the most discerning technology enthusiasts in the UK. So read on to find out how you can take part in this exciting new event.



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about how much the products have changed the way you work or play, helped you in your business or simply given you enjoyment.

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All you have to do is visit www.britishtechologyawards.co.uk to enter your nominations in one or all of the 13 categories (see opposite). When you've done that, you will have the option of entering a prize draw for some great technology prizes worth a total of £1,000.

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Everyone who enters a nomination for the British Technology Awards 2008 and chooses to supply the required contact details (name, phone number and email address) will be entered in a prize draw to win £1,000 worth of superb technology products. Full details of the prizes will be posted on the BTA website, and prize winners will be announced in October.

Key dates

All voting is online only via the British Technology Awards website (www.britishtechologyawards.co.uk). The procedure for the publicly voted categories comprises two stages, with the first round of nominations (the 'long list' nominations) open from 9 May to 6 July 2008. From the nominations received, a shortlist of the top nominations in each category will be published, ready for the second round of voting that runs from 7 July to 12 September 2008.

The winners in each category will be announced publicly on 3 October 2008. A full list of the terms and conditions for the prize draw and voting eligibility rules are available on the website (www.britishtechologyawards.co.uk).



Bookmark the BTA website for regular news and updates

How to vote

To ensure that the British Technology Awards really are driven by real-world users, in the first round of voting you're not restricted to a list of products that you can vote for. Although you'll find product suggestions in each category, you're entirely free to ignore these and enter your own suggestions.

Your choices, not ours

The voting process couldn't be simpler. Simply go to the 'Vote Now' section of the website (www.britishtechologyawards.co.uk) and for each category, you'll find a dropdown list box. If you want some help on the type of product appropriate for each category, just browse through the dropdown list to see if your favourite product is there. If not, simply choose the 'Other – please specify' entry and type your nomination in the text box. All we ask is that you be as clear and specific as possible, entering the product or service's name as fully as you can, including model numbers, versions and names as appropriate.

Once you've entered all your nominations, follow the on-screen instructions to enter your contact details and submit your entry. And that's it, but don't forget to bookmark the website so you can keep in touch with news and updates about the British Technology Awards.

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Awards categories

The following awards categories are open to public nominations and voting:

- Best Gaming Technology
- Best Home Entertainment Technology
- Best Kids' Technology
- Best Mobile Technology
- Best Music Technology
- Best Online Technology
- Business Technology of the Year
- Gadget of the Year
- Greenest Technology
- Most Indispensable Technology
- Most Stylish Technology
- Online Retailer of the Year
- Technological Innovation of the Year

In addition, there are two special awards that will be judged by an expert industry panel

- British Technology Awards Hall of Fame
- British Technology Awards Gold Award



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LETTERS

Send your letters to The Editor, PCW, Incisive Media, 32-34 Broadwick Street, London, W1A 2HG Send your email to letters@pcw.co.uk

LETTER OF THE MONTH

The pleasure is in the game

The past couple of years have no doubt been momentous for gaming, with all three next-generation consoles showing their true colours. The Xbox 360 paved the way for online gaming, the Playstation 3 showed the true meaning of high definition, while the Nintendo Wii revolutionised the way we play games and captured the hearts of many non-gamers.

Direct X 10 has brought in a new level of detail and realism to games that wasn't possible before. And to top it off, Halo 3 was the fastest-selling video game with more than \$300m in sales in the first week alone, making it the biggest entertainment launch in history.

You only have to look at the new technology coming to know that these next few years are going to be even more exciting. A quick search on the internet and you'll find a Head Tracking program, created by a guy

called Johnny Chung Lee, that changes a game's image as your head moves, creating a realistic 3D experience. This is done simply with a Wii remote as the tracker and the infra-red lights from the sensor bar mounted on a pair of glasses. The games industry has a very big future ahead of it and I, for one, will gladly be taken along for the ride. Seb Carss

First-day sales of Halo 3 sales reached \$170m in the US alone



COSTLY OFFERS

I expect your inbox will be swamped, but I want to thank you for Barry Fox's article in June's PCW on Shopper Discounts and Rewards. At the start of the month I too clicked to get a £10 cashback and deleted a couple of what looked like spam emails. I got another email last night and phoned up and cancelled my "membership". If I hadn't read your article, I too would have had money taken from my account. I will check my next statement to make sure they haven't taken money. Like Barry, I am an old hand, having used computers since 1970 and having taught IT since 1985. I too thought I was wise to scams.

Your article needs to be spread widely. I have sent everybody the warning and suggested they both read your article and pass the email on to everyone they know. Ian O'Hara

GAMING FOR FREE

In the June issue's Letter of the Month, Fred Riley mourns the demise of text games and hopes that one day "new titles will be produced by writers with imagination". He is not alone in enjoying this kind of game, and may be interested to know that text games (now more generally known as "interactive fiction") are alive and well, continuing to be both played and written, albeit by a relatively small band of enthusiastic amateurs.

The vast majority of these more recent text games can be downloaded for free via a number of sites such as Baf's Guide (www.wurb.com/if) or the Interactive Fiction Database (http://ifdb.tads.org).

The quality of such amateur-produced software is variable, and modern amateur-written text games tend to be shorter than Hitchhiker's Guide to the Galaxy

or Zork, but there are some excellent titles among them, and I'd strongly urge Fred Riley (or anyone else who liked this kind of game) to give some of them a go. For further information, see the Interactive Fiction FAQ (http://plover.net/~textfire/raiffaq/ifaq) or visit sites such as Brass Lantern (http://brasslantern.org). Eric Eve

POWER CRAZY

I was horrified to learn how much power the Cyberpower Infinity SLI GX2 PC (PCW June 2008) uses in idle mode. I just stared in disbelief and saw it as one more nail in the coffin of our beautiful planet. Sure, as a games machine with your Recommended and Best Buy awards, it looks a fine product. This is great if it's just used for games, but once set up in pride of place in a front room, office or bedroom, it will probably be used



The powerful Cyberpower Infinity PC also draws a fair amount of power

mostly for the usual surfing, emails and downloading.

This is wrong to me on so many fronts. Why isn't there some automated switch on the graphics card that knows when you're just idly surfing or when you need to run Crysis on top spec? I am no expert, but that must be possible.

It may be short of £2,000 now, but when the price drops these machines with their energy-consuming, planet-killing, top-end graphics and similar will be munching up our precious resources while bringing closer the chance of our planet's demise.

So, I would recommend if you are going to shell out for one of these super gaming machines, then please also get an energy-efficient base unit, connect them up with a KVM cable to your keyboard, mouse and screen, and have the best of both worlds: energy efficient surfing and downloading on one and top quality gaming on the other.

To finish, I was also wondering if you could measure and print idle and peak power draw for all

the hardware you review, as with me and maybe others the power concern does enter into the equation to what I may buy or ignore.

Micheal Bishop

Will Stapley replies: There's no doubt that power drawn by graphics cards is a big issue. Hybrid SLI (Intel) and Hybrid Crossfire (AMD/ATI) graphics, which will be available soon, will address this problem by switching to integrated graphics when performing non-graphics intensive tasks. Our recent motherboard group test (PCW June 2008) covered this in more detail. In answer to your second point, we do try to mention power draw when appropriate, but we will look into putting it into our standard testing procedure.

The Apple Macbook Air might fit into an envelope, but we wouldn't recommend sending it in one



LAPTOP LETTER

I love the TV ad for the Macbook Air; if it develops a fault and needs to go back to Apple for repair, presumably one can just ship it in a plain A4 envelope? Great, no more hunting in the loft for the box it came in.

As a hardware support engineer I did not think anyone would be so daft as to send me their laptop in an envelope, but a user recently sent me his Dell Latitude via Royal Mail in an, admittedly, padded envelope. I fully expected to open it and find at least a cracked bezel or, worse, a smashed LCD, but it was intact. It's not as bad as the chap who once superglued his RAS token to the laptop's lid, though.

Bob Merrison

WIRELESS WASTE

I'm always being asked to help friends with their computers. Often it's to help fix their internet connection. More often than not, a quick restart of the broadband router solves the problem.

What I'm having a lot of trouble with now is third-party wireless software. Why do computer companies insist on installing their own wireless connection software when Windows has provided its own perfectly acceptable solution since XP SP2 was introduced?

Normally when faced with this problem, removing the extra

software and using the Windows Zero Configuration tool with the correct drivers fixes it, but why do the companies waste their time and effort in the first place?

Lloyd Quenby

XP INSURANCE

I read your article 'Demand for XP will continue' with interest. I decided to purchase a new insurance copy of XP, since I will use Linux rather than Vista. I've often thought about this, but the withdrawal of XP will give me the impetus. My question is this: with SP3 on the horizon, will there be time to purchase an XP SP3 installation disc from Microsoft?

Joe Connell

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The device also functions as an alarm clock and can even display RSS and blog feeds. For further information on the Musicpal visit www.freecom.com.

CLARIFICATIONS & AMPLIFICATIONS

● **ARM 'equal on speed and better on power drain' (PCW June 2008).**

In the news article about AMD, we incorrectly stated that Intel cites the Atom chip as draining 100MW in standby. It should have read 100 milliwatts (mW).

● **Bug-free Phenom chips arrive (PCW June 2008).**

We incorrectly stated that Intel plans to release an energy-efficient version of the Phenom processor. AMD, and not Intel, makes the Phenom.

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The big three

Portability, startup speed and a decent application suite are just some of the things to consider when choosing a laptop

What do you look for in a laptop? Portability? Battery life? Compatibility? Connectivity? Value? All of the above? If you're like most people, you'll probably just go for the best value model that most closely replicates your desktop experience. After all, it makes sense to have a smooth transition from desktop to mobile, right?

There are some impressive deals out there. With a few pounds change from £300 at the time of writing, you could get yourself a 15.4in laptop running Vista Home Basic on a 1.6GHz Mobile Celeron with 1GB Ram, a 120GB hard disk and rewritable DVD drive – that's a respectable specification, and from HP no less.

But should you be choosing a laptop based on the same core specifications as a desktop? Your mobile IT needs could be quite different from your

and 2.7kg, it's too big and heavy for me. How about startup times? As I described in last month's column, Vista is slow at the best of times, but start it from a slower laptop drive and you could be waiting several minutes. In terms of applications, a full Vista laptop scores well, but most don't come with an office suite as standard.

While your requirements may be different to mine, it's revealing how a typical budget Vista laptop, like the HP model described, could be so far from what I really need. As far as I'm concerned, Asus got it almost spot-on with its original Eee PC 4G 701 last year. Sure it was cheap at £230, but what drew me in was its small size, light weight and quick startup. The 4GB solid state drive may sound small and the Linux OS unfamiliar, but spend a few minutes with the Eee and you'll find it a doddle to use, and it packs in all the software that most of us need from a mobile unit with space to spare.

My only complaint was the narrow 800x480 pixel display and greed for greater storage, which Asus has now addressed with its latest Eee 900 model. It features a bigger 1,024x600 pixel display that shows most websites without scrolling, as well as a 20GB SSD configuration hard disk with Linux or 12GB with Windows XP. The smaller drive balances out the licensing cost of XP, although, ironically, it's the Microsoft OS that is hungrier for space.

Asus is asking around 50 per cent more for the new model, though, which crucially encroaches on the territory of budget laptops boasting 10 times the storage, double the screen size and DVD drives as standard. But don't assume a higher-spec Vista model makes for a better portable. The Eee is almost one third of the weight of the HP model described, half its physical size, powers up faster and comes with all the applications I need on the road as standard.

This is why, despite the price hike, the new Asus Eee PC 900 is probably the nearest yet to being my ideal laptop – and if its Intel Atom-based successor sports longer battery life, then I'll be even happier. Again, they may not be an ideal match for your requirements, but they do illustrate that the portable for you may not necessarily be the one that closest matches your desktop configuration. **PCW**

'Buying a laptop should involve thought into how you work in a mobile environment'

requirements back at base. Indeed, as far as I'm concerned, buying a laptop should involve serious thought into how you intend to work in a mobile environment, rather than simply trying to find the most powerful configuration for the money.

To give you some idea, here's what I look for in a laptop. Number one is portability. I hate lugging round a big laptop, so want something as small and light as possible.

The second thing is speed, but not in terms of processor grunt. As someone who snatches a few minutes of work here and there while out and about, I want a laptop that's ready for action.

Third is having the applications I want to use, but these might be more basic than you'd think. All I need on the road is a usable web browser, word processor, email client and media player.

Beyond this I look for USB, Ethernet and wireless connectivity, a keyboard I can type on comfortably, a decent screen and as long a battery life as possible. But the big three for me are portability, startup speed and a decent but simple application suite.

So how would that £300 HP laptop measure up? Well in physical terms, at 358x227x36mm

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Cautionary tales: part two

Problem with your Wifi router and AOL connection? Join the back of the queue, says Barry Fox

Last month's message was check your credit card for nasty surprises; this month, it's check your Wifi router, especially if you're using it only with an Ethernet cable. Until recently, the airwaves were thick with unprotected Wifi signals. People were struggling to make their routers work and never getting as far as setting up WEP or WPA security. Generic network names such as 'Netgear' or 'belkin_54g' advertised signals as free for anyone to use, perhaps for downloading porn or pirated music and movies on someone else's internet account. In some cases, open Wifi can provide a gateway for viruses and data theft.

Now, with more vendors providing routers with pre-set encryption and easy-to-use setup wizards, most networks are secure. So I got quite a shock when I found my system offering open access under the generic name 'Netgear'.

'Emails to AOL Help are either ignored or trigger an illiterate response'

My phone is on a BT line, but my broadband connection comes from AOL. Since Carphone Warehouse (of Talktalk broadband fame) took over the UK network in October 2006, I've dreaded calling the AOL help line. Calls are VoIP-routed to India and I pay several pounds to listen to distorted music-on-hold before talking to poorly trained helpers who say "What?" because the line is so bad. One helper seemed not even to know about AOL's neat One Click Fix software, which can solve many technical problems.

Emails to AOL Help are either ignored or trigger an illiterate response: "Thanks for contacting AOL... I understand your inconvenience regarding this issue and sincerely acknowledge the inconvenience caused due to this... It has been done by the member service and I cannot locate the exact reason... I would like to help you with this matter, however, on email help we do not have access to that area and I can only provide you the general inquiry related to technical... so may I request you to call our member service to resolve this issue... we are fortunate to know that you have taken time to let us know about this issue... And

that's about all for now... We hope this mail is of some use to you."

AOL uses Local Loop Unbundling, which allows the network to put its own equipment in BT's exchanges. So the only way to report a faulty broadband connection is to call AOL Help. The helper then goes through a tick box list of tests before reporting the line fault to BT.

One test is to unplug the Wifi router. The next is to cold reset the router by pushing a recessed button. What AOL's tick list fails to warn is that cold resetting loses all settings. Some are non-standard for AOL, such as the MTU and PPOE settings. A cold reset also wipes the Wifi encryption settings. It's obvious when you think about it, but not when you're paying to be bullied by a VoIP-impaired help line. And the helper's tick list did not include any warning to make a note of line and security settings. So when BT repaired the line, my router started broadcasting an unencrypted signal under the generic name Netgear. Anyone using only an Ethernet connection to their PC may not find this out.

Several times previously I've asked AOL for press comment on the poor quality of its consumer support. But AOL refers me to Carphone Warehouse Broadband Services, whose press office just ducks, dives and ignores.

Because of the serious security implications of what AOL's Help Line was now doing, I again asked CPW's press office for comment. After several reminders, a spokeswoman assured me that "the senior complaints manager who works in the CEO's office is looking into it" and I'd "have a response very soon". That was well over a month ago and again I've heard nothing further.

CPW chief executive Charles Dunstone recently told financial analysts: "We anticipate a year of considerable further progress." His goal is 3.5 million broadband customers by March 2010. CPW is pushing AOL hard, with offers of a free laptop or PS3 and "great customer service and technical support" for a minimum of two years.

If you are serious about customer service Mr Dunstone, how about moving your help lines back to the UK, improving training and taking press questions on loopholes in subscriber security more seriously? **PCW**

Guy Kewney



guykewney@gmail.com

Sing when you're winning

Microsoft needs to look to the future with its operating systems if it's not to be left behind in the past

Steve Ballmer is a very successful man. You can watch him, if you like – the Net Events TV site (www.netevents.tv) has a bunch of recordings, including a very recent one where he's giving an "inspirational" speech to Microsoft employees in London. There was something ghastly about it, and in one sad way, it reminded me of someone else.

Long ago, far away, in another part of the forest there was a young writer called Guy Kewney who had an idea: "I'll bet these microcomputers would work in my house! I wish I had one." He went on to become pretty well known. That was back in the 1970s, and by the mid-80s, things were pretty good for him. Then...

Well, things carried on getting good, but by the early '90s, although he was at the height of his fame, and although he was eagerly head-hunted

'Ballmer is able to hide from issues because the company is making a lot of money'

by the top publishing company of the time, things were already going wrong. Some of those things are nobody else's business. Personal stuff – private miseries. But watching Ballmer address Microsoft employees at a London conference, I realised that he was, as I had been, in a hole professionally – and sinking deeper into the mud. Things that I should have been dealing with, I was ignoring, or hiding from.

And Ballmer, like me in those days, is able to hide from issues that really matter to Microsoft, simply because the company is making a lot of money. In my case, my salary levels were enough to make me feel that things were going OK. How wrong I was. Some of the bad stuff was outside my control. I assumed that there would always be rich, powerful media companies that wanted my services and would be prepared to pay. Wrong on both levels. Many of the media empires were about to go into meltdown.

The other assumption I made was that if they had money, I'd be their first choice to hire. I always had been, so why would things change?

Ballmer's video goes on about "people are our best asset" and how the "greatest people want to

work with winners" and so on. All his points boil down to "we're winning, so we always will win".

Wrong. Microsoft's revenues are fine, but when it comes to customer satisfaction, it has never known it so bad. To quote one consultant who just bought a new laptop: "The old one was getting so cluttered it was impossible to use. The amount of work involved in fixing it was overwhelming. Much easier to spend £300 on the 'bargain of the week' and get a clean platform and start again."

The "wild success" of Vista is the result of bullying of computer builders, forcing them to include it in the price of a new PC. I know that people are always reluctant to change for change's sake, but previous iterations of Windows always offered me something new. Everybody wanted Windows for Workgroups or NT 3.51 and queued up to get the early test versions.

That's not happening today, even a year after Vista's appearance. To quote another customer: "When suppliers like Sony are forced to include an XP Pro downgrade disc in the packaging, not just a note saying you can have one if you ask, you know that the army isn't marching behind its leaders any more."

Does Ballmer realise he's walking out beyond the cliff edge? Another video shows him shouting (he always shouts!): "Developers, developers, developers, developers..." over and over. Yes, developers are Microsoft's greatest asset: hundreds of thousands of coders, all steeped in the .Net framework, Visual Basic, C# and the Windows way. But is it enough to be programmer-friendly?

In the days of MS-Dos, we all accepted that Unix was better for the programmer, but sadly, not easier for the user. These days, the see-saw has made Windows the heavy guy, close to the grass roots of programming; Linux is the airy, user-oriented, compact environment and Apple (a Unix variant) the truly friendly one. Apple succeeds despite charging over the odds for hardware. It can do this not because it's flawless, but because people see it as being worth it.

Microsoft can't march into the future unless its customers are happy, not just buying because they have no choice. Ballmer must see that or he'll lead the company straight back into the past. **PCW**

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Cheap and very cheerful

PC prices may be low, but PCW can go one better. Emil Larsen shows how to build a Linux-powered PC base unit for less than £100

Over the years at PCW we've covered many DIY PC projects, but not recently, largely because (we thought) it ceased to be a cost-effective option when the price of PCs started to fall through the floor. But looking around at what you get in some 'bargain' PCs available on the web and the high street, we realised that with a judicious bit of buying we could probably give some of them a run for their money. Thus was born the PCW £99 PC.

No manufacturer we know of hits the £99 price point for a simple PC base unit. Yes, it's very basic and doesn't include keyboard, mouse, monitor or a copy of Windows (it's intended to run Linux), but if you've got that healthy curiosity for how a computer works, there's immense satisfaction in building your own design too. It's a great starter project, and the beauty is that you can customise it as much as you want and your wallet allows.

The next few pages will look at how to build a fully-functional Linux-powered PC base unit, using new, branded components for less than £100 to handle word processing, spreadsheets, audio encoding and playback



and, yes, even video playback. But if you're not interested in the race to the bottom, we've also looked at putting together a slightly more deluxe version for just £125 which is smaller, more attractive and a little speedier.

We've also got the low-down on what the heart of our PC – Intel's tiny D201GLY2 motherboard – is capable of. It's one of the

smallest, cheapest and, frankly, cutest microATX motherboards we've encountered.

If you haven't thought about building a new PC for a while, perhaps this will inspire you to give it another go – we certainly had great fun putting it all together and were stunned when we even managed to install and run Windows Vista on it.

BUILD A PC FOR £99

The ingredients

This is the full list of components we used for our little £99 marvel. With the exception of the motherboard, which was supplied courtesy of Kustom PCs (www.kustompcs.co.uk) they were all bought by us from Ebuyer in one shipment – this penny-pinching tip helped us save on delivery costs, although we haven't included the £10.69 next-day shipping costs in our tally (normal shipping is about £6). However, all prices include Vat.

- Intel D201GLY2 motherboard with CPU £50 (average price – see text)
- Kingston Value Ram DDR2 PC2-4200 512MB (KVR533D2N4/512) £7.99
- Seagate ST380215AS 80GB hard drive £23.49
- Cascom ATX midi tower case with 275W power supply £13.98
- Lite-On LTN-526 52X CD-Rom drive £2.53
- Total component cost £97.99

Before we go any further, a word of warning: at this end of the market, things can be very volatile, with stock appearing and disappearing with alarming speed. As

'There is lots of great kit available at bargain prices. Stick to good brands where possible and shop around mercilessly for the best prices'

we went to press, the case we used was no longer available, for example, but a slightly classier model appeared for £15. So don't be disappointed if you can't find exactly the same components as us – the principle remains that there is lots of great kit available at bargain prices. Stick to good brands where possible and shop around mercilessly for the best prices.

This Kingston PC2-4200 512MB Dimm module is verified by Intel for use with our motherboard



Now let's look at our specific components in a little more detail before seeing how to put it all together and get it up and running.

Affordable performance

The meat and potatoes of any system is its motherboard and CPU. Intel's D201GLY2 serves both in one go since it has a Celeron 220 1.2GHz CPU soldered to the motherboard.

This motherboard is a curious marriage between Intel and Sis. It's built and branded as an Intel board, but uses a Sis northbridge,

efficiency is better than many older Netburst (Pentium 4) based Celerons.

A version of the board with an -A suffix has a fan placed on top of the CPU heatsink and Kustom PCs (www.kustompcs.co.uk) supplied us with this model, the D201GLY2A, where it costs £59.95. After hunting around a bit, we found the fanless version for as low as £41.14, but on average you should be able to pick it up for around £50.

But even at the top end of the price range for the -A variant, it would only push the system price up to £107.84 – hardly a deal-buster.

The motherboard has an impressive amount of functionality, comparable to many high-end systems. This includes stereo audio, VGA graphics (from an Sis Mirage 1 chip), 10/100Mbps/sec Lan, one Pata, two Sata ports and support for six USB ports.

The backplate adds line-in and microphone inputs for audio recording, one serial port, one parallel port and PS/2 ports for older keyboard and mice. It features two USB ports, which we doubled to four by hooking up the case's front two USB ports to one of the jumper blocks on the motherboard. There is a second jumper block for a further two USB ports if your case supports them.

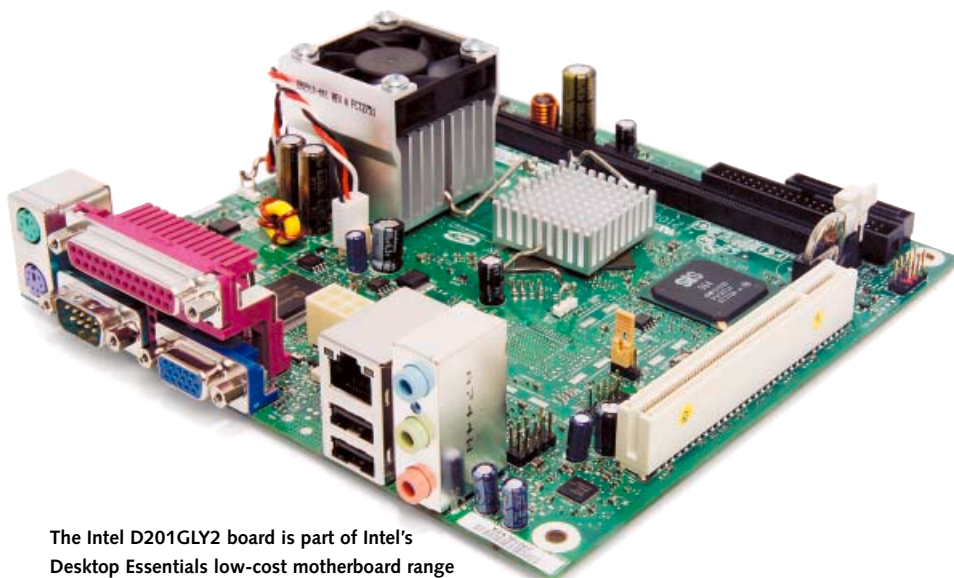
The D201GLY2's real value lies not in its price, but in its size; a large ATX AMD motherboard and CPU with more features and performance can be bought for around £55. The D210GLY2 is a microATX form factor, which means it will gel with the fittings in either an ATX or microATX case.

MicroATX covers a range of sizes though, since all it really specifies is where the screw fittings should be. The D210GLY2 is the smallest size a microATX board can be, measuring just 17.1cm square.

That means it's suitable for cash terminals, Windows Home Servers (indeed, Tranquil uses a version of this board in some of its WHS systems) and other bespoke devices that require a small case.

southbridge and integrated graphics. Sis is known for its affordable chipsets, although they rarely set the world alight with their performance.

The Celeron 220 CPU has a 533MHz front side bus, has 512KB of L2 cache and has a thermal design power (TDP) of a meagre 19W. Crucially, it's based on Intel's Core architecture, so its performance and energy



The Intel D201GLY2 board is part of Intel's Desktop Essentials low-cost motherboard range

Don't forget the memory

The motherboard has a single Ram slot, which Intel says supports up to 1GB of 533MHz Ram with Cas5 timings. In testing we found it was happy with 2GB Ram, while any faster Ram is reigned in to run at the D201GLY2's pace.

For our Scrooge-like purposes, we chose a single 512MB Kingston Value Ram PC2-4200 Dimm (part number KVR533D2N4/512) costing £7.99 – we chose this because it's been specifically tested by Intel for compatibility with this board (see <http://tinyurl.com/6pnjsr>).

Storage solution

The D201GLY2 motherboard has one parallel ATA (Pata) port, which many new optical drives continue to use, since Pata offers enough performance for even the fastest Blu-ray writer. A Lite-On 52X CD-Rom drive for £2.53 was the perfect match for the £99 PC, allowing us to install Linux or Windows XP: if you want to try Vista or some larger Linux distros, you'll need to add about £10 for a DVD drive.

Spending big bucks on faster hard drives is fool's play today, since entry level hard drives provide very good performance for everything but HD video buffs.

For £23.49, an 80GB Seagate Barracuda 7200.10 Sata disk with a 7,200rpm spindle speed and 2MB cache provides excellent grunt for the price.

If you have some old Pata hard drives lying around that you would like to use as your primary hard drive, to save some cash or access files stored on them, you can. A PCI Parallel ATA controller card like Via's VT6421A, costing £10.99, slots neatly into the D201GLY2's empty PCI slot and gives you one extra Pata input and two extra Sata ports. The

Pata input can be used with two drives at once (be it hard disks and/or optical drives) in a standard master/slave configuration.

A case in point

We did contemplate putting our PC in a shoe box, but decided a proper case would be worth splashing out on. The cheapest suitable new case we could find at the time of writing was a Cascom ATX midi tower from Ebuyer.

Not pretty, but perfectly functional – this Cascom case also includes a 235W power supply

It includes a 235W Cascom power supply and cost us a paltry £13.99. We're not sure how reliable this will turn out to be, and we would make replacing the PSU one of our first priorities. The case construction consists of poorly finished galvanised steel, which isn't the nicest stuff to handle, but it does the



Storage is incredibly cheap these days – our hard drive and CD-Rom drive cost just £26 in total

BUILD A PC FOR £99



Adjustable ties make light work of keeping wires and leads in order

job, has oodles of room and is finished in suitably plain beige.

The 5.25in external drive-bay covers don't fit very evenly but the case is light, solid and has an excellent front panel, with large and easy to use power and reset buttons, two USB ports plus headphone and audio jacks.

Cable management

Putting together a PC is essentially a doddle, since if a plug fits, it's usually the right one. But the result can look very messy indeed. Having well-routed cables makes it is easy to change components at a later date and also aids air flow.

If you've got some plastic cable ties lying about, it's possible to bundle cables neatly and route them around the motherboard, rather than across it.

'Well-routed cables makes it is easy to change components later'

The easiest way to get rid of extra power leads and other excess cable is to tuck it behind the motherboard track or behind the drive caddies. For the cables that are being used, something like Akasa's packet of five Velcro cable ties can keep them in one bunch. They are easily adjusted to suit varying thicknesses and cost £1.97.

For systems that require even better cable routing, Vantec's UV Reactive cable sleeving kit for £5.82 is a top choice. It includes cable ties, braided sleeves to protect your cables

Cooling is improved if cables are tied up, it also makes it easier to tinker with components

and heat-shrink tubing (hairdryer required) to seal the sleeving around your cabling. With some UV cold cathodes fitted these will fluoresce, too.

To use the braided sleeves, cut a length that is an inch longer than you need and then compress it until the sleeve doubles in width. This way the cabling slides in easily until the entire length and plug is covered.

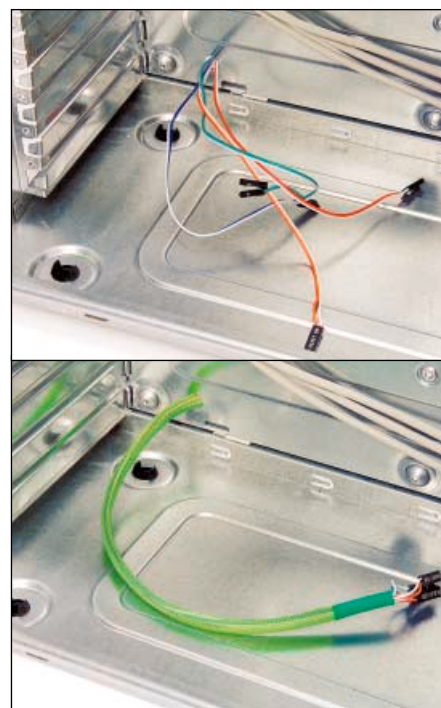
An inch and a half of heat-shrink tubing should then be placed at either end of the mesh. To seal, you will need to use a

hairdryer set to maximum heat and a low air speed, which will shrink and tighten the rubber tubing.

While not as flashy, cable ties attached to a sticky pad are often the tidiest accessories. These sticky pads can be stuck to the chassis and power supply to accurately and firmly guide cables around the motherboard. Kustom PCs sells packs of two for 49p.

Building complications

Our power supply didn't have any Sata power connectors for the hard disk. We used a four-pin Molex to Sata power converter, which can be bought for 99p at www.amazon.co.uk.



Cables can get in the way (top) but are easily tidied up with some heat-shrink tubing (bottom)

After running some tests with different sticks of Ram, we started to get "No bootable device – insert boot disk and press any key" error messages. Resetting the Cmos to factory defaults, using the relevant jumper, fixed this problem.

Apart from these minor glitches, we had no problems with the build, proving once and for all that cheap really can be cheerful.



Results

Operating system, performance and functionality

To keep the price below £100, using Linux is a must. Ubuntu 7.10, which we chose for its popularity, has problems with Sis Mirage graphics so we chose "Install Ubuntu in safe graphics mode" when booting from the CD.

Network and audio worked straight away. As with any Linux distribution though, you must update the operating system to get DVD playback and MP3 support.

Windows XP installed fine and, to our surprise, Vista Home Premium also installed with ease, although Intel doesn't support this configuration. The driver CD packaged with the motherboard has graphics, audio and network drivers for XP, but we couldn't get the audio driver to work on Vista.

Without anti-virus installed, startup times are impressive for this system. It took 52

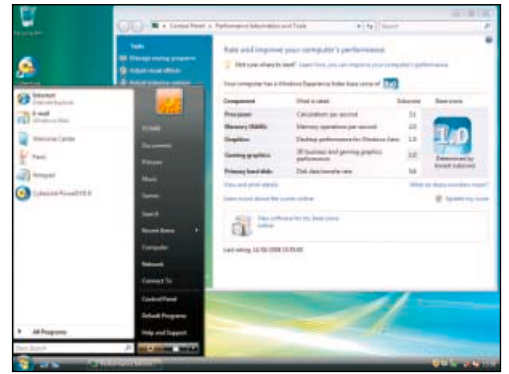
Our PC has surprisingly good Vista performance for just £99

seconds to boot into XP, 1min 17secs for Vista and 1min 8secs for Ubuntu.

All web browsing and basic office tasks run fine on the £99 PC. DVD playback was also good; In Vista, using Cyberlink PowerDVD 8, we saw CPU utilisation under 40 per cent throughout a movie and it was even better at dealing with standard-definition MPEG4 content, typically registering 30 per cent utilisation.

In Windows XP it took seven minutes, 41secs to rip 15 audio tracks (totalling over 70 minutes of audio) to 128KB/sec MP3 files using Windows Media Player 10.

Although Vista works well with basic programs on D201GLY2 systems, more taxing resource-hungry programs may soon crawl to a halt, which the Windows Experience Index reflected: it scores a rock-bottom 1 out of a maximum 5.9 (see screenshot). The fancy Aero Glass interface also, unsurprisingly, doesn't work with the Sis Mirage 1 graphics on our motherboard.

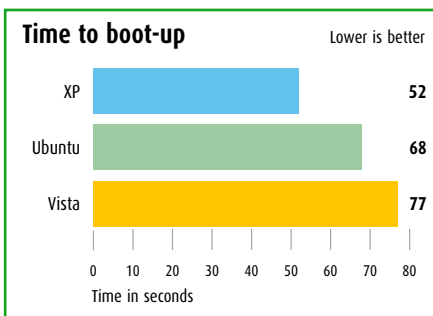


These scores are better than we expected, considering we felt PCmark05 might not run at all. It was faster than the Asus Eee PC and Belinea S.book 1 sub-notebooks and has comparable CPU performance to a 3GHz Celeron processor, which you'd have found in a £500 desktop PC from two years ago. It was a nice surprise in performance terms.

Windows Home Server

If you want to build a Windows Home Server, this £99 PC does the trick, albeit without a big hard disk, eSata support or Gigabit Ethernet. An OEM copy of Windows Home Server costs £99, upping the total cost of the system to £200, still well short of the servers in our WHS group test (see page 107).

It's even a pretty eco-friendly box as well. We measured an idle power draw of 38W, which is a good result for a WHS device, but could be improved further by using a more efficient (and more expensive) power supply.



PCmark05 scores:

● PCmark05 Overall	1,449
● PCmark05 CPU	2,183
● PCmark05 Memory	2,305
● PCmark05 Hard disk	4,237

The deluxe options

We're not a great fan of our £13.99 case since it's less than beautiful and poorly finished. It also has the noisiest PSU we've heard in some time, proving its inefficiency by drawing a whopping 5W even when the system was turned off but still plugged in a decent system would only draw a couple of watts. Getting a nicer case is the most crucial upgrade to the £99 PC and the D201GLY2 motherboard really deserves a smaller case to do it justice.

An 'Extra Value' piano black and red super-slim microATX case from Ebuyer does the job nicely. It comes with a 200W power supply, which is admittedly not as quiet or powerful as we'd like, but the £26.99 price point makes it worth the risk.

Using 1GB Ram (£10.17) and an Optiarc 20x SATA DVD writer (£15.95) pushes the total price up to £126.60, but this is now an attractive PC that will run Windows XP comfortably.

Adding even more luxurious components (see photo) would take the cost up to around £200.

The photo shown here is the case with a Gigabyte 780G motherboard (£62) and energy efficient Athlon X2 4400e (£43) with 2GB Ram (£30), which is our configuration of choice for a cheap media PC. The D201GLY2 is limited to a VGA output, whereas the Gigabyte 780G, which won PCW's microATX motherboard group test in the June issue, has HDMI, DVI and VGA onboard, so any TV, monitor or projector is within its grasp



Putting it all together



STEP 1

First you'll need to remove the case's default back-plate. Use a pair of pliers to carefully pull it out, and be careful of the sharp edges when you remove it. The D201GLY2 comes with its own specific back-plate in the box, which just pushes into the hole. The motherboard needs to be placed in the case with all the ports lined up snugly with the backplate.



STEP 2

If your case includes gold hexagonal spacers, fit them between the motherboard back-plate and the motherboard. With or without the spacers, secure the motherboard with four screws – one at each corner. The case includes a small bag of three different types of screws. Two types of screws have a lip, while the screws that have uniformly smooth head are the ones to use on the motherboard.



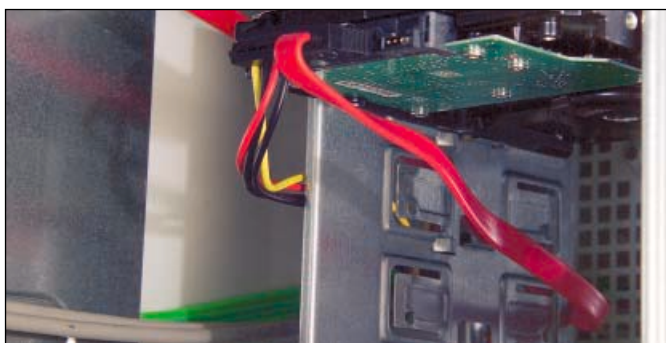
STEP 3

The system refused to boot when we didn't attach the four-pin 12V connector that feeds the CPU – although Tranquil was able to do with this motherboard in our WHS group test (see page 107). Make sure it is attached and the motherboard power connector is also in place. A clip indicates which way round the power adapter should fit.



STEP 4

The motherboard comes with a diagram to point out the headers for attaching the power and reset buttons and extra USB and audio ports. It has a sticky backing so you can put this diagram conveniently on a side-panel's inner face. On modern motherboards like the D201GLY2, getting the polarity of the power and reset jumpers the right way round doesn't matter.



STEP 5

Fit the optical drive and hard disk into the 5.25in and 3.5in caddy and use four screws for each drive. Screws with a thin lip and the finest thread are best for drive fittings. Our cheap CD drive uses a Pata data cable, which must be firmly inserted into the motherboard and drive. The hard disk uses a SATA cable, which can be routed around the back of the drive caddy for neatness.



STEP 6

We didn't connect the system (case) fan because fans generally increase dust build up in PCs and the CPU in our PC runs at such low temperature (with the minuscule fan whirring away, the CPU registered just 22.5°C when idling) that it's not worth the hassle or extra power draw. Now you're ready to connect your keyboard, mouse and monitor, power it up and start installing the operating system.

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Showtime for IPTV

Nigel Whitfield explores the technologies that are changing the way we watch our favourite television programmes

If you believe many of the posters on internet discussion forums around the net, "in a few years, things like Sky and Freeview won't matter, because we'll all be getting our TV over the internet".

Certainly, the accepted wisdom of many is that TV may arrive over the internet in the future, rather than the airwaves. But is that going to happen? How will it work? And, perhaps more importantly, what do people mean by 'Internet TV' and 'IPTV'? In this feature, we'll explore the technologies, and their alternatives, and look at what it could mean for the future of UK television.

Given its astonishing growth since the launch over Christmas 2007, it's no surprise that for many people in the UK, the BBC's iPlayer (www.bbc.co.uk/iplayer) and Internet TV are more or less synonymous – if you want to watch the same programmes you see on TV, when you want, it's the best source. There are alternative sites such as Youtube – which uses the same Flash video technology for streaming – or Joost, from the creators of Skype, which has a reasonable range of niche material, but when it comes to watching the latest programmes legally and in decent quality, the iPlayer is the biggest hitter.

It's not the only game in town, however, ITV has its own service at www.itv.com/catchup, and there's Channel Four's 4OD (www.channel4.com/4od/index.html) as well. There's a mix of technologies available, with 4OD using – like the original version of the iPlayer – a peer-to-peer (P2P) download service called Kontiki, so that programmes are ultimately stored on the viewer's PC, rather than streamed in real time. In fact, the BBC still offers this download option, but it's been largely eclipsed by the streaming version of iPlayer. The streaming works on more platforms than just Windows, as well as not being reliant on installing a P2P service on your computer, something to which many users have objected, and which doesn't find much favour with ISPs, either.

That, ultimately, is something of a shame as using a P2P distribution method is arguably a more efficient use of bandwidth than having millions of people trying to stream a programme at the same time from a single source, and could ease at least some of the problems ISPs are currently seeing.



IPTV or Internet television?

While services such as iPlayer, 4OD and Youtube might provide 'television' you can watch over the internet, they're not IPTV services in the strictest sense. This is where things can get confusing, even for the tech-savvy user. But, as more companies seek to offer TV programmes online, it will become increasingly important to understand what's on offer, and how it's delivered, to ensure that you don't fall foul of download caps, bandwidth limits, or simple incompatibilities.

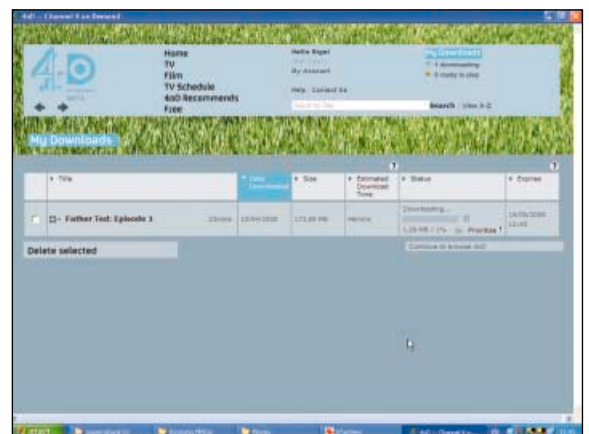
So, what exactly is the difference, and does it matter? To some people, 'IP television' simply means TV delivered over the internet; and the BBC iPlayer or Youtube certainly fall into that category. But to many, it's a more tightly defined set of protocols that make up a 'true' IP service. The difference, perhaps, is similar to the way in which people will refer to internet telephony, and include Skype's proprietary system within that, but when they talk

Channel 4's OD service uses the same peer-to-peer download technology as the BBC

about VoIP, many will tend to assume you're discussing services that use open protocols such as SIP, that allow interoperability.

Similarly, when it comes to TV over the internet, you can consider the popular services at present to be analogous to Skype – they're simple to get to grips with, on the whole they 'just work', and they don't use the same standards as a 'true' IPTV system.

In the strictest sense, an IPTV system is one that uses specific standards to deliver TV to a dedicated set-top box, using for example MPEG2 or MPEG/AVC video in 'transport streams' – the same sort of wrapper that is used in cable, satellite and terrestrial TV



ISPs: the missing link

Delivering TV shows via the internet is certainly technically possible – but there's a crucial component, which is the internet connection itself. And it's by no means clear that the ISPs are ready to make the investment necessary to provide the level of service that will be necessary for reliable internet TV.

For broadcast style services – distributing, say, BBC1 in real time – the most efficient way is to use multicast IP. So far, that's not something that's supported by many ISPs and to upgrade their equipment will cost money.

In fact, when it comes to investment, many ISPs appear far more willing to spend on traffic management, for example restricting P2P capacity, than on network upgrades. In the US and the UK, large ISPs have been throttling traffic-using protocols such as Bittorrent, which would effectively hobble the P2P download systems that many broadcasters are offering.

And with networks planned around the stop-start needs of domestic web browsers, the capacity isn't there to support many users simultaneously accessing content over the net. As we mentioned in last month's *PCW*, to avoid the bottleneck, ISPs may have to find ways to provide content from within their own networks.

But there are alternatives. Some in the BBC have suggested a content-delivery network, which could see services such as iPlayer distributed via dedicated links to local exchanges, though it's arguable whether or not the BBC should invest in such things.

An alternative argument from some within the ISP business is that they should receive a portion of the TV licence fee, to enable network upgrades. The BBC counters that the ISPs should charge people for the bandwidth they use (metered use), rather than advertising unlimited bandwidth for an unrealistic price and expecting a portion of the licence fee to plug the hole in their business plans.

boxes. But instead of being wrapped up in a broadcast medium, it's delivered via a TCP/IP connection.

And, since a huge amount of TV is still watched in real time, to make that part of the system more efficient, it can be delivered using a method known as multicast.

Multicast

On a normal TCP/IP network, information is sent from point to point, from your web browser to a server, for example, and then a stream of data is sent back again. And if 20,000 people all decide to watch Eastenders as it's broadcast, 20,000 copies of the same stream will be sent simultaneously, one to each user. It's hardly efficient; and that's where multicasting comes in.

There's a range of internet addresses set aside for multicast use, which is a one-to-many connection, where a server can send out one stream and many people can connect to it, provided they're on a network that supports multicasting. This means each bit of equipment between server and viewer needs to support it. In the UK, the BBC has done trials with a few ISPs, but it's not something you'll find as standard with a home broadband connection. And though it would potentially make online TV viewing more efficient, the problem of who'll pay for upgrades once again raises its head.

Of course, video doesn't have to be delivered at the same time to everyone – and many people think that as we become used to services such as Freeview Playback and Sky+, we'll become more and more used to

watching when we want to; so IPTV also encompasses video-on-demand, usually using a protocol called RTSP, or Real Time Streaming Protocol, which allows a server to provide a list of available content that can be requested by a client. RTSP is already used by Apple's Quicktime Player, Real Player and others, though in an IPTV network it's most likely to deliver MPEG2 or MPEG4/AVC, as the main broadcast digital TV streams do.

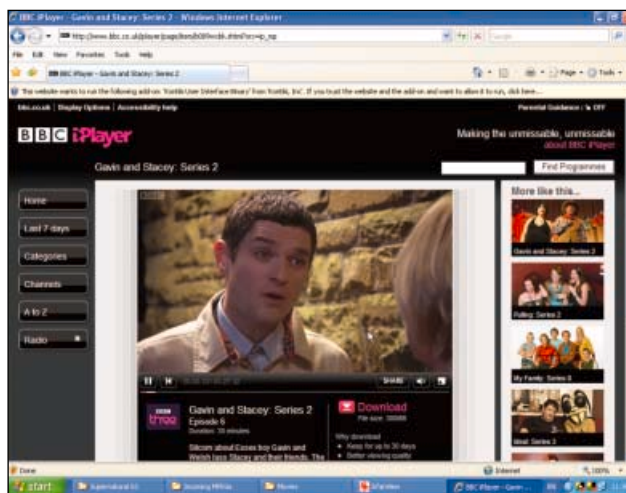
The final component of an IPTV system is the set-top box, which provides a programme

guide, allowing users to select one of the live streams, or request a connection to the server holding video-on-demand content.

The network matters

That all sounds fairly straightforward – and in theory, it's not too difficult. You can, for instance, set up your own in-house video-on-demand server, using tools such as VLC or Apple's Quicktime Streaming Server, and then connect to those streams, using a web browser, a client such as VLC, Quicktime Player or even a media streamer, if it supports the RTSP protocol.

But for effective IPTV, the network is crucial, which is why many IPTV systems in use are based around their own network. Not only does creating a network for IPTV mean you can design it for multicast, if you want to provide live TV, but you can ensure there's always enough bandwidth. As anyone who's tried to watch TV streamed over the internet knows, if things are congested, it can be a stop-start experience. That might be fine for catching up on something you missed, but not if it's your only way of watching TV.



The BBC iPlayer is at the centre of debate about who should pay for the bandwidth ISPs have sold to their customers

French operator Neuf provides an IPTV service over unbundled DSL lines, using a Netgem box similar to Evesham's iPlayer HD





Voom HD is delivered on Virgin Media's network using IPTV, rather than as a normal cable channel

To provide quality TV via the internet, you need to be able to guarantee bandwidth. Although the current version of the Internet Protocol, IPv4, doesn't have a built-in Quality of Service mechanism, you can protect certain functions, which is how ISPs can slow Bittorrent while not affecting web browsing.

It's also how ISPs that offer TV make sure it works; with BT's Vision, your file download speed can drop considerably when TV is being watched via the set-top box, while at its introduction the old Home Choice TV service – now owned by Tiscali – reserved a small amount of the broadband capacity for data, and kept the rest for TV.

In the longer term, as IPv6 is adopted more widely (see *PCW*, June 2008), it should become easier to provide good-quality IPTV across the public internet, but for now the companies offering 'true' IPTV services rely on having content within their own systems; so, when you ask for a catch-up viewing of a programme on BT Vision or Tiscali TV, it's not being transferred over the internet, but from within that company's network, saving precious external bandwidth.

In fact, some providers are suggesting they may abandon the idea of net neutrality, and provide better service to content providers who pay. Neil Berkett of Virgin Media has even suggested public service broadcasters may have to pay to ensure their content isn't stuck in the slow lane – see the box 'ISPs: the missing link'.

What next for internet TV?

Just as voice networks are moving towards internet protocols, with projects such as BT's 21st Century Network (21CN), so too is the world of TV. In many cases, it allows a company to provide both TV and telephone over the same network. Hull-based Kingston Communications was one of the first to provide TV via ADSL with a service called KIT. France's Neuf (www.neuf.tv) provides internet access, phone calls and TV, via a set-top box that's essentially the same as the Evesham iPlayer HD, and thanks to local loop unbundling, similar services are available from Tiscali in

TV on demand

Internet technologies aren't the only way to provide TV when you want it – both terrestrial and satellite television provide a service technically known as Push Video On Demand, or Push VOD. Programmes are broadcast in late-night slots, and a suitably equipped receiver stores them on its hard drive, allowing the user to watch them whenever they want. In the UK, Sky's Sky Anytime on TV operates on the satellite network, while Topup TV Anytime uses the digital terrestrial signal.

In both cases, users can choose a menu option on their set-top box, and see the programmes that are available, which will have been automatically recorded.

It's not true on-demand TV – essentially, it's just a way of making a PVR record programmes automatically – but it does give a little extra choice; on the Topup TV service, for example, you can choose to have a new film downloaded to your system every night.

The BBC has experimented with a similar idea, for high definition, where instead of being broadcast in real time, HD shows could be 'trickled' onto a compatible receiver, allowing them to be broadcast using less bandwidth. But with the planned introduction of HD broadcasts on Freeview at the end of next year, it's now unlikely that this system will appear outside the labs.

the UK, and are likely to appear as other LLU companies seek to expand their range of offerings. Virgin Media is investigating using IPTV over ADSL to provide a service outside its network areas.

Longer term, the International Telecommunication Union has published a set of standards under the IPTV GSI (Global Standards Initiative) banner that may hasten the adoption of IPTV. It covers broadcast and video on demand, as well as issues such as middleware – the software that allows users

'To provide quality TV via the internet, you need to guarantee bandwidth'

to select what they want to watch – and metadata to describe programming.

That can potentially make IPTV services very interactive and flexible. On the French Neuf TV HD service you can call up road traffic information, view a live mosaic of all the channels, or see real-time viewing shares for the popular channels.

While it's unlikely we'll see cable companies changing their networks from existing standards to IP-based ones overnight, there may well be a slow migration. Virgin Media, for example, is delivering the

Voom HD channel via IPTV as part of its 50Mbits/sec network trials.

But what of other internet television services? Joost (www.joost.com) has failed to repeat Skype's success, and no other UK broadcaster has had the success of the iPlayer, while Youtube is best for old gems, rather than current programmes.

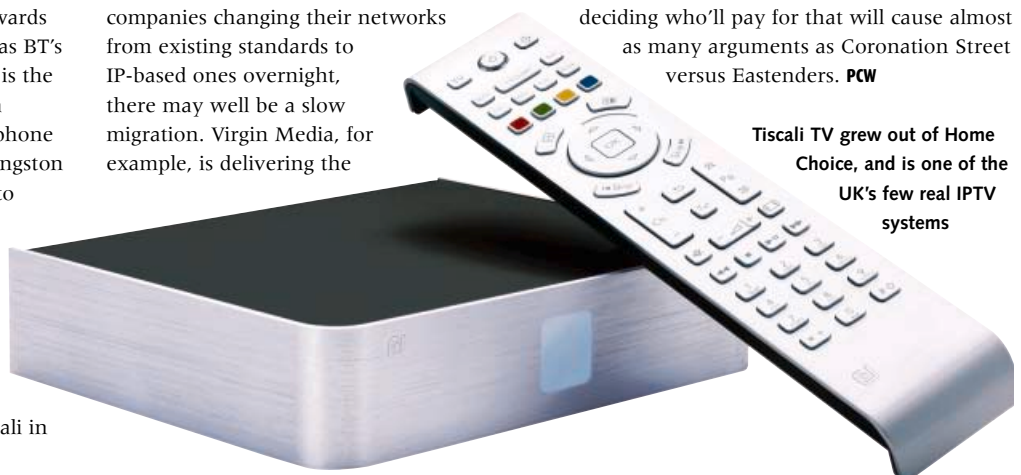
The situation may change this summer, thanks to Kangaroo, a joint project between the BBC, ITV and Channel 4, to bring their TV download services together, so you won't have to install separate software to access programmes from different TV channels.

Follow the money

There's little doubt technology for delivering TV over the internet works. What's likely to prove more problematic is working out who'll pay for it. In traditional broadcasting, TV companies pay to get their signal to the transmitters or satellites, consumers pay for their TVs, and cable companies pay for their own networks.

TV companies are happy to pay for the servers delivering their programmes, but between those servers and your computer or set-top box, there's a missing link. And deciding who'll pay for that will cause almost as many arguments as Coronation Street versus Eastenders. **PCW**

Tiscali TV grew out of Home Choice, and is one of the UK's few real IPTV systems





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Hard driving

Simon Crisp delves inside a hard disk to reveal the hidden secrets of modern data storage technology

Most of us don't give our hard drives a second thought; after all, it's just something on which to store files and photos.

They generally only come to our attention when they start irritating us by making noises or driving us to despair when they fail and lose countless hours of important work. But have you ever wondered how they work or what's inside them? In this feature we will explain how these mass-produced yet precision engineered products came about.

A brief history

The hard disk has been around for more than 50 years now. The grandfather of all hard disks was IBM's 350 storage unit (or 'disk file' as IBM called it), used in the 305 Ramac computer in 1956. It used 50 24in magnetic disks (platters) to hold five million 7-bit data characters and had one head for reading and writing data. But it was in 1973 that IBM introduced the technology on which most of today's drives are based. The 3340 or, to use its more popular name, the Winchester drive, introduced low-mass heads, lubricated disks and a sealed assembly. It had a capacity of 35MB or 70MB via two or four 14in disks.

1980 saw the first 5.25in full-height drive, the Seagate ST-506, which was the first hard drive for personal computers and held 5MB of data. Three years later Rodime introduced the 3.5in half-height form factor that we all know today, with the RO352 which held 10MB of data on two 3.5in

platters. 1988 saw the first low-profile 3.5in drive, the Conner Peripherals CP3022, which had a capacity of 21MB on a single 3.5in platter. This form factor became the standard for modern drives. The first 2.5in drive appeared the same year, when a company called Prairie Tek launched the 220, storing 20MB on two 2.5in platters.

The start of the 1990s saw IBM bringing three important advances in the way drives access data. The IBM Redwing, an 857MB drive launched in 1990, was the first to use magneto-resistive (MR) heads and a type of data decoding called PRML (partial response maximum likelihood). A year later IBM's Pacifica mainframe drive

'The hard disk has been around for more than 50 years now'

was the first drive to replace the magnetic oxide medium on the platter surface with a thin film medium.

The first 10,000rpm drive arrived in 1997 with Seagate's launch of the ST19101 Cheetah 9, which used eight 3.5in disks to provide 9.1GB of capacity – and a year later they had the first 10,000rpm drive with 3in disks, the Cheetah 18 (ST118202), which used 12 disks for its 18.2GB capacity.

The same year saw Hitachi bringing out an even faster drive, the DK3E1T-91, which had a spin speed of 12,000rpm, and in 1999 IBM launched the 1in Microdrive.

The turn of the century saw Seagate

SSD and Hybrid Drives

With all the publicity they've received lately, you could be forgiven for thinking that solid state drives (SSDs) are brand new. In fact, the first solid state drive was developed by Storagetek as long ago as 1978. M-Systems introduced the first flash based solid state drive in 1995, and the company was bought by Sandisk in 2006, allowing it to be amongst the first to sell an SSD to consumers.

Most SSDs use non-volatile Flash memory, which doesn't need power to retain any data when the system is switched off. Because the drives have no moving parts the seek time and latency delays found in mechanical drives aren't an issue, and so they offer extremely fast access times. It's not all good news though; sustained read and write times still can't compare to a standard disk drive and the price per GB is high in comparison to normal hard disks.

Hybrid drives are, as the name suggests, a fusion of traditional disk and Flash memory technologies; 256MB more of Flash memory built in as a persistent, dedicated cache. Aimed at the mobile market, the idea is to improve performance while at the same time saving power. If the Flash cache memory can supply the requested data to the PC, or save

it temporarily, it reduces the amount of time that the disk has to be spinning, helping to save power. It's a good idea – but unless the price of SSDs falls significantly in future, it may turn out to be a short-lived one, too.



Solid state drives have been around since 1978

reclaim the fastest spin speed crown with the Cheetah X15, rotating at 15,000rpm with a capacity of 18.3GB.

As well as capacities, drive interfaces improved, with the parallel ATA standard becoming faster, and then in 2003 the Serial ATA Working Group published the serial ATA (Sata) 1.0a specification. It's become well established, and now the drives in most new systems use the Sata interface.

Recording technology has changed too, with the first 'perpendicular recording' commercial drive appearing in 2005 in the form of a 1.8in drive from Toshiba (see box on page 46), but Seagate was first to the market with 2.5in and 3.5in drives (both in 2006) using the technology. It's this technology, which allows for closer packing of bits on the magnetic media, that enabled Hitachi to launch the first terabyte (1TB) drive in 2007. Last year also saw the advent of commercially available Flash-based solid state drives, or SSDs.

How do they work?

Hard drives work by storing and accessing data in a similar way to magnetic tape. On a disk, the data is stored by changing the magnetic polarity of small portions of its surface, which is coated with grains of cobalt-platinum. Think of a bar magnet – it can be pointing in one of two directions, with the north pole facing in the direction that disk is rotating, or against it.

In the most recent drives, the direction of magnetisation is perpendicular, so the north pole is either facing towards or away from the surface of the platter.

The direction of magnetisation indicates whether a binary '1' or a '0' is stored in that bit; the disk heads either apply a stronger magnetic field to change the polarity of a bit on the surface, when writing data, or detect the current state to read it.

Each platter has a head moving over its upper surface, and all the heads in a drive are moved by the same actuator – effectively accessing a cylinder at a time, across all the platters. The heads have to be extremely close to the surface in order to read or write the data, around 0.0003mm. To get that close to the disk surface without physically touching it, they ride on the air cushion created by the spinning discs. The only time

'The IDE controller can best be described as the brains of the drive'

the heads physically touch the discs is when the drive is switched off or if something drastic happens, say if the drive is dropped.

Most modern drives park the heads on a section of the disk reserved for that purpose, called the landing zone.

To read or write data, the controller has to wait until the appropriate sector passes underneath the disk head. The head position is monitored to check it's correct, and any errors are fed back in a closed loop system, ensuring that the drive stays correctly aligned.

The heads themselves are built from magneto-resistive materials – this means

their electrical resistance changes depending on magnetic fields near them, so as the disk moves underneath the head the resistance reflects the pattern of 0s and 1s stored. When data is written to the disk a current is applied to the heads, which creates a magnetic field that aligns the polarity of the part of the disk's surface below the head.

Data is stored in sectors and tracks (put simply, tracks are concentric circles, which are divided along their length into sectors). Both of these are established by low-level formatting, when the starting and ending points of each sector are written.

A sector contains a fixed number of bytes, usually 512 or 256, and these sectors are grouped together to form clusters. The actual file-storage operations and details such as the allocation of space are taken care of by the high-level formatting and the operating system.

IDE and ATA

When you access the data on your hard drive, the information comes via the IDE (Integrated Drive Electronics) controller on the drive's own circuit board – though in the first hard drives, you'd need a separate controller card in the PC and the drives themselves had less intelligence. The IDE controller can best be described as the brains of the drive. The drive is connected to the motherboard by the EIDE (Enhanced IDE) Sata port. These ports in turn are controlled by the controller chip on the motherboard.

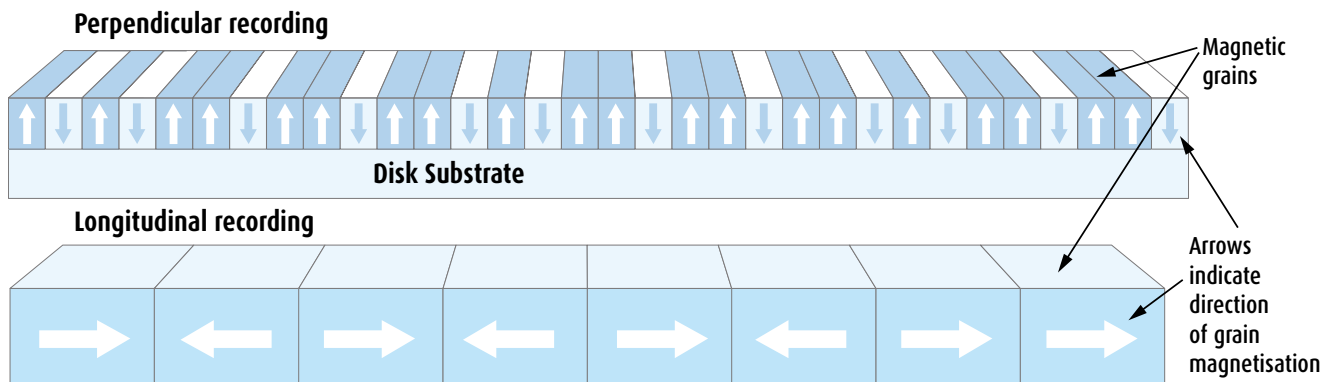
Before the widespread adoption of Sata, the most common terms used to describe hard-drive interfaces were IDE and ATA –

Perpendicular recording

Perpendicular recording technology is one of the most recent innovations in hard drives and as well as increasing recording density, it also helps overcome something known as the superparamagnetic effect. That's the name given to a process where the ambient temperature can randomly reverse the magnetic polarity of the grains

that make up the recording surface. When that happens, the integrity of the data is lost.

Aligning the grains perpendicular to the surface makes them more resistant to this effect, as well as increasing the density of storage, which has helped drives break the terabyte barrier.



'While some people think Flash drives are the future, some engineers disagree'

both of which mean the same thing. Because Western Digital coined the term 'IDE', other manufacturers had to come up with an alternative, and so AT Attachment was born; the AT (Advanced Technology) part refers to the AT bus architecture in the IBM PC/AT.

In fact, there are seven versions of the ATA interface and all are backwards compatible, with the chief difference being the speed of the connection.

Sata and SCSI

Introduced in 2003, the first Sata standard supported a maximum transfer rate of 150MBytes/sec, not much faster than the ATA-7 specification, but this was soon raised to 3.0GBytes/sec (300MBytes/sec) in the next revision of the standard. This faster speed is often incorrectly called Sata II; that's really just the name of the group responsible for the Sata specifications. To avoid misunderstandings, the group has since changed its name to Sata-IO.

The Sata cable uses connectors that require only four pins, not the 80 pins of the ATA cable, which obviously allows for much thinner cables.

Additionally, Sata's lower voltages mean that cables can be longer too. The other advantage of the Sata architecture is that it is point-to-point, thus doing away with the old master/slave configuration of ATA drives.

SCSI (Small Computer System Interface) drives have traditionally belonged in the

domain of servers and workstations, although they are not so common these days, as serial-attached SCSI (SAS) drives (see below) are making inroads into this area of the market.

Serial Attached SCSI

SAS is the latest generation interface for the server environment, a successor to the SCSI parallel interface that combines high-end features, such as multi-initiator support and full-duplex communication, with the smaller Sata interface. SAS can support both SAS and Sata drives, so Sata drives can be connected to SAS controllers, though you can't go the other way.

SAS, like Sata, operates at speeds up to 3Gbits/sec. It also has extended drive addressing which allows it to support up to 4,032 devices per port, a huge advantage over parallel SCSI or Sata.

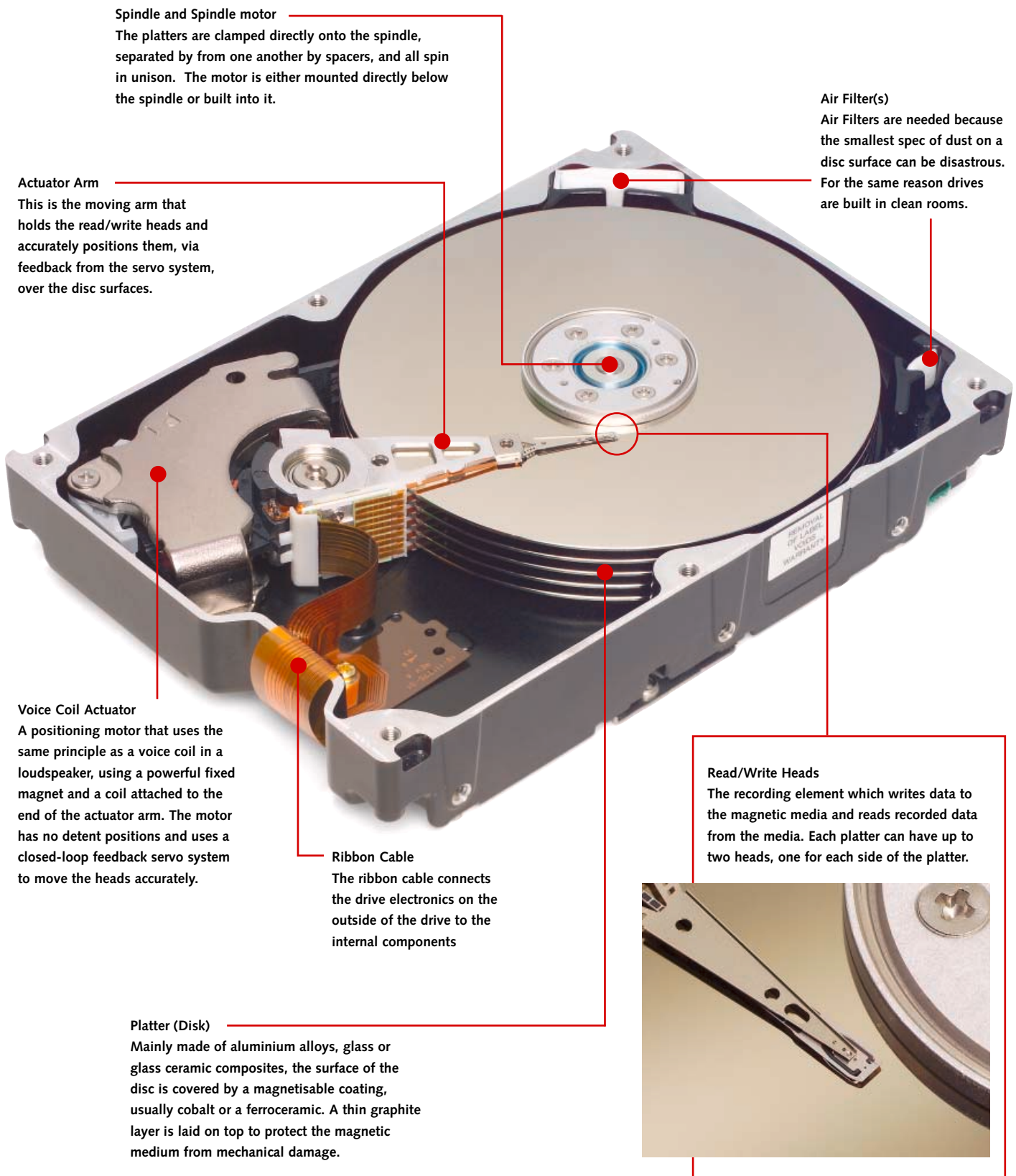
The future of hard disks

While some people think Flash drives are the future, some engineers disagree. Those who hold the technology close to their heart still have a few tricks up their sleeves. One is thermally assisted recording (TAR), which uses a laser to heat up the recording media while the head is writing the bits of data. This allows the use of small magnetic grains, increasing the density of storage. Another path to higher densities is to use patterned media.

On current disks, each recorded bit is made up of many random grains on the platter's surface – in patterned media, the magnetic layer is created as an ordered array of highly uniform islands, each island capable of storing an individual bit. What's certain is that despite reports of their impending demise, hard drives will be around for a long time yet. **PCW**

A closer look

Hard disk drives store and access your data, but do you know your read/write heads from your voice coil actuator? Here we delve into what's inside the case



Quick guide to drive interfaces

ATA-1	The first ATA specification introduced in the mid 1980s, rated at 8.3MBytes/sec.
ATA-2	Introduced in 1994 and also known as Fast ATA, it doubled the transfer rate of ATA-1 to 16.6MBytes/sec.
ATA-3	Introduced in 1997, this standard added interface improvements such as SMART error reporting technology and password protection.
ATA-4	The first Ultra ATA interface, introduced in 1998 it doubled the transfer rate to 33MBytes/sec, also known as Ultra ATA/33. It also added the ATAPI interface for devices such as CD-Rom drives.
ATA-5	Better known as Ultra ATA/66 this doubled the speed to 66MBytes/sec. The specifications also defined the mandatory use of an 80-conductor cable.
ATA-6	ATA-6 didn't double the transfer rate but topped out at 100MB/sec, hence its more common name - Ultra ATA/100.
ATA-7	This is also known as Ultra ATA/133, and is capable of transfer speeds up to 133MBytes/sec.
SERIAL ATA	Serial ATA (Sata), introduced in 2003, brought in a new serial four-pin interface, hot-swap and external (e-Sata) features and 120MB/sec (1.5Gbits/sec) transfer rates for Sata/150 devices. Sata/300 increases transfer rates to 300MBytes/sec.
SCSI-1	Introduced in 1980 and lasting until 1985, SCSI-1 could control up to seven devices and could transfer 8-bits of data at a time, at a stunning 5MBytes/sec.
SCSI-2	Appeared in 1986 with an 8-bit bus, 10MB/sec transfer rate and Command Tag Queuing.
SCSI-3	In 1993, SCSI-3 added Fast Wide SCSI (16-bit, 20 MBytes/sec), Ultra SCSI (8-bit, 10-20MBytes/sec) and Ultra Wide SCSI (16-bit, 40MBytes/sec).
ULTRA2 SCSI	Ultra2 SCSI (1997-2000) doubled the total bus throughput of Ultra Wide SCSI to 80MBytes/sec and also supported 16 devices per channel.
ULTRA 3 SCSI	Better known as Ultra160 SCSI, it supports 160MBytes/sec transfer speeds.
ULTRA320 SCSI	Still 16-bits wide and with full backwards compatibility, this offered 320MBytes/sec transfers by doubling the data clock rate.

Hard disk glossary

Access time The time taken between the issuing of an access command and the instant the target data may be read or written.

Areal density The amount of data that can be stored per square inch of disk surface.

Buffer A temporary data storage area that compensates for a difference in data transfer rates and/or data processing rates between sender and receiver, also called the drive cache.

Cluster A group of disk sectors.

Cylinder A set of data locations comprising all the concentric tracks with the same track number from all the platter surfaces.

Filesystem The operating system's way of storing and organising the data files on the disk.

Head The device that writes and reads data on a magnetic disk. Modern heads use giant magnetoresistive (GMR) or tunnelling magnetoresistive (TMR) technology, whereby

a material's resistance changes in response to magnetic fields.

Latency A delay between issuing a command and getting the response. In a disk drive there is both seek latency and rotational latency.

Logical block addressing (LBA) A way of specifying the location of blocks of data on the disk that replaces the old CHS (Cylinder, Head, Sector) method. The older 28-bit LBA system has been replaced on modern drives and PCs by 48-bit LBA, which removes the 137GB limit for hard disk sizes.

Longitudinal recording When recording the bits are horizontally aligned parallel to the disk surface.

Partition Logical section of a disk drive, each becomes a logical device with a drive letter.

Perpendicular recording Technology designed to overcome the limitations of Longitudinal recording. In Perpendicular recording the orientation of the data bit is vertical allowing for greater density.

Platter The disk inside a drive. Each platter (disk) has two surfaces, the top and bottom surface. The platter is made either of aluminium/magnesium alloy or, more recently, glass and has a magnetic coating.

Rotational latency The data access delay caused by the head waiting for the rotation of the disk to bring the data underneath it.

Sector Data tracks are divided into sectors along their length, each sector 512 bytes long.

Seek The movement of read/write heads across the platter to the desired data cylinder.

Seek time The elapsed time between the issuing of a seek command and when the head reaches the desired data cylinder.

SMART Self-Monitoring Analysis and Reporting Technology. Industry standard monitoring system to aid fault and failure prediction.

Track A concentric ring of data on a platter's surface.

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HAS MICROSOFT SERVED AN ACE?

With little publicity since its launch last year, Microsoft's Windows Home Server operating system has struggled to capture the imagination of the general public. But as our group test on page 107 shows, with the right hardware it's a quick and easy way to back up and share data across your home network. There are very few models available to buy in the UK, but we've rounded up the big names and pushed them to their limits.

We've also got a group test of the latest portable media players. It's easy to assume Apple has the market cornered, but if you can look beyond the iPod there are some impressive alternatives. We check out eight of the best on page 97.

You'll also find reviews of the latest kit, including Ultraviolet's high-end gaming notebook and a versatile sat nav from HP.



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OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.

Recommended: A product that combines great features, usability and value for money.

Great Value: Not the best in class, but a product that has superior features and performance for the price.

Best Buy: The best product in its class in terms of performance, features and value for money



REVIEWS



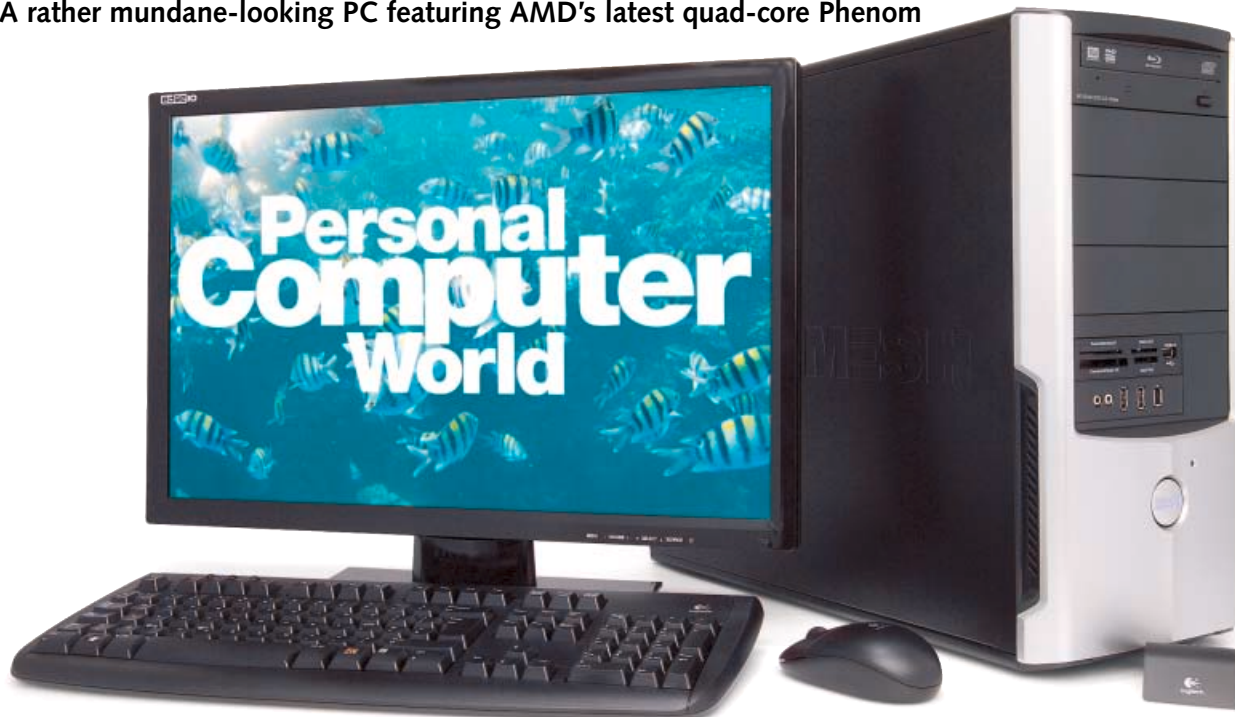
'The 2GB of built-in memory stores the preloaded maps, so the SD-card slot is free for you to load multimedia content'

Read the review on page 59

DESKTOP PC

Mesh Matrix X4

A rather mundane-looking PC featuring AMD's latest quad-core Phenom



The Matrix X4 is the first computer we have seen built around AMD's Phenom processor, in this case the Phenom 9550 X4 quad core, and coming with a Blu-ray disc reader, 1TB of storage and a 22in widescreen.

The processor has a clock speed of 2.2GHz and each core has 512KB of L2 cache, making a total of 2MB. The CPU is cooled by an Akasa AK-861CU cooler which does the job efficiently and quietly. An MSI K9A2 CF motherboard also sits inside and uses another recent AMD product, the 790X Northbridge chipset which, for the K9A2 CF, MSI has twinned with the older AMD SB600 Southbridge. Both chipsets are passively cooled which helps keep the system quiet.

A total of 4GB of 667MHz DDR2 memory will keep the installed Windows Vista Home Premium happy and help towards cutting down any video-editing time. The memory comes in the form of two Elixir 1GB modules and, should you need more memory (which you will once you start getting involved in editing high-definition content), the motherboard has two free Dimm slots and supports a total of 8GB.

Both the memory and CPU performance hold up well in the Vista Experience Index scoring 5.9, but the overall system score is just 4.1; being dragged down by the performance of the graphics. Powering the graphics is a passively cooled Sapphire HD3450 card with 512MB of dedicated GDDR2 whose performance will ruin any plans you might have to use the Matrix X4 for serious gaming. This is also demonstrated by the average framerate of just 8fps (frames per second) we achieved when testing system with the game Fear.

However, the hardware built in to the HD3450 is, perhaps, of more importance than the gaming

performance since it supports HDCP via the two dual-link DVI ports. It also has an HDMI output.

The monitor is an Edge10 W223 22in model. It has a native resolution of 1,680x1,050 pixels and comes with built-in pair of 2W speakers.

If you want decent gaming performance, swapping the HD3450 for something with a little more grunt will suffice. The K9A2 CF motherboard also supports Crossfire technology, however, although it provides two x16 PCI Express slots, in Crossfire mode they will only run at x8 speed – and only then if your graphics cards adhere to the PCI Express 2.0 specification. Fitting older PCI Express 1.0 specification cards will only give you x4 performance in Crossfire mode.

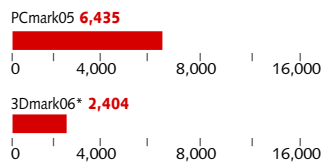
The tower case isn't the most stylish we've seen and the cable management could be better, but there is plenty of room inside to start upgrading. The motherboard offers two PCI slots and a single x1 PCI Express slot for extra cards. There is space for five disk drives, with two sitting empty should you wish to add more storage – two house the preinstalled hard drives while a third is used by the multi-format card reader.

The two hard drives are both 500GB Samsung HD501LJ units. The SB600 Southbridge supports Raid arrays so you could build the drives into arrays either to give you one big drive or to protect your data. Should you want to add more drives the motherboard has a single Sata port and the ATA port free.

Rounding off the hardware is a desktop set from Logitech comprising a cordless keyboard and optical mouse, while Microsoft Works 8.5 and a Cyberlink video-editing suite make up the software bundle.

This isn't a bad system by any means, but there are better value Intel-based alternatives. *Simon Crisp*

Performance



*Tested at 1,024 x 768 in 32-bit colour

Verdict

Pros Blu-ray drive; plenty of storage space

Cons Fairly expensive; better value Intel-based alternatives available

Overall A good, solid performing computer, but for this price you could get a faster Intel system

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall ★★★☆☆

Price £799

Contact Mesh 08447 36 04 40
www.meshcomputers.com

Specifications AMD Phenom 9550 X4 (2.2GHz) • AMD 790X motherboard • 4GB 667MHz DDR Ram • 22in Edge10 display • Blu-ray reader • Sapphire HD3450 • Two 500GB Samsung HD501LJ hard drives • Integrated 7.1 audio • Windows Vista Home Premium • One-year RTB warranty

NOTEBOOK PC

Ultraviolet Xodus DTP

A beefy chassis and equally impressive performance, but the price is hard to stomach



The Xodus DTP might be heavy and expensive but this gaming notebook set new benchmark records for several of our lab tests

T rue gaming laptops don't come much chunkier than this. Dell and HP may have 20in models, but this 17in notebook from Ultraviolet makes mincemeat of them in 3D programs, thanks to two top-of-the-range Nvidia 8800m GTX graphics cards in SLI configuration.

Out of the box it smashed our 3Dmark05, 3Dmark06, PCmark05 and Cinebench records for a laptop. It also broke our record for power consumption from a laptop, idling at an eye-watering 106W and nearing 200W when gaming, which is just shy of what its 220W power brick can supply and comparable to most desktop PCs. The power supply weighs 1.45kg, while the laptop itself tipped our scales at 5.40kg.

To offset the high power draw, a large 6,600mAh battery ensured it lasted 58 minutes in our DVD playback test. A Core 2 Extreme X6800, which is a 2.93GHz desktop dual core, is a major drain on the battery as it has a 75W thermal design point; twice that of Intel's laptop dual-core CPUs. There's 2GB DDR2 800MHz Ram, which is a little anaemic for such an expensive laptop in the new 4GB era, and two 200GB hard drives. Both are 7,200rpm drives, as opposed to the 5,400rpm models often seen in laptops, and use Raid 0 which offers improved performance.

The Xodus DTP uses a Clevo D901C chassis. It may be cumbersome, but it's attractive and robust. Clevo's designs form the base of many gaming notebooks, including Rock's and PC Specialist's gaming laptops, and measuring 6cm at its thickest point this is Clevo's biggest design. Laptops using Clevo's more common 17in chassis tend to come with dim screens but, although we noticed a slightly yellow tint to the Xodus' display, the Xodus DTP has the brightest screen we've

seen in our labs, hitting 146cd/m2 using a Spyder 3. And with a 1,920x1,200 pixel resolution, it can display an amazing amount of detail. Most laptops with 1,920x1,200 resolutions can't render new 3D games at that setting, but the Xodus DTP managed a 31fps (frames per second) average in our DirectX 10 World in Conflict benchmark at the screen's native resolution. This is a distinguished result considering settings were set to high with 2x anti-aliasing.

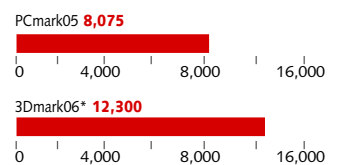
The gaming atmosphere is maintained by four speakers placed around the chassis, which create an immersive but not overly loud sound. The keyboard is large and responsive and crucially doesn't get hot during gaming like many laptops.

The chassis has four USB ports, an SD and Sony Memorystick card reader and audio outputs. DVI, VGA and S-video outputs will serve external monitors but there's no HDMI output, which is a shame since this laptop has a two-speed Panasonic UJ-220 Blu-ray writer so it would have been good to be able to output content to a big TV.

Dell's most expensive XPS M1730 gaming laptop has all the features of this laptop, but is more affordable at £2,700. Rock also has the Xodus DTP (with the same chassis), which is selling for £100 less. A free game, T-shirt, mouse mat, carry case and two-year warranty tentatively drag the Xodus DTP up to average value for money.

It's worth considering that hybrid power, coming soon, and mobile 45nm Penryn CPUs could give birth to a speedy gaming laptop with a life away from the mains. But waiting for the next best thing is often folly in the PC industry, and the Xodus DTP has few major flaws and outstanding 3D performance. *Emil Larsen*

Performance



*Tested at 1,024 x 768 in 32-bit colour

Verdict

Pros Fast gaming performance; top CPU performance; robust chassis; bright and detailed display

Cons Poor battery life; high power consumption; expensive; poor USB placement; 4GB Ram more appropriate for high-end notebooks

Overall The fastest gaming laptop we've tested, with classy chassis, but with a price tag to match

Features ★★★★★

Performance ★★★★★

Value for money ★★★☆☆

Overall ★★★★★

Price: £3,570.83

Contact Ultraviolet

Specifications Intel Core 2 Extreme X6800 2.93GHz • P965 / ICH8R chipset • 802.11a/b/g/Draft-N Wifi • 2-in-1 card reader • Webcam • Microphone • Windows Vista Home Premium • Two-year RTB Warranty • Carry case • 397x298x60mm (wxdxh)

DESKTOP PC

Zoostorm 3364-2354

A quad-core system for under £500, but one that's lacking graphics prowess



There's plenty of room inside the case, including a spare internal bay for fitting an extra hard disk

This compact computer houses a surprising amount of power. It also demonstrates the main reason for continuing to buy desktop PCs rather than the increasingly popular notebooks which many people opt for. That is, for the same price – £500 – as a mid-range notebook, here you get a pretty impressive desktop with a more powerful processor, more memory and a larger hard disk than we'd expect to find in a laptop. It even comes with a reasonable monitor, so you get a fully working, more impressive computer for the same price.

If mobility isn't important – and for many buyers of desktop replacement notebooks, it isn't – and you have the space at home, it's always worth considering the extra value you can get from a desktop such as this.

The Advanced Premium PC (it can be found on Zoostorm's website using the eight-digit code in the name) comes with an Intel quad-core processor (a Q6600, running at 2.4GHz) as well as 2GB of Ram. Both are ideally suited to Windows Vista Home Premium, which is supplied, and they're accompanied by a 250GB hard disk and a multi-format DVD writer.

The case is short and stubby, but reasonably well designed. The DVD writer and memory card reader are hidden behind black flip-out panels (there's an empty slot behind another panel if you wish to add another drive, such as a Blu-ray player). Inside the case there's plenty of room, with only one of the two memory slots used and no other expansion slot used. There's also a spare internal bay for fitting an extra hard disk. Everything is fairly tidied away inside, with lots of room for air to flow, meaning it runs cool and quiet.

The reason none of the expansion slots are used is because the computer lacks a dedicated graphics card,

preferring instead to use integrated graphics. On such a powerful machine, this puts little extra strain on the main processor, but it's fine for video playback and editing. Playing games causes more of a problem, though, and it will only cope with recent games if the detail levels are turned down. Given the other abilities of the PC, and the fact that a decent graphics card can be had for under £100, it's something that can be added later on by anyone who wants to play games.

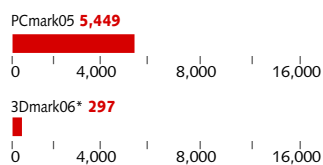
There is also no DVI port included, leaving just an analogue VGA socket, used by the supplied 19in monitor. This isn't a big deal if you want to hook up a DVI display, though, since adapters are readily available and also very cheap. Although there is no Firewire socket, there are six USB ports (four on the back, two under the panel at the front) and a network socket.

In our performance tests, the Zoostorm 3364-2354 notched up some respectable scores. In PCmark05, it achieved 7,650 in the CPU section and 5,746 in the hard drive test, although the integrated graphics result of just 1,658 pushed its overall score down to 5,449. As expected, it struggled with 3Dmark05 and 3Dmark06, scoring 682 and 297 respectively. If you're looking at playing games at reasonable detail settings, you'll definitely need to go out and purchase a dedicated graphics card.

There's no extra software (in addition to Windows Vista) included, but the Zoostorm comes with a decent Microsoft keyboard and mouse, and there is a one-year collect-and-return warranty.

In all, despite the lack of a graphics card and Firewire port, there is more than enough inside the 3364-2354 to justify its price. *Anthony Dhanendran*

Performance



*Tested at 1,024 x 768 in 32-bit colour

Verdict

Pros Good overall performance; plenty of expansion opportunities

Cons Poor graphics

Overall Gamers will want to upgrade the graphics, but you're still getting a lot for your money with this quad-core PC

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★
Overall ★★★★★

Price £499

Contact PC Nextday
www.pcnextday.co.uk

Specifications Intel Q6600 (2.6GHz) • 2GB Ram • integrated graphics • Cibox 19in TFT display (1,440x900) • 250GB hard disk • DVD writer • Multi-format memory card reader • Windows Vista Home Premium

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NOTEBOOK PC

Lenovo X300

The PC alternative to the Macbook Air



According to Lenovo's "hot air" advertising campaign, this is the PC answer to the Macbook Air. At 1.55kg, it weighs nearly 200g more than the Air, but what you lose in flair you gain in functionality since the X300 has a DVD writer fitted, something missing with the Mac. The X300 also has three USB ports and an Ethernet port; the Macbook Air has just one USB and no Ethernet.

The X300's CPU is a new edition to Intel's range. Called the Core 2 Duo SL7100, it marries a 1.2GHz

clock speed with 4MB L2 cache and a frugal 12W TDP. This combines with a GM965 chipset (with integrated X3100 graphics), 2GB Ram and a Samsung 64GB solid state drive to produce plenty of grunt for office software. The solid state drive ensures quick boot-up times (reflected by a notebook-record of 12,461 in PCmark05's hard disk section) and good battery life.

Apart from the function and control keys being in reverse order, the X300's large keyboard is superb for typing. A track-point and trackpad serve for navigation but the latter is squashed between the mouse buttons.

The rubberised chassis has little flex to it, despite measuring just 27mm at its thickest point. The matt-finished 13.3in (1,440x900 pixel) screen is also pleasing to work with and the stereo speakers produce a reasonable sound.

An HSDPA slot sits just beneath the 4,000mAh battery, which powered the X300 to four hours five minutes in our productivity test – just a little longer than the Macbook Air managed.

The X300 has a similar price to the Macbook Air with a 64GB solid state drive, but with just 44GB left once Lenovo's tools and Windows are installed, we'd be tempted to wait for a cheaper and more spacious mechanical hard disk version.

Emil Larsen

Verdict

Pros Good battery life; fully featured but lightweight; good security features; excellent keyboard

Cons Expensive; heavier than Macbook Air; small trackpad; little available hard disk space

Overall One of the best portable workhorses around with an excellent keyboard and compact chassis

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £1,957

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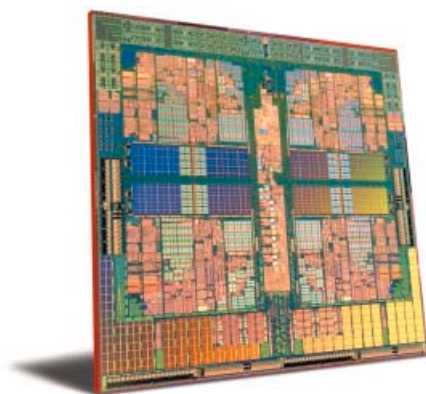
www.lenovo.co.uk

Specifications Intel Core 2 Duo SL7100 (1.2GHz) • 13.3in display • 802.11a/b/g/Draft N • 1.3-megapixel webcam • Vista Business • Fingerprint reader • Three-year RTB warranty • 311x231x27mm (wxdxh)

CPU

Phenom X3 8750

Are three AMD cores for the price of two Intel ones good value?



With the introduction of B3 stepping (Phenom 9050) quad cores, which don't have the translation lookaside buffer (TLB) bug that dogged the original Phenoms, AMD also introduced the X4 moniker, making way for triple-core Phenoms to get the obvious X3 name. Phenom triple-cores are essentially quad-cores with one faulty core, a common problem for CPU makers, but AMD is selling faulty quad cores as perfectly good triple cores.

We've tested the fastest triple core, an X3 8750

running at 2.4GHz with a 3.6GHz (full duplex) Hypertransport 3 link. We successfully overclocked it to 2.8GHz, so it offers much better overclocking than early Phenom 9000 chips.

The X3 8750 has a thermal design point of 95W, the same as a Phenom 9600 Black Box edition. Idle power consumption was 2W more than the Phenom 9600 running at 2.4GHz, but that's within the margin for error and means triple-core CPUs have identical idle power draw to quad-core Phenoms.

The X3 8750's pre-order pricing is around the same as 2.66GHz E6750s and new 2.66GHz E8200s. The 45nm E8200 is a bit faster than the 65nm E6750 and both these Intel dual-cores are faster than the 8750 in Cinebench's single-core tests and PCmark05's CPU test, but are slower in 3Dmark06's CPU tests and multi-threaded Cinebench tests.

Essentially one Intel core is faster than one AMD core, but three AMD cores for the price of two Intel ones is an easier sell. However, we struggle to name many consumer applications that can use more than two cores, so a 2.66GHz Intel chip will suit most.

If you're into 3D rendering then AMD's triple core makes sense. At the very least, AMD is beginning to be competitive in the mid-range.

Emil Larsen

Verdict

Pros Better performance than Intel in multithreaded apps; affordable; good upgrade for AM2 motherboards

Cons High power consumption; each core is slower than Intel's

Overall Triple cores break the CPU mould a bit

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★☆☆

Price £120

Contact AMD www.amd.com

Specifications Socket AM2+ • 2.4GHz • 512KB L1 cache • 1.5MB L2 cache (512KB per core) • 2MB L3 cache (shared) • 1.8GHz memory controller speed • 1,066MHz memory support • 3.6GHz Hypertransport 3.0 • 95W TDP

SAT NAV

HP Ipaq 314 Travel Companion

A quality all-round GPS with a huge range of features



As well as being quick to point you in the right direction, the Travel Companion has a range of additional multimedia features to explore

This slimline device features full maps of Western Europe, a vibrant 4.3in widescreen display and a range of additional multimedia features to keep you entertained on the move. In addition to typical navigation, you'll find media playback along with a range of other applications, including games that use the touchscreen display.

The 2GB of built-in memory stores the preloaded maps, so the SD-card slot is free for you to load multimedia content. These work extremely well and, where competitors often make it rather awkward to load and play back content, the Ipaq will automatically scan any attached memory card and populate a playlist for you. The audio player uses ID3 tags to organise tracks, the photo viewer offers a range of slideshow transitions and the video player had no problem playing our test files.

Impressed with the 'Travel Companion' features, we took the device out on the road to see how it handled traditional in-car navigation. Again, it worked extremely well. The interface is well organised and uses large, clear buttons that can be easily operated on the move to help you plan and manage a route. There's also the usual selection of navigation tools such as POIs (points of interest), full postcode searches and favourites, along with the ability to navigate to a city centre if you just want to be pointed in the right direction. The device had a pretty fast time to first fix of less than two minutes, and we noted that the GPS receiver did particularly well in retaining our location, even when there was no line of sight to satellites – when driving through a tunnel, for example.

The map view is very clear and, thanks to a combination of dedicated icons, depicting the next

turning and text-to-speech functions for voice prompts, were both accurate and helpful.

We were also very impressed by the adaptability of the map display. If you tap the screen, the default menu bars that display location and trip information disappear to reveal zoom controls, elevation, panning, 2D/3D views and a full-screen mode. In addition you can drag the screen to scroll around maps, and a mechanical scroll wheel mounted onto the right-hand side of the device allows you to zoom from street level up to 3,000m away.

The 600MHz processor means all the device's navigational functions, along with route calculation and recalculation, are extremely fast and responsive. We often found it particularly useful to be able to quickly zoom in or out to get a better view of the surrounding area.

There are plenty of settings that can be tweaked to adjust the device's performance, and an effective route editor shows you where you'll be going next and allows you to alter various parts of the journey to avoid potential travel blackspots. A speed camera database is built in, but although TMC information is available you'll have to pick up a separate antenna to enable this functionality.

With the Ipaq 314 available to buy online for around £200, it represents extremely good value for money. Though the mapping and general travel assistance is not quite up to the high standards set by Tom Tom, the media functionality is some of the best we have seen on a sat nav.

When you consider how much you're getting for your money it's one of the most impressive all-rounders on the market.

Paul Lester

Verdict

Pros Excellent navigation; fast performance; impressive media support; great value for money

Cons No built-in FM transmitter for media playback; TMC aerial not included

Overall HP has come up with a surprise performer, offering an excellent range of features at a very reasonable price

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £214.95

Contact HP 0844 369 0369

www.hp.com/uk

Specifications Centrality Titan 600MHz processor • 2GB built-in memory • Western European maps • 4.3in touchscreen display • 800x480 pixel resolution • Bluetooth 2 • 110x87x18mm (wxdxh) • 187g

PRINTER

Ricoh Aficio GX2500

Innovative printing technology, but high running costs



Inkjet printers can cost anything from £50 to £300 or more, but one problem that tends to afflict them all is the ink bleed that occurs when the inks seep into the porous fibres of a sheet of paper, causing a loss of fine detail in both text and graphics.

Ricoh has attempted to solve this problem with its new Aficio GX2500. Instead of water-based inks, the Aficio uses quick-drying gels that solidify on the paper's surface to eliminate ink bleed. The results are very good, although the really outstanding feature of

this printer is its sheer speed. Text quality is excellent, with smoothly outlined text characters that approach laser quality. Its ability to churn out 10 full pages of text in just under a minute is also quite impressive for a printer in this price range.

Photographic output on plain paper is very good too, although the printer's default settings did produce noticeable banding on our test images and it took a little experimentation with the driver to eliminate this. Once that was done, the printer produced a full A4 photographic image in an impressive 22 seconds.

We do have some reservations about the printer's running costs, though. Replacement gel cartridges are quite expensive, costing £26.35 for black and £32.90 each for the three colour cartridges. Ricoh estimates running costs of 1.49 pence per page for black-and-white documents, which isn't too bad.

However, that figure jumps to 9.91 pence when printing in colour, which is a bit steep compared to most ordinary inkjet printers. Ricoh told us that you never need to buy replacement printhead units for the Aficio, which provides additional savings. But even so, a cost of almost 10p per page for colour printing seems quite high – especially for home and small-business users.

Cliff Joseph

Verdict

Pros Very fast; good quality text and graphics

Cons Expensive colour gel cartridges

Overall A good performer, but the high price of the inks push up the running costs

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £130.43

Contact: Ricoh 020 8261 4000
www.ricoh.co.uk

Specifications Gel-based four-colour printer • 1,200dpi • 250-sheet input tray • A4-B5 paper sizes • 41.6x44x24.9mm (wxdxh) • 13kg

KEYBOARD

Logitech Dinovo Mini

A compact keyboard with a stylish design



The Dinovo Mini from Logitech joins a growing number of compact keyboards designed to free you from the constraints of a remote control when using a home theatre PC. It's also compatible with the Sony Playstation 3.

The palm-sized keyboard connects to your chosen device via Bluetooth. Logitech includes a custom USB Bluetooth dongle in the box, which will help you connect instantly and avoid the irritating scanning and pairing procedure. Once you've tweaked the

responsiveness of the circular Clickpad and customised the shortcut key settings via the supplied Setpoint software, you're ready to go.

The keyboard offers a full Qwerty layout and dedicated media keys, such as volume, play/pause, track skip and more. When enabling the Media Mode (a simple flick switch above the keyboard), these keys are highlighted above the rest to offer easy access when you're viewing media or using applications such as Windows Media Center.

In regular mode, the keys are backlit with an orange glow, making it easier to see what you're doing in dark conditions.

However, we had a few problems with usability that threaten to undermine the otherwise effective design. The touchpad is too small to operate comfortably and the Clickpad can hardly be described as touch-sensitive, since it requires a firm press to activate single- or double-clicks. Likewise, the keys are small and too close together for speedy, error-free typing.

The Dinovo Mini has a good dose of style and is well-built, but in practice it's not as nice to use as we'd hoped. Although it's a slightly more convenient way to access media functions, it's unlikely to speed things up in terms of general text entry.

Paul Lester

Verdict

Pros Stylish design; easy to set up and configure; media mode function

Cons Can be awkward to operate at speed; clickpad is too small

Overall There's no doubt the Dinovo Mini has its uses, but it's too awkward to operate in terms of text entry to thoroughly recommend

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £99.99

Contact Logitech 01753 870 900
www.logitech.com

Specifications Bluetooth 2.0 • USB port • 63 backlit keys • Li-Ion battery • 30-day battery life • 90x52x27.5mm (wxdxh) • 175g

AUDIO RECORDER

Olympus LS-10

Pocket recorder for those needing high-quality sound capture on the move

The pocket-sized LS-10 provides an affordable (if not cheap) way to make professional-quality recordings on the move. Noise-reduction technology and zoom-mic settings enable good sound capture in a variety of conditions. For outdoor use, the LS-10 even comes with a couple of wind mufflers that fit on its twin mics, which peep from the top of the device like a couple of ears.

The LS-10 is the size of a largish mobile phone. On the front, below its 3x3.5cm display, are a navigation pad and buttons for stop, record, erase, file listing, and menu access. There is also a configurable quick-access button, and one for marking a passage for repeated playback. On the back is a socket that fits any standard camera stand – a useful touch.

Arrayed around the edges are line-in, mic, earphone, and DC power sockets, a mini-USB port, volume and recording-level controls, sensitivity and



low-cut-filter toggles, and a hold switch that doubles as an on-off.

There is also a high-capacity SD slot taking cards of up to 32GB capacity – enough for hours of recording, even days in a compressed format. There is also 2GB of internal memory. The twin AA batteries last between 10 and 12 hours.

You can set recording levels manually, or let the LS-10 do it automatically. Noise-reduction technology and a choice of mic settings enable good recording in a variety of conditions. Formats supported include MP3, WMA, and (for best quality) uncompressed linear PCM. A built-in speaker is loud enough only to identify tracks.

Olympus aptly describes the LS-10 as a pocket studio. Musicians will love it for making quick recordings and getting ideas down – it comes with the Lite version of Cubase production software. The downside, from Olympus' point of view, is that it is also good for making bootleg recordings. *Clive Akass*



Verdict

Pros Smart; easy to use; good sound

Cons Screen a little hard to read sometimes

Overall Impressive pocketable device useful for anyone who needs professional-class recording on the go

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £293.75

Contact Olympus 0870 330 3001
www.olympus.co.uk

Specifications Up to (24bit/96KHz PCM) 20Hz to 44KHz frequency response • High sensitivity mode: -59dBv • Low sensitivity mode: -39dBv • 200mw maximum working output per channel • Windows 2000/XP/Vista • Mac OS X • 13.15x2.24x4.8cm (wxdxh) • 165g

MEDIA STREAMER

Logitech Squeezebox Duet

This popular music player gets a significant upgrade



Modern home audio streamers have been getting smaller and better of late, and Logitech has come up with one of the most compact players yet with its Squeezebox Duet. It features a remote control with a screen, which can talk to several Squeezebox receivers at once, allowing you to have tunes playing in as many rooms as you have receivers.

Setup was straightforward and once we had created a free Squeezenetwork account and downloaded the SqueezeCenter software to stream our collection, we were ready to go.

The device can be connected to a wireless network by following a step-by-step wizard on the remote control. From here you can choose which folders to share and play back through a hi-fi or home cinema equipment, which hooks up to the Squeezebox receiver via analogue or digital



(optical and coax) connections. As well as streaming your own music you can choose from a range of internet radio stations or podcasts, or sign up to various download services (which are paid-for but offer free trials). Stations or collections can be saved to a favourites list and you can create playlists on the fly, with extras such as a configurable alarm, search, screensavers and wallpaper giving an impressive degree of control.

Managing all these features and browsing the massive range of content available is very easy thanks to the well-designed remote and 2.4in colour display. It features a mechanical scroll-wheel that is pretty effective at navigating large collections.

Both the audio quality and the streaming capabilities are top-notch, and the Duet was very responsive when scrolling back and forth through tracks. The Duet isn't exactly cheap, but if you're happy to use your own speaker system to output the audio you'll save a lot over the competition. *Paul Lester*



Verdict

Pros Good streaming performance; easy to use; range of connections

Cons An expensive way to stream music

Overall It's expensive, but if you're after a complete music streaming kit there's nothing offering better value

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price: £279

Contact Logitech 01753 870 900
www.logitech.com

Specifications Analogue and digital optical/coax outputs • Supports AAC, MP3, OGG, WAV, WMA, FLAC audio formats • 802.11b/g wireless • Remote control with 2.4in screen • Two-year warranty

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VG1930WM

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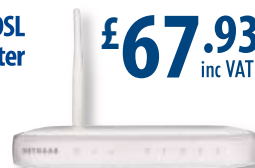
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49293PCW

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Part Code: WDG1NC5000E

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32616PCW

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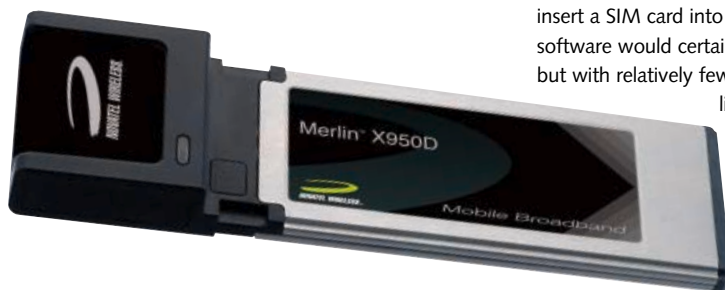
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MOBILE INTERNET

Novatel Wireless Merlin X950D

Enhance your mobile broadband upstream



HSDPA (high speed downlink packet access) has been around for some time and offers mobile broadband with a theoretical maximum downstream of 7.2Mbits/sec. Now the upstream data flow has been given the high-speed treatment in the form of HSUPA, with speeds of up to 2.1Mbits/sec.

The Merlin X950D from Novatel Wireless offers both HSDPA and HSUPA communication in the form of an Express Card. You'll find Express Card slots in most modern laptops, but owners of older models housing wider PC Card slots will need an adapter.

The X950D is relatively simple to set up and use. Upon placing it in an Express Card slot, the appropriate software is loaded onto the computer – you just need to

insert a SIM card into the device and you're away. The software would certainly benefit from a better interface, but with relatively few options to fiddle with, there's little room for error.

As is always the case with wireless, there's a big difference between theoretical speeds and those you can actually achieve. And with mobile broadband, you've also got to take into account the quality of the signal and how many other people are trying to use the service in your area. In our tests, with a Vodafone SIM card, speeds varied wildly. We tried it out at various times of the day in a central London location and, although there was the occasional spike up around 4Mbits/sec, the downstream averaged at around 1.8Mbits/sec. We didn't manage to get anywhere near the 2.1Mbits/sec upstream HSUPA promises, but we recorded an average of just under 800Mbits/sec, which isn't bad.

Broadband speeds aside, the Merlin X950D is a neat HSDPA/HSUPA device that works well. Although the interface can be confusing, all the required software is included on the card, so it's quick to set up and use on any laptop with an Express Card slot. *Will Stapley*

Verdict

Pros Works well; easy to set up and use

Cons Mobile broadband performance varies wildly

Overall A good device for fast uploads on the go, but speeds are ultimately dependant on coverage and contention

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £199

Contact Novatel Wireless
01256 405 600

www.novatelwireless.com

Specifications HSDPA/HSUPA compatible • LED indicator • Tri-band HSDPA/UMTS • Quad-band Edge/GPRS • 34x112x11mm (wxdxh) • 29g

WIRELESS ROUTER

Billion Bipac 7402GX

A router with 3G backup if your ADSL goes down



If your broadband connection is prone to occasional service outages, or you simply want the security of a failsafe option, the Billion Bipac 7402GX can hook you and your home or office network up to the internet via both ADSL and 3G.

You will obviously need a 3G service along with an appropriate data tariff, but there is no built-in 3G modem. Instead, the router houses a USB port, leaving you to purchase a 3G USB modem and SIM separately. The problem with this is that the router needs drivers

to support the various 3G modems. At the time of writing, three compatible modems were listed on Billion's website and if yours isn't supported, you will need to wait for an update. The speeds you can achieve using the 3G modem will depend on coverage and contention, but it can handle up to 14.4Mbits/sec using HSDPA.

Draft-N wireless is shunned in favour of 802.11g, which will disappoint those who want to use their existing Draft-N kit at full capacity. You will, however, find the usual selection of security tools, such as a Nat firewall and both Wep and WPA wireless encryption, along with VPN and QoS (quality of service) settings.

As far as usability goes, we have few complaints. The interface is reasonably easy to navigate and a quick installation guide takes you through the basics. It is, however, expensive; at £129, it costs more than the majority of Draft-N routers and 802.11g models can be picked up for less than £50.

The 3G feature is a bonus, but with no internal 3G modem supplied, we didn't expect it to boost the price by this much. And if your 3G modem isn't supported by the router, you'll have to wait for an update from Billion before it will work. *Will Stapley*

Verdict

Pros Good option for those who need a backup internet connection

Cons Separate USB modem required for 3G; expensive

Overall Easy to use and attractive, but this router is expensive and its 3G implementation isn't perfect

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £129

Contact Billion 0208 982 8228
<http://uk.billion.com>

Specifications ADSL2+ modem • 802.11b/g wireless • WPA/WEP security • VPN • Nat firewall • One detachable antenna • USB2 • Four 10/100Mbits sec Lan ports • 185x123.5x36mm (wxdxh)

PC CASE

Hiper Anubis

A robust and well-designed ATX tower case



The Anubis is Hiper's first ATX case and screams quality as soon as you get it out of the box. Build quality is first rate with the whole case constructed from 3mm thick 6063 T5 aluminium alloy, which gives it a reassuring weight of 10kg.

Adding to the feeling of build quality is the use of welded joints for the chassis, something you don't see everyday, which adds strength to the case – Hiper says the Anubis can withstand weights of up to 100kg. The whole case inside and out is finished in satin

black, with the exception of the motherboard back plate and part of the rear panel which are left in a natural alloy colour.

The top of the case has deep ridges acting like a heatsink; the downside of this design is that it will collect dust over time, although Hiper helpfully supplies a brush to keep it clean. Both side panels are held in place by a pair of sprung latches at the top of the panel, so there are no thumbscrews to undo. One of the panels has an acrylic window covered by a fine metal mesh, which adds to the impressive look of the Anubis.

One slight niggle is the motherboard tray isn't removable, but it does at least have all the stand-off holes engraved so there's no second guessing how to mount the motherboard.

You only get a single cooling fan with the Anubis – a 120mm model mounted in the roof. There are mounts for two more fans – one sits in the rear panel and the other at the front of the removable 3.5in drive cage. The rear panel has two holes drilled in it, both with rubber grommets should you want to go down the liquid cooling route.

All in all, this is an extremely impressive case with excellent build quality. *Simon Crisp*

Verdict

Pros Robust design; easy to access internals; good cooling

Cons Non-removable motherboard tray; only one fan included

Overall A well-designed case with outstanding build quality and some great design touches

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £99.99

Contact Hiper 01908 22 55 88
www.hipergroup.com

Specifications

Midi-tower case • One 3.5in bay fixed • Five 3.5in bays in removable cage • Five 5.25in bays • Two USB2 and audio sockets on top panel • 202x522x475mm (wxdxh) • 10.7kg

COLOUR MANAGEMENT

X-Rite Colormunki Photo

Calibrate your entire colour workflow



Colormunki Photo from X-Rite is a multi-purpose USB colour management device. It is designed to allow complete calibration and control of the colour workflow – from profiling your monitor through to profiling your printer and even to gathering and analysing spot colours from any surface.

A large, rotating dial in the centre of the Colormunki's casing houses a light source and light sensor. The dial has a single button on one side and a translucent white index marker on both sides, which is

illuminated by pulsing white LEDs. The measurement mode is selected by rotating the dial to line the sensor up with appropriate apertures in the outer case, while the vertical position is used to measure ambient light; between there and 90 degrees clockwise it measures reflected light from projector screens.

Self-calibration is at 135 degrees and the 180-degree position is used for both display calibration and reading print samples. A small catch in the corner of the case releases a sprung flap; a notch in this flap can be used to line up the Colormunki to measure reflected light – for example, spot colour – from any surface.

The CD install is only a link to download the latest software and help file from the Colormunki website, which is not much help if you don't have an internet connection, and installation is limited to three PCs only.

For display profiling, the Colormunki is placed into the provided pouch and suspended over the screen using the weighted strap to hold it in place. The measurement software displays in various shades of charcoal with minimal spot colours to give a crisp, step-by-step guide, with clear diagrams of how to proceed.

The sparse documentation and help files are disappointing, but overall the quality of the Colormunki hardware is impressive. *Terry Relph-Knight*



RECOMMENDED

Verdict

Pros All-in-one colour management product; easy to use

Cons Internet connection required for software install; sparse documentation

Overall Previous colour management solutions used separate products for display and print calibration. The limited documentation is disappointing, but this device successfully packs in complete colour management

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £319

Contact Colour Confidence
0800 0735 845

http://shop.colourconfidence.com

Specifications Printer, projector and screen colour management tool • USB cable (1.5m) • RGB and CMYK profiling • Internet connection required • Windows XP/Vista • Mac OSX 10.4 or higher

SCANNER

Kodak Scanmate i1120

High-volume scanning with impressive results



Given you can pick up a high-resolution flatbed scanner for a tenth of the price of this product, Kodak's little Scanmate i1120 may seem expensive, even given the discount of more than £100 online. But most flatbeds are not suitable for high-volume scanning. The Scanmate is designed for small offices that need to process up to 500 documents a day and is also suitable for reducing cabinets of paper to searchable DVD discs.

Scanning is not the main task, as most of the work involves organising the paper flow, filing the results, and perhaps putting them through some other process, such as optical character recognition (OCR).

The Scanmate packs a 50-page sheet feeder and can scan documents – both sides at once if necessary – at up to 20 pages a minute, depending on size and colour preferences.

It comes with Presto's Bizcard 5 software, for scanning business cards, and Nuance's Paper Port 11 and Omnipage 15, turning it into a fully-fledged OCR-enabled document-management system.

The Scanmate is also Twain compatible, giving it an edge over Fujitsu's similar (and very good) Scansnap, which has to be used in conjunction with proprietary software.

It's about the size of a small photo printer, and the initial set-up is a matter of plugging in the power and USB cables and loading the software. On the front of the Scanmate are two buttons. One is used to navigate to one of nine tasks indicated by number on a tiny LCD panel and the other launches the task.

Default tasks include common operations such as Copy and Print, but you can set up your own and assign them numbers.

Tasks can direct scans to applications, including Omnipage, which itself has highly-configurable workflows, so very complex operations can be performed at the click of a button. This saves training costs as well as time.

Scanning can also be done within applications – most conveniently from Paperport because it allows you to control where documents are stored. It is set to scan US Letter size by default, so it will clip the edges off European A4 pages, which will confuse many new users; software this clever should surely be able to adjust itself automatically.

One other small bug prevented this bundle from getting five stars in every category. Occasionally, scanning suddenly stopped and we got a message saying Paperport could no longer see the scanner.

Paperport recovered well, saving what had been scanned up to that point, and talked to the scanner after it had been restarted. This looks like a driver glitch and something we'd expect to be patched in the near future.



The Scanmate i1120 can cope with many different sizes and conditions of paper

The Scanmate coped well with a lot of different sizes and conditions of paper, jamming just once in a couple of thousand sheets – and then only because the paper was crumpled. Jams are easily cleared by pressing a button that opens the front to expose the entire paper path.

We scanned hundreds of 30-year-old typewritten pages, faded and heavily annotated, and managed to OCR them with impressive results.

The unedited OCR text with its scattered mistakes is good enough for simple indexing. You can save in a format called 'searchable PDF' which includes both a page image and a linked translation. Keyword searches will almost certainly locate the passage you need.

Files can be saved as standard PDFs, which allows you to correct the text in a PDF editor. If you don't need to keep the original layout, it's best to save as text or Word format for easier editing. Other output options include TIFF, JPEG, and RTF.

If you've a large pile of documents that need digitising, Kodak's latest Scanmate will definitely help you out.

Clive Akass

Verdict

Pros Small; extremely versatile; copes well with difference paper sizes and conditions

Cons Occasionally stalled during scanning

Overall A decent enterprise class document management for small offices and the home

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £438

Contact Kodak 0870 850 2351
www.kodak.com

Specifications: 600ppi • Twain compatible • 20ppm • 50-sheet document feeder • 301x157x128mm (wxdxh) • Windows 2000/XP/Vista



Buffalo BRHC-6316U2

Price £258.49 **Contact** www.buffalo-technology.com **Overall** ★★★★★

Only now are we seeing a raft of combo drives that support HD DVD and Blu-ray, despite HD DVD collapsing a few months ago. It can take months or years to develop a drive, so manufacturers who thought they were being cunning a while back now have products with limited extra appeal.

Buffalo's external USB drive can write to Blu-ray blanks at 6x, read HD DVDs at 3x and write to DVDs at 16x. In testing we couldn't manage above 12x and we're also not aware of 6x Blu-ray media yet. It also expensive and rather long, measuring 28cm deep, but it is well made and has two easily accessible open-door buttons.

Emil Larsen

Overall A very capable drive, but similar combo drives are cheaper

Lacie Hard Disk, by Neil Poulton

Price £109.90 **Contact** www.lacie.com **Overall** ★★★★★

Lacie's tradition of making designer hard disks continues with this Neil Poulton model. Its striking black enclosure is barely bigger than the 500GB 7,200rpm Samsung drive that resides inside it. A flashing activity-LED strobes light onto any surface in front of it – it's very bright and can get rather annoying. Basic back-up software is included, but when the Lacie disk isn't present the software rather pointlessly started backing up to the same hard disk as the source folder. Using HD Tune (www.hdtune.com), we measured 62.8MBytes/sec average transfer rate using eSata, which represents good performance. Using USB or Firewire 400 (included) performance dropped, but it does have great connectivity for the price.

Emil Larsen

Overall A dubious design, but it is fast with excellent connectivity



Logitech Spacemavigator

Price £39.99 **Contact** www.logitech.com **Overall** ★★★★★

We first reviewed this innovative 3D controller back in May 2007's issue (read a review at www.pcw.co.uk/2174146). Logitech has now given it an upgrade, with support for the role-playing game Second Life (www.secondlife.com) being the most notable addition.

Using the small, squat controller you can now walk and fly within the game using both horizontal and vertical hand movements, as well as twisting and tilting it. Aside from this addition, very little has changed. The Personal Edition version is for non-commercial use (the standard version costs £82) and it's compatible with over 120 titles including a variety of Cad applications and Google Earth.

Will Stapley

Overall Addition of Second Life support will boost this controller's appeal

Steelseries SP

Price £24.99 **Contact** www.steelseries.co.uk **Overall** ★★★★★

Laser and optical mice are usually sold as being able to work on all surfaces, but since shiny tabletops can cause inaccurate movement there's still a market for mouse mats. It's difficult to overlook the Steelseries SP, in part due to its massive 41cm diagonal measurement.

It comprises two layers, the bottom being rubber to grip to a desk and the top being a hard transparent plastic. The latter is textured but mice glide across it with minimal friction.

The build quality is top-notch and it includes a two-year warranty anyway. It looks good, is pleasing to touch and offers great precision for gamers and design addicts alike.

Emil Larsen

Overall A worthwhile treat for gamers and designers



PC Essentials

Our pick of the latest components and accessories

Corsair 16GB Flash Voyager GT

Price: £64.63

www.corsair.com

Overall: ★★★★★

Corsair offers 32GB and 16GB USB drives in its standard Voyager range, but the Voyager GT is a faster model. Thanks to its rugged design it's also able to withstand knocks and drops and is water-resistant as well.



Corsair TWIN2x4096-6400C4DHX

Price: £172.58

www.corsair.com

Overall: ★★★★★

You may think that having 4GB of memory in a desktop PC is overkill, but if you're running Windows Vista and playing hardcore games, it's a rather more practical and desirable proposition. Corsair's TWIN2x4096-6400C4DHX kit contains two 2GB PC2-6400 (800MHz) DDR2 modules with 4-4-4-12 timings and features large passive heatsinks, which come in handy as these modules overclock very nicely.

Western Digital Caviar SE16 WD6400AAKS

Price: £70.49

www.westerndigital.com

Overall: ★★★★★

Western Digital's Caviar 320GB disk was a popular drive offering fast performance combined with quiet operation through a single platter. However, its new disk, the WD6400AAKS, offers a 640GB capacity, 16MB of cache, a 7,200rpm spindle speed, 3Gbits/sec interface and a rated seek time of 8.5ms.



Western Digital Velociraptor

Price: £250

www.westerndigital.com

Overall: ★★★★★

We've been waiting a long time for Western Digital's next-generation Raptor drive, but its new 300GB Velociraptor proves the wait has been worth it, as it's the fastest SATA drive we've seen. Housed in a 3.5in frame, the drive itself is a 2.5in unit with a 10,000rpm spin speed and a quoted seek time of 4.2ms.

Crucial CT32GBFAB0**Price: £401.49****www.crucial.com/uk****Overall: ★★★★★**

While the jury may be out on whether SSDs (solid state drives) are the future of storage, two things are undeniable: current models have relatively small capacities and they are very, very expensive. Crucial is the latest company to offer SSDs and has two drives – our 32GB review model and a 64GB alternative at a whopping £735.05.

**Crucial SK01****Price: £24.96****www.crucial.com/uk****Overall: ★★★★★**

At least something concerning SSDs is reasonably priced. If you can afford an SSD, Crucial's SK01 storage kit is a neat way to put it to good use. The kit contains an external 2.5in USB2 enclosure, as well as a 3.5in drive bay to use the drive internally. You also get a 5.25in bracket to use in larger bays.

Dicota Take Off**Price: £35.24****www.dicota.com****Overall: ★★★★★**

Dicota's Take Off notebook bag is big enough to hold devices with up to 15.4in screens. Thanks to its padded compartment, it also helps protect them from damage. Getting into the Take Off takes a bit of getting used to, though, as instead of a Velcro or quick-release fastening to the cover flap, you have to unzip the flap to get into it.

**Hiper Hiperflow White UV****Price £2.94****www.hipergroup.com****Overall: ★★★★★**

Hiper has a reputation for building high-quality components such as cases and power supplies, but this attention to detail also extends to the humble case fan. The Hiperflow White UV fan has a maximum spin speed of 2,000rpm and runs quiet (19dBA) in operation. Even if your case doesn't have UV lighting, these fans are worth looking at. Also available is a 12cm model (£3.49).

**Transcend AxerAM 2GB 1066+****Price: £65****www.transcend-uk.com****Overall: ★★★★★**

The AxerAM range is Transcend's family of high-performance overclocking memory modules. The 2GB 1066+ kit comprises two matching 1GB modules of DDR2-1066+ (1066MHz) with 5-5-5-15 Cas timings at 2.1V. They look the business, too, with polished aluminium heatsinks to help keep the modules cool as you start to ramp up the speeds.



PC Specialist recommends Windows Vista™ Home Premium

pcspecialist.co.uk

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 512MB GeForce 8800GT
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 Integrated 56k Modem
 Onboard Gigabit LAN Port
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 Internal 3 in 1 Memory Card Reader
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 Integrated 2 Button Touchpad Mouse
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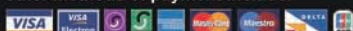
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 Onboard 10/100 LAN Port
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VIDEO/PHOTO EDITOR

Roxio MyDVD 10 Premier

The quick and easy route to the Hollywood A-list?



When we first started testing Roxio MyDVD 10 Premier, we began to get a sense of déjà vu. It didn't take us long to realise this was because we had, in fact, tested nearly all of its components before as part of Roxio Media Creator 10 Suite (read a review at www.pcw.co.uk/2201869).

As the name suggests, MyDVD 10 Premier focuses on video production, DVD creation and movie playback. It is made up of a number of programs intended to help users edit camcorder footage or

digital photos and output the results to a format that can be easily shared – either as a DVD movie or slideshow, a portable (PSP, iPod or mobile phone) media file or direct to home-movie channel, Youtube.

The main applications are Videowave and Photosuite, but the suite also includes a fairly competent media-management program, a label creator, a format converter and a number of useful utilities for importing, enhancing and viewing video and photos.

There isn't a massive amount of groundbreaking going on here, but if MyDVD 10 Premier has one stand-out selling point it would be its slick, easy-to-use presentation. From the launch screen, it's easy to choose which app to use, either by task or by name. Each program follows a similar workflow too, so it's easy to get the hang of. There are also the obligatory 'one-click' automated movie-creation tools.

We would highly recommend MyDVD 10 Premier to anyone thinking of embarking on home movie production if it wasn't for the fact you can buy all the same tools within Roxio Media Creator 10 Suite (which also comes with lots of additional features for digitising LPs and tapes, capturing audio, enhancing tracks and the like) for just £10 more. *Jonathan Parkyn*

Verdict

Pros Simple, easy-to-use tools; plenty of templates and supporting materials; supports high-def video

Cons Roxio Media Creator 10 Suite is only £10 more expensive

Overall A useful, straightforward set of tools, but it does in many ways feel like a cut-down version of Media Creator 10

Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★

Overall ★★★★★

Price £50

Contact Roxio 0844 448 5500
www.roxio.co.uk

System requirements 1.6GHz processor • 256MB Ram • 3GB hard disk space • DVD drive • Windows XP/Vista

DVD PLAYBACK

Corel WinDVD 9 Plus Blu-ray

DVD player that upscales standard movies to near-HD quality



Any PC with a DVD drive will probably have at least two DVD players already installed on it – the standard Windows Media Player and another player that was bundled with the drive.

It might, therefore, seem a bit pointless spending extra money on another piece of DVD software, but Corel's WinDVD 9 has a few interesting features that will come in handy for people who regularly watch DVDs on their PC.

This latest version adds support for Blu-ray discs, as

long as you have a Blu-ray player, as well as the latest Dolby and DTS high-definition audio formats. HD DVD is also supported, but with Blu-ray's rival all but dead, Corel has wisely left it out of the product's name.

But perhaps more interesting is the program's ability to upscale standard-definition DVD films so they approach the quality of high-definition videos. Ordinarily, you'd need to buy a standalone upscaling DVD player to do this, but WinDVD is one of the first programs we've come across that manages to pull off this trick using software alone.

We tried the upscaling option with a number of DVD films, and close examination of a series of still-frame captures did show a definite improvement in perceived image quality. The improvement isn't so obvious when watching a fast-moving action film, but when the camera lingers on a face or a scene for a second or two you really can see the difference.

Movie buffs who watch a lot of movies on their PC may well appreciate this upscaling ability enough to justify the cost of this program (there's a demo version that you can use to check out the upscaling feature). And if you don't need the Blu-ray features you can buy the less expensive WinDVD 9 Plus that just provides upscaling and a saving of around £15. *Cliff Joseph*

Verdict

Pros Plays Blu-ray discs; upscales DVD video

Cons Expensive; high system requirements

Overall A worthwhile investment for the more serious DVD fan

Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★

Overall ★★★★★

Price £55

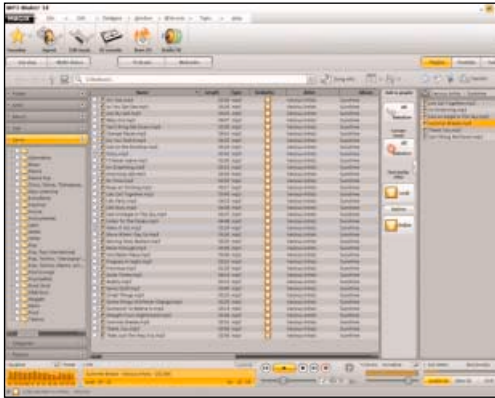
Contact Corel www.corel.co.uk

System requirements 2GHz processor • 512MB Ram • Nvidia Geforce 7600, ATI Radeon X1600 or above • Windows XP/Vista

AUDIO SUITE

Magix MP3 Maker 14

Import, edit and play music, and rediscover long-lost tracks



With free music players available, Magix MP3 Maker is not only different, but has the audacity to charge money. Is it really worth the cost?

Firstly, it will play and record all the major file formats, including WMA, AAC and even OGG, without modification.

Secondly the music finder software, which Magix calls Mufin, has now been integrated into MP3 Maker. All your tracks are analysed and playlists automatically

created based on style. It's a good way of matching a mood and rediscovering forgotten tracks, and there is no limit to the length of playlists. There are also presets allowing you to compile a playlist to fit a CD or DVD. Playlists can also be transferred to a portable media player, although we had to create a folder structure manually. Unlike rival Roxio Creator, if you burn audio to a DVD no user interface is created.

Tracks can be browsed by location or by track information and the current playlist is always on display, while directories of online radio stations and podcasts are regularly updated.

A DJ console allows you to mix tracks by matching their tempo. This speed of each track is detected automatically, but when we tested the fully automatic DJ it adjusted most tracks beyond comfortable levels.

One major frustration with previous versions of MP3 Maker remains, however, namely its inability to use the media control buttons on a keyboard.

MP3 Maker 14 is loaded with features and it's these that justify the asking price compared to the free alternatives such as Windows Media Player and iTunes.

The DJ console is a little specialised, but the Mufin track-generation tool would suit anyone with a large, and mostly forgotten, music collection. *Tim Smith*

Verdict

Pros Plays all formats; DJ Console and Mufin are great extras; print studio for inlays

Cons Doesn't use keyboard media keys; DVD discs are straight data discs

Overall A selection of useful tools helps justify MP3 Maker 14's price

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £30

Contact Magix www.magix.co.uk

System requirements 800MHz processor • 256MB Ram • 400MB hard disk space • Microsoft Windows 2000/XP/Vista

ARCADE GAME

Audiosurf

Race to become top of the pops with this innovative indie game



One of the great things about computer gaming is that for every expensive, samey shooter there are several instantly playable free games online (at www.shockwave.com, for instance). Audiosurf sits somewhere between these polar extremes. It's an independently produced game available through Valve's online distribution system, Steam, for just \$9.99 (approx £5).

Looking initially like an odd blend of Wipeout, Guitar Hero and Tetris, the premise behind Audiosurf is

highly innovative. It uses the MP3 collection stored on your computer's hard drive to generate tracks on which you race a small spaceship. The shape and speed of each track is unique to your chosen song, which also becomes the soundtrack to your game. As you speed down the track, you have limited movement (left and right is about it), but the idea is to 'catch' various colour-coded blocks as they hurtle past you. Warmer colours (reds, yellows) score higher than colder colours (blue) and collecting them in larger clusters or using power-ups boosts scores even further.

There's no specific goal other than getting high scores. However, even this aspect of the game has a spin in that Audiosurf features an international online league table, meaning you can be 'the best in the world' at a specific song. The more obscure the song, the better your chance of a shot at a top score – so it's easier to become king of Sons of the Stage by World of Twist than Twist and Shout by the Beatles, for example.

Presentation-wise, Audiosurf is a little basic, though it partially makes up for this with its highly individual style. Fans of complicated role-players may find the gameplay a little one dimensional, but that would be kind of missing the point. *Jonathan Parkyn*



Verdict

Overall It might lack the polish of big-budget commercial titles, but the highly original and extremely addictive Audiosurf is pure arcade gaming at its best. And it only costs a fiver

Overall ★★★★★

Price \$9.99 (approx £5)

Contact Valve

www.steampowered.com

System requirements 1.6GHz processor • 512MB Ram • 1.5GB hard disk space • 32MB Nvidia Geforce 2 graphics card or better • Windows XP/Vista

Best Buys



Your one-stop guide to the best-value products reviewed by PCW

With countless products available, shopping around for a new PC, peripheral or software package isn't an easy task, but with our Best Buys you can make a quick purchase with confidence. We've split our Best Buys into 40 of the most popular categories, covering everything from desktop and notebook PCs right through to digital cameras and software. Every month we update our Best Buys to include our most recent reviews and check the current pricing, although that's not to say you won't find a bargain online (try our price comparison site at www.pcw.co.uk/bestprices). You'll also find the

date of the magazine in which the product was first reviewed, along with an alternative suggested product for that category.

If the Best Buy entry has a web code listed alongside it, it means you can read the full product review on our website. Simply head online and use the format [www.pcw.co.uk/\[web code\]](http://www.pcw.co.uk/[web code]) (for example www.pcw.co.uk/2208243).

Each Best Buy product has gone through our rigorous testing and reviewing procedures, making this your one-stop guide to the best products on the market.

BUDGET PC



Zoostorm 3364-2354

Price: £499
Reviewed: July 2008
www.pcnextday.co.uk
Web code: n/a

This PC comes with a quad-core Intel Q6600 processor, 2GB Ram, 250GB hard drive and a 19in TFT. The only downside is the integrated graphics, but with expansion opportunities inside the case this can be rectified.

HIGH-END PC

Cyberpower Gamer Infinity SLI GX2

Price: £1,999
Reviewed: June 2008
www.cyberpowersystem.co.uk
Web code: N/A

This PC has an astounding amount of power, a great look and premium extra features. It's perfect for high-resolution gaming and comes with a 22in TFT, decent keyboard and mouse.



ALTERNATIVE

Chillblast Fusion Sentinel

£699 www.chillblast.com **Web code:** 2211955

A well-built, quiet PC with a quad-core processor, good all-round performance and space inside for future upgrades. It also features a Geforce 8800GT graphics card.

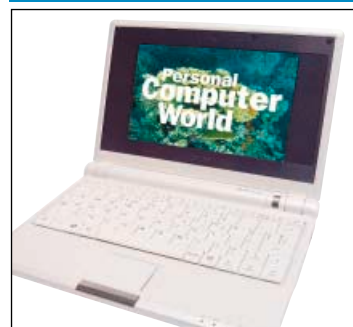
ALTERNATIVE

Ultravoilet Genesis XOC

£4,464.93 www.ultravoiletmachines.com **Web code:** N/A

The price may make your eyes water, but it doesn't get much faster than this with an overclocked QX6850 and two 8800 graphics cards

BUDGET NOTEBOOK



Asus Eee PC 4G 701

Price: £220
Reviewed: March 2008
www.asus.com
Web code: 2206346

It's no speed demon, but the Eee PC from Asus is the cheapest laptop you'll find. It runs a Linux operating system, has easily upgradeable components and is incredibly small. At this price, it's an absolute steal.

HIGH-END NOTEBOOK

Toshiba Satellite X200-219

Price: £1,399
Reviewed: April 2008
www.toshiba.co.uk
Web code: N/A

Thanks to its Core 2 Duo T7500, 320GB storage and pair of Nvidia Geforce 8600GT graphics cards, this is a superbly fast notebook. It comes with an HD DVD reader, great for watching high-definition movies.



ALTERNATIVE

HP Compaq 6715b

£586 www.hp.com **Web code:** N/A

With a 2GHz AMD Turion processor, 2GB of Ram, 160GB hard drive and 15.4in screen, this HP Compaq notebook is great value for money.

ALTERNATIVE

Alienware Area-51 m9750

£2,487.48 www.alienware.co.uk **Web code:** N/A

With a 64GB solid-state drive, this Alienware notebook is no slouch. It also has two Nvidia Geforce 8700M graphics cards for fast gaming.

WINDOWS HOME SERVER



Windows Home Server
Fujitsu Siemens Scaleo 1900
Price: £469
Reviewed: July 2008
www.fujitsu-siemens.co.uk
Web code: n/a
It might not be the most attractive piece of kit, but this Windows Home Server from Fujitsu Siemens has good read and write performance and useful added extras.

ALTERNATIVE

Belinea 0.center
£386.58 www.belinea.com Web code: n/a
With a striking design and solid performance, the 0.center is a great little Windows Home Server with easy hard disk access and good diagnostic tools.

ULTRA-MOBILE PC

Samsung Q1 Ultra
Price: £799
Reviewed: October 2007
www.samsung.com/uk
Web code: 2193548
This update to the popular Q1 brings a Qwerty keyboard, faster processor and better battery life. It also has a high-quality screen, comes with Windows Vista Business and is one of the cheaper ultra-mobile PCs.



ALTERNATIVE

OQO Model E2 HSDPA
£1,369.11 www.oqo.com Web code: 2206509
Not as well designed as Samsung's Q1 Ultra, but the keyboard is bigger and it comes with an HSDPA Sim-card slot for high-speed mobile broadband.

BUDGET GRAPHICS CARD



Palit Geforce 9600GT 512MB Sonic
Price: £121.32
Reviewed: June 2008
www.palit.biz
Web code: N/A
The G94 GPO used by this card is basically a cut-down version of the G92 8800 and GTS cards, but with fewer yet faster-clocked stream processors.

ALTERNATIVE

Asus EAH2400Pro
£32.89 <http://uk.asus.com> Web code: N/A
This card features low power consumption and, although not as fast as the Radeon HD 2400 Pro cards, it's cheap and has some impressive video capabilities.

HIGH-END GRAPHICS CARD

Foxconn FV-N88SMCD2-ONOC
Price: £195
Reviewed: Christmas 2007
www.foxconnchannel.com
Web code: N/A
You're getting a lot for your money with this 320MB card and the performance difference between this and the more expensive 640MB is slight. It comes with a USB joystick and a two-year warranty.



ALTERNATIVE

EVGA 8800 Ultra Superclocked
£487 www.evga.com Web code: N/A
An expensive choice, but it has excellent power usage and therefore more headroom for overclocking, which it uses to push the core clock speed to 612MHz.

TFT (17-22IN)



Philips 220WS8
Price: £189
Reviewed: February 2008
www.philips.co.uk
Web code: N/A
This 22in TFT screen has superb image quality, is evenly lit and, with a power draw of just 35W, it's also extremely efficient. The icing on the cake is Philips' excellent pixel policy. A great buy.

ALTERNATIVE

Viewsonic VX2255
£259 www.viewsoniceurope.com Web code: N/A
The VX2255's clear and excellent pixel policy along with its multimedia features mean it is great value at £259, despite the distinctly average image quality.

TFT (24IN+)

Samsung Syncmaster 245B
Price: £299
Reviewed: November 2007
www.samsung.com/uk
Web code: 2196900
Featuring accurate colours, a wide gamut and an adjustable stand, this Syncmaster 245B is a great-value 24in screen in a stylish chassis. It also houses VGA and DVI inputs, complete with HDCP support.



ALTERNATIVE

Hazro HZ26W
£576.82 www.hazro.co.uk Web code: 2202867
Although a little light on features, this is a high-quality S-IPS panel and excels both in terms of build quality and on-screen image quality.

PROJECTOR



Panasonic PT-AX200E

Price: £1,099
 Reviewed: March 2008
www.panasonic.co.uk
 Web code: N/A

Bright enough for general PC use and amazing with movies and games, Panasonic's PT-AX200E HD projector is a wise choice and comes with dual HDMI inputs along with excellent Game and Cinema presets.

ALTERNATIVE

Benq W500

£704 www.benq.co.uk Web code: N/A

At £700 the Benq is something of a bargain and makes for an ideal entry-level home projector and features 1080p/24 support.

SAT NAV

Tomtom Go 720

Price: £309
 Reviewed: February 2008
www.tomtom.com
 Web code: N/A

You're paying a bit more than you might for a number of perfectly capable rivals, but you get so much for your money with the Tomtom Go 720, including a customisable display and great performance on the road.



ALTERNATIVE

Mio 620t

£269 www.mio-tech.be Web code: N/A

Mio's new software is impressive and, considering the range of features, it's priced competitively. The maps look great and performance is equally good.

SMARTPHONE



O2 XDA Stellar

Price: £From free
 Reviewed: March 2008
www.o2.co.uk
 Web code: 2207227

Available on a number of other networks (and Sim-free) this smartphone features a slide-out display, Qwerty keyboard, built-in GPS and Windows Mobile 6. The screen also tilts for easier typing.

ALTERNATIVE

Nokia E51

£From free www.nokia.co.uk Web code: 2200554

Marketed as a business phone but with Wifi, HSDPA and multimedia tools, such as an FM Radio, it's great for corporate and home users.

DIGITAL CAMERA

Ricoh R8

£249.99
 Reviewed: June 2008
www.ricoh.co.uk
 Web code: 2213651

The R8 is simple to use, with a functional design, intuitive mode dial and simplified menu layout. You won't have to search through endless menus as all the key operations are readily available during shooting.



ALTERNATIVE

Pentax Optio A40

£219 www.pentax.co.uk Web code: N/A

This 12-megapixel compact camera houses some great features, not least of which is the excellent image stabiliser. It also shoots great photos.

PORTABLE MEDIA PLAYER



Sony NWZ-A815

Price: £89
 Reviewed: January 2008
www.sony.co.uk
 Web code: 2203060

It might lack some of the extra features found in other media players, but this Sony model excels in terms of audio quality and is easy to navigate. It also comes with a decent set of headphones.

ALTERNATIVE

Apple iPod Nano

£129 www.apple.com/uk Web code: 2199118

An astonishing design that produces good-quality video and audio. It also benefits from excellent battery life.

MEDIA STREAMER

Archos TV+

Price: £249
 Reviewed: May 2008
www.archos.com
 Web code: 2210545

With a 250GB hard drive, this device not only streams media across your network, but will also store content for retrieval. It's also a PVR, features a Qwerty remote control and has optional web browsing.



ALTERNATIVE

Linksys DMA2200

£229 www.linksys.com Web code: 2208886

This Media Center extender will stream movies, music and photos from your PC with the minimum of fuss.

LASER PRINTER



Brother HL-2170W

Price: £149
Reviewed: March 2008
www.brother.co.uk
Web code: 2207225

If you're looking for a good-quality mono laser printer for general home use, this Brother model is definitely worth considering. It's fast, compact and even has a wireless adapter. A bargain at this price.

ALTERNATIVE

Lexmark X500n

£301 www.lexmark.co.uk Web code: N/A

An amazingly good-value laser considering it's not only colour but also includes a scanner allowing you to scan, copy and print at speed.

PHOTO PRINTER

Canon Selphy CP750

Price: £110
Reviewed: October 2007
www.canon.co.uk
Web code: 2193769

It's a little bulky when in use, but this dedicated photo printer can produce high-quality prints in less than 70 seconds. A 2.4in display lets you perform basic image editing before printing.



ALTERNATIVE

Sony DPP-FP90

£150 www.sony.co.uk Web code: 2196751

It's not particularly cheap to run, but this printer produces high-quality photos from a variety of sources and is reasonably fast as well.

MULTIFUNCTION PRINTER



HP Photosmart C7280

Price: £249
Reviewed: May 2008
www.hp.com/uk
Web code: N/A

Aimed mainly at home office users who need both a fax and great photo printing. Combine this with high quality printing, scanning and copying and you've an impressive piece of kit on your hands.

ALTERNATIVE

Kodak Easyshare 5500

£199 www.kodak.co.uk Web code: 219926

This multifunction device features decent print, copy and scan functions, but its big draw is the low running costs.

NETWORK-ATTACHED STORAGE

Qnap TS-209

Price: £254
Reviewed: Christmas 2007
www.qnap.com
Web code: 2200223

If you're after a Nas device that does more than just share files over your network, this is it. You can schedule Bit Torrent downloads, stream media to UPnP devices and install your own drives in it.



ALTERNATIVE

Acer Aspire Easystore

£499 www.acer.co.uk Web code: 2206105

This Nas device features 2TB of storage (other sizes are available) along with wireless so you can place it anywhere in your home.

POWERLINE NETWORKING



Solwise NET-PL-200AV Push

Price: £50
Reviewed: March 2008
www.solwise.co.uk
Web code: 2207035

You'll need at least two of these to get your powerline network running, but they're the best around. Based on the Homeplug AV standard they're fast, resilient to electrical noise and great value for money.

ALTERNATIVE

Devolu Dlan 200 AV

£149 www.devolu.co.uk Web code: N/A

Small and well designed, these Devolu powerline devices use the Homeplug AV standard and have pre-programmed Quality of Service rules built in.

WIRELESS ROUTER

Linksys WAG325N

Price: £99.99
Reviewed: May 2008
www.linksys.com
Web code: N/A

It might look a little unconventional, but this Draft-N router from Linksys performs extremely well. It also features some sophisticated tools including VPN support and the option of creating virtual wireless networks.



ALTERNATIVE

Solwise Engenius Wireless-N Gigabit Router

£120 www.solwise.co.uk Web code: n/a

It might be a little pricey, but this router performed well in our tests and comes complete with some advanced network filtering tools.

EXTERNAL HARD DRIVE



CMS V2ABS-CE-120

Price: £175
Reviewed: Christmas 2007
www.cmsproducts.com
Web code: 2202396

A portable USB2 external hard drive that weighs a mere 150g and comes with built-in 256-bit AES encryption. Inside the case sits a 2.5in 120GB 5,400rpm Sata notebook drive.

ALTERNATIVE

Western Digital Mybook Studio

£204 www.westerndigital.com **Web code:** 2206075
 This stylish 1TB external drive comes with USB2, Firewire 800/400 and eSata interfaces for ultimate flexibility.

INTERNAL HARD DRIVE



Western Digital WD10EACS

Price: £185
Reviewed: January 2008
www.westerndigital.com
Web code: 2203061

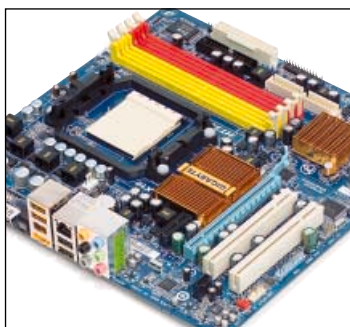
This drive features four 250GB platters to provide 1TB of storage. It includes some advanced technology such as Intelliseek, which calculates optimum seek speeds to lower noise, vibration and power usage.

ALTERNATIVE

Toshiba MK2035GSS

£79 www.toshiba.co.uk **Web code:** 2203064
 Weighing just 98g this 200GB 2.5in Sata hard drive is perfect for increasing the storage capacity of your notebook.

AMD MOTHERBOARD



Gigabyte GA-MA78GM-S2H

Price: £60
Reviewed: June 2008
www.giga-byte.co.uk
Web code: N/A

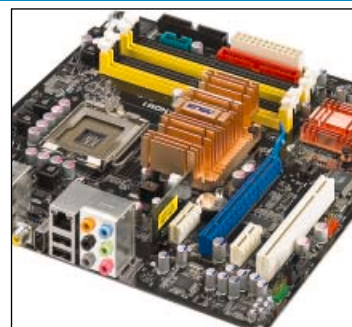
With a wide range of ports, including eSata, and a good selection of options in the Bios, this is a great AMD board. Finally, after two years of losing to Intel, AMD's engineers have a winner on their hands.

ALTERNATIVE

EQS AB1S-RS690MKM

£46 www.eqscputers.com **Web code:** 2204803
 The cramped design limits upgrade potential, but it's a keenly priced AMD motherboard that features an on-board HDMI port for HD video.

INTEL MOTHERBOARD



Asus P5E-VM HDMI

Price: £81
Reviewed: June 2008
<http://uk.asus.com>
Web code: N/A

This board has a great range of features. With the integrated graphics enabled, we comfortably overclocked it to 3GHz with our 2.4GHz Core 2 Quad Q6600 attached, so enthusiasts should take note of its capabilities.

ALTERNATIVE

Gigabyte GA-G31MX-S2

£53 www.giga-byte.com **Web code:** 2202711
 Considering the price, you get plenty of features on this Intel board, including Intel's G31 Express chipset and ICH7 Southbridge.

PC CASE



Akasa Eclipse-62 V2

Price: £92.38
Reviewed: May 2008
www.akasa.co.uk
Web code: N/A

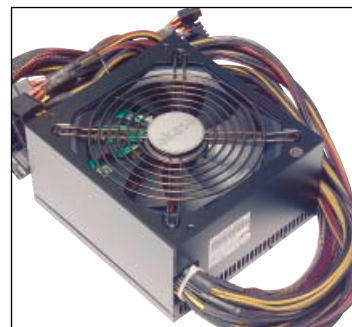
It might not have the flashy design of some cases, but with the whole case, including the roof, able to come apart, along with its easily-removable motherboard plate, it's the ideal chassis enthusiasts and modders alike.

ALTERNATIVE

Coolermaster Cosmos 1010

£139.83 www.coolermaster.com **Web code:** n/a
 Thanks to its extra-large design, this case not only looks impressive but is also very easy to work on and comes complete with temperature probes.

POWER SUPPLY



Akasa Powermax 1000

Price: £135.11
Reviewed: March 2008
www.akasa.co.uk
Web code: 2207736

This 1,000W power supply has two +12V rails and the single 135mm dual-ball bearing fan makes it a lot quieter than you would expect. It comes with a variety of power connectors.

ALTERNATIVE

Enermax Galaxy 1000W

£233.83 www.enermax.com.tw **Web code:** 2164011
 The 1,000W Enermax Galaxy power supply will suit those with SLI graphics and other power-sapping components, but it comes at a fairly high price.

OFFICE SUITE



Microsoft Office 2007

Price: £357
Reviewed: May 2007
www.microsoft.com
Web code: 2183475

The new interface to Office is something you'll either like or loathe - we like it, but upgrading comes at a price, both in cash and in effort. Despite this, it's still the leader in office productivity software.

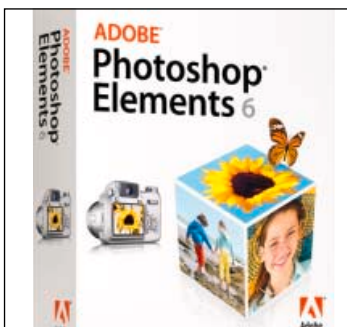
ALTERNATIVE

Corel Wordperfect X3

£276 www.corel.co.uk Web code: 2149856

This latest version of Corel's office suite includes tools such as PDF exporting along with improved compatibility with other office applications.

IMAGE EDITING



Adobe Photoshop Elements

Price: £69
Reviewed: June 2008
www.adobe.co.uk
Web code: N/A

Although the interface could do with some work, this is still the best image editor currently available for home users. With a range of advanced tools, it really does help you get the best from your photos.

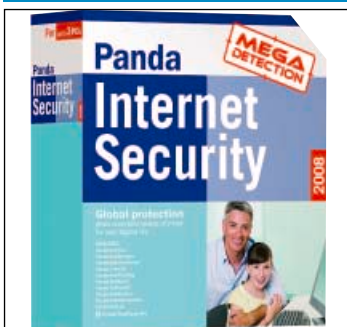
ALTERNATIVE

Corel Paint Shop Pro X2

£79 www.corel.com Web code: n/a

A little bit more expensive than its main rival, Photoshop Elements, but Paint Shop Pro X2 excels in terms of ease of use.

PC SECURITY



Panda Internet Security 2008

Price: £42.99
Reviewed: January 2008
www.pandasecurity.com
Web code: N/A

A feature-packed internet security suite with fast anti-virus and spyware detection tools, including heuristic scanning. It also has fast scan times and a decent firewall, along with backup and PC optimisation features.

ALTERNATIVE

Agnitum Outpost Pro Security Suite 2008

£30.80 www.agnitum.com Web code: 2204511

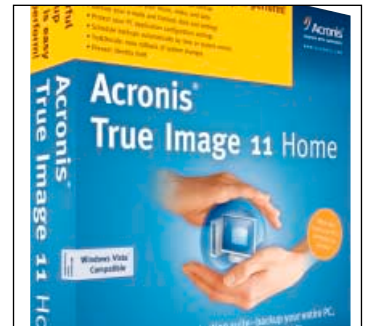
Outpost offers solid protection at a competitive price with fast scanning and a quality firewall, though it does lack some extras found in rival suites.

SYSTEM UTILITY

Acronis True Image 11

Price: £39.99
Reviewed: April 2008
www.acronis.co.uk
Web code: 2208669

True Image 11 is an excellent backup and recovery solution that offers an unprecedented level of control over disk cloning, scheduled backups and secure file deletion. And, despite the range of features, it's easy to use.



ALTERNATIVE

Paragon Hard Disk Manager

£29.99 www.paragon-software.com Web code: 2205339

A comprehensive, all-in-one suite of hard disk maintenance and backup tools that's easy to get to grips with and comes at a good price.

VIDEO EDITING

Pinnacle Studio 11 Ultimate

Price: £89.99
Reviewed: November 2007
www.pinnacle.com
Web code: N/A

This video-editing package is well designed and has powerful video tools, advanced audio tweaking and an easy-to-use interface. A standard version, without the high-definition features, is available for £39.



ALTERNATIVE

Cyberlink PowerDirector 6

£49.99 www.cyberlink.com Web code: 2174641

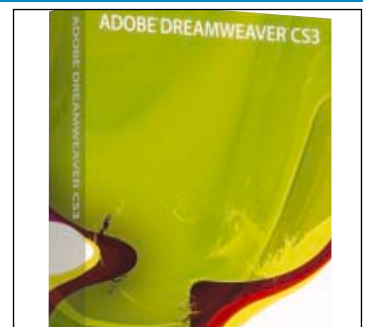
Although this budget video-editing suite lacks advanced editing tools, it's incredibly easy to use and is attractively priced.

WEB DESIGN

Adobe Dreamweaver CS3

Price: £393
Reviewed: July 2007
www.adobe.com
Web code: 2186591

Powerful HTML coding and design tools along with CSS templates and Ajax widgets to help non-programmers get started. There's also a big emphasis on CSS, including a CSS Advisor tool for newcomers.



ALTERNATIVE

Microsoft Expression Web

£260 www.microsoft.com Web code: 2185242

Expression Web is a very good web-editing suite if you accept the inevitable Microsoft bias, featuring CSS support and a powerful interface.

BUSINESS PC



Dell Latitude D531

Price: £586
Reviewed: October 2007
www.dell.com
Web code: N/A
 With a dual-core AMD Turion processor clocked at 1.8GHz, 2GB of Ram and Vista Business, this is a good budget model. It also features a built-in DVD writer, 120GB Sata hard disk and both Wifi and Bluetooth.

ALTERNATIVE

HP Compaq dc7800
£598 www.hp.co.uk Web code: 2207533
 The space-saving design of this affordable business desktop is very compelling and it can attach directly to an optional HP TFT screen.

BUSINESS PRINTER



HP Laserjet P1505n

Price: £205.63
Reviewed: June 2008
www.hp.com
Web code: N/A
 Compact, stylish and quicker than it looks, this Laserjet from HP is a very capable small-business printer and is stunningly good value to boot. It also features an integrated network interface.

ALTERNATIVE

Zebra P100i
£1,245.50 www.zebracard.com Web code: 2212221
 A great device for small businesses needing to print plastic cards in volume. It takes up little desk space and is able to print in full colour.

NETWORK SECURITY



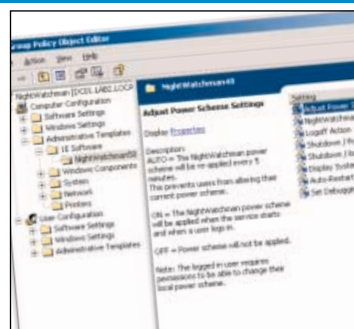
Smoothwall Smoothguard 1000-UTM

Price: £3,231.25
Reviewed: September 2007
www.smoothwall.net
Web code: 2194393
 A comprehensive array of security tools, load balancing and failover facilities and extensive reporting options, mean this network security device justifies the high price.

ALTERNATIVE

Webroot Antispyware Corporate
£22.56 www.webroot.com Web code: N/A
 At this price you get a one-year licence for 10 users, which is great value. It also covers two key client security bases in one go.

NETWORK MANAGEMENT



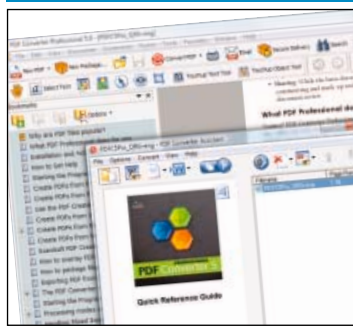
1E Nightwatchman

Price: £14.10
Reviewed: March 2008
www.1e.com
Web code: 2207429
 This piece of software costs very little but could save you a lot. Using simple command-line controls, it will close applications on the PCs on your network and then shut the machines down to cut your energy bills.

ALTERNATIVE

Prefix IT PrefixNE
£Up to 2.94 per PC per month www.prefixit.com Web code: 2205651
 Easy to install and use, this network management application lets you keep track of all the kit on your network and is perfect for small businesses.

COLLABORATION SOFTWARE



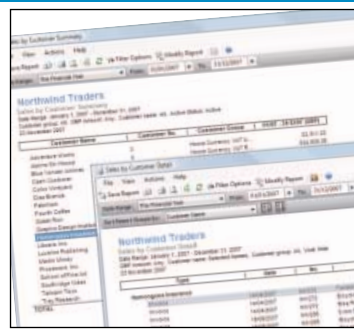
Nuance PDF Converter Professional 5

Price: £99
Reviewed: June 2008
www.nuance.co.uk
Web code: N/A
 It may often take second billing to Adobe Acrobat, but this latest release is cheaper and just as good, if not better. The only problem is there are so many new tools to learn.

ALTERNATIVE

C2c Archive One Policy Manager
£40 www.c2c.com Web code: 2212370
 This is a well-conceived and easy-to-implement Exchange storage management tool that can enhance performance and even reduce costs.

BUSINESS ACCOUNTS SOFTWARE



Microsoft Accounting 2008

Price: £149
Reviewed: February 2008
www.samsung.co.uk
Web code: 2207529
 A late entrant to the UK accounting market, Office Accounting 2008 is easy to use, feature-rich and will shake up the competition. It also offers in-depth integration with Outlook 2007 Business Contact Manager.

ALTERNATIVE

Intuit Quickbooks Pro 2008
£299 www.quickbooks.co.uk Web code: 2203178
 A sensible update to what is one of the most accessible and easy to master small-business accounting packages around, including syncing with Outlook.

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"Best Buy Award"
★★★★★

Computer Shopper Aug 07



BiGuard S10
"Recommended Award"
★★★★★

PC Pro Feb 07



BiGuard S10
"Best Buy Award" – SSL VPN Group test
★★★★★

SC Magazine Oct 07

"Scored superior in all categories" - SC Magazine - Best Buy Award

BILLION™

How we test

Performance testing is an important part of *PCW's* reviewing process, and to obtain our authoritative results we use the UK's best PC testing resource. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs

At the core of our PC performance tests are industry-standard benchmarks from Bapco and Futuremark. Sysmark 2007 Preview is the latest Vista-compatible version in a long line of Bapco benchmarks and it allows us, for the first time, to compare the application performance of Windows XP and Windows Vista-based systems with the same benchmark. It tests real-world application performance by running a series of scripts to mimic authentic user tasks. It loads and runs full versions of 14 market-leading applications, which are:

- Adobe After Effects 7
- Adobe Photoshop CS2
- Macromedia Flash 8
- Microsoft Outlook 2003
- Microsoft Word 2003
- Microsoft Windows Media Encoder 9 series
- Adobe Illustrator CS2
- Autodesk 3ds Max 8
- Microsoft Excel 2003
- Microsoft Powerpoint 2003
- Microsoft Project 2003
- Sketchup 5
- Sony Vegas 7
- Winzip 10

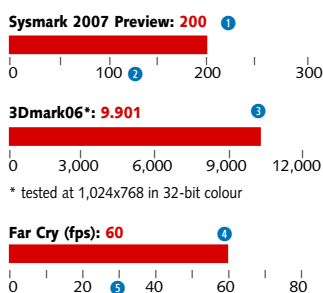
Note that scores from Sysmark 2007 Preview are not comparable to scores from previous versions of Sysmark. All scores are relative to the Sysmark reference machine, which scores 100 (see below for details).

In *PCW's* labs, our staff have over 20 years of combined testing experience. We know all the perils and pitfalls of practical benchmarking, and we contribute to the development of industry-standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. Listed below are the main benchmarks we use for testing PC systems and components.

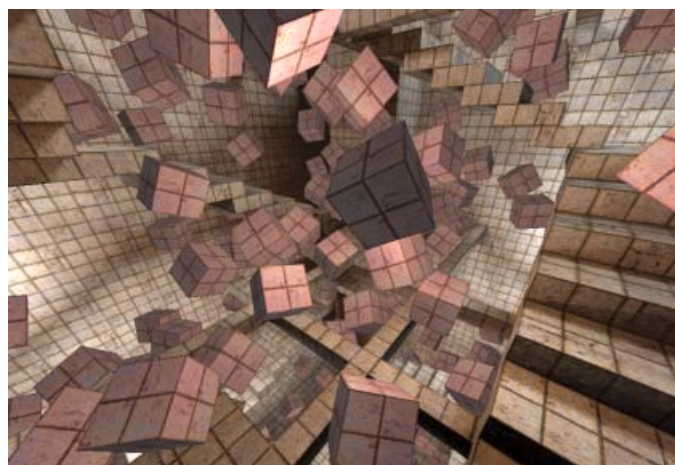
- Bapco Sysmark 2007 Preview – an application-based benchmark that tests real-world system performance.
- Futuremark 3Dmark06 – the latest version of 3Dmark that tests DirectX 3D graphics performance.
- Games – we use built-in benchmarks in Far Cry and Fear to see how graphics cards perform in a real-world games.
- Futuremark PCmark05 – a synthetic benchmark used to test the performance of a PC's major subsystems.
- Test beds – we use standardised AMD and Intel-based test rigs to test components and peripherals.

There's more information about our testing procedures and benchmarks on our Labs site at www.reportlabs.com/testbed/bguides/benchmarks.php.

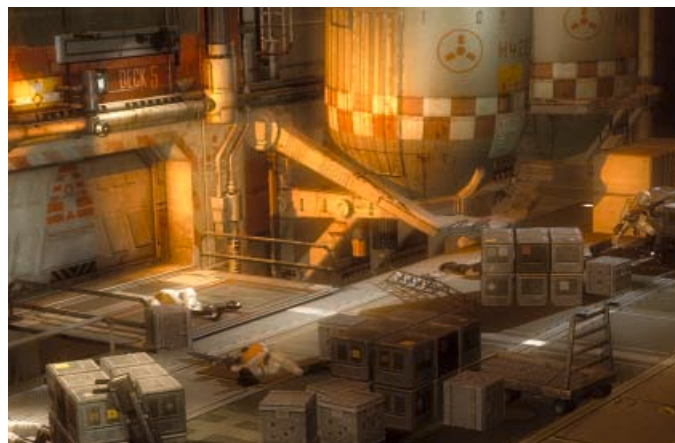
Performance



- 1 A score of 200 indicates that the system is twice as fast as the reference PC.
- 2 The reference PC (Intel Core 2 Duo E6300 1.8GHz, 1GB Ram) scores 100.
- 3 An Nvidia Geforce 8600GT would score in the region of 9,900.
- 4 Fear: A score of 60fps (frames per second) or higher is most desirable.
- 5 A result of 30fps or above means the machine can produce playable frame rates at the tested resolution.



PCmark05 measures memory, processor, graphics and hard drive performance



3Dmark06 is used to test 3D graphics performance

Results Browser - BAPCO SYSmark 2007 Preview 1.01

Viewing Test Results
Select a test from the list to see its results

Results_2007-06-12 02:50 - OfficialRun_3.xml

Test Summary

Project Name: 2007-06-12 02:50 - OfficialRun_3
No. of Iterations: 3

Scores

	Official Rating	Iteration 1	Iteration 2	Iteration 3
E-Learning	65	65	64	65
VideoCreation	58	61	56	57
Productivity	71	71	72	72
3D	75	75	75	75
SYSmark® 2007 Preview Rating	67			

In order to publish test results, you must submit a Full Disclosure report (FDR) to BAPCO (report@bapco.com).

Sysmark 2007 Preview tests real-world performance using common apps

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**ON TEST**

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Editor's Choice

'Whether you're a games addict, film fanatic or home video buff, there's something here that will provide the performance you need'

Desktops of desire

Laptops might be all the rage right now, but as Cliff Joseph finds out, you still can't beat a desktop for sheer performance and upgradability

The conventional desktop tower PC has been a bit neglected of late. Laptop sales are booming and many companies are putting their emphasis on home theatre-style systems that are designed for the living room, rather than the desktop.

However, there are times when nothing but a big, powerful desktop PC will do and, in terms of upgradability, they simply can't be beaten. Therefore, we decided to take a look at some of the high-end PCs currently on sale, setting a maximum price of £1,299 including Vat and asking for each computer to be submitted with a monitor, keyboard and mouse.

Gaming is the obvious market for many of the more powerful PCs that are currently on the market and computers with two graphics cards are commonplace.

However, games aren't the only applications that require this sort of horsepower. Video-editing is a demanding task that requires plenty of storage capacity and Ram, as well as raw processor power – especially if you're working with footage that's been shot on a high-definition camcorder.

Playing high-definition video is also very demanding – only two of the eight computers in this group included a Blu-ray high-definition DVD drive, but this is a feature that will almost certainly become more common in home PCs now that Sony's Blu-ray has finally won the format war.

So whether you're a games addict, film fanatic or home video buff, there's something here that will provide the features and performance you need.

Ambros Shuttle SG33G6

Price £1,206 **Contact** Ambros 020 8861 2223 www.ambros.co.uk



The emphasis with Ambros' PCs is always their compact design, and this model – based on the Shuttle SG33G6 'Glamor' chassis – certainly manages to cram a lot of power and features into its compact frame.

Measuring 20x18.5x31cm (wxhxd), the SG33G6 is a fraction of the size of its tower-sized rivals, but it performs well and provides a full complement of multimedia features at a great price.

The SG33G6 is based on a dual-core processor rather than the quad-core processors found in some of its rivals, so it doesn't have quite the same horsepower. Nonetheless, its healthy 3GHz clock speed produces respectable results. It's also backed up by good performance in other areas – the graphics card, memory and hard disk all perform reliably, and its average 44fps (frames per second) in our 3D gaming test makes it a very respectable games machine.

And, if you fancy a quick burst of impromptu multiplayer gaming, you can even use the Speed-Link feature developed by Shuttle to link the SG33G6 to another PC via USB to create an instant network without having to set up a Wifi or Ethernet network.

The SG33G6 comes with a 22in widescreen monitor, but it also has an HDMI connector if you want to hook it up to a flat-screen TV and use it as a home-theatre system. And, of course, its compact design means it will sit neatly under a TV in your front room – unlike any of the other PCs in this group.

Some people might prefer a tower system with more room for expansion and upgradeability, but the Shuttle SG33G6 manages to combine strong performance with a space-saving design that will appeal to many home users.

Verdict

Pros Compact design; good performance and features

Cons Limited scope for expansion and upgrades

Overall An attractive, compact PC that doesn't compromise on performance or features

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Arbico Elite 9840 GTX

Price £1,299 **Contact** Arbico 08456 252 627 www.arbico.co.uk



Arbico's Elite 9840 GTX arrived equipped with Nvidia's new Geforce 9800 GTX graphics card, which, not surprisingly, turns in an impressive performance that will appeal to most games fans. It produces an average of 50fps when running World in Conflict – a score beaten only by the massively overlocked Gamer Infinity XT Elite from Cyberpower.

The Elite 9840 doesn't seem to have any real

weaknesses – at least not in performance terms. The powerful graphics card is backed up by a 3GHz Core 2 Duo processor, overclocked to 3.6GHz, which provides plenty of raw processing power, and our benchmarks show the memory and hard disk do their part too.

It's nice to see the Elite manages to squeeze in a 750GB hard disk as well, providing plenty of storage space for large video files, digital photos and your music collection.

The high-quality 22in Samsung monitor and 5.1 surround-sound speakers ensure that the Elite provides everything you need for an impressive all-round home entertainment system. Arbico even manages to include both a TV tuner and wireless adapter, adding to the Elite 9840 GTX's strong value for money.

The machine does have a couple of rough edges, though. Its internal design is less than perfect – all the expansion slots are occupied, so there's little scope for upgrading. All four memory slots are full too, so upgrading the memory means you'll have to throw away some of the existing modules.

Still, a PC like this isn't going to need upgrading any time soon, so this isn't too serious a problem. And with this combination of power and performance, the Elite 9840 GTX will continue to earn its keep for several years to come.

Verdict

Pros Very strong, all-round performance; TV tuner; built-in wireless

Cons Poor internal layout limits upgrade potential

Overall A powerful desktop PC backed up with useful multimedia features

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Cyberpower Gamer Infinity XT Elite

Price £1,250.20 **Contact** Cyberpower 0800 019 0863 www.cyberpowersystem.co.uk



The vast Coolermaster chassis used to house Cyberpower's Gamer Infinity XT Elite has an element of over-compensation about it.

However, it does at least give you an indication of the power throbbing away inside.

Cyberpower has taken some relatively commonplace components – a 3GHz Intel Core 2 Duo processor and Nvidia Geforce 512MB GTS graphics card – and overclocked them almost beyond

recognition. It's hardly surprising, then, that Cyberpower opted for the Coolermaster chassis, as the Infinity Elite needs a really efficient cooling system to keep it operating smoothly.

Still, it seems to work and the result is a PC that sits comfortably at the top of most of our performance graphs. With an average speed of 57fps when running World In Conflict, and equally strong results in our Cinebench and 3Dmark tests, the Infinity Elite is the clear choice for the hard-core gamer who wants every last microsecond advantage they can get for their online frag-fests. Even the disk performance is enhanced by using a 74GB high-speed Raptor drive as the main system drive and a second 250GB drive to provide additional storage. And, of course, the huge tower chassis provides plenty of room for expansion and upgrades.

This single-minded emphasis on performance does produce a few compromises elsewhere, though. There's no wireless networking or bundled software, a relatively modest 2GB of Ram, and the Creative 7.1 speaker system won't blow you away with high-quality audio. Still, if you're looking for a PC that provides plenty of horsepower, then the Infinity Elite is hard to beat – especially when you take into account its three-year warranty.



Verdict

Pros Impressive performance; plenty of upgrade potential

Cons No Wifi or bundled software

Overall The name says it all: a massively powerful PC aimed at the hardcore gamer

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Dell XPS 630

Price £1,249 **Contact** Dell 0844 444 5818 www.dell.co.uk



Dell's XPS 630 has the look of a big, mean gaming machine. It's a large tower system bedecked with gratuitous headlights that beam at you from beneath the upper edge of the unit, and a forward-sloping front panel that gives it a business-like poise.

However, it's by no means the most powerful gaming system in this group. The quad-core Q6600 has a relatively modest 2.4GHz clock speed – the

slowest in this group test – so it obviously doesn't challenge the many rival systems running at 3GHz or more. To be fair, this is backed up by a Geforce 8800 GT graphics card that provides respectable gaming performance – around 36fps when running World in Conflict. For most people, that level of performance will be all they need for gaming, as well as for other tasks such as video-editing or digital photography.

However, it's still a little disappointing in a machine that's so clearly aimed at the power-hungry gaming audience. There are other machines in this group that provide similar levels of performance, but these – most notably the Blu-ray-equipped models from Mesh and Wired2Fire – also manage to outgun the XPS 630 in other areas, thanks to their greater multimedia versatility.

In its favour, the XPS 630 has a very high-quality 22in screen, which will be very good for playing games and watching DVDs. It's a shame, though, that Dell couldn't stretch to include a proper set of speakers – which is hardly asking a lot from a machine in this price range.

The XPS 630 is by no means a poor performer. However, most of its rivals offer either stronger performance or a wider range of multimedia features, leaving it looking a little overpriced in comparison.

Verdict

Pros Good upgrade potential; high-quality widescreen monitor

Cons Relatively modest gaming performance; no bundled speakers

Overall A very respectable mid-range PC that is saddled with a top-of-the-range price

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Mesh Extreme HD

Price £1,299 **Contact** Mesh Computers 0844 736 0440 www.meshcomputers.com



Although Mesh's Extreme HD system uses the same hulking CoolerMaster chassis as Cyberpower's Gamer Infinity system, this PC puts its emphasis elsewhere.

In this case, it's the 'HD' in the name that makes Mesh's intentions clear. The Extreme HD is one of just two PCs in this group that includes a Blu-ray player, which – now that Blu-ray has triumphed over Toshiba's rival HD DVD format – makes it a good choice for

watching high-definition films and video. It's also accompanied by a 24in widescreen monitor with 1,920x1,200 pixel resolution that is capable of displaying Blu-ray films in all their HD glory. Throw in the 5.1 surround-sound speaker system and you've got an up-to-date home-entertainment system.

Mesh also includes some decent software, including a copy of Microsoft Works, Cyberlink's DVD Suite, which can handle Blu-ray playback, as well as programs for burning your own CDs and DVDs.

The rest of the system's specification is more conventional. Its 3.16GHz Core 2 Duo processor is relatively modest compared to some of the quad-core and overclocked processors in this group, although it should be more than adequate for most home users. The twin Geforce 8800GT graphics cards did well in 3Dmark05/06, but surprisingly only managed 31fps in World in Conflict, which could be down to a driver issue.

Mesh could probably have managed to squeeze the Extreme HD into a much more compact and visually attractive chassis, as its multimedia-oriented feature set doesn't really require this kind of souped-up gaming chassis. However, it is still an excellent choice for those who are interested in music and video as well as the occasional marathon gaming session.

Verdict

Pros Blu-ray drive; 24in widescreen monitor

Cons No Wifi; bulky tower chassis

Overall Moderate performance is enhanced by its up-to-date Blu-ray support and 24in display

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

PC Specialist Apollo Q930 GX2

Price £1,299 **Contact** PC Specialist 0844 499 4000 www.pcspecialist.co.uk



The Apollo Q930 GX2 from PC Specialist is a good all-round performer with an attractive design. During our tests it was nicknamed 'the Tardis' because of the glowing circular panels at the front. There's a set of USB and audio connectors on the left-hand edge of the front panel that can accept a range of peripherals.

Things aren't quite so pretty inside the Apollo, though, as components such as the bulky cooling

system and graphics card mean most of the expansion slots are inaccessible. Some of the spare drive bays are also quite tricky to get to, so this probably isn't the best choice if you want a machine that can be easily upgraded. However, the Apollo's overall performance is very solid, meaning you probably won't need to think about upgrades anyway.

The Apollo performed well in most of our tests, although its 2.5GHz processor is relatively modest compared to the faster processors used by some of its rivals. The 2.5GHz quad-core processor and Geforce 9800 GX2 graphics card are more than adequate for tasks such as video editing and playing games, although dedicated gamers will probably prefer a faster processor to go with the graphics card.

The Apollo includes a good 22in widescreen monitor, along with a full 5.1 surround-sound speaker system, and will function well as a home theatre machine. The graphics card also has an HDMI connector, so you've got the option of connecting it to a flat-screen TV.

It may not have any particularly outstanding features, but the Apollo's generally solid performance, attractive design and multimedia features make it a good choice for anyone who needs a powerful desktop system for home or office use.

Verdict

Pros Attractive design; solid all-round performance

Cons Limited scope for future upgrades; slow processor

Overall Performance could be improved a little, but this is still a good all-round multimedia PC

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Ultraviolet Home Elemental

Price £1,244.78 **Contact** Ultraviolet 01908 574 093 www.ultravioletmachines.com



Ultraviolet's Elemental Home PC is more sedately designed than most of the PCs in this group, with a sombre matte-black finish and lack of flashing lights and buttons. It's tidy on the inside, too. The cooling system is relatively compact – despite the fact that the processor has been significantly overclocked – and provides easy access to the expansion slots and spare drive bays. It's a pleasant contrast to the insides of many of these PCs, and

makes the Home Elemental a good choice for people who will want to upgrade the machine in future.

It's just as well the processor has been overclocked, though. The Q6600 is a quad-core processor, so it provides plenty of power, but its standard 2.4GHz clock speed wouldn't have kept up with the other machines in this group. Ramping it up to 3GHz helped it to produce a solid set of results. Its gaming performance should keep most people happy, although its average of 37fps in our World in Conflict test does leave some room for improvement.

Our only real complaint is the monitor. Samsung monitors usually provide good quality, but a mere 19in screen is a little disappointing for a PC in this price range. Still, Ultraviolet makes up for it elsewhere; the Home Elemental is one of the few PCs in this group to include wireless networking as standard (though it's 802.11g, rather than the newer Draft-N). It's also got a beefy set of Logitech surround-sound speakers that will enhance your games or DVDs. Ultraviolet has even managed to include some decent software, such as Ulead's Videostudio, to provide the machine with video-editing features.

While not a top performer, the Home Elemental provides good all-round performance and features, along with a reassuring two-year warranty.

Verdict

Pros Solid performance; good upgrade potential; built-in 802.11g

Cons Relatively modest 19in monitor; just 2GB Ram

Overall A solid, if unremarkable PC, enhanced by its bundled hardware and software extras

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall ★★★★★

Wired2Fire Diablo SLI

Price £1,299 **Contact** Wired2Fire 0845 388 9051 www.wired2fire.co.uk



Like the Mesh Xtreme HD, the Diablo SLI puts the emphasis on its wide range of multimedia entertainment features, rather than raw power.

It's one of just two PCs in this group (the other being the Mesh) to include a Blu-ray drive for playing high-definition films. There's a good 24in monitor too, and a serious set of Logitech G51 surround-sound speakers. Most of these PCs treat the speaker system as something of a low-cost afterthought, but the G51

speakers are quite impressive, costing more than £150 when bought on their own and providing a hefty 150W total output that should certainly do justice to your games and video entertainment.

The Diablo SLI even outdoes Mesh for multimedia versatility by including a TV tuner and remote control as well. That makes it the most obvious choice for people who are looking for a powerful music and video system.

That's not to say that the Diablo SLI is a slouch when it comes to games. It may not be the top performer for games and 3D performance – its 3GHz Core 2 Duo processor can't match overclocked models, such as the Cyberpower Gamer Infinity XT Elite – but it still produced a very respectable 38fps when running World in Conflict. However, it's worth pointing out that the 'SLI' in the Diablo's name refers to the motherboard and not the graphics card (a single, overclocked Nvidia Geforce 8800 GTS). A second graphics card is an option if you order a custom system via the company's website, but this particular model includes only a single card.

Even so, the Diablo provides respectable games performance, combined with a wide range of additional multimedia features that provide very good value for money.



Verdict

Pros Good performance; good music and video playback features

Cons Despite the name, there's only one graphics card

Overall A good, all-round PC that provides a strong combination of performance and features

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall ★★★★★

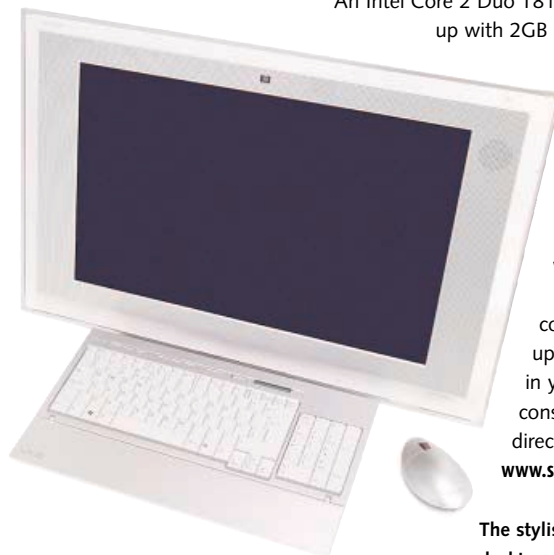
The Sony alternative

As it's not a traditional desktop PC, the Vaio VGC-LT2S didn't make it into this group test. However, it is the only desktop-style PC Sony sells, so we've decided to include it as an alternative.

Looking more like a standard widescreen television than a computer, this Windows Vista Home Premium PC has plenty to offer. The 22in screen dominates and is surrounded by an acrylic border. Various icons, such as power and a Sony logo, light up this border when in use, giving the PC a touch of class – should they become an annoyance, you can switch them off.

The display has a glossy coating to provide vivid colours and HD video looks absolutely stunning. The slot-loading Blu-ray drive on the side enables you to watch all the latest blockbusters. The drive will also write Blu-ray discs, so if you have an HD camcorder you can share your HD videos with other Blu-ray owners.

A selection of ports is dotted around the side of the chassis, including USB and digital audio. Pop off the rear cover and you'll find yet more ports such as Ethernet (an alternative to the built-in 802.11g wireless) and a multiformat card reader.



A single aerial input links up with two hybrid (digital and analogue) TV tuners, which means you can record two channels at the same time, or watch a live broadcast while recording another.

The keyboard is wireless (powered by four AA batteries) and connects to the computer via digital radio, but we were surprised not to see a trackpad on it. A remote control and plain-looking wireless mouse are also included.

An Intel Core 2 Duo T8100 processor running at 2.1GHz, backed up with 2GB of Ram, ensures Vista runs smoothly. And with the 500GB hard drive you've also got plenty of space to store your digital content. If you're into gaming, however, the Nvidia Geforce Go 8400 GT graphics will disappoint. Although the VGC-LT2S will cope with most games at low detail settings, it simply won't be able to handle the latest titles.

At £1,299, this is an expensive computer, and you lose out on the ease of upgradability. But if you're after a PC to sit in your lounge, it's definitely worth considering. The Vaio VGC-LT2S is available direct from Sony (020 7365 2947 or www.sonymstyle.co.uk).

The stylish-looking VGC-LT2S is the only desktop-style PC Sony makes

CPUs vs GPUs: A battle for supremacy

Every PC tested in our group test this month contains an Nvidia graphics card and a dual-core or quad-core Intel processor. The increasing number of processing cores in systems looks set to continue with Intel's six-core Dunnington chips, slated for launch at the end of 2008, and AMD's eight- and 12-core processors, rumoured for launch in 2009.

The gold-rush towards more and more cores reflects that CPU makers are struggling to raise clock speeds beyond 4GHz. Graphics cards, however, already have lots of cores that run at a slower pace – Nvidia's 9800GTX has 128 cores, while AMD's Radeon HD 3870 has 320.

Both Nvidia and AMD are aiming to get graphics cards doing a lot of traditional CPU work since very few applications actually benefit from multi-core CPUs today.

Nvidia has been quickest off the mark with its Cuda software which, in essence, lets C++ programmers use their code on Nvidia's

DirectX 10 graphics cards (8000-series and up). The first bits of software, from Adobe and Elemental, will launch in the coming weeks. A beta version of the latter, Elemental's RapiHD, was recently demonstrated to PCW converting 1,280x720 high-definition video to 320x240 at 244fps – around 13 times faster than a 3GHz Intel quad-core chip – on a 9800GTX graphics card with a Cuda-enabled driver.

Anti-virus scanning is another big benefactor of Cuda-based GPU work, with Kaspersky recently demonstrating its anti-virus software completing scans on a graphics card in one-twentieth of the time it takes on a regular CPU. Cuda has the potential to accelerate countless Windows applications, especially since Nvidia promises software developers using Cuda will get even more support than games developers get from Nvidia's 'The way it's meant to be played' programme, which has ensured many modern games play best on Nvidia's graphics cards in recent years.

Intel isn't standing still though, promising that its discrete graphics card, called Larrabee, will compete with Nvidia and AMD's high-end graphics cards. Intel also has a Cuda type tool in development, called M-Plus, which Nvidia says further reflects the shift away from CPUs to GPUs. Even more proof comes, perhaps, from AMD's purchase of graphics company ATI.

If the graphics card does take over from the CPU, some experts think traditional sub-scalar CPUs could become relegated to simple I/O controllers, negotiating data between memory and peripherals in a PC. That's an extreme scenario perhaps, but there's no doubt Intel and AMD will have to change tack very quickly anyway to stay dominant.



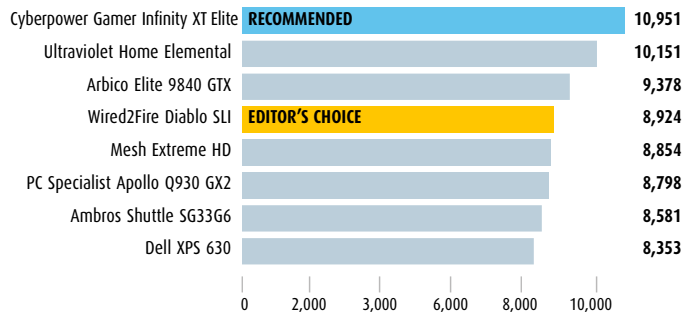
The PCs in this group test each contained an Nvidia graphics card

Lab results

Big desktop PCs are often used to do the tasks their less powerful counterparts cannot, so good performance in graphics and processing power is paramount

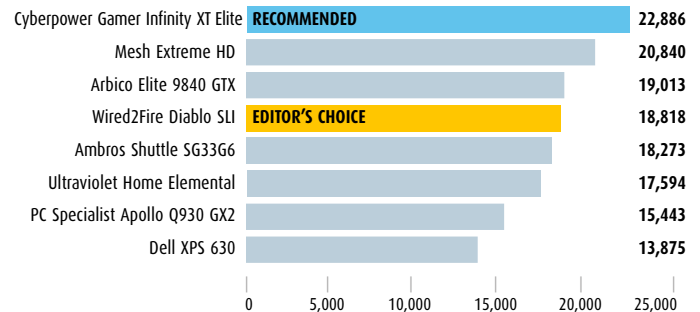
PCmark05 (overall)

Bigger is better



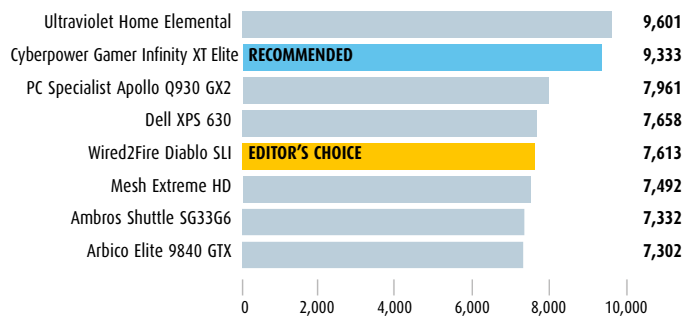
3Dmark05 (1,024x768 in 32-bit colour)

Bigger is better



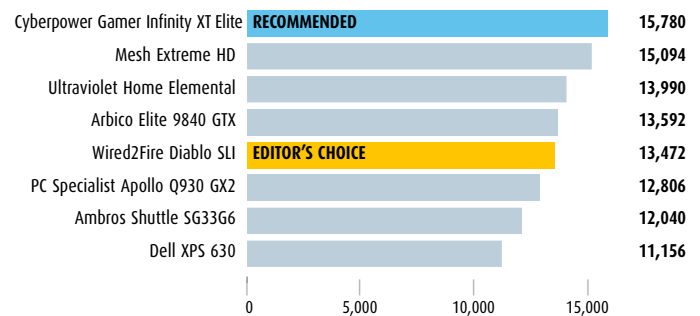
PCmark05 (CPU)

Bigger is better



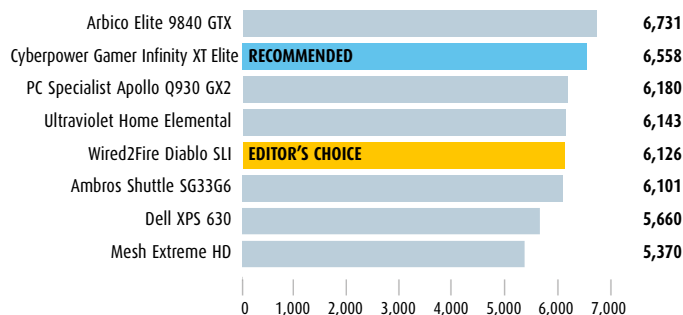
3Dmark06 (1,024x768 in 32-bit colour)

Bigger is better



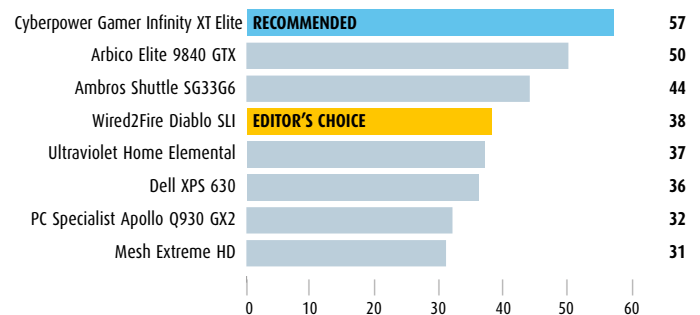
PCmark05 (hard disk)

Bigger is better



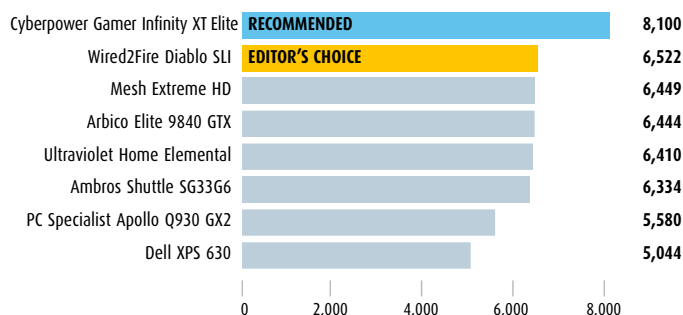
World in Conflict (1,024x768 in 32-bit colour, fps)

Bigger is better



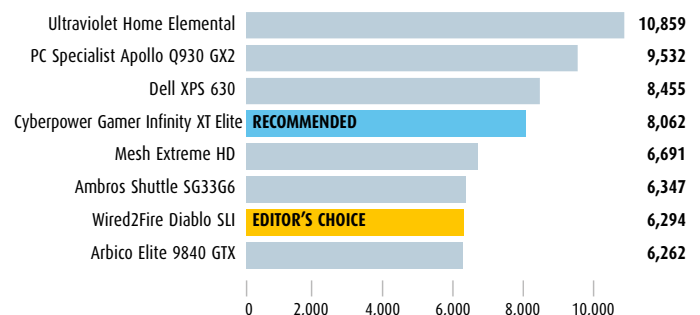
PCmark05 (memory)

Bigger is better






Cinebench 9.5 (multi-CPU)

Bigger is better



Please see page 82 for an explanation of how we tested the PCs ↘

£1,299 high-end PCs

			
MANUFACTURER	AMBROS	ARBICO	CYBERPOWER
Model	Shuttle SG33G6 Deluxe	Elite 9840 GTX	Gamer Infinity XT Elite
Price (inc Vat)	£1,206	£1,299	£1,250.20
Delivery charge	£7.50	£29.36	£0
Sales telephone	020 8861 2223	08456 252 627	0800 019 0863
URL	www.ambros.co.uk	www.arbico.co.uk	www.cyberpowersystem.co.uk
HARDWARE			
Processor	Intel Core 2 Duo E8400	Intel Core 2 Duo E8400	Intel Core 2 Duo E8400
Speed (overclock)	3GHz	3GHz	3GHz (3.8GHz)
Motherboard	Shuttle FG33	Gigabyte GA-P35-DS3R	Asus P5E
Chipset	Intel G33	Intel P35	Intel X38
Ram	4GB DDR2 G.Skill 800MHz Cas5	4GB DDR2 Corsair Dominator 1,066MHz Cas5	2GB DDR2 Corsair Dominator 1,066MHz Cas5
Occupied/spare memory slots	2/0	4/0	2/2
Primary hard disk(s)	Samsung HD501J	Samsung HD753J	WD Raptor
Primary hard disk capacity/speed	500GB 7,200rpm	750GB 7,200rpm	74GB 10,000rpm
Secondary hard disk	None	None	Samsung Spinpoint
Secondary hard disk capacity/speed	N/A	N/A	250GB
EXPANSION AND I/O			
No of USB2/Firewire ports	6/2	11/3	8/2
No of 3.5/5.25in bays	2/1	6/3	4/7
No of free 3.5/5.25in bays	1/0	4/2	2/5
No of PCI/PCI-E16/PCI-E4/PCI-E1 ports	1/1/0/0	3/1/0/3	2/2/0/2
No of free PCI/PCI-E16/PCI-E4/PCI-E1 ports	0/0/0/0	0/0/0/1	1/1/0/1
No of serial/parallel/PS/2 ports	0/0/0	0/0/2	0/0/1
Other ports	HDMI, 2x eSata	eSata	None
MULTIMEDIA			
Graphics cards and memory	Zotac Nvidia Geforce 9600GT 512MB	BFG Nvidia Geforce 9800 GTX 512MB	Nvidia Geforce 8800GTS 512MB
Monitor, size and native resolution	Asus MW221U 22in 1,680x1,050	Samsung 2232BW 22in 1,680x1,050	Hanton 22in 1,680x1,050
Optical drive	Pioneer DVR-115D	TSScorp SH-S203P	Lite-on LH-20A1H
Optical drive formats supported	DVD+/-RW DL, DVD-Ram	DVD+/-RW DL, DVD-Ram	DVD+/-RW DL, DVD-Ram
Soundcard	Realtek ALC888D	X-Fi Xtreme Gamer	X-Fi Xtreme Gamer
Speakers	Logitech S200	Cyber Acoustics CA5150 5.1	Creative T6100 7.1
Keyboard/mouse	Microsoft Digital Media keyboard and mouse	Logitech Deluxe 660 cordless desktop	Logitech Deluxe 660 cordless desktop
OTHER INFORMATION			
Additional extras	Fingerprint reader	DVB-T TV Tuner	None
Networking	802.11g, Gigabit Ethernet	802.11g, Gigabit Ethernet	Gigabit Ethernet
Power supply	300W	500W	630W
Operating system	Vista Home Premium 32-bit	Vista Home Premium 32-bit	Vista Home Premium 32-bit
Bundled software	None	None	None
Standard warranty *	1yr RTB	2yrs RTB	3yrs RTB
SCORES			
Features	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★

* (RTB = return to base, C&R = collect and return)



DELL	MESH	PC SPECIALIST	ULTRAVIOLET	WIRED2FIRE
XPS 630	Mesh Xtreme HD	Apollo Q930 GX2	Elemental Home	Diablo SLI
£1,249	£1,299	£1,299	£1,244.78	£1,299
£0	£0	£0	£50 (approx)	£29
0844 444 5818	0844 736 0440	0844 499 4000	01908 574093	0845 388 9051
www.dell.co.uk	www.meshcomputers.com	www.pcspecialist.co.uk	www.ultravioletmachines.com	www.wired2fire.co.uk
Intel Core 2 Quad Q6600	Intel Core 2 Duo E8500	Intel Core 2 Quad Q9300	Intel Core 2 Quad Q6600	Intel Core 2 Duo E8400
2.4GHz	3.16GHz	2.5GHz	2.4GHz (3GHz)	3GHz
Dell	Asus P5N-E SLI	Asus P5N-D	EVGA 650i Ultra	Asus P5N-D
Nvidia Nforce 650i SLI	Nvidia Nforce 650i SLI	Nvidia Nforce 750i SLI	Nvidia Nforce 650i	Nvidia Nforce 750i SLI
2GB DDR2 ProMOS 800MHz Cas6	4GB DDR2 Samsung 667MHz Cas5	4GB DDR2 Corsair XMS2 800MHz Cas5	2GB DDR2 OCZ 832MHz Cas5	4GB DDR2 Corsair XMS2 800MHz Cas5
2/2	4/0	2/2	2/2	2/2
Samsung HD501LJ	Seagate Barracuda 7200.10	Western Digital Caviar SE	Western Digital Caviar	Western Digital Caviar SE
500GB 7,200rpm	500GB 7,200rpm	500GB 7,200rpm	500GB 7,200rpm	500GB 7,200rpm
None	None	None	None	None
N/A	N/A	N/A	N/A	N/A
7/1	8/2	9/2	8/3	8/2
5/2	7/4	5/4	7/4	7/4
3/1	6/3	3/3	5/3	6/3
2/2/1/1	2/2/0/1	2/2/0/2	3/1/0/2	2/2/0/2
1/1/1/1	1/0/0/1	0/1/0/1	2/0/0/1	2/1/0/1
0/0/2	0/1/2	1/1/2	0/0/2	1/1/2
Multiformat card reader	2x eSata	Multiformat card reader, HDMI	Multiformat card reader	None
Nvidia Geforce 8800GT 512MB	2x Sparkle Nvidia Geforce 8800GT 512MB	Asus Nvidia Geforce 9800GX2 1,024MB	EVGA Nvidia Geforce 8800GT 512MB	BFG Nvidia Geforce 8800GTS 512MB
SP2208WFP 22in 1,680x1,050	Iiyama PLE2403WS-B1 24in 1,920x1,200	LG 226WTQ 22in 1,680x1,050	Samsung 920NW 19in 1,440x900	Benq G2400W 24in 1,920x1,200
PBDS DH-16W1S	Pioneer BDC-202	LG GSA-H55L	Lite-on LH-20A1S	Pioneer BDC-S02BK
DVD+/-RW DL	BD-Rom, DVD+/-RW DL, DVD-Ram	DVD+/-RW DL, DVD-Ram	DVD+/-RW DL, DVD-Ram	BD-Rom, DVD+/-RW DL, DVD-Ram
X-Fi Extreme Gamer	X-Fi Extreme Gamer	X-Fi Extreme Gamer	Azalia 7.1	Realtek HD
None	Creative Inspire A500 5.1	Creative T6100 5.1	Logitech X-530 5.1	Logitech G51 5.1
Dell enhanced USB mouse & keyboard	Logitech Deluxe 660 cordless desktop	Logitech Deluxe 660 cordless desktop	Microsoft Business Hardware keyboard & mouse	Logitech G5 Laser mouse & Internet 350 keyboard
XPS mouse mat	None	None	None	Videomate U100 USB TV tuner and remote control
Bluetooth, Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	802.11g, Gigabit Ethernet	Gigabit Ethernet
750W	550W	700W	600W	550W
Vista Home Premium 32-bit	Vista Home Premium 32-bit	Vista Home Premium 64-bit	Vista Home Premium 32-bit	Vista Home Premium 64-bit
Roxio Creator DE 10.1, Microsoft Works 9	Microsoft Works 9, Cyberlink BD Suite	Nero 7 Essentials, Cyberlink DVD Suite	Crysis, Ulead Videostudio 5	Cyberlink BD Suite, Compro Digital TV 4
1yr on site	1yr RTB	1yr C&R	2yrs RTB	2yrs C&R (2nd year labour only)
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

Vendors of group test products are only obliged to sell them at the prices quoted here (which include credit card surcharges) for the life of this PCW issue. They may also change components under certain circumstances.

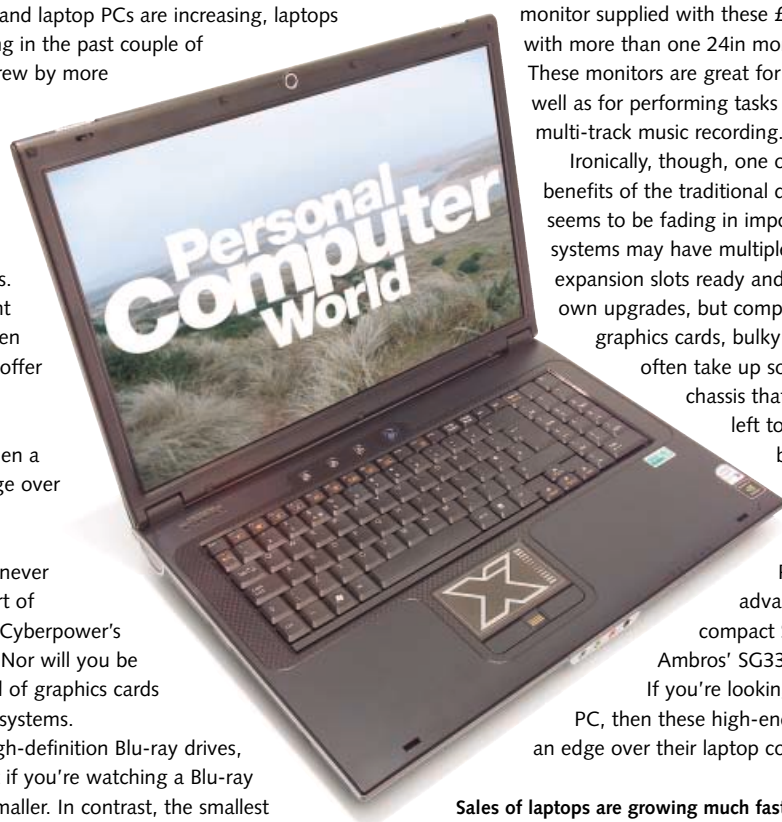
Laptops vs desktops

Although sales of both desktop and laptop PCs are increasing, laptops have been making all the running in the past couple of years. Sales of laptop systems grew by more than 26 per cent last year, compared to an increase of just two per cent for desktops.

That's hardly surprising when you look at the sort of performance and features now available in many laptop systems. The use of Intel's energy-efficient Core 2 Duo processors mean even quite compact laptops can now offer 'desktop replacement' levels of performance.

However, there are times when a desktop PC has a clear advantage over a laptop. The need to minimise power consumption and heat output in a laptop means you'll never be able to overclock it to the sort of performance levels achieved by Cyberpower's Gamer Infinity PC, for instance. Nor will you be able to fit a laptop with the kind of graphics cards found in most of these desktop systems.

You can find laptops with high-definition Blu-ray drives, but you won't get much benefit if you're watching a Blu-ray film on a screen that's 17in or smaller. In contrast, the smallest



monitor supplied with these £1,299 PCs was 19in, with more than one 24in monitor included as well. These monitors are great for watching films, as well as for performing tasks such as video editing or multi-track music recording.

Ironically, though, one of the more obvious benefits of the traditional desktop tower system seems to be fading in importance. Large tower systems may have multiple drive bays and expansion slots ready and waiting to install your own upgrades, but components such as twin-size graphics cards, bulky fans and cooling systems often take up so much space inside the chassis that there's not much room left to install them. Aside from better cooling, the monolithic CoolerMaster cases used by some of these PCs don't offer major advantages over the more compact Shuttle chassis used by Ambros' SG33G6 system.

If you're looking for a really powerful PC, then these high-end desktops do still have an edge over their laptop counterparts.

Sales of laptops are growing much faster than desktop PCs

Editor's Choice

Editor's Choice **Wired2Fire Diablo SLI**
Recommended **Cyberpower Gamer Infinity XT Elite**



Wired2Fire Diablo SLI

If you're spending £1,200 or more on a PC, then you're perfectly entitled to expect pretty high levels of performance from it – and none of these £1,299 PCs could be described as a poor performer. Even so, there's a clear difference in emphasis that is evident when we looked across the range of these systems.

For sheer raw power, the Gamer Infinity XT Elite from Cyberpower is the clear winner. Its overclocked 3.8GHz processor and graphics card



Cyberpower Gamer Infinity XT Elite

make it the obvious choice for gamers who want maximum speed for running the latest 3D action games. However, its emphasis on power alone has involved compromises in other areas, such as its small amounts of Ram and hard disk storage, and low-cost speaker and monitor components.

There are other machines that provide a wider range of features while still producing strong games performance. The second place for games performance went to Arbico's Elite 9840

GTX, which also includes a TV tuner and wireless adapter to enhance its value for money.

We were also pleasantly surprised by the gaming performance of Ambros' SG33G6, while its compact design and HDMI output will allow it to sit under a flat-screen TV to form the centrepiece of a home-entertainment system.

If gaming isn't your top priority, then the Mesh Extreme HD might be more suitable. With its high-definition Blu-ray drive and 24in widescreen display, it is a good choice for people who like to watch movies on their PC.

However, the machine that offers the best all-round combination of performance and multimedia features is the Diablo SLI from Wired2Fire. Although the 'SLI' in the name refers to the motherboard and not dual-graphics, it still provides respectable games performance (with the option of a future graphics upgrade, if required), along with an impressive set of multimedia features. It matches the Blu-ray drive and 24in monitor of the Mesh Extreme HD, and ups the ante even further with an additional TV tuner and high-quality surround-sound speakers, which together ensure that it can handle games, TV, music and the latest high-definition video technologies. **PCW**

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EVERYTHING
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Windows Mobile Control. You can define which types of data (files, calendars, emails, tasks, and other ActiveSync protocol objects) users are allowed to synchronize between corporate PCs and their Windows Mobile personal devices.

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Media White List. Allows you to authorize access to specific DVD/CD-ROM disks, uniquely identified by data signature.

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Device/Port Auditing. Gives you a complete record of port and device activity.

Data Shadowing. Captures full copies of files that are copied to authorized removable devices, Windows Mobile PDAs and smartphones, burned to CD/DVD or even printed by authorized users.

Administration Assignment. Every user with local administrator privileges is not automatically given DeviceLock administration privileges. The Chief Security Officer has discrete control over who has DeviceLock administration privileges.

Anti-keylogger. DeviceLock detects USB keyloggers and blocks keyboards connected to them. Also, DeviceLock obfuscates PS/2 keyboard's input and forces PS/2 keyloggers to record some garbage instead of the real keystrokes.

Group Policy Integration. You have the ability to manage DeviceLock settings using the Windows standard Group Policy interface.

RSOP Support. You can use the Windows standard Resultant Set of Policy snap-in to view the DeviceLock policy currently being applied, as well as to predict what policy would be applied in a given situation.

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Editor's Choice

'Modern portable media players aren't just about music anymore, with most offering a wealth of additional features'

Playing media on the move

As Paul Lester finds out, the Apple iPod has more competition than ever before

Modern portable media players (PMPs) aren't just about music anymore, with most offering a wealth of additional features including video and photo playback.

With a number of impressive new entries from industry leaders, we've rounded up some of the most powerful players to see how they perform in the audio and video stakes and what extras they can provide to offer added value to the consumer. All are based on Flash memory, which makes them more durable compared to hard disk models, and prices start at just £129.

Since most players now have large, full-colour screens, we've paid close attention to video quality, as well as how easy it is to get playable content on the device.

Audio quality is, of course, important and we've tested all the PMPs using Shure's excellent SE210 earphones (www.shure.co.uk), which

generally outperform the rather average headphones included in the box.

Capacity is another important issue and the amount of space you get for your money can vary drastically, although many now offer expansion slots that allow you to increase the internal storage.

You'll also find that many players offer extra features such as an FM radio, clock and calendar, games and a voice recorder.

We'll be looking at how usable the players are, how easy it is to browse and access their various features and how well it all stacks up for the price before making our final judgements.

Thanks to Advanced MP3 Players (www.advancedmp3players.co.uk) for its help in supplying products for our group test. We've quoted RRP's in the reviews, but as usual, you'll be able to make big savings by shopping around online.

Apple iPod Nano

Price £129.99 **Contact** Apple 0845 600 1683 www.apple.com/uk



No media player group test would be complete without an appearance by Apple, and we've got its latest-generation Nano on test to see how it compares against some worthy rivals.

As you'd expect, the player is superbly slim and light, yet it still manages to fit a 2in 320x240 resolution display above a touch-sensitive scroll wheel.

Apple seems to have learnt a lot from previous forays into the market and now offers an impressive

range of additional features above music and video playback, including a calendar, contacts list, alarm, games, stopwatch and text viewer.

Each form of media playback uses a range of sub-categories to help you search by type. In the audio menu, for example, you can browse by artist, album and genre views or via a text-based search system. Both audio and video can be browsed using Apple's innovative Cover Flow tool, which skews album art or video clips on-screen in a rotating menu. These features, along with the touch-sensitive scroll that is just about large enough to operate comfortably, make this the most enjoyable player on test in terms of browsing and selecting various media and applications.

You can customise the items that appear on each menu and tweak other settings, such as the equaliser; although this equaliser doesn't offer a custom option, there's a wide range of presets to choose from.

Sound quality is impressive with clear, crisp audio and powerful bass and the screen is large and clear enough to view short video clips. The only area that Apple falls down in is with video format support. While there are applications, some free, that can help, it can be a fiddly process. Despite this, the excellent design and performance, along with its sheer usability, is enough to put the Nano on the top of our list.



Verdict

Pros Beautiful design; slim and light; impressive performance; range of additional features

Cons Video conversion can be difficult

Overall An excellent media player and thanks to Apple's recent revision of its pricing policy, represents great value for money to boot

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Archos 605 Wifi

Price £149.99 **Contact** Archos 0870 609 1263 www.archos.com



The Archos 605 Wifi is larger than the other players in this group test, but we've included it because of the massive range of features that it offers for a similar price. It sports a 3.5in screen along with built-in Wifi, which means you can connect to nearby hotspots to browse the internet or stream media.

Despite its large screen, the 605 Wifi remains very slim and light. It features a touchscreen display that you can operate with your fingers or the provided stylus. You'll also find a range of controls on the right

of the screen that make it easy to access the features of the player without using the touchscreen, if you prefer. There are plenty of options for adjusting audio and video playback, including a range of equaliser settings and effects, aspect ratio control and full slideshow features.

The display and interface is fully customisable with a range of wallpapers and effects and you'll also find a built-in PDF viewer. However, if you want to experience everything the 605 Wifi has to offer, then you'll need to purchase some additional plug-ins.

For around £15 each (find full pricing on Archos' website), you can add a video podcast plug-in to download and view online content, a cinema plug-in that improves the range of playable video formats (including MPEG2), as well as a web browser plug-in.

In our tests, the quality of both the audio and video output were excellent and, best of all, with such good format support you can drag and drop most content onto the 605 Wifi through Windows with no recoding required.

There's only 4GB of built-in memory, but an SD card slot will allow you to upgrade this and with the help of a few of the plug-ins, you'll find the 605 Wifi to be the most versatile, feature-packed portable media player on the market.



Verdict

Pros Excellent range of features; impressive audio and video performance; Wifi

Cons Fairly bulky; plug-ins cost extra

Overall Even with the extra cost for plug-ins taken into account, the 605 Wifi is fantastic value for money and the most feature-packed media player on the market

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Cowon iAudio 7

Price £149.99 **Contact** Cowon www.cowonglobal.com



The iAudio 7 from Cowon is only slightly removed from the raft of relative unknowns you often see shipped in from the Far East.

These players are often cheap and usually offer a wide range of features. However, they also tend to suffer from performance and usability issues, which means they generally only appeal to a budget market.

The iAudio has tried to distance itself from this group with some interesting enhancements, such

as the Jeteffect system, which offers a number of equaliser settings and sound effects designed to help customise the audio in a way not dissimilar to Sony's player. It's a welcome addition, but we didn't feel it delivered the kind of boost in audio quality we were hoping for.

There are a few other strings to iAudio's bow that might just edge it ahead of some of the competition, most notably it's the only player here to offer line-in recording – this means you can encode directly to the device from an external audio source, such as a CD player.

There's also a text reader, voice recorder and FM radio, which comes with an FM recorder to save broadcasts to a compatible compressed format. However, these features, along with the potential for video and photo playback, are hindered by the small 1.3in display; it's often difficult to work your way through the range of features on offer and its small 160x128 resolution means watching anything other than short video clips isn't a pleasant experience.

Copying video content across to the iAudio 7, using the supplied software, is quite fast and easy, so it may hold some appeal for music video and movie trailer clips. But the fact remains that the iAudio 7 doesn't stand up well in the face of its stiff competition.

Verdict

Pros Line-in recording; effective video conversion software

Cons Small display; unresponsive controls,

Overall A capable but ultimately uninspiring player in light of the competition on offer – if you're interested in using it for photos or video, you'd best steer clear

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Creative Zen

Price £128.99 **Contact** Creative 0800 376 7954 www.creative.com



Creative seems to have focused much of its recent efforts on its small Stone player, but the Zen can still hold its own in the mid-capacity video player market. It's a fairly basic affair, with a simple black finish and a range of controls that don't really live up to the aesthetics on offer from most of its competitors.

A reasonable range of features includes an FM radio, clock and calendar and contacts viewer, along with a built-in voice recorder and full-size SD card slot at the top to expand the internal capacity.

There's a decent amount of control over your

media, though, including equaliser presets with custom settings, a volume equaliser, bass boost feature and slideshow creation for photos.

The quality of the large 2.5in screen and the audio are also both very good – the display is certainly large and clear enough to enjoy video content on the go.

The interface is basic, but capable, and it's pretty easy to find your way around using the directional pad and control buttons – one of which is customisable.

One area where the Zen really stands out is video playback. We've already mentioned that content looks pretty swish on the high-resolution screen, but it's also one of the easiest players on test to populate with new media.

The Zen Media Explorer software supplied not only allows you to quickly add a library of music, but also to select, convert and transfer video, which is both fast and easy to do.

In addition, the software includes the Zencast application, which is basically Creative's answer to getting podcasts on iTunes.

The Zen's rather basic-looking design may feel a bit cheap compared to its rivals, but with effective video conversion and good overall performance it's a decent portable media player.

Verdict

Pros Effective video conversion and playback; decent performance; good software support

Cons Rather basic design; feels a bit cheap; few extra features

Overall It's not nearly as well designed as the Apple or Archos players, but the Zen does a decent job of managing video

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

iRiver B20

Price £169 Contact iRiver www.iriver.eu.com



Although the B20 isn't branded as part iRiver's popular Clix range, it retains all of the features, including the innovative four-way touchpanel controls that help you navigate around by depressing the exterior of the case in one of four directions. The bulk of the design is taken up by a beautifully vibrant 2.4in display, with a handful of additional controls such as volume, a shortcut key and power buttons on the sides.

One of the main reasons why the B20 is so appealing is the range of customisable features available. On a cosmetic level, you can change the wallpapers and themes to change the look and behaviour of the interface. There's a good degree of control over your music, with graphics equaliser presets, custom settings and sound enhancements capable of producing some of the best quality audio we've heard from a portable player.

You'll also find a Flash player, games, voice recorder, text viewer, alarm, podcast and audiobook support, making it one of the most feature-packed portable players money can buy. Of course, you can also view video content and photos on the device and thanks to the impressive display, they're enjoyable enough to watch on the move. One disappointment is that getting playable video on to the device is all but impossible without using the software supplied, which takes an age to convert and copy.

Another big feature is the built-in DAB radio. This has its drawbacks, adding bulk to the otherwise slim build, along with the chunky telescopic aerial. The main issue is that you're paying a lot of money for a relatively meagre capacity and, while you can increase this via the micro SD slot, those who won't make full use of the DAB radio should probably look elsewhere.

Verdict

Pros Packed full of features; very easy to use; customisable; great performance

Cons Expensive for the capacity; rather bulky

Overall The B20 is an excellent MP3 player and all-round media companion, but if you're not going to utilise the DAB radio, there are better options available

Features ★★★★★

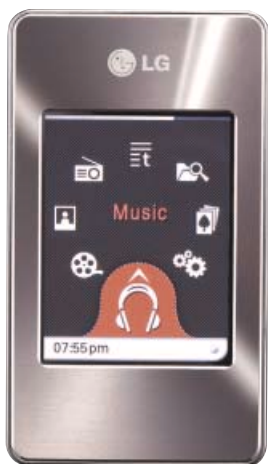
Performance ★★★★★

Value for money ★★★☆☆

Overall ★★★★★

LG Touch FM37

Price £139.99 Contact LG Electronics 0870 873 5454 <http://uk.lge.com>



Before Apple threw its hat into the ring, LG was one of the biggest advocates of touchscreen technologies on devices such as phones and MP3 players. The Touch FM37 is one of its latest players, but we're not convinced that the adoption of this technology does anything to improve on traditional controls. It certainly looks great, features a brushed aluminium chassis and, thanks to the touchscreen the exterior, is almost totally devoid of

controls. There's a twist to the navigational system in that rather than using on-screen buttons, you can find your way around by using predefined swiping motions to, for example, adjust volume by moving your finger in a circular pattern clockwise or anti-clockwise, or skip tracks by swiping to the left or right.

There are dedicated buttons on-screen that you can use, and once you get used to the various ways you can move around it does get a bit easier.

However, we had issues with the screen's visibility; the lack of physical controls means you need to see exactly what menu you're in to know what control movements to invoke. The fact that it becomes almost impossible to view clearly in direct light means you'll be frustrated by the lack of tactile buttons.

The features include an FM radio, voice recorder and text viewer built-in alongside video, photo and music playback. There are even a few touchscreen-oriented games. Performance in all three categories is very good; we were impressed by the audio quality and, if you're in a dark enough environment, the display is colourful during video playback. The media converter software supplied isn't particularly friendly though and does make converting and transferring video a bit of a trial.

While the touchscreen interface is interesting, it does little for actual usability, which is a real shame.

Verdict

Pros Looks great; impressive audio and video performance in the right environment

Cons Often frustrating touchscreen controls; difficult to use in bright conditions

Overall The touchscreen operation adds little to the usability of the FM37, and while it's capable in other areas we'd rather opt for a better all-rounder

Features ★★★★★

Performance ★★★★★

Value for money ★★★☆☆

Overall ★★★☆☆

Sandisk Sansa View

Price £159.99 **Contact** Sandisk <http://uk.sandisk.com>



The Sansa range of players has always been a popular choice for those looking to get value for money. While not nearly as feature-packed as much of the competition, they're usually solid players that offer high capacities for a very reasonable price.

The Sansa View is the upgrade to Sandisk's E-series and adopts an old-school iPod Nano-style design with a 2.4in display above a circular mechanical control wheel. It's effective enough, but the player is

disappointingly chunky in the light of a range of more compact competitors. There is a solid range of features, but nothing particularly inspiring; alongside audio playback you get a video and photo viewer, FM radio, voice recorder and audiobook reader.

Performance across the board is acceptable and there are a range of equaliser settings to tweak audio and slideshow settings for your photos, along with the ability to record FM radio direct to the device.

When viewing photos and video you'll find both the screen and controls automatically switch to landscape mode to make better use of a widescreen display. Despite claiming a wide range of support for video we still had to resort to using the supplied software to convert and copy across, and in some instances had issues with stable playback.

The screen is large enough to view video content comfortably, but we've seen more capable displays in this area.

Sandisk comes into its own when it comes to value though and at 16GB this is largest player on test here by some way. You can even upgrade the storage using the micro SD card slot on the side, so those looking for a basic, capable player in mind of storing a large music library will no doubt be impressed by what Sandisk offers for the money.

Verdict

Pros Great value for money; high capacity; easy to use

Cons Rather bulky; limited media control

Overall The Sansa View is a great value player for the less demanding user looking for high capacities, but it isn't particularly strong in any other areas

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Sony NWZ-A818

Price £129.99 **Contact** Sony 0207 365 2947 www.sony.co.uk



Sony has had mixed success in the MP3 player market. While its players have always produced great sound quality, the company has in the past omitted some fairly standard features.

The NWZ-A818 addresses one of the biggest, namely the inclusion of drag-and-drop that allows you to transfer music quickly and easily in the standard MP3 format. Aside from this, Sony has stuck with the effective design of the previous series, including a 2in

screen, video and photo playback and a range of innovative music search features such as the Time Machine shuffle, which picks tracks from a specific year and a file rating system.

Predictably, audio quality is great and you'll find a range of equaliser and environment presets that will allow you to tweak the sound to perfection. As mind blowing as this was through the Shure earphones we used to test all the players, it's worth mentioning that Sony was the only manufacturer here to include a decent set of headphones as standard.

The NWZ-A818 is no slouch when it comes to video content either, mainly because of the high quality of the sharp and vibrant display. One big issue we had, though, is that Sony no longer includes its Sonicstage application, so there's nothing in the box to help you convert video to a format the player can manage.

In terms of usability, the controls are well thought out and easy to access, making it straightforward to browse the features and tweak settings. But while there's an excellent degree of control over your media, there isn't a lot in terms of additional features. What this boils down to is a media player that makes no compromises on performance and quality, but if you're after extras such as games and an FM radio, you're best off leaving Sony's NWZ-A818 to the true audiophile.



Verdict

Pros Superb audio and video quality; excellent customisation features for media playback

Cons Few additional features; Sonicstage not included

Overall Despite focusing almost solely at media playback, the sheer performance of the Sony means it will definitely appeal to audiophiles

Features ★★★★★

Performance ★★★★★

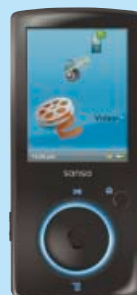
Value for money ★★★★★

Overall ★★★★★

Media players



MANUFACTURER	APPLE	ARCHOS	COWON
Model Name	iPod Nano	605 Wifi	iAudio 7
Price (inc.VAT)	£129.99	£149.99	£149.99
Sales Telephone	0845 600 1683	0870 609 1263	n/a
URL	www.apple.com/uk	www.archos.com	www.cowonglobal.com
SPECIFICATIONS			
Screen size	2in	3.5in	1.3in
Screen resolution	320x240	320x240	160x128
Internal memory	8GB	4GB	8GB
Memory card slots	✗	SD/SDHC/micro SD	✗
Customisable display	✗	✓	✓
Built-in speaker	✗	✓	✗
FM radio	✗	✗	✓
DAB radio	✗	✗	✗
Voice recorder	✗	✗	✓
Audio format support	AAC, AIFF, MP3, WAV	AAC, AC3, MP3, WAV, WMA	FLAC, MP3, OGG, WAV, WMA
Video format support	H.264, MPEG4	H.264*, MPEG2*/4, WMV	MPEG4
Photo format support	JPEG	BMP, JPEG, PNG	JPEG
Data connection	Proprietary USB	Mini USB	Mini USB
Maximum battery life in hours (audio/video)	24/5	16/5	60/5
Size (wxdxh in mm)	70x52x6.5	100x78x13	36x76x19
Weight	50g	146g	60g
SCORES			
Features	★★★★★	★★★★★	★★★★☆
Performance	★★★★☆	★★★★☆	★★★★☆
Value for Money	★★★★☆	★★★★☆	★★★★☆
OVERALL	★★★★☆	★★★★☆	★★★★☆



CREATIVE	IRIVER	LG	SANDISK	SONY
Zen	B20	Touch FM37	Sansa View	NWZ-A818
£128.99	£169	£139.99	£159.99	£129.99
0800 376 7954	n/a	0870 873 5454	n/a	0207 365 2947
www.creative.com	www.iriver.eu.com	http://uk.lge.com	http://uk.sandisk.com	www.sony.co.uk
2.5in	2.4in	2.4in	2.4in	2in
320x240	320x240	320x240	320x240	320x240
8GB	2GB	4GB	16GB	8GB
SD/SDHC	Micro SD	✗	Micro SD	✗
✓	✓	✓	✗	✗
✗	✓	✗	✗	✗
✓	✓	✗	✓	✗
✗	✓	✗	✗	✗
✓	✓	✗	✓	✗
M4A, MP3, WAV, WMA	AAC, ASF, MP3, OGG, WMA	MP3, OGG, WMA	AAC, MP3, WMA, WAV	AAC, MP3, WMA
MPEG4, WMV	H.264, MPEG1/2/4, WMV	H.264, MPEG4, WMV	MPEG4, WMV, H.264	H.264, Mpeg-4
JPEG	JPEG	BMP, JPEG, GIF	JPEG	JPEG
Mini USB	Mini USB	Mini USB	Proprietary USB	Mini USB
25/5	27/5	20/3	35/7	33/8
55x83x11	81x50x16	51.5x90x10	109x49x10	88x44x10
65g	75g	63g	82g	53g
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

Format foibles

Despite most modern portable media players offering video playback facilities, this is still one area that can prove to be a real pain for the consumer: format support.

While drag-and-drop is often suitable for music and photos, you may find that apparently compatible video files either aren't recognised at all or suffer from playback issues that make them unviewable.

Many of players claim to support all major formats, but with so many different formats flying around at varying resolutions, you may find yourself having to convert content before it can be played on your device.

To counter this, you'll usually get a software application or suite of programs included with your player that can convert and transfer video for you. However, these can be very slow and not totally reliable.

If you're planning on buying a player with the intention of watching a fair amount

of video content on the move, it's important that you take these issues into account.

Thankfully there are plenty of tools available online. Below, we've listed some popular tools used to convert files for use with portable media players. They will also be useful for getting video onto other devices such as mobile phones and gaming systems such as Sony's PSP. Best of all, they are free.

Read all about video codecs on page 146.

G-Spot

www.headbands.com/gspot

This freeware tool will examine individual media files and tell you exactly which codec has been used

AutoGK

Price: Free

www.autogk.me.uk

A collection of free utilities that will convert



Create or convert video files with DivX Author

DVD to DivX, Xvid and other formats. It also lets you split video files to create chapters.

DivX Author 1.5

Price: £25

If you are planning on creating or converting lots of DivX files, this is an excellent tool.

Read a full review at www.pcw.co.uk/2200281.

Editor's Choice

Editor's Choice Apple iPod Nano

Recommended Archos 605 Wifi • Sony NWZ-A818



Apple iPod Nano

Although most of these players are around the same price, internal capacity varied considerably. However, with most offering expansion options, and Flash media currently cheap, this isn't always a deal breaker.

One area where all the players scored highly was audio quality. The presence of audio enhancements and graphic equalisers meant that all of them will satisfy the average consumer. That said, Sony still manages to edge ahead of the competition with its audio and the NZW-A818 produced the best sound quality in the group, and for this we've given it a Recommended award.

If you're not worried about perfect audio but are instead looking for a player that offers great



Archos 605 Wifi

value for money, the Sansa View from Sandisk trumps the rest by offering a massive 16GB capacity for an extremely good price.

Video playback varied slightly more than audio quality, especially with the players featuring smaller screens. If you're planning on watching anything more than short clips we'd recommend at least a 2.5in screen.

Other factors you'll be left with when choosing between the others on test are design, portability, usability and additional features. Backing up its impressive audio performance, iRiver produced a worthy contender with its B20. The built-in DAB radio and wide range of additional features impressed, and although it's rather chunky in comparison to the rest and

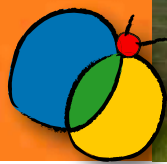


Sony NWZ-A818

expensive for the capacity, it certainly has plenty going for it.

It was a tight battle for top spot between Apple's iPod Nano and the 605 Wifi from Archos. They have totally different form factors, so if portability isn't a big concern the versatility of the Archos makes it difficult to ignore. Having said that, Apple has come a long way since the original iPod and is now offering a far better overall package. Since there can only be one Editor's Choice, we're going to opt for Apple's iPod Nano – it's superbly slim and light, benefits from Apple's excellent interface and offers a range of additional features to keep you entertained. But Archos' 605 Wifi comes a close second and collects a Recommended award. **PCW**

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email volunteering@rnib.org.uk
website rnib.org.uk/volunteering**



ON TEST

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Home Servers
Editor's Choice

'OEM versions of WHS are available to buy on popular internet shops, costing around £99'

Served at home

As Emil Larsen discovers, the latest Windows Home Servers are far more than glorified Nas drives

Microsoft's latest operating system, Windows Home Server, has been beset by problems since its launch in late 2007. A lack of manufacturers building PCs to use the operating system has been the biggest issue; Medion and Iomega both scrapped their products just before launch dates, citing a corruption bug and high cost respectively.

The corruption bug potentially ruins data backed up onto Windows Home Servers (WHS) and Microsoft promises that a fix is around the corner. However, at PCW we've not had any corruption issues, despite using WHS on a regular basis in both office and home environments.

Pricing is another uncomfortable issue. Without add-ins (third-party utilities that give WHS devices wide-ranging capabilities), Nas (network-attached storage) drives using Linux are very competent at storage, backup and media streaming. What's more, they cost half the price and consume half the power of most WHS systems.

In WHS' defence, the operating system is better suited to handling more users (it will cope with 10 different computers) as well as providing an excellent interface for managing shared folders and UPnP streaming for videos and music. It also has excellent remote administration and will monitor the security of every PC on your home network, making sure Windows and anti-virus updates are downloaded and installed.

OEM versions of WHS are available to buy on popular internet shops, costing around £99. But without Microsoft promoting a retail version in regular shops with better documentation and support, DIY Windows Home Servers haven't gained much traction. In reality, installing an OEM version of WHS onto our £99 PC (see page 33) produces a server with top performance – albeit a big and ugly one.

In this round-up, we've put the big four servers through their paces from HP, Belinea, Fujitsu Siemens and Tranquil.

Belinea O.center

Price £386.58 Contact Belinea 0870 160 8366 www.serversdirect.com



By volume, the O.center is the second biggest only to Fujitsu Siemens Scaleo 1900. Its striking glossy white and orange design definitely won't appeal to everyone, but we found it refreshingly different. Behind a front-facing swing-out door, it has four hot-swappable SATA drive bays, like the HP Mediasmart, so hard disks can be added or removed quickly and easily.

Out of the box, the O.center includes iWHS

Mediagenie and iWHS Control Center add-ins. The first organises UPnP distributed media, while the latter reveals a device manager for the WHS, showing software processes and network status. Visual indicators for CPU and Ram usage for every task is a great feature, since it lets you pinpoint inefficient add-ins or other system problems. The Control Center supposedly lets you remotely log on to any PC on your home network, but we struggled to get it working.

Inside, the O.center uses an AMD LE-1100 processor, which has the same 256KB of L2 cache and 800MHz front-side bus (FSB) as HP's Sempron 3400+. Its top 1.9GHz clock speed and AMD chipset (rather than the Mediasmart's Sis chipset) meant it was much faster than the Mediasmart in most tests. The O.center even came top in our unzip test by a considerable margin.

Belinea is the only manufacturer to include a USB stick loaded with the WHS operating system – in the event of a failure you can use this stick and the recessed system recovery button to restore the WHS and attempt data recovery. Four USB2 ports and one eSata are provided for external storage, while a PCI and x16 PCI Express slot could be used to expand connectivity.

A two-disk version is available for £468.83, but the one disk version we tested is excellent value for money.



Verdict

Pros Excellent processing performance; easy hard drive access; good diagnostics; USB stick recovery
Cons Physically large; only average energy efficiency

Overall The O.center's striking design is joined by solid performance and an affordable price tag

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Fujitsu Siemens Scaleo 1900

Price £469 Contact Fujitsu Siemens 0845 678 0172 www.fujitsu-siemens-shop.co.uk



Fujitsu Siemens' Scaleo 1900 uses Intel's WHS reference design. It's ugly, large and has rounded sides, but it has some hidden strengths.

Two feet let it stand vertically or horizontally and, like the Belinea and HP models, it can accommodate four hard disks. But, unlike the Belinea and HP servers, you have to remove two screws and a side panel to access the drives (two 500GB disks are present).

The Scaleo 1900 makes a terrific roar when starting

up, but quickly quiets down to a whisper. Three add-ins come pre-installed: Twonkyvision Mediaserver, Intel hardware monitor and Scaleo power management.

The hardware monitor is excellent, showing fan speeds, board temperature (this sat at 50°C after one day's testing) and CPU temperature (30-5°C and 3°C hotter than the HP and Belinea models respectively).

Twonkymedia streams internet radio stations to your computers and UPnP devices, with a simple 18-genre selection to get you started.

The power management add-in allows the WHS to hibernate on a scheduled basis – when you're out of the house, for example. When enabled, it reduces power to around 3W and cuts out the fans and lights for peace and quiet. There are free hibernate add-ins that do the same job, but Fujitsu Siemens' utility adds wake-on Lan functionality, which lets any PC bring it out of hibernation using its Scaleo Wake-up utility. But the power management's hibernate calendar isn't intuitive and the software ignores all entries containing times that aren't at five-minute intervals, for example a wake-up call at 14:59 will be disregarded.

Despite this, the Scaleo's functionality is impressive. It has more ports than any other device in this group test and its read and write performance was outstanding, thanks in part to using hard drives with 16MB buffers.



BEST BUY

EDITOR'S CHOICE

Verdict

Pros Valuable add-ins; especially wake-on Lan for hibernate function; excellent write and read performance

Cons Big and ugly chassis; hibernate function setup is awkward

Overall It can be frustrating, but the Scaleo 1900 is a well-balanced home server with great performance and features

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

HP Mediasmart EX475

Price £499 **Contact** HP 0845 270 4142 www.hp.com/uk



HP's Mediasmart EX475 is almost identical to the EX470 we reviewed some months ago (www.pcw.co.uk/2206785), but with a second 500GB hard disk. The benefit of using two disks means that folders can be duplicated across both disks so, if one fails, your data is still safe. The EX475 has a small footprint but retains excellent connectivity and four easily accessed hot-swappable SATA drive caddies.

Its interface is second to none, with a polished

page for its add-ins and some interesting diagnostic feedback, such as system and CPU temperature. HP also provides more Dynamic DNS (DDNS) options and an HP web-server template.

Two valuable add-ins, Photo Webshare and an iTunes server, are built into the interface. Photo Webshare allows users to host photos via the built-in web server, while the iTunes server automatically consolidates all the music in everyone's iTunes folder, but it won't touch DRM-secured tracks bought from the iTunes store.

Power draw is very high compared to the rest of the group and, while read performance was good, the EX475's crumbled in our multiple write and unzip tests.

It only managed 10Mbytes/sec when two computers were trying to write to it, which means it could take hours for the EX475 to back up two computers at once – a feasible scenario in the home. The unzip performance was also poor, leading us to suspect its Sis chipset isn't working too well. It costs a lot and we reckon it will add around £51 per year to your energy bill, more than any other device here.

The Mediasmart EX475 shouldn't be written off, though, since it has a great design and there are dozens of bloggers and forum users modding the Mediasmart to improve its performance and functionality.

Verdict

Pros Tiny size; reasonably attractive; easy hard drive access; polished interface

Cons High power consumption; slow multiple write speeds; poor archive performance

Overall Expensive and poor multitasking performance, but it has a great design

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Tranquil T2-WHS-A3

Price £462.95 **Contact** Tranquil PC 0845 555 7788 www.tranquilpc.co.uk



The T2-WHS-A3 is the only stackable WHS, so it can be placed under other AV devices, as long as there's good ventilation. It's also the only passive WHS, so there are no fans. This means it's near silent (only the hard disk whirs), has lower power consumption and dust is less likely to build up inside the case, improving long-term stability.

The CPU is cooled by copper heatpipes connected to a massive heatsink on the side measuring 32cm

long and 3.9cm thick. Its 1.2GHz Celeron processor and 1GB of Ram (double that of the other systems) handled our unzip test with aplomb. There are only two hard drive caddies (one occupied by a 1TB drive), which aren't easy to access. Three edges of the caddies are encased in another impressive heatsink.

During testing, transferring 1GB files failed around half of the time, accompanied by an error message saying 'The path is too deep'. This is a well documented and unresolved WHS bug and Tranquil recommended using the free utility Teracopy (<http://tinyurl.com/3bnl6t>) instead of Windows Explorer.

Its networking performance was poor because we tested with a Gigabit switch and the T2-WHS-A3 only supports 100Mbps/sec Lan. Our 50GB backup test took more than two hours on the Tranquil, compared with 14 minutes on a Fujitsu Siemens Scaleo 1900. However, if you don't have Gigabit Lan or use a Wifi or Homeplug network, file transfer performance from every home server will be similar.

The T2-WHS-A3 benefits from a VGA output, so you can access the server directly, but there's no eSata. Gigabit Lan costs an extra £14.10, but adding this along with four eSata ports increases the bill by £69.33.

Despite its low power consumption, the Tranquil is poor value compared with the rest here.

Verdict

Pros Stackable; VGA output; passively cooled; excellent energy efficiency; good processing power

Cons No eSata as standard; poor network throughput; WHS bug affects it; poor hard disk access

Overall Plenty of modding potential and a great passive design, but standard features on other WHS cost extra on the Tranquil

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Inside Windows Home Servers

PCW takes a look inside the four products on test to find out what's favourable and what could be improved under those casings



The O.center uses four vertically arranged SATA hard drive caddies for storage, protected by a swing-out door. The caddies are more stubborn to remove and replace than on the Mediasmart, but they are tougher.



The side panel must be removed for access to the Scaleo's hard drives, revealing two large system fans, which are noisy when starting up. There's space for four drives, in paired scaffolding that can be lifted out of the server.



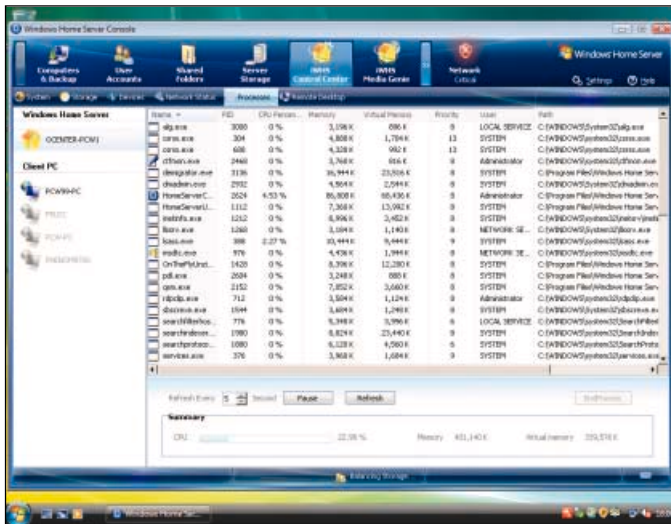
The Mediasmart has four horizontally arranged SATA hard drive caddies for storage, with lights alongside each drive to indicate which caddies are occupied. The caddies are easy to remove and a grilled door allows for excellent ventilation.



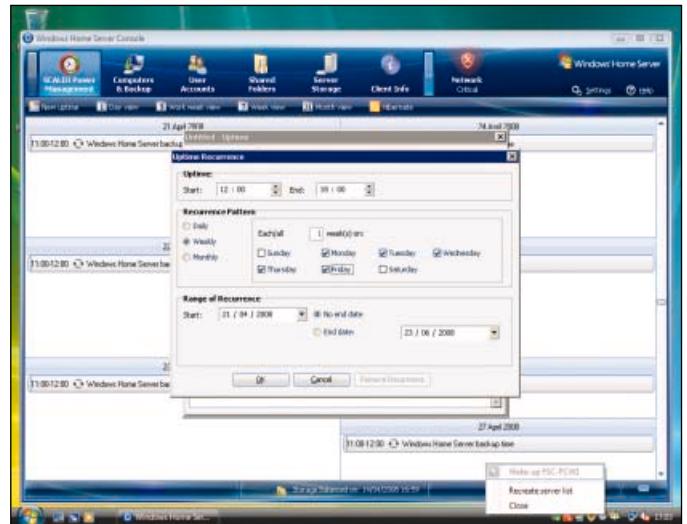
Opening up the T2-WHS-A3 reveals an awesome array of heatsinks and no fans. Three PCI-sized backplates (one was occupied by USB ports on our model) means you can add more connectivity or other hardware.

Taking control

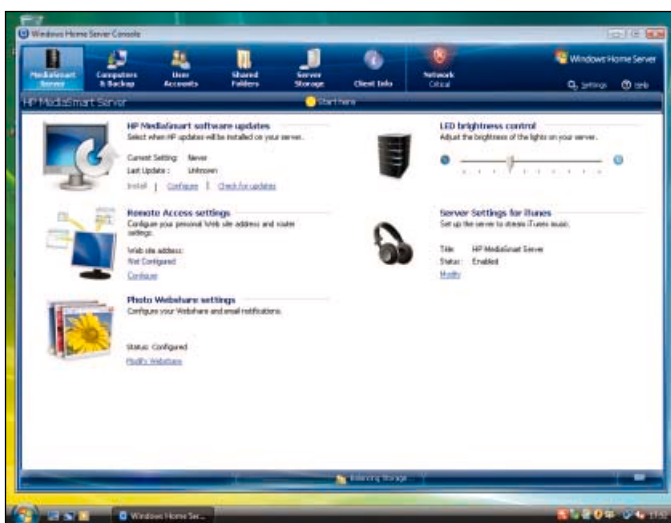
Discover more about each of the product's consoles and find out what these Windows Home Servers have to offer



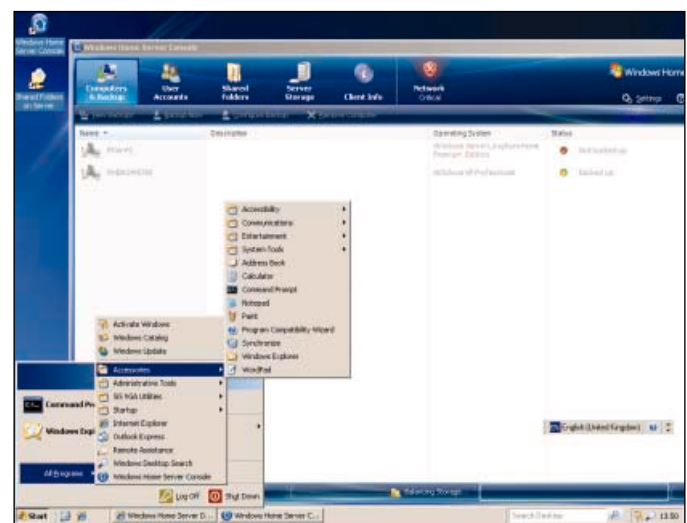
Belinea O.center: Belinea's iWHS Control Center add-in, on display here, shows every process with its CPU and memory usage. It's great for pinpointing bottlenecks and inefficient add-ins. It's also useful if you want to free up some memory. The system tab reveals temperature and fan speed information, although we couldn't get the Remote Desktop section to do anything useful.



Fujitsu Siemens Scaleo 1900: The Scaleo Power Management tab brings up a calendar, which Fujitsu Siemens describes as akin to Microsoft Outlook's calendar. In reality, it is nowhere near as flexible or reliable, but with persistence it can let you put the server to sleep at set times of the day. The Wake-up utility sits in the taskbar of all your home PCs and allows them to bring the Scaleo 1900 out of hibernation remotely.



HP Mediasmart EX475: This tab highlights the best of HP's polished interface. HP's custom photo webshare and iTunes server are easily visible and customised, while the LED brightness control lets you dim the lights on the Mediasmart, a feature lacking on the other three servers. When we checked for updates (using the link in this screenshot) our Mediasmart crashed and we had to do a factory reset to get it working again.



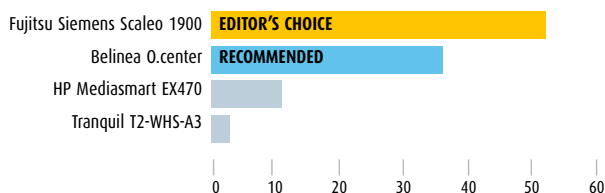
Tranquil T2-WHS-A3: Tranquil's server has no custom add-ins preinstalled. Instead it has a VGA output, which we've used here. By connecting a USB keyboard and mouse it works as a fully functional Windows Server 2003 PC, with reasonable driver support and a wide range of programs available for use. Here, we've taken a screenshot of the Home Server console which has been started on the T2-WHS-A3 directly (not from a different Vista PC, as with all the other screenshots).

Lab results

The Fujitsu Siemens scored highly with its read and write speeds, while the Belinea O.center produced the fastest time to decompress files

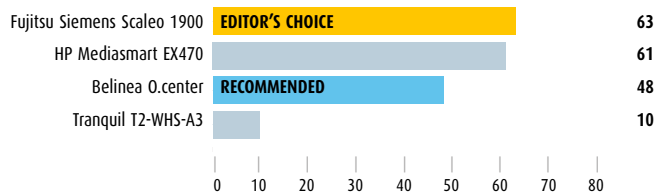
Write speed – two simultaneous users (Mbytes/sec)

Bigger is better



Read speed (Mbytes/sec)

Bigger is better



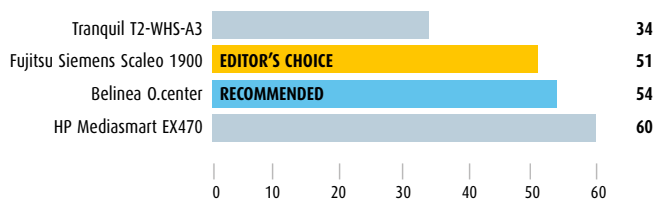
Idle power consumption (watts)

Smaller is better



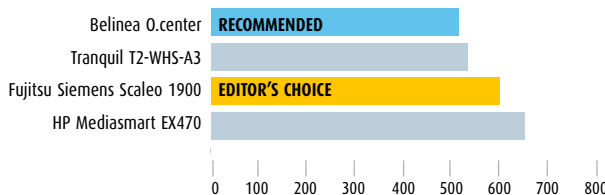
Load power consumption (watts)

Smaller is better



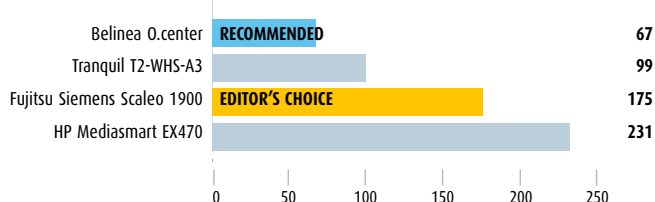
Total cost of ownership for three years (£) (based on idle power consumption and 11p/kWh)

Smaller is better



Time to decompress 217 files (seconds)

Smaller is better



How we tested

All results were repeated twice and an average taken, while erroneous results were retested. Storage balancing was completed and both folder duplication and media services were turned off for all tests. We used an eight-port Sitecom Gigaswitch for testing with a Belkin N1 router to provide IP addresses.

Idle power consumption (watts)

Each WHS was left to idle for 10 minutes before we measured its power draw. Tranquil's low-powered Celeron and fanless design does it wonders. Curiously though, after a day's testing, the power draw fluctuated between 31W and 38W – a trend the others didn't exhibit.

Load power consumption (watts)

As each WHS performed its read speed test, we noted its median power draw. Peak power draw can hit almost 100W for some of these devices, but for day-to-day use they are unlikely to draw more than this figure. The Mediasmart has the worst energy efficiency, although it and the Scaleo 1900 have two hard disks which pushes power draw up a bit. The O.center's energy draw is high considering it uses just one hard disk.

WHS read speed (Mbytes/sec)

Two 1GB files were transferred from the WHS to a PC and the average transfer rate measured – this represents the best case performance of the WHS. Using all Gigabit Lan equipment, we achieved 52.8Mbytes/sec from one high-end PC to another so, as expected, a WHS has lower performance due to its cheaper components. Tranquil is severely affected

by its 100Mbits/sec Ethernet port, while the others perform excellently, outclassing all Nas drives.

WHS write speed – two simultaneous users (MBytes/sec)

Four 1GB files were transferred onto each WHS from two PCs and the average transfer rate measured. This is a much tougher challenge for the WHS compared with the read test as it must negotiate two sets of requests. Fujitsu Siemens' Scaleo speeds ahead here, while Tranquil languishes in last place due to its 100Mbits/sec Ethernet port. HP's Mediasmart's performance weakens considerably when multitasking.

Time to decompress 217 files (seconds)

An assortment of pictures, programs and videos totalling 980MB were decompressed on the server using the On The Fly Unzipper add-in (<http://mswhs.com/2007/06/30/add-in-ontheflyunzipper>). The quicker this process is completed, the more this add-in is optimised for each server's hardware and the faster the server's CPU, Ram, hard disk and chipset are. Despite having a slow CPU, the Tranquil benefits from 1GB of Ram.

Total cost of ownership for three years (based on idle power consumption and 11p/kWh)

Here we've combined the initial buying cost and three years of energy bills. It ignores hibernate and sleep functions. Tranquil's high start-up costs aren't completely offset by its low power usage, but it still gets a good result. The HP's energy efficiency is poor while the O.center remains great value.

Windows Home Servers



MANUFACTURER	BELINEA	FUJITSU SIEMENS	HP	TRANQUIL
Model	O.center	Scaleo 1900	Mediasmart EX475	T2-WHS-A3
Price	£386.58	£469	£499	£462.95
Delivery charge	£5.82	£11.16	£11.74	£14.10
Sales telephone	0870 160 8366	0845 678 0172	0845 270 4142	0845 555 7788
URL	www.serversdirect.com	www.fujitsu-siemens-shop.co.uk	www.hp.com/uk	www.tranquilpc.co.uk
HARDWARE				
Processor	AMD Sempron LE-1100 1.9GHz	Intel Celeron 420 1.6GHz	AMD Sempron 3400 1.8GHz	Intel Celeron 220 1.2GHz
Available Ram	446MB	503MB	479MB	989MB
Hard disk manufacturer and model	Seagate Barracuda 7200.10	2x Seagate Barracuda 7200.10	2x Seagate Barracuda 7200.10	Western Digital Caviar GP WD10EACS
Capacity/Cache buffer per drive/speed	500GB/8MB/7,200rpm	1TB/16MB/7,200rpm	1TB/16MB/7,200rpm	1TB/16MB/7,200rpm
Empty hard disk caddies	3	2	2	1
VGA	ATI Atombios (16MB used Ram)	Intel 82945G (8MB used Ram)	Sis Mirage 761 (32MB used Ram)	Sis Mirage 662 (32MB used Ram)
EXPANSION AND I/O				
No of USB2/eSata ports	4/1	4/2	4/1	4/0
Other ports/slots	x16 PCI Express, PCI	x1 PCI Express	None	PCI, PS/2, parallel, serial, VGA, audio connectors
OTHER INFORMATION				
Networking	1x Gigabit Ethernet	1x Gigabit Ethernet	1x Gigabit Ethernet	1x 100Mbit Ethernet
Dimensions in mm (wxdxh)	165x288x322	117x334x414	139x252x247	387x367x77
Volume (cm ²)	15,301	16,178	8,652	10,936
Weight (kg)	7.05	8.4	5.9	7
Bundled hardware/software	Connector CD, recovery USB stick	Connector CD, recovery CD	Connector CD, recovery CD	Connector CD, recovery CD
Standard warranty (RTB = return to base, C&R = collect and return)	2yrs RTB	1yr C&R	1yr RTB	2yrs RTB
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★	★★★★★

Linux Home Servers

Nas drives might be more aptly named Linux Home Servers, since we're rarely come across one that doesn't use a light Linux installation as its operating system. Next month we'll be looking at the latest Nas drive enclosures, but we've already tested a number of Nas drives available. The fastest in our September 2007 group test, a Qnap Turbo Station 109, could only manage 18.4Mbytes/sec read speed,

slower than every Windows Home Server except the Tranquil server. Power consumption was better though, peaking at 14W on the majority of models.

Most also cost less than £200, and if one hard disk is enough for your backup needs we continue to recommend the £200 Turbo



Station 109. As well as backup, it also acts as a perfectly good FTP server, print server, iTunes server, DHCP server and Bittorrent-downloader.

The Turbo Station 109 is now a little off the pace

Add-ins for Windows Home Servers

A variety of add-ins provide a wide range of extra functionality to your WHS. They are downloaded as single files, with a .msi extension, and to install you must first place the file into the \Software\Add-ins folder. Once the file has copied over, you simply go into the WHS console, select Settings, Add-ins and then Available Add-ins and hit install.

There are plenty of add-ins available, here are some of our favourites:

DHCP for Windows Home Server – <http://tinyurl.com/4zwt58>

This is an add-in that lets your WHS dole out IP address on your network.

Download manager – <http://tinyurl.com/5vjcl8>

uTorrent – <http://mswhs.com/add-in-list>

These two add-ins let you schedule regular web (http) and Bittorrent downloads to make the most of your ISP bandwidth when you're not around.

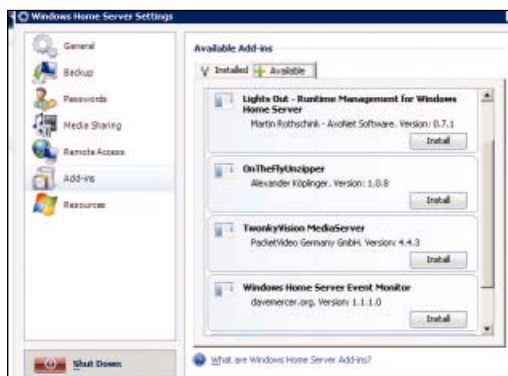
Powerswitch – <http://tinyurl.com/5ajd89>

Lights Out – <http://tinyurl.com/5zxx5z>

Both of these add-ins let you put your Windows Home Server to sleep or into hibernation mode on a scheduled basis.

On The Fly Unzipper – <http://tinyurl.com/5vjcl8>

We used this add-in as one of our benchmarks. It unzips files when they're uploaded to the server – useful when you're remotely uploading files because without this utility you have to upload them individually.



Increase the functionality of WHS with a variety of add-ins

Editor's Choice

Editor's Choice Fujitsu Siemens
Recommended Belinea O.center



Fujitsu Siemens Scaleo 1900



Belinea O.center

Every one of these Windows Home Servers is in a different league to Nas drives where performance, functionality and ease of use is concerned, but there are no guarantees that WHS will become a runaway success. If it is to succeed, some of the many operating system flaws will need to be fixed.

These issues include forced restarts every time you install a single plug-in, WHS refusing to copy files across from USB keys and hard drives before they get formatted, no backing up of Fat 32 PCs and no add-ins preinstalled. Better yet, Microsoft could include an add-in database that could be accessed from the WHS console in a Windows-update manner.

We were also disappointed that neither the manufacturers nor Microsoft provide a download of the connector CD – so, once

you've lost it, you could be in very deep water if you need to access your WHS.

Power Pack 1, a service pack to be released imminently, reportedly fixes a few bugs (but not the corruption bug) and includes support for 64-bit operating systems. This is a step in the right direction but, for now, testing and living with WHS isn't always a happy experience.

We were genuinely surprised when it came to choosing a winner. Having seen how big and ugly Fujitsu Siemens' Scaleo 1900 and Belinea's O.center were at Cebit 2007, we didn't think they'd have a chance. We had already been impressed by HP's Mediasmart server when we reviewed it in January this year but, while it has the best case and most polished interface, performance and power draw is relatively poor compared with the others.

The Scaleo 1900 takes the Editor's Choice crown for its excellent write speeds, which are the most important aspect of performance since WHS are primarily about backing up data. It also has the best preloaded plug-ins and reasonable energy efficiency. Its power draw is particularly impressive considering it uses two hard disks, while the O.center has one.

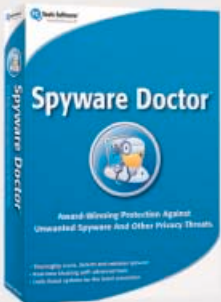
Enabling folder duplication does slow the WHS down a little; our read and write tests on the Scaleo 1900 were six and 30 per cent slower respectively with duplication enabled.

The Tranquil T2-WHS-A3 has even lower power requirements, but since it only uses one hard disk you can't duplicate folders across two hard disks for extra protection, which the Scaleo 1900 can. The T2-WHS-A3's write errors were a cause for concern and Tranquil has told us it has had two reports from customers with an identical problem. The lack of eSata and Gigabit Ethernet as standard is plain annoying though.

If you're interested in building a low-powered WHS for half the price of the designs on test here, we recommend you read our £99 PC feature on page 33, since it uses the same motherboard as the Tranquil WHS – an Intel D201GLY2 design.

Belinea's O.center picks up our Recommended award for being good value for money. It also has the best hard drive access, so if you regularly tinker with numerous disks this is your best bet. The extra USB stick and custom-made add-ins add extra sparkle to a great package. **PCW**

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OPERATING ONLINE

A website has gone from being 'nice to have' to an essential business tool, but getting noticed among all the others is becoming increasingly difficult. In this month's Business section we have a feature on the basics of search engine optimisation, containing a wealth of advice on how to stand out and get 'Googled' ahead of your competition.

We also take a look at a couple of web-based software services. One takes the hassle out of setting up and running an online shop, while the other can deliver customer, product and accounting tools directly to your browser for a monthly fee.

Of course, you'll still need PCs, so we look at what NEC thinks should be on your desktop. Plus we've reviewed a managed wireless networking product from Colubris and a single-port KVM switch from Raritan, designed for small businesses.

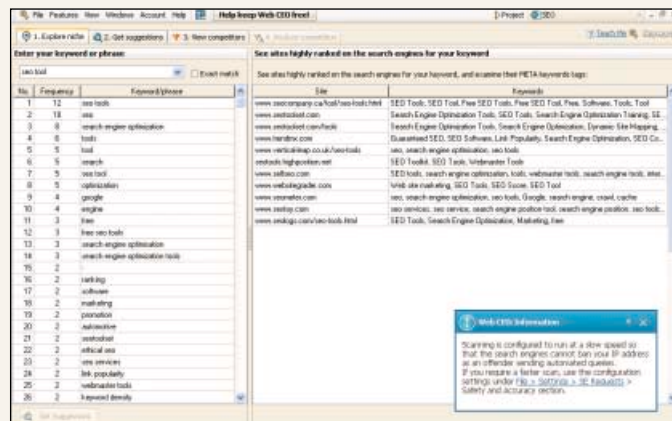
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BUSINESS



OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.

Recommended: A product that combines great features, usability and value for money.

Great Value: Not the best in class, but a product that has superior features and performance for the price.



Editor's Choice
Business



Recommended
Business



Great Value
Business

The business awards are used for products that are more suited to home offices or small businesses.

'Unlike a lot of KVM (keyboard, video and mouse) products, the KX II-101 is a complete solution'

Read the review on page 124

Getting your website noticed

There are ways to make websites more visible to search engines without employing consultants, explains Stephen Copestake



Search engine optimisation, or SEO, is the process of improving websites so that search engines rank them more highly. Sites that appear higher in search engine rankings are far more likely to be seen, and therefore viewed.

Broadly speaking, there are two approaches to SEO: white hat (ethical) and black hat (unethical). Although black hat techniques can work in the short term, in the long term they're self-defeating, as they will probably be detected by search engines, resulting in the site being permanently blacklisted, so they won't be discussed here.

Avoiding black hat techniques is no loss, however, since white hat techniques are plentiful and free. They can appear complex, which tends to drive small companies with no dedicated IT department into employing SEO consultants to do it for them. The problem with this is cost, as many small businesses don't have the budget. But with some time and effort, it's possible to do the job yourself with the help of free software. Here we provide a broad overview of what you need to do.

Keyword optimisation

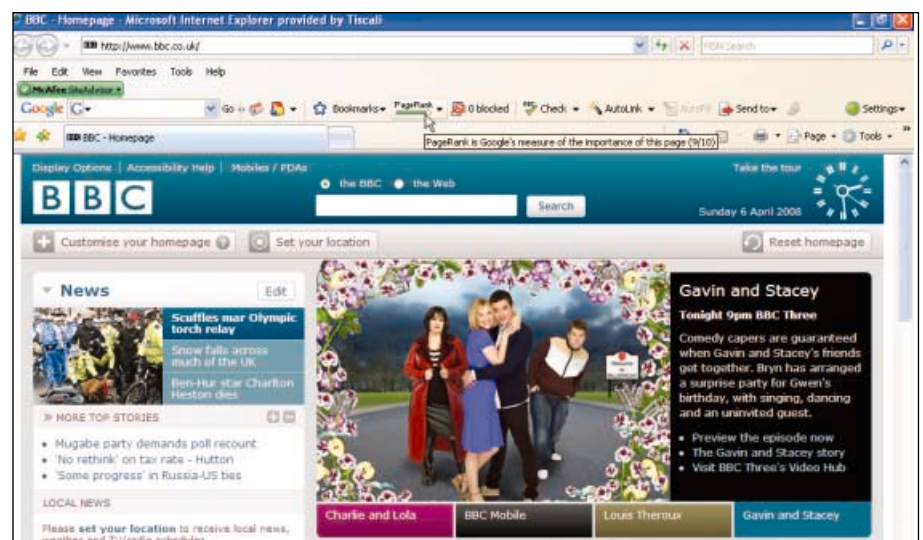
Google is by far the most popular search engine, so it's a good idea, in the early stages at least, to confine your SEO activities to it. Any optimisations you carry out to make your site Google-friendly are also likely to work with other search engines, as they follow broadly similar principles.

Keyword optimisation is the most important aspect of SEO – if this isn't right,

none of the other techniques will work. The main point is that you want to attract relevant traffic, so you need keywords that are specific to the website's theme. Each page should have keywords that are targeted at its content. They should also be multiple, rather than single. For example, 'SEO book' and 'SEO books' would be far more useful than just 'book' and 'books'.

You should also use variants and abbreviations. For instance, in a site devoted to SEO, it would be better to use 'search engine optimisation', 'search engine optimization' and 'SEO'. The reason is that search engines such as Google examine

You can identify high-scoring websites with Google Toolbar's Pagerank feature



words on your site and determine whether they are semantically related; if they are, the site ranks higher. There's no point in using what search engines call 'stop' words – a, the, and, in, on, of, be, I and me – because they will simply be ignored.

The first step is to compile a brief list of likely looking keywords. Some will be obvious (a publisher selling books on SEO would consider 'SEO books'), while others will be found via research. While it isn't a good idea to blindly copy keywords (they may be unsuitable), it is advisable to use the View/Source (or equivalent) option in your browser to inspect the code of leading online competitors. You can then decide whether to use the keywords by testing them in a keyword tool – a good one is www.vretoolbar.com/keywords. Enter the keyword you want to test, select an area and click 'Suggest'. After a pause, you'll see estimates of how many times that keyword was used in the past month or so. It's sometimes a good idea to select keywords with the least traffic, so you'll be competing with fewer sites to top the search engine tables.

Once you've decided which keywords should give the best results, use your web design software to label them as meta

tags for your site. Alternatively, add meta tags to your pages by editing the HTML using a text editor – there are plenty of online tutorials available, such as <http://tinyurl.com/3xhs87>.

Site issues and relevance

Originally, search engines ranked sites in terms of keywords; sites with more instances of a keyword ranked higher than those with fewer. To remove the abuses this led to, less subjective site factors were registered to determine a site's overall relevance – the more your site has, the higher it ranks.

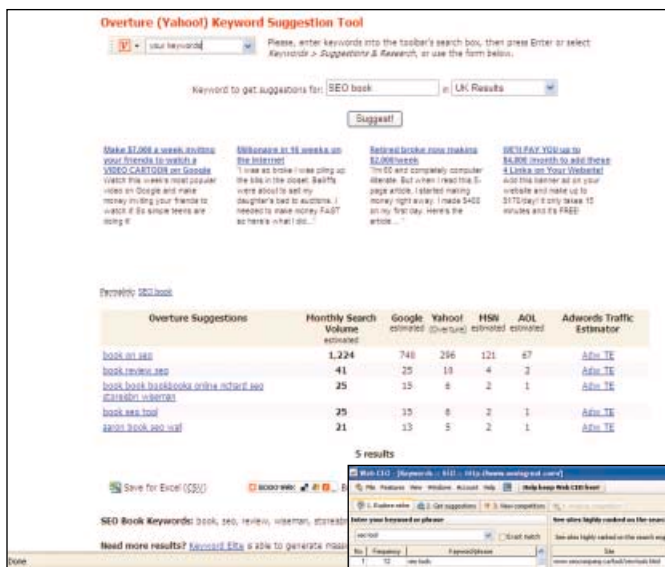
The principal changes are as follows. Domain names should be relevant so that search engines can determine how appropriate your site is to your subject. Page and file names should be relevant, too; whatever keywords are appropriate for a given page should be used in its page and file names. Images should be described by Alt tags in the HTML code. Aside from facilitating accessibility, Alt text is read by search engines to evaluate what the image is about, which contributes to website relevance.

Judicious use of header tags on your pages – to add structure and outline the main section headings – can also help, as Google uses these to assess relevance. Internal links within your site should not have the same anchor text; vary this as much as possible to increase relevance. Make the hyperlinked text relevant to what it's linking to. For example, instead of hyperlinking the text 'click here', use the appropriate keywords, such as 'contact us'.

The most crucial change that search engines underwent was a strong reliance on how other people view your site. In other words, most search engines assess which sites link to yours, then make a judgement about how relevant and significant they are. They use highly complex algorithms to assess inward links, so you need links from sites that are well known, contain few links and use themes that are similar to yours. As your site develops and more search engines find it, desirable sites should link to yours. In the interim, be proactive and find them yourself.

A quick way to decide whether a site is worth being linked to is to use the Pagerank feature in the free Google Toolbar. Download this from <http://toolbar.google.com>, install the Toolbar, go to the site you want to assess and view its Pagerank rating. If the Pagerank gauge is close to full, it's desirable. Some sites have forms you can complete to request a link. With others, send the site owner a brief email stating what parts of the site you like and explaining why you'd like to link with it.

Whenever possible, link with directories. A quick internet search will reveal thousands, some free and others pay-for-use. The site <http://info.vilesilencer.com> also has a database of industry-specific directories (visit



Left: Use a keyword suggestion tool to locate popular keywords

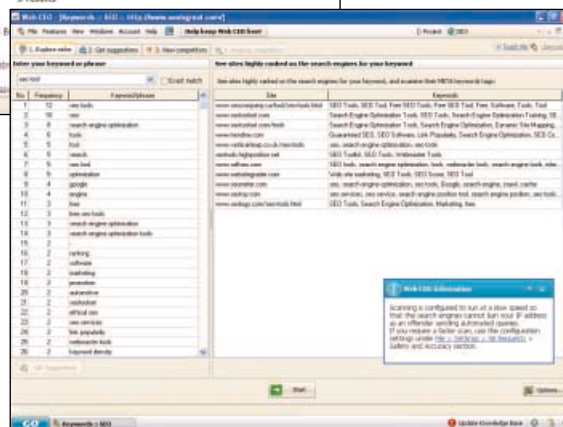
Bottom: Another high-quality site analysis and optimisation tool is Web CEO Free (www.webceo.com)

<http://tinyurl.com/yu3nt9> to download the file directly).

Google Analytics

Once your site has been optimised for search engine relevance, you'll need to monitor its performance and target areas that need improvement. Apart from supplying arguably the best search engine, Google also provides probably the best free site analysis tool – Google Analytics, which generates more than 80 reports providing detailed information about, among other things, the number and duration of hits your site receives. It can also tell you which search engines visit it, which pages are the most popular, which adverts are the most successful and what browser and operating system visitors are using. You can also specify your own goals and filters.

If you already have a Google Account, you can use this to sign up for Analytics on www.google.com/analytics. If not, click the 'Sign



Up Now' link on the same page and follow the instructions to acquire one. When you've verified your new account, head back to the Google Analytics page. Signing up involves entering your site's URL, assigning an account name and entering contact information. You'll also be instructed to embed a Javascript tracking code snippet into all the pages you want to track. When you've finished the setup process, Analytics will begin to track your site and you'll be able to gather, view and analyse data about your website traffic. **PCW**

Create a successful sitemap

Creating a sitemap is an advanced technique that will prompt Google to crawl your site sooner and more effectively, especially after you've made changes. It's a highly useful tool for monitoring site and keyword performance. And the good news is that you can use a free web service to create a basic sitemap.

If you don't have a Google account, go to <https://google.com/accounts> and set one up. Now log on to www.sitemapspal.com and enter your domain name. Click 'Submit'. In the field below, you'll see some code. Copy this into Notepad and save the file as sitemap.xml. Upload this file into your

website's root folder. The next stage is to tell Google your sitemap is there. Go to <http://tinyurl.com/4lwv7y> and sign in to your account. On the next screen, enter your domain name and click 'Add Site'.

You should now see confirmation your site has been added. On the left, click 'Sitemaps' and then 'Add a Sitemap' on the right. Select a type (usually 'General Web Sitemap'), enter your sitemap's URL and click 'Add General Web Sitemap'. Google should confirm it has registered your sitemap and should crawl it within a few hours. For more on sitemaps, see Hands On Web Development, December 2007.



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DESKTOP PC

NEC Powermate ML470

Well-built with a choice of dual- and quad-core processors



The Powermate ML470 is available with Intel dual- or quad-core processors in a choice of three chassis styles

Specialist business desktops and their vendors are few and far between these days. Of course, HP and Dell spring to mind but there are others, such as NEC, which offers a range of desktop PCs in its Powermate line-up designed specifically with the small- to medium-sized business in mind.

We looked at the latest member of that family, the Powermate ML470, which focuses on performance and manageability and comes in three configurations, starting with a tiny small form factor (SFF) chassis for where desktop space is at a premium.

We reviewed the more roomy standard desktop, while an under-the-desk micro tower is also available. All come in sturdy, well-designed metal cases. Everything inside is easily accessible and there is no need to use tools to swap or add an extra drive or fit an adapter, for example.

A neat BTX motherboard is at the heart of the system and this has support for Intel's vPro technology. With the right tools, that means you can turn the PC on and off remotely and perform inventory and other remote management tasks even when it has been switched off. The motherboard has also been designed to minimise power and cooling requirements and the model we tested was very quiet in operation.

Performance is largely down to the processor specified and support for Intel's new 45nm dual-core processors is another key feature. The review system came with a 3GHz Core 2 Duo E8400, which gave it plenty of get up and go, but the ML470 can be purchased with slower dual- and single-core processors, or an even faster quad-core chip. Maximum memory is 8GB (4GB on the SFF model)

with 2GB supplied as standard and, on all but the smallest chassis, two Dimm slots free for expansion.

An integrated Intel Graphics Media Accelerator 3100 looks after the video interface, using up to 256MB of shared memory. It's not the greatest of video controllers and a DVI interface is an optional extra, but it's more than adequate for most business applications. That said, if you want to support more than one monitor, or run more graphically demanding applications, an add-in card will be needed, with NEC offering a choice of Nvidia adapters to meet those requirements. No monitor is included in the price.

In terms of storage, a SATA (serial ATA) hard disk is included, ours shipping with a 250GB 7,200rpm Seagate Barracuda, the fastest and biggest drive currently offered on this model. A DVD/CD writer is attached to a second SATA interface, with two other SATA connectors if needed, plus integrated Raid 0/1 support. However, you'll have to specify the micro tower chassis to accommodate more than one hard disk.

Two PCI and a couple of PCI Express expansion slots are provided, together with an integrated Gigabit Ethernet interface and eight USB2 ports – two at the front and six at the rear. The keyboard and mouse, though, come with standard PS/2 connectors.

A competent and well-made desktop, the ML470 compares well with better-known alternatives with its choice of Windows XP and Vista pre-loads (not included in the price) and a variety of installation and data transfer services available. Platform stability is guaranteed for a minimum of 15 months and business buyers get a three-year, on-site (next day) warranty with other terms available.

Alan Stevens

Verdict

Pros Choice of chassis; dual- and quad-core processors; Intel vPro management; quiet running

Cons Plug-in video controller may be required for more demanding users; monitor costs extra

Overall It won't set hearts aflutter, but the Powermate ML470 is a well-built, capable business desktop

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £462.95
(£394 ex Vat)

Contact NEC 0844 894 0165

www.nec-computers.co.uk

Specifications Intel Core 2 Duo E8400 processor • 2GB DDR2-667 memory • Four SATA connectors • 250GB 7,200rpm SATA hard disk • Integrated Raid 0/1 • SATA DVD/CD writer • Integrated Gigabit Ethernet interface • Two PCI and two PCI Express expansion slots • Eight USB2 ports

WIRELESS NETWORKING

Colubris Wireless MSC

Manage wireless access points with this scalable device



The MSC-5100 can be used to centrally manage and secure wireless users connecting via up to 10 access points

Cheap wireless access points may be an acceptable way of supporting Wifi users on a small network, but it's a far from scalable approach. As numbers grow you're likely to encounter performance and roaming issues, and you'll end up having to manage lots of individual access points. All of that can be avoided by using the Colubris wireless Multiservice Controller (MSC) which, together with associated Multiservice Access Points (Maps), offers seamless Wifi access and central policy-based control of all your Wifi access and security settings.

Colubris wireless controllers are available to handle hundreds of access points and thousands of users. For our tests, however, we chose the entry-level MSC-5100, designed expressly for small businesses with up to 100 users spread over 10 access points. Likewise there are several different Map products to choose from; Colubris sent us a couple of basic MAP-320 units with 802.11a/b/g wireless capabilities.

The MSC-5100 is easy to install. It comes in a small, rugged metal box with power supplied either by an external adapter or via Power over Ethernet (PoE). A console port is provided for local management, with a pair of Gigabit Ethernet interfaces alongside for Lan and internet connectivity. The MAP-320 is similarly rugged and can be wall or ceiling mounted. It can also use PoE with two ports for network attachment.

A web-based interface is used to configure and manage everything, with the access points discovered automatically and a default policy, referred to as a VSC (Virtual Service Community), configured ready to use. You can either modify the default settings and/or create VSCs of your own, each specifying the rules to be applied when authenticating users, encrypting

wireless sessions, determining Quality of Service (QoS) requirements and so on.

For example, you might have one VSC for guest users, restricting them to web browsing, and another for authenticated Lan users, enabling them to connect to file and print servers. VLAN mapping is available for secure transport of guest traffic over the Lan, with an internal Radius server for authentication plus support for external Radius and Active Directory services.

Once users have been authenticated the MSC hands all the required processing to the access points which, unlike with other solutions, are fully featured products that can be deployed independently if needed. The impact on Lan bandwidth is therefore much lower, while security is taken care of by encrypted management tunnels between the MSC and the access points it controls.

The Colubris hardware can also be used to implement self-contained wireless hotspots and to link wireless users in places where cabled connectivity isn't available. Remote links can be simply bridged or mesh networks can be configured, with lots of accompanying deployment guides to cover these and other applications, plus lots of additional documentation.

Initial setup is pretty easy and we had few problems using the Colubris hardware to add wireless networking to our test network to control wireless access by user type. However, as you delve deeper it's easy to get overwhelmed by the vast array of options provided, with very little in the way of wizards or other aids to help simplify the tasks involved. Indeed, to take full advantage of what's on offer most small businesses will need to buy from a specialist reseller, able to advise and configure the hardware for them. *Alan Stevens*

Verdict

Pros Central management of Wifi access points; seamless roaming; policy-driven access and security controls; choice of access points

Cons Can be complex to deploy, with few wizards or other configuration aids

Overall If you want to keep control of your wireless users, this product is hard to beat

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price MSC-5100 £540.50 (£460 ex Vat)

MAP-320 £297.28 (£253 ex Vat)

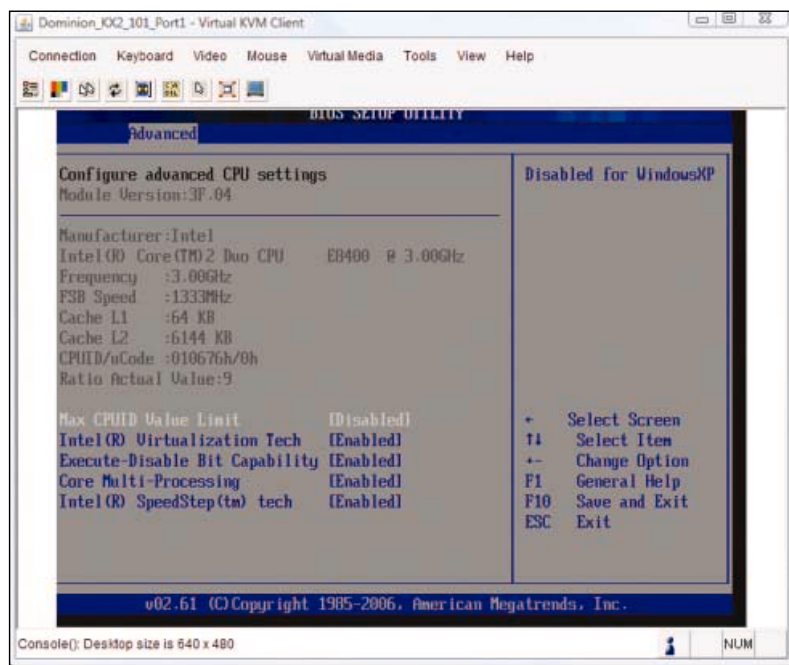
Contact Colubris Networks
01932 796 040 www.colubris.com

Specifications MSC-5100 – manage up to 10 wireless access points • Dual Gigabit Ethernet ports • 802.3af PoE integrated stateful inspection and Nat firewalls • Per-user and per-device security and access controls • Radius, Active Directory and HTML user authentication

KVM OVER IP

Raritan Dominion KX II-101

Take full control of remote servers with this tiny device



The Dominion KX II-101 (above) is a complete, single-port, KVM over IP solution for remote server management

Left: Because it's hardware-based, the Dominion KX II-101 provides remote access right down to the Bios level

Managing servers in remote branch offices can be a pain. Sure, you can use Windows Remote Desktop or VNC rather than go there in person, but that only works if the operating system is up and running.

If remote management is part of your job, the Dominion KX II-101 from Raritan may be of interest – it's an affordable KVM (keyboard, video and mouse) over IP solution designed to let you manage remote servers right down to the Bios level.

Unlike a lot of KVM products, the Dominion KX II-101 is a complete solution, with all the cables you'll need included in the box and nothing extra to buy. It's also a single-port device that's designed to manage just one remote server, which helps to keep costs down.

The simple installation process is another benefit and the device is so tiny it needs no rack space, although a mounting bracket is included, if required. A flying lead is used to attach it to the host server, with a standard 15-pin connector for the video interface plus PS/2 keyboard and mouse jacks. A DVI connector isn't available, but few servers have this kind of digital video interface anyway, so it's unlikely to be an issue.

For servers without PS/2 ports for the mouse and keyboard, there's a USB connector and lead, which also needs to be connected if you want to use the virtual media facility now available on this device. A cable to allow a local console to be attached is another standard option.

A UTP Ethernet port connects the KX II-101 to the local network and there's support for 802.3af Power over Ethernet (PoE), enabling it to pick up its

power this way, where available. Alternatively, a small AC adapter is provided to make it all work.

It doesn't matter what operating system is installed on the server and very few changes are likely to be required to its setup. You do, however, need to make sure the video settings match one of the supported modes, but most common settings are on the list, the highest being 1,600x1,200 pixels at 60Hz.

In some cases you might also need to tweak the mouse settings to make the pointer more responsive, but we attached the KX II-101 to an existing Windows server and were very happy with the results. It also delivered acceptable performance both over the Lan and from a PC in another location, connected via broadband and a secure VPN tunnel.

We were also impressed by the virtual media option added in this, the second generation of the product, whereby storage on the local PC can be accessed as though directly connected to the remote server. We tried this with a USB memory stick and an ISO CD-Rom image to remotely install applications from the local media, after which we were able to reboot the server to make them work.

The device itself can be configured via a web browser and there are lots of security options available, including user authentication against Active Directory, Ldap or Radius servers, plus encryption of both KVM and virtual sessions using 256-bit AES.

A standalone management tool is another option. It can also be integrated into larger Raritan KVM setups and a two-year warranty is included. The documentation could be made easier to follow, but it's all there and for anyone looking to manage remote servers, the KX II-101 has a lot to offer. *Alan Stevens*

Verdict

Pros Small form factor; user authentication and 256-bit encryption; USB support; virtual media; good mouse synchronisation
Cons Expensive alternative where remote control software gives acceptable results; no DVI connector

Overall A great solution for situations where remote control software isn't good enough

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★
Overall ★★★★★

Price £445.33 (£379 ex Vat)

Contact Raritan 020 7090 1390
www.raritan.com

Specifications 15-pin DIN video connector • PS/2 keyboard/mouse connectors • USB port and lead • 10/100Mbps/sec UTP Ethernet port • 802.3af PoE compatible • External AC adapter • Maximum video resolution 1600x1200 pixels at 60Hz • Local console port

The N3200 is the Ultimate Media Storage System for Home and Business



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- **Huge capacity** in a small box, making it the perfect accessory for people with a digital lifestyle.
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- More than just data archive, by simply plugging in a webcam the N3200 becomes a **web surveillance server!**

N3200

- Capacity: Bare Box, 750GB, 1.5TB, 2.25TB, 3TB and rising
- RAID 0, 1, 5 or JBOD capabilities
- Dual Gigabit
- Hot Swappable



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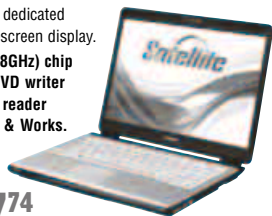
TOSHIBA A210-11P DUAL CORE

Toshiba notebook with ATI 256MB dedicated graphics and a 15.4" TruBrite widescreen display.

- AMD Athlon 64 X2 TL-56 (2x 1.8GHz) chip
- 2GB RAM, 200GB, dual layer DVD writer
- WiFi, webcam, Bluetooth, card reader
- Windows Vista Home Premium & Works.

Stock status: Factory rework stock
 Warranty: 1 year warranty

£329⁹⁹ ex VAT **£387⁷⁴** inc VAT



TOMTOM ONE V2 EURO

One of the most compact easy to use sat nav units currently available.

- 3.5" touchscreen, European maps
- Choice of 2D & 3D map views
- Postcode nav, Bluetooth, SD slot
- Car kit, charger and cradle inc.

Stock status: Factory rework stock
 Warranty: 6 month warranty

£89⁹⁹ ex VAT **£105⁷⁴** inc VAT



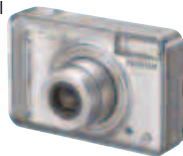
FUJI FINEPIX A800

Easy to use high resolution 8.3 megapixel digital camera with dual xD/SD card slot.

- Large 2.5" LCD colour display
- 14 scene modes - 4 scene assist
- Intelligent flash mode technology
- Anti-blur, movie mode with sound

Stock status: Factory rework stock
 Warranty: 6 month warranty

£49⁹⁹ ex VAT **£58⁷⁴** inc VAT



FUJI

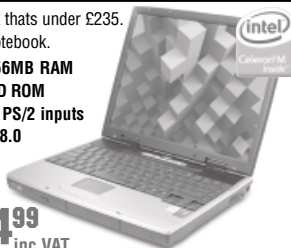
UK PRICE LOW 14.1" NOTEBOOK

An ECS Intel Celeron M notebook that's under £235. That's right a brand new 14.1" notebook.

- Intel Celeron M processor, 256MB RAM
- 40GB hard disk and CDRW/DVD ROM
- USB, Serial, Parallel, VGA & PS/2 inputs
- Windows XP Home & Works 8.0

Stock status: Brand new stock
 Warranty: 1 year warranty

£199⁹⁹ ex VAT **£234⁹⁹** inc VAT



HP PHOTOSMART M525

- 6.0 megapixel camera, 3x optical zoom
- 1.7" display, easy to use menu, auto flash
- 7 shooting modes, movie mode with sound

Brand new stock, 1 year warranty

£42⁵⁴ ex VAT **£49⁹⁸** inc VAT



LEXMARK X1420 WIRELESS PRINTER

- WiFi or USB 2.0 connection to your computer
- 12 pages per min mono, 5 pages per min colour
- 6 colour printing, up to 4800 dpi res

Brand new stock, 1 year warranty

£34⁹⁹ ex VAT **£41¹¹** inc VAT



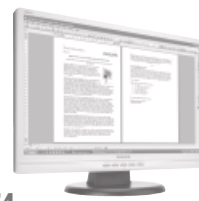
PHILIPS 19" WIDESCREEN

High resolution 19" widescreen monitor with a large viewing area.

- 1440 x 900 pixel WXGA+ res
- 5ms response, 850:1 contrast
- Brightness & contrast controls
- Auto adjustment, VGA cable

Stock status: Factory rework stock
 Warranty: 6 month warranty

£89⁹⁹ ex VAT **£105⁷⁴** inc VAT



HP PAVILION G3100 DUAL CORE

HP Renew stock - boxed like new with a full warranty, all the quality you would expect from a new PC.

- Intel Pentium D 925 (2x 3.0GHz) processor
- 1GB RAM, 160GB hard disk, dual layer DVD drive
- Intel GMA 950 251MB graphics, card reader
- Windows Vista Home Premium & Works

Stock status: HP renew stock
 Warranty: 1 year warranty

£169⁹⁹ ex VAT **£199⁷⁴** inc VAT



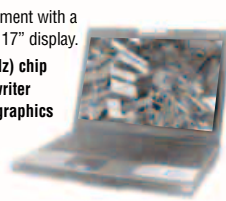
ACER 7003 17" WEBCAM

Ideal desktop computer replacement with a superb CrystalBrite widescreen 17" display.

- AMD Sempron 3400+ (1.8GHz) chip
- 1GB RAM, 120GB HD, DVD writer
- nVidia 6100 128MB shared graphics
- Windows XP Media Center

Stock status: Rework stock
 Warranty: 6 month warranty

£254⁴⁷ ex VAT **£299⁰⁰** inc VAT



ONETEL DECT ANSWERPHONE

- Single cordless handset with blue backlit display
- 100 name/number phonebook, handsfree calling
- 80 minute digital answerphone, 9 ringtones

Brand new stock, 1 year warranty

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ACER ASPIRE 3662 XP MCE

- Celeron M 420, 1GB RAM, 80GB hard disk
- DVD writer, 15.4" CrystalBrite display
- ATI 256MB graphics, WiFi, XP Media Center

Factory rework stock, 6 month warranty

£212⁷⁴ ex VAT **£249⁹⁹** inc VAT



GATEWAY CORE 2 DUO NOTEBOOK

Enjoy mobile entertainment more with this powerful 17" Ultrabright widescreen 1440 x 900 display.

- Intel Core 2 Duo T5300 (2x 1.73GHz),
- 2GB RAM, 120GB HD, DVD writer, WiFi, LAN
- Intel GMA 950 251MB graphics, card reader
- High def stereo sound, Vista Home Premium

Stock status: Brand new stock
 Warranty: 1 year warranty

£349⁹⁹ ex VAT **£411²⁴** inc VAT

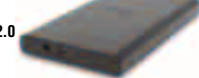


LACIE MOBILE 2.5" 250GB HARD DISK

- Weighs just 230g, bus powered - no AC adaptor, PC or Mac compatible
- Ultra portable, high speed USB 2.0

Brand new stock, 2 year warranty

£59⁹⁹ ex VAT **£70⁴⁹** inc VAT



PURE DIGITAL ONE - BLACK

- DAB radio with FM mode for hiss free sound
- Tune by station name, scrolling info display
- Clock, alarm & kitchen/sleep timers

Factory rework stock, 1 year warranty

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HP M9070 QUAD CORE DESKTOP

High spec super powerful HP desktop that is packed full of features - watch TV with the built-in DVB tuner.

- Intel Core 2 Quad Q6600 (4x 2.66GHz)
- 3GB RAM, 500GB HD & 320GB media drive
- DVD writer, nVidia 8500GT graphics, WiFi
- Windows Vista Home Premium & Works

Stock status: HP renew stock
 Warranty: 1 year warranty

£499⁹⁹ ex VAT **£587⁴⁹** inc VAT



HP SLIMLINE S3230

Not much desk space, no room for a tower PC? HP slimline with wireless keyboard and mouse.

- AMD Athlon 4400+ (2x 2.3GHz) chip
- 2GB RAM, 320GB HD, DVD writer
- ATI HD2350 831MB graphics, card reader
- Windows Vista Home Premium & Works

Stock status: HP Renew stock
 Warranty: 1 year warranty

£249⁹⁹ ex VAT **£293⁷⁴** inc VAT



TOSHIBA L40-14N

Toshiba 15.4" notebook for under £300, with a Pentium Dual Core Processor.

- Intel Pentium T2310 (2x 1.46GHz)
- 1GB RAM, 120GB HD, DVD writer
- 15.4" display, Intel 358MB graphics
- Vista Home Premium & Works

Stock status: Factory rework stock
 Warranty: 1 year warranty

£249⁹⁹ ex VAT **£293⁷⁴** inc VAT



CREATIVE STONE PLUS - 2GB MP3

- Tiny MP3 player stores up to 1000 songs
- FM radio, microphone, clock, stopwatch
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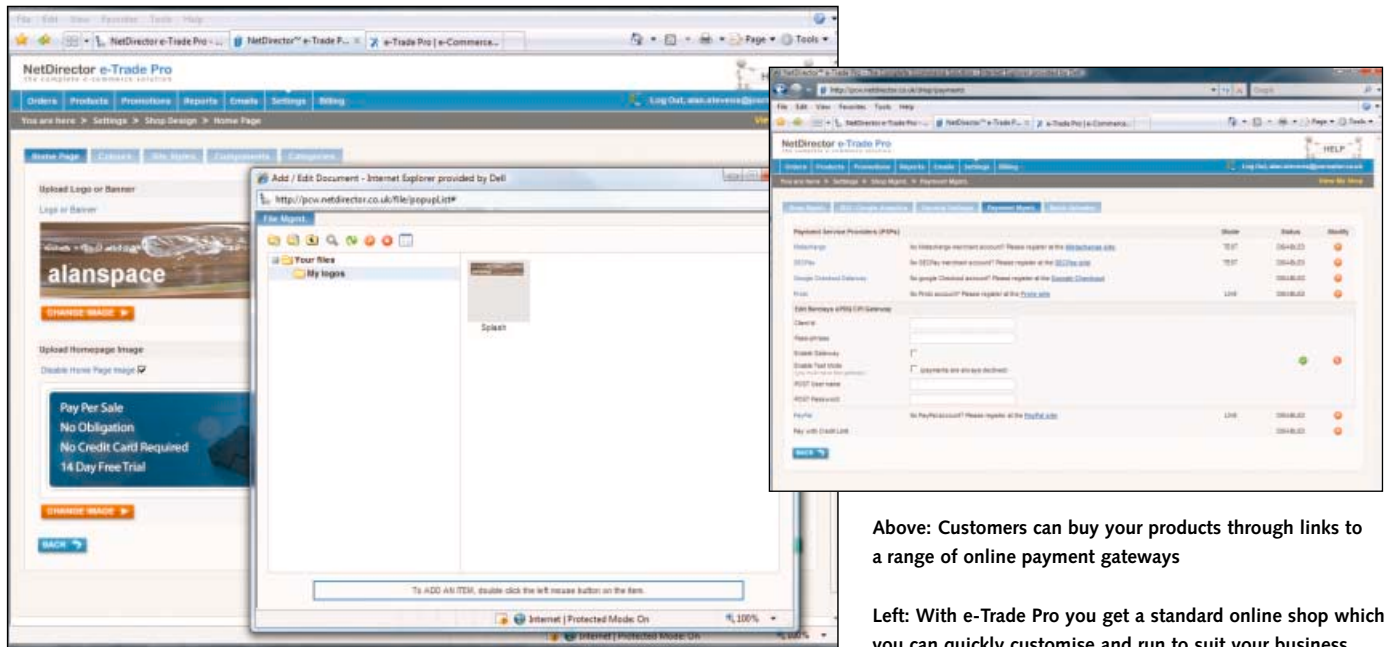


Stock & prices subject to change. E&OE

ECOMMERCE

Netdirector e-Trade Pro

Start selling online with this pay-as-you-go service



Above: Customers can buy your products through links to a range of online payment gateways

Left: With e-Trade Pro you get a standard online shop which you can quickly customise and run to suit your business

If you want to sell goods or services on the web you have a number of options open to you. One is to pay someone to design and build an online shop for you, and another is to create your own, either from scratch or using one of the specialist tools available for the purpose. With Netdirector e-Trade Pro, however, you can do it all online, the fixed monthly fee giving you access to the tools needed to both build and manage your shop, with hosting also included in the deal.

Having signed up for the e-Trade Pro service and supplied basic company details, it takes just less than a minute before you're presented with a vanilla-flavoured shop built to a standard design. This can then be customised to suit your business with options, for example, to display your own logos and banners, change the colour scheme, alter the way menus are displayed and so on.

Unfortunately, the basic layout is more or less fixed, so if you check out the various reference sites they all look pretty similar. Still, a custom design service is available if you want, and there's nothing wrong with the basic template, which does enable you to get up and running quickly.

The next step will normally be to enter details of your products and services. There are no database import facilities or dynamic links, but as well as manually adding products, they can be bulk-imported in .csv format, and there's a template to help with this process. Products can then be categorised, images added, prices and delivery terms set and so on.

There are no limits on the number of products you can list, and a number of promotional tools are also available, including the ability to direct

customers to related items, highlight featured products and accept offer codes.

A whole clutch of payment gateways can be used to enable customers to send you money, including Barclays ePDQ CPI, Google Checkout, Protix and Paypal, with the usual online basket and checkout procedures built into the shop as standard.

We signed up for the free trial of e-Trade Pro, which gives 14-day access to the full package, and found it very easy to use. Building a shop for real is likely to take several days but there's nothing difficult about it – all that's required is a little time and determination. Tracking and processing orders is easy too, with a management dashboard to see what's been happening and mail alerts when orders are taken. Order processing is then largely down to you, but stock-level management can be automated and Sage integration added as a chargeable extra.

Other useful options include the ability to display adverts and to capture customer details and use them for marketing mail shots and newsletters.

In terms of performance, the reference sites we looked at all worked well and we were impressed with the response of both these and our trial shop. On the downside you are reliant on a single service provider for all your trading requirements, and transferring your website elsewhere could be a problem. There were also a few gaps in the documentation that could do with filling.

Other than that, we found Netdirector e-Trade Pro to be an effective tool for small companies looking to get up and selling on the web. Alternatives may have more to offer, but it's quick and it works, and that's what matters.

Alan Stevens

Verdict

Pros No special software needed; managed from a browser; support for multiple payment gateways; hosting included; add-on services

Cons Fixed shop design; limited import/export formats; total reliance on single service provider

Overall A quick and surprisingly effective way of setting up shop on the web

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £116.33 (£99 ex Vat) per month

Contact G-Forces Web Management
0845 055 9040

www.netdirectoretrade.co.uk
System requirements PC with web browser and internet access

TOPFIELD

- HDMI output with upscaling capability
- 500GB hard disc drive (up to 250 hours recording)
- Dual recording and playback simultaneously
- HDMI output (720p/1080i)
- USB 2.0 supported
- MP3 decoding
- 2 tuners



TF5810PVRt

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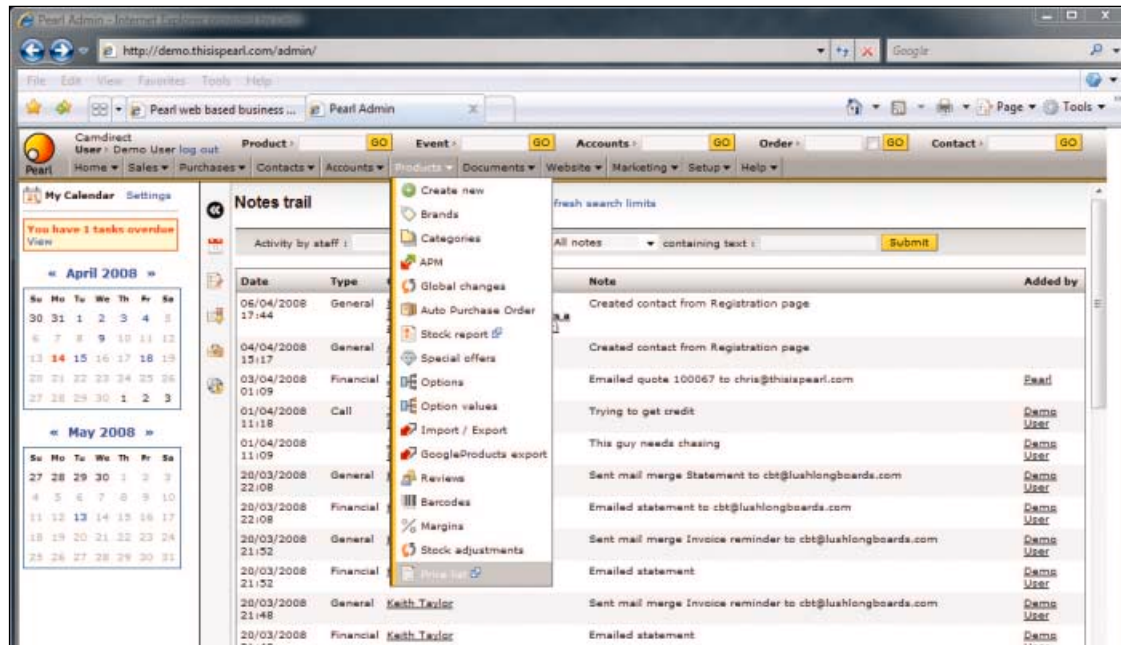
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BUSINESS MANAGEMENT

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Manage your business from a browser with these integrated online tools



Pearl provides an integrated set of business management tools in your browser

Not to be confused with the programming language, Pearl with an 'a' is an integrated suite of business management tools delivered as a web-based service. As such, the software involved is managed and maintained for you, and run on servers hosted by Rackspace UK. All you need is a browser.

What you can do with the software depends on the licence involved. A basic Pearl Office licence delivers a set of contact/customer management tools (effectively an online CRM system) plus others to manage the products your company needs to market and sell. By using these, it's possible to log phone calls, emails and other contact/customer activity, as well as generate quotes, invoices and purchase orders, run your own email marketing campaigns and so on. Up to 75,000 contacts and 20,000 products can be managed, with everything held in your own secure database, a copy of which can be downloaded for safekeeping.

Up to five users can access the Pearl Office software at the same time, with no user limits if you upgrade to Pearl Office Pro (£99/month ex Vat). The Pro version adds extra functionality, including enabling files to be attached to contact and product records, and invoices to be generated from call logs. It also adds support for public calendars, multiple departments and timesheet recording.

An accounting module is another optional add-on (£15/month ex Vat) that provides a fully integrated set of sales, purchase and nominal ledgers, along with stock control, bank account and Vat management. It's also possible to design and run an ecommerce website using Pearl (from £50/month ex Vat), with customisable templates and an integrated content

management system together with the usual online shopping cart facilities and payment gateway support.

Evaluating and testing this kind of integrated service is time-consuming and, if you're interested, the company is happy to set you up with a dedicated trial of your own. For our purposes, Pearl gave us access to its permanently available demo system, which gave us a good idea of what you can expect. The interface has the usual web idiosyncrasies (lots of pop-up windows and no right mouse button menus), but it doesn't take long to master and we found most of the tools easy to understand. That said, there's a lot to get to grips with and training is recommended.

On the plus side, the tools required to run a small business are available and written to work together, integration being one of the key selling points. Response times were good and Rackspace has a proven availability record, but we'd recommend talking to the developers about your requirements and searching for references before signing up.

There are a few other caveats, too, most notably the lack of integration with other applications, such as Outlook, Word and Excel, although you can import and export contacts and other data. A payroll facility is also missing, but there is an Epos module (£15/month) for retail businesses and a Pearlmil module (£5 per user/month), which, as well as an integrated email client, allows you to track email conversations.

A backup ISP service will be required – start using Pearl to run your business and any loss of connectivity would be disastrous. This aside, it's worth investigating further, especially if you work in a growing business, have limited time or IT expertise and simply want to get on with the job. *Alan Stevens*

Verdict

Pros Available tools all designed to work together; licence covers multiple users; integrated accounts module; hosted and managed service

Cons Limited integration beyond the tools provided; reliance on internet connection; single supplier

Overall An interesting and workable alternative to buying and running your own business management software

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price From £57.58 (£49 ex Vat) per month

Contact Pearl 0845 003 8935
www.pearlbusinesssoftware.co.uk
System requirements PC with internet access • web browser (Firefox recommended)

BUSINESS MICROMART

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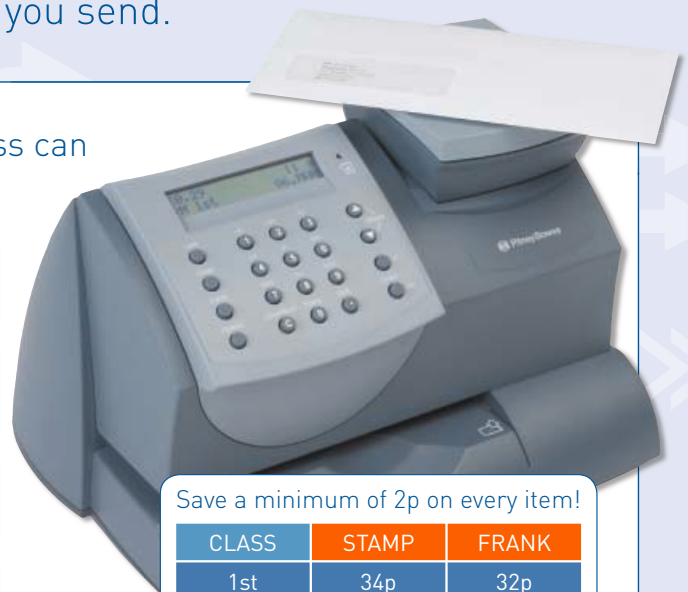


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LIGHTEN YOUR VIDEO LOAD

This month's Hands On is packed, as ever, with useful tips and tricks for all PC users. We've plenty for those with video on their mind – in Digital Imaging we find out about the DivX codec and the features in the latest version, and Hardware looks at trimming and compressing video for Media Center users, with some troubleshooting tips in the Performance column.

In Web Development we look at how to set up your own web server, and in Visual Programming there's a look at Microsoft's new Silverlight tool – can it really give Flash a run for its money?

There's a raft of tweaks for Fedora users in Linux, and details of the rebranded Foldershare service in Networking. Users of Microsoft's office suite – and others – will find some tips in Word Processing, along with tricks and updates for Windows users, and a look at some useful functions in both Databases and Spreadsheets.

Rounding it all off, as usual, is Question Time; our experts are always keen to hear from you, so if there's something you'd like to see covered, please drop them a line using the addresses on page 137.

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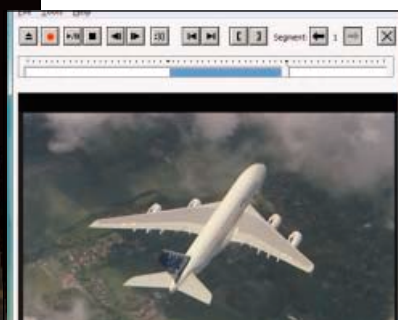
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Right: Editing TV shows needn't mean a loss in quality (see page 138)

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Advice from our experts

PCW's experts solve your PC problems

DATABASES

Q I am using Access 2003 and need to build a table that has an autonumber field as the primary key – INVOICENO. I can do this, but I need it to begin at the number my invoices start, which is 1231. Autonumber starts at 1 and I can't find a way to stop this. As far as I can see, I will have to enter 1,230 numbers and delete them to get to where I want to be. Can you help?

Rebecca Sugar

A Yes, this is odd behaviour from Access and it has always been – even from version 1.0. The good news is that there is a trick you can use to save all that typing. Create a new table with one field called, for convenience, the same as your autonumber field INVOICENO.

Enter a single record with the value 1230. Then create an Append query based on the new table and set up the invoice table as the target (see screen 1). The SQL for this is:

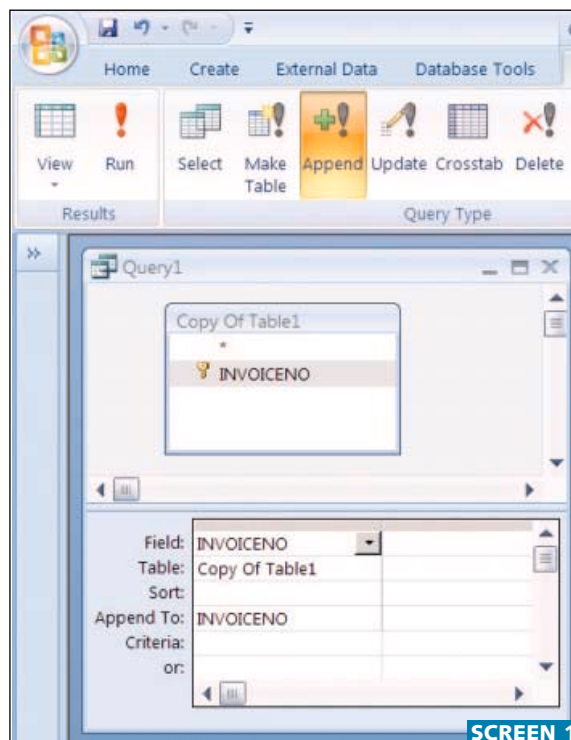
```
INSERT INTO Table1
( INVOICENO )
SELECT [Copy Of
Table1].INVOICENO
FROM [Copy Of Table1];
```

(Key: ↵ code string continues)

When you run this, it inserts the number and from then on Access will insert numbers from 1231 onwards. So you only have to delete one row, not 1,230.

DIGITAL IMAGING

Q I am using a Canon HV30, on the highest quality setting, and viewing via an Optima HD81 projector. I'm looking for editing software that will retain the high definition and allow copying to a DVD. The 'artistic' editing will be kept to a minimum, nothing more than taking out the mistakes and rearranging clips. Can you suggest suitable video-editing software? I'm not certain from the reviews in the November issue if all the software can copy high definition to the DVD.



Do I need a high-definition DVD player when not playing from the computer? Am I affected by the ousting of HD DVD by Blu-ray?

Jane McKinstry

A All of the applications reviewed in the November group test are capable of editing HDV, but only two of them, Nero 7 Premium Reloaded and Roxio Easy Media Creator, will burn Blu-ray discs. If you want to play HD-quality content on your HDTV from a set-top box, then you'll need a high-definition player, which effectively means Blu-ray. Unless you've invested in an HD DVD player and commercial titles, or have produced your own movies on HD DVD, its demise won't be a problem for you. In fact, it now makes the choice much easier.

Q Don't laugh, but I use Microsoft Photostory3 for creating picture slideshows to run on my PC, which can easily be converted to SVCD or DVD format.

The program is easy to use and generally does what I want. The only thing I can't do is change the default time duration for showing the picture. This is set at five seconds, but can only be altered by configuring each picture individually. I've tried altering the Windows XP default setting, but this only changes the standard Windows folder show.

Any thoughts on this one – a Registry tweak maybe?

Ron Hak

A Mark Coffman's TweakPS allows you to change the duration of all frames in a Photostory3 project, as well as remove all motion settings and randomise the frame order. You can get it from www.windowphotostory.com/TweakPS.

HARDWARE

Q I'm wondering about the best configuration for carrying out fairly heavy digital processing of still photographs, such as creating and editing panoramas from multiple images. Obviously, I need as much Ram as I can afford and a decent CPU, but I imagine there's no great advantage in having more than a standard graphics card. Would you agree that top-of-the-range cards are unnecessary unless you're into gaming? What specifications would you suggest for a decent photo workstation?

Douglas Bainbridge

A You're absolutely right that Ram is number one for this kind of application and that a top-end 3D graphics card will make little difference. When you open a photo (or any kind of file), it's loaded into Ram and can be worked on quickly. As you open more photos, you'll gradually run out of Ram, at which point your computer will need to resort to virtual memory. However, this employs the hard disk and is massively slower.

So, the trick is to ensure you have sufficient Ram to avoid resorting to virtual memory for your particular workflow. Remember, though, that you'll be working with uncompressed image data, which approximately works out as the number of megapixels multiplied by three – so every 10-megapixel image open represents 30MB of uncompressed data. Your photo-editing program will also consume multiples of this to allow instant undos. So it's clear that even having a few large images open at the same time can race through your Ram.

We'd recommend 2GB as a minimum and if you're really serious, you might want to consider 4GB or even more. Note that 32-bit Windows XP and Vista will only 'see' a maximum of just over 3GB, regardless of how much you install, so if you want to use 4GB or more, you'll need to use a 64-bit operating system such as 64-bit Vista Ultimate.

As for graphics cards, their 3D processors can't currently be used to accelerate traditional 2D photo image processing, although cunning developers are finding ways to exploit this muscle outside of gaming – for example, Vista's visual effects, along with the 3D side of some high-end editing programs. GPUs are highly specialist tools, but in future we may be able to use them like the co-processors of the past.

Q I'm having real problems finding Ram to upgrade my Dell Dimension 8250 desktop PC – it's the 533MHz bus version and is currently equipped with 756MB of non-ECC RD-Ram. I can't find any Ram for sale at the usual outlets, while in December

	A	B	C	D	E
1	Sqm	Hrs	£ per sqm	Hrly rate	Total
2	11.0	5.5	30.00	9.50	
3	9.5	4.8	32.50	9.50	
4	10.0	5.0	29.50	9.50	
5	8.0	4.0	32.00	9.50	
6	12.0	6.0	29.00	9.50	
7	9.0	4.5	32.50	9.50	
8	8.5	4.3	30.00	9.50	
9	10.5	5.3	29.00	9.50	
10	9.0	4.5	31.00	9.50	
11					£ 3,084.38
12					
13					

There are various ways of totalling a job with one formula

SPREADSHEETS

Q When copying a cell or range from one Excel worksheet to another, is it possible to retain the column width? Paste Special allows you to paste the values or column width, but not both at the same time. At present I have to manually reset the width.

Craig Sawyer

Mismatched icons

LINUX

Q In Nautilus some of my videos have preview icons and some have a generic icon, though they are all the same type of video and it is making my folders look messy. How do I get previews to show for all of them?

Mark Hunter

A When you visit a folder, Nautilus generates preview icons and stores them for later use, so it doesn't have to

generate them each time. If Nautilus can't read a file for some reason (such as a missing codec), it marks it as not having a preview, so as not to keep trying. Unfortunately, there's no quick and obvious way to fix this; instead, you need to delete these markers directly. Press Ctrl and L in Nautilus to go to a folder, then enter ~/.thumbnails in the location bar (note the leading full stop). Inside you will see a folder called 'Fail'. Delete this and next time you visit a folder with missing previews, Nautilus will attempt to regenerate them again.

Dell claimed that the product was no longer available.

The PC itself works fine, I'd just like more Ram. Can you enlighten me as to why this situation exists and whether there is anything that I can do about it?

I notice some memory sites offer generic memory modules by specification, as opposed to being specifically designed for a certain PC model. Would they be of any use and if so, what specification should I be looking for?

John Monaghan

A The first step when upgrading memory is to do what you've already done: enter your manufacturer and model into the comprehensive databases of suppliers such as www.crucial.com/uk and see what they suggest. Unfortunately as you've discovered, though, few if any now stock the memory used by your Dell Dimension 8250.

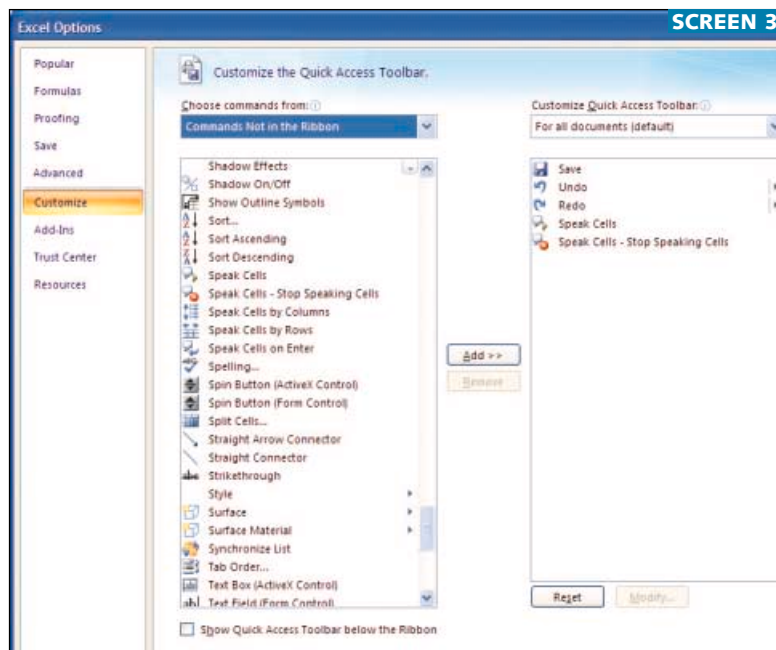
The 8250 used RD-Ram Rimm modules, which at the time were a high-performance alternative to

conventional memory. Sadly, though, this type of memory has long been discontinued and is now hard to come by. Crucial still sells PC800 Rimm modules for around £150 for 512MB (in a matched pair of 256MB modules), which will work in a Dimension 8250, but only the 400MHz bus version. Your 533MHz bus version requires PC1066 Rimm modules, which are even rarer.

'PC technologies are superseded quickly and it's often hard to find compatible parts for older systems'

If you find generic PC1066 Rimm modules, they might work in your Dell, but there's no guarantee. Also remember that RD-Ram needs to be installed in identical pairs. An alternative is to reduce your memory bus to 400MHz in the Bios and install PC800 Rimm modules instead, although if you can't run your memory clock independently to the CPU bus speed, your processor will become underclocked as a result.

It's an annoying situation, but not an uncommon one in the technology world. PC technologies are superseded quickly and it's often hard to find compatible parts for older systems at affordable prices – or even at all.



Find the function 'Adding Text to Speech' in Excel 2007 by going to 'Commands Not in the Ribbon'

Quick Access Toolbar. You will also need to add 'Stop Speaking Cells' and, optionally, you can add 'Speak Cells by Columns', 'Speak cells by Rows' and 'Speak Cells on Enter'. Click the OK button. Highlight a range of your worksheet. Click the new Speak Cells icon and if your speakers are on, you will hear the entries read back to you. You can speed up or slow down the reading speed by choosing Speech in the Control Panel and moving the Voice speed bar. The number of different voices offered depends on the version of Windows you're using.

Q Is it possible to find out what is in one part of an Excel formula? For example, if I have the formula `=SUM(B2:B10,C11)` in a cell, is it possible to display what is in cell C11 without switching to it?
Sara Kelly

A You can do this with a function key. In the Formula Bar, highlight C11 and press F9. The contents of cell C11 will be displayed in the Formula Bar (see screen 4).

WINDOWS

Q For years on the right-hand end of my XP taskbar, I've had a small loudspeaker with which I could easily adjust the volume. This has now disappeared and I can't seem to retrieve it.
Joe Leaf

A Go to Control Panel, Sounds and Audio Devices. In the Volume tab, tick the box for 'Place volume icon in the taskbar', then OK (see screen 5). This will do exactly what you've asked it to do.

Q I use Firefox as my web browser and have got it to remember several logins and

The F9 route to displaying part of a formula

	A	B
1		
2		£ 105.00
3		£ 114.00
4		£ 123.00
5		£ 132.00
6		£ 141.00
7		£ 150.00
8		£ 159.00
9		£ 168.00
10		£ 177.00
11		£500
12		
13		

A Use the regular Paste button, or right-click and choose Paste. Now a little Paste Options icon appears to the lower right-hand corner of the cell selected. Click the arrow beside it and choose 'Keep Source Column Widths'. Then you'll have both the values and original column width. The icon only appears when selections are copied to the Clipboard, not when cut to it.

Q We issue detailed job quotations using an Excel worksheet. Material quantities are entered in column A, hours required for that part of the job in column B, the unit cost of each material in column C and the applied hourly rate in column D. Is it possible to total the whole job with one formula?
Dean Lewis

A Excel offers many ways to do it. You could use the array formula, `=SUM(A2:B10*C2:D10)` using Ctrl & Shift & Enter instead of Enter. Excel will add curly brackets to acknowledge it's an array formula. However, the simplest solution is to use `=SUMPRODUCT(A2:B10,C2:D10)` and just press Enter (see screen 2). Either way, Excel will multiply each item in the range A2:B10 by the appropriate amounts in C2:D10, then total the whole thing.

Q If I use the SUBTOTAL function a number of times in an Excel column, how can I add all the amounts in the column

but exclude the subtotals to arrive at an accurate grand total?
Shelby Wood

A Oddly, perhaps, you use another SUBTOTAL function. Specify the whole range including the existing subtotals. If you have values in the ranges A1:A4 and A6:A9 and A11:A14 with subtotals in cells A5, A10 and A15, then in cell A16 you can display a grand total using `=SUBTOTAL(9,A1:A15)`. The first argument of 9 represents SUM, just as it does in the subtotals you've used already.

Q I've upgraded to Excel 2007 and I can't find the read-back feature. In Excel 2002, I used to have my worksheet audibly proofread by choosing the Text to Speech toolbar on the View menu. I can't even find Text to Speech in the Excel 2007 Help file.
Marty Moore

A This feature is not offered under any of the tabs on the Excel 2007 Ribbon. You have to do a little customisation. You can only add items to the Quick Access toolbar at the top left of the screen, not the regular Ribbon, but it's quite easy.

Click the Office button and choose Excel Options, Customize. In the dialogue box, (see screen 3) choose 'Commands Not in the Ribbon' using the dropdown arrow at the top left. In the list beneath this, click on 'Speak Cells'. Click the Add button to the right and this icon will be added to the

passwords for various sites. However, others have access to this PC and I would like to remove some of these without clearing them all – as you can do in Tools, Clear Private Data. Is this possible?

Mike Stanley

A It is, and you should do this before anyone else reads this reply, as this Firefox feature is most unsafe for sensitive information. Go to Tools, Options, Security and click the 'Show Passwords...' button. This will produce a list of sites and login names. You can click again on the 'Show passwords...' button to see the actual passwords. To remove an entry, highlight it and then click on the Remove button.

WORD PROCESSING

Q I know Word 2003 can automatically create numbered paragraphs when you start numbering them manually, or use the numbering button on the formatting button, but is there a way to do the opposite?

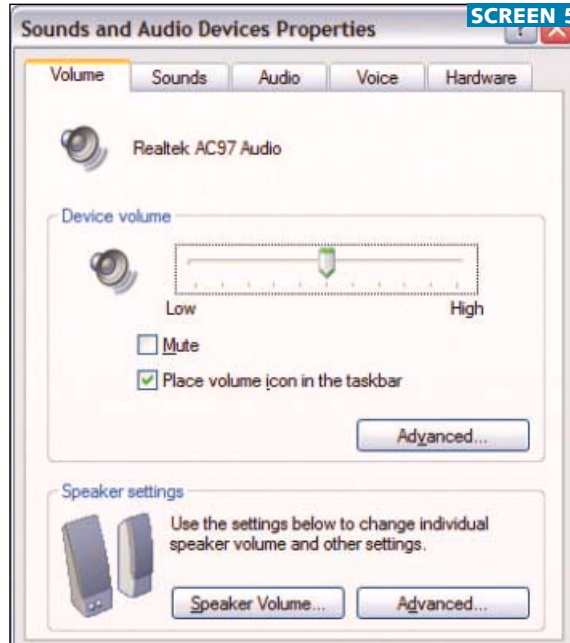
I have some documents created by others with numbered paragraphs, and I'd like to change these to plain numbering, but selecting the paragraphs and clicking the numbering button removes the numbers completely.

Nikki Morland

A You can stop Word's automatic numbering by going to Tools, AutoCorrect Options, AutoFormat As You Type, although changing a Word numbered list into plain text takes a little more cunning.

Select the numbered paragraphs – you'll see the numbers themselves are not selected. Now click on Edit, then Cut and the paragraphs and numbers will vanish. Next, click on Edit, Paste

A long-awaited improvement – default paste options in Word 2007



Special, Unformatted Text. This procedure replaces the 'smart' numbering with plain text numbering.

Getting the volume control back in the notification area

Q Almost every time I want to paste copied text, I need the pasted version to be in the same style as the receiving document rather than that of the source, particularly web-based text. Therefore, I always have to use Paste Special, Unformatted Text, which means copy/paste is not a two-click action, but three plus the selection of unformatted text.

I have the Paste Special icon on my Quick Access toolbar, which reduces some of the pain, but is there any way to change the default in Word, so that the default paste is unformatted text?

David Shaw

A You mentioned the Quick Access toolbar, so you are using Word 2007. In which case, the

answer is 'yes' – this is one of the better improvements. If you go through the Office Button to Word Options, Advanced, you'll see a set of options covering the default paste formats (see screen 6). You can also get to the options a bit quicker by clicking on the 'Paste Options' button when you've just pasted something and choosing 'Set default paste'.

Q I came across an interesting problem in Word 2003. I had been looking for an easy way to use the three-dot mathematical 'therefore' sign. I inserted the symbol with a shortcut. When I attached it to a macro, it inserts a square.

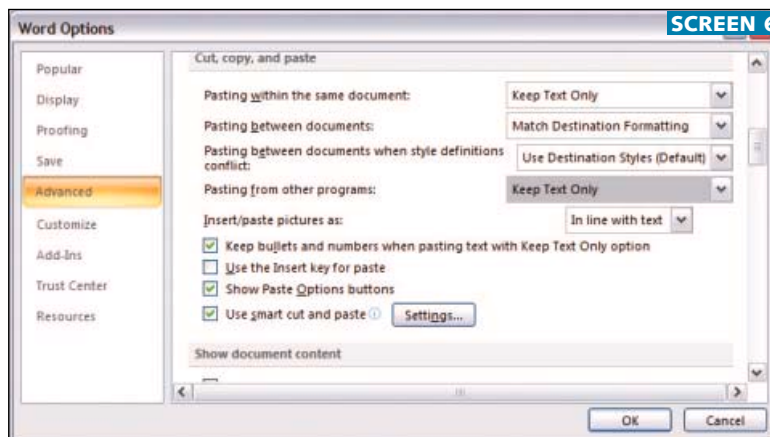
Patrick Wilmore

A This sounds as if the macro isn't switching to the correct font. The symbol is located at Unicode 2234 (hex), but the glyph is not present in many fonts – if Word can't find a glyph in the active font, it substitutes it with a square. One foolproof way is to type 2234, followed by Alt & X. This changes to the MS Mincho font and inserts the symbol.

If you record this action, then change the font back to that of the enclosing style by pressing Ctrl & Spacebar, then stop recording – you should have a foolproof macro. If you prefer to create the macro from scratch, the code should look like this:

```
Sub Therefore()  
    Selection.TypeText <  
    Text:="2234"
```

```
Selection.ToggleCharacterCode  
Selection.Font.Reset  
End Sub
```



LET US HELP YOU

All our experts welcome your queries. Please respond to the appropriate address below

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Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Hardware column.

Email hardware@pcw.co.uk

Please do not send unsolicited file attachments.

Putting the squeeze on video

Reduce video file sizes, and find out how people use the Asus Eee

In this month's Hardware column, we're revisiting several issues and topics from recent editions. We're addressing some of the comments received following our coverage of the tiny Asus Eee PC ultraportable laptop, and looking at an effective workflow for archiving Windows Media Center Edition TV recordings.

Nip and tuck

Nothing consumes hard disk space like TV recordings. Digital video is much larger than photo or music files at the best of times, but with most entertainment PCs recording raw transport streams as broadcast, they're often much heavier than the optimised files found on downloads and discs.

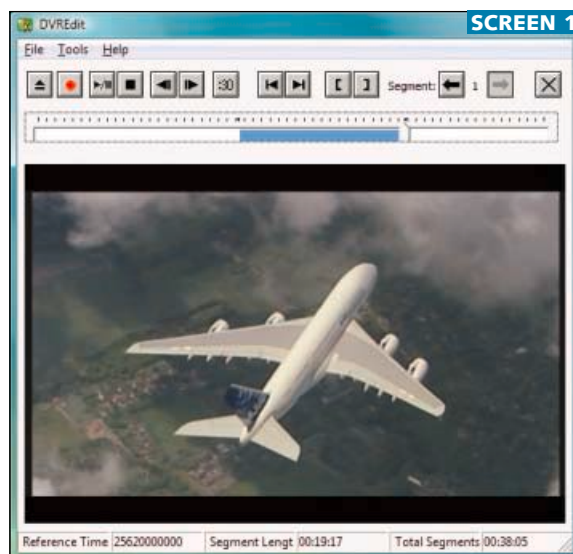
Throw in some padding to ensure the beginning and end of your favourite shows aren't missed and files become even bigger. So if your PC is recording shows and you prefer to archive rather than delete them, you'll almost certainly be either running low on space, or perhaps already have several disks full of material.

Luckily there are plenty of utilities designed to chop and squeeze your precious recordings, and we checked out several options in an earlier Hardware column. Following months of tweaking and experimenting though, we'd like to share the workflow that has proven most effective for our own Windows Media Center Edition (MCE) system.

Chop chop

The obvious way to deal with ever-growing media collections is to recompress the files. But while recompression is part of our workflow, it's worth first investing some time in editing, as this can result in some large savings with no loss in quality.

Take an average one-hour TV show with, say, five minutes of padding at



either side; this results in a 70-minute file. To accommodate trailers, station IDs and continuity announcements, the hour-long show will rarely last longer than 58 minutes, so your recording already has at least 12 minutes of wastage.

If the show was broadcast on a commercial UK channel, you could expect at least three ad breaks, lasting around 10 minutes in total – this figure can vary, but your hour-long show could now be fast approaching 45 minutes of actual material, which is 25 minutes less than what you've recorded. There's potentially a saving of over one-third there after editing.

Half-hour shows result in even bigger differences. You could start with a 40-minute file thanks to padding, but have only around 28 minutes of actual show on a non-commercial channel, or as little as 20 minutes on a channel with adverts.

The material could typically represent half of what you originally recorded, so it's clear editing can make significant savings in storage without resorting to time-consuming and

Editing TV shows to cut out padding at either side, along with adverts in between, can save a serious amount of disk space with no loss in quality

potentially damaging recompression. So what's the best tool for the job?

Editing MCE recordings

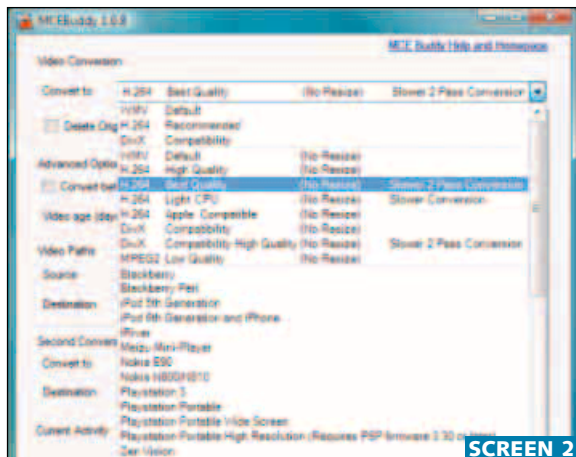
Microsoft's DVR-MS format used for storing TV recordings on MCE systems may feature fairly standard video codecs (such as MPEG2 for UK TV), but proves surprisingly incompatible with popular editing programs. Even Microsoft's own Windows Movie Maker can be tripped up. The version that comes with XP doesn't work, while Vista's may claim compatibility but we've never had much luck with it.

Luckily there's a free utility that does the job quickly. Go to <http://the.greenbutton.com/files> and download Alex Seigler's DVR-Edit. This is a standalone utility that operates outside the MCE interface and lets you crop recordings and cut adverts.

Once you've opened a file, DVR-Edit will start playing it and allow you to mark in and out points by clicking on the square bracket icons (see screen 1). The idea is to surround the parts you want to keep with the brackets, so in written terms you would have something like this: [first half of show] ad break [second half]. This would then crop the beginning and end of the file along with removing the segment in the middle.

It's quick and easy to do this by dragging the slider to a rough position with the mouse, then using the arrow keys on your keyboard to nudge back and forth before marking the in and out points.

DVR-Edit also offers recompression options, but we've never had much joy with them, so we'd advise just using the chopping side. It'll also save the final file pretty quickly since there's no recompression taking place. The result is files that look identical in playback and include all the meta data



describing the show, but which could occupy up to half the space of the original. It really is amazing to see how gigabytes of free space reappear after editing a few files.

Compression

Of course editing can only go so far, and unless you have stacks of storage free, you'll be looking into recompressing your recordings (edited or otherwise) sooner rather than later. Until recently, the most common route to take with DVR-MS files was to compress them into Windows Media Video, WMV files.

WMV can be a great format, but we've never been very impressed by the quality when converting from UK DVR-MS files. An alternative involves stripping out the raw MPEG2 data and recompressing that into a format such as DivX, but again the results (in size and quality) can be less than impressive with existing tools.

Now there's another option, exploiting the latest H.264 compression. This is a very efficient compressor used for delivering many high-definition files, but it's equally useful for recompressing standard-definition TV recordings.

There's also a free utility that will do it for you: MCE Buddy, from <http://mcebuddy.com> (see screen 2), is designed to recompress into a variety of formats and can optionally delete ad breaks automatically, thanks to a third-party plug-in.

As with many utilities, some parts work better than others. So instead of relying on the complete service it can be worth cherry-picking the parts that work best for you. For us, those were the H.264 compression options.

We found its 'best quality with no resize' H.264 setting could compress existing DVR-MS files to around 40 per cent of their original

MCE Buddy offers a number of recompression options for recordings made on a Media Center Edition PC

PCW reader Stephen Stewart installed Windows 2000 on his Asus Eee PC and uses it to run GPS-based mapping software for unusual regions in the world. Here he's using Fugawi software to navigate Granada

size, with very little compromise in quality. This compares favourably against WMV, which at best quality typically halves the size of an MPEG2 original using most tools.

MCE Buddy runs in the background, consuming spare CPU cycles and can be set to monitor folders for automatic conversion. You can also configure it to convert during idle times. It can also be set to make two different conversions of the same file into different destination folders, perhaps using high quality for archive and another for use on a portable – a number of profiles are offered.

With MCE Buddy running in the background of a 2.66GHz Core2Duo E6700 system used for general office tasks, best quality two-pass H.264 conversions with no resizing took two hours and 18 minutes to recompress a 1.56GB 60-minute DVR-MS file into a 600MB AVI file – and the result was virtually indistinguishable from the original. The single-pass conversions also looked good and took half the time. To put that in perspective, a WMV conversion of the same file took only 20 minutes, but measured 800GB and upon close inspection arguably looked slightly poorer.

H.264 conversions are clearly more time consuming even for single passes, and you'll also need software to play them back, along with a sufficiently quick computer. But 2.4GHz Pentium-class systems should be up to the job, and by installing ffdshow's codecs (from <http://sourceforge.net/projects/ffdshow/>), you'll be able to watch the files in Media Player.

Like most recompression options though, you will lose the tagging of DVR-MS, so name the file clearly. Also perform some tests first to ensure your PC can decode the files smoothly before deleting the originals.

So, if your MCE recordings are consuming more disk space than you'd like, but you can't bear to delete them, then consider DVR-Edit to cut out the

unnecessary material and recompressing the result into H.264 with MCE Buddy. You'll be surprised by the storage savings. If you have your own successful video archiving workflow, we'd love to hear about it.

Eee revisited

Just before wrapping up this month, here's a quick look at some of your comments and questions following our coverage on the Asus Eee PC ultraportable laptop. A theme has been using alternative operating systems.

Martin Thomas is running the EeeOS, a basic Debian OS with a few additions such as Openoffice, Pidgin and Xcalc from <http://eeeos.interactivelaboratories.com>. "It is very fast, 50 seconds to boot to desktop, and so far very reliable. I have it running from a 4GB SD memory card split into 3GB/1GB for the OS and data."

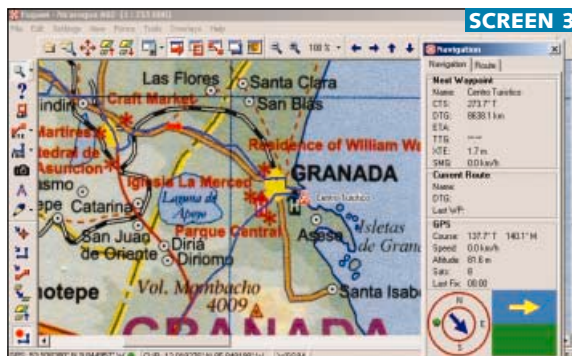
Tim Bradshaw's using the optional full desktop mode, but wondered if it was possible to boot directly into it, rather than rebooting from the default desktop. The excellent eeuser forum has a solution at <http://wiki.eeuser.com/howto:getkde>, although we haven't tried it ourselves.

Stephen Stewart has installed Windows 2000 on his Eee as it has a smaller footprint than XP. He's configured it for use with a GPS receiver to provide a powerful in-car navigation in remote places around the world – see screen 3 and his informative web page at www.xor.org.uk/silkroute/equipment/satnav800.htm.

Finally, Nick Ellerby wrote to ask why bother installing XP on an Eee at all, especially as retail versions cost around £150 which clearly approaches the £230 price of the laptop itself. Well, in terms of price, OEM versions of XP Home and Professional will work just fine and are available for just over £50 and £80 respectively.

As to why, there are many applications, utilities and devices (such as mobile phones) that are much better supported in Windows than the Eee's Xandros, and of course some people simply prefer to use a familiar OS. Indeed, recognising the popularity of XP as an option for the Eee, Asus has already announced that some models will come with it pre-installed.

The Eee continues to be one of the most fun and useful devices released in recent times, so if you're using yours in an unusual environment or with a different OS, we'd love to hear from you. **PCW**





Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Performance column.
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Media malfunctions

If XP Media Center Edition stops recording programmes, there is a simple solution

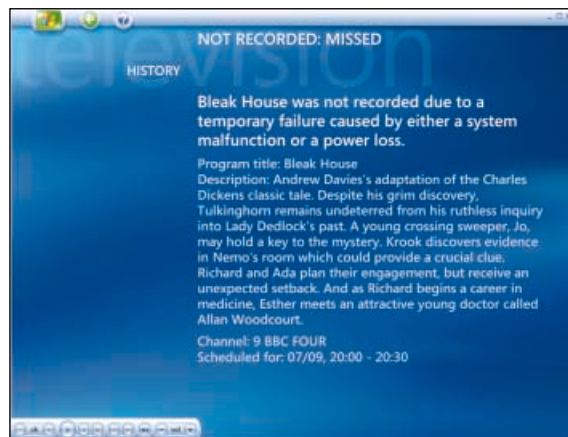
Windows XP Media Center Edition (MCE) may be one of the best personal video recording systems around, but it's not without its problems. In this month's Performance column, we're revisiting a common issue facing MCE PCs with a solution that could save hours of frustration and lost recordings.

Temporary failure?

Of all the potential hiccups facing an MCE PC, one of the strangest and most annoying is when your system suddenly starts failing to record certain shows for no apparent reason. If this is happening to you, check your PC's Event log or MCE's History page for the problem. It might be something easy to fix, but if the message says "xxx show was not recorded due to a temporary failure caused by either a system malfunction or power loss", then you have our utmost sympathies.

After running smoothly for two years, my MCE system suffered from this last year and suddenly started randomly missing a stack of recordings. As documented in April's Performance column (see www.pcw.co.uk/2213072), I was also sure there hadn't been a system malfunction or power loss. Searching revealed that plenty of others were experiencing the same issue, but unusually, no-one seemed to have a definite solution.

As a self-confessed telly addict, my MCE PC is what IT managers like to call a 'mission-critical' system, so after attempting a few failed fixes, I gave up, reformatted and reinstalled from scratch. As reported in April's edition, this did the trick, with the PC successfully recording everything I asked it to until a few weeks later when exactly the same problem recurred. I couldn't believe it, although having only recently made a



clean OS installation, it did somewhat point the finger at a hardware issue, as Windows had always suggested.

The only way I could get it to record shows was to leave it fully powered up 24 hours a day, which wasn't good for my green credentials. It was also noisy and infuriating since it had successfully woken from a low-power S3 standby state to record shows then go back to sleep again since building it two years earlier.

Not alone

Coincidentally around this time, a colleague's MCE PC started to suffer from the same problem, and we received an email from PCW reader Paul Coogan, who also experienced the issue and was prompted to get in touch following April's edition.

Media Center forums suggested the problem could be related to the system clock going out of sync. If the time wasn't exactly right when the PC awoke from standby to make a recording, it appeared Media Center often failed to record the show. Windows has long offered a built-in time synchronisation facility, but for some reason that didn't solve this problem.

Some forum postings suggested a third-party clock sync utility was the

An increasing number of MCE owners are getting this 'temporary failure' error when MCE fails to record a TV programme, but could it be down to the motherboard's battery?

answer and indeed Paul found this solved the issue on his own system.

Like me, though, Paul wasn't satisfied with this, as not only does it involve an additional expense, but the system had worked fine in the past. Subscribing to a clock-syncing service seemed like applying a plaster to a wound that wouldn't heal. Paul then decided to check all the hardware in his system and finally found the culprit: a flat motherboard battery. It seems obvious now that the battery could be the issue, but as we discovered, this can also happen on new motherboards.

Interestingly the battery might not even have to be completely flat to cause problems; my own battery gave a meter reading mid-way. Still, replacing the battery with a new one appears to have fixed the problem on Paul's system. As for mine and my colleague's, it's early days and I'll report back in the future.

Either way, the CR2032 battery used by my Abit motherboard can be bought for less than £2 and switched while the power's running on your PC, thereby not losing any of your Bios settings. You'll do this at your own risk, but if you power down your system before switching the battery, take a note of any custom Bios settings so you can re-enter them following the replacement if necessary.

Having 'fixed' the problem on my entertainment PC to find it return a few weeks later, I'm sceptical. But of all the solutions available, replacing the battery is a no-brainer.

So if you're experiencing the temporary failure message on your MCE system, consider swapping the motherboard battery for a new one. If it works, it could save many hours of troubleshooting. Finally, thanks to Paul Coogan for putting in the legwork and getting in touch. **PCW**

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Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Windows column.

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Customise your Open With list

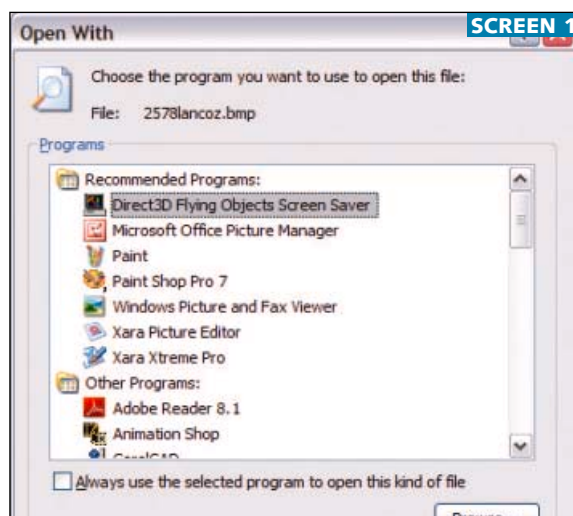
Grappling with file extensions and singular adventures in the future of Windows

When you right-click on a file in XP's Explorer do you find that your 'Open With' list is over-populated? I find, over time, entries appear that are either unwanted (I don't want to view JPEG pictures in the Quicktime Viewer, or my browser) or inappropriate (Adobe Reader will try – but fail – to read old Windows 3 legacy Cardfiles).

Windows keeps track of what can open what in two sections of the Registry. The default ownership of a file extension is stored in the HKEY_CLASSES_ROOT branch of the Registry, which is common to all users. On a standard Windows-with-Microsoft Office installation, this means DOC and RTF files will open in Word by default but you can also 'Open With' Wordpad.

Other 'Open With' choices are stored in the HKEY_CURRENT_USER branch of the Registry, which means these can be customised on a per-user basis. For example, if you want to see the raw formatting code of an RTF file, you can right-click on it, Open With (you may need to hold down the Shift key to get that menu item) and then 'Choose Program'. The top few 'Recommended' programs are the existing default options, below that is a list of other possibilities – if you don't see what you want you can use the Browse button.

Don't tick the 'Always use the selected program...' box unless this is what you really want to do. Having once opened, say, an RTF in Notepad, you'll find the latter added to the recommended Open With list. As well as adding your own programs to the list, you'll find that Windows – or other applications – can do this for you, whether you want it or not. For example, if you've tried the trick with the 3D Flying Objects screensaver



below, you'll find 'Direct 3D Flying Objects Screensaver' has been added to the list for BMP files (see screen 1).

You can prune this list by editing the Registry but create a System Restore Point first. Run Regedit, then go to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FileExts. Here you will find entries for every registered file type, including many you may never have heard of. Open any extension you want to prune, then open the OpenWithList key. From the string values on the right, delete any you want removed (see screen 2). You may need to do some detective work here as the programs are listed by their executable name rather than the program title – in screen 2, ss3dfo.scr is the screensaver and shimgvw.dll is the Windows Picture and Fax Viewer. If

An unwanted 'Open With' program...

...and how to get rid of it

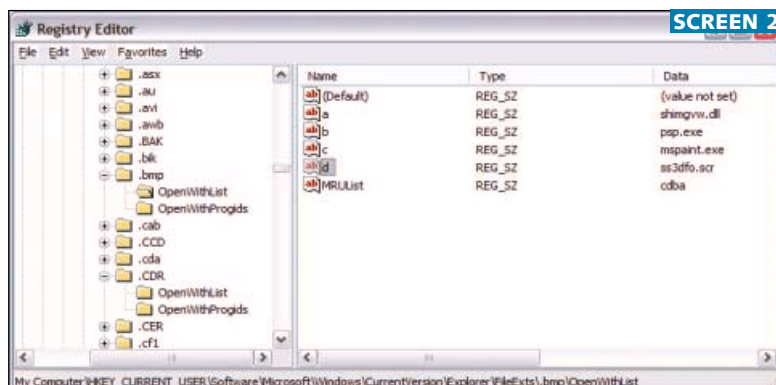
you don't recognise a program, a search for the file, followed by an examination of its properties should reveal all.

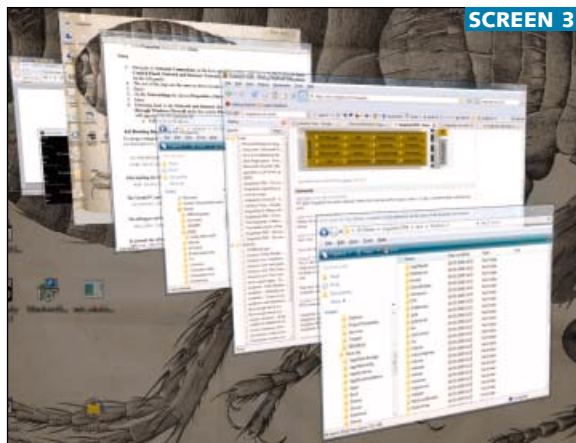
Finally, don't forget you can use the right-click 'Send To' command to open any file in a non-associated application. To add, say, Notepad, to the 'Send To' list, open the SendTo folder. In XP the easiest way is Start, Run, sendto, and in Vista it's Start then type shell:sendto in the Search box. Once the folder is open, you can create shortcuts in the normal way.

Switching tips

The whole point of Windows, since version one, is you can run more than one program at a time and switch between them. In 16-bit versions you could do this (and you still can) by clicking on a window to bring it to the front. This can often involve having to move or minimise a lot of windows, so an easier way was (and still is) holding down the Alt key and pressing Tab repeatedly. Windows 95 brought us the Taskbar, with every running program or open folder represented by a button. Except Control Panel items. To see these you need to use the Alt & Tab trick that produces a panel with a tile for each window.

In Vista there's a further refinement in that Control & Alt & Tab keeps the





SCREEN 3

panel open when you release the keys, until you click on an item. Control & Windows key & Tab does a similar thing with 3D Flip – as does the Quick Launch button (see screen 3). Finally, just to complete the set, Control & Tab switches between tabs in both Internet Explorer and Firefox.

The Vista Quick Launch Flip button has been known to go missing. Here's how to get it back. Make sure the Taskbar is unlocked, then right-click on the handle of the Quick Launch toolbar and Open Folder. When the folder opens, create a new shortcut, and in the 'Type the location...' box, type:

```
c:\windows\system32\
rundll32.exe DwmApi #105
```

(Key: ↵ code string continues)

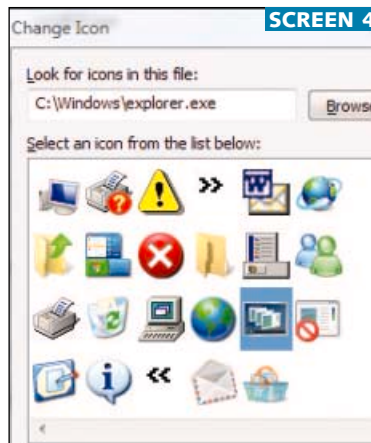
Note that there is a space either side of DwmApi. Click Next, give the shortcut any name you like, then click Finish. This will restore the functionality of the icon, but it will appear as a blank sheet of paper. So right-click on it, select Properties and then Change Icon. Hit the Browse button, go to C:\Windows\explorer.exe where you'll find the real thing (see screen 4).

Singularity

Normally, this column confines itself to real-world Windows issues, but this month we're going to take a step or two out of the box and look at a project named Singularity. This is not, Microsoft emphasises, the 'next version of Windows' but an operating system being developed by Microsoft Research and designed to be more stable and secure than existing operating systems. The project isn't officially open source, but anyone can get their hands on the source code for 'academic non-commercial use'. You can download the Singularity RDK from www.codeplex.com/singularity but you'll need a few other things.

Left: Flipping through windows in Vista

Right: Getting back that flipping icon



SCREEN 4

First, having downloaded the Singularity ZIP file you need to extract its contents. In the top-level folder you'll find a PDF named Building and Running Singularity RDK 1.1. Read this first, and you'll discover you need to download and install the Windows Debugging Tools from the link in the PDF. Next, unless you have a sacrificial PC with at least 512MB of Ram, you will need to download and install Microsoft Virtual PC. This is worth having in its own right, as it lets you run 'guest' operating systems on XP Pro, Server 2003 or Vista Business, Enterprise and Ultimate. So, for example, you can run Windows 98 in a window just to remind yourself what operating systems were like 10 years ago or to run old programs that just won't work with Vista. You can find it at www.microsoft.com/windows/downloads/virtualpc/default.mspx and, like all the downloads mentioned here, it's free.

You will also need version 1.1 of CLR to run Singularity. Although the PDF states that 'If you're up to date with Windows Update, you should have it installed' this is where we hit a problem. All our attempts to build Singularity from the source code failed, with a reference to .Net

Customising the screensaver, with apologies to Botticelli



SCREEN 5

framework 1.1 being required, although .Net 2.0 was installed on the XP machine. But having installed .Net 1.1 on a Vista machine all went well. I won't go into detail as it's all in the PDF, but basically, having assembled the ingredients you first need to run a script that places a shortcut on your Desktop. This will open the Singularity build environment, where you can create various versions from a minimal Tiny, to the one-with-everything World. The latter can take a long time – over three hours on the test PC.

Next you have to create and configure a Loopback Adaptor on the host PC – again this is adequately documented in the PDF and you don't need to download anything. Having copied and renamed a ready-made Virtual PC configuration file, you are ready to start the debugger and boot up the Singularity Virtual PC.

Should you have got this far, do not expect anything like Vista or XP. What you get is a command-line interface, and there's not a great deal you can do with it, unless you're a programmer. You can have a go at compiling and running some of the applications and projects supplied. Unfortunately we don't have room for a further blow-by-blow account, but there are instructions – and some lively debates – in the discussions pages at www.codeplex.com/singularity. Although this is definitely not the 'next version of Windows' I can't help wondering if Microsoft has a desire to start again without the Windows and Dos legacy impedimenta.

Department of obscure tips

Here's a very strange one for XP. First catch a bitmap – this can be anything you like and we've tried images varying from Botticelli's Venus to photos of the cat. Size doesn't seem to matter, but 800x600 pixels is plenty. Now go to Display Properties, Screensavers and choose 3D Flying Objects from the list. Click Settings, crank the Resolution and Size to the maximum, then choose 'Textured Flag' from the Style list. Click on the Texture button and navigate to your bitmap, and Open. OK out of the Settings dialogue and click Preview. You'll see the chosen image flying around the screen, furling and unfurling like a flag and occasionally turning itself inside-out (see screen 5). This also works in Windows Millennium and 98 SE. **PCW**



Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time he prefers to travel the world – and snap it with his camera.

→ Comments welcome on the Linux/Unix column.

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Secrets of Fedora 8

How to get the best out of this major Linux distribution

Last month, we looked at Fedora 8, one of the major Linux distributions currently available. We saw some of the features of this release and touched on a number of post-installation steps. This month, we'll continue and take a closer look at some of these.

If you keep up to date with developments in Linux, you may know that Fedora follows a regular release cycle, similar to that of Ubuntu. Fedora 9 will in fact be available as you read this. However, Fedora is perhaps the most pioneering distribution when it comes to experimenting with new technology, and for that reason some people may wish to stick with the previous release for a while longer. Fedora 8 has not remained stagnant at all, and has continued to receive very regular updates, including enhancements to security and many other areas.

The update process is the first thing you should perform upon booting a new installation. Be prepared for a long wait, even on a fast broadband connection, for the number of updates pushes the download to well over 300MB. Included will be a new kernel, so a reboot will be required following the completion of the update. The panel utility will take care of the entire process.

As we saw last month, the third-party livna repository (<http://rpm.livna.org>) is all but essential on any Fedora installation that is to be used as a working desktop system. Head to the site with Firefox and download the Fedora 8 repository RPM linked on the main page. You must save the RPM to disk (Firefox prompts to open the file by default), and then double-click the icon that appears on the desktop. After following the prompts an error window will appear to warn you that

```

root@fedora:~# yum install libmms libmodplug libmp4v2 libmpcdec libquicktime libsidplay libtimidity mjpegtools-libs mpeg2dec neon timidty++-patches wildmidi-libs x264 xvidcore
libmms                i386      0.4-1.lvn8      livna           40 k
libmodplug            i386      1:0.8.4-2.fc8  fedora         167 k
libmp4v2              i386      1.5.0.1-5.fc8  fedora         263 k
libmpcdec             i386      1.2.6-3.fc8    fedora          27 k
libquicktime          i386      1.0.1-1.lvn8   livna          387 k
libsidplay            i386      1.36.57-14     fedora          84 k
libtimidity           i386      0.1.0-4.fc8    fedora          47 k
mjpegtools-libs      i386      1.9.0-0.4.rc2.lvn8 livna         271 k
mpeg2dec              i386      0.4.1-3.lvn8   livna          102 k
neon                  i386      0.27.2-2       fedora          109 k
timidity++-patches   i386      2.13.2-6.fc8   updates        8.5 M
wildmidi-libs        i386      0.2.2-4.fc8    updates         47 k
x264                  i386      0-0.10.20070819.lvn8 livna          245 k
xvidcore              i386      1.1.3-1.lvn8   livna          240 k

Transaction Summary
-----
Install      29 Package(s)
Update       0 Package(s)
Remove       0 Package(s)

Total download size: 16 M
Is this ok [y/N]:
  
```

Installing packages in the terminal window may be easier than using the search facility

the package cannot be verified. This warning is normal, since it is a third-party package, and can be ignored. The first time you install any package from livna you will be prompted to accept a security key. The packages are signed with this key, so go ahead. This will prevent further warnings.

The packages in the new repository can be accessed by the graphical Add/Remove menu option. The search facilities in this application are a little clunky, and so it may be quicker to install the packages from the command line when you know the name of those you want (see screen 1). For example, to install playback support for MP3, AAC, MPEG-2, x264 and MPEG-4 in gstreamer apps (such as the default audio and video player), you need three gstreamer plug-in packages from livna. From a terminal window enter:

```

$ su -
# yum install \
gstreamer-plugins-ugly \
gstreamer-plugins-bad \
gstreamer-ffmpeg
  
```

(Key: ↵ code string continues)

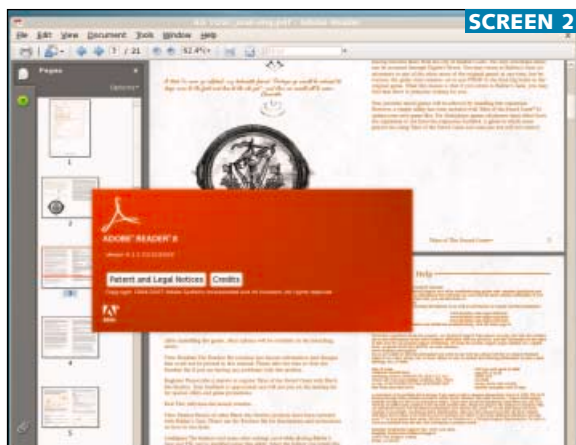
The first command logs you in as root, the second calls the 'yum' package manager command, the style of which will be familiar to those who have used Ubuntu's and Debian's 'apt-get'. Alternatively, load up the Add/Remove menu option and search for these packages, marking them for installation. Either method will result in several dependent packages also being retrieved. One advantage of running yum at the command line is that you can see which repository each of the packages comes from.

Further multimedia

For video DVD playback, you will need another package from livna, but at the same time you might want to install the VLC media player, which is a much better application for DVDs than the included Totem:

```
# yum install libdvdcss vlc
```

Adobe's Flash plug-in is not included in livna. For this, head to www.adobe.com and click the 'Get Flash Player' image. If you are already running Fedora, you will be taken to the correct screen automatically.



Select 'rpm for Linux' from the dropdown menu, and save and install as before with the RPM from livna. While on Adobe's site you may wish to download Acrobat Reader too (see screen 2), though the included Evince Document Reader application is very good in its own right.

ATI and Nvidia hardware drivers are available from livna. With these installed it's easy to enable Compiz. Unfortunately, the setup is not quite as simple as with Ubuntu, where the necessary package is automatically presented to you for a one-click install. If you have a recent Nvidia card (a 6xxx model or better), it's all quite simple enough – just install `kmod-nvidia`:

yum install kmod-nvidia

Owners of older cards will need to install 'kmod-nvidia-96xx' or perhaps even 'kmod-nvidia-legacy' (for the oldest cards) instead. Also included in the drivers is a utility to configure them. This can be found under System, Administration, Livna Display Configuration. The driver installation does automatically update the X.org configuration file to use the new drivers, however. ATI owners will probably want to stick with the installed drivers if 3D works already, or try the 'kmod-fglrx' package.

Without the binary drivers it is not possible to get hardware 3D support on Nvidia chipsets, but if you do not want to use Compiz or run any 3D applications (mostly games), this should not be an issue.

Once the 3D drivers are installed, enable Compiz by selecting System, Preferences, Look and Feel, Desktop Effects. Here you can choose to enable the desktop cube effect or wobbly windows. If you are a Compiz fan, it is a better idea to stick to Ubuntu for now, as it has a newer version with better configuration options.

Adobe Reader, one of the third-party applications available for Fedora

If you would like to install Google Earth, you must download the package manually from <http://earth.google.com>. Save the file `GoogleEarthLinux.bin` to the desktop. Now right-click on its icon and select Properties, followed by the Permissions tab, and mark the file as executable. This is a necessary step for arbitrary downloaded executable files for security purposes.

Now simply double-click the icon and accept the defaults in the installation pop-up window. 3D graphics support is required for Google Earth to run (see screen 3).

More settings

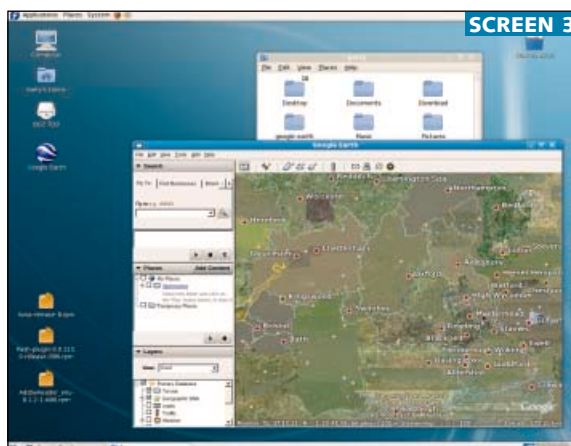
The language settings during installation only configure the basic keyboard layout. To change the system language from US English, go to the System, Administration, Language menu and select as appropriate. For a more specific keyboard layout, select System, Preferences, Hardware, Keyboard. In a UK installation, 'Generic 105-key (Intl)' will be chosen, which is fine for most

'Fedora is perhaps the most pioneering distribution when it comes to new technology'

circumstances. If you have an extended keyboard with multimedia keys, you may be able to enable them in some applications if your model is present.

The file manager, Nautilus, opens a new window by default for every folder you access. It also remembers the position and size of the window when you later access the same folder. Some people like this behaviour, while some loathe it. To change to the more common

Fedora 8 desktop, here running Google Earth



single-window file browsing, go to the Preferences menu from any file browser window and select the Behaviour tab. Here select the 'Always open in browser windows' option.

Fedora 9

As you read this, Fedora 9 will be available as the latest release. The timing of the release is close to Ubuntu 8.04, and so many features are shared between the two. The Gnome desktop is 2.22, the same as Ubuntu 8.04, and this brings many new enhancements, such as a new network-transparent virtual filesystem (GVFS), support for Google Calendars in Evolution, a new remote desktop viewer, the Policykit security framework, better DVD support and Youtube searching in Totem, and almost countless improvements in stability, speed and additional minor features. See www.gnome.org for more details of the new features.

Firefox 3 likewise replaces version 2, which brings considerable speed and memory benefits over the previous version, as well as better web standards support.

As above, Fedora tends to be a bit more 'bleeding edge' than Ubuntu, and this hasn't changed with Fedora 9. Encrypted filesystem support is available at installation, and the ext4 filesystem is supported as an experimental feature. The installation can now resize ext2, ext3 and NTFS filesystems, making it easier to set up dual or multi-boot systems.

Network Manager has a version bump, providing better network switching and sharing capabilities. Also at the latest version is X.Org, with significant work going into seamless hot plugging of new displays and resolution switches, as well as faster startup and shutdown times.

For KDE users, the latest KDE 4.0 release comes as standard, with some fall-back packages from KDE 3.5 for those that are not yet released or stable enough in the 4.0 series. Fedora is the first distribution to offer KDE 4 as standard.

Upstart, developed by Canonical for Ubuntu, makes its way into Fedora to improve startup flexibility and performance. At the lower level, the brand new gcc 4.3.0 is provided, with the latest 2.6.5 kernel. All these features make Fedora 9 an exciting release, especially for those who want to try out the most recent software. **PCW**



Ken McMahon is a freelance journalist and graphic designer. His involvement with digital cameras began with a Commodore 64. He graduated to Macs and now works mostly with PCs.

→ Comments welcome on the Digital imaging & video column. Email digitalimaging@pcw.co.uk Please do not send unsolicited file attachments.

DivX deconstructed

Delve into the DivX video codec plus DivX Converter, Pro and Author

Someone once said you can never have too many fonts. I'm not sure I'd agree and, if you substitute video codecs for fonts, I think you'll have a hard time finding anyone who'd go along with it. The profusion of video codecs means that you can be confronted with a difficult and confusing choice when it comes to outputting video – DV, HDV, MPEG1, MPEG2, MPEG4, H.264, DivX, Xvid, WMV, Real Video. What's the difference between these formats?

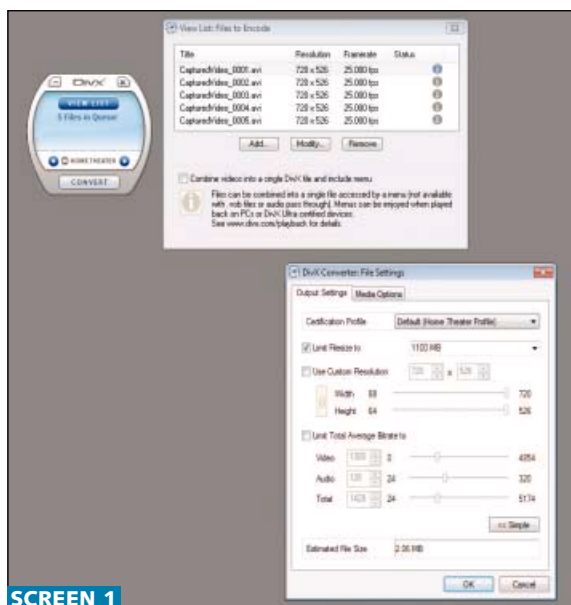
In some cases the answer is very little; DivX and its open-source rival Xvid are both MPEG4 codecs, as is Nero's AVC. Having said that, there are quality differences between them at given compression rates and, if you're planning to produce content using these codecs, the availability of editing tools can be a problem.

This month I'm going to take a look at DivX, a commercial codec that's increasing in popularity, gaining support among hardware manufacturers, and adding new features and affordable authoring tools to its stable of products.

Modern codecs such as DivX are designed to be versatile. They can encode at a variety of frame and bit rates and apply varying degrees of compression, which means you can use a single codec to produce output for a variety of destinations.

The one thing that DivX has gained a reputation for is being able to produce good-quality video at high rates of compression, which makes it ideal if you want to cram a lot of video into a limited storage space. If you're travelling and want to take your video collection with you for playback on a notebook PC or a PDA, then DivX provides everything you need.

The first thing you need to do if you want to use DivX is visit the website – www.divx.com – and download DivX for



SCREEN 1

Windows 6.8. DivX is also available for Mac OSX. The free download includes the DivX codec, standalone player, web player, and 15-day trial versions of both DivX Converter – an easy-to-use transcoder application – and the DivX Pro codec, an advanced version of the DivX codec with preset encoding modes for video quality up to 1080p HD. The full version of the DivX Pro codec costs £10.99 and is a worthwhile buy, particularly if you want to produce HD resolution content at relatively small file sizes.

While you're at it, you should also download the trial version of DivX Author. This is a new application that, as well as encoding video in the DivX format, provides tools for authoring DVD-style menus. The menus can be used to navigate between movies and to jump to chapter points within them.

Using DivX Converter

The great thing about DivX Converter is its ease of use. Once you've decided on the conversion profile to use, all you

need to do is drag and drop files onto the applet, click the Convert button and the rest happens automatically (see screen 1). Five profiles are available: Home Theatre, HD 720p, HD1080p, Qmobile (for PDAs and smartphones) and Mobile (for phones with basic video playback facilities).

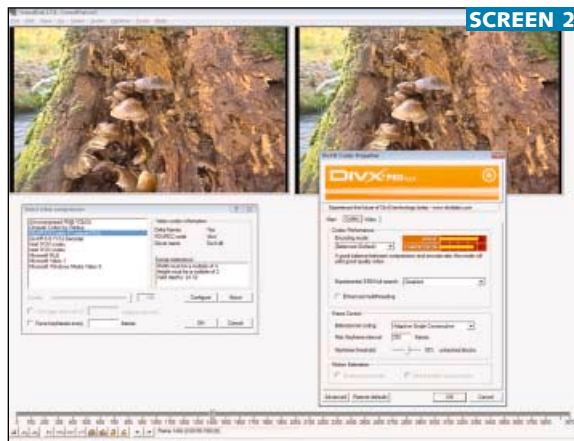
The Home Theatre profile encodes at full original resolution, up to a maximum 720x576 with a maximum average bit rate of 4,000Kbits/sec. Though there's no custom conversion option, you can edit the settings of any of the preset profiles if you wish.

The Output Settings window provides both Simple and Advanced configuration options. In Simple mode there's a pop-up menu that provides a choice of file size options with helpful names, such as DVD-R (1,100MB), so if you've got four movies to fit on a DVD-R, the choice is obvious.

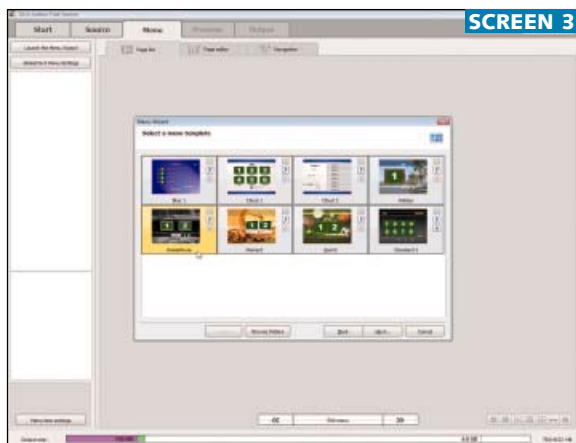
In addition to the limit file size options, the Advanced configuration panel provides custom resolution settings and allows you to individually define average bit rates for video and audio. There's also an audio tab in which you can select from multiple tracks where available and choose subtitle tracks. An option to maintain AC3 encoded audio if

Conversion to DivX is quick and easy with the Converter

The DivX Pro Codec allows you to export from other apps



SCREEN 2



the output settings profile supports it is also provided.

If you want to use DivX Converter to convert video on DVD you need to pay an extra £5.49 for the MPEG2/DVD plug-in. There are alternatives, one of which is to get DivX Author (see below), which, as well as allowing easy incorporation of DVD material, provides DivX menu authoring tools. Alternatively you could use DVD conversion software, such as AutoGk www.autogk.me.uk.

DivX Pro with other apps

To access all the features of the DivX Pro codec, select DivX as the file export or output option from your video-editing application. Screen 2 shows the DivX Pro Codec in use with Virtualdub.

The Main encoding panel provides the same output profiles as the Converter but beyond that there are more advanced configuration options. The default settings provide single-pass encoding at a bit rate determined by the selected profile.

If you want to work out your own bit rates, there's a handy bit rate calculator that calculates it on the basis of duration and required file size, and enters the results into the codec configuration panel.

Below that a quality/speed slider can be used to set the degree of compression. Alternatively this can be selected from a pop-up menu on the codec pane, where you'll find other advanced options. These include options for increased encoding performance on suitable hardware – Enhanced multithreading and Experimental SSE4 take advantage of features in Intel Core 2 and Penryn processors.

The video pane includes tools for resizing and cropping as well as some video-processing filters. There's a

DivX Author provides a good set of templates

choice of noise-reduction filters, de-interlacing options and something called Psychovisual enhancements, which turns out to be considerably less weird than it sounds. The DivX psychovisual enhancement system manipulates the compression process to mask artifacts where they are least likely to be spotted.

DivX Author

DivX Author is a new application that, like DivX Converter, transcodes video into the DivX format – but it also allows you to add DVD-style navigational menus so that you can easily locate video content from multiple clips on a DVD or hard drive. DivX menus are only supported in the DivX software player or on hardware DVD players that carry the DivX Ultra Certification sticker.

In DivX certified players the content may still play, but the menus won't be available (see the DivX certification box on the right for further details).

DivX Author makes it very simple to add source video content from your own DVDs, DVD-VRs and other sources. You can include existing chapter points and add new ones. For example you could add the contents of four DVDs to one DivX disc with a top-level menu enabling the selection of any one of the four, and navigation beyond that containing the existing movie chapters.

DivX Author is very similar in functionality to the DVD authoring modules of video-editing applications such as Ulead Videostudio, Pinnacle Studio and Adobe Premiere Elements.

DivX certification

There are two levels of DivX hardware certification – DivX Ultra Certified means that players will play the new breed of DivX files with built-in DVD-style navigational menus. These files have the extension .divx and can be produced by both DivX converter and DivX Author, the latter providing menu-editing tools.

DivX Certified indicates that a player will play DivX encoded clips, which usually have the .avi file extension. You may also be able to play .divx files in a DivX Certified player – the menu will be ignored but the movie files themselves will play in sequence. If a DivX Certified player won't play .divx files and you authored the disc yourself you can remedy the situation by renaming the .divx file to .avi and reburning the disc.

It provides a good selection of customisable design templates and will automatically produce a complete menu structure with all the necessary navigational elements, from a selection of clips with predefined chapter points.

DivX Author lacks tools for burning movies to DVD, instead it writes a .divx file to your hard drive, which you can then burn using the free DivX player or your preferred disc-burning utility. **PCW**

Xvid – the open-source alternative

Xvid (www.xvid.org) is an open-source competitor to DivX, published under the GNU General Public License. It runs on Windows, Mac OSX and Linux. Like DivX, Xvid is based on MPEG4.

There's a bit of complicated history and there's more than one version of events. The short version is that DivX Networks, (now DivX, Inc) the company that produces DivX, started a project, called Project Mayo, to develop an open-source version of DivX. Some time later, many of the participants in the project, having become frustrated at the lack of progress, went off to start up their own open-source project which was to develop into Xvid.

Unlike DivX, Xvid is a codec only – it doesn't come with a player, or conversion

and authoring tools, so you need to use third-party tools for playback and video conversion. Fortunately there's no shortage of those and many are freeware, shareware or budget items. Take a peak at Virtualdub, www.virtualdub.org, Gordianknot <http://sourceforge.net/projects/gordianknot> and its simpler automated sibling AutoGK www.autogk.me.uk.

Alternatively, any commercial video-editing and encoding software you use should work, providing you have the codec installed. The same goes for playback using your preferred player and, of course, the DivX software player and DivX certified DVD players will also play back content encoded with Xvid.



Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Word processing column.
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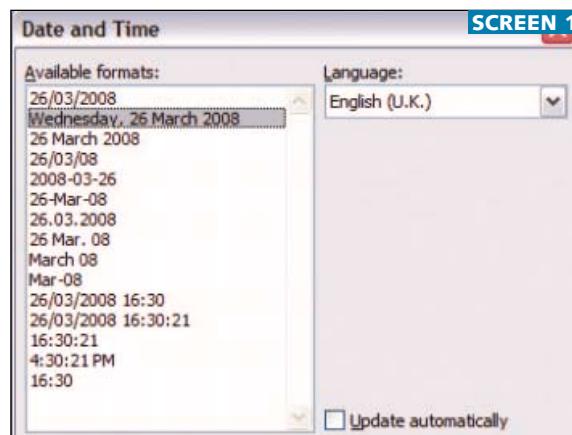
Play the dating game

How to set a default date in Word, plus a word count conundrum

In May last year we looked at various ways of inserting dates into Word documents. To recap briefly, if you use Insert, Date with the Automatically Update box unticked the current date or time will appear as unchanging text – just as if you had typed it in. With the Update box checked, then a date field is inserted instead, which will update to the current date or time automatically when the document is saved, printed or re-opened or if the field is manually updated. Usually, say when writing a letter, you don't want this to happen, but there's a neat way to get the best of both worlds. If you Insert, Field, (in 2007, Insert, Quick Parts, Field) and choose CreateDate, then save as a template, all documents based on that template will appear with the creation date of the document (ie the date or time the document was first saved) rather than that of the template. Although the creation date is a field, it won't ever change.

One useful trick in Word is that you don't have to choose a date and time format every time you insert a date. You can select any of the available formats and click the Default button. Next time you insert a date, this format will be pre-selected, though you can override this by selecting a different format (see screen 1).

Openoffice Writer offers similar facilities in a more roundabout way. If you Insert, Fields, Date, you'll get a plain dd/mm/yy (eg 11/06/08) date that will stay fixed. For more options, go to Insert, Fields, Other, turn to the Documents tab, and select Date from the list on the left. In the middle column you'll find a choice of Date and Date (fixed) that corresponds to the Word 'Automatically Update' option, and in the right column a wide choice of formats (see screen 2). There's also an intriguing 'Offset'



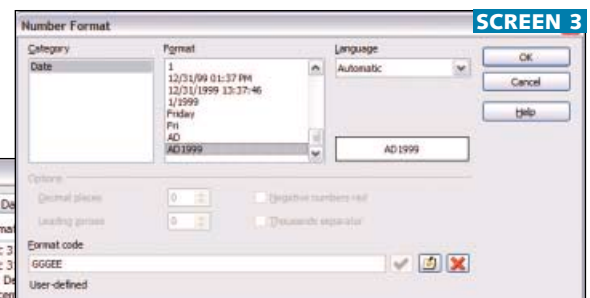
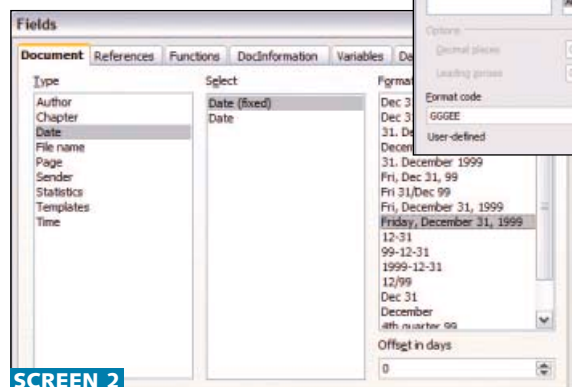
option where setting this to 1 will produce the next day's date, and -1 the previous day, and so on. If you don't see what you want in the list of formats, scroll down to the bottom of the list and choose 'Additional Formats...'. This produces another dialogue giving a slightly longer list, but you also get the opportunity to design your own formats – with comments – and add them to that list (see screen 3). If you press the Help button you'll find you can use week numbers, weekday names, quarters, eras and so on.

What isn't present is a way of setting the default date or time format – Insert, Fields, Date always produces the dd/mm/yy style. One way round

is to start the macro recorder, insert the date in the required format as above, then stop the macro recorder. Writer will prompt you to name and save the macro, so you could call this 'Today' and save it in My Macros, Standard. Having done that, go to Tools, Customise, Menus. Choose the Insert Menu, then click the Add button. In the 'Add Commands' dialogue, choose 'OpenOffice.org Macros', and navigate down until your Today macro appears in the right-hand pane. Click Add, close the 'Add commands' dialogue, OK out of the Customise dialogue and your Today macro will be on the top level of the Insert menu, giving you the date in the format you recorded. You can also use the Customise dialogue to put the macro on a toolbar or assign a key combination.

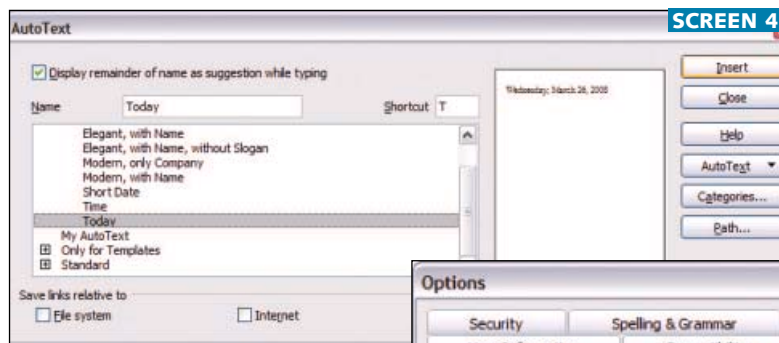
Another, easier way is to set up an Autotext entry. Insert the date field in the desired format, then select it. Go to Edit, Autotext, type a name for the Autotext entry – you could use 'Today' again. Writer will suggest a one-letter shortcut – T – which you can accept or change. Click on the

Setting the default date format in Word will save you some time



Left: Choose a date format in Openoffice...

...or craft your own (above)



SCREEN 4 You can set up an autotext date in Openoffice

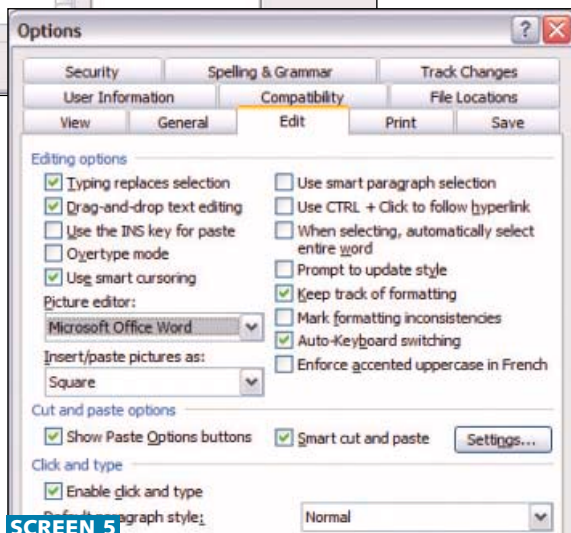
Autotext button and choose New (to keep the font formatting of the selection) or New (Text only) to keep just the contents (see screen 4). Close the Autotext dialogue, and you'll be able to insert your date in the chosen form by typing the shortcut letter(s) followed by F3. Shortcut letters are not case-sensitive.

The real word count

Like most columnists, I can't just waffle on as it suits me. Although it may seem like that at times, in fact this column is constrained by a word count target, and if you're really at a loose end, you'll find there are 1,500 words in the column, give or take a few. But what counts as a word?

If you run Tools, Word Count you will get one answer. If you run the Spelling and Grammar checker with the Readability Statistics you'll get a different one. If you select all, copy and paste into Notepad, then copy back from Notepad into a new, blank document you may get a third figure. And other word processors have other foibles – according to Openoffice, last month's column is 41 words longer than Word reckoned. Abiword made it eight words fewer, and Lotus Symphony generously tacked on more than 200 extra words. I pasted the text into the online word counter at www.wordcounttool.com, which added a mere 38 words. These experiments took place with a document unsullied by headers, footers, endnotes or footnotes.

Some of this is explicable. If you create a Word document containing a bulleted or numbered list, each bullet counts as a word, which makes some sense. Until you run the Readability Statistics and then you'll find they are not counted. There are obviously other discrepancies, so if any sharp-eyed readers have spotted any, I'd be grateful for the chance to share that information with the rest of the readership.



SCREEN 5

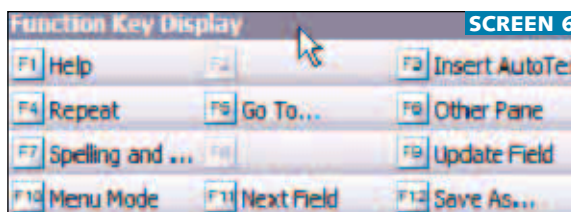
Backing up all your options can be made easier

Save settings – the easy way

Word 2003 and earlier has a wealth of customisable material under Tools, Options. Everyone will have their own preferences, such as increasing the number of recent files, turning off fast saves and using smart paragraph selection. Unfortunately, this information, which is stored in the Windows Registry, has been known to go astray, and restoring your finely crafted preferences means wading through 10 or 11 tabs, each of which contain up to 20 options (see screen 5). So here is a quick and easy way to save and restore those options that doesn't involve any direct dealings with the Registry.

Start Word and create a new, blank document – that is, one based on Normal.dot. Go to Tools, Macro, Record New Macro. Give it a name – such as SaveMySettings – and make sure it's stored in 'All Documents (Normal.dot)'. Click OK to start recording. Now go to Tools, Options. Click through each tab in turn, and when you've done this, click OK to close the Options dialogue. You can

A cheat sheet for the function keys



SCREEN 6

now stop the macro recorder – there should be a tiny toolbar somewhere on the screen, or you can go back to Tools, Macro, Stop Recording.

Although you may not be aware of a great sense of achievement, if you go back to Tools, Macros and edit the macro you have just recorded, you'll find that you've created up to 250 lines of code – the number varies with the version of Word. Although you didn't change anything, the macro recorded the state of each tab. Should your settings go missing, running the macro will set them back to the state when the macro was recorded.

Tool Tips or TOOLTIPS?

Here's a bizarre little Word foible that regular correspondent Jean Elliot brought to our attention. If you record a macro in Word 2003 or earlier, you are first prompted to give it a name and optionally assign it to a Toolbar or Keyboard shortcut. If you give your macro name in the format 'WordCount', for example, and assign it to a Toolbar, hovering over its button will produce the tooltip WORDCOUNT. However, if you assign the macro to a toolbar after recording it, or assign an existing macro created from code to the toolbar, it appears as the more elegant 'Word Count' – with a space before the uppercase C. As it is rather more effort to assign a macro to a toolbar after recording, Jean wondered if it were possible to get recorded macros to show the more elegant version. It is possible to write a macro to change a tooltip, but this involves even more effort than going via Tools, Customise. If any reader has a better idea, we'd be glad to hear it.

Cognitively dysfunctional

It's a great thing having all those function keys in Word whose behaviour can be modified by holding down one or more of the Shift, Alt and Control keys. What isn't so great is trying to remember them all, especially when there's no menu equivalent, such as the various F9-related field operations. With Word 2000, XP and 2003, there's a discreetly hidden toolbar to help. Go to View, Toolbars, Customise and on the Toolbars tab tick 'Function Key Display'. Close the Customise dialogue and you'll have a neat little toolbar that not only duplicates the function keys, but shows exactly what they do – press a modifier and the button labels change to suit (see screen 6). **PCW**



Stephen Wells is a freelance journalist and a regular contributor to computer magazines. He's been writing PCW's Spreadsheets column for over 10 years.

→ Comments welcome on the Spreadsheets column.
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Dig out facts with D functions

Explore how Excel's D-lovely functions can make array formulas redundant

With the hundreds of functions already included, why does Excel also offer a D series like DSUM and DCOUNT?

It's because when you analyse a table they eliminate the need to create complicated array formulas – those are the ones that are entered with Ctrl & Shift & Enter instead of just Enter. Excel adds curly brackets to the entry to acknowledge recognition of the array.

`{=COUNT(IF(MONTH(Date)=5,IF(`

`(Date="May",1,0)))}`
 (Key: ↵ code string continues)

for instance could be replaced by `=DCOUNT(Expenses,"Date",May)` Delightful! Though actually D stands for database.

A snippet of a simple table recording a travelling salesperson's expenses could look like screen 1. It's pretty dull as it stands but, by using a few D functions, a manager can glean useful information. Although the following may seem a lot of work for a small table, similar formulas can provide comparable answers from a big database. For simplicity, all places visited are listed under City although some of them are towns.

First change the worksheet name on the tab to Table. Then it simplifies things if you create a few Names. Highlight the complete table, A1:E15. In the Name box at the left of the Formula Bar type 'Expenses'. Press Enter.

What's in a name?

Excel offers various ways of creating Names. For this example we can try a few more. To make a Name out of the label 'Hotel' just highlight the Hotel range of the table, including the label, and press Ctrl & Shift & F3. A dialogue will appear with the default position 'Create Names from values in the top row'. Click OK and the job's done.

	A	B	C	D	E	F
1	Date	City	Meals	Travel	Hotel	
2	Mar 31	Plymouth	32.55	14.78	117.00	
3	Apr 1	Southampton	25.63	23.55	128.00	
4	Apr 2	Southampton	34.55	12.99	127.99	
5	May 10	Southampton	29.88	30.01	127.98	
6	May 11	Portsmouth	63.32	5.00	111.00	
7	May 12	Brighton	52.36	23.45	89.00	
8	May 13	Brighton	78.90	12.65	88.50	
9	May 14	Southend	29.33	24.11	98.00	
10	May 15	Southend	35.44	17.88	97.99	
11	May 16	Chelmsford	64.11	21.01	114.00	
12	May 19	Ipswich	45.99	11.99	121.00	
13	May 20	Ipswich	47.88	23.21	120.99	
14	May 21	Norwich	89.22	20		
15	May 22	Norwich	78.91	19		

SCREEN 1

Left: Part of a record of a travelling salesperson's expenses

As ever, Excel 2007 includes a more complicated way of creating a Name. Highlight everything in column B, including the label. Press Alt and let go. Some little capital letters appear at the top of the screen. You then type in a sequence of these letters, in upper or lower case. Type 'm' and then 'c' (without the quotes) and the same dialogue box appears as in the previous paragraph. Press OK as before.

Just to check that you have indeed created a Name, highlight the values, but not the label, in column B and the Name 'City' will appear in the Name box.

Here's another way of doing it. Highlight the values, but not the label, in column C. Right-click the mouse and the New Name dialogue box can be displayed. The Name 'Meals' will be at the top and the correct range will be given at the bottom. Again, just press OK. Create a Name for the Travel values using the method of your choice.

Names can also be used for little formulas that D functions won't accept as arguments. Go to another sheet. On the tab call it 'Info'. In the cells A13 to A17 type in City, Plymouth, Southampton, Portsmouth, and Brighton respectively. Name the range A13:A17, Southern.

In D13 enter "Date", including the quotes. In D14 enter:

	A	B	C	D	E	F	G	H	I	J	K
1											
2										11	
3										7	
4										£ 36.10	
5										£ 30.02	
6										Brighton	
7											
8											
9											
10											
11											
12											
13	City	"Date"	City	City	Hotel					£ 88.50	
14	Plymouth	FALSE	Brighton	Southampton							
15	Southampton										
16	Portsmouth										
17	Brighton										
18											
19											

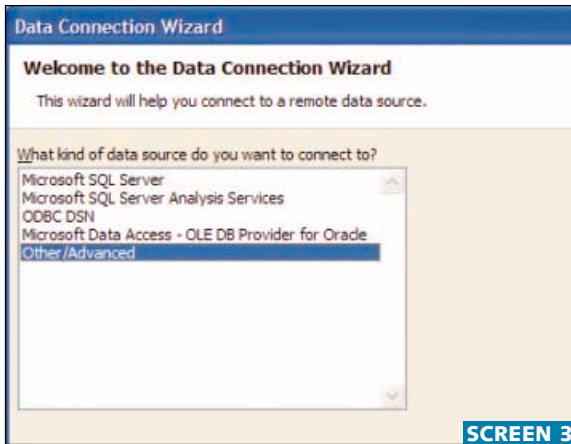
Below: Querying the data with D functions

SCREEN 2

`=Table!A2>DATE(2008,4,30)`.

Name the range D13:D14 'May'. In cells F13 and H13 enter 'City'. Type 'Brighton' in F14 and 'Southampton' in H14. Name F13:F14 'Brighton' and H13:H14 'Southampton'. Type 'Hotel' in J13. Enter `=MIN(Hotel)` in J14. Name J13:J14 'Rates'. Now you can start asking some questions. In this example, the answers are in column J of the Info worksheet (see screen 2).

It's optional to type in the questions. Here it says in A2: How many business days of the trip were in May? In J2, as mentioned at the start, you could enter the array formula `{=COUNT(IF(MONTH(Date)=5,IF(` (Date="May",1,0)))} but it's simpler to take advantage of the relevant D function and enter `=DCOUNT(Expenses,"Date",May)` The three arguments of the function are Database, Field, and Criteria. The database here is named expenses. The field is the label "Date" in quotes



to differentiate it from a Name. The criteria is the Name, May. The answer either way is 11.

Cell A3 asks “How many days were spent in the Southern Region?” This covers Plymouth to Brighton. In J3 enter

=DCOUNT(Expenses,1,Southern)

Note that a column can be referred to by its column number in the table, as well as by its field name. The number of days was 7.

“How much was spent on travel in Brighton?” is asked in cell A4. The answer is £36.10 and is provided by the entry in J4

=DSUM(Expenses,4,Brighton)

If the manager wants to know “What were the average daily meal expenses in Southampton?” he would enter in J5

=DAVERAGE(Expenses,3, Southampton)

to find the answer is £30.02.

He might also be interested to know which city had the lowest-priced hotel. Cell J6 has the formula

=DGET(Expenses,2,Rates)

and gives the answer as Brighton. The DGET function is useful for extracting a single value from a table but it does have a little flaw.

If more than one record matches the criteria it returns, #NUM!, indicating an error. One way around this is to avoid duplicate entries in a column, even if it's only by one penny. This is not very professional but it is permissible.

There are 12 D functions available. They are specifically designed to work with databases. They all work within a field of a database that matches the criteria you specify.

DCOUNT, DSUM, DAVERAGE and DGET have all been demonstrated above. DMAX and DMIN find the highest and lowest value in a field you specify. With a

A wizard helps you download other databases

list of dates they will provide the latest and earliest.

DCOUNTA counts the number of nonblank cells in a field. DPRODUCT, DSTDEV, DSTDEVP, DVAR, and DVARP all work in the same way as their equivalent without the D except they all use the three arguments, database, field, and criteria.

Actually, it's a better description of Excel's flat-file database to call it a list. It's not relational like Microsoft Access. However Excel has the feature to query external databases so I should mention it. Under the Data tab in Excel 2007 there are four buttons in the Get External Data group.

The first button is 'From Access'. Click that followed by the New Source button and the Data Connection Wizard starts (see screen 3). It offers to help you connect to a Microsoft SQL (Structured Query Language) Server, or Microsoft SQL Server Analysis Services; ODBC (Open Database Connectivity) DSN (Data Source Name); Microsoft Data Access for

'Note that a column can be referred to by its column number in the table, as well as by its field name'

Oracle; and Other, which offers a dozen more ways of connecting.

The 'From Web' button opens the New Web Query dialog box and provides a place to enter the website carrying the database. The 'From Text' button opens the Text Import Wizard with its many options.

The 'From Other Sources' button offers similar connections to the other buttons. Whether you want to import a database from a network or the web, from Excel, Access, Dbase, Foxpro, Oracle, Paradox or text-based databases, Excel makes it easy to do so.

Other ways of looking at it

I mentioned at the start that this month's example shows just a snippet of a larger table, and the objective was to call attention to the special database functions in Excel. But if the record of a travelling salesperson's expenses was this short there is a faster way of answering some of the manager's questions.

If using Excel 2007, click in the table. Under the Data tab, click the Subtotal button and fill in the displayed dialogue box so it reads 'At each change in: City, Use function: Sum'. Under 'Add Subtotal to' check the boxes beside Meals, Travel, and Hotel. Also check 'Summary below data'. Click OK and immediately you have the total cost of meals, travel and hotels in each city (see screen 4).

The table is also outlined. To the left of the column letters you'll see a small 1, 2, 3. Click on the little 2 and the detail is gone. Just the totals for each category of expense for each city are displayed, with grand totals at the bottom. To display the detail again, click the little 3. To show grand totals for meals, travel and hotels, click the number 1.

If you wanted to see the maximum spent in each category for each city just click the Subtotal button again and change 'Sum' to 'Maximum' in the 'Use function' box.

If you don't check the 'Replace current subtotals' item then you'll see both the subtotals and the highest amount in each category for each city.

To see the expenses for only the days of the trip in March and April you could click within the table, click on the Sort & Filter button under the Home tab. Then click the down arrow by the Date field name and in the displayed filter box just put a check against March and April. **PCW**

	Date	City	Meals	Travel	Hotel
1					
2	Mar 31	Plymouth	23.55	11.78	117.00
3		Plymouth Total			117.00
4	Apr 1	Southampton			128.00
5	Apr 2	Southampton			127.99
6	May 10	Southampton			127.98
7		Southampton Total			383.97
8	May 11	Portsmouth			111.00
9		Portsmouth Total			111.00
10	May 12	Brighton			89.00
11	May 13	Brighton			88.50
12		Brighton Total			177.50
13	May 14	Southend			98.00
14	May 15	Southend			97.99
15		Southend Total			195.99
16	May 16	Chelmsford	64.11	21.01	114.00
		Chelmsford Total	64.11	21.01	114.00

Adding subtotals to the table in a few clicks



Nigel Whitfield edited computer magazines before going freelance in 1995. A specialist in internet and consumer issues, he has a degree in Computing Science from Imperial College.

→ Comments welcome on the Web Development column. It returns in the September issue.
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Take control of your server

In order to build a website, you'll need to get to grips with your web server

Creating web pages is very often only a small part of putting together a website these days. As we've seen over the years, there are many other things you will need to do besides putting together a bit of HTML, such as writing web applications and scripts using tools like PHP or Perl, creating style sheets with CSS and designing your graphics.

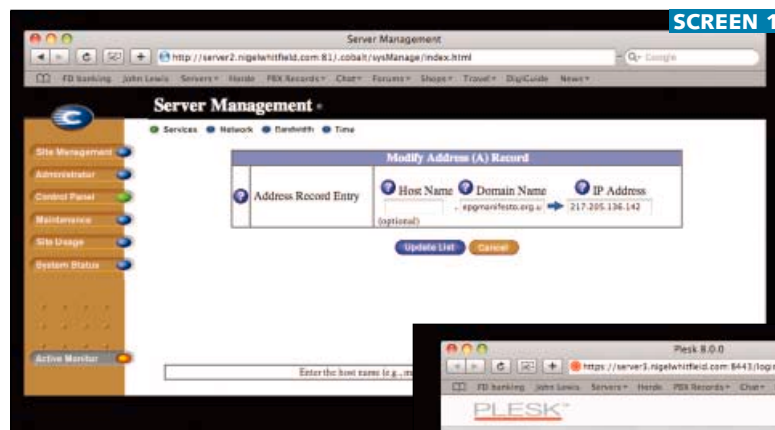
There are other tasks too, which we've touched on briefly, and though they might not be things you'll have to do every day, if you do a lot of web design and have sites that attract lots of users, you'll probably have to think about them at some stage. Chiefly, that's the more 'administrative' side of things, such as registering domain names and sorting out web space.

Simple solutions

If you have a very simple website, chances are you'll be happy enough hosting it in the free space that comes with your internet access, or one of the many free hosting sites available online. But if you want to do anything remotely professional, sooner or later – and it'll save a lot of pain if it's sooner – you'll have to consider setting up proper hosting for your own site.

This is where things can start to become complicated. We're not going to look at all the options you need to consider when you choose a web host, but rather at the different tasks you may need to get to grips with if you choose anything other than the most basic hosting arrangements.

By those, we mean the sort of package where you approach a hosting company, or a domain registration outfit, and say: "I want to buy this domain and I need somewhere to host the pages too." You can typically do this either way round – buy a domain and add hosting, or buy hosting and



Left: It's a good idea to set both yourdomain and www.yourdomain to the same IP address so that users can omit 'www' if they wish

get a 'free' domain name. Either way, the net result is often much the same – you'll get the domain set up and receive an email with the details of how to log in to the web server via FTP or SFTP and upload pages, without having to do much more configuration after that.

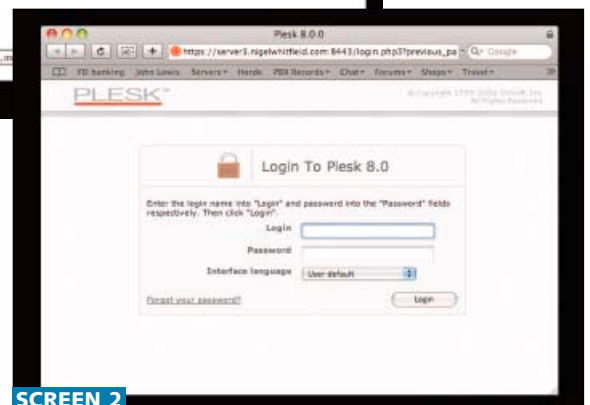
Self service

Once you start to go beyond that, though, you'll find that unless you're prepared to pay for a lot of hand-holding, you'll have to set up quite a few extras yourself, which means getting to grips with server management, DNS, databases and

'If you want to do anything professional, you'll have to set up proper hosting for your own site'

various other things. This is what we'll be looking at in this month's Web Development column. In short, you've bought a domain name, so what do you need to do next?

We'll assume, for the sake of argument, that you've rented a dedicated server, based on a Linux platform; it's a common type of

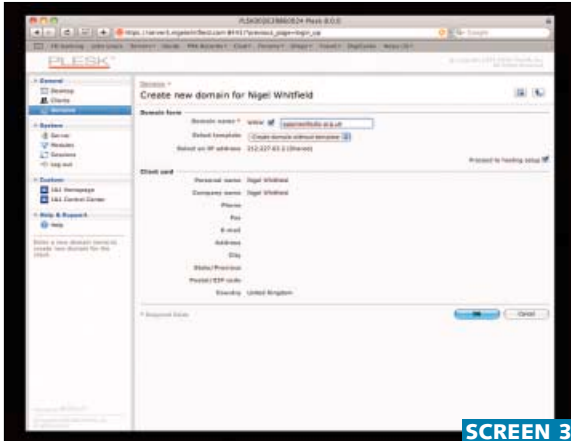


Bookmark the Plesk sign in page – it's the gateway to managing your web server

hosting and these days you can acquire such a server very cheaply. In fact, at the bottom end of the market, it may not be a truly dedicated piece of hardware – for which you'll usually have to pay around £50 a month – but a virtual machine. Nevertheless, the principles are fairly similar.

The server will typically come with the Apache web server, scripting languages such as PHP, and a database server, which is most likely to be MySQL. It's likely to come with mail server programs in case you want to set up mailboxes or lists as well, and there'll be FTP or perhaps even Linux shell access to the system. And you're most likely to end up with a welcome email that gives you a web address, a user name and a password.

So what on earth do you do next? If you're new to arranging hosting, it can be quite bewildering.



Control panel software

In the main example here, I've used the Plesk web admin system, which can be irksome; I find the way it handles some DNS settings annoying, for example.

A few years ago, many users would have been familiar with the interface of Cobalt's RaQ series, which was one of the first 'web appliances' that found its way into countless server farms. RaQ is long

gone now, but replacements such as Blue Quartz have kept the interface alive. Other alternatives include CPANEL, which is offered by many web hosts.

If you have a particular favourite interface that you find useful, or tips and tricks to share with other PCW Web Development readers, please drop me a line and I'll share the info in a future column.

First steps

First things first: your server is likely to have a domain name that means nothing to you, although it will be more useful to the technical support team – it will tell them where to find it in the equipment rack. But the IP address is all important; on a cheap hosting package, you'll probably only have one, but you may have been allocated more.

Essentially, you can share an address between many websites, but you can only have one secure certificate on each, so if you have two websites that will need https, you'll need two IP addresses.

Stage one is making sure that your domain name points to your web server; we're not going to worry about email at the moment. Conventionally, you'll want **www.yourdomain.wherever** to point to the web server, but you might also want to arrange it so that people can access your site without the 'www'. So, you need to log in to the web control panel for your domain registrar, and – depending on the options on offer – add an 'A' record for 'www', the name of the host, and give the IP address of your new server. You may simply have a 'web forwarding' option, and if that allows you to enter an IP address, then enter the one that's allocated to your server.

If you want the site to be accessible without the 'www', add an 'A' record for just the domain name itself, with the same address; you can see this in screen 1, where the entry is being made into the DNS control panel of a Cobalt RaQ server (see box).

Now, once the updates to the DNS take place, if someone types in the name of your website, they'll be taken to the home page of your web server – and they'll most likely see a basic 'under construction' or 'just registered' page. That's because the server won't

Creating a new domain in Plesk is just a matter of form filling

have a clue about which domains it is supposed to provide pages for.

When a web browser requests a page, it contacts the server and passes the name of the file it requires, as well as the domain – so you have to tell the server to respond to the domain name as well.

How you do this will depend on the server admin tool you're using; for this part of the example, we'll use the Plesk system, which is on Linux servers from 1&1, one of the popular

'You can share an address between many websites, but you can only have one secure certificate on each'

web hosts. You first have to sign in to their control panel, which will provide you with the details of your server, and a link will take you to the server's own control panel. From there, you simply sign in to Plesk; if you bookmark the sign in screen (see screen 2), you can go there directly in future without having to bother with the 1&1 control panel.

In Plesk, you have to create 'clients', who then create domains.

You can enable or disable options such as PHP and disk quotas for each domain on your server

So, the first thing you need to do is click the Clients link in the left-hand pane, then Add New Client Account to create a client with your own name. You can choose which of your IP addresses on the server are available to which client; if you have more than one, add them all.

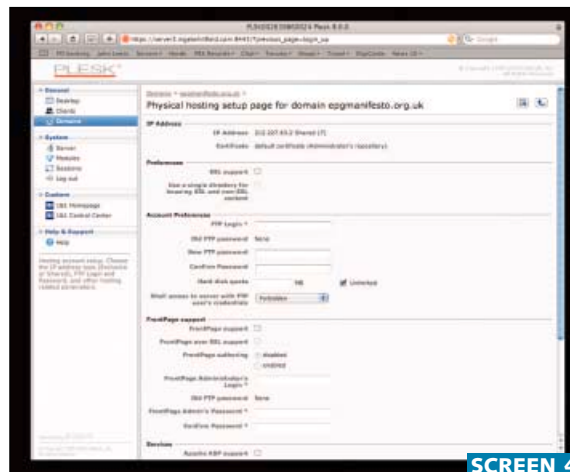
Now you're ready to set up a domain that will host your website. Click Domains, then Add Domain and then click on the link for your own client name. On the next screen, type just your domain name in the box, and make sure the 'www' is ticked to the left so that the pages can be accessed both with and without the prefix. Make sure there's a tick in the box for 'Proceed to hosting setup' (see screen 3) and click on OK.

On the next screen, choose 'physical hosting' to tell Plesk you want to host the web page on this server and click OK again. Now you'll see the hosting setup page, as shown in screen 4, where you can create an FTP user for uploading files to the site, set a disk quota and enable or disable other options, such as Linux shell access, PHP scripting, CGI and other options. Click on OK and your site's ready to run.

Afterwards, you'll see the admin page for the domain you've just set up; in this example, we had the DNS running on a different server, so you'll need to click on the DNS button and disable the DNS options in Plesk for this domain.

Alternatively, you could amend the DNS information via Plesk – and you'll have to tell your domain registrar that this server holds the DNS info, but that's a whole other topic.

In September's Web Development column, we'll look at how you can set up a MySQL database on your server, using the tools provided by Plesk and PHPMyAdmin. **PCW**





Alan Stevens has implemented and supported networks for over 25 years, working for IT vendors, system integrators and customers. He now mostly researches and writes about networking matters.

→ Comments welcome on the Networks column.

Email networks@pcw.co.uk

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Share folders and libraries

Explore the world of Windows Live Foldershare file-sharing service

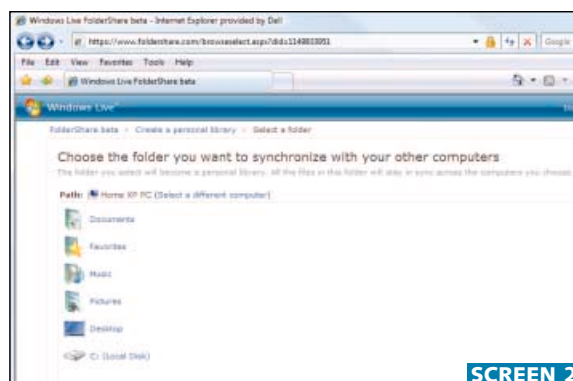
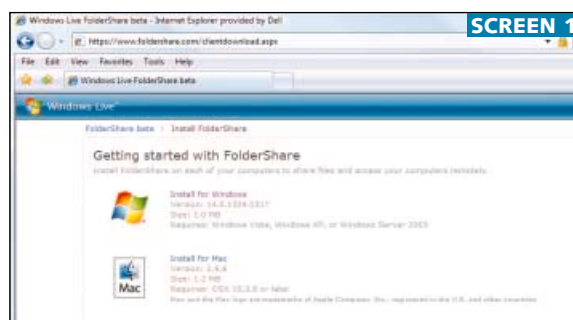
Microsoft recently announced a major refresh of its Windows Live Foldershare service. Of course, some of you may use the service already, but for those who don't, we'll look at what it offers, how it works and, just as important, some of the things it can't do.

Peer-to-peer sharing

Purchased from the original developer, Byte Taxi, back in 2005 and little changed since then, Foldershare is a peer-to-peer file-sharing and synchronisation service. A hosted Windows Live server manages access and co-ordinates all the synchronisation and transfers, which can be local (where the clients are on the same Lan) or over the internet, with security in each case provided by SSL and AES (Advanced Encryption Standard) encryption.

Foldershare is free and offers a number of useful facilities. For example, it allows you to synchronise documents held on a home or office desktop with those on a notebook when travelling. Any changes made while out and about can then be automatically applied to the desktop PC and vice versa, with manual updates if preferred. You can also give friends and colleagues access to your Foldershare libraries with either automatic or manual synchronisation. It's also possible to remotely access a computer that's logged onto Foldershare and get to all of its files from any other system, via an internet connection and a browser.

The latest refresh doesn't really add any more functionality beyond this, but Foldershare's website is now more efficient. The GUI has been updated to match those of other Windows Live services and the Foldershare client redesigned to make it simpler to use,



with full support for Windows Vista also added.

Getting started

The first thing you have to do is install the Foldershare client onto an initial PC – typically a home or office desktop system – containing the documents you want to share and synchronise.

Simply browse the Foldershare website (www.foldershare.com), then click the Getting Started button to go to a download page with links for both Windows and Apple Mac clients (see screen 1). Click the required link and either install the client directly or save it to disk and run it at your leisure.

Installation is quick and, once finished, there's a setup wizard to help complete the configuration. This will ask if you're signed up with a Foldershare account or whether you want to create a new one before

configuring the client to connect with those credentials. A taskbar icon is then started every time you log on to Windows, to show that the client is up and running. The same client can be installed on the other PCs you want to use, which would normally be configured to log on using the same Foldershare credentials. Management of the libraries through which folders are synchronised is then done via the Foldershare website.

From here, for example, you can create one or more personal libraries, either by choosing an existing folder on one of your client PCs (see screen 2), or by creating a new one.

It's important, however, to understand the mechanism involved as, despite creating what appears to be a library on the server, the data transfers needed to synchronise the contents are made peer-to-peer. Make a change to a file in a folder connected to one of your libraries and it will be replicated directly to the same file in similarly connected folders on other client PCs (see screen 3).

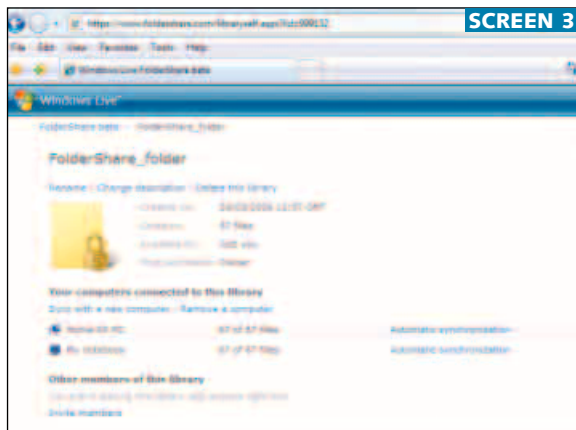
Nothing is held on the Foldershare server, which has a number of implications. Where files are being constantly updated, for example, Foldershare could generate a lot of unnecessary traffic. You could also run into update conflicts, especially if the files are used by other applications, in which case the use of folders dedicated to holding documents for sharing is arguably the best approach. It can also help with management as, with careful naming, you can make it clear that a folder has been associated with a Foldershare library rather than, say, using My Documents or other folders commonly used for other purposes.

Sharing libraries

To access personal libraries from different clients, you need to give them

Top: Clients for Windows and Apple Mac can be downloaded from the Foldershare website

Bottom: Libraries are connected to a folder on each client PC



access via the website then log on with the same Foldershare username (your email address) on each one. In addition, however, you can also opt to share libraries with other users.

Shared libraries are created and accessed in the same way as personal ones, by associating a folder on a client with a library on the Foldershare server. You then 'invite' other Foldershare users to connect to the library, and their client displays a pop-up to let them know what you've done. You also get a choice of access permissions depending on what you want invited users to be able to do (see screen 4). Readers, for example, can only view files while Contributors can only add new ones. Editors can view, add, change and delete content while Senior Editors are also allowed to change library permissions.

Finally, it's possible to remotely browse the complete file system on any of your clients from any internet-connected PC (see screen 5). All that's needed is to log on via the Foldershare website and any of your online clients will be accessible.

Performance will depend on the internet connections involved, but it's usually good. However, all you'll see will be the local file system, with no access to network storage even where it's mapped to a local drive letter. Hidden system files can't be seen either, unless the appropriate change is made on the client PC, and there are no facilities to run applications remotely. For that you'll need separate remote-control software or a hosted service designed to provide the facility.

Local control

And that's about it. For the most part, you manage everything to do with Foldershare via the website. However, the client taskbar applet does provide some local management and

Changes made to library folders on one PC are synchronised peer-to-peer with those on other clients

When you invite another Foldershare to connect to one of your shared libraries, you can control their access permissions

troubleshooting facilities. From its pop-up menu, for example, you can open the folders connected to Foldershare libraries directly, rather than having to navigate to them by other means. There's also a link to the Foldershare website, a status/activity monitor and a trash folder where any deleted files will be copied, in case you want to recover them.

A settings editor is another option and allows you, for example, to change any proxy server settings you might have and the way the Foldershare client works with Nat (network address translation) firewalls, although it doesn't usually have any problems in this area. You can also turn logging on or off and limit the size of the log files produced. I normally turn it off as the information in these files isn't particularly intelligible.

Foldershare limitations

Despite its recent refresh, Foldershare is still classed as a beta service. That means you can't expect to get much in the way of official Microsoft support, although an online forum and a few developer blogs are available if you're prepared to poke around a bit. There's no guarantee of availability – Foldershare suffered an infamous two-week outage in December last year plus a shorter, 24-hour break for "improvements" while I was writing this column. Other than that, it's normally reliable, so don't let the beta label put you off too much.

You're also limited to synchronising a maximum of 10 folders, each containing up to 10,000 files, which can themselves be up to 2GB. Those are pretty big limits and there are no restrictions in terms of the type of file that can be synchronised so, again, this shouldn't be an issue. Neither should platform support, although Windows 2000 has been dropped, so the updated service is

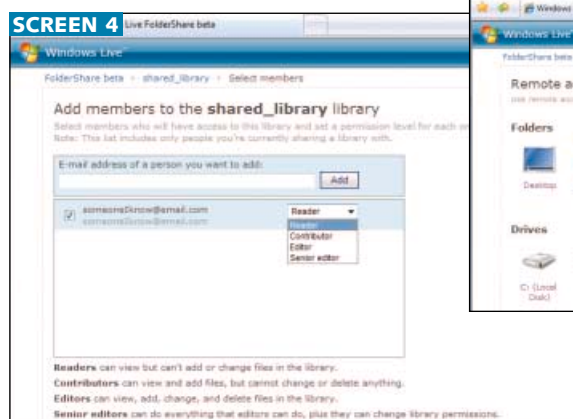
only available to PCs running XP, Vista or Server 2003, plus Apple Macs running OSX 10.3.8 or later.

There are, however, things you can't do with Foldershare that you can with alternative peer-to-peer folder-sharing products. One of the most often cited is the ability to synchronise or back up files to an online data store, which means leaving at least one PC on and connected to the internet to keep files up to date at all times.

Microsoft's solution would be to use Windows Live Skydrive (<http://skydrive.live.com>) to store files online. Up to 5GB of space is available free with this service, but there are no synchronisation facilities, so you'd need to use this as well as Foldershare for a complete solution, which is far from perfect. Alternatively, you might consider subscribing to Office Live Workspace, another free service that, as well providing online storage and synchronisation of general files and folders, also allows you to synchronise Outlook data.

Unfortunately, Office Live Workspace is another beta Microsoft service, but Powerfolder (www.powerfolder.com), for instance, is an open-source utility that is available for Linux, Windows and Apple Mac platforms. It's not free (a single licence costs a one-off €29, about £23), but as well as peer-to-peer synchronisation you get 5GB of online storage and scheduled backup facilities.

Others worth investigating include Be In Sync (www.beinsync.com), another chargeable service, and Allway Sync (www.allwaysync.com), which is available free, albeit with some limits on what it will do. You could also consider Microsoft Office Groove 2007, although you're then starting to get into workgroup collaboration – a different ball game altogether. **PCW**



Above: Via the Foldershare website, you can remotely browse the local file system of any of your online client PCs

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Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars.

→ Comments welcome on the Databases column.

Email database@pcw.co.uk

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Using SQL sub-queries

Fine tune your database queries, choose your Access version, and code maps

This part in our occasional SQL series introduces sub-queries. Understanding sub-queries gives you a useful and adaptable technique for writing queries. The WHERE clause, covered in the Christmas Database column (see www.pcw.co.uk/2204038), lets you select rows that meet certain conditions. Sub-queries let you add further refinement to the selection. A sub-query is just an SQL statement that would run on its own but is nested within another SQL statement. Here's an example:

```
SELECT FirstName, LastName,
Dept
FROM SalesStaff
WHERE SPID IN
(SELECT SPID
FROM SalesStaff
WHERE Dept = 'Horticulture') ;
```

(Key: ↵ code string continues)

This is in the sample file DBCJuly08.MDB on the cover disc as a query called Q01. You'll also find it at www.pcw.co.uk/2151344. The file contains all the queries described in this column and each has a number for easy identification, for example Q02, shown here in brackets after the relevant query. An SQL statement can have many sub-queries within it, which brings us into the realm of complex nested SQL. A great deal of complexity can be introduced, and long, complicated code can be (and has been) written. In my opinion, very complex SQL is often undesirable for two reasons. First, it makes the code unreadable for anyone who has to understand, maintain or edit it later. Second, the query may run slowly. This is because the query optimiser can find it difficult to identify an optimised pathway through the operations contained in convoluted code. The result is that the query runs sluggishly.

Both of these issues are addressed by writing a series of simpler SQL

SPID	FirstName	LastName	Dept
1	Alice	Orange	Stationery
2	Clive	Barrel	Horticulture
3	Stewart	Green	Footwear
4	Bill	Brown	Stationery
5	Kelly	Greene	Horticulture
*	(New)		

SaleID	SPID	Product	Price
1	1	Fountain pen	£23.99
2	3	Boots	£99.99
3	2	Spade	£8.00
4	1	Envelopes	£2.50
5	5	Bulbs	£3.00
6	2	Fork	£8.00
7	5	Twine	£0.75
8	3	Wellingtons	£20.00
9	1	Envelopes	£2.50
10	5	Dibber	£4.00
*	(New)	0	£0.00

SCREEN 1

statements with one calling another. Not only is it easier for human beings to see what the code is doing, debug it and edit it if necessary, but these simple statements won't give the optimiser indigestion and the queries will fly. This is a complex area and some people write very clever, complex SQL statements that are faster than a series of smaller ones. But such people are relatively rare.

People learn SQL more easily when it's split into smaller chunks, making me more of a fan of this approach. Let's write a sub-query: DBCJuly08.MDB is available in two versions – the Access 2007 version is called DBCJul08-07.MDB. Screen 1 shows the tables that underpin the example.

The first thing to note is that the sub-query is wrapped in brackets (the number refers to the query name in the sample database):

```
(SELECT SPID
FROM SalesStaff
WHERE Dept = 'Horticulture') ;
(Q02)
```

It's a complete statement that runs if you remove the brackets and returns the Sales Person ID (SPID) for both people from the Horticulture department. As SQL is a

These are the two tables upon which the sub-query is based

set-based language, it returns the values as a set (see screen 2).

The first three lines of code: `SELECT FirstName, LastName, Dept FROM SalesStaff WHERE SPID IN`

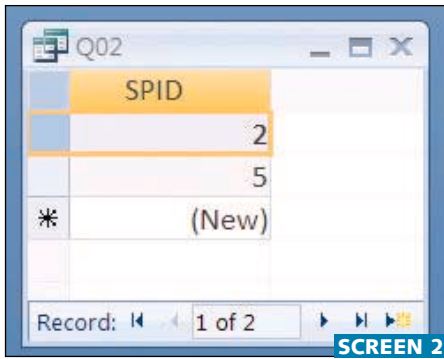
ask for the first and last names from the SalesStaff table of anyone with an SPID that is in the set returned by the sub-query. The result is shown in screen 3.

Sub-queries are logical, easy to write and can be useful. Use them – they are your friends.

Poll position

In the past, I have run polls asking which database engines people want me to cover. On the last four or five occasions, the answer has been an unequivocal 'Access'. So I'm not asking which engine this time, but which version. Although Access 2007 has been out for a while, I have continued to illustrate this column using Access 2003. It always takes people time to move to any new version of software, but I feel this column should move with the times.

It has been clear that the step to 2007 is quite a stretch and it seems many people don't like the new Office



This is the result from the sub-query when run on its own

look and feel. Many question, for example, whether the ribbon adds anything at all to Access' driveability. So, if 99 per cent of you find 2007 detestable and have decided to stick with earlier versions, that's what I should do, too, right? So it's poll time. If you have an opinion on this, please email me with either '2003' or '2007' in the header, but read on a little before you reach for your email system.

Readers have also expressed an interest in more coverage of Microsoft SQL Server and the upgrade path from Access. For instance, Dick Drinkrow writes: "With SQL Server Express now widely available, could we have some focus on the migration from Access thinking to SQL thinking as part of the database column ... SQL Express would be a nice touch for those of us who, for various reasons, have to move to a more substantial environment but don't wish to tackle Microsoft's multiple 10in-thick training manuals."

What do you think? If you wish to vote, include either 'Yes SQL Server' or 'No SQL Server' in an email header. Anyone wishing to vote on both issues can combine choices in a single header, as in '2003 No SQL Server'. I look forward to seeing your choices.

Dbase

Despite what I said above, I do receive occasional emails about other database engines, and in the past month or so I've had two about Dbase from Ron Dodge and Peter Moon. Both readers have Dbase skills and useful Dbase programs. Ron has an application, written in the days of Dos and still running under Windows XP with Visual Dbase, but which fails to print following a change of PC. Peter has many programs he'd like to run again.

It's worth investigating www.dbase.com, the website of Databased Intelligence (DBI) an organisation describing itself as "the legal heir to the Dbase legend". dBASE

The full query identifies the two members of staff in the Horticulture department

Plus is the latest incarnation of this long-lived database engine.

Dbase entered public life in 1981 as an Ashton-Tate product and quickly became the prime platform on the PC for database development. It was, to be blunt, a little short on friendliness. You fired it up, the screen went blank, and if you looked very carefully, you found a single full stop in the bottom left-hand corner. It was called the 'dot prompt'. And then you just started typing. It sounds dire from a 2008 perspective, but it was a great program and I retain more than a passing fondness for it. Dbase developed over the years, was bought by Borland in 1991 and then went through a somewhat chequered patch. In the hands of DBI it has staged something of a comeback and was given a major overhaul in 1999.

Dbase Plus runs under 32-bit Windows and has an object-oriented programming language called DBL. It can access data from Oracle, SQL Server,

'Sub-queries are logical, easy to write and can be useful. Use them - they are your friends'

Sybase, MySQL, Informix, DB2, Interbase, Firebird, Pervasive SQL, Access and others via ODBC. It supports Foxpro, Visual Fox and Paradox (.DB) and, possibly of more interest to Ron and Peter, Dbase native .DBF tables (levels 3, 4, 5 and 7). Tools include a Project Manager to oversee the building of Dbase applications, a debugger, SQL Query Designer and a Table Designer for creating or modifying tables.

More mapping

In the May column, I wrote about mapping Ordnance Survey (OS) co-ordinates stored in Access on to a Map Point map, and I received a clever piece of coding with a mapping theme from Mike Webb, but without the

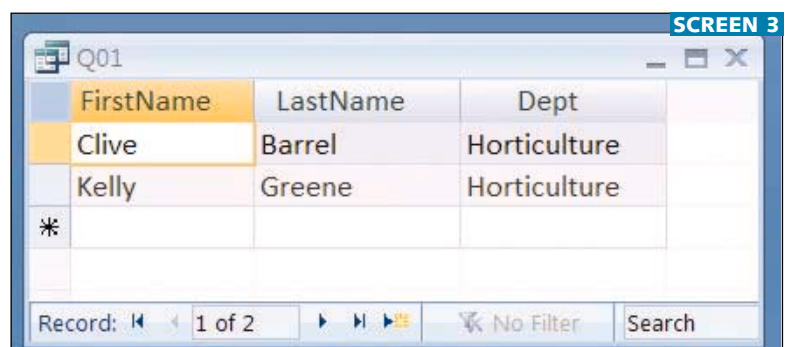
map. Mike works with maintenance and emergency callout engineers and wanted a way to optimise the engineers' travelling time. If an engineer is called to a location for an emergency, Mike wanted to identify other nearby locations where a maintenance visit could be made.

Mike stores the OS grid references of each location to the accuracy of a metre square. He calculates the location of each as distance in metres east and north from the origin of the whole Ordnance Survey coverage of the UK. This is a point slightly south-west of the Isles of Scilly (a false origin devised by the OS to ensure all co-ordinates are positive). Using Pythagoras' theorem (the square of the hypotenuse is equal to the sum of the squares of the other two sides) Mike then works out the distance from the engineer's current location to other locations. Finally, he translates these into eight directions on a compass rose (south, south-west, west, north-west, etc). The final solution tells him how far away, and in which direction, lie locations where the engineer could usefully pay a maintenance visit. It has minor imperfections: as Mike says: "It falls down somewhat where an estuary is in the way, but has proved to be generally successful." He also says: "I know it could be simplified, but once I found out that it worked, I just wanted to tiptoe quietly away." This is, I think, a great example of what you can do with a database and imagination, and I am grateful to Mike for sharing this interesting project.

Mike's email, complete with all the SQL, is included in a memo field in a table called Mapping in the DBCJuly08.MDB file.

End note

Mark Whitehorn has been writing the database column in PCW for about 15 years. Selected highlights are available in book form. Visit www.penguinsoft.co.uk for details. PCW





Tim Anderson is an IT journalist and software developer, and began writing for PCW in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the Internet.

→ Comments welcome on the Visual programming column.
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Microsoft sees the Silverlight

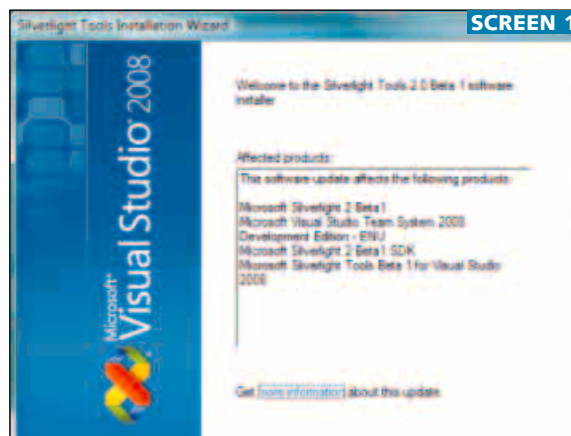
Get inside the program Microsoft is hoping will combat Flash

In the 1990s, Microsoft waged war with Sun over Java, the cross-platform runtime and language with the potential to make Windows irrelevant. Microsoft's answer was .Net, a runtime with similarities to Java but which ran only on Windows. Mono is an open-source implementation that runs on Linux and the Mac, but Microsoft has always presented .Net as a Windows programming platform. Java had a big head start, but nevertheless Microsoft successfully established .Net as an alternative. The competition has been good for both platforms.

History is repeating itself, but this time the threat comes not from Sun but from Adobe. Macromedia Flash was initially just a multimedia plug-in that enabled special effects. The company, now part of Adobe, extended the reach of Flash, improved it, and ensured every platform that matters is supported. Early efforts to position Flash as an application runtime were laughable, but the pieces have come together. Flash 9 introduced Actionscript 3.0, with features bringing it closer to Java or C# than its scripting origins, and improved performance. Flexbuilder gives developers a graphical designer and a developer-oriented programming tool built on the Eclipse IDE. This year, Adobe has also delivered Air (Adobe Integrated Runtime), enabling Flash applications to run on the desktop. Who needs Windows?

The growth of the internet and the rise of broadband have made Flash increasingly important to web designers. The balance between HTML and Flash content on the web seems to be shifting and most web video is now delivered as Flash.

Around four years ago, Microsoft started work on its own cross-platform browser-hosted runtime, which it announced at the 2005 Professional



Developers Conference in Los Angeles. It was called Windows Presentation Foundation Everywhere. The first release version, Silverlight 1.0, appeared last year, but has attracted limited interest because it is only programmable via Javascript in the browser. Silverlight 2.0, unveiled at the Mix08 conference in Las Vegas, includes a subset of the .Net runtime, enabling C# or Visual Basic code to run in browser applets. Through the multi-language capabilities of .Net, it can also run code in other languages, including Ruby and Python. It is cross-platform, with Microsoft supporting a Mac version, and the Mono folk supporting Linux. That means there will be an open-source Silverlight runtime.

As with its war against Java, Microsoft is trailing its competition. Does it have any chance against Flash? My guess is that Silverlight will gain significant usage from Microsoft platform developers, but Flash will remain dominant. Microsoft's advantage is its familiarity to Visual Studio developers. There are also aspects of Silverlight's design that improve on Flash from a developer perspective. The Silverlight runtime can render an XML layout directly, whereas Flash applications have to be

Installing the Silverlight 2.0 tools

compiled first. Adobe has its advantages, especially in the designer community. However, it's early days, with Silverlight 2.0 still in beta.

The parallel with the earlier Java war isn't exact. A key difference is that with Silverlight, Microsoft is acknowledging cross-platform matters. The Microsoft of old would have derided the idea as 'write once, debug everywhere'. Today, with the web growing and Mac resurgent, it's cross-platform or nothing.

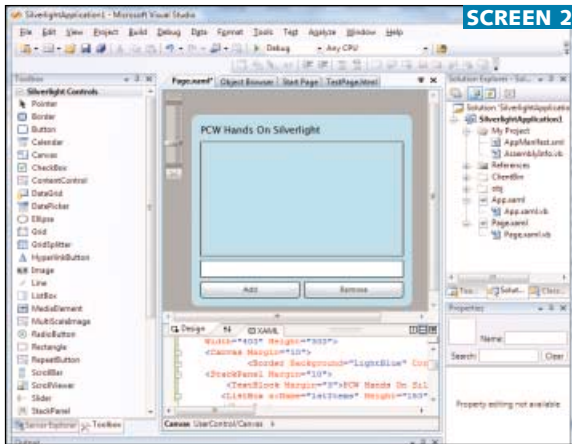
Hands on with Silverlight

If you have Visual Studio Standard or above, you can install Microsoft's Silverlight designer and tools (see screen 1). It is a beta, so the usual warnings apply.

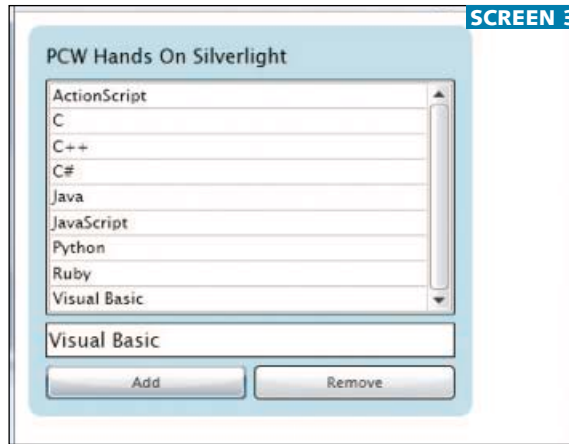
To create a simple application, run Visual Studio, and start a new Visual Basic Silverlight application. Next, a dialogue asks whether you want a new website or just a test HTML page. The latter is fine for this example. Visual Studio opens with a blank Silverlight user control (see screen 2). This is the equivalent to an empty page, if you think in web terms, or a form, if you think in Windows terms.

Double-click Page.xaml to open it in the designer. This application will create the archetypal to-do list. For this, you need a Listbox for the items, a Textbox for new items, and two buttons to add and remove items.

The layout language in Silverlight is XAML, Microsoft's XML format for defining a GUI. It is the same language used in Windows Presentation Foundation, but in cut-down form. A Silverlight canvas can be a fixed number of pixels, or proportionate to the browser page. By default, Visual Studio creates a control 400x300 pixels. Within the control, you can either use absolute positioning, or layout controls that work well when resized.



SCREEN 2



SCREEN 3

The example Silverlight application running in Firefox

The Silverlight designer in beta 1 is not fully functional. It can display your layout, but does not allow visual editing. You can drag controls from the Toolbox, but they must be dragged to the XAML code, not to the designer itself. To get a basic layout, delete the generated Grid element and drag a Stackpanel to the editor. Inside the Stackpanel, drag a Textblock and a Listbox. Within the Textblock, type some text that will form the heading for the applet. The Listbox is collapsed by default, so give it a Height attribute, say 180 pixels. The editor supports Intellisense, which pops up suggestions as you type.

The three elements so far are stacked vertically, but the two buttons below need to be in the same row. To do this, insert a second StackPanel with its Orientation attribute set to Horizontal. Then add two buttons. Make sure each element you want to work with programmatically has a Name property, which needs to be entered as x:Name to resolve to the correct XML namespace. Again, Intellisense helps with this.

This gets the basic layout, though there is room for improvement. The Margin attribute inserts space around an object. I have used this and a Border element to vary the appearance. The Corner Radius attribute sets rounded corners.

The next step is to add the code. Anyone who has worked with ASP.Net will find this familiar, since it uses a similar code-behind model. Click somewhere in one of the Button elements and press the spacebar to bring up a list of attributes. Select Click and press Enter, then select New Event Handler and press Enter again. Visual Studio generates an event handler called, for example, btnAdd_Click. Go to the Solution Explorer and double-click Page.xaml.vb to open the code editor.

The Silverlight designer in Visual Studio 2008

The event handler is ready for you to type in code, which is trivial. Here is the code to add an item to the list:

```
Me.lstItems.Items.Add(
(Me.txtItem.Text)
```

This is the code to remove an item:

```
If lstItems.SelectedIndex <> -1 Then
```

```
lstItems.Items.RemoveAt(
lstItems.SelectedIndex)
End If
```

(Key: ↵ code string continues)

Click Run or press F5 to run the project. The application should work in Internet Explorer or Firefox (see screen 3). Support for other browsers, including Opera, is promised.

If you wanted the list to persist, so it would reappear when the user went back to the page, you could populate the list from a database on the server, and save it back when the user made changes. Silverlight ties in with Microsoft's Windows Communication Foundation, which lets you create a web service in ASP.Net, and call it in Silverlight. Silverlight also supports generic web services using Soap, JSON or plain XML, offering another way of doing this. Or you can store or load data on the user's machine, using Isolated

Storage. This lets you save and load files to a protected location, where it can't be seen by other web applications.

Silverlight's future

The next generation of Windows development is meant to be WPF, the GUI framework that went live with the release of Vista. The snag with WPF is it requires a powerful machine to run well, and depends on a large runtime. Even those who have Vista still need to download and install .Net Framework 3.5 to run the latest version. WPF makes lovely applications, but it will be years before the runtime is widely deployed. Further, WPF does not fit so well into a web-centric, cross-platform world.

Silverlight has a relatively small runtime, currently around 4MB. That is less than a quarter the size of the .Net Framework for Windows when it came out in 2002. In addition, the user experience is generally much better: a simple web dialogue prompting to install the Silverlight plug-in.

Silverlight is much less powerful than WPF, and is not suitable for heavyweight client applications. That said, it is plausible that .Net developers may stick to Windows Forms for their traditional desktop applications, while turning to Silverlight for next-generation, web-centric, lightweight clients that will still run their Visual Basic or C# code. Third-party vendors are stepping up with rich Silverlight 2.0 controls (see screen 4), and Microsoft is providing decent design tools in its Expression Blend, as well as appealing to Visual Studio developers. Silverlight will struggle to catch Flash, but within the Microsoft community at least, it looks most promising.

Resources

Get the Silverlight beta and other resources from www.silverlight.net. PCW

Third-party vendor Infragistics has business-oriented visual controls for Silverlight, seen here in a demo application



SCREEN 4

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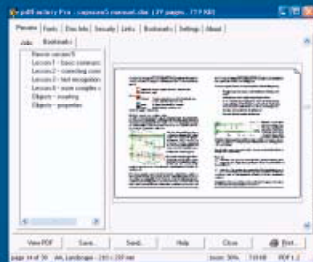


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- 8 in 1 Card Reader, Keyboard and Mouse
- Microsoft Windows XP Home & Works Software
- Factory refurbished stock. Supplied with 1 year warranty
- 17" TFT Monitor add £85+VAT (£99.88 inc VAT)



GATEWAY
INTEL CORE 2 DUO
2GB/120GB 17" LAPTOP
£349 ~~£410.08~~
+VAT inc VAT

- Gateway MX8716B, Intel Core 2 Duo T5300 1.73GHz
- 2GB DDR2 Ram, 120GB SATA Hard Drive,
- DVD±RW Drive, 4 in 1 Memory Card Reader
- 17.1" UltraBright WXGA Widescreen TFT Display
- Intel Graphics Media Accelerator 950 up to 1.3GHz
- Modem, Lan, Wireless, S-Video and Firewire
- Microsoft Windows Vista Home Premium & Works 8.5 s/w

CORE 2 DUO
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17" TFT



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DVDRW WIRELESS
WIDESCREEN LAPTOP
£199 ~~£233.83~~
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- eMachine N12 Wireless Widescreen XP Home Laptop
- AMD Sempron Mobile 3200+ CPU, 512MB Ram
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- 15.4" Widescreen, Wireless, Modem, Lan & USB Ports
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ACER
ATHLON 64 X2 4400+
1GB/250GB DVDRW
£225 ~~£264.38~~
+VAT inc VAT

- Acer Aspire T180 with AMD Athlon x2 4400+ CPU
- 1GB Ram, 250GB Hard Drive, DVD+/-RW drive
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- Microsoft Windows Vista Home Premium Software
- Factory clearance refurb stock with 1 year warranty
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- 19" TFT Monitor add £99+VAT (£116.33 inc VAT)



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LATITUDE D600
CENTRINO NOTEBOOK
£189 ~~£222.08~~
+VAT inc VAT

- Dell Latitude D600 Notebook, Intel Pentium M 1.3GHz
- 512MB Ram, 20GB Hard Drive, DVD ROM Drive
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- Gateway MT6220B, Intel Celeron M430 1.73GHz CPU
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HP COMPAQ
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- Compaq Evo D530 SFF Mini Desktop/Tower PC
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- Serial and Parallel ports, CD ROM and Floppy Drive
- Integrated Graphics, 10/100Lan plus USB ports
- Preloaded with Microsoft Windows XP Pro software
- Ex-lease stock and supplied with 6 months warranty.
- Keybrd, mouse, monitor & mem available at extra cost



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PCMCIA CARD
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- Linksys WPC550 PCMCIA Card
- 802.11g Wireless LAN
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- 15-pin Parallel
- 15-pin USB
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- 15-pin PCMCIA



EMACHINE
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2GB/320GB PC
£239 ~~£280.83~~
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- eMachine E4220 Intel D925 Dual Core 3.0GHz CPU
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- Microsoft Windows Vista Home Premium & Works
- Factory clearance stock boxed as new. 1 year warranty
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DVDRW WIFI SUBNOTEBOOK
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- 12.1" TFT Crystal Bright Widescreen
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- Microsoft Windows XP Home and Works Software
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TRAVELLING



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PDA MOBILE PHONE
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+VAT inc VAT

- CECT T689 Dual Sim PDA Mobile Phone. Features
- includes 2 sim sockets on any network both running at
- the same time. Ideal for people using 2 mobile phones
- travelling abroad etc. Also features PDA functions with
- Touchscreen, PC connectivity, Camera, MP3 & MPEG4
- functions. Includes PC cable, Headphones, Charger etc.



TOSHIBA
TECRA M2 CENTRINO
CDRW+DVD XP PRO LAPTOP
£199 ~~£233.83~~
+VAT inc VAT

- Toshiba Tecra M2, Intel Centrino 1.6GHz CPU
- 512MB Ram, 40GB Hard Drive, CDRW+DVD Drive
- 56K Modem, 10/100Lan, Card Reader & Wireless Lan
- 14.1" 1024 x 768 Resolution TFT Colour Display
- Serial, Parallel, USB, PCMCIA & SD Card Reader
- Preloaded with Microsoft Windows XP Pro Software
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COMPUTER BARGAINS

1 STAND LANE, RADCLIFFE, MANCHESTER, M26 1NW.

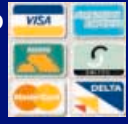
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* Netcraft January 2008.
PC Pro recommended: virtual ISP group test 01/2008

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▶ WWW.WEBFUSION.CO.UK

WebFusion
WHERE WEBHOSTING WORKS

Franking is cheaper than stamps...



...So why pay more?

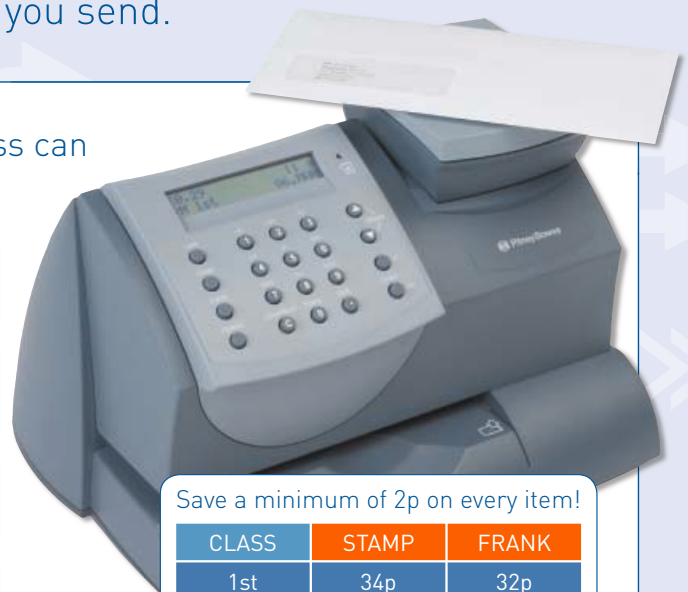


Franked Mail is cheaper than Stamped Mail – and that's official!

Royal Mail are delivering a strong message to businesses by providing discounted postal rates for franked mail – with savings of at least 2p for every item you send.

But that's not the only way your business can benefit from a franking machine:

- 1 **No more trips out of the office to buy stamps** – order your PostagebyPhone® in under a minute.
- 2 **Use the exact postage every time** – no more over stamping to ensure it gets there.
- 3 **Promote your business** – print your company name on every piece of mail.
- 4 **Pay for your postage in arrears** – with a unique *Purchase Power* account



Save a minimum of 2p on every item!

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1st	34p	32p
2nd	24p	22p

Product shown: DM50 Small Office Franking Machine.

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Contact us today to take advantage of our 30 day **FREE** trial offer. We'll even load your machine with **£20 FREE** postage credit to use during the trial - what have you got to lose?

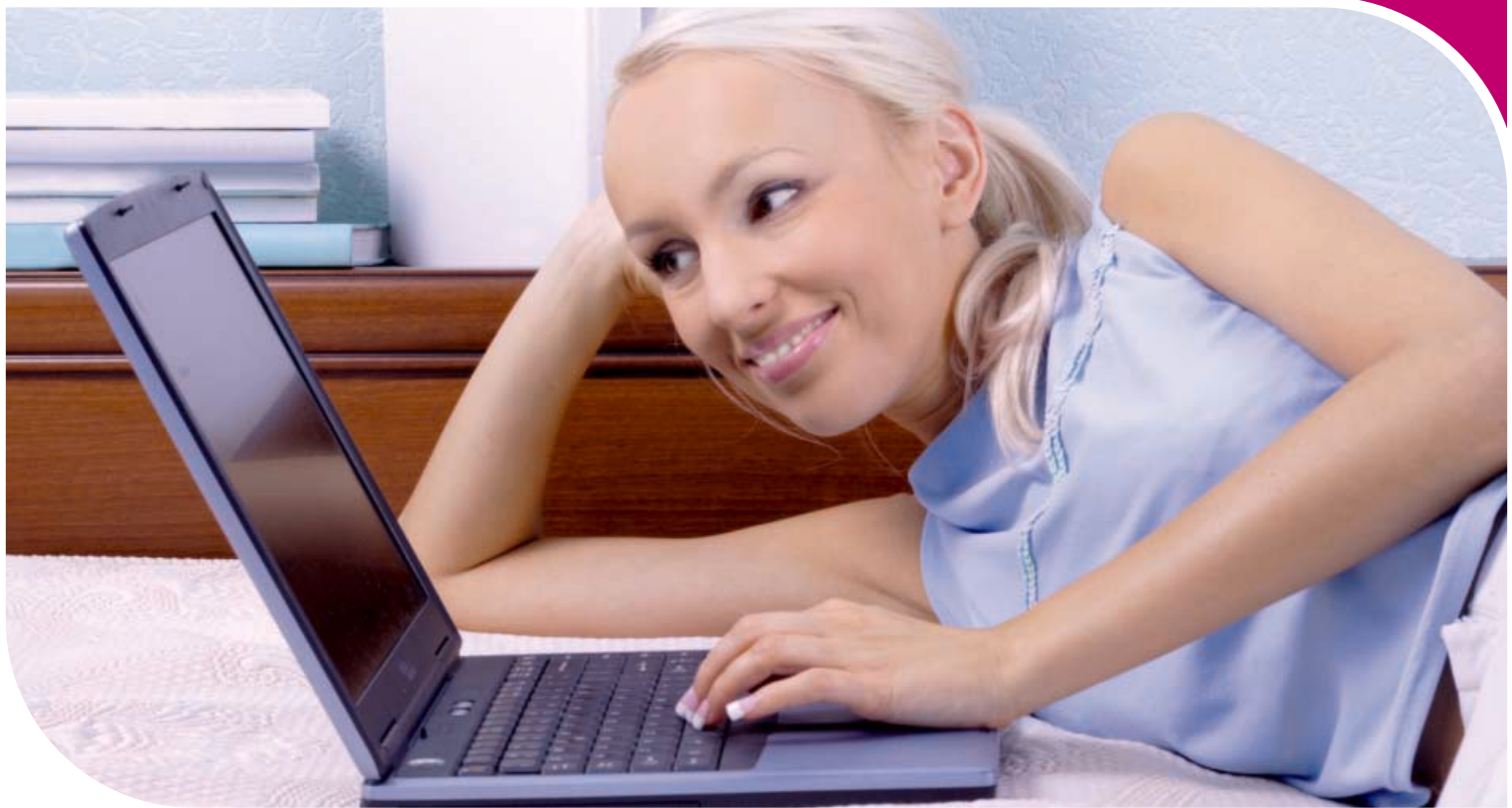


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www.frankyourmail.com

Our volunteers do vital work



Are you an IT expert who enjoys a challenge and likes working with people?

Royal National Institute of Blind People (RNIB) is the UK's leading sight loss charity helping anyone with a sight problem. There are around two million people in the UK with a sight problem and every day another 100 people will start to lose their sight.

We need volunteers to visit people with sight loss in their own homes to help with installations and troubleshoot problems with hardware or software.

**Contact the Volunteer Support Team to find out more on 0845 603 0575
email volunteering@rnib.org.uk
website rnib.org.uk/volunteering**

ON THE CD

Norman Parental Control ● Agnitum Outpost Antivirus Pro ● Avanquest Web Easy Express 7 ● Spyware Doctor 5.5 Starter Edition ● Cyberlink You Cam 1



ON THE 8GB DVD

Norman Parental Control ● Agnitum Outpost Antivirus Pro ● Avanquest Web Easy Express 7 ● Spyware Doctor 5.5 Starter Edition ● Cyberlink You Cam 1 ● Roxio Easy Media Creator 10 ● Mandriva Free DVD Edition ● Mandriva One Live CD ● Zenwalk Live



Let our workshops on the following pages show you how to use some of the software on the CD and DVD

COVER DISC

HELP LINES

WEB:
www.pcw.co.uk/disc-support

EMAIL:
help@pcwsupport.co.uk

PHONE: 01702 668 198
(9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed & 10am to 2pm Sat)

Note that we cannot give support for programs on the disc

SOFTWARE LISTING

ON THE CD

5 BONUS PROGRAMS

Avanquest Web Easy 7 Express
Norman Parental Controls
Agnitum Antivirus Pro
Cyberlink Youcam 1
Spyware Doctor 5 Starter Edition

10 TRIAL VERSIONS

Ad-Aware 2007 Plus
Ashampoo Uninstaller 3
Ashampoo Winoptimizer 5.02
East-Tec Eraser 2008 v8.9
Lavasoft Personal Firewall 3
Lavasoft Privacy Toolbox
PCSync
Spyware Doctor 5.5.0.212
Xara Xtreme 4
Yosemite Filekeeper Pro

6 FROM THE MAGAZINE

Allway Sync 7.1.2
Microsoft Virtual PC 2007
Powerfolder 3
Singularity RDK 1.1
Tweak PS

Windows Foldershare
4.0.1329.0317

30 FREEMARE

Abiword 2.6.2
Bitcomet 1.00
Crossloop 2.11
Editpad Lite 6.4.1
eM Client
Filezilla 3.0.8.1
Glary Utilities Free 2.5
Googlepreview 3.10
IE7pro 2.2
K-Meleon 1.1.4
Keepass 1.11
Local Cooling 2
Malwarebytes Anti-Malware 1.09
Microsoft Windows Search for Windows XP 4.0 Preview
Miro 1.2.2
Mozilla Lightning Project for Windows 0.8
Nokia PC Suite 6.86.8.4
Norton Removal Tool 2008.0.3.15
Pictomio 1.0.8 Beta
Songbird 0.5

Spicebird 0.4
Starburn 10
Toneshop
Trendmicro Hijack This 2.0.2
Ultradefrag 1.3.4
Wengophone 2.1.2
Winamp 5.53
WinSCP 4.10 Beta
Wordpress 2.5
Yeahreader 2.3

ON THE 8GB DVD EVERYTHING ON THE CD PLUS...

1 BONUS PROGRAM

Roxio Easy Media Creator 10 Lite

2 TRIAL VERSIONS

Norton Antivirus 2008 15.5.0.23
PowerDVD 8

4 LINUX & OPEN SOURCE

Damn Small Linux 4.3 Preview
Mandriva 2008.1 Free DVD

Edition
Mandriva 2008.1 One KDE Edition
SystemrescueCD 1.0.1

100 RESOURCES

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Browsers, Managers & Extensions
Burning & Media
Business & Office
Developer & Web
Development Tools
General Utilities
Internet & Networking Tools
Optimisation & Diagnostics
Portable Applications
Security



INFORMATION

System requirements Windows 2000/XP/Vista, 50MB disk space

Contact www.norman.com

Registration Visit www.norman.com/Support/auth and enter your details, using the OEM code CPNPC12-UK

Need to know This version is licensed to run for 12 months, the same as the commercial version.

Norman Parental Control

Protect your kids from the seedier side of the web

The Internet is packed with resources to help children learn, have fun and stay in touch with friends. But look a little further and it's easy to come across a darker side of the web: pornography, violence and images so horrific they'll scar even adult viewers. It makes sense to keep some control over what your children can do online and there are few easier ways than with Norman Parental Control.

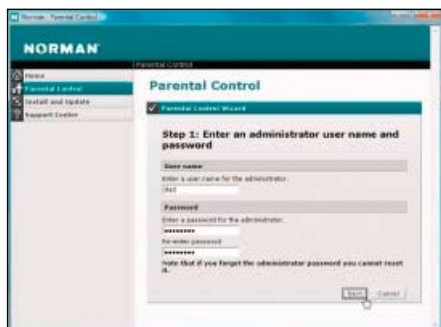
The system starts with the creation of a user profile, which is based on one of three types: adult users get to browse anywhere; teenagers see everything except sites associated with sex, gambling, weapons or drugs; and children can only visit sites that you specify. The settings affect the searches you can make, too. If the program is keeping you away from gambling sites, for

instance, then entering a keyword like 'poker' in Google will just produce a "you can't do that" warning message, which means you don't get to see any dubious links in the first place.

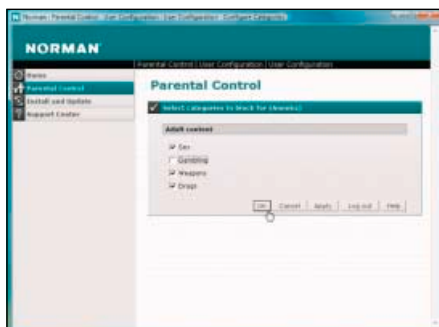
You can configure these settings to suit your needs. If you're not concerned about gambling content, say, then you can turn off that category in your teen's profile. You can also block access to specific sites by adding them to the Blocklist for a particular user.

Most useful of all is the ability to schedule internet access for individual users. If you don't want your kids online at 1am on a school day, for instance, then tweak their user profiles to allow only a couple of hours earlier in the evening. It only takes a few seconds, and the restrictions apply immediately.

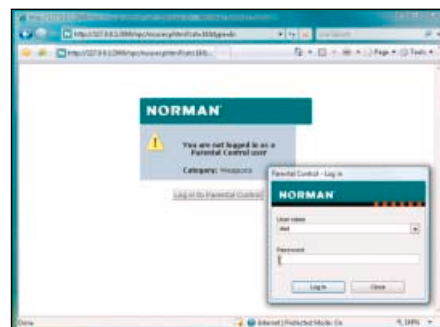
Take control of your family's internet access in just five minutes



1 Right-click the Norman Security Suite icon in your System Tray, and select Norman Security Suite to begin. Click Parental Control and enter your user name and password. Now select User Configuration > Add User to create a profile for one of your family members. Choose the profile type that most suits that person (Adult, Teen or Child) and click Next.



2 Enter a user name and password for this user, then click Next > Finish > OK. And that's it: your user is created using the default profile. You'll probably want to tweak the permissions a little, though, so click Configure and customise the profile to suit your needs. A Child profile requires you to enter sites you consider child-friendly - for instance, CITV (www.citv.co.uk).



3 Create user profiles for all your family members, then click Parental Control > Configure Parental Control and define the minimum internet access that you need (Partially Restricted Teen or Totally Locked-down Child). Now anyone can use the browser up to that limit, but if they click on a dubious link or search for a forbidden word, then they'll be asked to log in before continuing.

UPGRADE OFFER

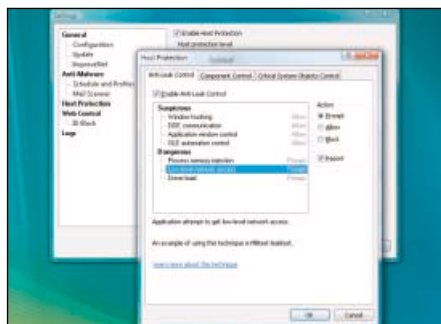
NEW FEATURES

Powerful anti-virus engine
Rootkit detection and removal
Comprehensive anti-spyware
Norman Sandbox technology
Advanced personal firewall
Easy automatic updates

SAVE 50% ON NORMAN SECURITY SUITE

Upgrade to the Norman Security Suite and you'll gain powerful security tools such as a speedy anti-virus engine, rootkit detection and removal, and a comprehensive anti-spyware module. There's also Norman Sandbox technology, which aims to detect even brand new threats and prevent them infecting your PC. A firewall blocks port probes and other online attacks, and there's the same parental controls tool you've tried here. This would normally cost £45 for a one-year licence, but as a registered parental controls user, you need only pay £22.50, a chunky 50 per cent discount. Just enter the coupon code COVMT8 at the checkout screen to qualify for this special price.

Agnitum Outpost Antivirus Pro



Install Agnitum Outpost Antivirus Pro and it will immediately go to work, using its database of more than 600,000 malware signatures to protect from threats arriving via disc, the web, instant messaging or email. That's much like any other anti-virus tool, but this program includes extras that differentiate it from the competition.

You get plenty of configuration options, it's easy to set up custom profiles and there are several tricks you can use to speed up scanning.

A Host Protection module monitors your programs for all kinds of potentially dubious behaviour: process memory injections, low-level network access, accesses to vital system Registry

INFORMATION

System requirements Windows 2000 SP4/XP/Vista, 50MB disk space

Contact www.agnitum.co.uk

Registration Visit www.agnitum.com/promo/pcw/ and enter the code DIDVL-V3MJS-C8KGS-SK444-CF8IA

Need to know The program licence will expire six months after installation

Outpost Antivirus Pro is highly configurable

keys, and more. This could help block new infections not yet in the signature database.

You'll be alerted if anything is detected, but you can also monitor what's going on by checking the Event Viewers, which detail what's going on, minute by minute – a useful indicator that everything is still working as it should.

There's also an ID Block module, which checks that personal details such as addresses, phone or credit card numbers aren't being transmitted. Optional password protection ensures other PC users can't easily change your configuration. And Export and Import options make it easy to back up and restore your settings.

UPGRADE OFFER GET OUTPOST SECURITY SUITE

Upgrade to Outpost Security Suite and you'll also gain a two-way firewall, securing your broadband and network connections from attack. The Bayesian anti-spam engine frees your inbox from junk mail, while cookies and referral URLs are managed to help maintain your privacy online. You can even control the elements displayed on web pages for faster browsing. As a registered owner of Outpost Antivirus Pro, you can upgrade to the full suite for around £20, saving £5 off the usual price. Find out more at www.agnitum.com/products/security-suite/index.php.

PC Tools Spyware Doctor 5.5 SE



When key browser settings keep changing, you're seeing lots of pop-ups, and the program crashes even more than usual, it's natural to wonder if you've been infected by spyware. So if your current anti-virus tool gives your PC a clean bill of health, then you'll want a second opinion, ideally from a specialist program such as PC Tools Spyware Doctor Starter Edition.

If you're running the program for the first time, you might be surprised at how fast it can be. There's no sitting around for an hour or so: the most common attack points were inspected in around five minutes on our test PC. And while full system scans will take longer, they're still quicker than much of the competition.

INFORMATION

System requirements Windows 2000/XP/Vista, 50MB disk space

Contact www.pctools.com

Registration Not required

Need to know The retail version contains extra Onguard resident protection tools, which are not available in this Starter Edition

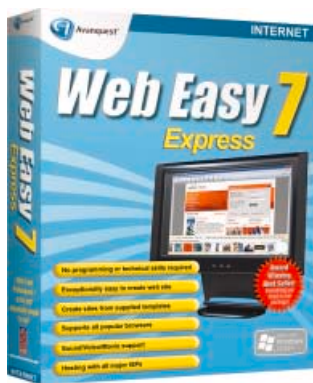
Spyware Doctor's speedy scanning engine can find and remove the latest malware within minutes

Once a scan is complete, you get a detailed report listing everything the program has uncovered. Threats are categorised according to their severity – low, medium or high – and you can then choose to fix all or any of these issues.

Spyware Doctor also comes with a real-time protection feature, Onguard, which could be useful if your current anti-virus software isn't up to the task. This includes Fileguard, which monitors the applications and files you open. You also get Immunizer Guard, which prevents known malicious ActiveX controls from running on your system. Click the Onguard button to ensure this protection is properly configured to suit your needs.

UPGRADE OFFER SAVE 30 PER CENT ON SPYWARE DOCTOR

Move to the retail version of Spyware Doctor and you'll gain access to the complete set of Onguard real-time protection tools. These monitor your browser settings, cookies, network configuration and Windows startup settings, preventing unauthorised changes. You also get Process Guard to find and prevent malicious hidden processes from running on your system. A one-year, three-computer licence for PC Tools Spyware Doctor normally costs £29.95, but as an owner of this version, you need only pay £20.96, saving 30 per cent. Click Upgrade > Upgrade Now to order.



INFORMATION

System requirements Windows 2000/XP/Vista, 150MB free disk space

Contact www.avanquest.co.uk

Registration Get your serial code from www.avanquest.co.uk/vnu/weeasy/register

Need to know Limited selection of templates included. Other features, such as the e-commerce objects, are only available in the Professional Edition.

Avanquest Web Easy Express 7

Take the hassle out of web design with this easy-to-use editor

Creating a great website is no easy task. Do it manually and you'll need a good eye for design, a great understanding of how sites should be structured, and technical knowledge of scripting and style sheets. And that's just to get started. It all adds up to a lengthy list of requirements, but Web Easy Professional Express 7 is here to help you create polished, professional websites even if you've no previous design experience.

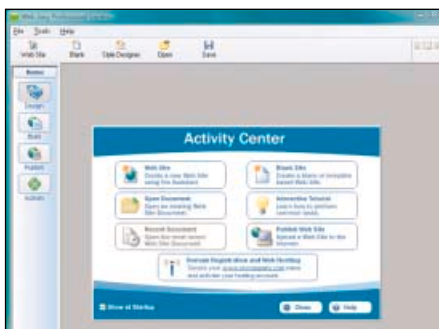
If you're interested in a simple page or two, then the Personal Wizard can to help. Each step prompts you for new information, including likes, dislikes, stories, images, links and more. When you've finished, it builds the site for you.

If you're after something more professional, then there are additional wizards for blogs,

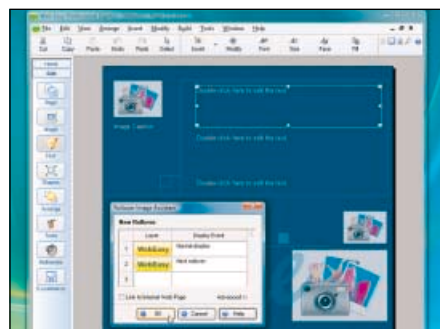
business and commercial sites, and in the Express version you also get a limited selection of stylish templates.

No pre-built set of pages can ever deliver exactly what you need, so the program also allows you to change the text and images, tweak colours, apply special effects and more. Or, if you know what you're doing, there's always the option to start with a blank page and build your site from scratch. Whichever path you take, you'll be able to customise your site further with Youtube videos, calendars, calculators, a 'Contact us' form, and other useful objects. And when you're finished, use the built-in Publishing Assistant to upload the site to your own web space, or the author's hosting service, which you're able to try out for free.

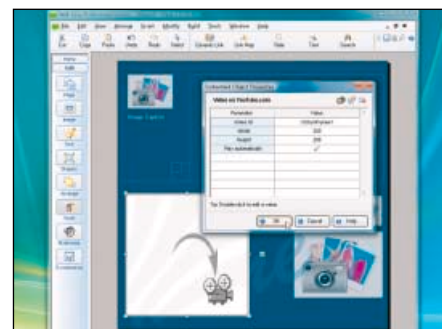
Create a professional website in an evening – no experience necessary



1 Launch Web Easy Professional Express and it will display the Activity Center (click Tools > Activity Center if you've closed it already). If you're a web-development novice, then click Web Site to launch the Assistant, which will ask you a series of questions and produce the site for you. If you're more experienced, click Blank Site and choose a template (only the top few are available in this version).



2 Here's page one of your new site. It won't be ready just yet, so feel free to customise it. Double-click any words or blocks of text, for instance, and replace them with your own content. Then select each placeholder image in turn, click Modify > Replace Image, and point the program at whatever photo you would like to use. Right-click elements on the page for more options.



3 Navigate through the pages using the top-right toolbar, or the View > Page menu. Click Insert > Page if you need to add more (although the maximum is limited in this version), and don't miss the Objects. Click Insert > Object and you can dress your page with Google or Youtube videos, animations, dividers and more. Click Build > Preview to see how your site looks in a browser.

UPGRADE OFFER

NEW FEATURES

85,000 element media library
135 professionally-designed templates
Ebay page wizard
Generate web photo albums
Create and host podcasts
Search engine optimisation

SAVE £15 ON WEB EASY PROFESSIONAL 7

Upgrade to Web Easy Professional 7 and you'll benefit from extras such as a massive clipart library and 135 professionally designed site templates. New wizards help generate everything from web photo albums to pages for selling your products on Ebay. And you can customise your site in all kinds of interesting ways. For example, the Dynamic Views feature creates pages that can change according to the time of day, day of the month, month of the year and more. Best of all, you can have all this for only £24.99, a generous £15 off the usual asking price. Place your order at www.avanquest.co.uk/vnu/weeasy/offer.



Cyberlink Youcam 1

Get more from your webcam with this fun video application

INFORMATION

System requirements 512MB RAM, Windows XP/Vista, 300MB hard disk space

Contact www.cyberlink.com

Registration Get your CD key from www.cyberlink.com/english/cdkey.jsp?id=1867

Need to know To ensure a smooth installation, completely close down (don't just minimise) any instant-messaging software

It's easy to have fun with instant-messaging software. All the popular applications allow you to customise your text chat with sounds, icons, animations, smilies and more. Video conferencing has always been a little dull by comparison, but install Cyberlink Youcam and you can soon liven things up.

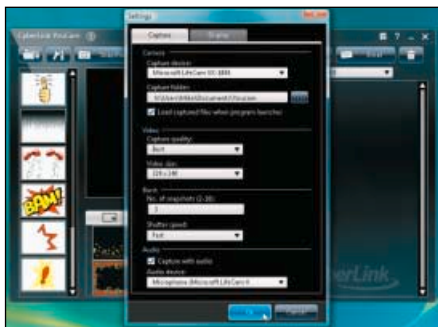
At its simplest, the program runs alongside your video-messaging software and provides access to a host of special effects, including Emotion Effects – temporary animations that tell the other person how you're feeling. Or you can also apply fancy frames to the image, overlays such as softly falling snow, or distortions that stretch and warp your face.

If you take your video conferencing seriously, then that might sound a little, well, trivial. And

it's true; placing your video image in a heart-shaped frame probably won't be suitable for all your conversations. But then you can also use Youcam to create custom videos for family and friends. So, if your nephew is eight tomorrow, and you can't be there in person, then a WMV-format video message created with the Happy Birthday frame could be just the thing.

It's just as easy to capture images, either individual snapshots or a series of frames, and they're all immediately available from the program's straightforward interface. These can then be emailed to whoever you like in a couple of clicks. Or you could even use the Cyberlink Youcam to create a video blog, and use to the Youtube button to put it online just as fast as your internet connection will allow.

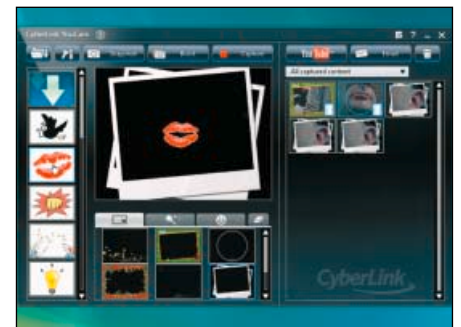
Create fun custom videos to share with friends and family



1 Cyberlink Youcam installs a video-communication service to help it work with just about any video-messaging software. This may not work if your messaging application is running during installation, though, so close it down first. Once the program is working, use the Settings dialogue to tune your equipment.



2 Now feel free to experiment by adding a few special effects. The Emotion Effects on the left-hand side, add temporary animations like a 'bright idea' lightbulb. The panes at the bottom add other elements such as picture frames, filters like a sepia effect, and distortions to twist, stretch, squeeze, and otherwise make you look very weird.



3 Now try recording yourself. The Snapshot button takes one image, Burst takes several in quick succession, and Capture records a WMV-format video until you click Stop. Anything you record will be displayed in the Captured Content pane on the right-hand side. Double-click a video to view it and use the Email or Youtube button to share the file with others.

UPGRADE OFFER

NEW FEATURES

- Motion detection
- Time-lapse recording
- Scheduled recording
- 3D animated avatars
- Share images/presentations
- Hi-res webcam support

UPGRADE TO CYBERLINK YOUCAM 2

The latest version of Youcam adds extras such as the ability to start recording when motion is detected, or at a time you specify. 3D animated avatars – from Abraham Lincoln to a talking dog – will follow your movements and facial expressions. But there's a serious side to the program, too. It now allows you to share images and Powerpoint presentations, for instance, and everyone in the conference can draw on them directly. There's new support for high-resolution webcams and images can be printed. The list price is around £18, but as a registered owner of Youcam 1, you can upgrade for only £10. Find out more at www.cyberlink.com/multi/products/main_125_ENU.html.



Roxio Easy Media Creator 10 Lite

Create data or audio CDs, run backups and more

INFORMATION

System requirements Windows XP/Vista, 50MB disk space, DirectX 9-compatible graphics and sound card, Windows Media Player 10 or later

Contact www.roxio.co.uk

Registration Follow the instructions during installation and register at www.roxio.co.uk/cd

Need to know This version does not contain the MPEG-2 or other codecs found in the retail edition

The world is full of disc-burning suites, all delivering the same sort of functionality in a similar way, so at first glance it might be hard to see why you should be interested in Roxio Easy Media Creator 10 LE.

However, building an audio CD, for instance, takes only a few drag and drops and a click or two. There's support for many audio and playlist formats: MP3, WMA, WAV, CDA, M4A, WPL, ASX, M3U, FLAC, MPGA, MP4 and OGG. And not only does Roxio Creator 10 LE allow you to normalise the tracks to a consistent audio level, it also lets you decide what that level should be.

Creating data CDs or DVDs is just as easy, while still giving you features you won't always find elsewhere. Can your disc-burning software automatically compress files to save space? Or

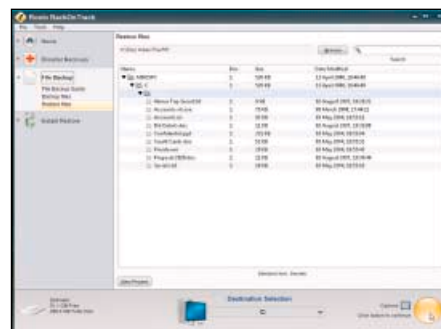
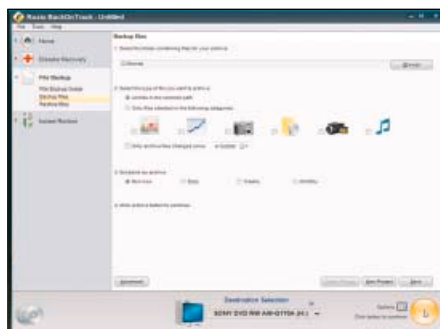
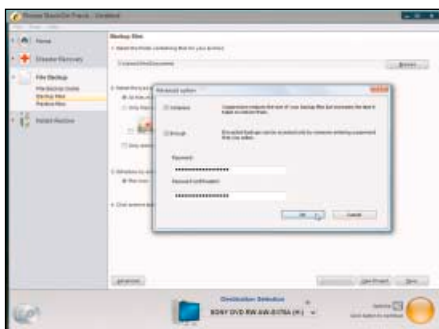
encrypt them to protect confidential files?

There's also a useful backup tool in Roxio Backon Track, perfect for quickly saving copies of your latest digital photos or office files.

Even the most basic functions, like the ability to copy discs, come with useful extras. Here you're also able to create and burn disc images, for example, and again there's support for reading a wide range of file formats: GI, ISO, UDI, CUE, C2D (the program writes GI and ISO images only).

Other highlights include the ability to rip audio CDs or create labels and inserts for your own discs, and there's plenty of fine control over the burning process for those who need it. If you'd like to squeeze more onto your discs by enabling overburning, say, then just click Tools > Options: it's all there.

Enjoy hassle-free backups with this quick and simple tool



1 Launch Roxio Creator LE 10, click Data and Backup > Backup Files. Click Advanced and turn on compression if your files will fill more than one disc. If you're backing up anything with personal data, select Encrypt and enter a password, too. Make up something you'll be able to remember, but no-one else will possibly be able guess, preferably including a mix of letters and numbers.

2 By default the program starts with your Documents folder, but click Browse to point it elsewhere if you like. You can choose to save all files in that folder (and all the folders beneath it), or choose only particular files: music, photos, videos, whatever it might be. Choose whatever works for you, then insert a blank disc into the drive and click the orange button at the bottom left.

3 There's no additional 'Burn' screen and no further options to choose; the program just gets on with saving your data to disc. By default it verifies the data too, so the process takes longer but it's also far more secure. If you need to restore any data in future, click Restore Files, browse to the index on your backup disc, select the files you need and click the orange button to restore them.

UPGRADE OFFER

NEW FEATURES

- Full Blu-ray support
- Record streaming audio
- Create custom video DVDs
- Automatically add smart soundtracks
- One-click Youtube uploading
- Sync media files with your mobile

GET ROXIO EASY MEDIA CREATOR 10

The biggest advantage of moving to Easy Media Creator 10 is the extensive video support. Video Doctor will fix your footage, there's an editor to add a professional touch, you can have automatic Smartsound soundtracks, and the finished results can be burned to DVD or Blu-ray discs. But you also gain extras such as the ability to record streaming audio, simultaneously rip CDs from multiple drives, manage audio or video files on mobile devices, automatically catalogue your CDs and DVDs, and much more. Right now the entire suite is available for only £44.99, 25 per cent off the usual price, and you can order by launching Creator LE 10 and clicking Audio > Upgrade > Learn More.

COMPETITION

WIN! A Shuttle HD media centre PC

This month PCW and Shuttle, the leading designer and manufacturer of SFF (small form factor) PCs, have teamed up to give away one complete multimedia home theatre PC worth £1,095.

The prize – a Shuttle XPC G5 6801M home entertainment PC – comes with a next-generation Blu-ray/HD DVD combination drive that delivers the crystal clear images of high-definition movies seamlessly.

The Shuttle XPC G5 6801M is built around the Shuttle XPC Barebone SN68SG2 dressed up with a PF27 media centre fascia. Its elegant black chassis provides excellent connectivity on both the front and back panel. A range of connectors sit behind the flip-down front doors – including USB 2.0, Firewire, a multiformat card reader and, of course, the Blu-ray/HD DVD combination drive.

The XPC G5 6801M's Wifi interface means that you can easily connect the PC to the internet and your home network wirelessly.

Inside, an AMD AM2 X2 4200+ processor and 2GB of 667MHz DDR2 Ram run the show. In addition, there's a large 320GB SATA hard drive that provides plenty of space for all your digital needs.

Graphics are provided by a silent, passively cooled ATI Radeon HD 3450 graphics card, which accelerates HD decoding so that movies look silky smooth. You'll get crisp audio with the smooth video too, thanks to its digital SPDIF output.

There's a remote control for accessing this home entertainment PC, plus a keyboard and mouse, which means this multimedia package will conquer any living room with ease.



You need never leave the sofa again with the XPC G5 6801M

Windows Vista Home Premium, Power DVD 7.3 Ultra and a dual DVB-T (Freeview) TV tuner card complete the package.

For your chance to win this fantastic media centre, answer the question below and enter online at www.pcw.co.uk/competitions. The competition opens on 15 May 2008 and closes on 13 June 2008.

What does SFF stand for?

- a) Simple Fan Features
- b) Small Form Factor
- c) Standard Format Footprint

This competition is open to readers of PCW, except for employees (and their families) of Incisive Media, and Shuttle. PCW is the sole judge of the competition and the Editor's choice is final. Offer applies to residents of the UK and the Irish Republic only. Entrants must be over the age of 18 and only one entry per household will be accepted. Winners will be selected at random from all correct entries received. No cash alternative is available in lieu of prizes. Incisive Media will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competition. Incisive Media reserves the right to substitute the prize for one of greater or equal value if circumstances make this unavoidable. Prizes will be dispatched by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competition. Incisive Media will use all reasonable efforts to ensure that the prizes are as described on this page. However, Incisive Media cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

The winner of the April competition is Sheila Loak, who wins a Wireless Entertainment Desktop 8000, the Lifecam VX-7000, the Lifechat ZX-6000 and a Toshiba Satellite P200-12D laptop. The runners-up are Brigid Doyle, Terri Day, Patricia Mcgall, Carol Coughlin, Janice Baker who each won the Wireless Entertainment Desktop 8000, Lifecam VX-7000 and Lifechat ZX-6000.

ENTER ONLINE AT www.pcw.co.uk/competitions

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→ <http://labs.pcw.co.uk> → <http://www.reportlabs.com/testbed>

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10 tips for buying safely

- 1 Get written quotes from shops specifying components used, or print off and keep spec sheets from websites.
- 2 Use a credit card if possible for purchases of £100 or more; you could get compensation from the card company if a supplier goes out of business.
- 3 Keep good records, storing receipts, correspondence in one place.
- 4 In England and Wales, the onus is on retailers to prove that faults found within six months on purchases are not inherent.
- 5 Goods ordered online, by phone or post can be returned under the Distance Selling Regulations without explanation within a reasonable time – this is widely accepted as being seven days.
- 6 Open and inspect all goods as soon as possible after delivery and make sure they work.
- 7 Companies are not obliged to repair or replace goods damaged by accident or misuse, unless it is caused in transit by a delivery service.
- 8 Companies cannot charge for a service that isn't being delivered, but never stop a direct debit while under contract.
- 9 Consumers should not suffer financial loss for repairs that are not their fault, so claim back carriage charges.
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Computing on the move

Fed up with having to carry a laptop around with you just to get access to your data and applications? We show you how the latest generation of portable technology and services can let you work on the move using a USB memory stick, phone or even your MP3 player.



Ultra-mobile PCs

They're small, stylish and highly portable, but what are ultra-mobile PCs actually good for? Our group test of the latest models weighing less than 1.5kg will show you exactly what they're capable of and which one you should buy.



DIY network storage

With a barebones Nas enclosure you can turn your old hard disks into fully-fledged network storage devices. We look at eight of the latest dual-bay enclosures and pick our favourite.

Accessorise your notebook

There are plenty of ways to enhance your notebook PC without spending a fortune. We look a selection of the latest and greatest accessories, covering everything from desk stands to coolers.



**There's lots more in August's PCW
DON'T MISS IT...**

JULY 2003

PC Blockbusters! we screamed, as we reviewed 10 £700 ex Vat PCs. Only one manufacturer, Mesh, is still with us today, and we recommended its system thanks to its high-spec Athlon XP 2500+ CPU, Radeon 9500 graphics card and game pad.

We also reviewed AMD's first steps into its golden era of performance and energy efficiency in the server space. Armari's Opteron 242 rack server had two 64-bit Opteron 242s running at 1.6GHz with 2GB of Ram and two 15,000rpm hard drives. There was precious little 64-bit code to test with, but 32-bit performance was every bit as good as dual-2.4GHz Xeon chips.



From the archives: Take a look at the important events in technology five, 15 and 25 years ago.

A sliver of page was dedicated to the first 3G handset on sale in the UK: the NEC E606. Instead of concentrating on high-speed browsing and emailing, we stated that 3, the operator, focused "largely on frivolous services targeted at the affluent consumer". The interface was horrible and the Premiership football highlights for £1 a pop weren't going to entice many viewers.

We also reported Apple's success after putting 200,000 songs online for sale in the US at 99 cents each. Apple sold a million songs within a week, while EMI set out its own plans to make 140,000 songs available for download for £1 in the UK.

JULY 1983

Probably the most important release of July 1983 was Epson's classic FX-80 dot matrix printer, which inspired a whole generation of follow-on products. The machine was remarkable for its versatility and ease of use. As our reviewer said, "The FX can be configured for various conditions by changing the settings of internal switches. You don't have to take the machine apart to get at them... and they can thus be changed even with the paper still in the printer, a great

improvement." This talk of DIP switches has got us all misty-eyed – they were the drivers of their day.

Elsewhere, two writers set about pulling the groundbreaking Apple Lisa to pieces and putting it back together again.

"Reviewing the Lisa in terms of what its hardware looks like and can do is rather misleading," wrote our reviewers. "To force a distinction between the hardware and the software really overlooks the purpose of an integrated environment." We're pretty sure they meant you could move things with a mouse and point at things.



JULY 1993

Our cover story was the brand new Pentium chip, also called – unofficially – the 586. Pentium processors were in short supply from Intel and, after being unveiled in 1992, weren't seen in PCs until late the following year. The first batch of Pentiums suffered from a reduced precision floating point unit and ran very hot. In our round-up we recommended sticking with a 486.

PC soundcards were an expensive luxury in 1993, and the Logitech Audioman was intended to redress

the balance. This device connected to a parallel port and combined a soundcard, speaker and microphone in one unit for £99. It looked similar to a Richard Rogers (think Millennium Dome and Heathrow's Terminal 5) skyscraper.

Meanwhile, we put 22 large CRT monitors through their paces in a group test, with sizes ranging from 17in to 28in. Names such as Aydin and Qume have vanished from retail, but most of the makers are still going strong. Prices ranged from £699 for a 17in Philips screen to £3,198 for the Aydin, which may explain a thing or two.



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