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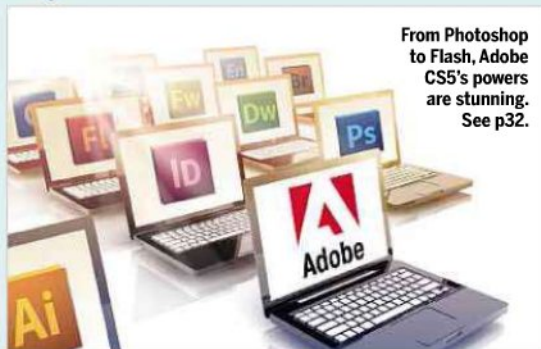
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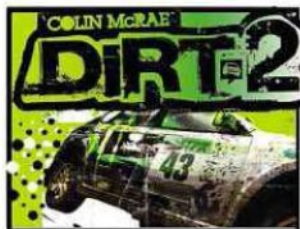


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Politicians should stop interfering in technology and start helping, says Tim Danton



“In their heart of hearts, presuming they have them, politicians must absolutely hate technology. It's like a mythological beast that won't fall under their thrall:

as soon as they think they understand one aspect, and build legislation to control it, the beast has been joined by 20 others speaking strange languages they don't understand.

Despite these beasts' horrific proportions, our *General Techlection* feature (see p108) shows that the UK's major political parties are trying to jump on what they perceive to be vote-winning bandwagons. Broadband is the most obvious example, with the Labour, Conservative and Liberal parties all setting out their promise-laden stalls. Sadly, they're still using terms they don't seem to understand.

If only technology was so simple it could be controlled like the transport system. “In the 19th century, we built the railways,” said shadow Chancellor George Osborne, “in the 20th century, we built the motorways. In the 21st century, let's build the superfast broadband network.”

That's a superb soundbite, but broadband isn't a network of roads or track. In fact, broadband isn't even broadband anymore. The official Ofcom definition of broadband still says “always-on services, offering data rates of 128Kbits/sec and above”, which is so open to being ridiculed I won't even honour it by doing so.

To see how slippery this subject is, note how our incumbent Government has got its cables in a twist attempting to detail its “2Mbps/sec for all” promise. It turns out broadband is so tricky to define that the Government can't even tell us what those guaranteed 2Mbps/sec connections really are (as Barry Collins mentions in his swipe at the national media on p20).

I'm not arguing for a moment that governments shouldn't interfere with our technology infrastructure. They're absolutely right when they say this is going to be the power behind a growing sector of our economy, and if we left all the investment decisions to private companies such as BT and Virgin Media, the so-called Digital Divide between town and country would grow ever more accentuated.

Where I get annoyed is when our governing bodies pick fights they can't win, not least because they don't understand the layers of complexity behind it. Attacking file-sharers is one obvious example. Even as I tap out these words there will be a representative of the gigantic music industry lobbying members of

Parliament, muttering in their ear about the harm file-sharing is doing to this key money-generator for the UK economy. “Close them down,” they whisper, “take away their connections. Throttle them.”

But that particular mythical beast has well and truly escaped, and with a single piece of ill-advised legislature – cobbled together with amendments from the House of Lords – the Digital Economy Bill will do horrible amounts of harm when the people behind it are trying to do good. And that's assuming their intentions are honourable. You only need to look at the controversy surrounding Stephen Byers, Patricia Hewitt and Geoff Hoon to see how easy it can be, if Byers' claims are to be believed, for industry money to sway bills passing through our hallowed chamber.

The even bigger problem is that legislature specifically attacking file-sharers falls victim to the cliché of treating the symptom rather than the cause. The Government would do far better to examine the copyright laws, still based on the Copyright, Designs and Patents Act from a pre-internet 1988, to help create a new business model. Or, frankly, just to ignore the problem entirely: there are powerful market forces at work, with Spotify and iTunes both pumping new sources of revenue into the music industry's coffers.


Yet more problems stem from the international nature of the internet. I don't agree with everything the EU does, but it alone stands firm against corporate giants such as Microsoft in a way that governments – no doubt conscious of the taxes paid by such companies in their countries – seem unable to.

There are problems with the browser ballot, not least of which is that at least a third of the 12 browsers offered are so poor I wonder if I shouldn't create a browser myself. But at least we now have a pragmatic approach to Microsoft's dominant position when it comes to the web browsers being used: from hereon in, Microsoft needs to rely on the quality of its browser rather than just being the default choice.

Our next Government must ignore the areas it can't control and concentrate on the areas it can influence. The UK needs more developers, it needs more great business ideas being turned into great businesses, and, yes, it needs a broadband infrastructure that will put us on the top of the pile. If I can yet be convinced that any of the major parties has a realistic vision that will deliver on this triumvirate, they'll have my vote – and I hope yours.

The Ofcom definition of broadband is so open to being ridiculed I won't even honour it by doing so

Tim Danton is editor of PC Pro. He'd also struggle to define 2Mbps/sec broadband, so it's probably best not to ask him. Read his blog instead at www.pcpro.co.uk/blogs/timdanton



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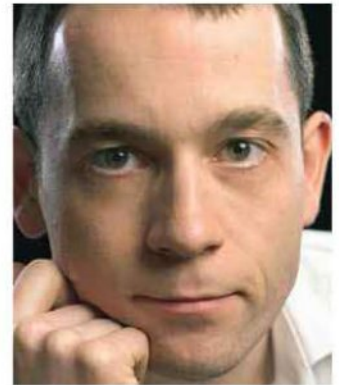
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Don't condemn GPU computing just yet, let it show what it can do, says David Fearon



“ So Nvidia's Fermi GF100 chip is here (see p64), and with it another flurry of optimistic claims about the shiny future of GPU computing. Personally, I'm less than convinced that GPGPU is ever going to be fully integrated into mainstream programming: it's just too much of a faff for most purposes.

Nonetheless, the potential performance advantage is massive. The maximum double-precision floating-point performance for the 480 CUDA cores in the GeForce GTX 480 is 672 gigaflops; that's 672 billion super-accurate floating-point operations per second. That compares to about 65 gigaflops for the very latest six-core Intel CPUs. Gigaflops are a crude measure, but do illustrate the level of power on offer if you can squeeze your problem into the GPU way of doing things.

So why is Fermi so underwhelming in our initial tests? Well, the most obvious conclusion would be that it isn't very good. Another might be that it was never going to blow anyone's socks off running current software.

Most of the research work in computer graphics isn't centred on achieving greater visual realism *per se*: it's about achieving a given level of apparent realism using the fewest resources. In other words, it's about thinking up tricks to make a scene appear more complex than it is, so you don't have to wait until next week for your frame to finish rendering.

TV and film sets are a good real-world analogy: they're constructed with a finite set of resources, restricted both in manpower and time. The goal isn't to make something real but something that looks real enough for the purpose – and quickly. The convincing facade is just a set of cleverly arranged plywood uprights, painted and dressed to look like a real courtroom, or pub, or the bridge of a starship. It's the representation that matters, not the substance.

The same thing happens in computer graphics. One of the classic tricks to achieve it is through texture mapping: by overlaying 2D pictures on simple 3D objects you can make them look more complex. A few flat polygons, painted with a skilfully designed texture-map image, can look like a brick wall or a mountainside as long as you're not looking too hard. Get up close, though, and the trickery collapses into an ocean of blocky pixels, just as it does when someone in *EastEnders* slams a door too hard and the whole set wobbles.

But with the amount of computing power on offer from the new GPU generation, those flat, plywood representations are ripe for gaining a bit of depth. The push from Nvidia is towards replacing the sham of texturing and shading with actual geometry.

More complex geometry isn't the only goal. A couple of weeks back I was given a demonstration, from Nvidia's arch enemy Intel, of its experimental ray-traced game engine. I wasn't overly impressed.

Subjectively – and that's what matters in graphics – it was at the same level as a basic texture-mapped engine circa 1998: low resolution, low detail and just not very good. The engine was running on a few of the latest-generation Xeons. Even with eight 32nm cores pounding away at the problem, the frame rate was a long way from silky smooth. Put simply, it needed a heck of a lot more computing power.

Like increased geometry, ray tracing is a replacement for fast but fake set-dressing techniques, this time in lighting your set rather than constructing it. Fake techniques such as Phong shading use a simple, fast algorithm to approximate the effect of light falling on a polygon, but without directly modelling the light itself. Ray tracing, on the other hand, does it properly. But calculating the path of every individual light beam reaching a viewer's eye needs a serious amount of computing grunt.

It also needs a fair dollop of finesse: ray tracing algorithms are complex computational jobs better suited to a CPU, with its full support for branching paths of execution, than a traditional GPU stream processor that prefers things to go from input to output with no conditional deviations or loops.

This is the kind of computing jugular that Nvidia is throwing itself at with Fermi: it's going for more sophisticated, flexible GPU cores, able through sheer weight of numbers to do certain complex things that current CPUs can't manage in a reasonable time.

But that means the latest game engines aren't written using the right approach – they're based around faking it. All those clever cores are sitting around doing simple things when they're capable of much more. If you get a group of structural engineers to help with your plywood film set, they're not being put to good use; get them to construct a real building and it might be a different story.

The same applies to GPU computing. So give it a while before you write it off.

”

The goal isn't to make something real but something that looks real enough for the purpose – and quickly

David Fearon is PC Pro's deputy editor. That tearing sound you can hear is the plywood analogy being stressed way beyond breaking point. Read his blog at www.pcpro.co.uk/blogs/davidfearon

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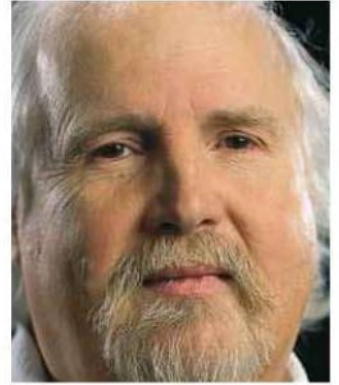


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Happy to share his memes, Dick Pountain introduces a new word to the English vocabulary



“ I'm not one who makes up new words lightly, which makes me rather restrained by IT industry standards, where marketing departments make up several a week. Perhaps it's because I make a living from words, and inventing new ones feels like debasing the currency. One I hate in particular is “blogosphere”, which sounds like the single testicle of some mythical forest monster. However, I've softened towards the term recently, having accepted that it does refer to something real for which there's no other suitable word.

Let's consider the precise meaning of blogosphere from two aspects. On the one hand, it's a physical phenomenon, a vast network of interconnected computers each containing a chronological list of utterances by an individual person that is readable from all the others. On the other hand, you can ignore these physical underpinnings and view it as a realm of human discourse, an enormous virtual space where people exchange ideas and opinions. The blogosphere is a massively connected flux of messages, some of which are original messages entering for the first time, while most are old messages. Occasionally, a message leaves the blogosphere and emerges into the “real world” by appearing in print or on the TV news.

There's something about this concept of a blogosphere that puts one in mind of Richard Dawkins' notion of “memes”, in which he describes the way ideas are passed around the pool of human speakers and subjected to selection pressure analogous to that which affects genes. However, there are subtle differences between the two notions. In Dawkins' meme theory, selection pressure is applied by individual minds when they accept or reject a particular idea such as Christianity or the offside rule. In the blogosphere, however, whatever selection takes place is mostly governed by the connectivity of the network rather than the content of the messages: some blogs have lots of connections, others far fewer, which actually sounds more like the neuronal structure of the brain than of a gene pool.

Thinking about all this tempts me, much against my better judgement, to coin a new word: the “psychosphere”. There are several billion people on this planet, each of whom has a mind that can store memories and use them to generate ideas. We don't have direct access to the contents of each other's minds, but we can talk to each other to exchange

ideas, which means the whole human world is a massively connected network that long pre-dated the blogosphere. Let's call this the psychosphere.

We all keep images of the people we know in our minds, which aren't merely visual and auditory but also behavioural: they help us to guess what the other person is thinking and predict how they'll react to us. Such representations have profound effects on real-world actions. In fact, they're the glue that binds societies together. For example, a hierarchy involves images of other people as being above or below us in authority, and they govern whether or not we obey those people. Bonds of affection are governed by images of other people as liked or not liked. We constantly manipulate the image we want to present to other people as we negotiate different institutional contexts, all the stuff that US sociologist Erving Goffman used to call the Presentation of Self.

While this psychosphere is something like Dawkins' realm of memes, it isn't confined to ideas, words or thoughts, but includes all manner of physical behaviours including rituals, tics, dances, flinches, bows, kisses and kicks, and it can illuminate the roots of religious notions separately from the theologies into which they later evolved. Whenever a person dies, something about them persists after their death, but it isn't their ghost, soul or spirit; it's the image of them in the minds of all the various people who knew them. This psychospheric “ghost” can survive as long as those people live, and if the dead person was particularly powerful or charismatic – Alexander the Great, say, or Jesus – then stories about them might be told to the next generation, and so on.

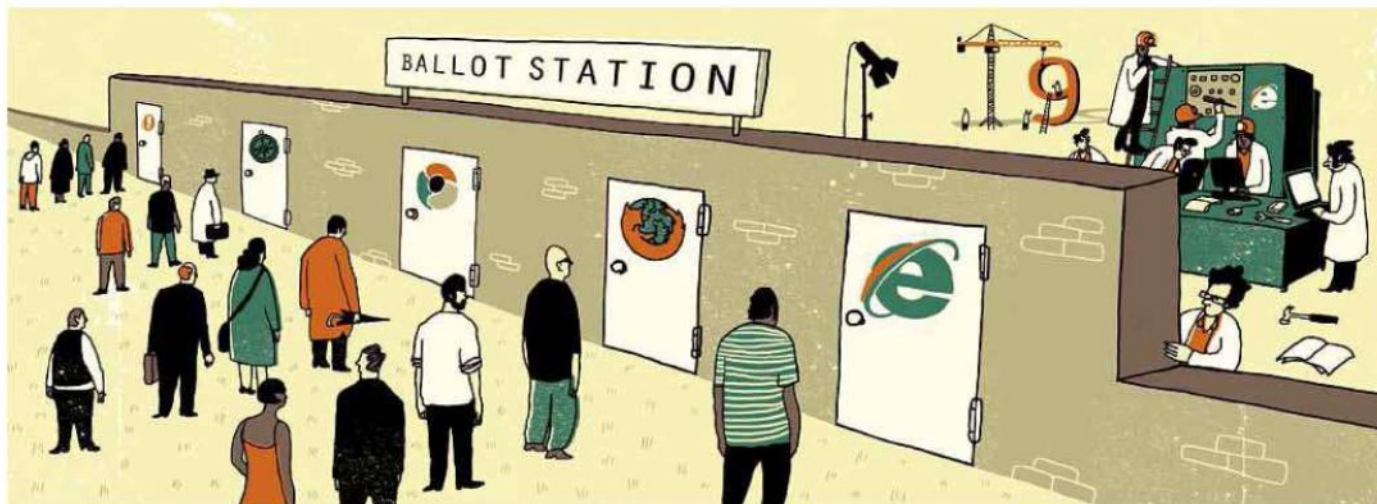
Of course, the image will alter at each telling, exaggerating some qualities at the expense of others, until the historical image bears little resemblance to the original person. Instead, the person's image becomes the symbol for some quality – bravery, compassion, wisdom – that a particular group of people wish to cultivate. The evolutionary purpose of our mental images of others was to help predict others' behaviour, and that purpose lives on in the psychosphere whenever we ask ourselves, “What would X have done?” For some X might be Jesus Christ, for others it might be Mao Tse Tung. It's a powerful and dangerous mechanism for inducing uniformity of behaviour; freeing yourself from it is hard, and the result not always easy to live with. **”**

“Blogosphere” sounds like the single testicle of some mythical forest monster

Dick Pountain is a minor lexicographer currently in remission (although he did contribute to WorldWideWords about blues terminology recently: www.pcprouk.co.uk/links/188idea). Next month he promises to write about computers.

News

IN-DEPTH REPORTS, ANALYSIS AND OPINION



IS MICROSOFT OUT OF LIVES WITH IE9?

IE9 WILL BE MUCH IMPROVED, BUT MICROSOFT IS RUNNING OUT OF CHANCES TO GET ITS BROWSER RIGHT

Microsoft is making grand promises for Internet Explorer 9, as the company looks to battle back in a market transformed by the browser ballot.

At the heart of the revamped browser are GPU-accelerated graphics and a new JavaScript engine called Chakra, which Microsoft claims will storm past Firefox in the performance stakes, and even give Google's astonishingly quick Chrome a run for its money. Microsoft is also promising that IE9 will be far more compliant with web standards such as HTML5 and CSS3 than previous offerings.

"HTML5 is the frontline of the browser war," said Michael Azoff, principal analyst with Ovum. "It provides a direct link between the client side and the web, supports dynamic displays and integrated video. IE's playing catch-up to its rivals, but Microsoft still wants developers to use Silverlight rather than HTML, so that's going to dictate how enthusiastically

the team embraces it. You can never write Microsoft off, but it needs to get this right, or it will lose a lot of ground."

We won't be waiting long to see if Microsoft has the browser to back its promises. New builds of Internet Explorer 9 will appear approximately every eight weeks until the first beta, although Microsoft said the final release is "many months away".

The company will be hoping IE9 can arrest the decline of its market share, which has been further eroded by the browser ballot imposed by the EU. The ballot gives users the choice of 12 rival browsers if they have Internet Explorer set as their default, and is Microsoft's sop to the EU, which was investigating if the bundling of IE with Windows was anti-competitive.

Web statistics firm StatCounter has reported that during the ballot's first month, Microsoft's market share dropped by 2.5% in France,

1.3% in Italy, and 1% in Britain. Opera – which brought the original complaint against Microsoft to the EU – has claimed the browser ballot accounted for 46% of its total UK downloads since launch, while Mozilla would only say that "it's had a significant impact in downloads".

A victory for the web

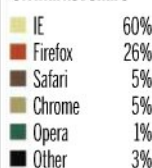
"The choice screen is a victory for Opera today, but over time, it's a victory for the web and the standards that are out there," said the company's CTO Hakon Wium Lie in an interview on p15. "Web designers have been wary of adding web functionality not implemented by Microsoft, because they knew it wouldn't be seen by many, but that's changing and the more users we can get using other standards-compliant browsers, the better we are."

Mozilla claimed the most important aspect of the ballot was that it ensured Microsoft played nicely with other browser manufacturers in the future.

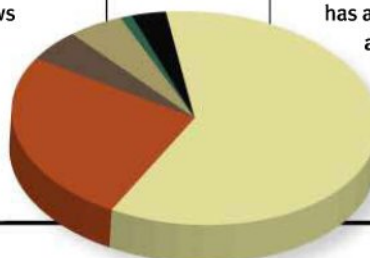
"If a user has chosen a browser other than Internet Explorer, Microsoft has agreed to respect this choice and not reverse it through an automated update. We think this is more important than the ballot screen itself," said Mozilla Europe president Tristan Nitot.

Illustration:
Olvind Hovland/
www.nbillustration.co.uk

UK market share



Figures by StatCounter
ending 10 March



EXCLUSIVE

Argos in credit card email debacle

PC PRO UNCOVERS MASSIVE LAPSE IN HIGH-STREET RETAILER'S CREDIT CARD SECURITY

PC Pro has uncovered a massive security breach at one of Britain's best-known retailers, Argos.

The company was caught sending out customers' names, addresses, credit card numbers and three-digit security codes in unencrypted order confirmation emails. Anyone intercepting or gaining access to the order confirmations would have all the details necessary to steal someone's credit card.

Worse still, the emails contained a web link – ironically, intended to direct customers to Argos' security page – which also contained the customer's credit card details. Customers clicking on that web link would have left plain text details of their credit card numbers in their browser's web history, as well as server logs maintained by employers and ISPs.

Argos refused to divulge how many customers had been affected, but the flawed emails were being sent out from April 2009 until the problem was fixed at the beginning of March.

At least two people who received the emails have told PC Pro they

subsequently had their credit card details stolen, although there's no evidence the theft is linked to the email.

Security experts said there was no way of telling where the data may have ended up. "This information is being sent unencrypted over email, so anybody monitoring network traffic could see the data," noted Sophos Labs security expert, Paul Baccas. "If the email is going to a webmail or company account, this information will be stored and accessible to people with access to those servers."

Argos told PC Pro it "takes the security of its customers' data extremely seriously, is fully aware of the requirements of the Data Protection Act, and has taken remedial action in relation to this matter".

Caption here
please caption
here please

? NEED TO KNOW



Text 2.0

OUR MONTHLY GUIDE TO A TECHNOLOGY YOU REALLY SHOULD KNOW MORE ABOUT

➔ **That name is so bad it makes me want to weep.**

Well you can't, it would throw off Text 2.0's eye tracker. You see, Text 2.0 is a reading aid that triggers actions when your gaze hits keywords in the text – offering translations of foreign words, for example, or remembering where you left off reading when you look away from the screen.

➔ **That's no use, there aren't any foreign words in Heat.**

Thankfully, the device's creator, Ralf Biedert of the German Research Center for Artificial Intelligence, isn't looking to revolutionise the world of tawdry celebrity tat. He envisages Text 2.0 being used to create an entirely new type of book, which he calls the Hollywood Book.

➔ **Of course he does, he likes to hear me gag.**

Admittedly, the marketing needs a little work, but the concept is sound. Biedert wants books that feature elements from movies. So instead of describing a complicated fight in Harry Potter, a video would start when your eyes hit that paragraph, potentially making books more interesting to word-shy children. Text 2.0 is being targeted at eBook readers and slates, although he'll need to knock down the €27,000 asking price first.

➔ **Why read Harry Potter? At that price, I could have the ginger, funny one perform it for me.** We'd pay double that to stop him. Either way, Biedert's already touting the technology to manufacturers.

BIOLOGIST IN CHARGE OF BROADBAND

The man tasked with helping to deliver the Government's 2Mbps/sec universal broadband pledge has absolutely no experience in the broadband industry.

Simon Towler has been appointed head of broadband policy and programmes at the Department for Business, Innovation and Skills (BIS), and boasts an impressive CV that includes a PhD in molecular biology and a three-year stint as deputy director of better regulation at BIS. Noticeable by its

absence is any experience in IT or telecoms.

"The appointment of the head of broadband policy and programmes was made in line with the usual employment procedures in the civil service," a BIS spokesperson informed PC Pro when we asked why he'd been chosen. BIS

refused to comment on its employment procedures.

The appointment is particularly odd given that BIS was recently embarrassed by a committee of MPs, after it failed to define what the Government's universal 2Mbps/sec commitment actually meant.



NEWS GRID

WHAT HAPPENED

PHONE 7 AXES CUT AND PASTE

Microsoft has dropped cut and paste from Windows 7 Phone Series, claiming that customers won't even notice it's gone. Instead, Microsoft will offer "smart linking", allowing users to double-click on items such as phone numbers, and add them to their address book. Cut and paste will even be disabled on the mobile version of Office 2010 Web Apps, which will ship with Windows Phone 7 Series handsets.



WHAT THEY SAID

"We've looked at copy and paste and asked 'what do users want to do with that?'," said Todd Brix, senior director for mobile platform services product management at Microsoft. "Then we've introduced a smart algorithm that kind of guesses that this is an address, this is a phone number, this is a proper noun, this is a URL, and we try to anticipate what they want to do with it. If it's a phone number, chances are they're going to create a contact with it, or make a call with it. It's much simpler."

WHAT WE SAID

"Is Microsoft really going to introduce Windows Phone 7 Series without cut and paste, and risk the ridicule of its few remaining supporters?" wondered reviews editor Jon Bray.

"After all, when Apple, RIM and Google have all demonstrated it can work on a consumer smartphone, there's no reason why Microsoft can't find a way to implement the feature alongside smart linking. And with Office remaining a cornerstone of the OS, it would be folly to omit it."

IPAD BATTERY BONANZA

Apple has hit on a novel way to boost iPad sales: send a free one out with every new battery. The slate features Apple's signature sealed case, which means that users need to return the complete iPad to Apple if they want the battery swapped out.

With past products, Apple has simply replaced the battery for a service fee, but with the iPad the company intends to deliver an entirely new unit to customers at a cost of \$105.95 in the US.

While customers may jump for joy at receiving a new iPad with each battery change, the system has its flaws. "You will receive a replacement iPad that will not contain any of your personal data," Apple's support note states.

"Before you submit your iPad for service, it is important to sync your iPad with iTunes to back up your contacts, calendars, email account settings, bookmarks, apps, etc. Apple is not responsible for the loss of information when servicing your iPad."

"Apple isn't a charity, and it's making this announcement for business reasons," said *PC Pro* editor Tim Danton. "It has to offer a service to customers whose batteries fail, and judging from the figures, it should still turn a profit on the process. If this is anything like the scheme Apple already offers iPod owners, who send in battery-dead machines and receive either a new or refurbished model in return, then the main costs are for labour, replacement batteries and postage. Don't be fooled: this is no 'free iPad for life' scheme."

BROADBAND HIGHS AND LOWS

Virgin has announced plans to use telegraph poles to bring 50Mbps/sec broadband to rural areas. The company will trial the scheme for six months in the village of Woolhampton in Berkshire and, if the trial is successful, Virgin claims around one million UK homes could benefit from the "aerial deployment" of fibre. Meanwhile, Ofcom has demanded that BT grants rival ISPs access to its underground fibre lines, but a bemused BT claimed it had been offering just that since the start of the year.

"BT's fibre network is already open to all Communication Providers [CPs]," said BT. "Seventeen CPs are either trialling or providing services using our unbundled service." BT also tacitly endorsed Virgin's telegraph trial, noting that, "Duct access is unlikely to be the 'silver bullet' to get fibre to the countryside, but all options should be explored."



"Giving rival fibre providers access to BT's telegraph poles or underground ducts is all well and good, but it doesn't solve Britain's looming broadband crisis," said online editor Barry Collins. "The plain truth is that – BT aside – there's still no-one willing to put their money on the table for a large-scale fibre roll-out. The Government's much-loathed landline tax may be the only realistic chance of fibre ever reaching outside of the big cities."

UK LAUDS CYBERWAR DEFENCE

A House of Lords report has found the UK is better equipped than many of its European neighbours to weather a serious cyberattack. The report, carried out in the wake of attacks on Estonia's internet network in 2007, highlighted the UK's computer emergency response teams and concluded that it is "highly unlikely that the UK could be 'cut off' from the internet by remote electronic attack or technical failure".



"We are conscious that cyberattacks, or natural or man-made disasters, can cause acute disruption to the internet in the short term," the report said. "We believe that the UK is reasonably well placed to cope with such disruptions. We note that it is thought to be a leader among Member States, with developed practices that set benchmarks."

The report did flag one possible concern. "A failure of the Thames Barrier would flood the London Docklands and have a major impact on the internet," the report warned.

"The damage that could be wrought on this country by a co-ordinated cyberattack is terrifying to contemplate, and it's reassuring that somebody is thinking about our defences," said news editor Stuart Turton.

"However, I'd have been more reassured by the report's findings if it had been written by somebody who could evaluate the evidence presented, preferably somebody with a working knowledge of cyberwarfare. I'd be far more interested to hear how the networks are being regularly tested, the methodology used, and how they fared."

WHAT YOU SAID

■ "Awful decision by Microsoft," said Bassey1976. "Let's hope someone sees sense and fixes this before the launch." The sentiment was echoed by saqib. "I have yet to see a tagging/linking system able to pick up all the subtleties and quirks people use to format their data." Aryehsc claimed the omission could disillusion users: "I have the HTC HD, and the reasons I chose Windows Mobile were multitasking and cut and paste. Looks like Android will be the logical progression for a Windows Mobile 6 user."

■ "If Apple sold cars, I could get a new one every time it ran out of petrol," reckoned shrek59. Mogmios carried on. "It would be nice to see a basic MobileMe service thrown in so the device will keep itself backed up when attached to a network, but users should be backing up regularly, so this shouldn't be a big problem."



■ "In our village, with a population of more than 1,000 people, the best we can hope for is 512Kbits/sec," said skarlock. "How we would all love to make proper use of iPlayer and related services."

OxfordRob said it wasn't only a rural issue. "Everyone keeps banging on about the rural areas having problems with internet access, but what about those of us in urban areas that are in not spots? I live in Oxford, and after four visits from BT and line tests the most we will get is 256Kbits/sec."

■ Phantombudgie wasn't impressed. "You mean all those government departments with Windows XP and IE6 are impervious to cyberattack? By 'a leader among Member States' do you mean 'slightly above the average level of very poorly prepared?'" he wondered. Greemble was far more cheerful about the entire thing. "The UK has a very strong weapon that saves it from cyberterrorism/warfare. It's called the infrastructure – anyone trying an all-out assault will get bored waiting to log in to their target."

ON THE SPOT



Demolishing Internet Explorer's web veto

OPERA CTO HAKON WIUM LIE EXPLAINS WHY THE BROWSER BALLOT IS GOOD FOR THE WEB – AND HOW IT COULD BE BETTER

The roll-out of Microsoft's browser ballot screen, which offers Internet Explorer users a choice of 12 different browsers, is in full swing, with rivals already reporting a significant surge in downloads as a result (*read the full story on p12*).

The choice screen was a concession to the EU, which was investigating whether Microsoft's bundling of Internet Explorer with Windows was anti-competitive, after a complaint from Opera. We caught up with the company's chief technology officer, Hakon Wium Lie, to find out whether Opera's concerns had been addressed.

Q Now the browser ballot is here, are you happy with the way that it's been implemented?

I think offering 12 browsers is a little too much. We argued that the choice screen should be decided by rendering engine, rather than brand name. We didn't succeed in that argument, so there are ones in there that are just skins on top of IE, and it's debatable whether they qualify as browsers or not. They, of course, would say they do, but I'm not so sure. I know what it takes to build a rendering engine, and there's a whole lot of work in there, whereas creating a skin is much easier.

Q Why is it important to have different rendering engines?

Different rendering engines promote a wider use of standards. Until now, Microsoft effectively had a veto on new functionality on the web, because if it wasn't implemented in Internet Explorer nobody would start using it. Web designers were hesitant to use standards because of IE's big market share – if you can call it market share in a place where a market hasn't really existed – but that will change with increased use of more standards-based browsers, and with IE9 we'll see if Microsoft has improved its support as well.

Q Are you optimistic about Internet Explorer 9?

Well, I'm happy that Microsoft has increased its support for HTML5 and CSS3. I still think it has a long way to go, though, so we'll see.

Q Opera reported that UK downloads jumped 85% on the back of the ballot. Were you surprised by that?

It was hard to know what to expect, and I have to say, these numbers we're publishing, it's hard to know what they mean. The roll-out of the choice screen takes place over several months, and Microsoft has staggered it so that it doesn't take down its servers. The numbers are interesting, but we don't know if it's something that's going to last over time, or just the next week until the novelty wears off.

Q Even getting more people to try Opera must count as a success?

Of course we're happy for every new user. From the beginning, it was clear that users across Europe hadn't really been given a choice about their browser. They opened their new computer, found the blue "e" there, and they started using the internet. They didn't think about the alternatives, or have any idea about where to go to find a better browser. That's something the ballot changes, but it shouldn't only be available to Europeans. Users across the world deserve better browsers – we'll see if this is something the EU can export.

Q You obviously still have concerns about the browser ballot. Will you be taking them to the EU?

We've already presented our arguments to the EU, but I think it's planning further meetings to evaluate the effectiveness of the choice screen, so we'll see what happens in the future.

INSIDE INFORMATION

1 ARTIFICIAL SMILES

A concept camera developed by the Berlin University of the Arts will automatically insert a smile on unhappy faces.

The Artificial Smile Camera uses facial recognition software to detect whether a subject is smiling. If the software detects a frown, or an otherwise unamused expression, it dips into a pool of hundreds of existing images to find the perfect smile to fit the face. Once done, the smile is applied by the camera and the image taken.

"Editing software such as Photoshop has led to the touching up of images in the pursuit of perfection," said project lead Stefan Stubbe. "Artificial Smile allows only smiling people's pictures to be taken, irrespective of their former emotional state."

The developers plan to release the source code behind Artificial Smile to the open-source community.

2 SWAPPABLE NETBOOK SCREENS

Pixel Qi plans to sell its hybrid screens directly to customers brave enough to swap out their netbook panels manually – a process the company's chief executive describes as "like changing a light bulb".

The low-power Pixel Qi screen can flick between ePaper and LCD modes, although the company claims even the LCD mode will be readable under fluorescent lighting and direct sunlight. The company – headed by One Laptop Per Child's former chief technology officer Mary Jo Jepsen – is in negotiations with several manufacturers to bring the screen to their devices, but in the meantime it will begin selling the screens as DIY kits.

"It's only slightly more difficult than changing a light bulb," Jepsen wrote in a post on the Pixel Qi blog. "It's basically six screws, pulling off a bezel, unconnecting the old screen and plugging this one in. That's it. It's a five-minute operation."

2

4

3 SUPER-FAST BROADBAND

The Prime Minister has promised "super-fast broadband" for the entire country by 2020, as internet access pushes itself to the forefront of the political agenda.

Gordon Brown didn't specify what he meant by super-fast broadband, but the Prime Minister promised the network will reach "100% of homes" by 2020. He also attacked the Conservatives' pledge to deliver 100Mbps/sec connections by 2017 through private investment, claiming the approach will create a digital divide.

"We can't allow the market to provide a solution on its own terms and according to its own timetable," said Brown. "The result would be super-fast broadband coverage determined not by need or by social justice, but by profitability. The alternative is our vision: ensuring, not simply hoping for, universal coverage."

The UK isn't the only country making grand promises. The US has unveiled a plan aimed at delivering 100Mbps/sec internet to 100 million homes by 2020, while Australia will hook up 90% of homes with 100Mbps/sec by 2017.

4 QUANTUM CAMERAPHONES

A new camera sensor that uses quantum dots instead of silicon could significantly improve the picture quality of camera phones.

According to InVisage Technologies, current silicon-based camera sensors have a light-absorbing efficiency of around 25%, which is degraded even further by the circuitry required to translate light into images.

To compensate, DSLRs and compact cameras feature larger sensors – a trick smartphones can't employ because of their smaller cases. However, InVisage's QuantumFilm sensor is built on quantum dots, which the company claims are around 90-95% efficient.

"Silicon is used for two functions," an InVisage spokesperson told *PC Pro*. "One is to convert light into data, which it is very good at. The second is to capture light, and silicon is inherently a bad system for this, as it loses light and sometimes leaks into other pixels."

The technology will be available to phone manufacturers by the end of the year, and should be no more expensive than current CMOS sensors.



Will anybody buy Palm?

SPECULATION MOUNTS OVER TAKEOVER BID

Palm's \$22 million (£14.6m) loss in the third quarter has led to speculation the company might find itself on the end of a takeover bid.

Palm shipped 960,000 phones to partners in the third quarter, but only 408,000 of those were sold, leaving stockpiles of Pre and Pixi handsets cluttering warehouses. As a result of this backlog, Palm has forecast fourth-quarter earnings of \$150 million – less than half of what had been expected.

Palm chairman Jon Rubinstein described the results as "extremely disappointing", with speculation rife that the company was bracing itself for a takeover bid.

"While we believe Palm has some value with its webOS... we are unsure of the company's prospects as an ongoing concern," said Kaufman Bros analyst Shaw Wu in a client note.

"The question is, what would anybody acquiring Palm get?" asked Tony Cripps, principal analyst with Ovum. "WebOS is good, but it's a contributing factor to Palm's problems. The Pre was pitched into a market against smartphone makers with better ecosystems, and it hasn't found traction with developers."

"I've heard speculation that Nokia was sniffing around, but with Symbian and MeeGo, Nokia's platforms are complicated enough. If anybody's going to buy Palm it would be a Dell or HP, large companies that have expressed an interest in the space, but haven't got a large presence there," he concluded.

Illustration: www.acutegraphics.co.uk



VigorIPPBX 3510
with full integration of your
existing ISDN/analogue lines



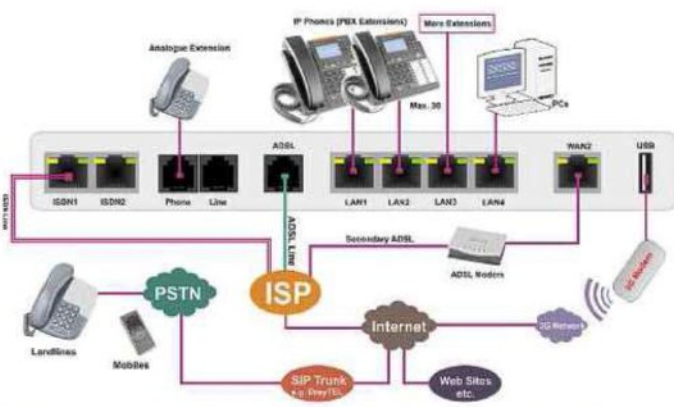
VigorIPPBX 2820
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VigorPhone 350
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DrayTek's new range of IP PBX products enable you to make the switch from traditional phone lines to VoIP Telephony quickly and easily. A VoIP PBX lets you take advantage of the huge flexibility, scalability and cost-savings compared to traditional phone lines and phones.

IP Phones make use of your existing Ethernet (CAT5) infrastructure and remote offices' phones are seamlessly integrated into one system so that extensions can call each other and transfer calls regardless of whether they are at the next desk, or in the next continent! Visit the web site for further product information, in-depth implementation examples and deployment guides.



- IP PBX's and Routers combined with ADSL and load balancing
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- Up to 100 phone extensions
- Use existing LAN infrastructure Seamless integration of remote and local (in-office) extensions
- Call Transfer & Intercom
- Voicemail for every extension
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- Ideal for load-balancing routers, dual-WAN firewalls or any router or firewall needing ADSL added.



Vigor 2710 Series

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- USB Storage (NAS)
- VoIP capability with 2 phone ports
- QoS for high VoIP quality



Vigor AP-700

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- WPA/WPA2 Encryption
- Multiple levels of client security



Vigor 2955 Series

Dual WAN SSL VPN Appliance

- High Performance (90Mb/s)
- Dual Ethernet WAN Ports for load balancing or WAN backup
- Robust firewall & QoS
- CSM & Web content filter
- 200 VPN tunnels & SSL VPN



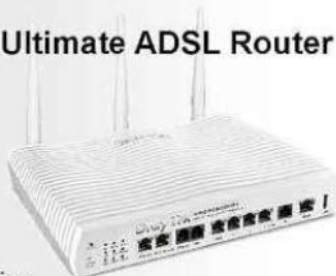
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PoE or Gigabit Ethernet

- Power-over-Ethernet (PoE)
- Gigabit & SFP Connectivity
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- Stackable
- SNMP Management
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Vigor 2820 Series - The Ultimate ADSL Router

- ADSL Router & Firewall
- Secondary WAN (Internet) Interface
- 3G (Cellular) Backup (USB)
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- Content Management Controls
- Twin VoIP Ports and 802.11n WiFi
- Vast array of security features



See web site for full specification



DrayTek
www.draytek.co.uk



The location lottery

GEOLOCATION SERVICES ARE EVERYWHERE, BUT ARE WE BEING LED INTO A PRIVACY MINEFIELD? STUART TURTON INVESTIGATES

The web has always been nosy. Facebook asks "what's on your mind?", Twitter wants to know what you're doing, and Google hoards every piece of search data it collects on you for 18 months.

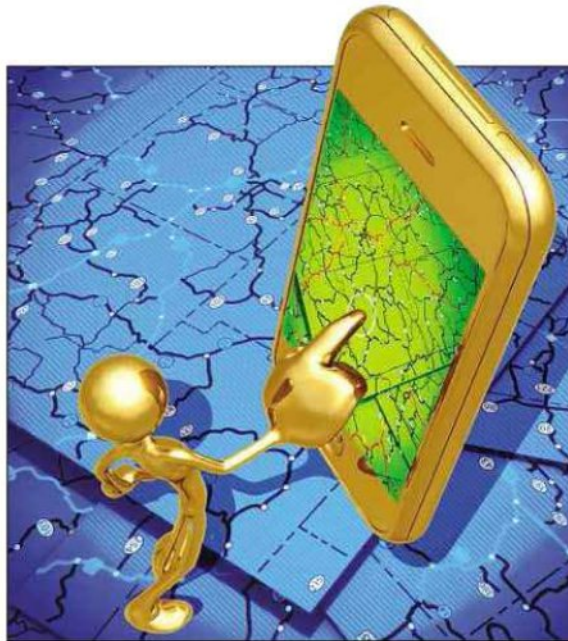
However, the web is currently obsessed with a new question: "where are you?" Firefox and Chrome have implemented an API that provides websites such as Facebook and Twitter with location data gleaned from GPS, Wi-Fi access points, or mobile base station triangulation. Over the next year, the sites plan to automatically pin this information to status updates, uploaded photos and tweets.

And, the craze isn't confined to social networks. Navigation-software maker Sygic has launched an iPhone app called Aura that broadcasts your location in real-time to everybody on your contacts list, allowing you "to bump into friends when you're out". But while companies have been keen to tout the convenience of location-based services, they're also excitedly examining the impact on their bottom line. Google, for example, has filed a patent for "determining and/or using location information in an ad system", and the search giant isn't shy about its plans for turning your location into a commodity.

"The Google keyword ad server allows advertisers to specify one or more countries in which their ad may be served... however, many businesses have only a regional or local reach. For example, a restaurant may want to target ads only to potential customers within a 30-minute drive. A dry cleaner may want to target ads only to potential customers in the same town," the patent reads.

It's no wonder companies are lining up to embrace geolocation, but experts have warned that customers are being quietly led into a privacy minefield.

"Geolocation data is covered by data protection laws in the UK, but if all that data gets posted to Facebook, what happens to it then?" said Rosemary Jay, a specialist in data protection with law



firm Pinsent Masons. "It sits outside of European control. It's a similar issue to the retention of search data, but that wasn't particularly easy to access. Facebook and Twitter means all that data is associated with a specific account, which makes it much more useful."

Jay also raised the question of what happens when these services become ubiquitous. While Google and Twitter aren't likely to go bust anytime soon, there's no guarantee that the tiny social network you're a member of won't be bought out in the future. Sensitive information such as health records require customer consent to be sold on, and the Information Commissioner keeps a wary eye out to ensure the rules are followed. As it stands, there's no guidance on geolocation data, despite the fact it could offer a daily record of your movements, which means there's nobody dictating what this data can and can't be used for.

This concern was at the forefront of a recent Electronic Frontier Foundation report, which wondered how companies might mine such a rich vein of data in the future. "Suppose that an insurance company manages to obtain a record of Alice's movements over the past year, and decides that there is some aspect of

that record which is grounds for raising her premiums or denying her coverage," the report said.

"The problem with that decision is not just that it is unfair, but that Alice may have no ability to dispute it. If the insurance company's reasoning is misinformed, will Alice have a practical way of knowing and disputing it?"

Of course, companies claim that using geolocation services is entirely optional. Chrome, Firefox and Aura have them switched off by default, but there's no guarantee they'll remain that way. Back in December, Facebook caused a furore when it assumed that most people would want to share their profile information with everybody on the web, and set that option as default. A hasty revamp and apology followed, but it was clear how the social networking site viewed user data.

Given the backlash, it seems perverse to suggest people are edging closer to Facebook's way of thinking, but as the creators of Please Rob Me (<http://pleaserobme.com>) have so dramatically demonstrated, the public is already happy to share its location for a lot less than a cut-price pizza. Please Rob Me scraped information from Foursquare – which requires users to post their current location on Twitter to earn badges – and used it to cobble together a list of empty homes. The site brought a storm of controversy, but its founders were unrepentant, claiming people had become far too blasé with their data.

"Foursquare asks people to check in at their house, or their girlfriend's or friend's house, and share that address for a badge," said Boy van Amstel, one of Please Rob Me's developers. "They're not aware of how much they're sharing. Not long ago, people wouldn't give their full name on the internet, and we're well beyond that point, but nobody realises."

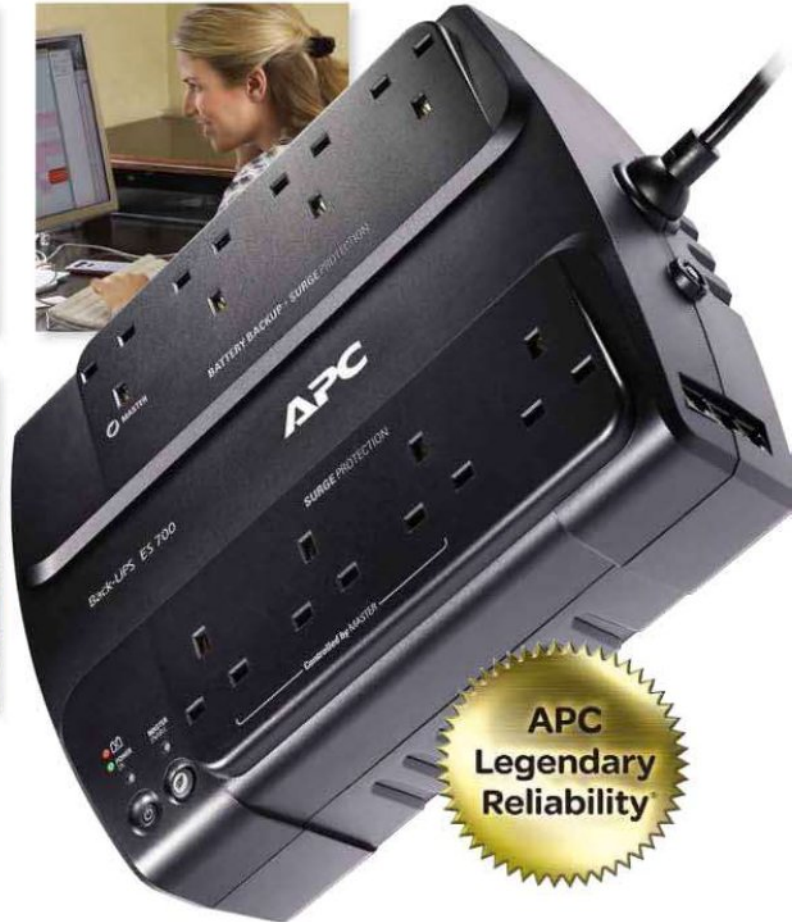
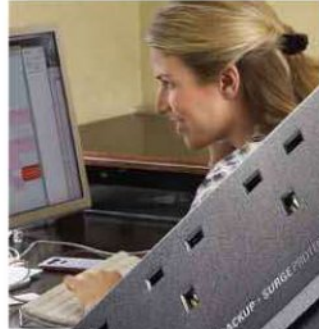
The web has always been nosy, and we've always been happy to oblige, but next time the web asks "where are you?", it might be worth asking "why do you want to know?"



STUART TURTON

Stuart Turton is PC Pro's news editor, and welcomes geolocation. He's hoping it will tell him where the public's common sense is hiding. Read his blog at www.pcpro.co.uk/blogs/stuartturton

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When the BBC landed an interview with Bill Gates, it sent newsreader Fiona Bruce to ask the questions

When will the national media finally start taking tech seriously, asks Barry Collins

“

I've spent a fair part of the past few months in the House of Lords, helping politicians make sense of the Digital Economy Bill. There's one question I've been asked more than any other: how do we get the national press to take this matter seriously?

A whole swathe of dangerous, obtuse and downright misleading legislation in the Bill has just been rubber-stamped by the House of Lords, but you'd be practically none the wiser if you relied on national newspapers or television for your technology news.

Thorough technology reporting is rarely in the news pages. Take, for example, the Government's pledge to deliver nationwide 2Mbps/sec broadband by 2012, a policy that will affect millions of people across the UK.

In February, a committee of MPs published a report revealing this pledge to be meaningless, because the Government couldn't define 2Mbps/sec. When pressed, the Department for Business, Innovation & Skills said it "should look and feel like a 2Mbps/sec commitment as someone in areas served by those markets would understand it". As the MPs noted: "This is not a helpful statement... We are concerned that the Government is committed to a Universal Service Commitment of 2Mbps/sec, with a budget of £200 million, without a clear definition of what it means."

Did any of our national newspapers pick up on this scandalous waste of public money? Not according to the search engines of *The Guardian*, *The Times*, *The Daily Telegraph* or *The Independent*.

In fairness, the newspapers have covered some of the issues arising from the Digital Economy Bill. The clampdown on file-sharing and the 50p broadband tax has been reported by all the papers above – often in great depth on their websites – but the stories are often relegated to the business pages or media sections of the newspapers themselves.

In part, this reflects a reluctance by the nationals to take technology seriously. *The Guardian's* highly respected *Technology* section has been axed from the newspaper, although Charles Arthur, Jack Schofield et al continue to deliver excellent tech coverage online; *The Sunday Times's* technology section *Doors* (for which I used to work) has long been folded into the gadget-obsessed *In Gear*, which is tucked away in the property section; and *The Times's* and *The Telegraph's* printed technology sections have also evaporated.

Even when newspapers do cover technology, they tend to veer horribly off course. *The Daily Mail* dug

itself into a huge hole in March, when it devoted a double-page spread to an undercover investigation into the social networking site Facebook. Its reporter posed as a 14-year-old girl and made the shocking claim that "within 90 seconds, a middle-aged man wanted to perform a sex act in front of me". There was only one problem: it wasn't Facebook. It could never have been Facebook; under 18s aren't allowed to be contacted by adults they don't know, let alone within 90 seconds. *The Daily Mail* swiftly retracted the claim, but even someone with the merest hint of technical know-how would have spotted this error.

The only time newspapers seem to give technology expansive coverage on the news pages is when they uncover a "scandal" ("Internet rehab for 12-year-olds", screamed the front page of the *London Evening Standard* as I was writing this column), or Apple launches a new product (*The Guardian* devoted the entirety of pages 2 and 3 to the unveiling of the iPad).

Television is no better. Five has its fluffy *Gadget Show*, while the BBC's more worthy *Click!* is stuck in the graveyard Sunday morning slot, and repeated at greater length for the benefit of about eight viewers on the BBC News Channel. If the BBC does bring technology into prime time, it has to dress it up with celebrities. When the Beeb landed an interview with Bill Gates in 2008, it sent newsreader Fiona Bruce to ask the questions. And when its flagship "investigative news programme" *Panorama* poked into the file-sharing clampdown, it was hosted by DJ Jo Whiley, whose experience of investigative journalism is largely restricted to asking Oasis if they get on with the Manic Street Preachers. Little wonder BitTorrent was described as a "website", record industry figures went unchallenged, and the minister for Digital Britain was lobbed a series of questions so soft they could have been used to stuff cushions.

When the BBC commissions a show on the Hadron Collider it sends for Royal Society fellow Brian Cox; when it makes a programme on genetics it calls on Professor Robert Winston. So why does it get the host of *Antiques Roadshow* to front weighty tech issues?

When I spoke to Open Rights Group chief executive Jim Killock recently, he expressed fears that issues such as cutting off file-sharers' broadband and blocking websites hadn't been properly debated. Is it any wonder when the mainstream media treats these matters with such contempt?

”

Barry Collins is the online and features editor of PC Pro. He may have written his last article for the nationals. Read his blog instead at www.pcpro.co.uk/blogs/barrycollins

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Toshiba NB305

PRICE £255 (£300)
WEB ID 355678

SUPPLIER www.cclonline.com
ISSUE 187

A finely designed 10in netbook with a new Pine Trail Atom processor, nearly nine hours away from the mains, comfortable ergonomics and a tempting price. Don't pay anything more for a netbook.



1.66GHZ INTEL ATOM N450; 1GB DDR2 RAM; 250GB HARD DISK; INTEL GMA 3150 GRAPHICS; 1,024 X 600 10.1IN TFT; 802.11BGN WLAN; 10/100 ETHERNET; 3 X USB; D-SUB; WINDOWS 7 STARTER 32-BIT; 266 X 193 X 36MM (WDH); 1.36KG; PART CODE: PLL3AE-00FOONEN.

ALTERNATIVE CHOICES

Samsung N210

PRICE £247 (£290)
WEB ID 356152

SUPPLIER www.laptopsdirect.co.uk
ISSUE 187

Nine hours of battery life, slick new looks and good ergonomics make this an excellent netbook.

Asus Eee PC 1005HA

PRICE £214 (£251)
WEB ID 260476

SUPPLIER www.laptopsdirect.co.uk
ISSUE 179

A great value netbook. If you need portable computing at a bargain price, this is ideal.

VALUE LAPTOP

Acer Aspire Timeline 3810TZ

PRICE £404 (£475)
WEB ID 356191

SUPPLIER www.ebuyer.com
ISSUE 187

The very definition of a superbly balanced, inexpensive ultraportable, with good build, a fair amount of power, and nearly ten-hour battery life.



1.3GHZ INTEL PENTIUM SU4100; 4GB DDR3 RAM; 250GB HARD DISK; INTEL GMA 4500M; 1,366 X 768 13.3IN TFT; 802.11BGN WLAN; GIGABIT ETHERNET; 3 X USB; D-SUB; HDMI; WINDOWS 7 HOME PREMIUM 64-BIT; 322 X 228 X 29MM (WDH); 1.6KG; PART CODE: LX.PE602.045.

ALTERNATIVE CHOICES

HP Pavilion dm3

PRICE £451 (£530)
WEB ID 355963

SUPPLIER www.laptopsdirect.co.uk
ISSUE 187

Strong build combines with stunning looks to produce an excellent laptop. Part code: VJ388EA.

Samsung R580

PRICE £491 (£577)
WEB ID N/A

SUPPLIER www.cclonline.com
ISSUE 188

Strong performance from a Core i3 processor, good looks and a low price. Part code: NP-R580-J502UK.

HIGH-END LAPTOP

Sony VAIO F11

PRICE £945 (£1,110)
WEB ID N/A

SUPPLIER www.play.com
ISSUE 188

With Core i7 power, 6GB of DDR3 RAM and Nvidia's GT 330M graphics, it's a strong performer. Add a Blu-ray drive and a high-quality, 16.4in Full HD screen, and you have a great all-round desktop replacement.



1.6GHZ INTEL CORE I7-720QM; 6GB DDR3; 500GB HARD DISK; BLU-RAY READER; NVIDIA GEFORCE GT 330M; 16.4IN 1,920 X 1,080 TFT; HDMI; D-SUB; 802.11ABGN WLAN; GIGABIT ETHERNET; 3 X USB; 1 X ESATA; WINDOWS 7 HOME PREMIUM 64-BIT; 1YR C&R WARRANTY; 387 X 262 X 43MM (WDH); 3.1KG; PART CODE: VPCF11S1E/B.

ALTERNATIVE CHOICES

Samsung R780

PRICE £672 (£790)
WEB ID N/A

SUPPLIER www.play.com
ISSUE 188

A huge screen, stylish design and strong components for such a low price. Part code: NP-R780-J50BUK.

Dell Studio 15

PRICE £684 (£804)
WEB ID 353653

SUPPLIER www.dell.co.uk
ISSUE 184

A Core i7 mobile CPU in a stylish 15.6in laptop. The price has gone up, but there's still some value.

VALUE PC

PC Specialist Aurea i3-530 Pro

PRICE £382 (£449)
WEB ID 354979

SUPPLIER www.pcspecialist.co.uk
ISSUE 186

Intel's new Core i3 processors usher in an era of tremendous power at mainstream prices, and this PC Specialist system takes full advantage for less than £400.



2.93GHZ INTEL CORE I3-530; 2GB DDR3; ASUS P7H55 M PRO MOTHERBOARD; 500GB HARD DISK; DVD WRITER; INTEL HD GRAPHICS; 9 X USB; GIGABIT ETHERNET; WINDOWS 7 HOME PREMIUM 64-BIT; 1YR RTB WARRANTY; 190 X 474 X 423MM (WDH).

ALTERNATIVE CHOICES

ViewSonic VOT120 PC Mini

PRICE £181 (£213)
WEB ID 352294

SUPPLIER www.it247.com
ISSUE 183

A tiny PC with just the basics inside, but at this price it's an attractive option.

Acer Aspire Revo R3600

PRICE £169 (£198)
WEB ID 253134

SUPPLIER www.ebuyer.com
ISSUE 178

Acer's Revo combines Intel's Atom with powerful Nvidia graphics for smooth HD playback and more.

HIGH-END PC

Chillblast Fusion Midgard

PRICE £779 (£915)
WEB ID 353071

SUPPLIER www.chillblast.com
ISSUE N/A

An overclocked Core i5 CPU and a Radeon HD 5850 make for a powerful, affordable combination, and the rest of the system is as well put together as you'd hope at this price. Add a good TFT for a fine entertainment PC.



2.66GHZ INTEL CORE I5-750 OVERCLOCKED TO 3.6GHZ; 4GB DDR3; MSI P55-CD53 MOTHERBOARD; 500GB HARD DISK; DVD WRITER; ATI RADEON HD 5850; 2 X DVI-I; DISPLAYPORT; HDMI; 12 X USB; ESATA; PS/2; GIGABIT ETHERNET; WINDOWS 7 HOME PREMIUM 64-BIT; 2YR C&R WARRANTY; 208 X 515 X 479MM (WDH).

ALTERNATIVE CHOICES

Chillblast Fusion Chaos

PRICE £680 (£799)
WEB ID N/A

SUPPLIER www.chillblast.com
ISSUE 188

The monitor isn't great, but this is a blisteringly fast PC in a great chassis.

Yoyotech Warbird i750X

PRICE £681 (£800)
WEB ID 355366

SUPPLIER www.yoyotech.co.uk
ISSUE 187

Thanks to an overclock, the second fastest PC we've ever seen comes in at a remarkable price too.

ENTHUSIAST PC

Wired2Fire Hellspawn XFire

PRICE £1,188 (£1,396)
WEB ID 352735

SUPPLIER www.wired2fire.co.uk
ISSUE 182

Combines devastating power with quality throughout the PC and peripherals. It's expensive, but it couldn't be matched in our Windows 7 PCs Labs.



2.66GHZ INTEL CORE I5-750 @ 3.8GHZ; 4GB DDR3; MSI P55-GD65; 1TB HARD DISK; BLU-RAY READER; 2 X ATI RADEON HD 4890; 24IN SAMSUNG 1,920 X 1,080 TFT; 2 X GIGABIT ETHERNET; 2 X ESATA; WINDOWS 7 HOME PREMIUM 64-BIT; 1YR C&R WARRANTY + 2YR LABOUR; 218 X 472 X 493MM (WDH).

ALTERNATIVE CHOICES

Chillblast Fusion Mustang

PRICE £1,056 (£1,241)
WEB ID 352738

SUPPLIER www.chillblast.com
ISSUE 182

A superbly built system with plenty of power, solid peripherals and a reasonable price.

Eclipse Armageddon X58-i795N275

PRICE £1,181 (£1,388)
WEB ID 265009

SUPPLIER www.eclipsecomputers.com
ISSUE N/A

A bold and inventive rig that mixes unusual components with superb performance.

BUSINESS LAPTOP

Sony VAIO S11

PRICE \$953 (\$1,120) SUPPLIER www.play.com
WEB ID 355510 ISSUE 187

An ergonomically excellent business laptop that's powerful and offers five hours battery life. It's the perfect laptop for work use with a touch of entertainment thrown in.



2.4GHZ INTEL CORE I5-520M; 4GB DDR3 RAM; 500GB HARD DISK; 13.3IN 1.366 X 768 TFT; NVIDIA GT 310M; 802.11ABGN WLAN; 3G MODEM; 3 X USB; FINGERPRINT READER; WINDOWS 7 PROFESSIONAL 64-BIT; 1YR RTB WARRANTY; 328 X 228 X 34MM (WDH); 1.97KG. PART CODE: VPCS11V9E/B.

ALTERNATIVE CHOICE

Lenovo ThinkPad T510

PRICE £1,108 (\$1,302) SUPPLIER www.lenovo.co.uk
WEB ID N/A ISSUE 188

A workstation laptop with superb construction, great features and a set of components that powered it to the highest benchmark score we've yet seen.

ENTHUSIAST LAPTOP

Acer Aspire 8942G

PRICE £1,089 (\$1,280) SUPPLIER www.saveonlaptops.co.uk
WEB ID N/A ISSUE 188

This is a true desktop replacement. There's a massive 18.4in screen with a 1,920 x 1,080 resolution, raw horsepower thanks to Intel's Core i5 processor and ATI's HD 5850 graphics, plus 640GB of storage for good measure.



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ALTERNATIVE CHOICE

Alienware M15x

PRICE £1,106 (\$1,299) SUPPLIER www.alienware.co.uk
WEB ID 353383 ISSUE 184

Fuses the usual extrovert styling with some powerful components for applications and games. It's expensive, but worth it.

EXECUTIVE LAPTOP

Sony VAIO Z11

PRICE £1,872 (\$2,200) SUPPLIER www.morecomputers.com
WEB ID 355384 ISSUE 187

While similar to the classic Z51, it sacrifices a little of that battery life to cram in a Core i7 processor that's incredibly powerful in such a portable laptop. Sleek, light and staggeringly powerful.



2.66GHZ INTEL CORE I7-620M; 6GB DDR3 RAM; 4 X 64GB SAMSUNG SSD DRIVES; 13.1IN 1.920 X 1.080 TFT; NVIDIA GT 330M; INTEL GMA HD GRAPHICS; 802.11ABGN WLAN; 3G MODEM; 3 X USB; EXPRESSCARD/34; WINDOWS 7 PROFESSIONAL 64-BIT; 2YR C&R WARRANTY; 1.41KG. PART CODE: VPCZ11Z9E/B.

ALTERNATIVE CHOICE

Dell Adamo

PRICE £935 (\$1,099) SUPPLIER www.adambydell.co.uk
WEB ID 350734 ISSUE 181

Light, slim and gorgeous; it may not match other ultraportables for sheer power or longevity, but it's nonetheless an immensely desirable laptop.

BUSINESS PC

Lenovo ThinkCentre A58

PRICE £320 (£376) SUPPLIER <http://uk.insight.com>
WEB ID 353335 ISSUE 184

In Lenovo's superbly upgradeable chassis sits a good selection of value components offering reasonable power, plenty of scope for the future, and Windows 7 Professional. It is versatile and well built.



2.66GHZ INTEL PENTIUM DUAL CORE E5300; 2GB DDR2; 320GB HARD DISK; DVD WRITER; INTEL X4500 GRAPHICS; D-SUB; 6 X USB; 2 X PS/2; GIGABIT ETHERNET; TAMPER-DETECTION SYSTEM; WINDOWS 7 PROFESSIONAL 32-BIT; 1YR ON-SITE WARRANTY; 312 X 355 X 101MM (WDH). PART CODE: SML7LUK.

ALTERNATIVE CHOICE

VeryPC Broadleaf

PRICE £686 (£806) SUPPLIER www.very-pc.co.uk
WEB ID 352723 ISSUE 183

Impressively low power consumption in a small, easily upgradeable chassis.

ALL-IN-ONE PC

Sony VAIO L11

PRICE £1,160 (\$1,364) SUPPLIER www.morecomputers.com
WEB ID 352261 ISSUE 186

A truly stunning Full HD 24in screen with multitouch capabilities makes the VAIO the perfect match for the touch-friendly Windows 7. Plus, under all that sits a powerful all-in-one PC.



3GHZ INTEL CORE 2 DUO E8400; 4GB DDR2; 500GB HARD DISK; BLU-RAY READER; 24IN 1.920 X 1.080 OPTICAL TOUCHSCREEN TFT; NVIDIA GEFORCE G210M; 5 X USB; DUAL TV TUNER; 802.11BGN WLAN; GIGABIT ETHERNET; WINDOWS 7 HOME PREMIUM 64-BIT; 1YR C&R WARRANTY; 584 X 200 X 433MM (WDH). PART CODE: VPCL11S1E/S.

ALTERNATIVE CHOICE

Acer Aspire Z5610

PRICE £664 (£780) SUPPLIER www.play.com
WEB ID N/A ISSUE 186

An impressive 23in touchscreen Windows 7 PC at a more affordable price than the brilliant Sony.

MEDIA STREAMER

Western Digital WD TV Live

PRICE £80 (£94) SUPPLIER www.amazon.co.uk
WEB ID 353542 ISSUE 183

Don't be fooled by its compact dimensions, Western Digital has created a media player of formidable ability. Inexpensive, uncomplicated and powerful, the WD TV Live will play almost anything.



SUPPORTS AVI, VOB, MP6/MPEG, MKV, TS/TP/M2T, MP4/MOV, M2TS, WMV9, JPEG, GIF, TIF/TIFF, BMP, PNG; MP3, WAV, WMA, AAC, FLAC, MKA, AIFF, OGG; 2 X USB; 10/100 ETHERNET; HDMI 1.3A, COMPONENT, COMPOSITE VIDEO OUT; OPTICAL S/PDIF OUT; 2YR RTB WARRANTY; 126 X 100 X 40MM (WDH).

ALTERNATIVE CHOICE

Sonos ZonePlayer S5

PRICE £297 (£349) SUPPLIER www.advancedmp3players.co.uk
WEB ID 355609 ISSUE 187

It's dear but this all-in-one Sonos is a great entry point to multiroom audio.

UP TO 23IN TFT

BenQ G2222HDL

PRICE £106 (£125) SUPPLIER www.overclockers.co.uk
WEB ID 355315 ISSUE 187

With a Full HD panel and image quality good enough to match dearer rivals, we can forgive this BenQ's slightly iffy black level and lack of features. At this price it's a bargain.



22IN 1.920 X 1.080 TFT; 250CD/M² BRIGHTNESS; 1,000:1 CONTRAST RATIO; 5MS RESPONSE; DVI, D-SUB INPUTS; 3YR ON-SITE WARRANTY; 505 X 393 X 175MM (WDH); 5KG.

ALTERNATIVE CHOICE

Asus MS236H

PRICE £167 (£197) SUPPLIER www.ebuyer.com
WEB ID N/A ISSUE 188

The image quality isn't perfect, but the beautiful design makes it a real work of art.

24IN+ TFT

Samsung SyncMaster 2494HM

PRICE £220 (£258) SUPPLIER www.dabs.com
WEB ID 352165 ISSUE 181

This widescreen 24in TFT has a few minor flaws, but the stylish design, plentiful features and high-quality 1080p panel still make for a compelling high-end purchase.



24IN TFT; 1.920 X 1.080 RESOLUTION; 5MS RESPONSE TIME; 300CD/M² BRIGHTNESS; 1,000:1 CONTRAST RATIO; HDMI; DVI; D-SUB IN; 2 X 3W SPEAKERS; 2-PORT USB HUB; 3YR ON-SITE WARRANTY; 573 X 250 X 420MM (WDH); 8.4KG.

ALTERNATIVE CHOICE

LG Flatron W2442PA

PRICE £151 (£177) SUPPLIER www.dabs.com
WEB ID 352168 ISSUE 181

A flexible, sturdy 24in TFT with good image quality for an attractive price.

SPECIALIST TFT

Eizo Foris FX2431

PRICE £769 (£904) SUPPLIER www.scan.co.uk
WEB ID 262681 ISSUE 180

Eizo brings its entertainment range to the UK at last, and the FX2431 is a truly stunning piece of kit: flawless picture quality, every connection you'll need, and a price tag that only a tiny minority will stomach.



24.1IN TFT; 1.920 X 1.200; 6MS; 360CD/M² BRIGHTNESS; 1,000:1 CONTRAST; 2 X HDMI, DVI, D-SUB IN, COMPONENT, COMPOSITE, S-VIDEO; 2W SPEAKERS; 2 X USB; 5YR RTB WARRANTY; 566 X 230 X 444MM (WDH); 10.5KG.

ALTERNATIVE CHOICE

Dell UltraSharp U2410

PRICE £366 (£430) SUPPLIER www.ebuyer.com
WEB ID 353803 ISSUE 185

A professional-grade monitor that compromises a little to hit a good price.

DIGITAL COMPACT CAMERA

Canon Ixus 105

PRICE £135 (£159)
WEB ID N/A

SUPPLIER www.jessops.com
ISSUE 188

It excels as an all-purpose snapper, is easy to use and understand, and has a tiny amount of headroom for learners thanks to its manual ISO and exposure compensation modes. It's affordable too.



NEW ENTRY

12.1MP CCD; 4X OPTICAL ZOOM; 2.7" LCD; SHUTTER SPEED 1-1/1,500 SEC; 80-1600 ISO; +/- EV; SD, MMC SLOT; EVALUATIVE, CENTRE-WEIGHTED, SPOT METERING; LI-ION BATTERY; 91 X 21 X 56MM (WDH); 140G.

ALTERNATIVE CHOICE

Sony Cyber-shot DSC-W290

PRICE £123 (£145)
WEB ID 353254

SUPPLIER www.camerabox.co.uk
ISSUE 183

It isn't a spectacular innovation tour de force, but the W290 gives a good zoom range, wide-angle lens, a big screen, and good quality for less than £200.

DIGITAL SLR CAMERA

Nikon D5000

PRICE £439 (£515)
WEB ID 352456

SUPPLIER www.amazon.co.uk
ISSUE 182

A recent price drop brings this tremendous Nikon to the top of the A List, combining HD video with its best-in-class still images. The best digital SLR camera available for less than £500.



12.3MP CCD; 27-82.5MM ZOOM; 3X OPTICAL ZOOM; 2.7" TFT; SHUTTER SPEED 1/4,000 TO 30 SECS; 100-6400 ISO; +/-5EV EXPOSURE COMP; LI-ION BATTERY; 1YR RTB WARRANTY; 127 X 80 X 104MM (WDH); 906G.

ALTERNATIVE CHOICE

Pentax K-m

PRICE £323 (£380)
WEB ID 351685

SUPPLIER www.camerabox.co.uk
ISSUE 182

Well made, comfortable and produces excellent images. It isn't exactly cutting-edge, but as a cheap, capable camera for a novice it's a great choice.

DIGITAL VIDEO CAMERA

Sony Handycam HDR-TG7VE

PRICE £462 (£543)
WEB ID 260005

SUPPLIER www.amazon.co.uk
ISSUE 180

It's desirable, produces quality results and is full of advanced features, turning the playback experience from a necessary chore into something that's easy and actually fun to do. It's expensive, but well worth it.



1080/50i AVCHD FORMAT (1,920 X 1,080 PIXELS); 4MP STILL; 1/5" CMOS; 10X OPTICAL ZOOM; OPTICAL IMAGE STABILISER; 2.7" TOUCH-SENSITIVE TFT; 1YR RTB WARRANTY; 62 X 117 X 30MM (WDH); 230G.

ALTERNATIVE CHOICE

Sanyo Xacti VPC-HD2000

PRICE £296 (£348)
WEB ID 246397

SUPPLIER www.ebuyer.com
ISSUE 175

Fiddly to use, but this all-rounder is an excellent choice for those who want good-quality video and stills, all in a pocketable package.

BUDGET SMARTPHONE

Samsung Galaxy Portal I5700

PRICE Free, £20pm, 24mths
WEB ID 356383

SUPPLIER www.t-mobile.co.uk
ISSUE N/A

The Galaxy Portal gives Google Android a chance to shine with a good specification – most notably its fast performance and capacitive touchscreen – and it feels well made too. There's no better budget choice.



NEW ENTRY

800MHZ CPU; 1GB INTERNAL STORAGE; 3.2" 320 X 480 TFT; QUAD-BAND GSM/GPRS/EDGE/3G/HSDPA; 3.2MP WEBCAM; A-GPS; GOOGLE ANDROID 1.6; 2YR RTB WARRANTY; 57 X 12.9 X 115MM (WDH); 120G.

ALTERNATIVE CHOICE

LG InTouch Max GW620

PRICE Free, £20pm, 24mths
WEB ID 355456

SUPPLIER www.t-mobile.co.uk
ISSUE 187

Highly capable for such a cheap smartphone, with a slide-out keyboard for good measure.

PREMIUM SMARTPHONE

Apple iPhone 3GS

PRICE £161 (£189), £25pm, 24mths
WEB ID 259162

SUPPLIER www.apple.com/uk
ISSUE 186

With most of the 3G's annoying restrictions removed by Apple, from the lack of MMS messaging to turn-by-turn satnav, the iPhone manages to regain the top smartphone slot. The 3GS is also more powerful and boasts a digital compass.



600MHZ PROCESSOR; 16GB STORAGE; 3.5" 480 X 320 TFT; BLUETOOTH 2.1; QUAD-BAND GSM/GPRS/3G/HSDPA; 802.11BG WLAN; GPS; DIGITAL COMPASS; 3MP CAMERA; IPHONE OS 3; 1YR RTB WARRANTY; 62.3 X 12.6 X 115.3MM (WDH); 133G.

ALTERNATIVE CHOICE

RIM BlackBerry Bold 9700

PRICE Free, £30pm, 18mths
WEB ID 353500

SUPPLIER www.buymobilephones.net
ISSUE 186

More compact and better built than its predecessor, and with fantastic battery life too.

POCKET VIDEO CAMERA

Creative Vado HD

PRICE £110 (£129)
WEB ID N/A

SUPPLIER <http://uk.creative.com>
ISSUE 188

The latest edition of Creative's pocket marvel is a fantastic video camera: small, light and colourful, with solid image quality, the opportunity to adjust exposure and easy to use software onboard. And at this price it's top value too.



NEW ENTRY

720/30P H.264 MPEG4 FORMAT; MANUAL EXPOSURE COMPENSATION; 4GB INTERNAL STORAGE; 2" TFT; INTEGRATED USB; HDMI OUT WITH BUNDLED CABLE; 1YR RTB WARRANTY; 57.5 X 17 X 98.5MM (WDH); 92G.

ALTERNATIVE CHOICE

Flip MinoHD (2nd gen)

PRICE £153 (£180)
WEB ID N/A

SUPPLIER www.play.com
ISSUE 188

Gorgeous build and superb video quality for a pocket camera, but it's just a tad too expensive.

ALL-IN-ONE

Canon Pixma MP640

PRICE £122 (£143)
WEB ID 351181

SUPPLIER www.colonline.com
ISSUE 181

Improves on its predecessors, with a larger screen plus tremendous speed and quality, and now comes with every feature you could possibly need in a home all-in-one.



FIVE-COLOUR A4 ALL-IN-ONE; 9,600 X 2,400DPI PRINT; 4,800 X 9,600DPI SCAN; USB; ETHERNET; 802.11BG WLAN; 3IN COLOUR TFT; 150-SHEET REAR TRAY CASSETTE; DUPLEX UNIT; CD/DVD TRAY; 1YR RTB WARRANTY; 450 X 368 X 176MM (WDH); 8.8KG.

ALTERNATIVE CHOICE

Canon Pixma MX870

PRICE £135 (£159)
WEB ID 356053

SUPPLIER www.printerbase.co.uk
ISSUE 187

Slightly quicker than its predecessor and with full Windows 7 support out of the box – at last.

INKJET

Canon Pixma iP4700

PRICE £71 (£83)
WEB ID 351157

SUPPLIER www.play.com
ISSUE 181

Not a huge change from the iP4600, but that matters not – with its speed, quality and design, it remains the finest home photo inkjet on the market, and it's barely any dearer to buy and run.



FIVE-COLOUR A4 PHOTO INKJET; 9,600 X 2,400DPI RESOLUTION; 1PL NOZZLES; USB; PICTBRIDGE; 150-SHEET REAR FEEDER; 150-SHEET CASSETTE; DUPLEX UNIT; CD/DVD TRAY; 1YR RTB WARRANTY; 431 X 296 X 153MM (WDH); 5.7KG.

ALTERNATIVE CHOICE

Canon Pixma iP2600

PRICE £30 (£35)
WEB ID 218067

SUPPLIER <http://direct.tesco.com>
ISSUE 168

Prints 6 x 4in photos in 1min 40secs, and crisp text at 8ppm, all for a pocket-money price.

PERSONAL LASER

Lexmark C540n

PRICE £130 (£153)
WEB ID 353659

SUPPLIER www.oyyy.co.uk
ISSUE 184

A well-built, network-capable colour laser with reasonable running costs, a huge 250-sheet paper tray and fast, top-quality document and image output – all at a competitive price.



1,200 X 1,200DPI A4 COLOUR LASER; 21PPM QUOTED PRINT SPEED; USB; ETHERNET PORTS; 250-SHEET INPUT TRAY; 100-SHEET OUTPUT TRAY; 595 X 495 X 402MM (WDH).

ALTERNATIVE CHOICE

Samsung ML-2525

PRICE £78 (£92)
WEB ID 354760

SUPPLIER www.ebuyer.com
ISSUE 186

Small, cheap to buy and run, and the quality and speed are as good as anything at this price.

EXTERNAL HARD DISK

Iomega Professional External Hard Drive

PRICE 1TB, £78 (£92)
WEB ID 350878

SUPPLIER www.morecomputers.com
ISSUE 180

With a brushed aluminium design that echoes the Mac Pro, as well as both eSATA and USB connections, this drive will look good on any desk. The price is impressive too.



1TB EXTERNAL DESKTOP HARD DISK; 16MB DATA BUFFER; 7200RPM SPINDLE SPEED; eSATA, USB CONNECTIONS; POWER SWITCH; 2YR WARRANTY; 117 X 197 X 31MM (WDH); 936G.

ALTERNATIVE CHOICE

Buffalo DriveStation USB 3.0

PRICE 1TB, £85 (£100)
WEB ID 355048

SUPPLIER www.misco.co.uk
ISSUE 186

It may be a little early to jump on the USB 3 train, but this Buffalo offers a terabyte of storage for not much more than a standard drive.

WIRELESS ROUTER

DrayTek Vigor 2110n

PRICE £94 (£110)
WEB ID 355780

SUPPLIER www.broadbandstuff.co.uk
ISSUE 187

Dual-band is missing, but the 2110n cable router is absolutely crammed with useful features where it counts, and performance is rock solid at close range and at a distance. ADSL users needn't miss out either – the 2710n offers the same features for less.



802.11BGN CABLE ROUTER; 4 X 10/100 ETHERNET; 3 X EXTERIOR ANTENNAE; UPNP; WDS; WPS; WMM QOS; VPN DIAL-OUT; USB PORT (SUPPORTS STORAGE, PRINTERS, MOBILE BROADBAND); 2YR RTB WARRANTY; 215 X 53 X 148MM (WDH).

ALTERNATIVE CHOICE

Buffalo WZR-HP-G300NH

PRICE £55 (£65)
WEB ID 356095

SUPPLIER www.play.com
ISSUE 187

A fantastic single-band cable router, with a good range of features and top performance, but at a bargain price.

NETWORK STORAGE

Netgear Stora MS2110

PRICE £136 (£160)
WEB ID 354088

SUPPLIER www.play.com
ISSUE 185

For all but the most experienced users, the Stora does a fine job of simplifying complex tasks and performs very well. With such an affordable price as well, it's a great way to store and share files in your home.



CONSUMER NAS DEVICE; 1TB STORAGE CAPACITY; 2 X 3.5IN SATA DISK BAYS (1 FREE); UPNP MEDIA SERVER; PRINT SERVER; RAID1; USB; GIGABIT ETHERNET; 150 X 146 X 175MM (WDH).

ALTERNATIVE CHOICE

Asus Home Server TS mini

PRICE 1TB, £297 (£349)
WEB ID 355051

SUPPLIER www.asus.co.uk
ISSUE 186

It lacks high-end enterprise features and a level of consumer polish, but the mini remains a practical and affordable Home Server.

PROCESSOR

Intel Core i5-750

PRICE £135 (£159)
WEB ID 351385

SUPPLIER www.ebuyer.com
ISSUE 185

The price-performance sweet spot of Intel's latest platform, the i5-750 is a quad-core monster that makes Core 2 look geriatric. At this price, it should be the beating heart of your new-build PC.



2.66GHZ (MAX 3.2GHZ TURBO BOOST) SOCKET LGA 1156 QUAD-CORE PROCESSOR; 8MB SMART CACHE; 2.5GT/SEC DMI; 95W TDP; 45NM PROCESS; SUPPORTS VIRTUALISATION, 64-BIT.

ALTERNATIVE CHOICE

AMD Phenom II X4 965

PRICE £120 (£141)
WEB ID 350725

SUPPLIER www.ebuyer.com
ISSUE 185

The top of AMD's line offers superb bang per buck, with an unlocked multiplier to go beyond stock speed.

INTEL MOTHERBOARD

Gigabyte GA-H55M-UD2H

PRICE £66 (£78)
WEB ID N/A

SUPPLIER www.overclockers.co.uk
ISSUE 186

If you're upgrading to a new Core i3 or i5 processor, you'll want an H55 motherboard. This one offers plenty of sockets, including DisplayPort and HDMI, at a decent price.



SOCKET LGA 1156 MOTHERBOARD; INTEL H55 CHIPSET; 1 X PCI-EXPRESS X16, 1 X PCI-EXPRESS X4, 2 X PCI SLOTS; 4 X DDR3 DIMM SOCKETS; MAX 16GB RAM; 5 X SATA; 1 X eSATA; HDMI, DVI, DISPLAYPORT, D-SUB OUTPUTS.

ALTERNATIVE CHOICE

Gigabyte GA-EX58-UD5

PRICE £156 (£183)
WEB ID 250506

SUPPLIER www.dabs.com
ISSUE 175

For an Intel Core i7-based system, boards don't come much better than this – it will cost you, though.

AMD MOTHERBOARD

Gigabyte MA790XT-UD4P

PRICE £84 (£99)
WEB ID 350830

SUPPLIER www.scan.co.uk
ISSUE 179

A forward-looking AM3 board with support for up to 16GB of DD3 memory, the latest AM3 Phenoms and eight SATA drives. And our tests showed it won't consume much power, either.



SOCKET AM3 MOTHERBOARD; AMD 790X CHIPSET; 2 X PCI-EXPRESS X16, 3 X PCI EXPRESS X1, 2 X PCI SLOTS; 4 X DDR3 DIMM SOCKETS; MAX 16GB RAM; 8 X SATA; 8-CHANNEL AUDIO.

ALTERNATIVE CHOICE

MSI DKA790GX

PRICE £68 (£79)
WEB ID 250534

SUPPLIER www.eclipsecomputers.com
ISSUE 179

A DDR2-based board that's ideal for older AMD chips – and it supports the latest Phenom II CPUs too.

VALUE GRAPHICS CARD

ATI Radeon HD 4770

PRICE Typically, £72 (£85)
WEB ID 252012

SUPPLIER Depends on brand
ISSUE 177

ATI's first 40nm card has been superseded by the 5770, but at this price it still offers a great blend of playable frame rates and superb value – perfect for gamers on a budget.



PCI-E 2.0 GRAPHICS CARD; 40NM DIE; 640 STREAM PROCESSORS; 750MHZ CORE CLOCK; 826 MILLION TRANSISTORS; 512MB GDDR5 MEMORY; 800MHZ MEMORY CLOCK; 128-BIT MEMORY BUS.

ALTERNATIVE CHOICE

ATI Radeon HD 5450

PRICE Typically, £31 (£37 inc VAT)
WEB ID 355276

SUPPLIER Depends on brand
ISSUE N/A

It's small, cheap, power-efficient and handles Blu-ray and HD decoding with ease.

ENTHUSIAST GRAPHICS CARD

ATI Radeon HD 5870

PRICE Typically, £255 (£285)
WEB ID 351784

SUPPLIER Depends on brand
ISSUE 182

Despite its single GPU, the 5870 manages to outperform ATI's previous dual-GPU HD 4870 X2, and does so at a similar price and with lower power consumption. With this sort of speed, the X2 version will be frighteningly quick when it arrives.



PCI-E 2.0 GRAPHICS CARD; 40NM DIE; 1,600 STREAM PROCESSORS; 850MHZ CORE CLOCK; 2.15 BILLION TRANSISTORS; 1GB GDDR5 MEMORY; 1,200MHZ MEMORY CLOCK; 256-BIT MEMORY BUS; 2 X 6-PIN POWER CONNECTORS.

ALTERNATIVE CHOICE

ATI Radeon HD 4890

PRICE Typically, £109 (£129)
WEB ID 250614

SUPPLIER Depends on brand
ISSUE 176

A card with plenty of gaming muscle, but at a more palatable price than the HD 5870.

INTERNAL HARD DISK

Samsung SpinPoint F1 750GB (HD753LJ)

PRICE £47 (£55)
WEB ID 252120

SUPPLIER www.scan.co.uk
ISSUE 176

It's a tad dearer than others at this capacity, but its write speed was the fastest of all in our recent hard disks Labs, and read speeds were among the front-runners too.



MODEL: HD753LJ; 3.5IN SATA/300 DISK; 750GB CAPACITY; 7200RPM SPINDLE SPEED; 32MB DATA BUFFER; 12.8MS AVERAGE SEEK TIME (MEASURED); 3YR RTB WARRANTY.

ALTERNATIVE CHOICE

Crucial M225 256GB

PRICE £400 (£470)
WEB ID N/A

SUPPLIER www.aria.co.uk
ISSUE 188

It isn't cheap, but it's an SSD capacious enough to be the only drive in your PC.

INTERNET SECURITY

Norton Internet Security 2010

PRICE £43 (£50), 3 PCs
WEB ID 351781

SUPPLIER www.symantec.co.uk
ISSUE 185

Novices may balk at the sheer range of features on offer, but when it comes to malware protection Norton's latest is second to none. Don't be put off by horror stories from years ago: this one's a winner.



ALTERNATIVE CHOICE

AVG Anti-Virus Free 9

PRICE Free
WEB ID 355402

SUPPLIER <http://free.avg.com>
ISSUE 185

AVG's free package detects an impressive range of online threats, and the LinkScanner module lets you look before you leap on the web as well.

BACKUP

Acronis True Image Home 2010

PRICE £34 (£40)
WEB ID 351961

SUPPLIER www.acronis.co.uk
ISSUE 182

The latest True Image brings Nonstop Backup for reverting to any five-minute interval in a rolling backup, support for accessing backups as virtual hard disks in Windows 7, and an integrated online backup component – although it will cost you an extra £3.95 a month.



ALTERNATIVE CHOICE

Carbonite Online Backup 3.5

PRICE \$55 per year
WEB ID 179994

SUPPLIER www.carbonite.com
ISSUE 169

The best consumer online backup service gets better, with file version storage, downtime backups and easy migration to another PC.

ACCOUNTING

Sage Instant Accounts

PRICE £64 (£75)
WEB ID 175275

SUPPLIER www.amazon.co.uk
ISSUE 164

With Microsoft scandalously pulling support for its hugely successful accounting products, Sage Instant Accounts reclaims centre-stage with what remains a solid application for small businesses that's easy to use. Since it was first reviewed the price has dropped massively, too, so it's great value.



ALTERNATIVE CHOICE

Brightbook

PRICE Free
WEB ID N/A

SUPPLIER www.brightbook.co.uk
ISSUE 188

A useful and free invoicing tool that has the potential to be the future of small-business accounting – but it isn't perfect.

OFFICE SUITE

Microsoft Office 2007

PRICE £60 (£70)
WEB ID 100909

SUPPLIER www.comet.co.uk
ISSUE 148

Genuinely useful new features and a total interface overhaul make this the best version of Office yet. This Home and Student edition offers the best value, containing Word, Excel and PowerPoint.



ALTERNATIVE CHOICE

OpenOffice 3

PRICE Free
WEB ID 232614

SUPPLIER www.openoffice.org
ISSUE 171

With a high-quality word processor, spreadsheet, presenter and database in one free package, this is a functional alternative to Microsoft Office.

WEB DEVELOPMENT

Adobe Dreamweaver CS5

PRICE £357 (£419)
WEB ID N/A

SUPPLIER www.adobe.co.uk
ISSUE 188

With traditional single-page web design coming to the end of the road, Adobe's web design app has had to undergo some dramatic changes. This latest edition makes PHP and CMS its core focus, which gives it the new lease of life it so desperately needed. Once again, Dreamweaver is a must-have tool.



ALTERNATIVE CHOICE

Adobe Creative Suite 5 Web Premium

PRICE £1,429 (£1,679)
WEB ID N/A

SUPPLIER www.adobe.co.uk
ISSUE 188

Overkill for most purposes, but it's the ultimate tool for creative professionals developing interactive Flash applications for the web.

GRAPHICS/DESIGN

Adobe Creative Suite 5 Design Standard

PRICE £1,032 (£1,213)
WEB ID N/A

SUPPLIER www.adobe.co.uk
ISSUE 188

Lets you take advantage of InDesign's new Flash capabilities, and use Flash Catalyst as a route into converting artwork into Flash and AIR apps. It's also a real bargain upgrade for existing Design Standard users.



ALTERNATIVE CHOICE

CorelDRAW Graphics Suite X5

PRICE £399 (£469)
WEB ID N/A

SUPPLIER www.corel.co.uk
ISSUE 188

Not worth an upgrade from X4, but if you're buying from scratch it's a very reasonable alternative to Creative Suite 5.

PHOTO EDITING

Adobe Photoshop Elements 8

PRICE £53 (£62)
WEB ID 351859

SUPPLIER www.adobe.co.uk
ISSUE 182

The "big" addition is face recognition, but far better utilities are Photomerge, which automatically combines bracketed shots, and Recompose, which alters the composition of segments of photos without distorting the surrounding areas. Still the best non-professional photo editor on the market.



ALTERNATIVE CHOICE

Google Picasa 3.5

PRICE Free
WEB ID 352597

SUPPLIER www.picasa.google.com
ISSUE 183

Easy-to-use tagging capabilities, including advanced and effective face recognition, add to an appealing free package for the less experienced.

VIDEO EDITING

Corel VideoStudio Pro X3

PRICE £67 (£79)
WEB ID 355612

SUPPLIER www.corel.co.uk
ISSUE 187

With HD support throughout, a brand-new front-end, and an impressively efficient processing speed, this snappy entry-level suite is great for amateur video editors. Creative experimentation is encouraged, which makes for a more enjoyable experience and better end results.



ALTERNATIVE CHOICE

Adobe Premiere Pro CS4

PRICE £660 (£776)
WEB ID 232998

SUPPLIER www.adobe.co.uk
ISSUE 171

Premiere Pro CS4 is a great tool. Having elements such as Encore and OnLocation to back it up is what makes it a particularly persuasive package.

AUDIO PRODUCTION

Ableton Live 8

PRICE £255 (£300)
WEB ID 257713

SUPPLIER www.dolphinmusic.co.uk
ISSUE 179

Ableton's flair for innovation shows no sign of diminishing. This is the best version of Live yet, and its rounded and unique feature set means it's the best all-purpose music-production software available today.



ALTERNATIVE CHOICE

Steinberg Cubase 5

PRICE £408 (£479)
WEB ID 247229

SUPPLIER www.dolphinmusic.co.uk
ISSUE 175

Highly accomplished studio tools make Cubase 5 a viable alternative for those who mainly focus on conventional multitrack recording.

PC Pro Enterprise A List

RACK SERVER

Dell PowerEdge R610

PRICE £3,932 exc VAT SUPPLIER Dell 0844 444 3066
WEB ID 251047 ISSUE 177

A well-built rack server with a wealth of new features. Power consumption is low, it's as quiet as a mouse, and Dell's new software delivers a comprehensive systems management package.



1U RACK; 2 X 2.4GHZ E5530 XEON; INTEL 5520 CHIPSET; 12GB DDR3 UDIMM; DELL PERC 6/I WITH 256MB CACHE AND BBU; SUPPORTS RAID0, 1, 10, 5; 4 X 147GB FUJITSU 10K SFF SAS HARD DISKS; 1GB SD CARD; 4 X EMBEDDED GIGABIT, DUAL PORT PCI-E GIGABIT ADAPTER; 2 X PCI-E SLOTS; 2 X 502W HOT-PLUG POWER SUPPLIES.

ALTERNATIVE CHOICE

HP ProLiant DL380 G6

PRICE £3,116 exc VAT SUPPLIER HP 0845 270 4215
WEB ID 260986 ISSUE 180

One of the best 2U rack servers on the market just got better. The DL380 G6 offers improved storage potential and low power consumption.

PEDESTAL SERVER

Dell PowerEdge T710

PRICE £4,156 exc VAT SUPPLIER www.dell.co.uk
WEB ID 355762 ISSUE 187

Dell's mighty T710 pedestal server offers the best expansion potential in its class and combines this with good value, excellent build quality and enterprise level remote-management facilities. Quite simply power in a box.



TOWER CHASSIS; 2 X 2.53GHZ E5540 XEON; 12GB DDR3; 1GB SD CARD; 8 X 146GB HARD DISKS IN HOT-SWAP CARRIERS; DELL PERC 6/I WITH 256MB CACHE AND BBU; SUPPORTS RAID0, 1, 10, 5; 6 X PCI-E 2.0 SLOTS; 4 X GIGABIT; 1.100W ENERGY SMART HOT-PLUG SUPPLY; DELL MANAGEMENT CONSOLE SOFTWARE.

ALTERNATIVE CHOICE

HP ProLiant ML350 G6

PRICE £2,536 exc VAT SUPPLIER HP 0845 270 4215
WEB ID 350893 ISSUE 181

This server offers good value and expansion potential. It also comes with the best remote-management tools on the market, and is quiet and power efficient.

SECURITY APPLIANCE

WatchGuard SSL 100

PRICE £1,375 exc VAT, 25 licences SUPPLIER www.watchguard.co.uk
WEB ID 353422 ISSUE 184

Delivers tough security for remote workers at a price SMBs can afford. The range of authentication methods is unbeatable at this price, allowing strict remote access to network resources.



1U RACK; 1.3GHZ CELERON-N; 2GB 400MHZ DDR2; 80GB SFF SATA HARD DISK; 2 X 10/100 ETHERNET; WEB MANAGEMENT SUPPORTS 100 SIMULTANEOUS AUTHENTICATED USERS. OPTIONS: 1YR LIVESECURITY UPDATES, £330 EXC VAT. 2YR, 3YR OPTIONS ALSO AVAILABLE.

ALTERNATIVE CHOICE

eSoft ThreatWall 450

PRICE £2,258 exc VAT SUPPLIER eSoft 020 3355 3160
WEB ID 244458 ISSUE 173

Easy to deploy, with plenty of features and good performance. It's cost effective, although not as good value as some.

STORAGE APPLIANCE

Synology DiskStation DS1010+

PRICE Diskless, £620 exc VAT SUPPLIER www.synology.com
WEB ID N/A ISSUE 188

A NAS appliance that's packed with network storage features, offers high expansion potential, and is a real speed demon. It has something for everyone.



DESKTOP CHASSIS; 1.67GHZ DUAL-CORE PROCESSOR; 1GB 800MHZ DDR2; FIVE HOT-SWAP SATA DRIVE BAYS; SUPPORTS RAID0, 1, 5, 6, HOT-SPARE AND JBODS; 2 X USB 2; 2 X GIGABIT; ESATA; INTERNAL POWER SUPPLY.

ALTERNATIVE CHOICE

Enhance Technology UltraStor RS8 IP-4

PRICE Diskless, £1,950 exc VAT SUPPLIER Enhance 001562 777 3488
WEB ID N/A ISSUE 188

An affordable IP SAN appliance with plenty of redundancy and a lot of expansion potential.

BACKUP DEVICE

HP StorageWorks Ultrium 1840

PRICE £2,021 exc VAT SUPPLIER www.it247.com
WEB ID 120516 ISSUE 155

The fourth generation of LTO delivers hardware encryption, 800GB native storage and phenomenal speeds of up to 114MB/sec if you have a good enough setup to take advantage.



ULTRIUM LTO-4 TAPE DRIVE; NATIVE CAPACITY 800GB; TRANSFER RATE 120MB/SEC; ULTRA320 SCSI LVD INTERFACE; BACKWARD READ/WRITE COMPATIBLE WITH LTO-3; READ COMPATIBLE WITH LTO-2; HP DATA PROTECTOR EXPRESS SOFTWARE BUNDLE.

ALTERNATIVE CHOICE

Quantum LTO-4 HH

PRICE £1,490 exc VAT SUPPLIER Span 020 8288 8555
WEB ID 213831 ISSUE 168

A compact LTO-4 SAS tape drive kit for businesses with big backup requirements and a need for speed.

BUSINESS LASER

Kyocera FS-2020D

PRICE £260 exc VAT SUPPLIER www.ebuyer.com
WEB ID 256909 ISSUE 177

Perfectly acceptable print quality, impressive speed, and a high monthly duty cycle with low running costs make this a great business choice. Note that the dearer networked model is well worth upgrading to.



1,200 X 1,200 DPI A4 MONO LASER; 35PPM QUOTED PRINT SPEED; USB, PARALLEL PORTS; BUILT-IN DUPLEXER; 250-SHEET INPUT TRAY; 500-SHEET OUTPUT TRAY; WINDOWS XP ONWARDS; 375 X 393 X 267MM (WDH); 12KG.

ALTERNATIVE CHOICE

Lexmark C780n

PRICE £521 exc VAT SUPPLIER www.printerland.co.uk
WEB ID 156378 ISSUE 161

Excellent print quality and reasonable running costs make this an affordable colour alternative.

UPS DEVICE

APC Smart-UPS 1000VA

PRICE £280 exc VAT SUPPLIER www.apcc.com
WEB ID 351214 ISSUE 179

It's by no means the cheapest of our recent shootout, but it has superior management software and better features than other UPS devices we've seen.

670W OUTPUT CAPACITY; SURGE RATING 320J; DB-9 RS-232C SMARTSLOT; USB; 2YR RTB WARRANTY; 170 X 439 X 216MM (WDH); 18.9KG.



ALTERNATIVE CHOICE

MGE Evolution 1150VA

PRICE £205 exc VAT SUPPLIER www.kikatek.com
WEB ID 351217 ISSUE 179

Looks good value, but this is offset by the smaller number of outlets and the fact that managing additional systems will cost extra.

NETWORK BACKUP

Computer Associates ARCserve Backup 12.5

PRICE From £547 exc VAT SUPPLIER www.ca.com/gb
WEB ID 253609 ISSUE 178

No other Windows backup software on the market offers backup, restore and data de-duplication functions as a single, integrated solution – and at no extra cost.



ALTERNATIVE CHOICE

Symantec Backup Exec 12.5 for Windows Servers

PRICE Per server, £521 exc VAT SUPPLIER www.dabs.com
WEB ID 247631 ISSUE 175

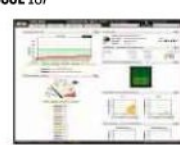
Offers protection for both Microsoft's and VMware's virtual server environments. Pricing is competitive and the base product includes Symantec's CPS.

NETWORK MONITORING

Ipswitch WhatsUp Gold 14.1 Premium Edition

PRICE 100 devices, £2,046 exc VAT SUPPLIER www.whatsupgold.com
WEB ID 355567 ISSUE 187

This latest version adds even more valuable features, all easily accessible from a single console. Classy network management at an affordable price.



ALTERNATIVE CHOICE

NetSupport DNA 3

PRICE £1,680 exc VAT SUPPLIER www.netsupportsoftware.co.uk
WEB ID 350570 ISSUE 180

Easy to deploy and cost effective, NetSupport's DNA has many features you won't find in other asset-management solutions.



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Reviews

OUR VERDICT ON THE NEW HARDWARE AND SOFTWARE RELEASES



It just goes to show what a difference good software design can make

Shiny new hardware may be enticing, but the real substance is in the software, says Jonathan Bray

“It’s always exciting when a new technology touches down, and even after years in the business a major release still has the ability to send a shiver down my spine. Be it a sleeky laptop, powerful graphics card or stunning camera, I’m like a child on Christmas morning when the package arrives.

This month, there’s plenty to get excited about this month. A 3D laptop that works well has finally arrived (see p48), we’ve tested Nvidia’s next-generation graphics card – the long-awaited Fermi (see p64) – and Olympus’ lovely PEN E-PL1 camera has impressed us with its combination of practical design and outstanding image quality (see p56). Goosebumps? I’m practically coming out in hives.

But I’m beginning to worry. Is this obsession with new hardware unhealthy? Can I trace it back to deprivation in childhood? More to the point, is my enthusiasm misplaced? I think it just might be, as a couple of incidents this month have underlined.

In the Labs, I’ve long been seeking a simpler way of calculating the overall ratings that appear at the foot of reviews. You might be surprised to learn that we don’t just stick a finger in the air to decide on these little red stars – they’re the result of laborious totting up of feature points, painstaking testing, assessment, and retesting and recording of results.

To date, however, the calculation process has been about as comfortable as pulling teeth: a drawn-out process involving many Excel spreadsheets, complicated calculations, and the input and examination of rows and rows of raw data. I’ve tried to simplify things for the rest of the team, so they can focus on testing and reviews, but with mixed results.

Our first spreadsheet, and one we used for years, involved everyone knowing all the equations and adding extra cells where necessary. This was slow and painful, so I attempted to build an automated spreadsheet with cells locked down, to stop prying fingers making changes that were difficult to track

and fix. It worked, but ended up being too complicated to maintain.

At this point, I decided to give databases a whirl – surely form-based data entry would make things easier for the team? So I transferred my focus to Microsoft Access 2007. I wish I hadn’t. It was a nightmare stream of “how do I do this?”, “why can’t I do that?”, and a lot of swearing at the screen before I gave up.

Finally, I downloaded a trial of FileMaker 10 (web ID: 244746), and what a difference it made. After an hour or so of fiddling, I had a workable database that not only calculated the scores and was easy to use and tweak, but stored and made searchable everything entered into it. It’s one of those applications that’s so easy to understand I was able to add extra features I hadn’t thought of previously, and I didn’t have to resort to Google once.







It just goes to show what a difference good software design can make, and how important it is to choose the right software in the first place. It’s why we’ve dedicated a massive ten pages at the front of this month’s reviews section (see p34) to the latest release of Adobe’s Creative Suite. These are the applications that many illustrators, production professionals, web designers and software developers around the world use every day of their working lives.

For these people, improvements in the software they work with day to day can be far more exciting and beneficial than a shiny new laptop. It can help them work more efficiently, which can lead to earning more money. It can help them create a more attractive, interactive end product, and win contracts they may not have won before. It can help produce innovative work that may not have been possible previously.

So, in future I’ll try to curb my enthusiasm for the baubles of the hardware world and get stuck into the world of software instead. It might just do me some good.

Jonathan Bray is PC Pro’s reviews editor. He’d like to point out that the next issue of PC Pro will not only include reviews of the video production side to Adobe’s software juggernaut, but also version 11 of FileMaker. Read Jonathan’s blog at www.pcpro.co.uk/blogs/jonathanbray

HOT PRODUCTS – REVIEW OF REVIEWS

Product	Our verdict	Other verdicts		
 HTC Legend p58	<p>■ Finally, an Android smartphone that stands toe to toe with Apple's finest on design, speed and ease of use.</p> <p>★★★★★</p>	<p>■ It's safe to say HTC has broken yet another mould with the Legend, stunning the world with both its hardware and software design. EG</p> <p>★★★★★</p>	<p>■ Lives up to its name. It's fast, fun, and manages to be easy to use and full of potential at the same time. CN</p> <p>★★★★★</p>	<p>■ Undoubtedly our favourite Android phone so far. The screen looks amazing and that aluminium chassis is something to behold. TR</p> <p>★★★★★</p>
 Samsung R580 p49	<p>■ Does just enough to earn a recommendation, with good ergonomics and great performance at a very sensible price.</p> <p>★★★★★</p>	<p>■ Offering impressive power and usability, the Samsung R580 is another great addition to the Samsung range. WL</p> <p>★★★★★</p>	<p>■ With abundant speed and good build quality, we're happy to recommend the Samsung R580 as a desktop replacement. PCA</p> <p>★★★★★</p>	<p>■ Its style, features, performance and value make it a well-balanced all-rounder that will stand the test of time better than most. TR</p> <p>★★★★★</p>
 Olympus PEN E-PL1 p56	<p>■ If you were thinking about buying a high-end compact, you should consider paying the extra for one of these instead.</p> <p>★★★★★</p>	<p>■ An attractive, well-built and very capable camera with a more aggressive price tag than competing models. PB</p> <p>★★★★★</p>	<p>■ The most affordable PEN yet, and finally there's a built-in flash, which is sure to extend its appeal beyond early adopters. PL</p> <p>★★★★★</p>	<p>■ A good value camera, the Olympus E-PL1 offers DSLR image quality without the clunky build, but still not the quickest. PCM</p> <p>★★★★★</p>
 Lenovo ThinkPad Edge 13 p51	<p>■ For corporate customers looking to roll out a fleet of sturdy, inexpensive lightweight laptops, this fits the bill perfectly.</p> <p>★★★★★</p>	<p>■ May not carry the premium features of higher-end ThinkPads, but for a budget ultraportable there's little to complain about. EG</p> <p>★★★★★</p>	<p>■ Loosens up the ThinkPad look – but losing an optical drive keeps it a yard short of being a top-choice compact business laptop. CN</p> <p>★★★★★</p>	<p>■ A fashionable small business ultraportable that combines a great new keyboard with good battery life. LM</p> <p>★★★★★</p>
 Creative Vado HD p60	<p>■ Improved quality on the previous version and an attractive price help Creative catch up with its main rivals.</p> <p>★★★★★</p>	<p>■ The widest-angle lens of any HD pocket camcorder, exposure controls and great low-light video quality. PCW</p> <p>★★★★★</p>	<p>■ A few tweaks, but the new Creative Vado HD doesn't advance the pocket camcorder by any great measure. PL</p> <p>★★★★★</p>	<p>■ The latest Vado is a mixed bag, with good video quality but aggravating touch-sensitive controls. ER</p> <p>★★★★★</p>
 Canon Ixus 105 p61	<p>■ Excels as an all-purpose snapper, easy to use and understand, and it's great value for money too.</p> <p>★★★★★</p>	<p>■ While a thing of beauty physically, the Ixus 105's average pictures and trailing-edge tech fail to inspire. CNU</p> <p>★★★★★</p>	<p>■ Well crafted and simple to operate. Offers a fair deal too, despite the fact that its feature set is relatively modest. PL</p> <p>★★★★★</p>	<p>■ Hardly a breakthrough product, with average image quality, but the Ixus 105 is easy to grasp from the get go, fast and responsive. PB</p> <p>★★★★★</p>

CN CNET, CNU CNET UK, DTR Digital Trends, EG Engadget, LM Laptop Mag, PB Photography Blog, PCA PC Advisor, PCM PCMag.com, PCW PC World, PL Pocket-lint, SD Steve's Digicams, TR Trusted Reviews, WL What Laptop. Scores have been converted from the original to scores out of six or, if not available, are our own interpretation.

HOW WE TEST

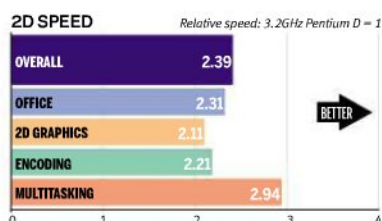
2D TESTS

We test desktop PCs and laptops with our own independent benchmarks, custom-built to our specification. We split the results into four categories: Office, 2D Graphics, Encoding and Multitasking, with the Overall score being a straight average of the four.

For instance, the Office test consists of several Office 2003 applications interacting with one another: we generate a 10,000-record Access database, extract the resulting data into Excel, merge this formatted data into Word and, finally, create a PowerPoint presentation from a selection of the data.

We provide full details of all the tests on the cover disc: click on the Editorial tab and select the PC Pro Benchmarks 2005 PDF document.

Our reference is a dual-core Pentium D 840 PC with 1GB of PC3200 RAM and GeForce 6600 GT graphics. A score of 1.25 indicates a PC is 25% faster than our reference system.



You'll find this graph below each PC and laptop review. It shows, at-a-glance, how fast systems are overall and in each section of our benchmarks.

3D TESTS

We use pre-recorded demos in Crysis and Call of Duty 4 to test gaming performance. In Crysis we use the Low, Medium and High quality settings in 1,024 x 768, 1,280 x 1,024 and 1,600 x 1,200 screen modes respectively. High-end systems are tested using the Very High settings. In Call of Duty 4, we set the quality options to On or Off and use 1,024 x 768 (Low), 1,280 x 1,024 (Medium) and 1,600 x 1,200 (High).

3D SPEED (CRYSIS)

HIGH SETTINGS	10fps
MEDIUM SETTINGS	27fps
LOW SETTINGS	86fps

GOOD PLAYABLE UNPLAYABLE

An average of more than 35fps is high enough for smooth gameplay; between 20fps and 35fps is playable, but may stutter in intensive scenes; 19fps or lower is unplayable.

LAPTOP BATTERY LIFE

We run two battery tests. The first is a light-use test, the screen on medium brightness and CPU power saving turned on. Then we run a complex multitasking job until the battery runs out.



Indicating minimum and maximum battery life.



So here it is. Some 18 months after its last release, Creative Suite 5 has arrived to set the benchmark for professional creatives producing work for page and screen.

With big updates to flagships and market leaders such as Photoshop, InDesign, Dreamweaver, Flash Professional, Premiere Pro and After Effects, there's a huge amount to get to grips with. In fact, with the introduction

of yet another key application, Flash Catalyst, Creative Suite 5 sees the synchronised launch of 16 applications (see *table opposite*). Over the following pages, we take an in-depth look at those most relevant to print and web design. Coverage of the video production tools follows next issue.

But that's not all. There are two important support programs: Device Central CS5, for testing how content works on an ever-wider range of mobile device emulators; and the media

management tool, Bridge. Adobe is also using the launch of Creative Suite 5 to move into services. Most of these weren't running at the time of review, with the exception of BrowserLab (see p43).

Which suite to buy?

To get your hands on all CS5 services, support apps and standalones, you'll have to shell out for the Master Collection. At around £2,300 exc VAT it isn't cheap, especially as Adobe again

Illustration:
Jan Cihak



penalises UK users with a punitive dollar-sterling exchange rate. However, users of any CS4 or CS3 suite can now upgrade for around half that price.

The big problem with the Master Collection is that it's unlikely any one user will be producing commercial print, websites, rich internet applications and broadcast video. Most users will find it makes more sense to buy one of Adobe's targeted suite editions, while businesses would do better to buy a mix of suites using Adobe's volume licensing schemes.

The cheapest edition and the most focused is CS5 Design Standard. This provides Photoshop CS5 (see p36), Illustrator CS5 (see p40) and InDesign CS5 (see p38). Throw in Acrobat 9 Professional (web ID: 204861), and it's an impressive combination made even more so by a strong round of upgrades.

For those wanting to mix print and web design, Adobe provides Design Premium CS5 and, thanks to CS5's flat-rate upgrade pricing from any CS4 suite, it's a bargain for existing Design Standard users. Here, the new Flash capabilities of InDesign CS5 prove central, as they provide a bridge between traditional page-based design and screen-based delivery.

Adobe also opens up another route towards Flash-based delivery with Flash Catalyst CS5 (see p45). This takes artwork produced with the creative tools and converts them into interactive Flash and AIR apps. Finally, Design Premium includes the powerful new Dreamweaver CS5 (see p42).

CREATIVE SUITE 5 EDITIONS	DESIGN STANDARD	DESIGN PREMIUM	WEB PREMIUM	PRODUCTION PREMIUM	MASTER COLLECTION
OVERALL RATING	★★★★☆	★★★★☆	★★★★☆	Reviewed next month	Reviewed next month
Adobe Photoshop CS5 Extended	○	●	●	●	●
Adobe Photoshop CS5	●	○	○	○	○
Adobe Illustrator CS5	●	●	●	●	●
Adobe InDesign CS5	●	○	○	○	○
Adobe Acrobat 9 Pro	●	●	●	○	●
Adobe Flash Catalyst CS5	○	●	●	●	●
Adobe Flash Professional CS5	○	●	●	●	●
Adobe Flash Builder 4	○	○	●	○	●
Adobe Dreamweaver CS5	○	●	●	○	●
Adobe Fireworks CS5	○	●	●	○	●
Adobe Contribute CS5	○	○	●	○	●
Adobe Premiere Pro CS5	○	○	○	●	●
Adobe After Effects CS5	○	○	○	●	●
Adobe Soundbooth CS5	○	○	○	●	●
Adobe OnLocation CS5	○	○	○	●	●
Adobe Encore CS5	○	○	○	●	●
Adobe Bridge CS5	●	●	●	●	●
Adobe Device Central CS5	●	●	●	●	●
Price	£1,032 (£1,213 inc VAT)	£1,509 (£1,773 inc VAT)	£1,429 (£1,679 inc VAT)	£1,509 (£1,773 inc VAT)	£2,303 (£2,706 inc VAT)
Upgrade price	£357 (£419 inc VAT)	£516 (£606 inc VAT)	£476 (£559 inc VAT)	£516 (£606 inc VAT)	£794 (£933 inc VAT)

Key: ● Yes, ○ No.

So what about dedicated web designers? The big news is Adobe has dropped the Web Standard edition with the clear implication that existing users should upgrade to Web Premium. This sounds like a blow for small-scale developers, but upgraders will find that Web Premium more than doubles the four core Web Standard apps, and at a tempting price too.

There's some logic to Adobe's decision to drop Web Standard and promote Web Premium, as the traditional web page hand-crafted by the webmaster is reaching its sell-by date. By calling time on the old static page-based model and providing a relatively simple route to a Flash-based future, Adobe can argue it's helping designers keep up with the changing nature of the web. Developing a RIA in Flash Builder is a long way from throwing together a

simple HTML-based web page, however, and it means most designers would be better off upgrading to Design Premium.

There is an alternative. The rise of content management systems (CMS), coupled with Dreamweaver CS5's new-found support for them, means if you're a Web Standard CS4 user you may be better off just upgrading Dreamweaver and investing your time in getting to grips with WordPress, Joomla or Drupal instead.

Ultimately, the best choice of how you access that power depends on where you're coming from and, more importantly, where you want to go. But, between its various suite editions, standalone applications and upgrade options, there's no denying Adobe's Creative Suite 5 has done it again, providing an extraordinary range of new creative power. **TOM ARAH**

Adobe Creative Suite 5

THE NEW SUITE ADDS MASSES OF POWER ACROSS THE CREATIVE BOARD, BUT IS IT WORTH UPGRADING? **TOM ARAH** FINDS OUT



➔ **Photoshop CS5** remains focused on bringing the best out of your digital photographs.

PHOTO EDITING

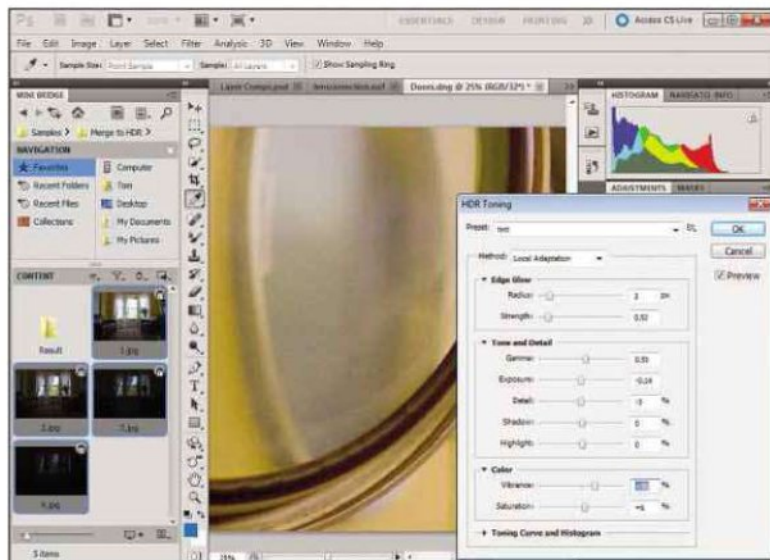
PRICE
£548 (£644 inc VAT)

UPGRADE
£159 (£187 inc VAT)

SUPPLIER
Via Adobe website

INTERNET
www.adobe.co.uk

REQUIREMENTS
Windows 7/Vista/XP



Adobe Photoshop CS5

Major improvements throughout and extraordinary pixel processing magic see Photoshop CS5 firing on all cylinders

Adobe Photoshop has dominated the world of professional photo editing since its original launch back in 1990. The nature of computing has changed radically in the intervening 20 years, and Photoshop CS5 reflects that fact with the inclusion of both 32- and 64-bit versions, the latter promising faster performance depending on how much RAM you've installed.

Photo editing has moved on too, from managing the occasional scan to thousands of digital camera images, and CS5 boasts key improvements that recognise this fact. The main image management element, Bridge CS5, remains in place, and it's largely unchanged here, but within the application there's been a major step forward. The new Mini-Bridge panel now allows you to quickly and directly search and view image previews without the clutter of metadata panels, and without having to load up the full Bridge application.

In the raw

Another significant shift in modern photographic practice is the increasing importance of raw file formats, which store the full tonal range of unprocessed camera data. To this end, Photoshop CS5's Camera Raw 6 plugin has been significantly improved. It now supports more than 275 raw formats, and offers

more control over vignetting and sharpening. There's also better control over noise reduction, and the added ability to deliberately add noise as grain – an attractive effect in its own right, and a useful cover for a multitude of sins.

You don't have to be using raw formats to benefit from new features, however. Photoshop CS5's Merge to HDR Pro command, which allows you to take bracketed shots in any format and combine them to produce perfectly exposed images, has also been enhanced. Images are aligned more effectively now, and the new Remove Ghosts option helps remove the blurring effect that moving items can introduce.

The Merge to HDR Pro dialog also adds advanced tone-mapping control over gamma, exposure and detail, as well as colour control over vibrance and

saturation. Throw in control over edge glow radius and strength, and you have all the power you need to create high-impact images – styling that you can save and reapply later. Similar creative possibilities are also now made available to standard 8-bit images via the HDR toning adjustment.

Through the lens

Next on the list is the Lens Correction filter – used for fixing pin-cushion and barrel distortion – which has been promoted and made more powerful, with a new Auto Correction tab. This allows corrections to be made based on a combination of image metadata, camera and lens profiles. You can download profiles directly from the filter and there's also a free profiling tool available to download, so those with technical nous can profile their own equipment.

Elsewhere, the Ruler tool's new Straighten command makes it easier to straighten your image and produce better compositions during cropping. And one particularly useful tweak is the change to Photoshop's workspace presets, all of which now maintain changes until explicitly reset.

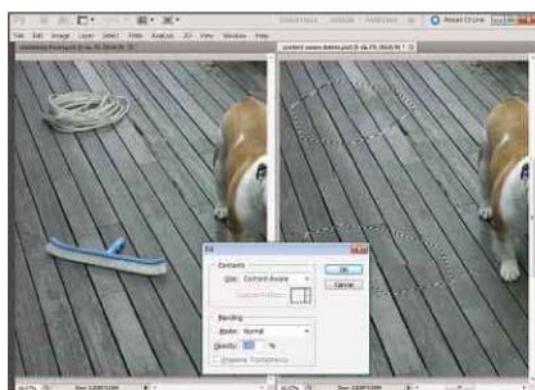
Making a splash

Small productivity enhancements can make a surprisingly big difference to working life, but Adobe also likes to add a bit of wow factor to each new version of Photoshop. The new Puppet Warp capability certainly fits the bill: simply click on an image layer; set top, middle and end pins; and by applying a mesh over your subject, it allows you to manipulate your subject as if it was a jointed puppet. With three distortion modes, plus settings for mesh density and pin depth, there's plenty of control on offer.

Photoshop CS5 also moves into new creative territory with its enhanced art

capabilities. Previously, Photoshop's brushes were based on a single tip, but now you can access far more realistic multiple bristle-based brushes. Using the Brush palette you can then fine-tune bristle properties such as shape, density and stiffness with both the stroke preview and the onscreen representation of the brush updating accordingly.

The biggest artistic advance, however, is the introduction of the Mixer Brush. This mixes the "reservoir" colour with "pickup"



Content-Aware Fill lets you remove unwanted objects from pictures almost magically.

colours continuously sampled from the underlying image. By varying the Wet, Load, and Mix settings, you can control the extent to which your brush interacts with the existing colours in the image, as well as factors such as how quickly your brush loses its paint. Select a bristle-based tip and the option to sample all underlying layers, and you can quickly give an existing photograph an attractive, artistic look and feel.



The new Mixer Brush and bristle-based handling open up new possibilities, enabling you to give existing photos an artistic feel.

Core improvements

Photoshop's main focus is still photography, however, and its special strength remains photo-compositing. Successful photo-compositing demands seamless object edges, and these are now easier to produce thanks to Photoshop CS5's reworked Refine Edges dialog. Particularly significant is the new Smart Radius option, which automatically selects and varies its selection approach according to the nature of the underlying edge; hard for a leather jacket, say, but soft for a mohair jumper.

Object edges can be fine-tuned with the Refine Radius tools, and you now

have greater control over how the mask is displayed onscreen. When you're happy with the result, you can directly output the mask as a selection, a new document or a layer. For the latter, there's an option to Decontaminate Colours, which helps to remove unwanted colour fringes.

Photoshop CS5's most outstanding new feature, however, is Content-Aware Fill. Simply make a selection, hit this command and Photoshop analyses the pixels surrounding the selection and intelligently attempts to fill the space.

The program can do only so much, and the surrounding areas need to be suited to the technique for such invisible mending to work well.

However, it's extraordinary how often the Content-Aware Fill command does effectively fill the gap. Even when it doesn't, it gives a good starting point for further fine-tuning, and it can become quite addictive tidying up your images by removing distracting elements such as litter. Where the technology really comes into its own is retouching. Switch the Spot

Healing Brush to its new Content-Aware mode, then click or drag over unwanted elements such as blemishes or telegraph wires, and they seamlessly melt away.

What more could you ask for? With productivity enhancements across the board and important new capabilities in the key areas of artistic rendering, colour and image correction, photo-compositing and image retouching, this is a major release. Best of all, at the venerable age of 20, Photoshop CS5 is still able to surprise and delight with its image-processing magic. **TOM ARAH**

EASE OF USE
★★★★☆
FEATURES
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

Adobe Photoshop CS5 Extended

Photoshop CS5 Extended adds to its 3D capabilities, but whether it's worth the effort is debatable

Photoshop Extended's name sounds impressive, but in reality it isn't extra bitmap power on offer, but the ability to manage and render pixels in 3D space.

In previous versions you could import 3D models, but Photoshop's 3D creation capabilities were limited to producing flat "3D postcards" and the odd primitive. This version moves into another dimension by letting you extrude and otherwise manipulate pixel selections, vector shapes and text.

To do so, you select an object and hit the new 3D Repoussé command. You can then select from a range of preset previews and take fine control over the depth, scale, bend, shear, twist and



The new Repoussé command lies at the centre of Photoshop Extended CS5's new 3D capabilities.

inflation of your extrusion, as well as the type of bevel.

In addition, Photoshop CS5 Extended takes finishing options more seriously than before. A range of presets can be applied directly from dropdowns in the

Repoussé dialog or from the main 3D panel, and you can set different materials for individual surfaces and directly edit the texture maps that make them up.

There are also a number of lighting presets, and CS5 lets you add point, spot and infinite light sources. You can now load images, including HDR photos, as lighting sources and set a Ground Plane Shadow Catcher.

With your scene finally rendered (using the new Adobe Ray Tracer 2 engine), the results can be striking. But although the 3D power Photoshop Extended offers is exceptional for a bitmap editor, it's still slow and awkward compared to a dedicated 3D application.

At least Photoshop CS5 Extended now lets users create the simple 3D titles and logos that are probably the extent of their 3D ambitions. However, it's just too awkward and expensive to be practical, and when you can do the same more easily and for less money with the likes of Xara Xtreme 4 (web ID: 194691), there's even less reason to splash out. **TOM ARAH**

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EASE OF USE
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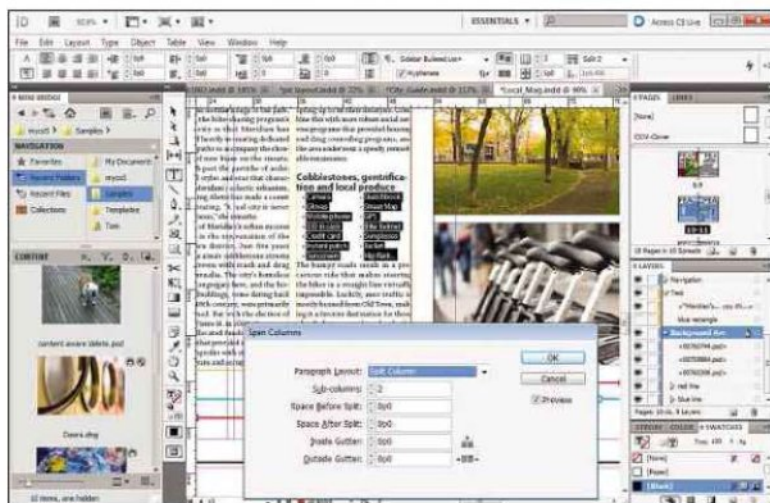
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REQUIREMENTS
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EASE OF USE
★★★★★
FEATURES
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★



Adobe InDesign CS5

Improved graphics and text layout make InDesign CS5 the professional publishing choice for both page and screen

Adobe InDesign is generally seen as having won the professional publishing crown, but the war isn't over. Not long after the release of CS4, QuarkXPress 8 (web ID: 207438) outflanked InDesign with its impressive productivity enhancements and embarrassingly superior Flash output.

InDesign CS5 is Adobe's response, and it immediately closes down a major weakness by allowing you to mix and match page sizes within a publication. Adobe adds an unnecessary and confusing Page tool in the process, but the size can at least now be set from the dropdown on the Pages panel.

More welcome is the improved handling of the elements that make up each page. The Layers panel now shows an Illustrator-style hierarchical view of objects, which makes it easier to hide and lock individual elements. It also makes it easier to re-order elements and add objects to existing groups. Best of all, you can isolate the components in a group, without having to ungroup them first.

The most eye-catching new feature is the way placed graphics are handled. The new Mini-Bridge panel lets you browse and select files by thumbnail, drag multiple files onto the page, and place items in a grid, simply by hitting the left and right arrow keys to create columns and rows. Once placed, you can refine a grid using the Gap tool, which updates multiple

frames simultaneously by modifying the white space between them.

InDesign's long-standing range of fitting options and keyboard modifiers lives on, but in a similar vein to the Gap tool you can simplify matters with the Auto-Fit setting, ensuring that content resizes along with its frame. CS5 also adds a basic on-picture Content Grabber widget for repositioning.

Further refinements to frame handling include the ability to set corner effects directly on the frame itself and to handle each corner separately. You can generate and automatically position captions, including data pulled directly from the image file itself, and each caption can be live, so when you change the image it automatically updates.

In terms of text layout, you can now create a grid of multiple text frames using the cursor keys, and span and split columns. The latter can be applied on a style or per paragraph basis, and text

can span its own column, all columns or a set number of columns. Even more impressive is the ability to split text within the current column.

CS5 also does more to recognise that publishing is a collaborative effort, and so includes a copy of CS Review for initiating reviews and receiving feedback directly within the application.

The rest of the new features are focused on interactive publishing. InDesign has long offered half-hearted support, but CS5 finally takes the subject seriously. This is most apparent in the dedicated workspaces Interactive and Interactive for PDF, and five new panels.

The first of these, Animation, lets you apply and customise a huge range of preset animations such as fades, grows, fly-ins and bounces. The second, Timing, lets you orchestrate animations by linking and delaying effects. The third, Object States, lets you set up different states, such as formatting or page layouts, which you can then target with action options from the existing Buttons panel. Media lets you choose a poster image and controller skin for embedded video files – including SWF and FLV – and even lets you set up navigation points that actions can jump to. The fifth, Preview, shows you how your publication behaves without having to export it first.

Put it all together and InDesign CS5 is a powerful interactive and online authoring tool, whatever your requirements. If all you need is simple online viewing you can instantly output an existing print publication as SWF, complete with built-in page navigation. For added value and offline reading and playback, you can add video and audio, and output to interactive PDF. For maximum impact you can completely repurpose publications for media-rich screen-based interaction.

Finally, for maximum power and the most engaging publications (and a feature that QuarkXPress simply can't match), InDesign CS5 lets you output to editable Flash FLA format to go on and add more depth using Flash Professional CS5 (see p44).

The real strength of InDesign CS5 is that all this added power hasn't come at the expense of development elsewhere. Even if you have no interest beyond print, InDesign CS5 is a must-have upgrade and a crushing response to QuarkXPress. **TOM ARAH**



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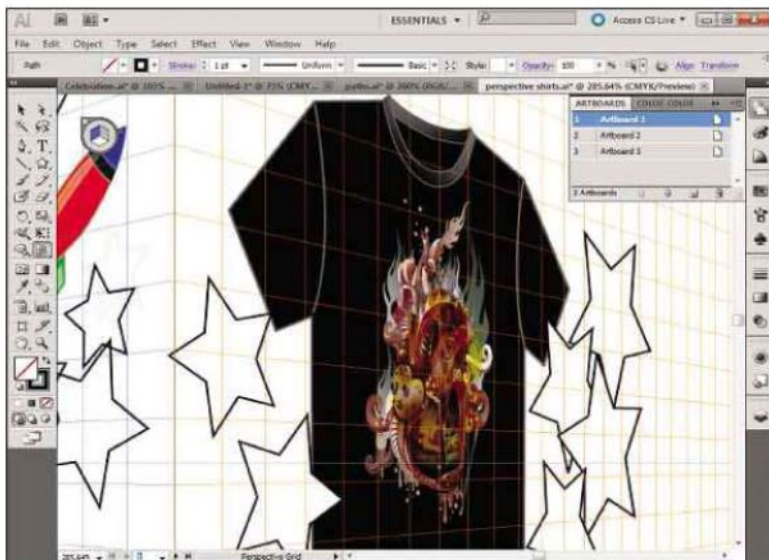
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REQUIREMENTS
Windows 7/Vista/XP

➔ Illustrator's new perspective handling tools make it simpler to design 3D objects.



Adobe Illustrator CS5

Perspective handling and some lateral thinking boost Illustrator's creative drawing credentials – but it's hard going

First launched in 1988, Adobe Illustrator has an even longer pedigree than Photoshop. And for much of this time its creative capabilities have been effectively circumscribed by PostScript, Adobe's page-description language.

Illustrator CS5 is still defined by PostScript – it has to be in order to enable high-resolution, fully scalable vector output – but Adobe does what it can to push the envelope. This time, it kicks off with better control over arrowheads and dashed lines.

The big change is that Illustrator CS5 adds a Width tool, allowing you to drag out from multiple points along a path to interactively vary its width. This neatly sidesteps one of the big limitations of PostScript: that paths can be stroked only at a uniform width.

For more expressive strokes, Illustrator CS5 also enhances the handling of brushes by providing control over how shapes are stretched along a path and how tight corners are handled. It also introduces the Bristle Brush. By managing factors such as shape, density, stiffness and paint opacity, this produces strokes that look uncannily like they were created with an artist's paintbrush. It's an extraordinary achievement within a vector environment.

As well as stroking open paths, PostScript lets you fill

closed shapes. Often, the best way to create exactly the shape you want is to combine existing objects, and to help with this Illustrator CS5 adds a dedicated ShapeBuilder tool. It isn't intuitive, however, and most users will stick with an occasional visit to the Pathfinder panel.

A more successful attempt to give existing power a creative twist is the introduction of Drawing modes. The first mode, Draw Behind, forces all drawing to appear behind the current selection, while the second, Draw Inside, hides any drawing outside the current selection. Both effects were previously achievable through re-ordering or clipping masks, but this new approach feels more creatively flowing.

Illustrator's longest-standing PostScript/EPS-inspired limitation was its restriction to single pages. This was

finally lifted in the previous CS4 release (web ID: 231822) through the introduction of multiple artboards, but the way in which these were created and managed was bizarre. CS5 introduces more familiar page-style handling via an Artboards panel, where you can quickly create blank artboards and re-order existing ones (although without previews). You can also export individual artboards as AI files and paste objects across all artboards.

Each new artboard now has its own axis origin, which makes object placement much simpler. Even better in this regard is Illustrator CS5's new Align to Pixel Grid option, which ensures that single-pixel strokes won't end up undesirably anti-aliased. Four new anti-aliasing options for text enable the sharpest possible web output.

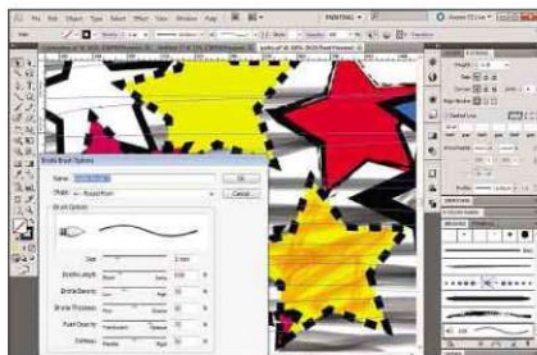
More exciting than all this is Illustrator CS5's big new addition: perspective handling. Select the new Perspective Grid tool and a grid appears on the workspace, which you can then manipulate by dragging control points around, creating 1-, 2- or 3-point perspective guide grids.

You can then use this as an aid to drawing, but the real power comes from the ability to attach objects to a particular plane. Select the left, right or ground plane on Illustrator CS5's onscreen Plane Switching widget, add a shape, and it will automatically conform to the plane's perspective. Drag existing flat objects with the Perspective Select tool, and they too will conform, shrinking or growing in size as you move them around the plane.

Drawing realistic perspective is a regular requirement for many illustrators and these tools will certainly make it simpler. For example, it's now straightforward to create realistic buildings, with multiple windows all in accurate perspective.

With some lateral thinking it's

amazing what creative control Adobe has managed to unlock from Illustrator's underlying architecture. But despite the fact that such workarounds can prove effective, only truly expert users will be able to realise their full potential and, even then, they aren't free flowing and easy to use. And so, while bringing out the full creative potential of Photoshop CS5 often feels like magic, with Illustrator CS5 it generally feels like hard work. **TOM ARAH**



The new Bristle Brush could release the artist in your design team, with uncannily realistic results.

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➔ A major reworking of Live View means developers can inspect and edit code directly in Dreamweaver CS5.

WEBSITE DESIGN

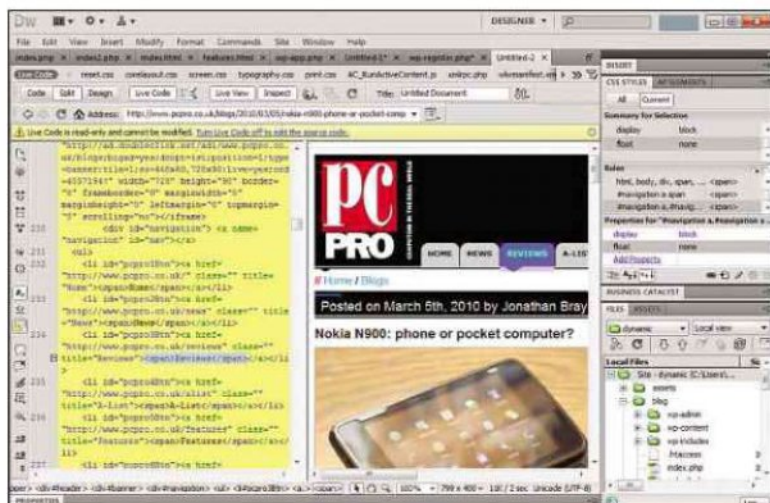
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REQUIREMENTS
Windows 7/Vista/XP



Adobe Dreamweaver CS5

Enhanced CSS and PHP handling, and lots of Live View improvements, save Dreamweaver's bacon

Dreamweaver largely created the web as we know it, through its ability to create custom web pages and custom web applications. However, the nature of the web is always changing and, with the rise of server-based content management systems (CMS), there's a real possibility that the desktop-based Dreamweaver may have had its day.

To stay relevant, the first thing Dreamweaver CS5 had to do was make it simpler to start designing websites, and it makes a good start. Previously, you had to jump through a number of hoops to define a site; now, you need only set a name and directory to begin work. When you're ready to move on to the next stage – say, setting up a test server – Dreamweaver will prompt you for the additional information.

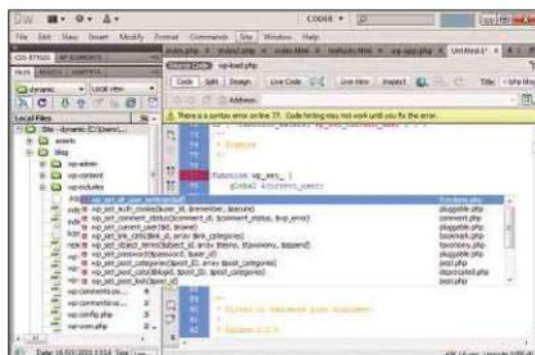
Dreamweaver CS5 has also overhauled its New Document command and it now includes a radically reworked range of CSS layouts. These not only follow modern best practice by including simplified selectors and starter code for menus, but are also full of helpful comments.

Dreamweaver's choice of CSS layouts is available whether you're creating static HTML-based pages or dynamic pages based on ASP, ColdFusion, JSP or PHP, but in this version there's a distinct emphasis on PHP. Core

PHP code hinting has been dramatically improved, with on-the-fly parsing and filtering, support for objects, as well as functions and greater information in the Description pane. The latter comes complete with a direct link to the PHP.net manual page.

Take the hint

More impressive is Dreamweaver CS5's new support for site-specific code hints, in particular for the big three open-source PHP-based content management systems: WordPress, Joomla and Drupal. All you need to do is point Dreamweaver to the folders containing your framework and hinting is set up accordingly. Base a site on WordPress, for example, type <Ctrl-Space> followed by "wp" and the relevant hints for WordPress methods appear, narrowing as you type.



PHP is Dreamweaver's favoured web scripting language, and code hinting has been radically improved in the latest version.

The biggest changes in Dreamweaver CS5 are apparent when you switch to the program's Live View mode, which lets you see your page as rendered in the open-source WebKit browser engine. Turn on Split view and Live Code, and you'll also see the code the browser is using to render the page. Dreamweaver CS5 highlights any changes in code as you move your mouse over the page, making inspection and debugging much easier than before.

The Inspect command provides similar power for CSS. To begin with, it helps you understand how the CSS box model is controlling the placement of your elements by highlighting borders, padding and margins in different colours. Then, as you move your mouse over the page, the CSS Styles panel updates in real-time to show relevant CSS rules and properties. You can also quickly change parameters and toggle CSS properties on and off to see the effects. These days, many designers have turned to browser add-ons such as Firebug to provide similar live CSS handling, but now you can inspect and edit directly in Dreamweaver.

Dynamic websites

Live View is great for static HTML/CSS pages, but what about CMS-based pages? These don't exist until they're generated on the server and presented to the browser, which looks like an insurmountable problem. To get around this, Live View offers Live Navigation. Simply <Ctrl-click> on a link; the necessary logic is run on your test server and the page is rendered accordingly. Select Follow Links Automatically and you can drill down to view the browser code and rendering for any CMS page.

Being able to view the final code isn't the whole story; CMS pages are also the result of the interaction of a whole host of logic-based PHP modules and linked CSS files. Again, it's no problem for

Dreamweaver CS5. Using its Dynamically Related Files capability, it can automatically load all associated components ready for viewing and editing. As each page may well involve dozens of files, you can also quickly filter related files based on name or file type.

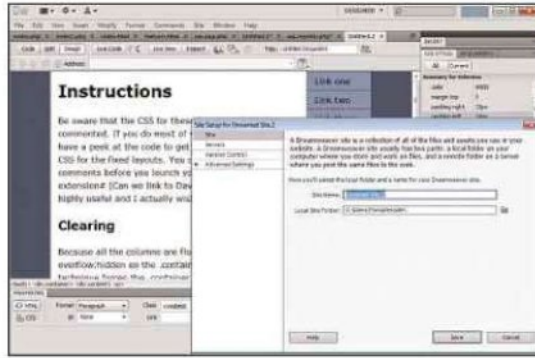
So far the assumption has been that the pages you're viewing in Live View are stored or created locally on your own system, but that isn't a requirement. Dreamweaver CS5

takes Live View to its logical conclusion by allowing you to enter a web URL into the Address field on the new Browser Navigation toolbar. This lets you view, inspect and edit not just static web pages, but also generated CMS pages and the dynamically related files that make them up.

It doesn't limit you to your own live pages either. You can browse and view the code involved in the creation of any web page. In effect, Dreamweaver CS5 becomes a glorified web browser, able not just to view any page but to deconstruct it and see exactly how it was created. The learning – and copying – potential is huge.

Output options

This is all very impressive, but web designers also need to ensure consistent presentation across all browsers. You can install the most popular browsers and preview your pages locally, but most applications don't let you have multiple versions installed, and installing browsers on different OSes is an even thornier issue.



The accompanying comments and helpful information make it far easier to set up both websites and pages in Dreamweaver CS5.

The solution is Dreamweaver CS5's BrowserLab service. This is a Flash-based application that generates snapshots of your pages as rendered by multiple browser versions on different platforms, and then lets you compare them onscreen. The downside is that it's free only for a year, and as yet there's no indication of how much it might cost after that. The upside is that its cloud-based approach enables cross-platform checking from a single system. It makes Microsoft Expression Web's desktop-based SuperPreview look not just underpowered but also misconceived.

Talking of underpowered and misconceived, Adobe has also updated Contribute CS5 (£187 exc VAT; upgrade, £91 exc VAT). It now includes the ability to add super and subscripted text and image hotspots, and can also handle Flash embedding. Most notable is the ability to set up predefined content types with their own workflow settings and support for direct editing of XML content. But Contribute's approach looks old-fashioned in the face of the new breed of powerful, open-source CMSes.

The advent of CMS is the "writing on the wall" for Contribute, and it might have proved the same for Dreamweaver. By effectively turning itself into a browser on steroids, though, Dreamweaver CS5 has again embraced the changing nature of the web. The shift to an increasingly CMS-based future won't be easy for designers, and they and new users have a mountain to climb getting to grips with WordPress, Joomla and Drupal. The results will be well worth the pain, however, and Dreamweaver CS5 is a watershed release. **TOM ARAH**

EASE OF USE
★★★★☆
FEATURES
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

Adobe Fireworks CS5

New features are thin on the ground, but it could have a role to play when used alongside Flash Catalyst

When Adobe acquired Macromedia, there was a possibility that it would stop development of Fireworks in favour of its own more powerful graphical applications. Instead, it added support for multiple pages and gave the program a new lease of life by enabling it to produce new user interface designs and full site prototypes.

This time around, much of the development effort has been put into quashing bugs, general streamlining and boosting responsiveness. There's a range of basic templates, and projects can be started directly from Device Central CS5, which sets the page size to the correct dimensions and lets you quickly preview your work in all sorts of target devices.

In terms of new graphical power, Fireworks CS5 provides various minor



Fireworks hasn't seen a big upgrade, but the introduction of Catalyst could potentially boost its usefulness within a wider context.

enhancements. The aspect ratio of rectangles can be constrained, for example, and snapped to the nearest pixel to avoid anti-aliasing. Adobe has also reworked the Properties panel to provide faster access to control over strokes and gradients, and added the

ability to create compound paths, both interactively and non-destructively.

You can look through thumbnail previews to choose which page you want to open, and insert pages into an open document. The enhanced text control sounds promising, but boils down to little more than support for undo and kerning shortcuts.

There isn't much here to shout about, and with Adobe concentrating its development efforts on Flash Catalyst (see p45), that's understandable. However, Catalyst isn't intended to produce designs from scratch, it's for converting artwork from other Creative Suite apps. As such, Fireworks CS5's most significant new feature is its enhanced FXG 2 output, which allows its files to be imported by Catalyst. With FXG support for

features such as layers, live filters and multiple pages, you can design your screen interface with Fireworks CS5 and then bring it alive with Catalyst. So, while Fireworks CS5 is a minor standalone release, within a wider context it gains a potentially important new role. **TOM ARAH**

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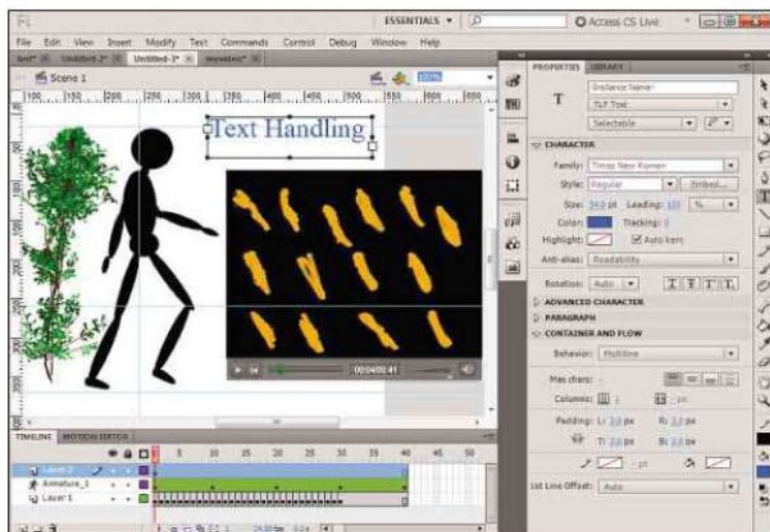
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REQUIREMENTS
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→ Flash Professional CS5 introduces a physics engine to create naturalistic effects such as objects wobbling when brought to a halt.



Adobe Flash Professional CS5

Enhanced animation, drawing, video and coding, but Flash Professional isn't the core app it once was

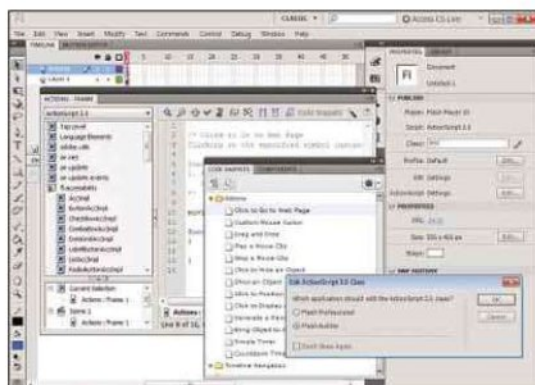
Adobe has all-conquering ambitions for Flash as the web platform of choice for designers and developers, but it began life as a simple animation package for producing online cartoons.

Things have progressed a long way from the basic tween effects with which Flash made its name, however. In the previous CS4 release, Flash added support for Inverse Kinematics for the realistic animation of jointed figures. Now, CS5 adds a physics engine that enables bones to be given spring and damping – that's what you need to create naturalistic effects such as objects wobbling when they're brought to a halt.

The main advantage Flash brings to online animation is its bandwidth-friendly vector handling. Here, Flash Professional CS5 has radically revamped its procedural Deco tool to enable it to add elements such as buildings, trees, flowers and animated particle effects.

Video support has seen radical change, allowing files to be encoded during import (the Media Encoder is still bundled for greater control). Once encoded, even externally loaded video is displayed directly and you can quickly scrub through it to add cue points.

Flash Professional CS5's text handling has also been overhauled,



Code Snippets are handy for non-coders, while integration with Flash Builder will be welcomed by heavy-duty developers.

with support for Adobe's Text Layout Framework. This adds advanced typographic control over features such as kerning, ligatures and tracking. More importantly, it allows Flash Professional to offer true threaded text blocks for the first time, complete with control over multicolumn layout, inline graphics, indentation and padding.

Flash Professional CS5's new text layout handling comes into its own when working with interactive publications produced with InDesign CS5, as it means text blocks can remain fully editable. The question is, as InDesign CS5 can now create its own advanced Flash-based SWF publications, why would you want to involve Flash Professional at all? One reason is the wider range of output

options on offer, most notably Adobe AIR. Flash Professional CS5 also introduces the ability to convert files to native iPhone applications. However, after the original fanfare surrounding the announcement, Adobe has been back-peddalling hard. The Packager for the iPhone component is provided only as a "preview", and you're encouraged to "explore" rather than use it in anger.

The other main reason to bring InDesign publications into Flash Professional is to add custom interactivity. Flash Professional CS5 introduces an ActionScript 3-based Code Snippets panel that lets you manage a whole host of tasks, such as timeline navigation, animation, audio and video. For heavier coding, custom class code hinting, code completion and the ability to reference code libraries more efficiently mean you can achieve a lot in Flash Professional CS5.

It still isn't the most efficient development platform, so for serious coders there's now the option to leave the program entirely to edit and debug ActionScript in Flash Builder, a new addition to the Web Premium Creative Suite.

Flash Professional CS5 takes another major stride towards modern development practice with its introduction of XFL, a new native "uncompressed FLA" format. XFL stores all information as open XML code and manages imported binary content as referenced files. This greatly boosts workflow productivity, allowing content to be updated simply by replacing linked files, and for multiple users to work on the same project simultaneously.

For Flash to fulfil its full potential as a web platform, the format needs to shift away from its proprietary, binary, standalone past towards a more open, integrated, modern future. Adobe is doing what it can to move Flash Professional in this direction, but it's the decision to bring Flash Builder into the CS mainstream and to provide an alternative design application in the form of Flash Catalyst (see opposite) that will have the most impact.

Effectively, this relieves Flash Professional CS5 of the advanced development duties for which it's manifestly unfit, and allows the program to concentrate on what it has always done best: producing high-impact web-efficient content. Flash designers will breathe a sigh of relief. **TOM ARAH**

EASE OF USE



FEATURES

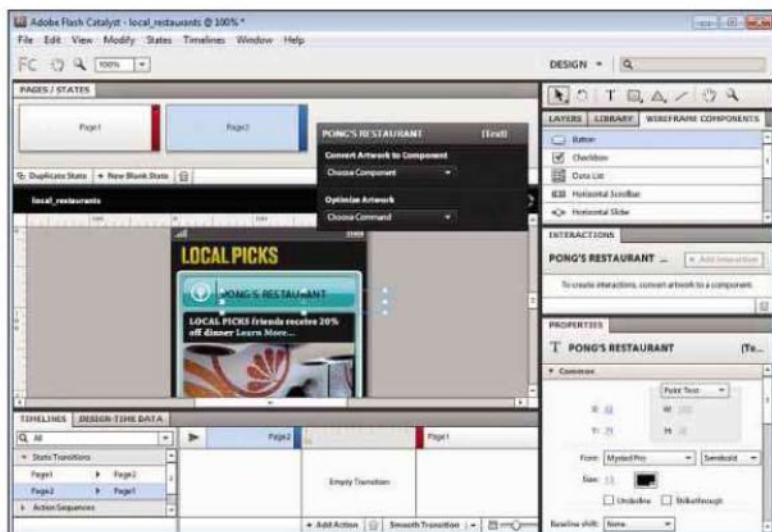


VALUE FOR MONEY



OVERALL





Adobe Flash Catalyst CS5

A rather basic first release that's too limited in features to compete with its main rival from Microsoft

For many years, Flash was a simple vector animation format and the only way to create it was to use the dedicated Flash Professional (see opposite). With Creative Suite 5, Flash is being pitched as an all-purpose web platform with multiple means of production, and the most significant element to this is the brand-new Flash Catalyst.

Included in all three Premium CS suites, Flash Catalyst is intended to take over the creation of interactive screen-based content from the frame-based Flash Professional.

At first sight, however, there isn't much to it. Hit the File | New command and you're presented with a simple dialog in which you set the default screen size and background colour. With the basic drawing toolset you add graphical elements such as straight lines, rectangles and a few other shapes. User interface elements such as scroll bars and buttons are dragged onto the stage, and elements can be styled using settings such as fill and stroke colour, plus basic blur, shadow, bevel and glow.

At this stage, designers will be feeling baffled. This isn't the advanced hands-on creative power for which Adobe is famous. The tools provided here are embarrassingly limited.

There's no need to feel confused, however, as Catalyst isn't designed to be a ground-up authoring application. Instead, as its name implies, it's designed to transform artwork created elsewhere, particularly in Illustrator, Photoshop and Fireworks. Catalyst's main job is to bring this static artwork to life, and it does this in a number of ways. First, it lets you add media files such as SWF Flash movies and FLV and F4V video. Using the Interactions palette, you can then add play and control actions without having to write any code.

Catalyst's most powerful feature is the ability to quickly create different states for components and screens using the Pages/States panel that runs across the top of the screen. It automatically

adds basic transitions or animations between states, and you can then smooth, manage and preview them via the Timelines panel.

This is all useful stuff but, again, the power on offer isn't groundbreaking or unparalleled. The latest InDesign (see p38) lets designers produce similar work in a more powerful publishing environment, and it would surely have been a lot simpler to expand Fireworks' site prototyping and UI design capabilities (see p43). So why has Adobe decided to reinvent the wheel?

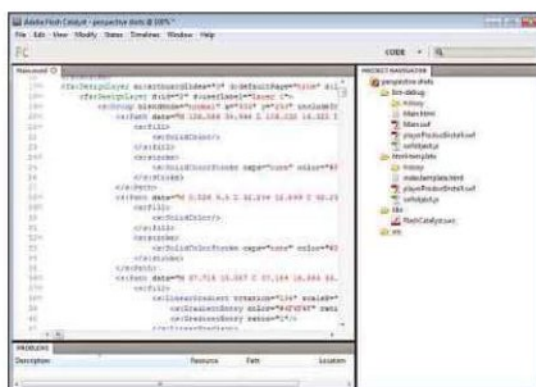
The reason becomes clear if you switch Catalyst to its Code workspace. Here, you'll see that everything about the interface you've built up is handled as MXML (Macromedia eXtensible Markup Language) code. That's significant because MXML is the XML-based language used by Flash Builder to handle presentations. The integration is so tight, Flash Catalyst saves its files to FXP, the same file format used by Flash Builder.

In the long run, Flash Catalyst's MXML-based approach and clear separation between application presentation and logic should pay dividends for everyone by enabling advanced UI features such as adaptive layouts. For the moment, though, its benefits are restricted to those users producing interfaces for further development in Flash Builder.

Also, the strictures of MXML-based authoring mean Catalyst feels more like a programmer's tool than a creative application, and with Adobe starting from scratch it feels underpowered. This is true not just of its creative tools, but also of its core features: smart guides, rich text handling, master pages, custom animation, advanced actions and an interactive preview are all missing.

The elephant in the room is Expression Blend (web ID: 353191),

which plays a very similar interactive design role based on Microsoft's XAML presentational language and integration with Visual Studio. Catalyst offers three major advantages over Expression: integration with the CS creative tools, a larger population of existing users, and the all-important penetration of the Flash player. Otherwise, there's no competition: Expression Blend is the model of an efficient, powerful, modern interactive design application; Flash Catalyst isn't. TOM ARAH



The Code view reveals what Catalyst is all about: MXML. This allows Flash Builder to import Catalyst's files directly.

WEB DEVELOPMENT

PRICE
£357 (£419 inc VAT)

UPGRADE
N/A

SUPPLIER
Via Adobe website

INTERNET
www.adobe.co.uk

REQUIREMENTS
Windows 7/Vista/XP

← Catalyst's own creative power is limited, but it comes into its own when building on artwork created elsewhere.

EASE OF USE
★★★★★

FEATURES
★★★★★

VALUE FOR MONEY
★★★★★

OVERALL
★★★★★



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3D LAPTOP

PRICE

£1,362
 (£1,600 inc VAT)

DELIVERY

Free

SUPPLIER

www.play.com

INTERNET

www.asus.co.uk

PART CODE

G51J-IX098V

SPECIFICATIONS

Intel Core i7-720QM • Intel PM55 chipset • 4GB DDR3 RAM • 2 x 500GB Seagate hard disks • Blu-ray reader • 15.6in, 1,366 x 768 120Hz TFT • Nvidia GeForce GTX 260M graphics • 802.11bgn WLAN • Gigabit Ethernet • Bluetooth • 4 x USB 2 • mini-FireWire • ExpressCard/54 • Windows 7 Home Premium 64-bit • 2yr C&R warranty • 375 x 265 x 41mm (WDH) • 3.65kg (4.42kg with charger)

Asus G51J 3D Laptop

The 3D effect is better than ever, but building it into a 15.6in laptop creates more than a few issues

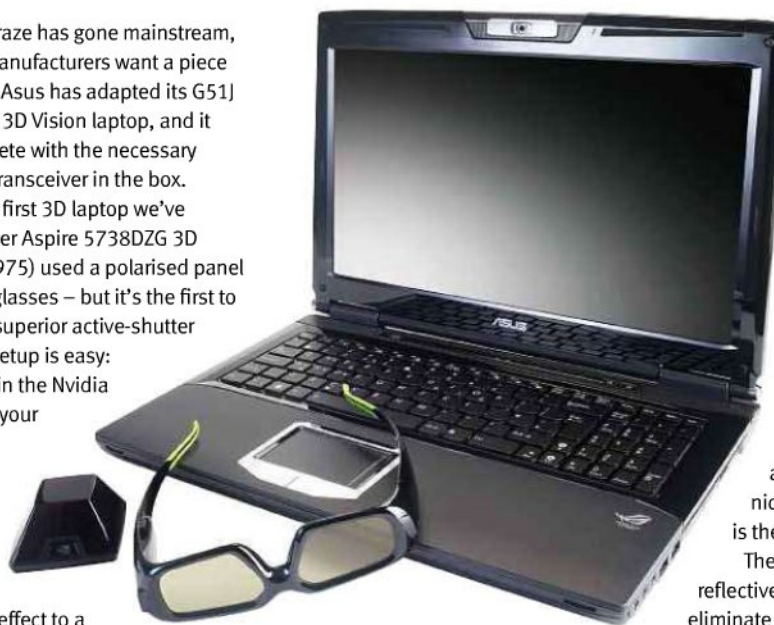
The 3D film craze has gone mainstream, and laptop manufacturers want a piece of the action. Asus has adapted its G51J to be the first 3D Vision laptop, and it comes complete with the necessary glasses and transceiver in the box.

It isn't the first 3D laptop we've seen – the Acer Aspire 5738DZG 3D (web ID: 352975) used a polarised panel and passive glasses – but it's the first to use Nvidia's superior active-shutter technology. Setup is easy: a wizard within the Nvidia drivers holds your hand through the process, and a demo animation allows you to dial the stereoscopic effect to a comfortable level before diving into any games.

The good news is that the 3D effect works exceptionally well, and we're seeing developers make proper use of it in the latest titles. Even going back to an older title such as Far Cry 2 sees the niggles from our early tests last year all but ironed out. If major titles keep building in 3D from the start, it will be hugely attractive to hard-core gamers.

The 15.6in screen size isn't the hindrance we'd imagined, provided you sit close to it. The speakers are loud and full by laptop standards, which adds to the immersion, and this bundle includes a comfortable but cheap Razer Salmosa mouse to aid your gaming performance.

If this all sounds like a glowing recommendation, there are still major issues to overcome. The glasses remain clunky and unappealing, although that's for Nvidia to rectify. A bigger problem is brightness: as the glasses darken things significantly the screen needs a strong backlight to compensate, and the Asus



The G51J uses Nvidia's active-shutter glasses technology to add the 3D effect.

can't match a decent 3D monitor in this respect. It meant we often missed things in the heat of battle, particularly when foes hid in the shadows.

The other main stumbling block is the graphics card. This type of 3D produces two full-resolution images and alternates them, which puts added pressure on the GPU. The Nvidia GeForce GTX 260M coped as well as it could – and the fairly



Even without the 3D, it's a powerful – and slightly garish – 15.6in laptop.

low 1,366 x 768 resolution limits the strain – but it still whined audibly and roasted the desk during games.

The G51J exists in non-3D models as well, so there's more to it than just visual wizardry. An Intel Core i7-720QM and

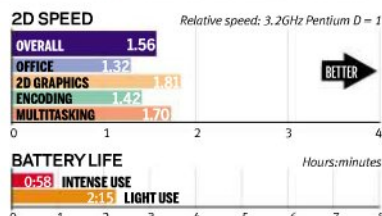
4GB of DDR3 RAM powered the Asus to 1.56 in our benchmarks, and in Crysis it managed an almost-playable 23fps at 1,600 x 1,200 and High quality settings.

Given its 3.65kg weight and light-usage battery life of 2hrs 15mins, the Asus isn't exactly portable, but it's comfortable to use. There's a full keyboard and number pad, the WASD keys have cursor arrows to help novice gamers, and the touchpad and buttons are responsive and nicely sized. Our only complaint is the uneven keyboard backing.

The 1,366 x 768 display is reflective – you'll need a dark room to eliminate distractions while using 3D – but it's sharp, with punchy colours and an even backlight. An HDMI port raises the possibility of outputting the 3D experience on a 120Hz HDTV, although the limitations of the mobile GPU will mean lowering settings for Full HD.

There's an eSATA port for adding storage, but you'll rarely need it thanks to a pair of 500GB hard disks inside. Asus also includes a Blu-ray reader, along with 802.11bgn WLAN and Bluetooth. A 2-megapixel webcam breaks up the thick, ugly plastic bezel, and the whole thing has a boy-racer style that won't appeal beyond its core gaming audience.

The G51J 3D does its job, but we're not convinced a 15.6in laptop is the best fit for 3D just yet; a larger laptop would allow more room for vital cooling. Then there's the price: at £1,362 exc VAT, it's hardly cheap, even with the glasses and a carry case. Early adopters will find enough to like, but we'd give mobile 3D more time to settle before shelling out. DAVID BAYON



3D SPEED (CRYSIS) See p33 for details

Settings	Score
HIGH SETTINGS	23fps
MEDIUM SETTINGS	50fps
LOW SETTINGS	92fps

GOOD PLAYABLE UNPLAYABLE

PERFORMANCE ★★★★★

FEATURES & DESIGN ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

An explanation of our benchmarks can be found on the cover disc

Samsung R580

A Core i3-powered laptop that combines striking looks, solid performance and an alluring price

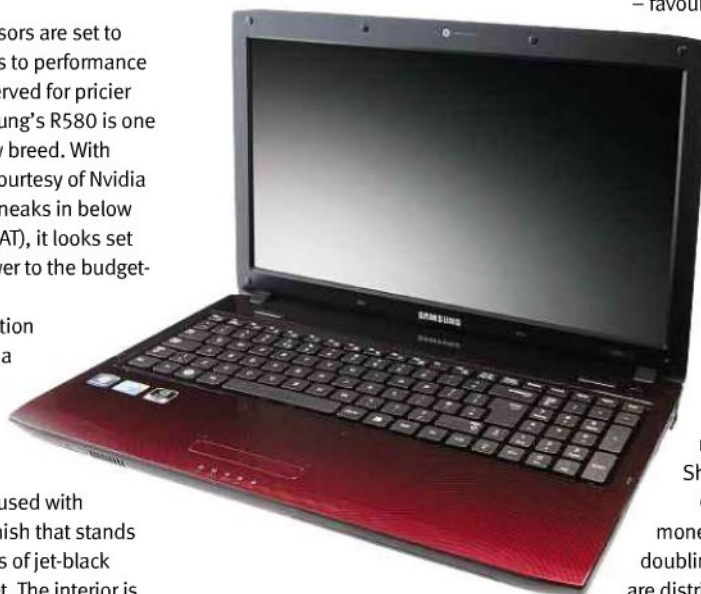
Intel's Core i3 processors are set to power budget laptops to performance levels previously reserved for pricier portables, and Samsung's R580 is one of the first of this new breed. With dedicated graphics courtesy of Nvidia and a price tag that sneaks in below the £500 mark (exc VAT), it looks set to bring portable power to the budget-conscious masses.

There's little question that the R580 makes a dramatic entrance. Samsung's Touch of Colour design makes a big statement, the lid infused with a glossy blood-red finish that stands apart from the legions of jet-black laptops on the market. The interior is equally fanciful, with the Scrabble-tile keyboard surrounded by red curves sweeping from edge to edge. Dab a finger on the trackpad and its corners are lit by glowing-blue LEDs. For a budget laptop, the R580 is quite a looker.

It's no petite stunner, though, and the 15.6in display means it isn't particularly portable. Weighing 2.52kg, nor is it the lightest on the shoulder.

Look past the Flash Harry exterior and there's little to disappoint. The Core i3-330M processor lacks the Turbo Boost trickery of its Core i5 and i7 cousins, but the 2.13GHz clock speed propelled it to a grand score of 1.32 in our benchmarks. And the Nvidia GT 310M graphics chipset, while no 3D-accelerating goliath, provides enough gaming grunt for the mid-range market, only stumbling to an unplayable 14fps once we upped Crysis to medium detail and a resolution of 1,280 x 1,024.

Importantly, screen quality is very good. Viewing angles are narrower



Whether in a home or office, the R580 will add a touch of style to its surroundings.

than you'll find on pricier notebooks, but they're still wide enough to prevent you from having to tilt the display to and fro on a constant basis. Images, both moving and still, leap from the panel with vivacity, with rich colours and good contrast setting the Samsung above many of its peers.

The alliance of a Core i3 processor and dedicated graphics take their toll



Name your connection and the R580 has it: HDMI, eSATA and much more besides.

when it comes to battery life, however. Despite the 4,400mAh battery clipped to the R580's underside, light usage called for a return to the mains after a modest 4hrs 2mins.

The move to a Scrabble-tile keyboard – favoured by many manufacturers for their 2010 range refreshes – is, on the other hand, entirely successful. The keys have a positive action at the end of each stroke, and as they rest on a firm, solid base, with no undue flex or give, there's no hint of the vague, woolly feel that we've encountered on other laptops. The layout could be a little better, however. We occasionally found our fingers hunting around to locate the needlessly shortened right Shift key.

Connectivity is bang on the money. Four USB ports, one doubling up as an eSATA connection, are distributed across the R580's left and right edges, and both HDMI and D-SUB video outputs make an appearance. An SD card reader nestles out of sight on the laptop's front edge. On the networking front Samsung has again been generous, with 802.11n and Bluetooth catering for the wireless side of things, and Gigabit Ethernet ensuring blink-of-an-eye transfers if you don't mind resorting to old-fashioned cable. One neat touch is that the USB port on the R580's left-hand edge also has the ability to charge USB devices while the laptop is switched off.

Some might find the R580's attention-seeking looks a little too gaudy for their tastes, but there's no doubt that it makes a great case for Intel's new budget-focused processor. Battery life isn't a strength – we're still waiting for the long-life Core i3 we know is possible – but the R580 does just enough to earn a recommendation. It provides good ergonomics, great performance and generous connectivity at a very sensible price. SASHA MULLER



VALUE LAPTOP

PRICE
£491 (£577 inc VAT)

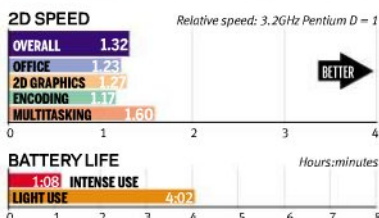
DELIVERY
£5 (£6 inc VAT)

SUPPLIER
www.cclonline.com

INTERNET
www.samsung.co.uk

PART CODE
NP-R580-JS02UK

SPECIFICATIONS
2.13GHz Intel Core i3-330M • 4GB DDR3 RAM • 500GB hard disk • Nvidia GeForce GT 310M graphics • 15.6in 1,366 x 768 TFT • DVD writer • 802.11bgn WLAN • D-SUB, HDMI outputs • Bluetooth • Gigabit Ethernet • SD/MMC card reader • 4 x USB 2 • eSATA • ExpressCard/34 • Windows 7 Home Premium 32-bit • 1yr C&R warranty • 380 x 256 x 37mm (WDH) • 2.52kg (2.9kg with charger)



3D SPEED (CRYSIS) See p33 for details

Settings	Score
HIGH SETTINGS	N/A
MEDIUM SETTINGS	14fps
LOW SETTINGS	47fps

GOOD PLAYABLE UNPLAYABLE

PERFORMANCE ★★★★★

FEATURES & DESIGN ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

An explanation of our benchmarks can be found on the cover disc

Sony VAIO M11

Standard components, uninspired design and poor battery life make this a VAIO to avoid

Sony's reason for steering clear of netbooks in the early days was that its products just didn't fit the cheap and cheerful template. Instead, the company aimed to retain its premium prices and try something different, but the quite baffling P Series pocket laptop (web ID: 248277) didn't exactly make waves. Neither did the company's first true netbook, the VAIO Mini W Series (web ID: 261835), which came with an unrealistic £340 exc VAT price tag.

Now, at last, we have the netbook Sony should have made a year ago: the VAIO M11. Its £254 price fits in with the most popular netbooks around today, and it shares all the usual specifications, but if you're expecting Sony's design and class to scale down to the level of the bog-standard laptop, prepare to be disappointed. When we say it's the netbook Sony should have made a year ago, we really mean it: the M11 looks and feels like a year-old piece of kit.

The black plastic chassis has no real heft to it, and comes with none of the standard VAIO touches to lift it from the crowd. Sony's Scrabble-tile keyboard is left out in favour of a standard netbook design, complete with woolly key travel and a layout and finish that could have come from any number of rivals. The touchpad is tiny and had erratic moments during our testing, although the buttons were responsive.

The lid is stronger than it looks and protects the display well, but the screen beneath is uninspiring. It has a matte finish that adds a little grain – particularly visible against light backgrounds – and although colours are fairly accurate, there's no punch to images. It's fine for when you're typing documents or browsing the web, which is what most netbooks will be used for, but we've seen much better on netbooks of a similar price.

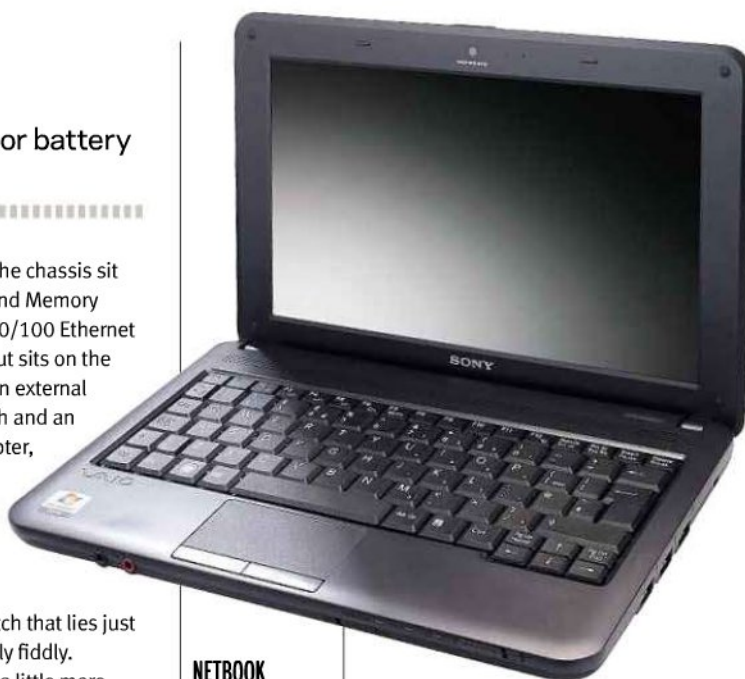
Around the edges of the chassis sit three USB ports, an SD and Memory Stick card reader and a 10/100 Ethernet port, while a D-SUB output sits on the left side for hooking up an external display. There's Bluetooth and an 802.11bgn wireless adapter, with a corresponding wireless slider switch on the front edge, and Sony has decided to use that sliding switch design for the power switch that lies just above it. It's unnecessarily fiddly.

Internally, the M11 is a little more up with the times. It's a Pine Trail netbook, so it uses a single-core 1.66GHz Intel Atom N450 processor and NM10 Express chipset, and comes with a 250GB SATA hard disk – the sort of setup you'll find in all the leading netbooks today. It does have one limitation, however: the VAIO M11's single 1GB stick of DDR2 memory is sealed inside the device with no means of upgrading it. That may not seem a deal-breaker given this netbook's likely low-level usage, but it firmly closes the door on future expansion possibilities.

A far bigger negative is the VAIO M11's battery. The best netbooks available today – like the A-Listed Toshiba NB305 – offer seven, eight and even nine hours away from the mains;



This Pine Trail netbook has the sort of setup you'd expect to find in all leading netbooks.



NETBOOK

PRICE
£254 (£299 inc VAT)

DELIVERY
Free

SUPPLIER
www.microanvika.com

INTERNET
www.sony.co.uk

PART CODE
VPCM11M1E/B

SPECIFICATIONS

1.66GHz Intel Atom N450 • Intel NM10 Express chipset • 1GB DDR2 RAM • 250GB Samsung hard disk • 10.1in 1,024 x 600 TFT • Intel GMA 3150 graphics • 802.11bgn WLAN • 10/100 Ethernet • Bluetooth • 3 x USB 2 • D-SUB • SD/Memory Stick card slot • Windows 7 Starter 32-bit • 1yr RTB warranty • 268 x 183 x 33mm (WDH) • 1.35kg (1.63kg with charger)

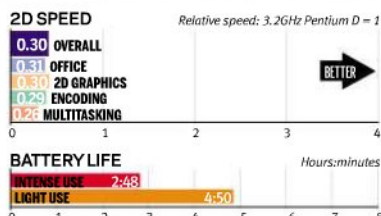
The Sony VAIO M11 looks and feels like a year-old piece of kit.

that's a full working day. With a low 3,600mAh capacity, however, the Sony fell well short of that, achieving a mere 4hrs 50mins in our light-use battery test. Pushed to its limit in the heavy-use test it gave us 2hrs 48mins, which is better, but however you look at these results, they're disappointing – especially so given that there's currently no high-capacity battery option available.

Performance is on a par with what you'd expect from an N450-powered netbook. It comes with Windows 7 Starter Edition installed, and the N450 managed only a limp 0.30 in our application tests. Not only that, but its CPU fan whirled pretty intrusively throughout. The integrated GMA 3150 graphics won't handle HD video playback – even at 720p – without a decent third-party codec installed, and they certainly aren't up to the task of gaming.

If we were in 2009, the VAIO M11 might be worth praising, but considering we've already seen a more innovative attempt from Sony – last month's W21 Eco Edition, with its 10.1in 1,366 x 768 screen – it's hard to find much to like. The internals are identical to every other modern netbook, the chassis feels basic, and the underpowered battery leaves it dead when others have four or more hours of life remaining.

We concede it isn't easy to innovate in the netbook sphere any more, but the M11 doesn't even bother trying, and by Sony's standards that's disappointing. Buy the similarly priced Toshiba NB305 instead. DAVID BAYON



PERFORMANCE

FEATURES & DESIGN

VALUE FOR MONEY

OVERALL



An explanation of our benchmarks can be found on the cover disc

Lenovo ThinkPad Edge 13

Its looks won't be to everybody's taste, but this latest ThinkPad is cheap and eminently sensible

Lenovo's ThinkPads have long been synonymous with seriousness and practicality, but the latest addition dares to buck the monochromatic trend. This bold, "heatwave" red Edge 13 will have ThinkPad purists choking on their cappuccinos.

A glance at the price will put the smile back on anyone's face, however, as will a quick play with the device. With a weight of 1.77kg it's heading into ultraportable realms, and the build suggests a laptop that's genuinely been designed to survive a life on the road.

The base is stiff and solid, and while the lid won't win any awards for its slimline allure – one cruel member of the *PC Pro* team remarked that it looked like a cafeteria tea tray – we had to really prod at it before seeing any showthrough on the display itself. Some will take exception to the childlike red lid of our review model, but it's possible to opt for a slinky gloss-black or sober matte-black finish instead.

The Scrabble-tile keyboard looks nigh-on identical to that of the superb ThinkPad X100e (web ID: 354865), and in use it feels just as good to type on. The slightly concave keys keep your fingers in the right place and have a wonderfully crisp action, each one bounding back to its original position ready for the next keystroke, and the layout borders on perfection. The trackpad and trackpoint combination is as good as ever, with a huge, wide trackpad making the most of the extra space on offer.

The model we received for review is, unusually, powered by an AMD Turion Neo X2 L625. Although you can specify the Edge 13 with an Intel processor, the 1.6GHz dual-core CPU here (coupled with 4GB of memory) is more than enough to keep Windows 7 Professional 64-bit running smoothly.

As the result of 0.71 in our application-based benchmarks shows, it's on level pegging with Intel's CULV efforts, and the ATI HD 3200 graphics chipset even has enough oomph to cope with HD video playback and some light gaming now and then.

One thing we noticed during the course of our testing, however, is that the base of the laptop, as with the ThinkPad X100e, has a tendency to become rather toasty in use. Performance isn't an issue for the AMD processor, but keeping cool certainly is; and when the cooling fan spins into action, which it does frequently, it emits an irritating whirr.

As we've seen in previous AMD-powered portables, the Neo processor also falls behind when it comes to power efficiency. The 6,300mAh cell at the rear would be enough to see many Intel CULV laptops survive more than nine hours in our light-use battery test, but the Edge 13 runs dry just short of six hours. Push the processor to its limits and up the ante with maximum screen brightness, and the battery expires after just 1hr 43mins.

The glossy 13.3in display, which has



Some say it looks like a tea tray, but the Edge is an eminently practical, low-cost laptop.



BUSINESS LAPTOP

PRICE
£399 (£469 inc VAT)

DELIVERY
£5 (£6 inc VAT)

SUPPLIER
www.misco.co.uk

INTERNET
www.lenovo.co.uk

PART CODE
NUE6WVK

SPECIFICATIONS

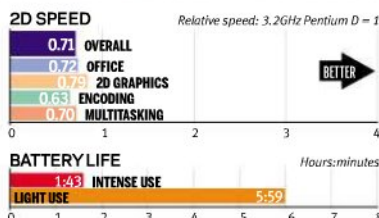
1.6GHz AMD Turion Neo X2 L625 • 4GB DDR2 RAM • 320GB hard disk • 13.3in 1,366 x 768 TFT • ATI Radeon HD 3200 graphics • Bluetooth • 802.11bgn WLAN • Gigabit Ethernet • 3 x USB 2 • 0.3mp webcam • SD card reader • Windows 7 Professional 64-bit • 1yr RTB warranty • 322 x 228 x 25mm (WDH) • 1.77kg (2.15kg with charger)

Lenovo's new keyboard design is a triumph, and an absolute joy to type on.

a 1,366 x 768 resolution, is a little more disappointing. Image quality is fine for most purposes, despite skintones looking a mite pale and pallid, but narrow vertical viewing angles are more of an aggravation. It's a problem that left us tilting the lid back and forth, to get the image just right.

Most of the ThinkPad's deficiencies are little more than minor annoyances, however. And elsewhere, the Edge 13 reverts to practical type. One particularly neat touch is that the baseplate – secured by five screws – gives quick access to all the commonly upgraded core components: the hard disk, memory, wireless card and the vacant mini-PCI card slot. That's an undeniable boon for IT departments and tinkerers alike. The power supply is a standard Lenovo one and, should you lose or break yours, it will be easy to track one down wherever you happen to be in the world.

Set against the slimline Acer Aspire Timeline 3810TZ (see *A List*, p28), the Lenovo ThinkPad Edge 13 puts up a remarkable fight. Many will be swayed by the Acer's alluring all-round blend of performance, battery life and classy good looks – and so they should. But for corporate customers looking to roll out a fleet of sturdy, inexpensive lightweight laptops, and for whom value for money, ergonomics and serviceability are key requirements, Lenovo's latest fits the bill perfectly. **SASHA MULLER**



PERFORMANCE ★★★★★
FEATURES & DESIGN ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

An explanation of our benchmarks can be found on the cover disc



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HIGH-END PC

PRICE
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DELIVERY
£25 (£29 inc VAT)

SUPPLIER
Via Chillblast
website

INTERNET
www.chillblast.com

POWER RATING
Idle: 87W
Peak: 222W

SPECIFICATIONS

2.93GHz Intel Core i3-530 overclocked to 3.8GHz • 4GB 1.333MHz DDR3 RAM • Asus P7P55D-LE motherboard • 500GB hard disk • DVD writer • ATI Radeon HD 5850 graphics • 1,920 x 1,080 23in DGM L-2362WD TFT • DVI, HDMI, DisplayPort out • Realtek HD Audio • Logitech S220 2.1 speakers • 10 x USB 2 • 2 x eSATA • 2 x PS/2 • S/PDIF • Gigabit Ethernet • Logitech Wireless 660 keyboard and mouse • Windows 7 Home Premium 64-bit • 2yr C&R warranty • 208 x 515 x 479mm (WDH)

Chillblast Fusion Chaos

Blistering performance and a superb chassis, but undermined a little by a poor monitor

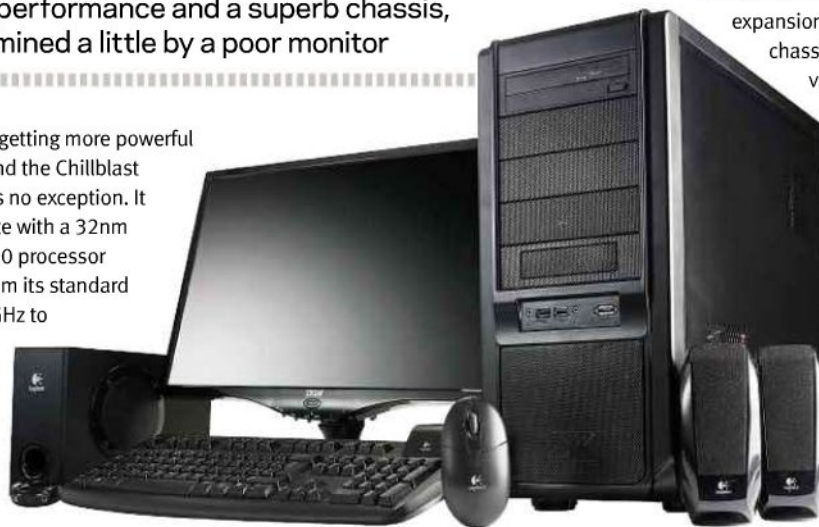
Cheap PCs are getting more powerful by the week, and the Chillblast Fusion Chaos is no exception. It comes complete with a 32nm Intel Core i3-530 processor overclocked from its standard speed of 2.93GHz to 3.8GHz, and this makes it the fastest Core i3-based machine we've yet tested. In our application-based benchmarks, it returned a scorching result of 2.29.

It isn't only quicker than other Core i3-based systems we've looked at, but also recent PCs bearing Core i5 chips. The £680 exc VAT PC Specialist Aurea i5-650 HD (web ID: 355528) scored 1.94 and the CyberPower Gamer Infinity i5 Hercules SE (web ID: 354091) returned a score of 1.93, a deficit of around 16%.

Equally impressive is that Chillblast has found room in its budget for a top-quality graphics card. The Bournemouth-based firm has picked an ATI Radeon HD 5850 (web ID: 352447), and as a result the Chaos produced stellar scores in our Crysis 3D gaming tests.

With High quality settings enabled and at a resolution of 1,600 x 1,200, it achieved an average frame rate of 60fps; with Very High quality settings at the same resolution it scored 37fps, and it maintained a smooth performance of 37fps even when we boosted the resolution to 1,920 x 1,200. In each test, the Chillblast Fusion Chaos outstripped the PC Specialist Aurea i5-650 HD by quite some margin.

The rest of the core specification is less spectacular, but still solid, with 4GB of RAM, a 500GB hard disk and a DVD



The package includes a 23in, Full HD monitor, Core i3 processor and powerful graphics card.

writer. External peripherals include a basic but comfortable Logitech wireless keyboard and mouse set, plus a pair of S220 2.1 speakers, also from Logitech. The latter, although clearly built to a low budget, are capable of producing surprisingly good sound quality.

In terms of build quality, there's more good news. The Chaos' Xigmatek Midgard case is both solidly made and looks great. Its matte-black finish, topped off by meshed panels and an orange case fan at the front, is at least as attractive as any of its rivals from Antec and Cooler Master. Inside, there's an



The Midgard chassis offers plenty of upgrade space and a host of noise-reduction features.

Asus P7P55D-LE motherboard with a PCI Express x16 slot, three PCI slots and two DIMM sockets left free for future expansion. At the front of the chassis sit a further three vacant 5.25in bays,

and below these are four spare 3.5in hard disk bays too. All the bays are fitted with plastic caddies, so you can add extra storage without needing to raid your toolbox.

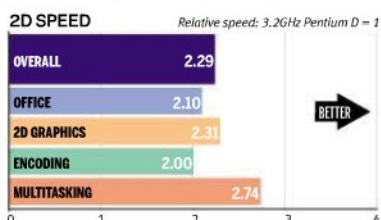
Look closer and a host of other neat touches reveal themselves, most of which focus on keeping noise to a minimum. There are

rubber washers on the hard disk trays and power supply to absorb irritating vibrations; the case fans are among the quietest we've heard; and the CPU cooler – an Arctic Cooling Freezer 7 Pro Rev 2 – isn't too loud either.

The ATI graphics card, however, throws a spanner in the works. While the default fan speed of just over 1,000rpm was enough to keep the chip cool and remain quiet when idle, it shot up to more than 1,800rpm under load. That was enough to generate an intrusive amount of noise.

This isn't the only problem. The Chillblast's monitor is distinctly below par. It's a DGM model and, while the 23in screen diagonal and resolution of 1,920 x 1,080 are both fine, we noticed a grainy finish when displaying lighter backgrounds, a backlight that bleeds badly along all four edges, and a weak, wobbly non-adjustable stand.

There are some disappointments then, but they aren't a complete disaster for the system as a whole. The Chillblast Fusion Chaos provides blistering performance in a superb chassis at an excellent price, and that's just enough to gain it a Recommended award. Upgrade the monitor when you buy it and it will be even better. **MIKE JENNINGS**



An explanation of our benchmarks can be found on the cover disc

Mesh Hush i7 980X

A stunningly fast PC thanks to Intel's six-core CPU, but this pushes the price too high for too little reward

We were introduced to Intel's first six-core "Gulftown" processor last month, with the Core i7-980X offering blistering performance and a typically ludicrous Extreme Edition price. Now Mesh has won the race to produce the first PC using the chip, and the resulting Hush i7 980X is as expensive as you'd expect.

It packs quite a punch, though. The six cores and 32nm die grab the headlines, but the Core i7-980X also offers Hyper-Threading technology to handle a dozen processes simultaneously, and there's a massive 12MB L3 cache. Turbo Boost has also been enhanced: the i7-980X can dynamically adjust individual cores from the standard 3.33GHz, down as low as 1.6GHz and up to 3.6GHz as required.

Mesh has paired this monstrous CPU with 6GB of 1,600MHz DDR3 memory, and the result is stunning levels of raw power. In our 2D application benchmarks, the Hush i7 980X roared to a score of 2.48. That's the best result we've seen from a processor running at its stock speeds; it's beaten only by overclocked beasts such as Chillblast's Fusion Mustang with its souped-up Core i7-920 (web ID: 352738).

The Mesh is a powerful gaming machine too. The best match for the CPU would have been a dual-GPU graphics card, but Mesh has opted for an ATI Radeon HD 5870, which is the next best thing. Our Crysis test at High settings was brushed aside with an average frame rate of 72fps, and even at Very High settings and a resolution of 1,920 x 1,200 it managed 38fps.

The rest of the Hush i7 980X's internal specification is of suitably high



The raw power this PC produces is something to behold – and that's without overclocking.

quality. Windows 7 Home Premium comes installed on a 64GB Kingston SSD to boost boot speed and keep core processes running as smoothly as possible. There's also a 1TB Samsung SpinPoint hard disk for data storage, and a Blu-ray reader.

There's a lot of raw power gathered together into one chassis, then, so it's hardly surprising the noise-reducing foam that lines the NZXT Hush case fails to muffle the hum. Mesh has opted to use the bundled Intel cooler for the CPU and, although it's a new design that directs air towards the rear of the case, it's frightfully loud when pushed.



The stock Intel cooler is a new design, directing air towards the rear of the case.

There's a switch on it for "quiet" mode, which we'd strongly recommend using, but even with this enabled the Mesh was far from silent.

The NZXT Hush case does have its strengths. It looks understated and stylish, and offers spare DIMM sockets, PCI Express x16 slots and drive bays for additional components. But the choice of other components makes it a little messy: the budget

X-Power PSU, for instance,

isn't modular, and a large cluster of its cables adds more clutter than we'd like.

Mesh's choice of peripherals is a mixed bag. The Iiyama ProLite E2407HDS – the non-HDMI version of the E2407HDS (web ID: 249100) – has a Full HD resolution and offers decent colour accuracy, smooth gradients and minimal backlight bleed around the edges of the screen. The keyboard and mouse are nothing special, though: Logitech's Deluxe 660 wireless set lacks any of the special features or media controls that power users and gamers demand. Note that Mesh hasn't included any speakers either.

It's tough to argue that the whole system justifies the £1,701 exc VAT price. You're paying a huge chunk of that for the six-core Extreme Edition processor, which, while undoubtedly impressive, is hardly leaps and bounds ahead of the fastest quad-core parts. But the thing that really unravels the Mesh Hush i7 980X is the competition: just £1,199 exc VAT will buy you the A-Listed Wired2Fire Hellspawn XFire (see p25), with almost as much power, a superb 24in Samsung screen and better peripherals. Only the most avid early adopter would buy this Mesh instead. **MIKE JENNINGS**

ENTHUSIAST PC

PRICE
£1,701
(\$1,999 inc VAT)

DELIVERY
£21 (\$24 inc VAT)

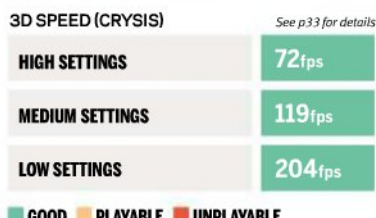
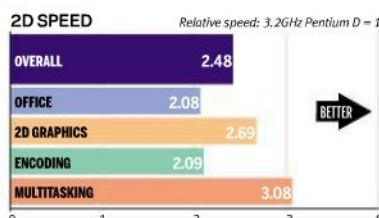
SUPPLIER
Via Mesh website

INTERNET
www.meshcomputers.com

POWER RATING
Idle: 121W
Peak: 337W

SPECIFICATIONS

3.33GHz Intel Core i7-980X • 6GB 1,600MHz DDR3 RAM • Asus P6T SE motherboard • 1TB Samsung SpinPoint F3 HD103SJ hard disk, 64GB Kingston SNV425S264GB SSD • Blu-ray reader • ATI Radeon HD 5870 • 24in Iiyama ProLite E2407HDS 1,920 x 1,080 TFT • 2 x DVI-I, HDMI, DisplayPort • Realtek HD Audio • 8 x USB, FireWire, eSATA, 2 x PS/2 • Gigabit Ethernet • Logitech Deluxe 660 wireless keyboard and mouse • Windows 7 Home Premium 64-bit • 1yr RTB warranty • 193 x 513 x 418mm (WDH)



An explanation of our benchmarks can be found on the cover disc



Olympus PEN E-PL1

With more sensible pricing, the latest addition to the PEN range is definitely a step in the right direction

The Micro Four Thirds "semi-compact" digital camera system is catching on, accounting for more than 10% of interchangeable-lens camera sales in December last year, according to market research firm GfK. No surprise, then, that barely eight months after Olympus' maiden Micro Four Thirds-based, retro-styled PEN E-P1 (web ID: 263374) comes a new variant. This model complements the existing E-P1 rather than replacing it, but it's a very similar design indeed, albeit 72g lighter.

The most useful addition is an integrated flash. While not hugely powerful, it pops up on a well-built, double-jointed arm that moves it well away from the centre line of the lens to keep the dreaded red-eye at bay. A touch of fill-in flash can also work wonders for shots such as outdoor portraits in strong sunlight, so it's a useful addition.

A proper viewfinder hasn't made it on to the feature list, though. The E-PL1 eschews the optical type in favour of an electronic LCD version, which plugs into its "accessory port". As with the Ricoh GXR's LCD viewfinder (web ID: 355543), it's outrageously expensive: in this case, £238 exc VAT. Fortunately, the 2.2in TFT has an excellent refresh rate so framing shots is a smooth process.

The design has taken a backward step: both the rear settings dial and the sub-dial have disappeared. This means that in aperture priority mode, for

instance, adjusting the aperture is done using the up/down buttons in the four-way cluster. It's a clumsy system: to increase aperture you press the up button to get the camera into aperture adjustment mode, and then the down button to make the adjustment. Legions of photographers accustomed to flicking a wheel on their DSLR for this setting are unlikely to take this kindly.

The issue around the performance of Micro Four Thirds cameras also remains. The fastest time we managed from switch-on to taking a shot was 2.5 seconds, which in comparison to a DSLR is positively treacly. The contrast-detect autofocus is the main culprit, taking a second or so, and this also increases shot-to-shot time to about two seconds unless you switch to manual focus. For leisurely holiday landscapes it's fine, but it does condemn the E-PL1 to a life of playing second fiddle to DSLRs.

On the positive side, the standout aspect of the E-PL1 is the quality you get



Olympus squeezes in a fast-refresh 2.7in TFT to help frame and review your shots.

◀ The E-PL1 is the most compact camera to date to boast DSLR-level image quality.

HIGH-END COMPACT

PRICE
£460 (£540 inc VAT) for body and 14-42mm (28-84mm, 35mm equivalent) lens

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for its size. With its large sensor – about ten times the surface area of that of a typical compact model – photos are excellent. Dynamic range is impressive, and high-ISO shots seem even better than those of the already fine E-P1. In fact, when we first looked at our ISO 3200 test shots we had to check the file metadata to make sure we hadn't made a mistake with the settings. At high ISO, a fair amount of detail is lost and tonal gradation is coarse, but noise levels are well controlled and way beyond a standard compact camera. ISO 3200 is genuinely usable, which has never been the case with any digital compact.

The E-PL1 has a fair bit going for it as a camcorder too. At its maximum 720p/30fps setting, video is a little soft but still excellent, and in video mode you have the option of single-shot, continuous or manual focus; because the focus is electronically linked, though, it's audible on the soundtrack. The shutter button remains active too, so you can take full-resolution stills while recording.

We reviewed the E-PL1 with the standard 28-84mm equivalent kit lens, which manually retracts to a fairly compact 45mm when not in use. But for aftermarket add-ons, the compact (22mm deep) 34mm equivalent fixed "pancake" lens has now been joined by superzoom 28-300mm and wide 18-36mm equivalents. Quality from the 28-84mm isn't perfect, with noticeable edge softness at wide angle and some fringing in the test shots we took in bright sunlight, but it's far from ruinous.

A big point in its favour is the price. The E-P1 cost £608 exc VAT at launch, almost £150 more than the E-PL1. Prices tend to drop a few months after launch, at which point we'd consider the PEN range to be good value. Even at the lower price point, however, it's unlikely to be your first choice when higher-quality, easier-to-use DSLRs such as the A-Listed Nikon D5000 (see p27) cost less.

As a luxury second or holiday camera for an enthusiast, the E-PL1 has a lot going for it. If you were thinking about buying a high-end compact you should consider paying the extra for one of these instead. DAVID FEARON

SPECIFICATIONS

12.3mp sensor • 4,032 x 3,024 maximum resolution • f3.5-f5.6 lens (28-84mm 35mm equivalent) • 2.7in TFT screen • shutter speed 1/4000 to 60 seconds • 100-3200 ISO sensitivity • +/-3EV exposure compensation • evaluative, centre-weighted, spot metering • lithium-ion battery • 1yr RTB warranty • 114 x 80 x 74mm (WDH) • 478g with lens

PERFORMANCE

★★★★★★

FEATURES & DESIGN

★★★★☆

VALUE FOR MONEY

★★★★☆

OVERALL

★★★★☆

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HTC Legend

Beautifully engineered hardware allied with great software, and it's super-fast too

It's a cliché but it's true. The iPhone 3GS has been top of the smartphone pile for nearly a year now, and its reign has been pretty much unchallenged. At last, however, it has a rival worthy of the name: the HTC Legend.

It's a gorgeous piece of kit, with a body machined from a billet of aluminium, an optical four-way control set minimally into the phone's subtle "chin", and soft touch pads on the rear to prevent the silver finish being scratched. Its profile – all sensuous curves, not-too-sharp edges and rounded corners – means the Legend is a fabulous phone to hold in the hand. Even the battery compartment is smart; instead of the rear panel clipping on and off, the SIM card, battery and microSD slot all sit beneath a small rubberised cap on the bottom edge.

Turn the Legend on and its tremendous OLED screen glows into life. Colours take on an almost hyper-realistic hue, which helps UI elements, graphics, video and web pages leap from the screen. Another advantage is the brightness, which keeps things clear and readable even when dialled down to one step above minimum to conserve battery. We've seen well-built phones before, but this handset could teach Apple a thing or two.

The beauty of the Legend isn't just skin deep, however; there's plenty of substance behind the perfect facade. For starters, it runs Android 2.1 (aka Eclair), which means you get a unified email inbox, support for multiple Gmail accounts and five home screens. The Legend also implements pinch-to-zoom gestures, just as the Hero did before it for iPhone-esque web browsing.

What you don't get is the full array of voice control that you do with Google's

Nexus One nor Google's turn-by-turn navigation application (as yet unreleased in the UK). You can, however, download the Voice Search app from the Android Market if you're desperate to look an idiot shouting search terms into your phone.

Then there's the latest version of HTC's Sense UI added on top. The key benefit of this is that it unifies contacts, pictures and updates from Facebook, Flickr and Twitter into one location. The updates come via the Friend Stream app, preinstalled on one of the home screens. But it also adds a home screen overview mode: on the main screen, simply hit the home button, or pinch your fingers as if to zoom out, and up pops a thumbnail view of each of the Legend's five home screens. Another tap takes you instantly to the screen you need, and you can even temporarily zoom in this view to take a closer look and then back out again.

Elsewhere, the HTC Legend boasts all the hardware you'd expect to see in a phone of this class. There's fast HSDPA data, strong call performance anywhere in the world with quad-band GSM

support, Bluetooth, Wi-Fi, an FM radio tuner and GPS. There's a full array of sensors, including a digital compass, accelerometer, plus light and proximity sensors. The 5-megapixel autofocus camera is good too. Images boast good contrast with less of the washed-out look we've seen with HTC phones in the past, and there's a single-LED flash on the rear for emergency use in low-light conditions.

What makes the jaw drop lower than anything else, however, is this phone's sheer speed. It responds to finger gestures as if reading your mind, with web pages and

menus whizzing by at express speed. Nothing judders, nothing lags and there are no delays. Only the iPhone 3GS can match it for sheer alacrity.

Surprisingly, this responsiveness doesn't appear to stem from sheer horsepower. The Legend's CPU is rated at only 600MHz, and it didn't put in a particularly stellar performance in our browser tests. It loaded the BBC homepage over Wi-Fi in an average of 14 seconds and scored 93 in the Acid3 test. Several phones are speedier than this, including the iPhone 3GS, which also scores higher in Acid3.

Neither is battery life particularly impressive.

With just a 1,300mAh lithium-ion cell inside, that isn't surprising, but we'd prefer to have seen more than 40% remaining after our

24-hour test. This involves 30 minutes of calls, an hour of music playback, an hour of the screen on idle, plus a 50MB download, with background Gmail synchronisation. It's below average, and lags behind the iPhone 3GS by a notch.

Two final complaints are that the strip of buttons that rest in the angle between the phone's chin and screen feels a little plasticky next to the quality of everything else, and the amount of storage is low. There's just 512MB of integrated storage and a 2GB microSD card in the box.

In the context of the phone as a whole, though, these are relatively minor complaints. It's wonderful to finally have an Android smartphone that stands toe to toe with Apple's finest on design, speed and ease of use. Better still, the HTC Legend manages to do so without costing the earth. The iPhone 3GS just about shades it, thanks to its superior app selection and slightly better battery life, but there's barely a hair's breadth between the two. JONATHAN BRAY



↑ A sumptuous screen and beautiful build mean this is a fabulous phone to hold and use.

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SPECIFICATIONS

600MHz processor • 512MB ROM, 384MB RAM • 3.2in 320 x 480 OLED screen • quad-band GSM/GPRS/EDGE/3G/HSDPA • Bluetooth • 802.11b/g WLAN • 5mp camera with LED flash • GPS • FM radio • light, accelerometer and proximity sensors • 1,300mAh lithium-ion battery • 1yr RTB warranty • 56 x 11.5 x 112mm (WDH) • 126g



HTC's attention to detail extends to the Legend's rubberised rear.

PERFORMANCE	★★★★★★
FEATURES & DESIGN	★★★★★☆
VALUE FOR MONEY	★★★★★☆
OVERALL	★★★★★☆

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PERFORMANCE
★★★★★
FEATURES & DESIGN
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

Creative Vado HD

Improved quality and an attractive price help Creative catch up with its main rival

It's been a few months since the last action in the pocket video camera sector, but now we have two to test. The first major player to show its cards was Creative, with an update to its excellent Vado HD.

It's very different from the first Vado HD: it's brightly coloured (with different colours available), smaller, slimmer and lighter at a mere 92g. Slotting it into a pocket is easier, as there's no longer an awkward protruding lens housing. Other changes include the addition of a motion-sensor mode and touch-sensitive controls instead of standard buttons. On a negative note, the original's 8GB storage has been cut to 4GB.

Elsewhere, the Vado HD retains the hallmarks of the Vado range. It has a built-in USB cable, a rechargeable lithium-ion battery, and Creative also bundles an HDMI output cable. The onboard Vado Central software is still among the best around, offering simple

editing and upload tools in a lightweight package.

First impressions suggest video quality has improved too. Considerably less detail is lost to compression and noise, while footage seems much sharper and cleaner than with the previous version. This is also apparent in areas of colour gradients. Cloudy skies, for example, proved a problem for the previous Vado HD, showing obvious, sharp transitions between subtly different areas of colour. That isn't the case here; the new Vado HD renders graduations smoothly and accurately.

Recording indoors in low light produced usable footage, with low



The Vado HD is smaller, slimmer and brighter than ever.

levels of noise. But in trying to give balanced output in bright areas, dark zones in otherwise well-lit scenes can look dingy. An exposure control lets you compensate, but it's difficult to see onscreen when you need to use it. This is enough to put it behind the new MinoHD (see below) when it comes to all-out quality, but Creative's aggressive pricing goes some way towards rectifying its faults. At a mere £110 exc VAT, it's considerably cheaper than the new Flip, and the HDMI and lighter software help it pull alongside its rival. JONATHAN BRAY

PC PRO RECOMMENDED
PC PRO A LIST

Flip MinoHD (2nd gen)

Excellent video quality and build, but needs to be considerably cheaper than this

The product development team at Creative must be pulling its hair out; as soon as it comes up with a challenger to Flip Video's dominant pocket cameras, its rival simply ups the ante: this month, in the shape of the updated Flip MinoHD.

The photograph doesn't do this little device justice. It's a beautifully engineered piece of kit. The matte-silver metal at the front feels wonderfully cool to the touch; newly rounded edges lend it a more sensual feel; and the integrated USB connector at the top flips out with Teutonic weight and precision.

The developer has listened to users' complaints this time too, adding the HDMI output that should have graced the first MinoHD, although there's still no cable included in the box. Internal storage has been doubled to 8GB, allowing the Flip to store up to two hours of HD footage.

Elsewhere, things look more familiar, with a fixed-focal-length lens recording video up to 1,280 x 720 in resolution at 30fps, and a familiar, intuitive set of controls.

The resolution hasn't moved on then, but the Flip MinoHD hasn't stood still in terms of quality. Contrast and colour saturation in particular are better than before, and this doesn't come at the cost of low light performance, which is superb. It's the best camera in its class, stretching out a noticeable lead over the Creative Vado HD.

Even the onboard editing and sharing software – FlipShare 4.5 – has been



The second-generation Flip MinoHD couples great design with top video quality.

redesigned, this time adding Flip Channels. These offer a simple way of sharing collections of videos online with a list of contacts. Once set up, each time you add a video to a channel, assigned contacts are notified of changes via email. FlipShare remains more heavyweight than Vado Central, though.

The new Flip MinoHD has a bigger problem than this to worry about, however. At £153 exc VAT, the new MinoHD is simply too expensive.

It's the best pocket video camera we've seen – boasting luxury and quality in equal measure – but that price means it just falls short of a Recommended award. JONATHAN BRAY

PERFORMANCE
★★★★★
FEATURES & DESIGN
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

Canon Ixus 105

Nicely designed and capable of great results, the Ixus 105 is a bargain

The Canon Ixus 95 is a superb compact camera – just ask anyone who owns one, or see any issue of *PC Pro* between June 2009 and last month, where it held a deserving place on the A List. Nothing lasts forever, however, and we were pleased to see its successor, the Ixus 105, bounce into the *PC Pro* office.

There are only the smallest external changes. The Ixus 105 ditches the Ixus 95's optical viewfinder – not such a bad thing, since the old viewfinder was too small – but retains Canon's trademark design, with attractively tapered edges. Flip it over and there's a bright and clear 2.7in, 230,000-pixel screen, plus big, easy-to-press controls. It's with only a hint of disappointment we noted the lack of a proper manual mode. You can adjust the Ixus 105's exposure compensation, but there's no direct access to the shutter speed or aperture size.

The obligatory bump in resolution is here, from the 95's 10-megapixel

sensor to the 105's new 12.1-megapixel sensor. That on its own isn't worth an upgrade, though. The 105's 4,000 x 3,000 pixel images aren't significantly bigger than the 95's 3,648 x 2,736 pictures.

The processor behind the images is unchanged, with Canon persevering with its ubiquitous DIGIC 4. It's fair to demand great things from Canon's line-up, and the Ixus 105 didn't disappoint in our tests. The wide-angle lens (28-112mm in 35mm terms) isn't prone to chromatic aberration and is pleasingly sharp. Even towards the top end of the ISO range (the Ixus 105 can be set as high as ISO 1600) you'll have to examine photos closely to see problems.

Noise was an issue, as was softness due to noise reduction, but faced with a once-in-a-lifetime shot you should be



The Ixus 105 is an excellent companion if you want a high-quality snapper to carry with you.

able to get a usable frame with a bit of care. It's just a little disappointing that the Ixus 105 doesn't apply this excellent level of detail capture to its movie mode – 640 x 480 at 30fps is all you get.

Canon's Ixus range has an immense reputation and the cute, well-designed Ixus 105 does nothing to undo it. It excels as an all-purpose snapper, is easy to use and understand, and has a tiny amount of headroom for learners thanks to its manual ISO and exposure compensation modes. Best of all, it's great value for money at just £135 exc VAT. Buy one and you won't be disappointed. **DAVE STEVENSON**

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PERFORMANCE

★★★★★

FEATURES & DESIGN

★★★★★

VALUE FOR MONEY

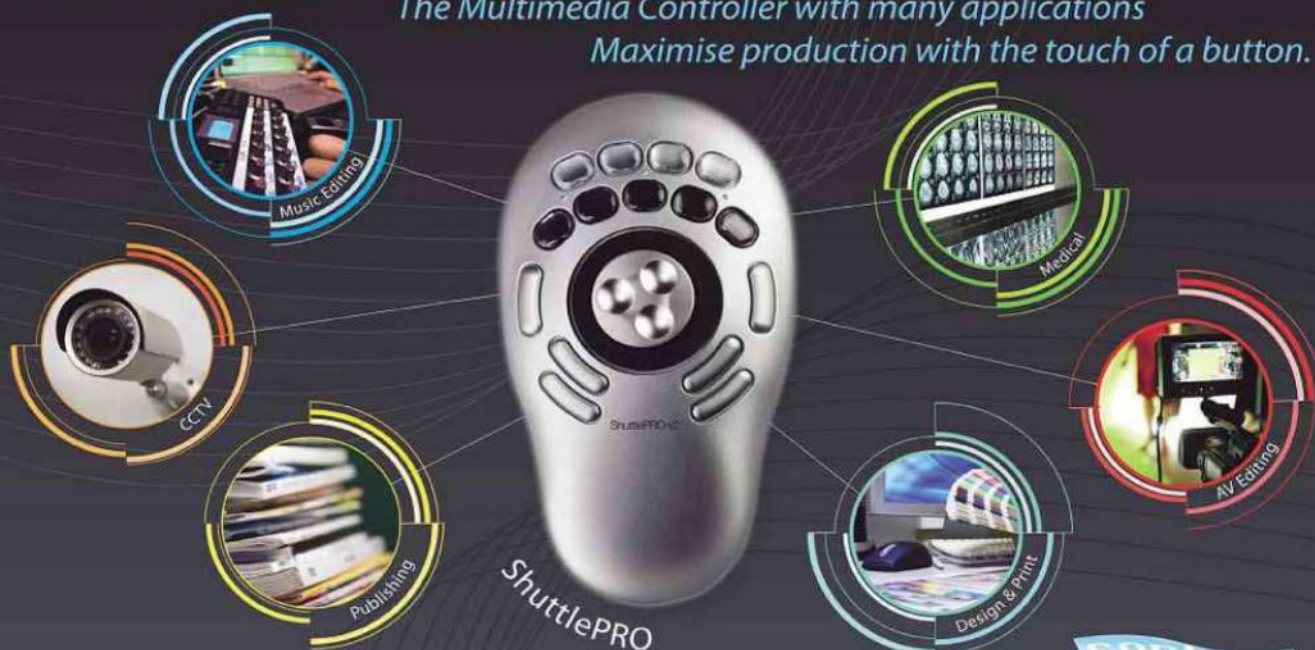
★★★★★

OVERALL

★★★★★

New Shuttle has landed

*The Multimedia Controller with many applications
Maximise production with the touch of a button.*



Contour Design Europe, contact us for further information admin@contourdesign.eu.com

Based in Windham, USA, Contour Design is renowned for creating and delivering the most fashionable and functional products on the market. For more than a decade we have continued to represent the cutting edge of innovative cellular, music and computer peripherals. From our shock absorbing dual injected iPod and iPhone cases to our leading edge ergonomic input devices, Contour delivers form and function to consumers world wide. Please explore our web site and enjoy the Contour family of products. www.contourdesign.com

23in TFT

PRICE

£167 (£197 inc VAT)

DELIVERY

Free

SUPPLIER

www.ebuyer.com

INTERNET

www.asus.co.uk

SPECIFICATIONS

23in 1,920 x 1,080 TFT
• 250cd/m² • 1,000:1
contrast ratio • 2ms
response • 566 x 150 x
407mm (WDH) • 3.9kg


PERFORMANCE

★★★★★

FEATURES & DESIGN

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

Asus MS236H

Image quality isn't perfect, but the slim, sleek and innovative design turns this into a tempting display

It isn't often a monitor can claim to look as desirable from behind as it does from the front, but the Asus MS236H almost looks like two different devices. It's both a sleek, black mirror of glossiness when viewed normally, and a retro piece of art when you feast your eyes on the Apple-white rear with its looping stand.

The stand clips on in seconds and, aided by a tiny triangle of plastic to act as a stopper, it can be gently rocked back or forward to adjust the angle. It works beautifully and is a mere 150mm deep. The body itself is extremely thin, with the trade-off being a small external power supply, hardly a major sticking point with looks like this. It comes with a choice of HDMI or D-SUB inputs – with an HDMI-DVI cable in the box – and a 3.5mm headphone output for HDMI.



The front is sleek, but the rear with its looped stand is even better (see left).

The front is all-black with a hint of the white rear framing the outside. The only features are an Asus logo beneath the left of the screen and a circular power button to the right, but a

touch-sensitive control panel glows into life when pressed. It's a little unresponsive, which made early tweaks frustrating, but once you have that process out of the way, the vanishing controls help keep the clean look far better than a set of buttons would.

We needed to make some changes out of the box, though. Using the Standard preset, the black level was poor, lending even the moodiest colours a pale, washed-out tone. Switching to Theatre mode solved that, with much deeper blacks and far better contrast throughout our tests – we'd leave it in that mode.

Colours are generally accurate and gradients smooth. The backlight is a little patchy in places, but viewing angles are good and the 2ms response time made for a pleasant gaming experience.

Image quality is above average overall, but a monitor like this is bought for its styling. In this regard, the MS236H is as desirable as any desktop monitor we've seen. If style matters most, you won't find much better. DAVID BAYON

23in TFT

PRICE

£299 (£351 inc VAT)

DELIVERY

£10 (£11 inc VAT)

SUPPLIER

www.navedigital.co.uk

INTERNET

www.eizo.co.uk

SPECIFICATIONS

23in 1,920 x 1,080 TFT
• 300cd/m² • 3,000:1
contrast ratio • 7ms
response • DVI, D-SUB,
DisplayPort inputs •
0.35W speaker • 5yr
RTB warranty • 547 x
221-236 x 347-518mm
(WDH) • 7.1kg

PERFORMANCE

★★★★★

FEATURES & DESIGN

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

Eizo FlexScan EV2333W

Affordable for a TFT of such quality, with a luxurious stand and some effective green features

Eizo's EcoView monitors don't just lower power consumption; they also come in at more attractive prices than their full-blooded brethren. Anyone used to £400-plus asking prices will be surprised to see Eizo's latest 23in model has a superior PVA panel yet costs just £299 exc VAT.

It also has one of the most flexible stands we've had the pleasure to use. The aptly named FlexStand is height-adjustable through more than 20cm, swinging all the way down to desk level. Combine that with a 30-degree backward tilt and it's comfortable to use in a variety of stances.

It's Eizo's EcoView functions that give this TFT its name, and they're successful in lowering power draw. With the maximum saving (with brightness set to



A sensor beneath the screen dims the brightness if you leave your desk.

minimum) the EV2333W drew just 13W, and at the 30% level deemed optimal in our test environment this rose to only

19W. Even at full brightness the power draw was only 36W.

A sensor beneath the screen optimises brightness and enables a power-save mode if you leave your desk for 40 seconds. The EcoView Index pops up onscreen to show you how green any changes are, and when you're editing a document or browsing the web these savings work well, reducing eyestrain as well as your electricity bill.

You'll want to switch them off for serious image work, though. Colours are excellent and gradients nigh-on perfect, but only at high brightness settings do you get anything like the punch and contrast you'd require for colour-critical work.

The EV2333W comes with a choice of DisplayPort, DVI and D-SUB inputs, and there's a 0.35W speaker in the front that isn't very good. But it's the picture that matters, and this Eizo does an impressive job of melding quality, flexibility and environmental features. For professionals on a budget, it's a great choice. DAVID BAYON

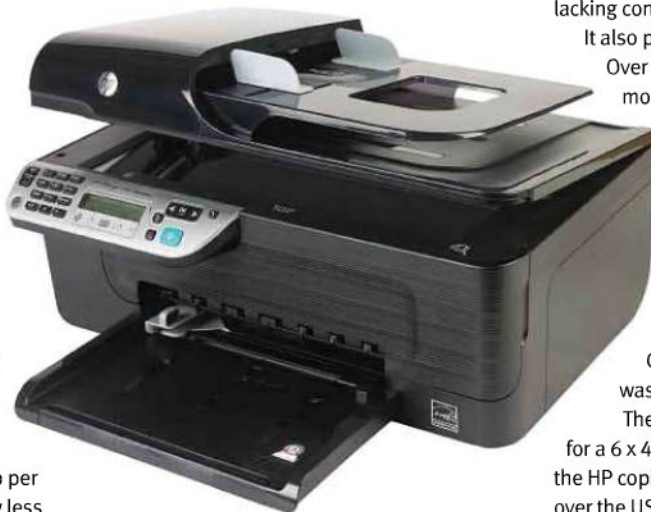
HP Officejet 4500

Good value, but it can't match its Canon rival for speed, quality or features

HP's Officejet all-in-ones aim to bridge the gap between home and the workplace at an affordable price. At £110 exc VAT, the Officejet 4500 undercuts its main rival – the A-Listed Pixma MX870 (web ID: 356053) – by around £25, which is a positive start.

It's more economical in the long-run too. It costs just 2.9p per colour page and, if you use the high-capacity black cartridge (which costs around £14 exc VAT), only 2p per mono print – almost a penny less than the Pixma.

The HP has an 802.11g Wi-Fi connection (as does the Pixma), a 20-sheet ADF and a 100-page input tray. But there have been cutbacks: the two-line LCD panel is awkward to navigate, and there's no proper output



The HP's key attractions are cheap running costs and wireless networking.

tray. There's also nothing to match the Canon's Ethernet connection, memory card reader, automatic duplexer and 2.5in colour screen.

The two-cartridge, black and tri-colour print engine is also fairly middling. Print quality was solid enough but, next to that of the five-ink Canon, text lacked sharpness. For images the gap was even wider, with photographs lacking contrast and punch.

It also proved slower in our tests.

Over USB, the HP churned out mono pages at 5.7ppm and colour prints at a disappointing 2.4ppm. These results were slightly slower when we printed the same documents over the Officejet's 802.11g wireless connection, and were outclassed by the Canon, which in colour tests was up to three times faster.

The scanner took 1min 39secs for a 6 x 4in photograph at 600ppi, and the HP copied mono documents at 4ppm over the USB connection. Scan quality is one area where the HP competes well, with sharp, clean results.

But in most other areas the Officejet 4500 falls short. Thanks to its broader range of features, flawless picture quality and decent speed, we'd spend our cash on the Canon Pixma MX870. MIKE JENNINGS

INKJET ALL-IN-ONE

PRICE
£110 (£130 inc VAT)

DELIVERY
£4 (£5 inc VAT)

SUPPLIER
Via HP website

INTERNET
www.hp.co.uk

PART CODE
CN547A

SPECIFICATIONS
Four-colour A4 all-in-one • 4,800 x 1,200dpi print • 1,200ppi scan • USB • 802.11g WLAN • 2-line LCD • 100-sheet input • 20-sheet ADF • 1yr RTB warranty • 428 x 420 x 215mm (WDH)

PERFORMANCE
★★★★★

FEATURES & DESIGN
★★★★★

VALUE FOR MONEY
★★★★★

OVERALL
★★★★★

Our best now even better.



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Nvidia Fermi GF100

It holds a small performance edge over ATI's latest, but Fermi's real strengths may be wasted on gamers

Nvidia's Fermi cards were unveiled in September 2009, but in truth we've been waiting a lot longer than that – the architecture it's replacing is two years old. We knew Fermi had "up to" 512 stream processors and 3.2 billion transistors; now it's finally here, we can find out for ourselves just how powerful – and, as we'll see, power hungry – the new cards are.

First things first: that target of 512 stream processors remains unmet. The GeForce GTX 480 has 480 of them, along with a 700MHz core and 1.5GB of GDDR5 memory with a 384-bit interface. The lesser GTX 470 has 448 stream processors, a 607MHz core and 1.25GB of memory with a 320-bit interface. Nvidia is keen to stress that there's headroom for faster cards.

If you're looking for Core i7 levels of instant domination, you're in the wrong place. Fermi won't flip the graphics card market on its head overnight. In fact, the first two cards are very close in both physical size and gaming performance to ATI's Radeon HD 5870 and 5850.

We ran a variety of game benchmarks and saw mixed results. In Crysis at 1,920 x 1,200 and Very High settings, the GTX

480 averaged 40fps to the HD 5870's 38fps; the GTX 470 scored 33fps to the HD 5850's 32fps. Higher settings saw similar margins. World in Conflict had the Nvidia cards ahead by almost 20%, and in Stalker: Call of Pripyat that margin was 5%. Other games had ATI's cards ahead by a whisker, and on average Nvidia's edge looks to be between 5% and 10%.

But the most interesting of all Fermi's specifications is its TDP: Nvidia quotes the GTX 470 at 215W and the GTX 480 at a massive 250W. With each card in our test rig it idled at 131W and 204W respectively; when stress-tested those

GRAPHICS CARD

EXPECTED PRICES

GEFORCE GTX 480
£365 (£429 inc VAT)

GEFORCE GTX 470
£254 (£299 inc VAT)

SUPPLIER

Depends on brand

INTERNET

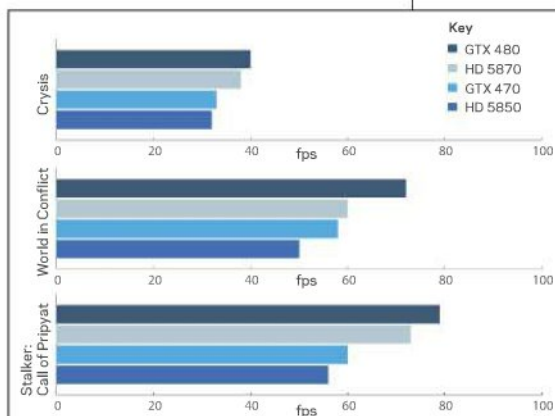
www.nvidia.co.uk

SPECIFICATIONS

GTX 480: 480 stream processors • 700MHz core • 1.5GB GDDR5 memory • 384-bit interface • 250W TDP • 122 x 280 x 38mm (WDH)

GTX 470: 448 stream processors • 607MHz core • 1.25GB GDDR5 memory • 320-bit interface • 215W TDP • 110 x 254 x 38mm (WDH)

↓ These graphs show gaming performance at 1,920 x 1,200 with Very High quality settings.



figures shot up to 380W and 406W. With the HD 5870 installed, it peaked at 267W, which gives you an idea of how hungry Fermi is. The GTX 480's core also reached 98°C, and the fan whined incessantly.

The new architecture isn't designed solely for 3D gaming. Fermi also boosts the GPU's ability to perform non-graphical calculations, such as those used in cryptography or video encoding, via the proprietary CUDA programming framework. It's also the first card from any company that supports C++ natively (with CUDA extensions to support the card's parallel architecture).

This sophistication is doubtless a major reason for the long wait, and the primary target is the workstation market, where its 512 potential cores can tear through data at hundreds of times the rate of a desktop CPU (see p9). For the home market, Nvidia is encouraging developers to use CUDA for in-game processes such as physics simulation and artificial intelligence.

We carried out a test using CyberLink PowerDirector 8 – which supports both CUDA and ATI Stream – and found little clear ground between the two. We rendered a 1080p video clip to AVCHD format, with a single accelerated filter effect applied to it, and both cards were boosted by around 35% over non-accelerated performance. ATI Stream boosted the HD 5870 by 39%.

It's nothing ground-breaking, and the benefit is limited to a select group of supported filter effects. Indeed, it remains to be seen whether Fermi's true powers will be utilised by mainstream applications. Many developers may prefer to stick with the basic but universal computing functions built into DirectX, rather than investing in Nvidia-specific CUDA routines.

The potential for workstation variants is arguably more interesting, but whether these two cards will tempt the fanboys who long ago ran out of patience is a different question. The GTX 480 is dear at £429 inc VAT, while the GTX 470 will still set you back £299. Does that 5% to 10% gaming boost justify a £70 premium over a quieter, more efficient HD 5850? We'd argue not. DAVID BAYON

PERFORMANCE

★★★★★★

FEATURES & DESIGN

★★★★★

VALUE FOR MONEY

★★★★☆

OVERALL

★★★★☆



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Gyraton Air Mouse Elite

PRICE £62 (£73 inc VAT)
INTERNET www.gyraton.co.uk

SUPPLIER www.misco.co.uk
RATING ★★★★★☆

Gyraton's Air Mouse Elite is a wireless pointing device with a split personality. Accelerometers from the people behind the Nintendo Wiimote allow mid-air cursor control with a flick of the wrist, yet set down the Elite on a flat surface and it automatically transforms into a standard mouse. In gyroscopic mode, it's a comfortable and remarkably accurate pointing device. It feels well made, comes with a rechargeable battery and docking cradle, and Gyraton claims a range of up to 30m. The bundled software allows customisation of the four buttons on top, implementation of basic gestures for browser navigation (among other things), and highlighting tools for use during presentations. It's an excellent device for those who need it, but a little on the expensive side. **JONATHAN BRAY**



Lindy Docking & Cloning Station

PRICE £43 (£50 inc VAT)
INTERNET www.lindy.co.uk

SUPPLIER Via Lindy website
RATING ★★★★★☆

Duplicating a hard disk is easy enough, but if you do it regularly, fiddling around inside a PC can become tedious. Lindy's Docking & Cloning Station offers an alternative: it will duplicate one bare 3.5in, 2.5in or 1.8in disk to another, including the master boot record and even EISA partitions, without connecting to a computer. It's compatible with SATA 150, 300 and 600 disks of up to 2GB in capacity, and you can also access docked disks over USB or eSATA. It's easy to use but slow: it clones drives bit by bit and took around an hour and a half to duplicate a 500GB hard disk. Overall, though, it's a handy piece of kit. **JONATHAN BRAY**



Blue Microphones Snowball

PRICE £62 (£73 inc VAT)
INTERNET www.bluemic.com

SUPPLIER www.play.com
RATING ★★★★★☆

Blue's new USB microphone is the definition of simplicity. Mount it on its sturdy, height-adjustable tripod, connect it to a PC, and all that's left to do is fire up your preferred audio-recording software and start podcasting. Power and audio are supplied via USB, and recordings are fixed at 16-bit, 44.1KHz. Unlike many budget microphones, you can switch the Snowball between "cardioid" and omni-directional polar patterns. The latter picks up sound from all around and the former captures only what's in front. The omni-directional pattern rewards with crisp, full-bodied audio; in cardioid mode, some of our recordings had a slightly nasal quality. It isn't cheap, nor is it perfect, but the Snowball's solid performance, retro design and ease of use will be more than ample reward for many. **SASHA MULLER**



Asus M4A89GTD Pro/USB3

PRICE £104 (£122 inc VAT)
INTERNET www.asus.co.uk

SUPPLIER www.cclonline.com
OVERALL ★★★★★☆

Asus' latest Socket AM3 motherboard is based on the new AMD 890GX chipset, which includes a SATA/600 controller plus the new Radeon HD 4290 GPU with support for DirectX 10.1 and dual-stream Blu-ray. The board offers two USB 3 ports, plus a Core Unlocker switch that enables all usable cores on your CPU, potentially turning your X2 or X3 processor into a true quad-core model. Meanwhile, Turbo Key II automatically pumps up your processor to its highest stable frequency, and GPU Boost does the same for graphics. If you want to squeeze every drop of performance from an AMD CPU, the M4A89GTD Pro/USB3 makes it easy – although, arguably, you could buy a cheaper board and invest more in the processor in the first place. **DARIEN GRAHAM-SMITH**



United Keys Display Keyboard

PRICE £98 (£115 inc VAT)
INTERNET www.unitedkeys.com

SUPPLIER APC Contech 01480 226622
RATING ★★★★★

This keyboard's main feature is a panel of nine dynamic function keys topped with 64 x 64 OLED panels. It comes with a set of default icons, but the real appeal lies in individualising these OLED panels. Each set of nine commands is assigned to a "layer" – an appropriate layer can be set to appear when an application is opened, for example – and the macro recorder means they can be programmed to trigger a simple key combination, a piece of code or a regularly used routine. It could simplify specialist applications, but the clunky software makes setup a chore. A website with downloadable layers for common applications should ease this issue in the coming months, but for now, you'll need to be patient to get the most from it. **DAVID BAYON**



Plextor PX-B940SA

PRICE £165 (£195 inc VAT)
INTERNET www.plextor-digital.com

SUPPLIER www.morecomputers.com
OVERALL ★★★★★

The Plextor PX-B940SA is the fastest Blu-ray drive we've seen, with a 12x write speed that's twice that of the fastest-rated available BD-R discs. Despite this, Blu-ray burn speeds were superb. The Plextor filled a 6x BD-R in 16mins 4secs, a full six minutes faster than we've seen previously. It was also fast when burning DVD-R discs, but slower than other Blu-ray burners we've tested with DVD-RW and CD-R media. Also, at £165 exc VAT, it's expensive – the majority of slower Blu-ray writers have been phased out to make way as speeds increase, but you can still save a good £25 by opting for a 10x model, and the difference in real-world use will be negligible. Only those for whom speed is imperative could justify keeping up with the cutting edge in internal optical drives. **MIKE JENNINGS**



Icy Box IB-318STU3-B

PRICE £39 (£46 inc VAT)
INTERNET www.icybox.de

SUPPLIER www.novatech.co.uk
RATING ★★★★★

If you have a spare 3.5in hard disk you're looking to reuse, Icy Box might have the answer. Its IB-318STU3-B is the first USB 3 hard disk enclosure we've seen, and it offers potential speeds far in excess of USB 2 connections. It's a nicely designed product, finished in attractive brushed aluminium, and it offers a physical power button on the rear and a pair of status lights on the front. Installation is as easy as screwing a spare SATA hard disk into an internal caddy, after which it appears to your PC like any other disk. The combined cost of the enclosure and new hard disk means it won't be for everyone – you can pick up an integrated 1TB USB 3 drive from Buffalo for £10 less – but for the huge number of people with a spare drive to hand it represents a cost-effective investment. **MIKE JENNINGS**

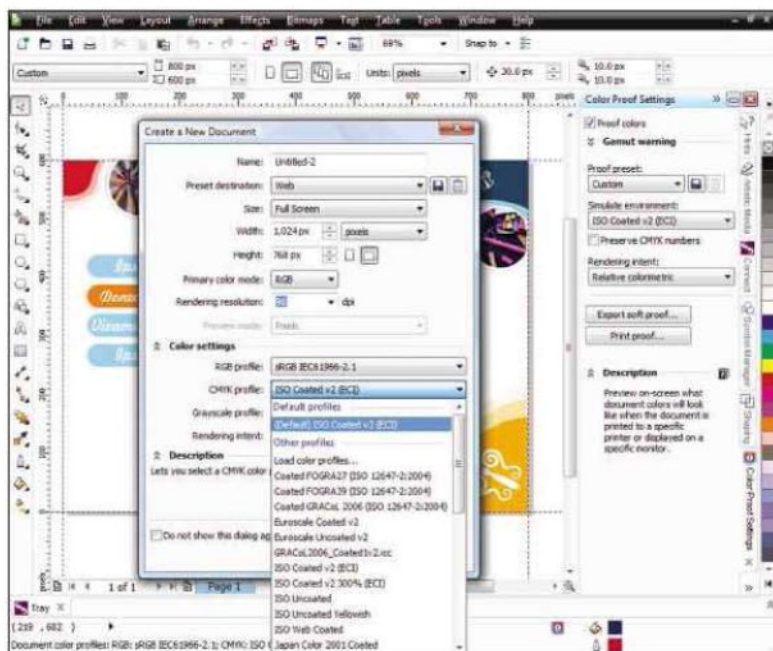


Devolo dLAN 200 AVsmart+

PRICE £111 (£130 inc VAT)
INTERNET www.devolo.co.uk

SUPPLIER www.maplin.co.uk
RATING ★★★★★

Manufacturers have a hard time differentiating their powerline networking gear from that of rivals. But devolo is doing its best to brighten up the sector – and has added an LCD screen to its latest product. The screen shows the status of other adapters on the network, signal strength, and indicates if you're streaming media. Alas, none of this is very useful, and with no backlight the screen can be difficult to view in dark, shadowy corners. Even if you can see them, though, the icons are no less cryptic than traditional LEDs. The units are also fairly bulky and far too expensive, which is a shame, since in tests we found them to be among the fastest, most reliable HomePlug AV-compliant products at both short and long range. **JONATHAN BRAY**



GRAPHICS SUITE

PRICE
£399 (£469 inc VAT)

UPGRADE
£179 (£210 inc VAT)

SUPPLIER
Via Corel website

INTERNET
www.corel.co.uk

← The new suite embraces industry-standard colour management throughout the design workflow.

CorelDRAW Graphics Suite X5

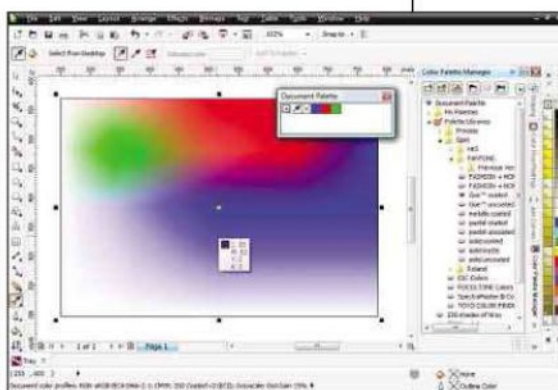
Improved content and industry-standard file and colour handling make for a solid but unexciting release

During the 1990s, CorelDRAW dominated the world of PC-based graphics and design, but the mantle has since passed to Adobe's Creative Suite. There's still a strong core of users that value Corel's more streamlined and affordable approach to design, however, and it's those loyalists Corel is targeting with this latest release.

With that in mind, it isn't surprising there's little that's obviously different about the new version. There's no big interface overhaul, no flash new splash screen and no spangly new look. But under the hood, there's plenty going on.

The first sign of this is the File | New command, which has been completely overhauled. Instead of simply dumping you on a blank page, it now fires up a dialog in which you can set various parameters, including the document's eventual destination. Leaving the destination at its print-orientated default gives you a choice of preset page sizes and, crucially, sets the new Primary Colour Mode parameter to CMYK.

Choose the alternative Web destination and CorelDRAW not only sets the Primary Colour Mode to RGB, but also switches on its new Pixels



preview mode. The big advantage of this is that it lets you see exactly how artwork will be anti-aliased on export, helping you produce crisper results. Another feature that helps you produce better online output is X5's enhanced Export for Web command. This lets you compare different export settings and manage transparency and colour palettes from a single dialog.

Colour management

The Primary Colour Mode is all you need to think about when managing colour locally, but where accuracy and consistency is crucial throughout your workflow – when producing printed

material for commercial use, for example – you need to take colour management seriously. And with X5, Corel has finally bitten the bullet, offering industry-standard, Adobe-style colour management, instead of the idiosyncratic colour management system of previous versions.

As such, colour management in X5 is now profile-based, which has the important benefit of providing a good idea of what your final colours will look like as you work. This is handled with X5's new Colour Proof Settings docker, where you can simulate colours onscreen, based on a chosen output profile, such as coated or uncoated print. You can also export or print your document based on the current simulation, so that your client or boss doesn't expect colours that the final output medium simply can't produce.

Format support

It isn't just in terms of colour management that Corel acknowledges Adobe's dominance. CorelDRAW has always been able to work with a huge range of file formats, and has extended that again here to more than 60, but the focus in X5 is on much deeper support for the main Adobe formats.

Alongside new level 3-based PostScript EPS import, CorelDRAW X5 now supports Photoshop CS4 PSD files complete with adjustment layers and masks, and Illustrator CS4 AI files complete with artboards and graduated transparency. The application's PDF support has also been updated with support for the latest Acrobat 9 format, while the Collect for Output command now defaults to exporting a PDF as a digital master rather than sending the original CDR.

There's a danger that this sort of high-end power adds complexity, which in turn could alienate CorelDRAW's non-professional users. To counter this, Corel has worked on making the program more friendly all round, with improved descriptive help in dialog boxes and more explanatory tool tips. In addition, alongside its existing online help and Hints docker, Corel now supports X5 with a full printed guide and more than two hours of video tutorials.

There are almost 30 docker windows to get to grips with, so you still couldn't call CorelDRAW X5 intuitive, but the learning curve and entire working approach is certainly far easier than that of Adobe Illustrator.

↑ The colour management helps to ensure what you see onscreen is what your printer delivers.

REQUIREMENTS
Windows 7/Vista/XP

WHAT ELSE IS IN THE SUITE?

During its 20-year history, the CorelDRAW Graphics Suite has included a vast array of supporting applications and content – this new version is no exception. Corel includes 10,000 items of clip-art, 1,000 photos, 350 document templates (most of them new), 1,000 OpenType fonts (including new core typefaces such as Helvetica and Frutiger) and 2,000 new car templates in the pack. Also new is the cut-down SWiSH miniMax for producing Flash animations, perhaps to make up for the loss of the long-gone and little-missed Corel RAVE.

The one application that has stayed the course since 1992's version 3 is Corel Photo-Paint. The main changes are based on the new features found in CorelDRAW, with Photo-Paint X5 gaining a new File | New dialog, Document palette and Corel Connect docker. In addition, there are three new bitmap effects: Vibrancy for intelligently adding saturation; Grayscale for removing it; and Photo Filter for applying lens effects.



Photo-Paint X5 offers bitmap editing in a similar environment to CorelDRAW.



Pixel-based preview and an integrated Export for Web dialog improve web output.

The new release is nothing to write home about, and Photo-Paint still isn't a replacement for a dedicated photo editor, but what it does offer is tight integration with the main CorelDRAW application. That alone makes it worth the install time.

Additions and improvements

Many of X5's core tools have been enhanced. With the Rectangle tool you can control rounding, scalloping and chamfering of corners direct from the Property bar, and also set whether these should be fixed or scaled when the rectangle is resized. The two-point Line tool enables you to force the path perpendicular or tangential to an existing object, while the new B-spline tool lets you add smooth curves via control points. For creative work, the Art Media tool now offers dozens of preset brush styles, while for absolute precision when drawing and positioning objects and nodes, you can use the new Object Coordinates docker.

PowerTrace, which allows you to automatically convert bitmaps into outlined or centerlined drawings, has also been reworked. With complete control over corner handling, colour merging and overlap removal, it delivers smoother and more easily editable results. And for centerline tracings, the new Join Lines docker lets you quickly tidy up paths by automatically extending broken lines between them.

Once you've drawn or traced the shapes that make up your drawing, you need to control each object's fill. CorelDRAW has built up plenty of formatting power over the years – including gradient, pattern and texture fills – but, in expert hands, the most naturalistic shading is delivered by gradient meshes. This is especially true now that X5 has simplified its default mesh, enabled transparency as well as colour handling, and added an option to smooth away hard edges automatically.

The simple, flat colour fill has also seen improvements. The Colour Eyedropper tool now provides onscreen feedback of CMYK and RGB/Hex values as you hover your mouse over drawings or the desktop. Even better, when you



Corel Connect can help you find content from within CorelDRAW or as a standalone application.

click or drag, the Eyedropper now automatically switches modes ready to apply the sampled individual colour.

Meanwhile, for managing groups of colours, CorelDRAW X5 adds a handy Document palette, which automatically lists all the colours applied to the current drawing. This palette is saved in the file itself and makes it much easier to apply colours consistently throughout and across projects.

New tools

X5 has done a reasonable job of enhancing CorelDRAW's existing functionality, but it's desperately crying out for some brand-new power to catch the eye. The feature Corel hopes will fill this role is Corel Connect. This acts both as a simple standalone application and as an integrated docker window, allowing you to browse or search through CorelDRAW's large collection of clip-art drawings and photos, and then quickly incorporate them into your work.

At this point longstanding users may well be slightly bemused, remembering that CorelDRAW X3 used to provide a similar feature that was dropped in X4. The Scrapbook docker allowed you to browse Corel content held online, and was arguably a more modern solution. However, Connect scores with its ability to search local drives and networks for non-Corel content, its optional standalone operation and the Tray panel that lets you collect potential options before deciding which ones to use.

Although Connect is useful for quickly knocking up eye-catching artwork, it's neither as new nor as powerful as Corel would like to make out, and it's typical of this release as a whole. Rather than breaking new creative ground, CorelDRAW Graphics Suite X5 focuses on developing and making the most of existing content and features.

It's still a major advance on the disappointing X4 release, and there's no doubt many new users will be better off choosing Corel over Adobe. However, Corel's existing users will quickly spot that CorelDRAW Graphics Suite X5 delivers few compelling reasons to upgrade. **TOM ARAH**

EASE OF USE



FEATURES



VALUE FOR MONEY



OVERALL



ACCOUNTS

PRICE

Free

UPGRADE

N/A

SUPPLIER

Via Brightbook website

INTERNET

www.brightbook.co.uk

REQUIREMENTS

Flash-enabled browser

EASE OF USE

★★★★★

FEATURES

★★★★★

VALUE FOR MONEY

N/A ★★★★★

OVERALL

★★★★★

Brightbook

A useful, free invoicing tool that might just represent the future of accounting – but it isn't perfect

The inexorable slump in the number of desktop-based accounting applications in the past year has been mirrored by a boom in online alternatives. One such tool is Brightbook, a free, web-based book-keeping application with a good chunk of what self-employed users need: invoicing, expense tracking and basic reports.

Its attempt to appeal to the less financially literate is clear from its bright homepage, which comprises a well-organised overview of your business' health. Expenses, payments and invoices are graphically compared, and outstanding invoices and income types are displayed alongside current profit expectations. Below this, business-critical events such as outstanding invoices are listed.

The Clients section, where you manage relationships with customers



The bright opening screen gives a great visual overview of where your money is coming from – and where it's going.

and organise quotes, invoices and payments, is excellent. On its Overview page you can get a summary of client balances and enter new client details; a separate Statements section shows selected client activity in greater detail. You can also issue invoices and quotes in this section. Quotes can be easily

converted into invoices through a button and invoices can be set to recur just by checking a box. Both VAT and discounts can be applied to transactions, and you can email invoices with covering messages from the web interface.

The banking functions don't work well. Security is robust – transactions are protected with SSL encryption – but Brightbook will import bank statements only in CSV format. Even then it's sniffy about them, first rejecting ours because the file extension was in upper case, then giving errors on the imported file.

Reports are limited too. The most useful is the VAT summary, which gathers quarterly data in the form required by HM Revenue & Customs, but you can't submit a return directly. There's no detailed profit and loss report, only a basic income and expense one.

So, Brightbook doesn't offer everything a small business could want. But for those who simply want to track their cash and invoicing, it's an excellent option. And it seems churlish to complain too much when it doesn't cost a penny. **TOM GORHAM**



DISK MANAGEMENT

PRICE

£25 (£29 inc VAT)

SUPPLIER

Via Paragon website

INTERNET

www.paragon-software.com/uk

REQUIREMENTS

Windows 7/Vista/XP

EASE OF USE

★★★★★

FEATURES

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

Paragon Hard Disk Manager 2010 Suite

A broad collection of useful hard disk utilities that would be an asset to any keen techie's toolbox

The name is vague, but it reflects the breadth of Hard Disk Manager 2010 Suite's abilities. It offers disk imaging, partition management and resizing, boot repair, secure deletion and even on-demand backup – all for a low price.

It wouldn't be a good buy if the tools were rubbish – but happily, they work well. Cloning disks is the work of a couple of clicks, and when it comes to imaging there are plenty of options such as encryption, file splitting, and filters to include and exclude certain files. New in this version is support for "hot processing", using the Microsoft Volume Shadow Copy Service or Paragon's own technology, so you can image a drive that's in use. And,



There's little Paragon Hard Disk Manager 2010 Suite can't do, from imaging to secure erasing to boot repair.

crucially, when it comes to restoring an image, partitions can be resized on-the-fly to suit the destination.

The supporting tools are well-conceived too. Plug in a disk containing a Windows installation from a different machine, and the Adjust OS utility updates drivers so the drive can be booted on the host PC.

There's an unexpectedly configurable secure erase tool too, which lets you define your own overwrite mask, while for real techies there's a basic sector editing tool.

You're even spoilt with the choice of two bootable discs, for occasions when you can't (or don't want to) boot from a system drive.

There are some things this edition of the software can't do. It isn't scriptable, nor can it change cluster sizes or work with virtual machine volumes, and there's no incremental drive imaging. If you require these features, you'll have to move up to the Professional edition.

With so many functions the interface can be overwhelming too, but if you're in the market for a general-purpose hard disk tool, Hard Disk Manager 2010 Suite is an excellent choice. **DARIEN GRAHAM-SMITH**

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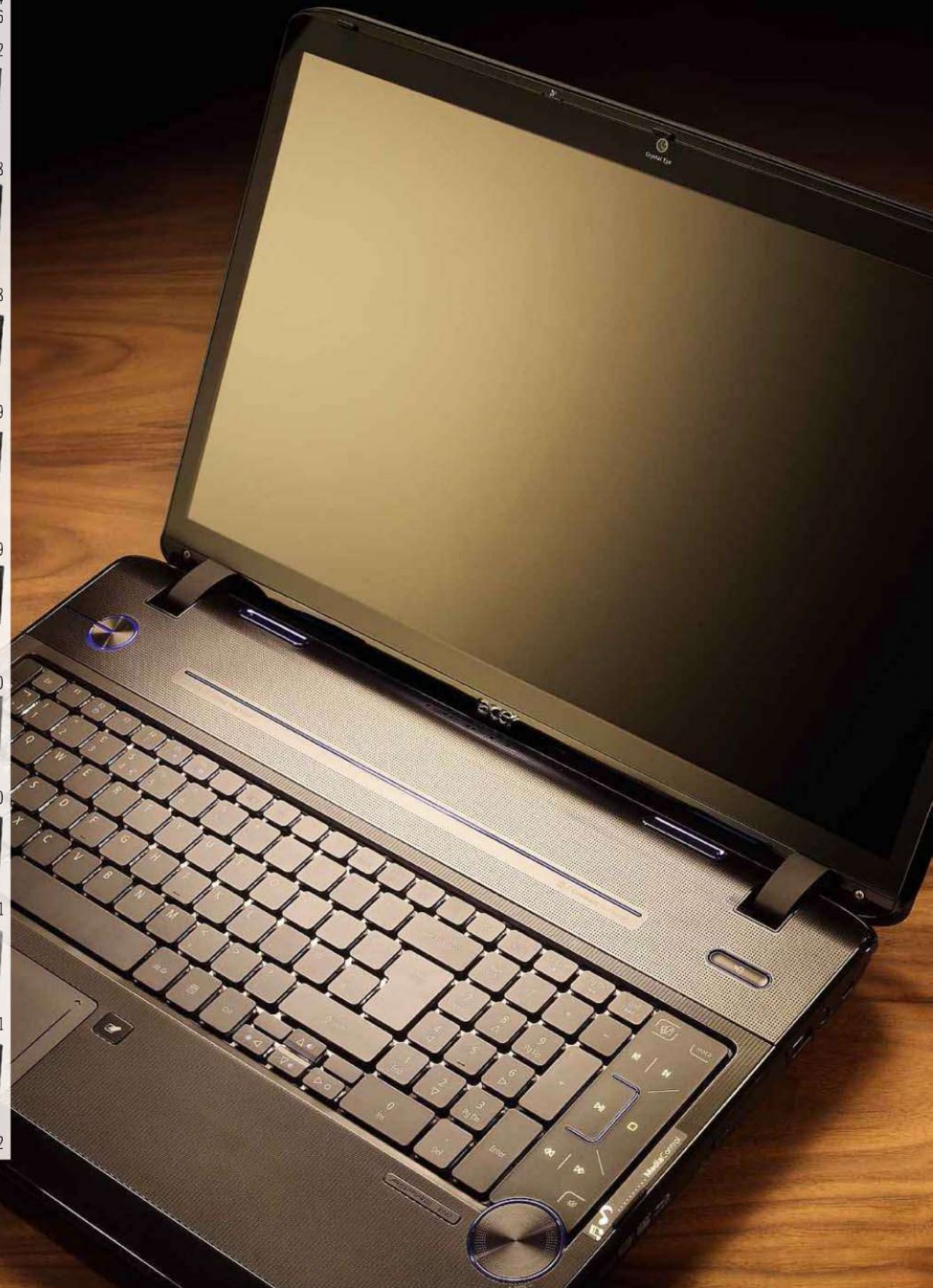
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Desktop replacements

POWER, PANACHE AND... PORTABILITY? WE TEST NINE DESKTOP REPLACEMENTS THAT DON'T ALL FIT THE TEMPLATE

The label "desktop replacement" traditionally conjures up images of gigantic beasts and empty wallets, but these days the meaning is less clear. If you want a laptop that can replace the high-resolution screen, the quad-core processor and the capacious hard disk of your old desktop, you may be surprised to discover it can cost you as little as £500 – and it needn't feel like carrying a bag of bricks.

If a back-breaker of a laptop is what you want, this isn't a problem either; this month's Labs reveals a variety of desktop replacement styles in bloom. At one end of the scale sit the monsters: the 18.4in Acer weighs more than 4kg and will decimate

whatever consumer task it's challenged with, while workstations from Dell, HP and Lenovo all pack the punch to blitz more serious applications.

At the other end, a selection of surprises awaits. Toshiba's businesslike Tecra A11 costs just £508 yet includes a new Core i3 processor; Apple's sleek MacBook Pro exudes build and design quality yet still weighs a mere 2.5kg; and the Samsung R780 combines a 17in screen, 2.85kg weight and impressive power for a tantalising £672.

Over the next eight pages you'll find nine powerful laptops for all possible scenarios, so set yourself a budget, decide what you need your new purchase for, then read on to discover the winners.

Buyer's guide

Plus how we test

The usual checklist when buying a desktop replacement has changed rapidly over recent months, and Intel has a lot to do with that. Its Core i5 and i7 processors are capable of tremendous performance, yet they're filtering down into even the cheapest of systems.

We're at the point where power isn't everything. If you're looking to run intensive apps it will pay to buy a laptop with either a Core i5 or i7 processor, and you may want to consider a professional workstation. But for everyone else, even the cheapest laptop here has enough power for the majority of needs, meaning other factors come into play. If it won't leave a desk very often you'll want a large, high-resolution display – sizes range up to 18.4in. With a large chassis you can expect plenty of ports, a decent hard disk and a Blu-ray drive.

For a more portable option, a 15in screen is still usable. The bonus is better battery life – up to four-and-a-half hours – the weight will be lower, and the price will be more palatable. The £508 cost of the Toshiba ably illustrates that.

The final option is the compromise: a 16in or 17in screen, a Core i5 processor, reasonable battery life, and a weight that won't kill you on the way to work. The Samsung and Sony are good examples, and may prove the best all-round bet.

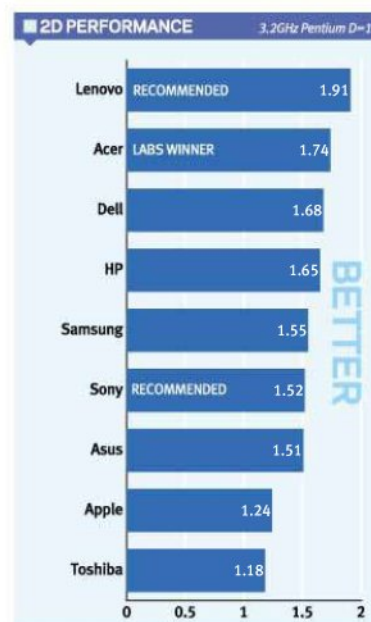
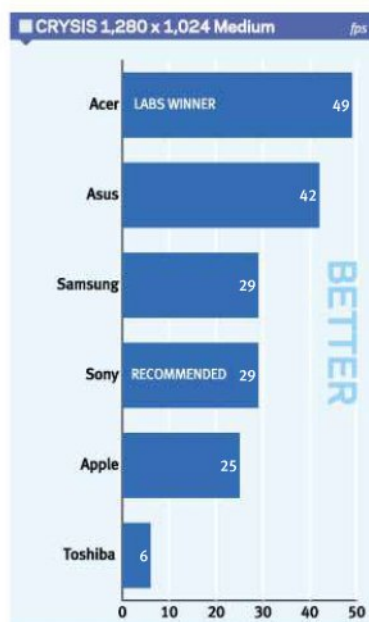
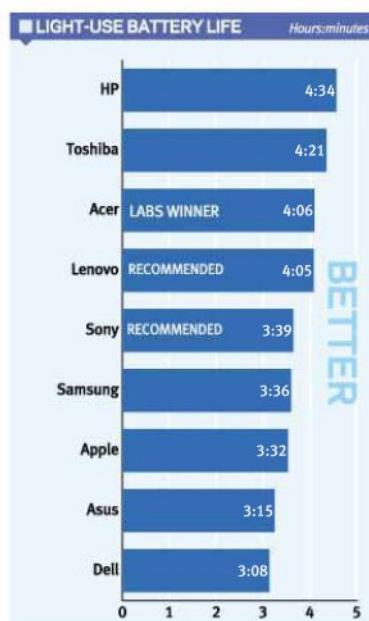
Performance

We test using real-world applications such as Microsoft Office, Adobe Photoshop and dbPoweramp Music Converter. The overall result is relative to a score of 1.00 from our reference PC – a dual-core 3.2GHz Pentium D 840 system with 1GB of PC3200 RAM, a 10,000rpm Western Digital Raptor hard disk and Nvidia GeForce 6600 GT graphics. If a machine scores 1.50, it's 50% faster than our reference machine overall.

We also run 3D benchmarks where appropriate, using Crysis. We run a pre-recorded test at three resolutions and settings. For workstations, we run the SPECviewperf 10 array of CAD/CAM and 3D modelling benchmarks.

RATINGS EXPLAINED

The star ratings you'll find at the bottom of each review are relative only to the products on test in any particular Labs. A one out of six rating doesn't mean the product is the worst of its type to be made, just the least impressive that month. Likewise, a six out of six score isn't necessarily an indication of perfection.



Battery Life

We run two battery tests. For light use we set brightness to 50%, disable wireless networking, and run a timer application until the battery runs out. For intensive use, we crank up the brightness to maximum and tax the system with our multitasking benchmark. This gives us a minimum and maximum battery life. In both cases, we use the power-management settings most suited to longevity and performance respectively.

Features & Design

We look at an array of objective measurements, such as the ports and connectors, networking capabilities and hard disk capacity, as well as features such as 3G modems and high-resolution displays. We factor in software bundles but, more importantly, points are given

for the length and type of warranty, as well as each company's performance in our Reliability & Service Awards (www.pcpro.co.uk/links/awards). The rating also includes subjective points – decided by two members of the PC Pro staff – for items that can't be measured objectively, such as build quality, style and the quality of speakers and any accessories.

Value for Money

The Value for Money score is based on a weighted average of the other scores; we then factor in how much each machine costs for a bang-per-buck result.

Overall

The Overall rating is a straight average of the Performance, Battery Life, Features & Design and Value for Money scores.



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Saving over £80 per month, with guaranteed ISDN30e equivalent quality.

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FEATURE TABLE Desktop replacements



	Acer Aspire 8942G	Apple MacBook Pro 15	Asus N61JQ	Dell Precision M6400
OVERALL RATING	★★★★★	★★★★★	★★★★★	★★★★★
Part code	LX.PQ902.008	N/A	N61JQ-JX021V	N/A
Price (inc VAT) ¹	£1,089 (£1,280)	£1,477 (£1,736)	£918 (£1,079)	From £1,279 (£1,503)
Delivery (inc VAT) ²	Free	Free	£5 (£6)	Free
Supplier	www.saveonlaptops.co.uk	Via Apple website	www.morecomputers.com	Via Dell website
Manufacturer's website	www.acer.co.uk	www.apple.com/uk	www.asus.co.uk	www.dell.co.uk
Dimensions (WDH, including feet)	440 x 303 x 43mm	364 x 249 x 23mm	384 x 264 x 33mm	393 x 287 x 42mm
Weight (travelling weight with PSU)	4.2kg (5kg)	2.5kg (3kg)	2.9kg (3.4kg)	4.3kg (5.3kg)
SERVICE & SUPPORT				
Warranty ³	1yr RTB	1yr RTB	2yr RTB	3yr on-site NBD
Manufacturer's reliability ⁴	★★★★★	N/A	★★★★★	★★★★★
Manufacturer's support ⁴	★★★★★	N/A	★★★★★	★★★★★
CORE COMPONENTS				
Processor	2.4GHz Intel Core i5-520M	2.8GHz Intel Core 2 Duo T9600	1.6GHz Intel Core i7-720QM	2.53GHz Intel Core 2 Quad QX9300
Motherboard chipset	Intel HM55 Express	Nvidia nForce 730i	Intel HM55 Express	Intel Q45
RAM fitted	6GB	4GB	4GB	8GB
RAM type	DDR3	DDR3	DDR3	DDR3
SODIMM sockets free	0	0	0	0
SODIMM sockets total	2	2	2	4
DISPLAY				
Display size	18.4in	15in	16in	17in
Native resolution	1,920 x 1,080	1,440 x 900	1,366 x 768	1,920 x 1,200
Graphics chipset	ATI Mobility Radeon HD 5850	Nvidia GeForce 9600M GT	ATI Mobility Radeon HD 5730	Nvidia Quadro FX 3700M
Video memory	1GB	512MB	1GB	1GB
Outputs	HDMI, DisplayPort, D-SUB	Mini-DisplayPort	HDMI, D-SUB	DisplayPort, D-SUB
DRIVES				
Hard disk nominal capacity	640GB	500GB	640GB	2 x 256GB
Hard disk formatted capacity	580GB	Depends on Windows partition	581GB	476GB
Spindle speed	5,400rpm	5,400rpm	5,400rpm	N/A
Interface	SATA/300	SATA/300	SATA/300	SATA/300
Make and model	Western Digital Scorpio Blue	Hitachi HTS545050B9SA02	Seagate Momentus 5400	Unbranded SSD
Optical drive type	Blu-ray reader	DVD writer	Blu-ray reader	DVD writer
Optical drive make and model	HL-DT-ST BDDVDRW CT21N	Matshita UJ-868	HL-DT-ST BDDVDRW CT21N	HL-DT-ST G520N
BATTERY				
Battery capacity	4,800mAh	Not stated	4,400mAh	7,260mAh
Replacement battery price (inc VAT)	Not stated	N/A	Not stated	Not stated
PORTS & COMMUNICATIONS				
Network (Mbps/sec)	1,000Mbps/sec	1,000Mbps/sec	1,000Mbps/sec	1,000Mbps/sec
Wireless technologies	802.11bgn	802.11abgn	802.11abgn	802.11bgn
WLAN switch/key combination	●/○	○/○	●/●	●/○
Integrated 3G	○	○	○	○
Modem	○	○	○	○
Media card reader	SD, MS, MMC, xD	SD	SD, MS, MMC, SM, xD	SD, MMC, xD
Ports	5U, 1EC/54, 1ES, 1FW, 1OSP, 3M	2U, 1FW, 1OSP, 2M	1U3, 2U, 1EC/34, 1ES, 1OSP, 2M	4U, 1EC/54, 1PC, 1FW, 2M
Pointing device type	Multitouch touchpad	Multitouch touchpad	Multitouch touchpad	Touchpad, trackpoint
OTHER PERIPHERALS				
Audio chipset	Realtek HD Audio	Cirrus Logic CS4206A	Realtek HD Audio	IDT HD Audio
Speaker location	Front edge, base	Alongside keyboard	Above keyboard	Above keyboard
Hardware volume control	●	○	●	○
Integrated microphone	●	●	●	●
Webcam	1mp	1.3mp	2mp	2mp
SECURITY				
Fingerprint reader	●	○	○	●
Trusted platform module	○	○	○	●
Smart card reader	○	○	○	●
Carry case	○	○	○	○
SOFTWARE SUPPLIED				
Operating system	Windows 7 Home Premium 64-bit	Mac OS X Snow Leopard	Windows 7 Home Premium 64-bit	Windows 7 Ultimate 64-bit
Recovery method	Recovery disc	Recovery disc	Recovery partition, burn own recovery discs	Recovery partition
Main software titles ⁵	○	Apple iLife	CyberLink Blu-ray Disc Suite	○

Key: ● Yes, ○ No. 1. Price correct at time of going to press. 2. Mainland UK only. 3. Warranty is parts & labour, UK mainland, unless otherwise stated. 4. Out of six for laptop reliability/support in PC Pro's Reliability & Service Awards 2009. Where N/A, companies didn't receive enough feedback to be rated in the survey. 5. Excluding multimedia titles and trial versions.



HP EliteBook 8730w	Lenovo ThinkPad T510	Samsung R780	Sony VAIO F11	Toshiba Tecra A11
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
VQ682ET	N/A	NP-R780-J50BUK	VPCF11S1E/B	PTSE0E-00U00YEN
£1,493 (£1,754)	£1,108 (£1,302)	£672 (£790)	£945 (£1,110)	£508 (£597)
Free	Free	Free	Free	Free
www.ebuyer.com	Via Lenovo website	www.play.com	www.play.com	www.ebuyer.com
www.hp.co.uk	www.lenovo.co.uk	www.samsung.co.uk	www.sony.co.uk	www.toshiba.co.uk
392 x 280 x 35mm	372 x 244 x 38mm	411 x 273 x 40mm	387 x 262 x 43mm	374 x 251 x 38mm
3.5kg (4.4kg)	2.77kg (3.24kg)	2.85kg (3.3kg)	3.1kg (3.5kg)	2.5kg (3.1kg)
3yr RTB	3yr RTB	1yr C&R	1yr C&R	1yr RTB
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
2.8GHz Intel Core 2 Duo T9600	2.66GHz Intel Core i7-620M	2.26GHz Intel Core i5-430M	1.6GHz Intel Core i7-720QM	2.13GHz Intel Core i3-330M
Intel PM45 Express	Intel QM57 Express	Intel HM55 Express	Intel PM55 Express	Intel HM55 Express
4GB	4GB	4GB	6GB	2GB
DDR2	DDR3	DDR3	DDR3	DDR3
0	0	0	0	1
2	2	2	2	2
17in	15in	17.3in	16.4in	15.6in
1,920 x 1,200	1,600 x 900	1,600 x 900	1,920 x 1,080	1,366 x 768
Nvidia Quadro FX 2700M	Nvidia NVS 3100M	Nvidia GeForce GT 330M	Nvidia GeForce GT 330M	Intel GMA HD
512MB	512MB	1GB	1GB	728MB
HDMI, D-SUB	DisplayPort, D-SUB	HDMI, D-SUB	HDMI, D-SUB	DisplayPort, D-SUB
320GB	500GB	500GB	500GB	160GB
298GB	454GB	466GB	453GB	141GB
7,200rpm	7,200rpm	5,400rpm	5,400rpm	5,400rpm
SATA/300	SATA/300	SATA/300	SATA/300	SATA/300
Seagate Momentus 7200.4	Seagate Momentus 7200.4	Toshiba MK5055GSX	Hitachi HTS545050B9SA00	Fujitsu MJA2160BH-G2
DVD writer	DVD writer	Blu-ray reader	Blu-ray reader	DVD writer
HP DVD-RAM GT20L	Matshita UJ890	TSST TS-LB23A	Optiarc BC-5500H	Matshita UJ890AS
5,200mAh	5,200mAh	4,400mAh	5,000mAh	4,860mAh
Not stated	£89 (£104)	Not stated	£153 (£180)	£83 (£98)
1,000Mbps/sec	1,000Mbps/sec	1,000Mbps/sec	1,000Mbps/sec	1,000Mbps/sec
802.11abgn	802.11abgn	802.11bgn	802.11abgn	802.11abgn
●/○	●/○	○/●	●/○	●/●
○	●	○	○	○
●	●	○	○	○
SD, MS, MMC, xD	SD, MMC	SD, MMC	SD, MS	SD, MS, MMC, xD
4U, 1EC/54, 1ES, 1FW, 2M	4U, 1EC/34, 1ES, 1M	4U, 1EC/34, 1ES, 2M	3U, 1EC/34, 1ES, 1FW, 1OSP, 2M	4U, 1EC/54, 1ES, 1S, 2M
Touchpad	Multitouch touchpad, trackpoint	Multitouch touchpad	Multitouch touchpad	Touchpad, trackpoint
SoundMAX HD Audio	Nvidia HD Audio	Realtek HD Audio	Nvidia HD Audio	Realtek HD Audio
Front edge	Alongside keyboard	Base	Above keyboard	Front edge
●	●	○	○	●
●	●	●	●	●
2mp	2mp	1.3mp	0.3mp	1mp
●	●	○	○	●
●	●	○	○	●
●	●	○	○	○
○	○	○	○	○
Windows XP Professional SP2	Windows 7 Professional 64-bit	Windows 7 Home Premium 32-bit	Windows 7 Home Premium 64-bit	Windows 7 Professional 32-bit
Recovery partition	Recovery partition	Recovery partition, burn own recovery discs	Recovery partition	Recovery partition, burn own recovery discs
HP Client Manager, Client Configurator, OpenView PC Configurator	Lenovo ThinkVantage Suite	○	○	○

Ports key: U3 = USB 3, U = USB 2, F = FireWire-compatible, ES = eSATA, S = serial, RJ-11 = phone socket, RJ-45 = network socket, PS/2 = mouse keyboard, CSP = coaxial S/PDIF, OSP = optical S/PDIF, M = 3.5mm minijack audio, EC = ExpressCard, PC = PC Card. Memory cards key: SD = Secure Digital, MMC = MultiMedia Card, SM = SmartMedia, CF = CompactFlash, MD = Microdrive, MS = Memory Stick, xD = xD-Picture.



PRICE
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BATTERY LIFE
★★★★★
FEATURES & DESIGN
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

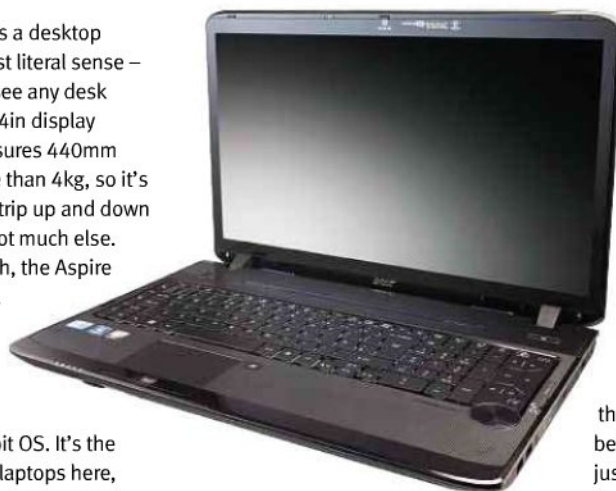
Acer Aspire 8942G

Huge and over the top, but the Aspire offers tremendous power at a surprisingly sensible price

The Acer Aspire 8942G is a desktop replacement in an almost literal sense – you'll barely be able to see any desk behind it. A gigantic 18.4in display means the chassis measures 440mm across and weighs more than 4kg, so it's good for the occasional trip up and down the stairs at home but not much else.

Once in place, though, the Aspire rewards you with power. Despite the dual-core Core i5-520M inside, it scored 1.74 in our benchmarks, helped by 6GB of DDR3 and a 64-bit OS. It's the fastest of the consumer laptops here, and should only fall behind the quad-core systems in heavily multithreaded tasks such as 3D rendering.

Acer has also included the most powerful consumer graphics chip this month, with the ATI Mobility Radeon HD 5850 averaging 49fps in our Medium Crysis test, and a creditable 20fps at



High settings. With a few detail settings lowered, you may even get close to the display's Full HD resolution in some less demanding games.

There's the obligatory Blu-ray drive for entertainment, while the screen is superb, with a bright and even LED

backlight, vibrant colours and a coating that's glossy without being overly reflective. The 5.1 speaker set produces fine audio, rich and full at both ends of the scale and with impressive volume, all controlled by a sleek rotary dial and separate backlit playback panel.

The whole design seems to follow those touches: the power button is a brushed-metal disc with blue trim that lights up when on; a pair of tiny blue speaker grilles look like exhaust vents beneath the screen; and the rounded edges of the front of the chassis look almost like the front of a car. It's all a tad over the top in true boy-racer style, but it somehow works on such a massive laptop.

It's unlikely you'll move from the mains for long, but battery life is better than you'd expect: we measured just more than four hours of light use, and almost an hour-and-a-half at full pelt. All of which combines to make the Acer a very tempting desktop replacement. The styling won't suit all tastes, but the 8942G costs little more than a grand, yet offers more power and entertainment features than you'd usually expect from a desktop PC.

PRICE
£1,477
(£1,736 inc VAT)

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BATTERY LIFE
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FEATURES & DESIGN
★★★★★
VALUE FOR MONEY
★★★★★
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Apple MacBook Pro 15

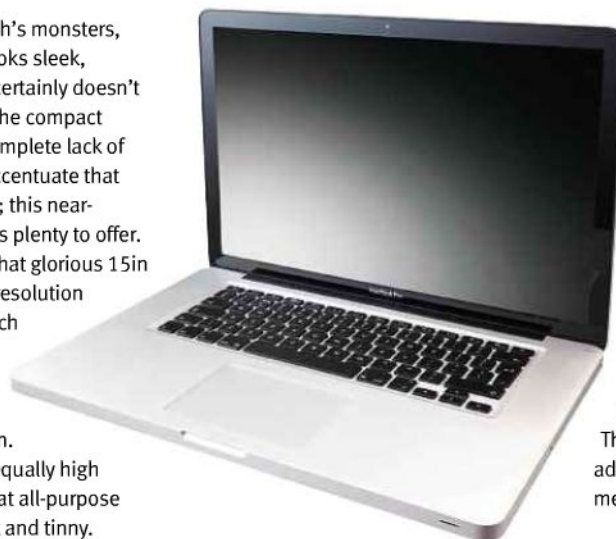
Beautifully built with a glorious screen, the MacBook Pro delivers everything we expected – including a sky-high price

Sitting among this month's monsters, Apple's MacBook Pro looks sleek, graceful and... small. It certainly doesn't look its 15 inches, and the compact keyboard and almost complete lack of external features only accentuate that illusion. Don't be fooled; this near-£1,500 wallet-buster has plenty to offer.

The biggest draw is that glorious 15in screen. Its 1,440 x 900 resolution is the right fit, and the rich tones make photos come alive. Colour accuracy is excellent and the backlight is even.

If the speakers were of equally high quality you'd have a great all-purpose laptop, but they're weak and tinny.

The MacBook Pro 15 is just 23mm thick and weighs 2.5kg, yet build quality is without compare. There's no flex in the base and the firm aluminium lid afforded only the slightest contact with the TFT



under pressure. The backlit keyboard won't be to everyone's taste, with a feathery feel to the key travel, but its sensible layout compensates.

But, this being an Apple product, it's difficult to see where the remainder of that price has been spent. A Core i7 refresh is rumoured soon, but for now it's limited to Core 2 Duo CPUs; this model's T9600 and 4GB of DDR3 RAM produced an uninspiring benchmark score of 1.24. The last-generation Nvidia GeForce 9600M GT graphics managed just 25fps at Medium settings in Crysis, and the battery gave us only 3hrs 32mins of light use. Admittedly, our benchmarks are in Windows; Mac OS longevity will be better.

The touchpad and its integrated buttons are a real opinion-splitter, and while we appreciate most will happily stick with Mac OS X, in Windows 7 the responsiveness is erratic and right-clicking is a pain. The mini-DisplayPort output requires adapters for other connections, and a mere two USB ports is restrictive.

You know what you're getting with a MacBook, and for many the design and quality is enough to justify the premium. But when you compare the specification, it just doesn't look a viable purchase for those without bottomless wallets.

Asus N61JQ

A USB 3 port and plenty of power lift the N61JQ above the masses, so it's a shame it has a couple of key weak points

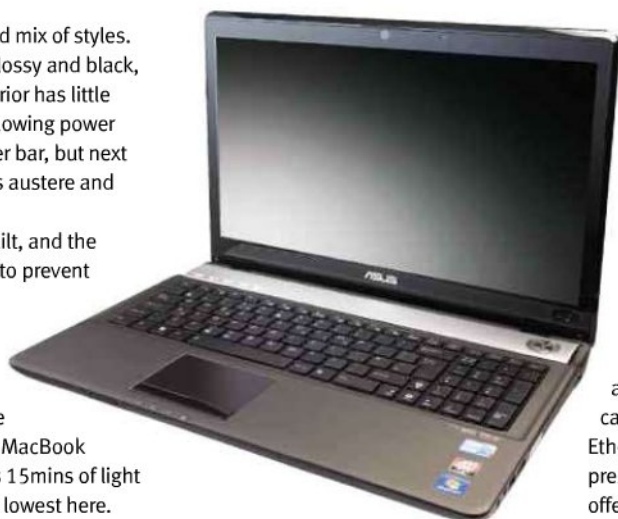
Asus' latest sports an odd mix of styles. The N61JQ's exterior is glossy and black, curvy and sleek. The interior has little flourishes, such as the glowing power button on a silver speaker bar, but next to the garish Acer it looks austere and almost businesslike.

The chassis is well built, and the screen has rigid support to prevent damage on your travels. At 2.9kg it isn't one of the heaviest in the group, although you'd struggle to call it portable in the way you might the MacBook Pro. It managed just 3hrs 15mins of light use, which is the second lowest here.

There's plenty under the hood, though, with a quad-core Core i7-720QM and 4GB of DDR3 RAM powering the N61JQ to a good benchmark score of 1.51. The Radeon HD 5730 managed a solid 42fps in Crysis at Medium settings, and its 17fps at High settings shows

some promise. Performance wasn't quite up there with the dominant Acer, but the four fast cores will prove handy when encoding video.

Whether you'll want to do so is a different question. The screen is glossy



and vibrant, and the colours accurate, but the 1,366 x 768 resolution is a little disappointing given the 16in diagonal. It will display 720p video natively but, with even the 15in Apple offering a higher resolution, the desktop doesn't feel as spacious as most.

The same can't be said for the keyboard: we're delighted to see it stretch across the width of the chassis, with room for full-sized keys and a number pad. It's comfortable to use, but the backing is bouncy and the key travel a little short for our liking.

Where the Asus makes up these deficiencies is with a solid feature set. A 640GB hard disk is joint-largest, and the N61JQ also features a Blu-ray drive – even if the screen can't take full advantage. Gigabit Ethernet and 802.11abgn wireless are present, and the Asus is unique in offering a single USB 3 port for those early adopters with compatible devices.

It's a nice touch, but it isn't enough to drag the Asus up to award status. The £918 price is reasonable, but with the Acer and Sony offering two different but superior packages for only a bit more, the N61JQ stays off the top this month.

PRICE
£918 (£1,079 inc VAT)

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PERFORMANCE
★★★★★
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★★★★★
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★★★★★

Dell Precision M6400

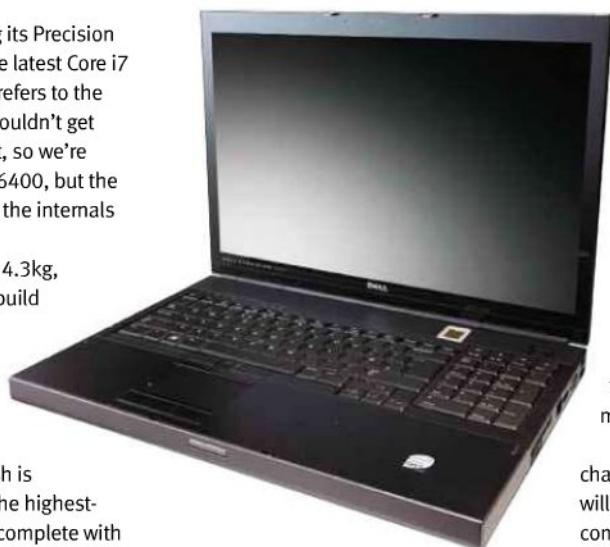
Big, brilliantly built and soon to pack immense power, but it remains an expensive option

Dell is currently refreshing its Precision workstation range with the latest Core i7 chips, and the price here refers to the new M6500 model. Dell couldn't get us one in time for this test, so we're reviewing the outgoing M6400, but the chassis is identical – only the internals will be changing.

It weighs a monstrous 4.3kg, complete with rock-solid build quality and a sharp 17in, 1,920 x 1,200 screen. Its white LED backlight is even and bright, and there's no flex in the sturdy lid. The glossy finish is reflective, but it's one of the highest-quality TFTs in the group, complete with ambient light sensor to reduce eyestrain and power draw as appropriate.

The wide chassis accommodates a well-laid-out keyboard with number pad and a trackpoint, although the latter's

extra buttons are a tad too recessed. The touchpad is great, though: it's backlit, so tap a small logo in the corner and four customisable buttons glow into view,



plus a timeline bar for video editing.

The Precision range is massively configurable, with the new M6500 models ranging from £1,279 to several times that. This sample came with the security triumvirate of fingerprint reader, TPM and contactless smart card reader, although you can opt for any combination of the three.

The Core 2 Quad processor in the M6400 scored 1.68 in our benchmarks. Given the choice of 32nm Core i7 chips, we'd expect the M6500 to match the Lenovo's sky-high performance when it arrives, and you'll be picking from ATI's FirePro M7740 and Nvidia's FX3800M workstation graphics. The range will continue to offer up to 16GB of DDR3 RAM, plus Blu-ray and multiple SSDs.

Given the supreme quality of the chassis, we have no doubt the M6500 will be a thing of brilliance – but it won't come cheap. The basic £1,279 model looks reasonable value, but once you try to match the other workstations here that price will soon magnify. For brute force the Dell won't disappoint, but the Lenovo is a more viable option for most.

PRICE
From £1,279
(£1,503 inc VAT)

SUPPLIER
www.dell.co.uk

PERFORMANCE
★★★★★
BATTERY LIFE
★★★★★
FEATURES & DESIGN
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VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

PRICE
£1,493
(£1,754 inc VAT)

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PERFORMANCE
★★★★★
BATTERY LIFE
★★★★★
FEATURES & DESIGN
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VALUE FOR MONEY
★★★★★
OVERALL
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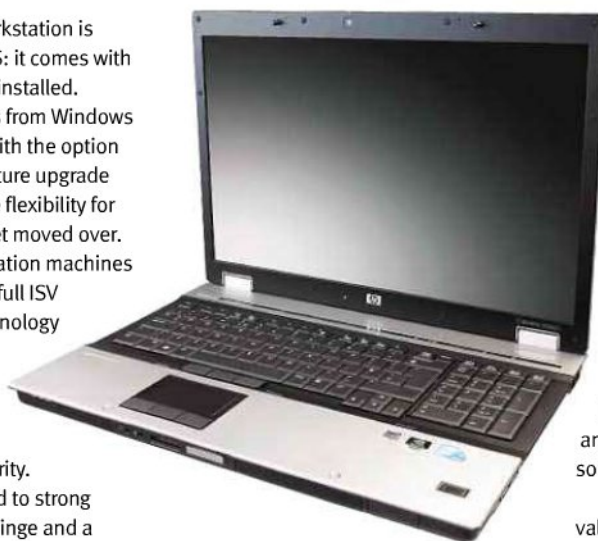
HP EliteBook 8730w

Solid construction, but it needs a refresh to compete with the two more modern workstations

HP's EliteBook 8730w workstation is unusual in its choice of OS: it comes with Windows XP Professional installed. Through downgrade rights from Windows 7 Professional, it comes with the option of a Windows 7 disc for future upgrade as required, adding a little flexibility for companies that haven't yet moved over.

As one of three workstation machines this month, it comes with full ISV certification and vPro technology for advanced remote management, as well as a smart card slot, fingerprint reader and TPM chip to increase security.

Its plain design is allied to strong construction, with a firm hinge and a rigid lid with a tight latch. The layout of the keyboard is excellent: keys have a nice depth of travel to them, which makes typing comfortable. A number pad sits to the right, and there's a separate trackpoint, with its own buttons



above the rather small touchpad. Little touches add colour to the predominantly silver finish: the touch-sensitive volume bar lights up blue, along with glowing wireless and quick presentation buttons.

The 17in screen has a 16:10 1,920 x 1,200 resolution, but the backlight is a little uneven and the screen lacks punch. The internals follow suit: this model sticks with a Core 2 Duo T9600 processor and 4GB of DDR2 RAM, which on paper looks relatively weak. However, the presence of XP boosted it to a score of 1.65 in our benchmarks – that's nowhere near the mammoth score of the Lenovo, and that machine has the more demanding Windows 7.

The Nvidia Quadro FX 2700M graphics also proved slower than both the Dell and Lenovo workstations when we ran the SPECviewperf array of CAD/CAM and 3D modelling benchmarks. In HP's defence, the EliteBook range is being refreshed with newer Core i5 and i7 models, so summer should see some improvement.

Whether this will increase the HP's value remains to be seen, but the price is at present too high for us to recommend it – even with its table-topping 4hrs 34mins battery life. It's undoubtedly well built and has the requisite business credentials, but it's slower, older and dearer than the superb Lenovo.



PRICE
£1,108
(£1,302 inc VAT)

SUPPLIER
www.lenovo.co.uk

PERFORMANCE
★★★★★
BATTERY LIFE
★★★★★
FEATURES & DESIGN
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

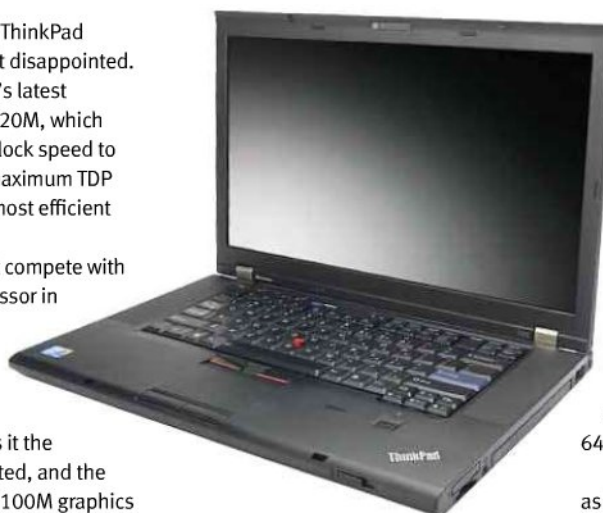
Lenovo ThinkPad T510

The construction, speed and feature set are all top of the pile – it's the workstation to beat

Lenovo's eagerly awaited ThinkPad workstation refresh hasn't disappointed. The new T510 packs Intel's latest dual-core 32nm Core i7-620M, which ups the old i7-720QM's clock speed to 2.66GHz and drops the maximum TDP to 35W. In short, it's the most efficient mobile Core i7 chip yet.

Those two cores won't compete with a decent quad-core processor in most multithreaded applications, but for other tasks it runs like lightning. A score of 1.91 in our benchmarks makes it the quickest laptop we've tested, and the ISV-certified Nvidia NVS 3100M graphics raced through our CAD/CAM benchmark more quickly than the others.

It has raw power in spades, then, but the ThinkPad's appeal lies in its design. The hooded edge to the lid makes it rigid as ever, and there's a WWAN antenna



inside it to get the most from the T510's 3G modem. The hinges are wider and the base feels rock-solid, and it features a fingerprint reader (with TPM chip) and a contactless smart card reader.

The speakers either side of the keyboard restrict its width, but it meets the usual ThinkPad standard. Touchpad and trackpoint are present, and Lenovo has added some nice touches, such as a key to quick-start VoIP conferencing.

The 15in screen looks muted next to the consumer models, but the 1,600 x 900 resolution suits the size and the backlight is evenly lit and bright. It coasted through our gradient and tinting tests, and it's fine for the occasional video or presentation too.

Most of the ports sit on the left side, with an eSATA/USB combo and both D-SUB and DisplayPort outputs. There's dual-band 802.11n wireless and Gigabit Ethernet, a fast 500GB hard disk and DVD writer, and Windows 7 Professional 64-bit as standard.

It may not be as big and comfortable as the Dell, but with a price of £1,108 when configured on Lenovo's website, it makes an awful lot more financial sense. More than four hours of battery life is good given the performance, and it comes with all the business features a workstation needs.

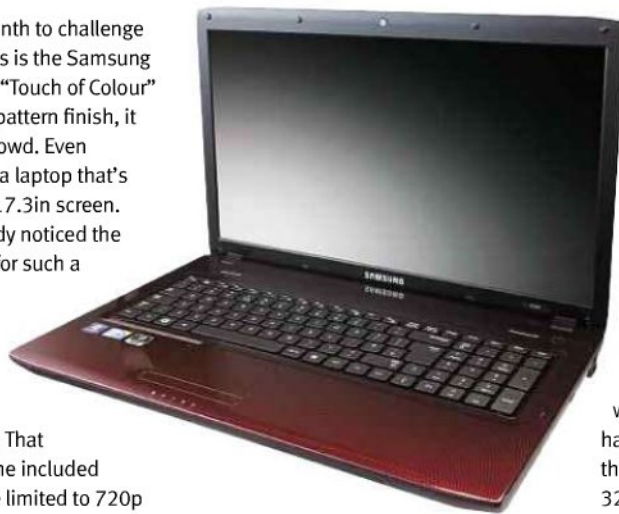
Samsung R780

A huge screen, plenty of features and a mouth-watering price make this the ideal value choice

The only laptop this month to challenge Apple in the style stakes is the Samsung R780. With its dark red "Touch of Colour" gradients and swirling pattern finish, it leaps out among the crowd. Even without the styling, it's a laptop that's hard to miss, given its 17.3in screen.

You may have already noticed the price, which looks low for such a monster, but there are reasons. For a start, that screen isn't Full HD, with Samsung opting for a less costly 1,600 x 900 resolution. That lessens the appeal of the included Blu-ray drive – you'll be limited to 720p playback – but it isn't a huge issue, as colours are gorgeous, contrast is good and the LED backlight is even and bright.

That large chassis comes with an equally large keyboard, stretching virtually from edge to edge. The Scrabble-tile design keeps the keys



consistent in size, and the firm backing and light travel make it comfortable to use. We're not wholly convinced by the trackpad, with a mottled coating that doesn't like greasy fingers, but four tiny corner LEDs signal its position in the

dark, and the buttons are responsive.

The other main reason for the low price is the choice of processor. On paper, you might expect the dual-core Core i5-430M in the R780 to perform worse than all but the Core 2 Duo parts.

However, once again Intel's Turbo Boost technology made a big difference in practice: it managed a decent 1.55 in our benchmarks, even edging the older Core i7 in the Sony. The Nvidia GeForce GT 330M graphics averaged 29fps in Crysis at Medium settings, showing solid gaming potential too.

Battery life is unspectacular, lasting 3hrs 36mins when idle and a mere hour when pushed, but the Samsung remains portable. It weighs 2.85kg despite its size, and comes with 802.11bgn wireless and a 500GB hard disk. The slight disappointment is the choice of Windows 7 Home Premium 32-bit, meaning not all of that 4GB of RAM is recognised.

It may not be a true powerhouse like the Acer, but the £672 exc VAT price is far lower than anything but the Toshiba. The R780 is a joy to use, it's more portable than it looks, and it's streets ahead in terms of value for money.

PRICE

£672 (£790 inc VAT)

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PERFORMANCE

★★★★☆

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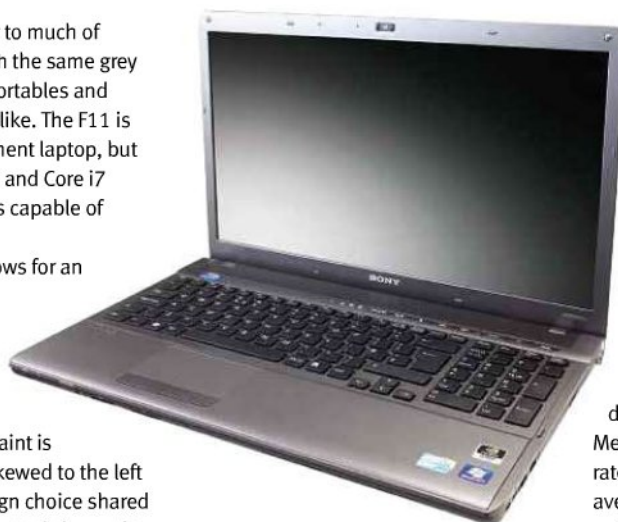
Sony VAIO F11

Plenty of power, a great screen and a plethora of features make the VAIO F11 a solid all-rounder

There's a nice continuity to much of Sony's VAIO line-up, with the same grey styling applied to ultraportables and desktop replacements alike. The F11 is ostensibly an entertainment laptop, but its 16.4in Full HD screen and Core i7 processor make it just as capable of workstation duties.

The wide chassis allows for an excellent Scrabble-tile keyboard, with light key travel and a rigid backing. There's a useful number pad to the right; a minor complaint is that the touchpad sits skewed to the left half of the base – a design choice shared by all the laptops with numeric keypads. Above the keyboard sit quick playback controls, and there's a programmable function button too.

The entertainment focus is strengthened by a Blu-ray reader, and



the 500GB hard disk is plenty for a video library. Should you need extra storage Sony has added a combined USB and eSATA port, along with two further USB ports, and there are HDMI and D-SUB

outputs for hooking up external displays.

With a quad-core Core i7-720QM and 6GB of RAM inside this model (the VPCF11S1E/B), we expected great things from our benchmarks, but it proved slower than the newer 32nm dual-core

Core i5 models. Nevertheless, a score of 1.52 shows potential, and its four cores and eight threads will come into their own when editing video or rendering 3D.

The display is vibrant enough to bring those videos to life, the backlight is even and bright, and the lid offers ample protection for slinging the F11 into a bag. The tones are a touch oversaturated for accurate colour work, but they're perfect for Blu-ray or gaming. The Nvidia GeForce GT 330M graphics drove Crysis at 1,280 x 1,024 and Medium settings with an average frame rate of 29fps. Battery life was merely average: 3hrs 39mins under light use.

The Sony isn't cheap at £945 exc VAT, and doesn't quite commit fully to either the role of workstation or entertainment monster, but if you want a laptop that can do a bit of both in a 3.1kg chassis, the F11 is ideal.



PRICE

£945 (£1,110 inc VAT)

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PERFORMANCE

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OVERALL
★★★★★

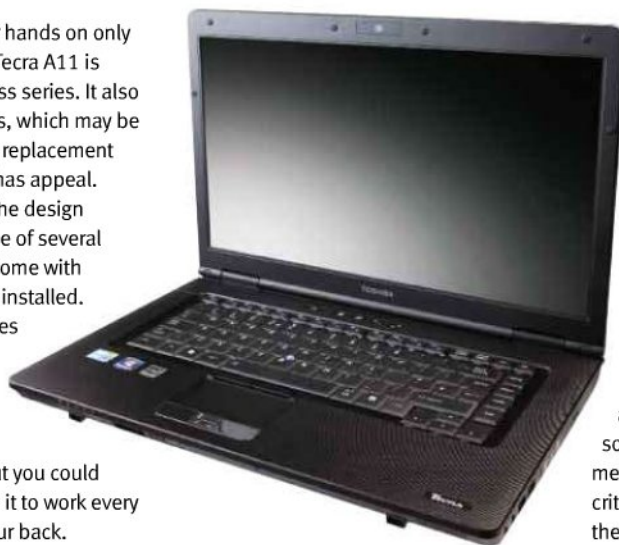
Toshiba Tecra A11

Underpowered in this company, but the Tecra A11 is a solid business laptop for a competitive price

So new we could get our hands on only the Core i3 version, the Tecra A11 is Toshiba's 15.6in business series. It also comes in Core i5 variants, which may be better suited to desktop replacement tasks, but this A11-12F has appeal. The build is sturdy and the design businesslike, and it's one of several laptops in the group to come with Windows 7 Professional installed.

Its 2.5kg weight makes it relatively portable, a fact furthered by a battery life of 4hrs 21mins. It isn't exactly petite at 38mm thick, but you could sling it in a bag and take it to work every day without breaking your back.

The downside to this portability is the Tecra A11's lesser specification. The dual-core Core i3-330M processor and 2GB of RAM produced a benchmark score of just 1.18, and the integrated Intel GMA HD chip rules out any serious



graphical work. An extra £100 or so will get you the same Core i5 processor that sits inside the Acer, but there's currently no discrete graphics option.

The 15.6in screen looks a little drab

compared to the Sony, and the resolution of 1,366 x 768 leaves the desktop looking less spacious next to the Full HD giants. Other drawbacks include the mere 160GB of storage, and a single-year's limited warranty.

Stick to work tasks, though, and the A11 is actually quite a nice machine. The combination of fingerprint reader and TPM chip improves security, and Toshiba has opted for both touchpad and trackpoint controls for added flexibility. The keyboard doesn't stretch the full width of the chassis, and the keys are a little clicky, but it's comfortable enough for regular use and has a nice, firm backing.

The array of ports includes DisplayPort, eSATA and even serial, and the Tecra has a spare DIMM socket to expand on the supplied memory in the future. And the above criticisms must all be measured against the £508 exc VAT price, which is by far the lowest here. Since this model is underpowered for some tasks, you'll want the Core i5 model for a true desktop replacement, but if your needs are more modest the Tecra A11-12F packs plenty of business appeal.

VIEW FROM THE LABS DAVID BAYON



If there's one thing we've learned from this month's Labs, it's that it's incredibly difficult to define what makes a "desktop replacement" any more.

The original concept must surely have been a laptop that can do the jobs for which you previously would have needed a powerful PC, but these days it could be argued that half the laptops we see each month fit that bill.

For consumers, a Core i5 processor, 4GB of RAM and a half-decent graphics chip are invariably enough to give levels of power that were unimaginable a year ago. Multiple fast cores to decode HD video; the graphical grunt to run the latest games; enough of everything to keep the family's computing needs satisfied, with leftovers to analyse proteins or look for ET in the downtime.

This being the case, it's easy to reach the conclusion that the gorgeous Samsung R780 does everything required for a mere £672. It has a Blu-ray drive and a 17.3in screen, albeit without a Full HD resolution and with a mere two cores in the processor. If you want more,

the Acer and Sony are within tantalising reach if you have the budget, and it's tough to make a convincing argument for anything dearer.

But if consumers have it easy, there's a whole other arena of portable computing that still pushes the hardware to the limit – the workstation laptop. The computing demands aren't surprising when you consider the host of tasks being carried out. From CAD/CAM work, 3D rendering and video editing, to medical imaging, seismic analysis, financial

staggeringly powerful machine. And the Lenovo, while less imposing and more portable, packs similar power into a fantastically built chassis.

The best part is that the only major components of these workstations that won't filter their way down into the consumer space are the ECC memory and the specialist graphics cards with their accompanying ISV certification. The processors are simply the latest 32nm iteration of the Core i7s inside

There are few major workstation parts that won't filter down to consumer laptops

modelling, data-mining – every one of these will tax the fastest workstations available.

We made sure we didn't neglect the workstation audience by including Dell's Precision M6400 and Lenovo's ThinkPad T510 systems, both of which are impressive pieces of kit. The Dell is upgradeable to an almost comical degree – as our previous review of the M6400 Covet demonstrates (web ID: 264793) – but even in a lesser configuration it's a

several other systems here, and laptop makers have repeatedly shown willing to cram 4GB of DDR3 RAM into the cheapest of laptops. So rather than dwelling on what makes a true desktop replacement, the real question is: how long before we're looking at £500 consumer laptops that can do everything you want in a blink of the eye?

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AMD

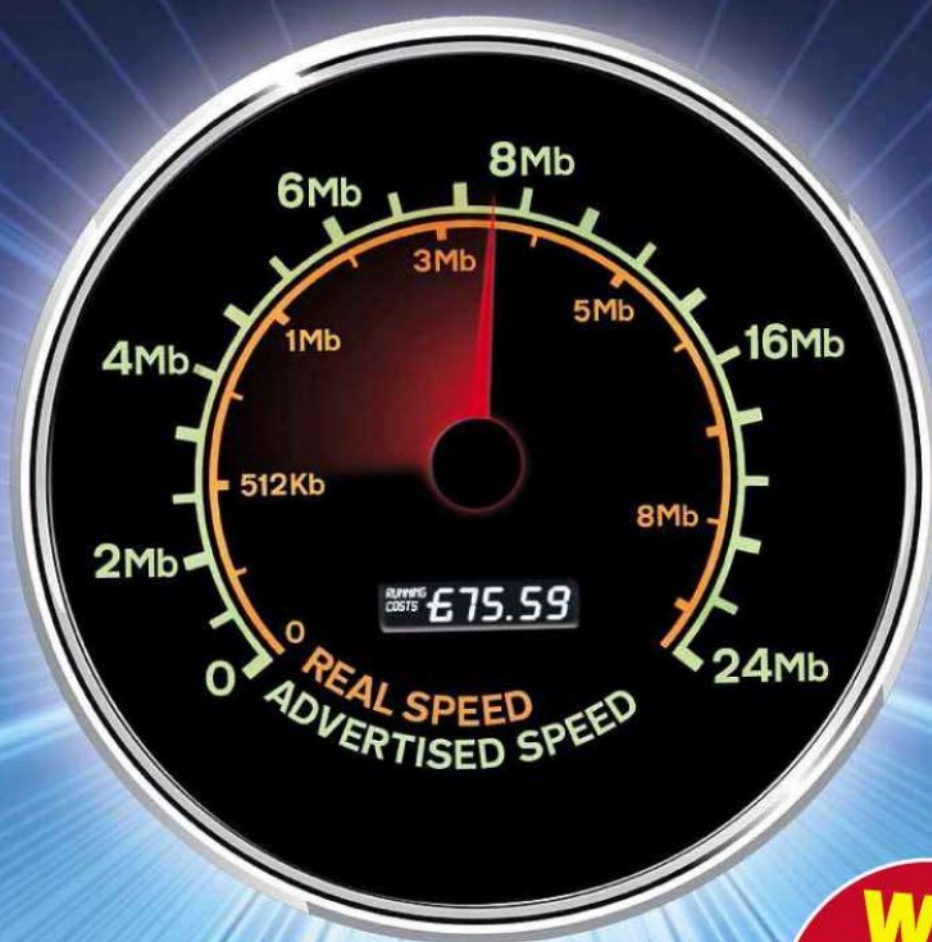


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Solid-state drives

SWITCH TO AN SSD AND YOUR LAPTOP OR PC COULD RUN FASTER AND MORE SMOOTHLY. WE TEST 18 SOLID-STATE DRIVES FOR PERFORMANCE AND VALUE

Super-fast boot times. Stutter-free Windows. Lightning-quick applications. These are the promises of solid-state drives, and with prices plummeting to well below £100 it's now possible for anyone to upgrade their laptop or desktop PC.

But buyer beware. Not every drive will deliver satisfactory performance when subjected to the demands of a multitasking Windows system and, compared to conventional hard drives, the prices are high.

This month, we've put 18 consumer SSDs to the test. They range from the Patriot PS-100 right up to Corsair's 256GB Performance Class SSD, which will set you back £476 exc VAT. With a combination of real-world tests and synthetic benchmarks, we identify which models will effortlessly

outpace their spindle-based counterparts, and which suffer from sluggish write speeds and latency issues.

We also look at some of the practical issues you should be aware of. On p92, we examine the importance of TRIM: a vital technology to keep your drives in peak condition. We consider the fine balance between size and price, and the difference between MLC and SLC drives – including why none of this month's drives is suitable for use in a server.

So, if you're ready to splash out and upgrade your personal system – or even if you're just curious about the potential of SSDs – read on. Our findings on the following pages will help you realise the full potential of solid-state storage, and can save you plenty of money as well.

Buyer's guide

Plus how we test

Choosing a solid-state drive may look like a straightforward matter of weighing performance against price, but the reality is far from simple. For a start, there's more than one way of quantifying performance – bare read and write rates indicate how quickly a drive can transfer large quantities of data, but random access performance is of importance too. Then there are issues such as firmware support and warranty. We've taken a whole spread of factors into account in determining the star ratings that accompany this month's reviews.

Performance

When buying an SSD, it's important to consider how you plan to use the drive. We suspect most SSDs are bought for use as system drives, since they can make Windows run more smoothly than any mechanical disk and allow applications to open almost instantly. If that's your intention, random access performance is just as important as the drive's sequential read and write rates, otherwise your system could stutter and stumble when you try to run multiple applications and services at once.

Typically, though, manufacturers don't cite random access performance figures for their drives, and give only theoretical maximum rates for sequential performance. To get a more complete picture of the strengths and weaknesses of the drives on test this month, we used a selection of real-world and synthetic benchmarks, plus some subjective tests. Before running these tests, we upgraded each drive's firmware to the latest version offered by the manufacturer, to ensure the best performance currently available from each model.

We then used the free AS SSD benchmarking tool (LINK) to determine each drive's capabilities in both sequential and random access operation. The results of these tests are at the foot of the table below, along with a breakdown overleaf of what they mean for the various drives.

Next, we carried out some simple file-copy tasks on each drive. Within Windows, we wrote and read a folder of 12,000 small files, plus a single 3GB file, between each drive and a RAM disk, timing the results to calculate an average transfer rate in megabytes per sec. These results can be seen in the table below, and should give you an idea of each disk's performance when used as a general-purpose data storage device.

We then installed Windows 7 on each drive and timed how long the system took to start up and display the desktop. Interestingly, we found that, regardless of which drive we booted from, the start-up time was the same: 23 seconds, versus 38 seconds when booting from a conventional hard disk (the A-Listed Samsung SpinPoint F1, see p28).

FEATURE TABLE Solid-state drives



	Corsair Extreme X32	Corsair Nova V64	Corsair P256	Crucial M225	G.Skill Falcon II	Imation M-Class	Intel X25-M	Intel X25-V	
OVERALL RATING	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	
Part code	CMFSSD-32D1	CSSD-V64GB2	CMFSSD-256GBG2D	CT256M225	FM-25S21-128GBF2	I27512	SSDSA2MH080G2R5	SSDSA2MP040G2R5	
Firmware version tested	2.1	1	VBM19C1Q	1916	1881	J090310	2CV102HA	2CV102HB	
Price (inc VAT) ¹	£96 (£113)	£132 (£155)	£479 (£563)	£400 (£470)	£221 (£260)	£84 (£99)	£165 (£195)	£79 (£93)	
Price per GB exc VAT	£3.20	£2.20	£2.01	£1.68	£1.86	£2.80	£2.20	£2.14	
Delivery	£7 (£8)	£7 (£8)	£7 (£8)	£7 (£8)	£4 (£5)	£8.50 (£10)	£7 (£8)	£10 (£12)	
Supplier's website	www.scan.co.uk	www.scan.co.uk	www.scan.co.uk	www.aria.co.uk	www.microdirect.co.uk	www.inmyshop.com	www.aria.co.uk	www.scan.co.uk	
Manufacturer's website	www.corsair.com	www.corsair.com	www.corsair.com	www.crucial.com	www.gskill.com	www.imation.co.uk	www.intel.co.uk	www.intel.co.uk	
Warranty ²	2yr RTB	2yr RTB	2yr RTB	5yr RTB	2yr RTB	5yr RTB	3yr RTB	3yr RTB	
TECHNICAL DETAILS									
Nominal capacity	32GB	64GB	256GB	256GB	128GB	32GB	80GB	40GB	
Formatted capacity	30GB	60GB	238GB	238GB	119GB	30GB	75GB	37GB	
Other capacities offered	64GB, 128GB, 256GB	128GB	64GB, 128GB	64GB, 128GB	64GB	64GB, 128GB	160GB	None	
NAND technology	MLC	MLC	MLC	MLC	MLC	MLC	MLC	MLC	
Cache	64MB	64MB	128MB	64MB	64MB	64MB	Not stated	Not stated	
TRIM support	●	●	●	●	●	Not stated	●	●	
Form factor	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	
PERFORMANCE									
Sequential read (MB/sec)	181.5	204.9	224.9	220.3	235.9	159.4	254.4	178.6	
Sequential write (MB/sec)	53.5	105.5	163.2	160.7	181.5	47.3	82.3	41.8	
4KB read (MB/sec)	27	27	25.1	25.7	26.9	17.9	21.1	19.9	
4KB write (MB/sec)	6.9	7.7	6.3	12.1	9.7	1.3	43.1	36.9	
4KB multithreaded read (MB/sec)	66.3	68.2	28.6	62.6	68.3	19.6	59.4	132.7	
4KB multithreaded write (MB/sec)	8.4	8.2	3.4	13	10.4	1.3	149.8	35.2	
Read small files (MB/sec)	65.7	69	66.2	68.1	69.1	60.2	76.5	59.5	
Write small files (MB/sec)	94	118.9	148.2	130.8	138.5	39.4	122.3	82	
Read 3GB file (MB/sec)	166.1	194.4	193.2	219.4	222.6	128.5	232.7	155.2	
Write 3GB file (MB/sec)	53.9	99.7	164.3	158.4	178.6	31.9	81.7	41.3	

Key: ● Yes, ○ No. 1. Price correct at time of going to press. 2. Warranty is parts & labour, UK mainland, unless otherwise stated.

It was a similar story with our real-world benchmarks: although applications opened more quickly from our SSDs, we saw no measurable benefit to actual application performance. So, if you're looking to boost your productivity, it's a better idea to invest in a new CPU or more RAM, rather than an SSD.

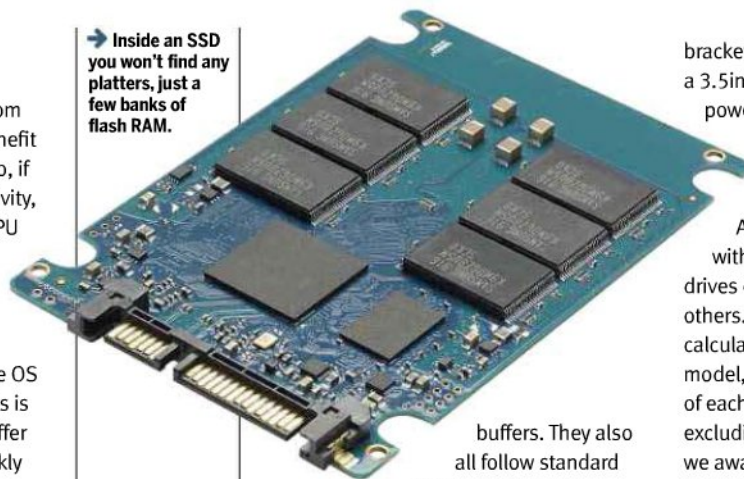
We finished up by testing each Windows installation ourselves, opening and closing windows and applications to see how smoothly the OS was able to run. Although simple, this is an important test, as some drives suffer from intermittent stuttering that quickly becomes frustrating.

Each drive's overall performance, based on the combined results of these tests, is reflected in its star rating for Performance, and any particular strengths and weaknesses are described in the text of the review.

Features

Consumer SSDs have evolved a fairly standard feature-set: all this month's contenders use MLC flash technology (see p92), with either 64MB or 128MB

→ Inside an SSD you won't find any platters, just a few banks of flash RAM.



buffers. They also all follow standard 2.5in designs, with SATA/300 interfaces, meaning you can install them in both laptop and desktop systems.

But some drives benefit from regular firmware updates (such as those that have added TRIM to recent models), while others are less well supported. The length of the warranty is worth considering too. These issues are reflected in each drive's Features score.

Some drives can be bought with optional "upgrade kits", including a

bracket to help you screw the unit into a 3.5in drive bay and a Molex to SATA power adapter. For this Labs, though, we've focused on bare drives.

Value for Money

All SSDs are expensive compared with mechanical drives, but some drives offer more for your money than others. In the table below, you'll see a calculation of price per gigabyte for each model, representing the usable capacity of each drive divided by its price excluding VAT. The Value for Money score we award reflects this price, but also factors in the drive's performance and features, so the highest score won't necessarily go to the drive with the lowest cost per gigabyte. Since the market for SSDs is fast-moving, note this calculation of value won't hold forever.

Overall

The overall score is a simple average of each drive's scores for Performance, Features and Value for Money, although due to rounding it may be higher or lower than expected.



Kingston SSDNow V Series	Kingston SSDNow V+ Series	OCZ Agility	OCZ Solid 2	OCZ Vertex	Patriot PS-100	Patriot Torqx	Samsung PB22-J	Super Talent MasterDrive GL	Super Talent UltraDrive ME
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
SNV125-S2/64GB	SNVP325-S2/128GB	OCZSSD2-1AGT120G	OCZSSD2-1C32G	OCZSSD2-1VTX30G	PS32GS25SSDR	PFZ64GS25SSDR	MMCRE28G5MXP-0VB	FTM16GL25H	FTM64GX25H
B090522a	AGYA0201	1.5	1.5	1.5	2.008	1916	VBM1901Q	090928S	1916
£106 (£125)	£210 (£247)	£238 (£280)	£77 (£91)	£92 (£108)	£55 (£65)	£132 (£155)	£239 (£281)	£60 (£71)	£167 (£196)
£1.77	£1.76	£2.00	£2.57	£3.06	£1.83	£2.20	£2.01	£4	£2.78
Free	Free	£7 (£8)	£7 (£8)	£3 (£4)	£3 (£4)	£7 (£8)	£7 (£8)	£7 (£8)	£7 (£8)
www.pcwb.co.uk	www.morecomputers.com	www.ebuyer.com	www.scan.co.uk	www.scan.co.uk	www.overclockers.co.uk	www.overclockers.co.uk	www.scan.co.uk	www.scan.co.uk	www.scan.co.uk
www.kingston.com	www.kingston.com	www.ocztechnology.com	www.ocztechnology.com	www.ocztechnology.com	www.patriotmem.com	www.patriotmem.com	www.samsung.co.uk	www.supertalent.com	www.supertalent.com
3yr RTB	3yr RTB	3yr RTB	3yr RTB	3yr RTB	3yr RTB	10yr RTB	2yr RTB	2yr RTB	2yr RTB
64GB	128GB	128GB	32GB	32GB	32GB	64GB	128GB	16GB	64GB
60GB	119GB	119GB	30GB	30GB	30GB	60GB	119GB	15GB	60GB
128GB	64GB, 256GB, 512GB	32GB, 64GB	64GB, 128GB	64GB, 128GB, 256GB	64GB, 128GB, 256GB	128GB, 256GB	64GB, 256GB	32GB, 64GB, 128GB	32GB, 128GB, 256GB
MLC	MLC	MLC	MLC	MLC	MLC	MLC	MLC	MLC	MLC
64MB	128MB	64MB	64MB	64MB	64MB	64MB	128MB	OMB	64MB
●	●	●	●	●	●	●	●	○	●
2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300	2.5in SATA/300
115	222.3	220.4	190.4	161.9	205.4	187.6	219.5	145.2	189.5
84.8	179.4	154.9	56.6	99.9	150.7	92.4	165.7	30.2	97.7
14	13.3	26.2	27.1	23.8	4.6	24.7	21.4	12.7	25.7
0.2	9.5	9.5	6	9	0.2	8.4	6.3	0.2	9.1
17.1	15.4	64.7	67.9	56.1	4.3	59.8	28.6	15.3	62.1
0.2	6.8	10.4	6.3	9.4	0.2	8.6	2	0.2	9.7
54.3	86.1	69.5	61.4	48.6	44.2	61.1	68.4	56.8	63.7
70.5	136.5	127.7	90.2	120	50.6	118.9	133.6	35	123.1
105.2	207.6	199.5	172.6	155.9	179.6	180.7	190.8	126.9	177.6
76	172.6	137.8	55.4	98.5	91.2	92.3	162.5	32.8	98.1

Results & analysis

SSD performance

Typically, when you look up the technical details of an SSD, the only performance figures you'll see are maximum sequential read and write speeds. These do give a partial indication of the relative abilities of each drive, but they're far from the whole story. The graphs on this page show the results of three different benchmarks performed by the AS SSD test suite, which we used to test every drive this month. For comparison, we also tested a mechanical hard disk – the Samsung SpinPoint F1, currently our A List recommendation.

The first graph shows measured sequential read and write rates. It's immediately clear that, when it comes to read operations of this type, even the slowest SSD beats a conventional hard disk, with the best ones yielding more than double the performance.

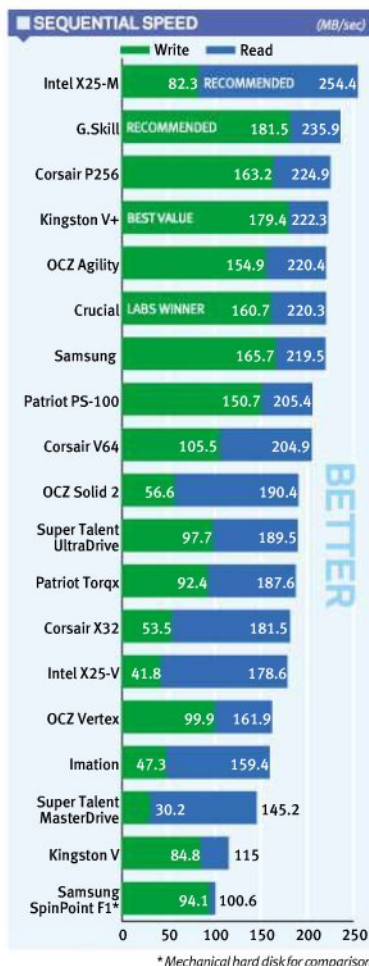
When it comes to writing, though, things are less clear-cut. It's easy to assume that all SSDs are faster than mechanical drives, but in fact nearly half our group failed to write sequential data as quickly as the SpinPoint.

Our next two graphs show random access read and write performance, again as measured by the AS SSD benchmark. The test taxed each drive with reading and writing 4KB blocks in random positions within a 1GB data file. The single-threaded test performed all reads and writes in series, while the multithreaded test launched 64 simultaneous threads of random 4KB reads and writes.

In these tests, SSDs generally fared significantly better than the SpinPoint. That's at least partly thanks to seek times: a mechanical drive must move a physical read/write head into the appropriate position over the platter before it can start to read or write data, incurring a delay of around 5-10ms each time. SSDs, conversely, can address memory cells directly without having to "seek" them first. This enables such drives to start servicing read and write requests within a fraction of a millisecond of receiving them.

RATINGS EXPLAINED

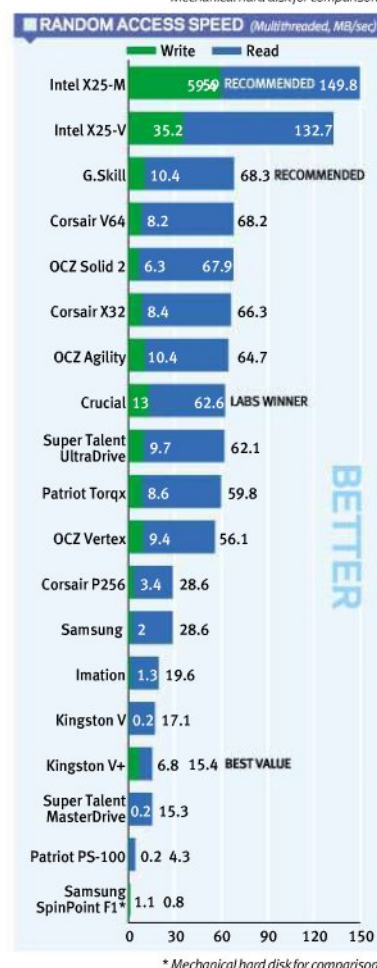
The star ratings you'll find at the bottom of each review are relative only to the products on test in any particular Labs. A one out of six rating doesn't mean the product is the worst of its type ever to be made, just the least impressive that month. Likewise, a six out of six score isn't necessarily an indication of perfection.



But although the SSDs all outclassed the SpinPoint, within the group we saw vast variations in performance, especially when it came to writing. Some drives that ranked near the top for sequential performance (such as the Corsair P256) achieved distinctly more average scores in these tests, while Intel's X25-M and X25-V models – not unequivocal winners in terms of sequential performance – sat far out in front of the rest.

Other drives, meanwhile, simply collapsed in the face of random write requests, yielding average rates of less than 1MB/sec. That's a big red flag if you're planning to use an SSD as your system drive, as your operating system is likely to spend more of its time reading and writing odd little files than accessing long streams of data.

You might take comfort from the thought that these scores are, at least, still comparable to a conventional drive. But we've found that poor random access performance is a much greater problem for SSDs than mechanical drives, yielding jerky, stuttering performance in Windows. So be warned: pick an SSD that can't handle the pace and you could end up wishing you'd stuck with your old hard disk.



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Teufel

Corsair Extreme X32 32GB

A mediocre drive, despite the name and the high price

PRICE £96 (£113 inc VAT) **SUPPLIER** www.scan.co.uk



From a self-styled "Extreme" drive we expected something special, such as an SLC design or a huge complement of cache RAM. In fact, with its MLC design, standard 64MB cache and two-year warranty, nothing obvious distinguishes the Extreme series from Corsair's newer Nova.

Indeed, in most of our tests the two models delivered similar results, including the strikingly fast 27MB/sec read rate achieved in the single-threaded 4KB read test.

In our sequential and large-file write tests, however, the Extreme was much slower than the Nova. That suggests, once its write cache is full, this 32GB unit has only half the input bandwidth of the 64GB Nova. It doesn't make the X32 unusable, but it doesn't reflect well on the drive.

The cost doesn't salvage things either. At £96 exc VAT, the Corsair Extreme X32 is well above the average price for a 32GB drive. That may add to the impression of it being something special, but the reality is performance levels are unexceptional.

PERFORMANCE



FEATURES



VALUE FOR MONEY



OVERALL



Corsair Nova V64 64GB

Corsair's latest brings nothing new to the table

PRICE £132 (£155 inc VAT) **SUPPLIER** www.scan.co.uk



The Nova is, as the name indicates, a new model from Corsair, and we hoped it would build on the latest technology to deliver unparalleled performance, or perhaps better value than older models. Sadly, it doesn't quite achieve either.

In our tests, the Nova didn't shame itself in any particular area, and in our 4KB random read test it averaged 27MB/sec – a joint first-place score. It proved more than capable of lending Windows a snappy feel. Across the whole range of tests, however, its combined scores leave it in sixth place. You can't really call this a new generation of performance.

The Nova breaks no new ground on value either. A price of £132 exc VAT for a 64GB drive is merely on a par with the Patriot Torqx, and we've seen smaller and larger drives this month that cost less per gigabyte. The standard Corsair two-year warranty is again merely as expected.

With new devices there's always scope for prices to fall, but until that happens we can't recommend the Corsair Nova.

PERFORMANCE



FEATURES



VALUE FOR MONEY



OVERALL



Corsair P256 256GB

A fine drive, but it's overshadowed by this month's Labs Winner

PRICE £479 (£563 inc VAT) **SUPPLIER** www.scan.co.uk



The "P" in this drive's name stands for Performance, and in several of our tests it acquitted itself well. Its average of 148.2MB/sec in our small-file write test was this month's best, and with large files its read and write speeds were just a few steps behind the leaders.

The 4KB tests were less encouraging. While read speeds of 22.1MB/sec single-threaded and 28.6MB/sec multithreaded are decent, write speeds of 6.3MB/sec and 3.4MB/sec are decidedly on the low side. We'd be uneasy about relying on this drive for intensive random access writes. Still, in everyday desktop use the P256 had no difficulty keeping up.

Next to the £400 Crucial M225 this drive looks overpriced, especially as the warranty is much shorter. In truth, the P256 works out less costly on a per gigabyte basis than most others this month, but the Crucial isn't only cheaper overall, it also offers more consistent performance.

The Corsair P256 is a decent drive, but since its main rival costs less and performs more consistently, it doesn't make it on to the podium.

PERFORMANCE



FEATURES



VALUE FOR MONEY



OVERALL



Crucial M225 256GB

A huge drive that's blazingly fast in every category

PRICE £400 (£470 inc VAT) **SUPPLIER** www.aria.co.uk



It isn't cheap, but the 256GB Crucial M225 is capacious enough to be the only drive in your system. That makes it ideal if you're looking to upgrade a laptop, and for desktop systems the single-drive option could help keep internal spaghetti cabling to a minimum.

Although the up-front cost is high, the M225 is one of this month's best-value options, working out at £1.68 per gigabyte. Platter-based drives cost a tenth as much, but for an SSD this is exceptional.

The real attraction is its performance. Although the M225 didn't come top in our tests, it came close in every single exercise. Sequential read and write speeds of 220.3MB/sec and 160.7MB/sec easily outpace a traditional drive, and strong results in the multithreaded read and write exercises ensure snappy performance no matter how you use your PC.

If your wallet won't stretch to a drive this size, a smaller SSD such as the G.Skill Falcon II or OCZ Agility will give similar performance. But the M225's value, plus its five-year warranty, makes it our first choice.

PERFORMANCE



FEATURES



VALUE FOR MONEY



OVERALL



G.Skill Falcon II 128GB

One of this month's star performers, and good value to boot

PRICE £221 (£260 inc VAT) **SUPPLIER** www.microdirect.co.uk



G.Skill specialises in memory products, so it should know about squeezing the best from a RAM chip. That's confirmed by a stellar set of test results: the Falcon II ranked first or second in no fewer than seven of our ten performance measurements. That includes a sequential write rate of 181.5MB/sec – 80% faster than a platter-based disk.

The Falcon II's performance in the 4KB random read and write tests was notable too; if it hadn't been for Intel's drives wrecking the curve, the G.Skill would have vied with the Crucial M225 for first place here too.

We saw no slowdown in Windows, no matter how many applications we ran, and we doubt that even hard-core database operations would faze the G.Skill (although as an MLC drive it isn't ideal for such a role; see p92).

At £1.86 per gigabyte, the Falcon II isn't quite the cheapest deal here, and you're looking at a two-year warranty versus the Crucial's five. When you consider you're buying best-in-class performance, however, those are easy reservations to swallow.

PERFORMANCE ★★★★★★ **FEATURES** ★★★★★☆ **VALUE FOR MONEY** ★★★★★★ **OVERALL** ★★★★★★

Imation M-Class 32GB

A stuttering slowcoach of a drive – steer clear of this one

PRICE £84 (£99 inc VAT) **SUPPLIER** www.inmyshop.com



Imation's M-Class has been knocking around since last May, and in such a fast-moving market that's cause for concern. Couple it with the complete absence of firmware updates for some batches of drives, plus the lack of stated support for TRIM or performance-restoring secure erase functions, and the alarm bells should be deafening.

Perhaps if the M-Class were a lightning-fast device we could overlook a few shortcomings. Sadly, its performance in our sequential read test was merely middling, and in the rest of our tests it fared distinctly worse.

In the 4KB write tests the M-Class averaged a pathetic 1.3MB/sec, and it managed just half the speed of a conventional hard drive when writing large files. It also visibly hiccupped during our desktop benchmarks.

For those reasons, we couldn't recommend the M-Class at any price, and especially not at £84 exc VAT, which is equivalent to £2.80 per usable gigabyte. On the upside, it comes with an exceptional five-year warranty, but that's the only positive.

PERFORMANCE ★★☆☆☆☆ **FEATURES** ★★★★★★ **VALUE FOR MONEY** ★★★★★★ **OVERALL** ★★☆☆☆☆

Intel X25-M 80GB

A grown-up drive with phenomenal random access performance

PRICE £165 (£194 inc VAT) **SUPPLIER** www.aria.co.uk



The original X25-M was the first mainstream drive to deliver a compelling performance leap over conventional hard disks, and this latest version – now with 34nm RAM chips – continues the good work.

Its sequential read speed of 254.4MB/sec nudges up against the technical abilities of the SATA/300 interface, but the real *tour de force* is random access write performance. Here, the X25-M achieved 43.1MB/sec single-threaded and a stunning 149.8MB/sec multithreaded. That's more than four times the maximum achieved by any non-Intel drive, so even the most intensive operations will run without a hitch.

Sequential write speeds are oddly mediocre at 82.3MB/sec; enough for everyday use, but hardly blazing. And the price isn't exactly a steal, working out at £2.20 per gigabyte. But what you get for that is random access performance that no other manufacturer can match, plus a three-year warranty. It's probably overkill for the average desktop, but if you need to do occasional heavy lifting, this is the drive to go for.

PERFORMANCE ★★★★★★ **FEATURES** ★★★★★★ **VALUE FOR MONEY** ★★★★★★ **OVERALL** ★★★★★★

Intel X25-V 40GB

Blazingly fast for random access operations, but not a winner overall

PRICE £79 (£93 inc VAT) **SUPPLIER** www.scan.co.uk



First, the good news: the "value" version of Intel's mainstream SSD retains the superb random access write performance of its big brother. Surprisingly, we found it gave even better performance in the multithreaded 4KB read test. That means it's a drive you can rely on not to freeze up in the face of extreme multitasking.

Sadly, although the X25-V delivers a smooth ride, its peak performance is nowhere near as impressive as that of the X25-M. This cheaper drive took 50% longer to read a large file, and twice as long to write it back. That leaves it barely faster than a conventional hard disk at reading large files, and when it comes to sequential writes it's actually slower.

It's a shame, because outwardly the Intel cachet is all here: the three-year warranty, the serious but not exorbitant price, and even a little sticker to go on your PC case proclaiming "my SSD rocks!". If you have an occasional need to thrash a big database the X25-V could help, but if you want a drive to accelerate your everyday computing, this isn't it.

PERFORMANCE ★★★★★★ **FEATURES** ★★★★★★ **VALUE FOR MONEY** ★★★★★★ **OVERALL** ★★★★★★

Kingston SSDNow V Series 64GB

It looks like a good deal, but poor performance means it's a dud

PRICE £106 (£125 inc VAT) **SUPPLIER** www.pcwb.co.uk



With a low price of £1.77 per gigabyte, the SSDNow V Series looks a tempting option if you just want an affordable drive to hold your OS and a few applications. Sadly, the performance isn't there.

Its sequential read speed was the lowest of the group, barely faster than a conventional drive, and sequential write speeds were slower. Performance in our small-file-copying tests was disappointing too, with the V Series just a hair's breadth above last place in our read tests and some way below the average at writing. The deal-breaker was a disastrous performance in our random access write tests: in both the single- and multithreaded tests the drive averaged an atrocious 200KB/sec.

In other words, the V Series simply won't deliver the performance boost you expect from an SSD, and is even likely to slow your computer down in some applications. That makes it a poor investment, regardless of the low price and three-year warranty. If you fancy a low-cost Kingston drive, check out the far more attractive V+ Series.

PERFORMANCE

★★★★★

FEATURES

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

Kingston SSDNow V+ Series 128GB

A nippy drive with good capacity and excellent performance for the money

PRICE £210 (£247 inc VAT) **SUPPLIER** www.morecomputers.com



Kingston claims its V+ Series uses "innovative" NAND flash memory. Kingston doesn't make it clear how this differs from the regular stuff, but it's certainly a better drive than the V Series. In our large-file read and write tests it achieved speeds of 207.6MB/sec and 172.6MB/sec, placing it close to first place. In the write test, it lost out only to the G.Skill. Its performance in our challenging 4KB tests was less distinguished, but not a disaster: we didn't notice any stuttering at the Windows 7 desktop.

What really makes the V+ Series stand out is its price: at £210, this 128GB SSD is much cheaper than the competition, with a cost per gigabyte that's on a par with our Labs-winning Crucial. The three-year warranty is good too, and will probably see you through the drive's life.

Although this particular unit may not realise the full potential of solid-state technology, it delivers that distinctive SSD smoothness while keeping the price bearable. We think that's a sensible compromise, and we're happy to recommend it as a result.

PERFORMANCE

★★★★★

FEATURES

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

THE STATE OF SOLID

The SSDs in this month's Labs are designed as drop-in replacements for conventional hard disks, and in everyday use they should behave just like their platter-based predecessors. After you install one, the biggest changes you can expect to see are your OS and applications loading up more quickly, and file transfers taking less time to complete.

But moving to SSD technology does raise some issues that don't apply to mechanical disks, and before you take the plunge it's important to understand them.

Size and price

Conventional hard disks are cheap. Shop around and you can buy a 1TB drive – big enough to store an entire library of home videos and music – for around £50. So as consumers we tend to buy far more space than we really need.

But, as this month's Labs clearly indicates, SSDs are expensive – typically costing some 30 times as much per gigabyte as an old-style spinning disk. So it's worth asking yourself some difficult questions about exactly how large a drive you need. For desktop systems, you can save a lot of money by choosing a

small SSD to hold your operating system and leaving personal data on a secondary, conventional drive. If you're upgrading a laptop, of course, your options are more limited.

On the other hand, you also should be aware that larger drives typically perform better than smaller models (one reason being that a design with more physical chips gives more scope for parallel transfers). It's a good idea to compare the manufacturer's quoted transfer speeds across different capacities before investing, especially if you're considering buying a drive from this month's Labs in a different size to the model we tested.

MLC vs SLC: speed and endurance

The flash memory chips used in SSDs come in two types. Multi-Level Cell (MLC) chips store two bits of data per addressable "cell" on the chip, while Single-Level Cell (SLC) chips store only one bit at each address. SLC chips are faster, especially when it comes to writing data, but since each cell yields only half the storage capacity of an MLC chip, it's twice as expensive to produce. That's why nearly all consumer SSDs use MLC technology.

As the market matures over the next few years, though, manufacturing costs may fall enough to make mainstream SLC drives a realistic proposition.

SLC chips have one other advantage over MLC: they last longer, or to be more precise more data can be written to them before they start to fail. Intel's MLC-based X25-M, for example, has an advertised write endurance of 35TB, while the 64GB X25-E, based on SLC technology and aimed at enterprise roles, is good for an immense 2PB of data.

This isn't an issue you need to worry about if you're buying an SSD for everyday desktop use, and most manufacturers don't even cite write endurance figures for their MLC models. But if you're building a business-class server that expects to handle a heavy volume of transactions, it's a reason to be cautious of consumer drives.

Drive geometry

Conventional hard disks are divided up into sectors, tracks and so forth. Such divisions are fundamentally meaningless in relation to SSDs, but these drives are designed to emulate the geometry of a conventional hard disk to ensure

OCZ Agility 128GB

Perfectly good performance and price, although not quite a winner

PRICE £238 (£280 inc VAT) **SUPPLIER** www.ebuyer.com



OCZ offers a few different ranges of SSD, this being its mainstream model. Happily, there's little compromise here, with the Agility a strong performer across all our tests.

It isn't a hands-down winner, however. As with the Crucial M225, the Agility didn't quite manage to take the gold in any one test, finishing around fourth or fifth overall. Read speeds were strong, though, and for real-world use we doubt you'd notice the difference between this drive and the Crucial or the G.Skill for either sequential or random access use.

Write speeds were more mediocre, but with solid random access write speeds of 9.5MB/sec in the single-threaded test and 10.4MB/sec in the multithreaded one, the drive won't grind your system to a halt.

OCZ's three-year warranty is generous too, and at an effective price of precisely £2 per gigabyte (based on formatted capacity) it's an affordable drive by SSD standards. Although its performance isn't quite up there with that of the high-flyers, the Agility is a good product that won't disappoint.

PERFORMANCE

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FEATURES

★★★★★☆☆

VALUE FOR MONEY

★★★★★☆☆

OVERALL

★★★★★☆☆

OCZ Solid 2 32GB

One of the cheapest SSDs around, but performance is poor

PRICE £77 (£91 inc VAT) **SUPPLIER** www.scan.co.uk



Solid 2 is OCZ's value range, and at £77 this is one of the cheapest 32GB models around. Larger drives generally offer more storage per pound, though, and we weren't impressed by the Solid 2's performance.

In our large- and small-file copy tests the Solid 2 was in the lower half of the pack, and a particular low point was sequential write speeds. Here, the drive's average write rate of 56.6MB/sec was much slower than that of a conventional hard disk, and less than a third of the rates achieved by the Crucial M225 and G.Skill Falcon II.

The Solid 2 did unexpectedly well in our random access read test, however. With rates of 27.1MB/sec single-threaded and 67.9MB/sec multithreaded it all but led the pack, losing out only to the mighty Intel. Write performance was poor, though, at around 6MB/sec in both tests.

So, despite the low headline price, the Solid 2 is a questionable investment. If you can muster the cash, a 128GB or 256GB drive will yield both better performance and more storage for your money.

PERFORMANCE

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VALUE FOR MONEY

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OVERALL

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compatibility with existing operating systems and software.

It isn't a perfect fit, though, and this has implications if you're migrating your system from a platter-based drive to an SSD. If you simply image your current system onto the new drive, the arrangement of the sectors may not match up properly with the 4KB storage sectors used by an SSD – and that could significantly degrade performance.

Happily, the solution is simple: use the disk tools built into Windows Vista or Windows 7 (or their respective setup routines) to initialise, partition and format your new drive. The OS or installer will automatically align all partitions so that the layout of the file system properly matches up with the internal geometry of the SSD. Yes, this means you'll have to perform a fresh installation of Windows and all your applications; but if you want to get the best from a solid-state drive, this is the way to do it.

TRIM

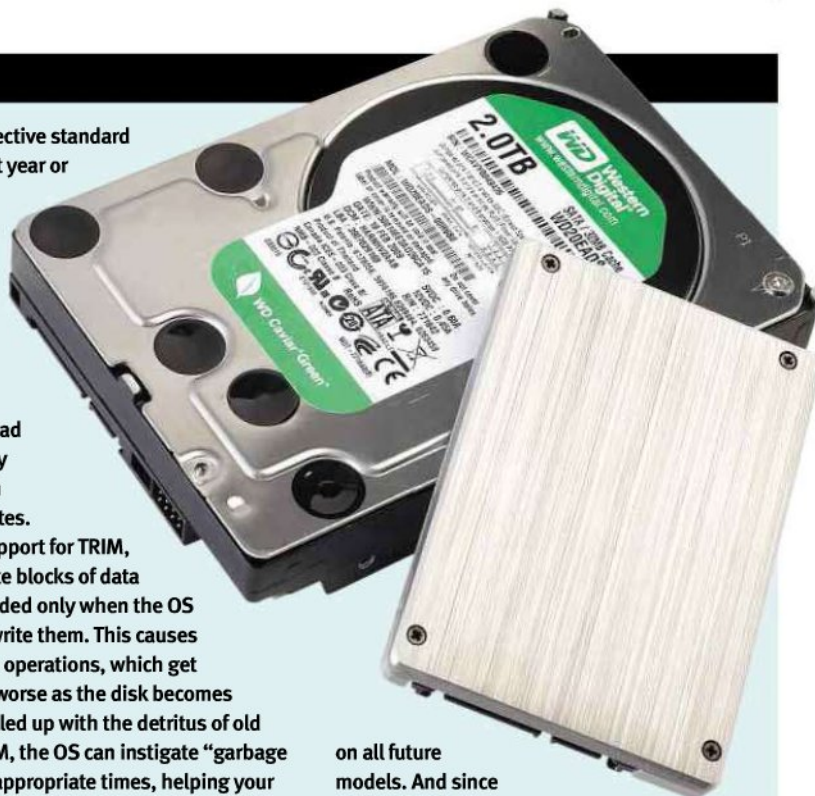
TRIM is a low-level command issued by the operating system to tell a solid-state drive to erase the data left behind by deleted files. This may sound like an obvious feature, but it's only

become an effective standard within the past year or so. Indeed, several of the drives in this month's Labs were originally released without TRIM support, and had it subsequently added through firmware updates.

Without support for TRIM, SSDs will delete blocks of data that aren't needed only when the OS wants to overwrite them. This causes delays to write operations, which get progressively worse as the disk becomes increasingly filled up with the detritus of old files. With TRIM, the OS can instigate "garbage collection" at appropriate times, helping your SSD to maintain peak performance even after years of use.

Happily, almost all of this month's drives support TRIM, and it's certain to be standard

on all future models. And since it's built into Windows 7, users of Microsoft's latest OS get the benefit automatically. If you're running XP or Vista, though, you're out of luck.



OCZ Vertex 32GB

An older drive that can't compete with the best modern devices

PRICE £92 (£108 inc VAT) **SUPPLIER** www.scan.co.uk



Vertex is supposed to be OCZ's performance brand, but this drive has been around for a year now, which by SSD standards makes it old. It's actually slower than OCZ's mainstream Agility drive.

Sequential performance is normally a strength of SSDs, but with read and write speeds of 161.9MB/sec and 99.9MB/sec the Vertex is only around 60% as fast as this month's front-runners. Random access results were stronger: the Vertex doesn't come close to the performance of the Intel drives, but it's only a smidge behind the blazing G.Skill Falcon II.

At a steep £3.06 per gigabyte, however, the Vertex is a tough sell. OCZ also offers a Vertex Turbo range of drives, promising a 25% improvement in sustained write performance, which would put the range roughly on a par with the Corsair Nova. The downside is that prices are even higher, working out around £3.60 per gigabyte for the 30GB model.

In short, the Vertex isn't dreadful, but its performance is overshadowed by newer drives. More importantly, the price simply doesn't add up.

PERFORMANCE ★★★★★ **FEATURES** ★★★★★ **VALUE FOR MONEY** ★★★★★ **OVERALL** ★★★★★

Patriot PS-100 32GB

It's cheap, but with performance like this the PS-100 isn't worth it

PRICE £55 (£65 inc VAT) **SUPPLIER** www.overclockers.co.uk



At £55, the PS-100 is the cheapest SSD in this month's test, and works out at a seductive £1.83 per gigabyte.

Alas, as our tests reveal, this is one situation where you get what you pay for. The PS-100 came last in every one of our random access read and write tests, achieving a shocking average write speed of just 200KB/sec. Performance in our small-file copy tests was significantly worse than a conventional drive too. Suddenly, it doesn't look like such a bargain.

The drive did perform more creditably in our sequential and large-file tests, turning out read and write speeds that were just the right side of the group average. If you have a specialist application that relies on long sequential transfers, the PS-100 could be just the ticket.

As a system drive for running Windows and applications, however, the Patriot's dreadful 4KB performance points to a stop-start experience that falls far short of what a faster drive will deliver. For that reason, we simply can't recommend it.

PERFORMANCE ★★★★★ **FEATURES** ★★★★★ **VALUE FOR MONEY** ★★★★★ **OVERALL** ★★★★★

Patriot Torqx 64GB

A solid performer that does the job, but it doesn't dazzle

PRICE £132 (£155 inc VAT) **SUPPLIER** www.overclockers.co.uk



After the dreadful PS-100, Patriot's far more capable Torqx comes as a relief. We can't endorse the claims of "fastest SSD in the world" that adorn the packaging, though. It didn't come anywhere near first place in our tests, on average achieving a solid mid-range score.

When it came to multithreaded random read performance, however, the Torqx did rather well. Although its score of 59.8MB/sec doesn't approach the Intel X25-V's astonishing 132.7MB/sec, it isn't far off the likes of the Crucial M225 and the OCZ Agility. That could make this a good drive for everyday multitasking, as long as your applications rely more heavily on reading data than writing it.

The Patriot Torqx has one other big point in its favour: it comes with an unparalleled ten-year warranty, which will surely see you through the lifetime of the drive. If you can live without that comfort, though, it makes more sense to go with the 64GB Corsair Nova instead, which costs the same and performs that little bit better overall.

PERFORMANCE ★★★★★ **FEATURES** ★★★★★ **VALUE FOR MONEY** ★★★★★ **OVERALL** ★★★★★

Samsung PB22-J 128GB

An adequate drive, but we expected better from Samsung

PRICE £239 (£281 inc VAT) **SUPPLIER** www.scan.co.uk



Samsung has an impeccable track record as a manufacturer of conventional hard disks. Its units have topped our A List for more than two years. However, the PB22-J makes a mixed impression.

First, the good news. Sequential transfers are fast, with only the G.Skill and the Kingston V+ Series beating the PB22-J in sequential writes. With smaller chunks of data, however, the Samsung was a disappointment. With 4KB write speeds of just 6.3MB/sec single-threaded and 2MB/sec multithreaded it was firmly in the bottom half of the group, and in our small-file read and write tests its performance was below average.

Despite these uninspiring scores, the Samsung had no problem keeping Windows and our test applications running happily without jolts or freezes – assisted, no doubt, by its unusually large 128MB cache.

Yet the G.Skill Falcon II, despite its smaller cache, outclassed the Samsung in every test, ran Windows just as smoothly, and costs £18 less. In the face of competition like that, the PB22-J is an also-ran.

PERFORMANCE ★★★★★ **FEATURES** ★★★★★ **VALUE FOR MONEY** ★★★★★ **OVERALL** ★★★★★

Super Talent MasterDrive GL 16GB

A tiny drive with atrocious performance. Steer well clear

PRICE £60 (£71 inc VAT) **SUPPLIER** www.scan.co.uk



As the smallest drive here, the MasterDrive GL isn't super-economical, working out at £4 per gigabyte; but the headline price is low and 16GB is enough to hold Windows and a few applications, so it's tempting to give the MasterDrive a whirl.

If you do, you'll regret it. It came last or second to last in eight of our ten tests. Its sequential write rate of 30.2MB/sec is on a par with an external USB drive, and although a read speed of 145.2MB/sec is quicker than a conventional hard disk, for an SSD it's decidedly sub-par.

In our random access write tests, the Super Talent averaged just 160KB/sec. That reflects a horrifically sluggish write process, which was also clearly discernible when we installed Windows on the MasterDrive. Little freezes were a frequent, unpredictable, occurrence.

Such were our findings with a brand-new drive and, since there's currently no TRIM support, you can expect the MasterDrive's performance to become even worse with use. It's most definitely one to avoid.

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Super Talent UltraDrive ME 64GB

A serviceable drive, but it's undistinguished in this company

PRICE £167 (£196 inc VAT) **SUPPLIER** www.scan.co.uk



The UltraDrive ME addresses the faults of its cheaper sibling. It brings TRIM support, works out at a more reasonable £2.78 per gigabyte, and offers dramatically better performance.

That doesn't make it a winner, but it does at least make for a usable drive. Sequential read and write speeds of 189.5MB/sec and 97.7MB/sec are just below the group average. It's a similar story with random access writes. Other drives do far better, but the average random access write speeds of 9.1MB/sec single-threaded and 9.7MB/sec multithreaded are fast enough to prevent intermittent pauses in Windows.

The UltraDrive's random access read performance, meanwhile, is positively impressive, matching the Labs-winning Crucial M225 and nipping at the heels of the G.Skill Falcon II.

That isn't enough to base a recommendation on, especially at this price and with a run-of-the-mill two-year warranty. All the same, it points in a promising direction for future Super Talent drives.

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VIEW FROM THE LABS DARREN GRAHAM-SMITH



Last year, you could justifiably have called solid-state storage an immature technology. SSD write speeds were distinctly iffy, performance was apt to drop off over time, and prices were discouraging to say the least.

But progress has come quickly. This month, we've seen several SSDs outstrip conventional disks in both read and write performance, while the near-universal adoption of TRIM has addressed long-term degradation issues.

Prices are settling down too, with this month's drives clustering around the £2 per gigabyte mark. That's still high compared to mechanical drives, but it means you can now get an SSD big enough to hold your OS for an eminently affordable £100.

And there's plenty of scope for further progress. Performance can only keep improving, and with SATA/600 already starting to appear on motherboards, there's no reason why future models shouldn't achieve double or triple the throughputs offered by current drives. As we discuss on p92, advances in memory cell technology could make SLC drives

more affordable too, bringing their increased write performance and longer lifespans to the mainstream market.

Such changes won't happen overnight, but you've only to look at the CPU and RAM markets to see how quickly semiconductor technology can advance when it's driven by demand. And the rapid evolution we've seen of late in the SSD market suggests that the snowball is already rolling.

For now, you should consider an SSD a luxury, rather than a functional upgrade

As a potential customer, of course, that gives you a dilemma. Should you invest now, or wait a year or two for a cheaper, faster device? It's a perennial problem when it comes to new technology.

And it bites particularly sharply here because if you look objectively at the state of the market, it's clear that SSDs are still a work in progress. Yes, they're significantly faster than conventional hard drives; they're also quieter and consume less power. But prices

remain high, capacities remain small and, as we discovered in our benchmarks, when it comes to typical desktop applications SSDs yield no measurable improvement in productivity over spindle drives.

That's not to say there's no benefit to be had: if your PC spends a substantial proportion of its time churning through disk-intensive processes then by all means leap at one of this month's winners and reap the benefits.

But for everyday use it's clear that SSDs aren't yet ready to displace mechanical drives. As much as this Labs indicates how quickly the technology is moving into the mainstream, it equally confirms that it isn't there yet.

There's nothing stopping you treating yourself to an SSD – it just means that, for now, you should consider it a luxury rather than a functional upgrade.

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NAME: APPLE IPAD
RELEASE DATE: 3 APRIL 2010
PRICE: FROM \$499
SCREEN: 9.7in
OS: APPLE IPHONE 3.0



NAME: LENOVO IDEAPAD UI
RELEASE DATE: 1 JUNE 2010
PRICE: \$999
SCREEN: 11.6in (DETACHABLE)
OS: LENOVO SKYLIGHT (LINUX)



NAME: HP SLATE
RELEASE DATE: LATE 2010
PRICE: UNCONFIRMED
SCREEN: 9-10in (UNCONFIRMED)
OS: MICROSOFT WINDOWS 7



Illustration: www.magictorch.com

Slates: Future or iFad?



NAME: ARCHOS 7 HOME TABLET
RELEASE DATE: APRIL 2010
PRICE: £130
SCREEN: 7in TOUCHSCREEN
OS: GOOGLE ANDROID 1.5



NAME: SONY DASH PERSONAL-INTERNET VIEWER
RELEASE DATE: 15 APRIL 2010 (US ONLY)
PRICE: \$199
SCREEN: 7in
OS: CHUMBY



NAME: DELL MINI 5 (UNCONFIRMED)
RELEASE DATE: LATE 2010
PRICE: UNCONFIRMED
SCREEN: 5in
OS: GOOGLE ANDROID 2

If even Apple acolytes aren't swayed by the iPad, will slates ever catch on? **Tim Danton** uncovers why they could be the hot technology of 2010

The personal computer is over 30 years old, and in that time the closest we've come to a revolutionary change in form factor is the laptop. Is it unreasonable to think a new type of device is coming? Judging from the reaction to Apple's iPad, you'd have thought not. "Another piece of locked-in proprietary bling for the easily pleased," commented Mango on the *PC Pro* blogs. "I see nothing here of value

except the Apple 'cool factor' and a sleek interface, for which you pay a LOT of money", weighed in the modestly titled "some bloke".

But there are a number of auspicious signs for the iPad, and slates as a whole. In this feature, we go behind the headlines to speak to the people beavering away in the hope slates will catch on, with the aim of answering one simple question: are slates the future or just an iPad?

THE RIGHT TIME, THE RIGHT PRICE

□ For a new type of product to break through, the price has to be right. Indeed, HP claims it could have released its slate device in 2008, but it deliberately held off.

"The reason we think 2010 is the optimal year for the slate platform is around what I call a perfect storm of innovation," said Phil McKinney, HP's chief technology officer. "It's around the fact that there's now this convergence of low-cost, low-power processors, [and the arrival of] Windows 7, an operating system that is touch-aware."

The key factor is cost. McKinney claims the HP slate would have sold for around \$1,500 two years ago, and while the company is yet to announce pricing, he promises "a mainstream price point" that will have to be similar to the Apple iPad to compete.

Certainly, many industry pundits were pleasantly surprised by Apple's pricing. For the most basic model, \$499 is difficult to criticise when you're getting a slickly designed slate with a 9.7in screen that uses IPS technology; this brings wider viewing angles and better colour accuracy than standard TFT panels.

However, market watchers insist that a low price alone isn't enough. "If people aren't going to find it useful then even if it costs £100 no-one's going to buy it," said Eszter Morvay, research manager for analysts IDC. "If operators are going to subsidise it then it's probably even going to be free, but if people find it useless or have something that does the same or more, then why spend the money?"

This puts the Sony Dash in an interesting position. It will launch in the US in April at an iPad-undercutting \$199. That's about the same price as the Chumby (web ID: 252754), the quirky device that uses third-party "widgets" to view anything from Gmail to a BBC News bulletin, and the Dash supports all the same widgets. The Chumby became a cult success, and with the Dash adding features such as support for streaming movies and TV shows and a web browser, theoretically it should do even better.

So if the price is right, and the technology is all in place, why isn't Sony releasing its Dash device in Europe in the



foreseeable future? "We think that the tablet form factor will challenge the shape of the market, but it will probably be 12-18 months before we see anything resembling mass-market adoption," said Sony's UK head of network communications, Anthony Brown.

Despite this, Brown acknowledges that we're now in a far better position than ever before: "The world has changed, with cloud computing, apps, 3G, and so on. We can be 'always on' and accessing content, but unless the hardware and content are joined as a proposition, it doesn't work."

Dell has made no announcement on price, but we expect its 5in slate – provisionally called the Dell Mini 5 – to

sell for a subsidised cost of around \$200. The Mini 5 will be sold via phone networks, in the same way as smartphones are today.

"If you're willing to pay a price that's around what a smartphone is today, then you're one of the people we'd be targeting for a slate," said Neeraj Choubey, Dell's general manager of tablets. "The devices share most, if not all, of the components of a smartphone, so the price won't vary significantly from a smartphone, at least initially."

So we come back to Eszter Morvay's point: will slates be compelling enough for people to pay up?

WHAT SLATES CAN'T DO

□ Let's start with the obvious: slates don't include keyboards. This means slates will be best suited for consumption of content, as opposed to content generation. Even then, insists Morvay, they lack appeal: "There's so much you can't do with a 10in tablet it's incredible. Are you going to watch a film or play games? No, you're not."

This raises an interesting point. When someone buys a slate, will they expect a device that delivers a similar set of features to a PC, or one closer to a smartphone? A lot of people were so disappointed they couldn't use programs such as Microsoft Office on their Linux netbooks that they simply returned them to the store. This never happens with a smartphone: you don't expect to make sweeping changes to a spreadsheet when the screen is 3in wide.

A quick glance at the latest *PC Pro* reader survey (see table, above right) shows there's still a set of tasks that people use their home and work computers for. Top of the list is email, with web browsing, word processing and photo editing not far behind. Of all the tasks in the top five, only web browsing jumps out as something a slate could be better equipped for than a conventional PC or laptop.

Steve Jobs went even further at the iPad's unveiling back in January. "What this device does is extraordinary. It is the best browsing experience you have ever had," he said. "It's way better than a laptop, way better than a smartphone."

Until, that is, you hit a website that requires Flash. By ignoring this rather

SECRET OF ITS SUCCESS

1972 PERSONAL COMPUTER

Home computers seemed a ridiculous concept in the 1960s, with computing restricted to scientific and corporate roles alone. Within a decade, and thanks in large part to IBM's decision to license its PC design, they became an unstoppable force.

While early sales were driven by hobbyists and programmers, soon a flood of people wanted to write documents, play games and learn: forget 26 hardbacks, Encarta turned a computer into an encyclopaedia. The deal was sealed by the rise of the internet.



WHAT DO PEOPLE USE THEIR PCs FOR?	
Email	95.8%
Word processing	82.8%
Web browsing	80.1%
Photo editing	76.5%
Accounts/spreadsheets	66.9%
Music - listening	66.9%
Games	48.2%
Social networking	42.2%
Database work	40.4%
Desktop publishing	34.9%
Internet telephony	33.1%
Video editing	31.3%
Web design	29.5%
Programming	27.4%
Music editing	22.9%

Source: PC Pro reader survey, February 2010

important little technology, Apple is cutting out a huge number of sites. If you have children, for instance, you'll be well aware of sites such as www.nitrome.com that use Flash to deliver free games, and it's also the choice for sites such as Disney and FarmVille. Then there are those minor news resources, www.bbc.co.uk and www.cnn.com, which use Flash for embedded videos.

Jobs also claimed that the iPad was a superb choice for email, but the sheer size of the device meant that during the demo he had to rest it on his lap when typing on the onscreen keyboard. You can use two thumbs to bash out text on the iPhone, whereas the iPad's bulk means that if you're standing you'll only ever have one hand free to tap away.

Which begs the question: of the 15 top tasks for which *PC Pro* readers use their computers, how many would the iPad excel at? Just as with web browsing, there's an argument for social networking and games – the accelerometer built into the iPad gives it some unique advantages, after all – and possibly even internet telephony. Being generous, we could say five out of the top 15. That still leaves ten tasks you're better off tackling with a laptop.

Of all the slates, only HP's runs the full-blown x86 operating system that is Windows 7. Theoretically, that means it could handle all the tasks we've listed here, with the help of a wireless keyboard, but we can't ignore Phil McKinney's use of the phrase "low power" processors. That cuts out the niche uses such as programming, video editing and database work, and restricts the speed of photo editing.

Lenovo is taking a completely different approach with the IdeaPad U1. Announced at this year's Consumer Electronics Show, it looks at first glance like any other laptop. "The rather special thing about it," explained Michael Littler, strategic marketing manager for Lenovo's IdeaPad division, "is that it transforms itself and splits in two. You can actually remove the entire screen, separate it from the notebook, and use it as a touchscreen tablet."

When you want to use it as a slate, you press two catches to release the screen from the confines of the lid. The main machine will continue plugging away in Windows 7 (you can hook up a normal screen separately), but the slate uses a Lenovo-customised version of Linux. "It's connected to Wi-Fi, you can connect to 3G, you can access all the photos, all your multimedia stuff," said Littler. "You're actually buying two computers in one."

The IdeaPad U1 is intelligent enough to synchronise your pictures and remember what website you were looking at under Windows 7, but by using its own version of Linux there's little doubt that Lenovo has hampered the machine's appeal. Having played with the U1 at CES, it can't rival Google's Android or the iPhone OS for usability.

WHAT SLATES CAN DO

☐ Enough negativity. We can't lose sight of all the amazing things that a slate will do that a laptop, desktop PC and even smartphone can't – or at least,



SECRET OF ITS SUCCESS

1975 LAPTOP



Once the idea of computers being personal took off, it was pretty obvious people would want to carry them around. Indeed, the concept was mooted by Xerox PARC back in 1968. While luggables such as the Compaq Portable, which effectively stuffed desktop components into a transportable chassis, were never going to attract mainstream buyers, business users jumped on laptops as soon as technology allowed for better batteries, flat screens and low-power components. They finally overtook sales of desktop PCs in the latter half of 2008, boosted by sales of a new subcategory: netbooks.

not as well. Much of the hype surrounding slates is about media consumption, and it's no surprise that traditional entertainment device manufacturer Archos is introducing its own "slate" in the Archos 7 Home Tablet. But Dell's Neeraj Choubey insists that, for slates to succeed they need to go beyond entertainment.

"This is a device that screams video," he said, referring to Dell's forthcoming 5in tablet. "It screams media consumption, look at my photos, look at my video, browse the web, look at websites in the manner the publishers meant them to be seen... but when you get to larger form factors, one of the things I'm really trying to get developers excited about is not just the media consumption on the device, it's about 'how do I make this a neat productivity tool?'"

"How do I address the needs of the consumer multiple times during the day? If I have a larger form-factor device and let's say that device is in the kitchen, what can I do with that device? What are the applications that would be interesting for a user that's in the kitchen?"

At the moment, this is all conjecture. While Dell is in discussion with developers, unlike Apple it hasn't pinned its colours to the mast and said what applications it will be launching with, or given any idea what its developer partners are working on.

One key inclusion to note, however, is GPS. This tiny piece of technology has already inspired dozens of smartphone applications that go way beyond satnav,

from practical tools such as a cycling route tracker to Rightmove's handy iPhone app, which reveals the details of properties on sale close to wherever you're standing.

Accelerometers also add an extra dimension to a slate's capabilities. As Jobs demonstrated during the iPad's unveiling, innovative developers have used this to create games for the iPhone that you can't find anywhere else: driving games, for instance, where you tilt the iPhone (or iPad, as the game has already been extended for Apple's new device) like a driving wheel.

Nevertheless, Dell's Choubey isn't convinced. "I think the iPad will maybe stay a little bit niche – and of course it's an Apple product and Apple fans will probably purchase it in their droves – but ultimately, when it comes to actual use I'm very confident the 5in device we're releasing right now will have appeal globally. Our device is based on what our customers are asking of us and for which there was a gap in the market."

It's easy to be dismissive of the iPad, but the iPhone met with a similarly cynical reaction upon its release. And the iPad has an advantage in the form of thousands of not-so-secret weapons: iPhone apps. More than 2.5 billion were downloaded from iTunes in 2009, and with 150,000 apps to choose from – all of which, Apple promises, will work on the iPad – there will be no shortage of content for iPad owners.

Much of this content will be less relevant for a device that may rarely be taken out of the home – Shazam's ability to identify songs, for example, doesn't have quite the appeal in your own living room as it does down the pub – but stock tickers, the forthcoming BBC apps and music services such as Last.fm and Spotify, all have an appeal that will cross over seamlessly from smartphone to slate.

Apple is by no means alone. One of the reasons Dell has opted for Google Android over a rival mobile OS, or its own adaptation of a Linux OS, is the "platform" offered by Android. "Clearly, the application store is a great draw," said Choubey, and he also explained that Dell was hoping its new device would inspire a fresh batch of apps.

"Developers have looked at our device and said, 'hey, it's a larger device, I can do interesting things with the screen that I normally couldn't do with a device with a 3in or 4in screen'."



And what if there were two screens to play with? That's exactly what Microsoft's Courier design (which is based on Microsoft's mobile operating system rather than Windows 7) will offer when it eventually appears – either late this year or early in 2011 – and as a concept it's very different to the rest of the slates.

The Courier opens like a book, with both screens supporting touch input and also a stylus. This tackles one of the major problems with the slate form factor: how do you enter text quickly and easily? Leaked demonstrations show handwriting recognition is built in, and it's this ability, combined with drag-and-drop features, that convert the Courier concept into a futuristic digital journal.

SECRET OF ITS SUCCESS

1992 PDA

The PDA was all about timing. In its heyday in the late-1990s, it was the only realistic way to carry personal information in electronic form, replacing the execrable and ubiquitous Filofax. Combine this with fast-enough processors, cheap-enough memory and good-enough screens, and you have the "perfect storm" conditions that marketers so love.

Once again, Apple was first in the market, with the Apple Newton announced in 1992, but it was the pocketable PalmPilot that captured people's imagination.



There's one problem for Microsoft, Dell, Apple and all the other slate producers, however. Until we see these new applications, almost all the capabilities we've referred to in this section can also be performed – albeit to a lower standard because of their smaller screens – by smartphones. And these have the killer app known as "being a phone". It's this, as much as music playback and the apps, that keeps them in our pockets all day.

So what incredible abilities could slates have that smartphones will struggle to match?

SLATES AS EBOOK READERS

There's one simple answer to that question: slates can double up as eBook readers. "Amazon has done a great job of pioneering this technology with its Kindle, and we're going to go a little bit further," said Jobs at the iPad launch. "We've created the new iBook store, integrated with the iBooks app, to allow you to discover, purchase and download eBooks right on to your iPad."

Content is key, and Jobs made great play of its launch partners, which include Penguin, HarperCollins and Macmillan, whose books will be available on the iPad. Microsoft is also expected to create an eBook store for its Courier.

Some might think this is bad news for Amazon and Sony, both of which have had great success with their dedicated readers, but Sony's Anthony Brown remains bullish. "The introduction of another mobile device that includes digital reading as part of its functionality is a good thing," he insists.

"Mobile devices with reading capabilities will play a key role in the paradigm shift from analogue to digital content. At Sony, we're focused on devices optimised for digital reading and believe that digital book sales will surpass print sales within five years, if not sooner."

This is an optimistic view, and it isn't shared by analyst Morvay. "I don't think five years from now people will be reading from little plastic thingies; you're not going to find me doing that."

Part of the issue is a gender split, says Morvay. "Even within the PC industry, the question of eReaders does come up, and when you talk to men

they're very excited, and when you talk to women they're not excited at all."

Nevertheless, she believes slates have the potential to destroy the nascent eBook reader market. "If they [slates] offer multiple functionality then it will definitely help the uptake, in which case they can maybe kill the eReader market. But again, it depends on the price as well: if the slate will cost twice as much as an eReader then people may still go for the eReader – or just continue to read books."

Dedicated eBook readers also have the advantage of staggering battery life, to the extent that longevity isn't based on hours but page turns. In general, you can expect around 6,000 to 8,000 turns from a dedicated device. Take the iPad, or any other slate, on a plane and you'll likely be switching off halfway across the Atlantic to conserve battery life.

The other problem for slates as eBook readers is the screen. There are inherent problems with staring at a backlit display all day, which Sony, Amazon and other manufacturers cleverly avoid by using E Ink technology; this gives almost the same contrast as a printed page, meaning you can work your way through a novel without giving your eyes a rest every 20 minutes.

The final problems are the same ones that haunt the whole eBook industry: DRM, price and new books. Reports indicate that Apple will include FairPlay DRM technology with its eBooks, which means you can only view the books you've bought only on five devices. While that may seem a reasonable restriction, DRM remains anathema to many users.

Then we come to price. Publishers are already becoming worried at the thought of shipping bestsellers for \$9.99 when they can

sell new hardbacks for three times that amount; their instinct is to hold off and sell electronic versions only after the initial rush has drifted away, in the same way that a paperback goes on sale some months after the hardback version. It could be that we end up with the worst of both worlds: overpriced eBooks shipping too late.

One other possibility, however, is that book fans would be willing to pay over the odds for "enhanced" eBooks. These could add video interviews with the author, a narrated introduction to each chapter, reading guides – anything extra that would persuade people to part with a little more money. While it could be viewed with cynicism – a trick played by the publishing industry to squeeze more cash out of its customers – it could also be the key to the success of eBooks on slate devices.

A NEW TYPE OF MAGAZINE

□ Apple showcased a *New York Times* reader at the iPad's launch, developed in the space of three weeks. "We think that we've captured the essence of reading the newspaper. The finite snapshot in time, the exquisite photography, and a superior reading experience all in a native application," eulogised Jennifer Brook, interactive designer at *The New York Times*. "It's everything you love about the paper and everything you love about the web."



Nice soundbites, but the reality was a little more mundane. You could jump to different sections, zoom in and, perhaps most impressively, resize text to a size you were comfortable with, and the page would dynamically adjust its layout. But other than a video on the sports pages, there was little additional content.

It took a partnership between Condé Nast's technology magazine *Wired* and Adobe to produce something with real impact. The idea behind the *Wired* Reader, which is still a prototype rather than a fully formed live app, is to produce an "experience" tailor-made for whatever type of device you're using.

"We're really hoping to convert the experience from just page flipping," explained Dave Dickson of Adobe's digital publishing division. "Content has become a commodity. It's about how we wrap that experience around the content,

SECRET OF ITS SUCCESS

1996 SMARTPHONE

IBM introduced the concept of a smartphone in 1992, but it took Nokia's Communicator series – launched in 1996 – to make an impact. Even then it remained a niche product, with most technophiles preferring to partner a "dumb" phone with a PDA. BlackBerry smartphones, launched in 2002, showed the devices' potential for professionals, but it was the advent of fast, 3G phone networks that accelerated the smartphone's uptake, thanks to the allure of internet in your pocket... along with tens of thousands of tailor-made apps for iPhone and Android users.





and that's what we'll continue to see."

Dickson points to extras such as video and 360-degree turnarounds, both of which offer an obvious advantage over static photography. They also demand more work from the publishers, so how will cash-strapped companies afford the added investment?

One possibility is to charge a subscription fee for the applications. Dickson points out that slates will also offer new options for advertisers. "They can insert 360-degree views and new implementations with accelerometers. Advertisers are always looking for new ways to target readers, and we see this as being a new way to engage audiences, and also for publishers to extend the formats they offer."

Adobe is well placed to make this judgement as its newly released Creative Suite 5 (reviewed on p34) is key to the whole process. Dickson calls it "a natural extension for a digital workflow". InDesign 5 will allow publishers to take a layout and transform it straight into Flash. It can then be exported as an iPhone and iPad app, or exported to Google Android, Windows and even Linux devices.

It doesn't take much imagination to see this being taken a step further in the future. Within the next year or so, we expect to see plugins made available for InDesign that will allow publishers to convert a page designed for a magazine into an optimised version for specific slate devices, matching the design and content to the size of the screen. That will be a huge improvement over the majority of iPhone versions of magazines that are already available, which in effect add a page-flipping wrapper to PDFs. It's cheap and time-efficient, but it's a long way from the "rich experiences" Adobe would like us to enjoy.

SO WHO'S GOING TO BUY SLATES?

□ There's one more problem. Publishers with deep pockets, such as Condé Nast, might be willing to take a gamble on the iPad and large form-factor slates, but smaller publishers need to put their resources where they can be guaranteed a return. The mass arrival of



smartphones hasn't unleashed a stream of new revenue into their coffers, so why should they believe a set of new devices will transform their fortunes? In short, who's going to buy slates, and how big will this market become?

"You've got a mature user base, which means people have multiple devices that they use for multiple purposes," said IDC's Morvay. "This is actually a key trend that's been driving growth for various portable form factors, whether netbooks, notebooks or ultraportables."

"Tablet PCs fit into that because I'm sure there are certain tasks where they can be very appealing. But the question is whether it's going to be 1% of the market or 15% of the market, and in what time span."

Dell is more precise, claiming that its research indicates there are two key markets to which the slate could appeal. First, and predictably, 18 to 34-year-old males who love new technology. "A certain portion of people will be excited by the device... they'll keep their normal phone as well as have this tablet device, which offers a superior web experience, a superior viewing device for multimedia."

Less predictably, Dell believes a secondary market will come from the "suburban mum" who, according to Choubey, "has multiple devices right now that she uses throughout her day. She might use her phone, she might use an email device, she may use a video camera, she may use a digital stills camera, she may use a navigation device in her car. This is a device that would replace all those devices and that she could easily carry in her purse."

So, at last, the speculation is coming to an end. Forget research and fancy hypotheses, 2010 will see reality in the form of a flurry of slate devices in all

shapes and sizes. It will see headline-grabbing apps for the iPad, huge investment from the hardware manufacturers that believe in the form factor, and an onslaught of iPhone-style advertising from Apple.

The trade of marketing blows will be a joy to watch, but equally fascinating is what's going on behind the scenes, in the R&D labs of Acer, Samsung and Toshiba. While all these companies are currently staying quiet about their slate plans, we're sure they all have prototypes waiting in the wings to see whether the slate thrives or dies.

At this point, you might expect us to make some hazy predictions along the lines of, "we'll just have to wait and see". But we'll be bolder than that. The Apple iPad will sell well, but it won't appeal outside the traditional Apple fan base. The HP slate will struggle, as will the Lenovo U1, as they're too easy to compare to cheaper laptops.

The only potential winner we can see is Dell, which is wisely asking people what they actually want to buy, and what they'll do with it; it's too easy to argue that many of the other devices are technology for technology's sake.

Even then, we remain doubtful that its Mini 5 – or whatever Dell ends up calling the 5in slate – will sell in droves. As the company's own Neeraj Choubey told us: "If we fail to figure out the user case where this is valuable at multiple times of the day, then this market will go away. No-one wants to pay a lot of money for a device that you only use once or twice per day." ■

SECRET OF ITS SUCCESS

2007 NETBOOK

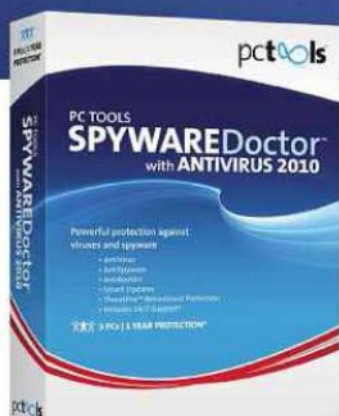


The netbook had three things in its favour from the start: a staggeringly low price of below £200, a low weight of around 1kg, and the word-processing, web-browsing and general computing capabilities of a normal laptop. Well, almost. Most manufacturers soon chose Windows over Asus' first choice of Linux, while the screen resolution jumped from 800 x 480 to a more practical 1,024 x 600. While these refinements boosted the price by around £100, sales continued to soar for this modestly priced ultraportable. It's now an important part of every major laptop manufacturer's line-up – Apple aside.



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— www.pcmag.com, 15 October 2009



15 October 2009
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Faking a photo is easier today than ever before. Using Photoshop, users can make an almost endless number of changes to their shots.

Some of these, such as brightening parts of an image to make them clearer, actually add to the editorial integrity of a photo. For instance, when President George Bush felt the call of nature during a UN world summit in 2005, his hastily scrawled note – “I think I may need a bathroom break? Is this possible?” – to Secretary of State Condoleezza Rice became instant satirical fodder. But the contents of the note were illegible to the

How do the experts tell if a digital photo has been faked?
Dave Stevenson takes a crash course in camera ballistics

photographer, Reuters freelancer Rick Wilking. The news agency only realised what it had later, when the original shot was cropped and brightened to make Bush's note legible.

But while photo editing can produce more useful detail in a shot, or draw the viewer's eye to a particular element, or simply make a picture more aesthetically pleasing, the ease with which a shot can be altered presents a problem. With many photographers working alone, the temptation to turn a lacklustre shot into a Pulitzer contender by changing key elements is immense. How do editors catch photographic fakers?

Photos courtesy of: www.pressassociation.com

PHOTOSHOP FORENSICS



BAD EDITS

Sophisticated photo editing is no longer the preserve of trained experts: even consumer packages such as Photoshop Elements allow you to easily remove people from scenes or change the backdrop of a portrait. And it's just as easy to find examples of photo fakery. Visit the Photoshop Disasters blog (www.photoshopdisasters.blogspot.com) and you'll find an assortment of photos – some from major publications – that have suffered at the hands of cack-handed, rushed or careless photo

→ Twiggy has visibly aged in Olay adverts, after the ASA ruled the original (top) was misleading.



editors. Phantom hands appear draped over the shoulders of models, the rest of their owners airbrushed out. Reflections go askew and, famously, supermodel Filippa Hamilton was pictured with an impossibly tiny waist in a Ralph Lauren advert. Photoshop Disasters' reproduction of the catastrophic image so incensed the fashion company that it threatened to sue the site if the image wasn't removed.

The misapplication of Photoshop in advertising can have serious consequences. Last year, the Advertising Standards Agency (ASA) upheld more than 700 complaints about an Olay advert featuring veteran model Twiggy. Crucially, the ad told consumers its Definity eye make-up would lead to "brighter-looking eyes", and implied the picture of a 60-year-old, wrinkle-free Twiggy was the result of its product. In

reality, Olay conceded its advert had been the recipient of "minor retouching" – enough for the ASA to conclude that the commercial was misleading under its Committee of Advertising Practice code.

Few people will be shocked to learn that glamour shots are often subject to the airbrush. But in photojournalism the emphasis is on telling a story accurately. Hugh Pinney, senior director of photography at the renowned agency Getty Images told *PC Pro* that an editorial image "has to be an accurate rendition of the scene that the photographer witnessed".

Public expectations of news images were put to the test in 2006 when

↓ Media organisations were duped in 2008 by the image of "four" Iranian missiles being launched. Note the original picture on the left.





Adnan Hajj, a freelance Reuters photographer, doctored images of a besieged Lebanon, repeatedly copying a plume of smoke from a bombed building and making the Israeli onslaught seem more destructive than it was. The incident, according to Pinney, is a "classic example" of overuse of Photoshop to falsify an image. "I think Reuters took a big hit," he said. Reuters' reaction was swift and unforgiving: Hajj was unceremoniously dumped, and his library of photos was deleted, despite his claims of innocence. Pinney said Reuters did the right thing, and claims he'd have done the same had the scandal hit Getty. The fallout from a faked image could be "catastrophic" for a news agency, he warned.

Media organisations were duped again in the summer of 2008, when news outlets around the world, including the *New York Times* and the BBC, ran an image distributed by Agence France-Presse showing the successful launch of four Iranian ballistic missiles. The image was produced by state-run Sepah News, but closer inspection revealed a surprise: the smoke plumes from two of the missiles were almost identical. While a degree of similarity could be expected from the simultaneous launch of two identical missiles, the arrangement of the image's pixels pointed to one thing: one of the missiles had failed on its launcher and an Iranian official, keen to avoid international embarrassment, cloned one of the successful launches over the top.

Turi Munthe is CEO at Demotix (www.demotix.com), a citizen journalist website that takes freelance contributions from around the world and distributes them, both on its own site and to mainstream media organisations. It has some significant scoops to its name: it owns the only image of the arrest of Henry Louis Gates Jr, head of

Harvard University's DuBois Institute for African and American Studies, who was mistaken for a burglar by police after Gates himself reported a break-in at his house. The arrest swiftly exploded into a national scandal about racism in the police force. So how does Munthe ensure Demotix's 5,000 contributors are delivering original, unmodified images?

"We're very, very careful about the material that comes our way," he said. "We need to be absolutely clear that Photoshop hasn't had a material impact on the truth of the image." Demotix checks for plagiarism, for instance, by scanning the metadata produced by the photographer's camera. All digital cameras append extra data to their images. This EXIF (EXchangeable Image Format) data includes information such as when an image was taken, the name of the camera model and, if the camera is suitably equipped, a geotag revealing where the picture was taken. This on its own is often enough to catch those who falsely claim to have covered an event.

Demotix also uses a service called TinEye, which markets itself as a "reverse image search engine". When an image is submitted to TinEye, a digital watermark is created and checked against the site's database of more than a billion images – the theory being that if a photographer is submitting an image that already exists, even if it's been edited, TinEye will find it. "You can check for plagiarism spectacularly easily," said Munthe.

LIE DETECTORS

So if an image already exists it will be caught. But is it possible to automate the detection of images with elements added or removed? If such a system ever arrives, it's possible it will come from

↑ A composite of two different images placed John Kerry at an anti-war rally, damaging his presidential campaign in the process.

↓ Paedophile Christopher Paul Neil's attempt to disguise his identity failed.



Dartmouth College, New Hampshire, where Professor Hany Farid and his team are working on a set of algorithms designed to detect edited images. Farid's work, which is part-funded by Adobe, aims to automatically analyse images to detect irregularities. "One of the things I see recurring over and over again is either taking something out of an image or putting something into an image," said Farid.

In 2004, for instance, a photo dating from the 1970s emerged showing Presidential candidate John Kerry sharing a stage with Jane Fonda at an anti-war rally. The photo enraged US conservatives and did untold damage to Kerry's campaign. But the photo was a fake – a composite of a photo of Kerry taken by Ken Light in 1971, and one of Fonda, taken by Owen Franken for Corbis images the year after.

When elements are added to a photograph, said Farid, inconsistencies develop. The lighting is different: one person may be lit from one side, while the other is lit from the front by multiple lights. It isn't only the direction of lighting that can be problematic: lights can have varying colours or brightness. "Your brain is very bad at detecting those inconsistencies," said Farid. "We've developed a series of tools that can measure in an image the lighting environment in which a person was photographed, and then look for inconsistencies." Farid's software, which is still under development, is "getting pretty good" at automatically detecting relatively small differences in lighting.

Another way of removing detail from a picture is with Photoshop's Clone brush, which copies pixels from one part of an image and replicates them over another part. Some photographers use the Clone tool to remove specks of dust from their images. In the case of Adnan Hajj, the Clone tool was used to make a plume of smoke appear larger than was the case. Would Farid's software have detected Hajj's forged images? Farid is unequivocal. "Yes, but also it was a very clumsy manipulation. I think if he was a little bit better people wouldn't have noticed visually, but we probably would have," said Farid. The same goes for Iran's non-launching missile image.

However, imaging professionals are sceptical that their picture editors will be replaced as a crucial line of defence against forgeries. Hugh Pinney from Getty Images said, "I can see a point where you could run a picture through

John Kerry photo courtesy of: www.kenlight.com

a bit of software and it will give you a history of what's happened to it," but that he would "rather put my faith in human beings".

Turi Munthe from Demotix agrees, raising the spectre of a photographic arms race, in which determined forgers come up with ways to outwit the technology employed to stop them. Hany Farid is ready for the fight: a battle between developers such as himself and fakers is inevitable, he said, but isn't necessarily something to fear. "You don't say that we're not going to have antispam filters because we're afraid it's going to create an arms race," he argued. "The faker will get better and better and better, but what we'll do is make it harder, we'll make it more time-consuming, and we'll take it out of the hands of the amateur, so only a relatively small number of people will be able to do it."

CRIMINAL FAKERY

Even if picture editors are reluctant, Farid's work has applications beyond the fourth estate. In 2009, he gave evidence in the High Court in Edinburgh as part of Operation Algebra, a hi-tech investigation that resulted in the conviction of eight paedophiles. "We routinely now have images, video, audio and documents in digital format introduced into a court of law as evidence," he said. "It really matters that you can believe the evidence."

Part of Farid's evidence included what he calls "camera ballistics", in which he proved that innocuous photos came from the same camera as another set of "horrific" images. Photoshop made the news in 2007 when 32-year-old Christopher Paul Neil, a Canadian paedophile, attempted to conceal his identity using Photoshop's Swirl tool. His relatively simple photographic deception was undone by German experts, and he was promptly arrested in Bangkok.

Ironically, having played a major role in making faked photos accessible to photographers and the public, Adobe itself may be the key to the new technology that will defeat the criminals and other scammers. Farid claims that Adobe's financial support of his work is no-strings attached, but that the company is concerned that its product is being used in "nefarious" ways. "I think Adobe sincerely worries about that. I don't think it wants its name to be used in the pejorative." ■

HOW TO SPOT THE FAKES

A new person

In this famous photo of former work and pensions secretary James Purnell, the man in question was running too late to meet his colleagues and make it into the final shot. Not to worry: the other people in the photo obligingly stood to the side in order to tell a tiny fib and allow Purnell to look as though his watch worked properly. A cursory inspection of the photo reveals that he was added afterwards, though.

According to expert Hany Farid, detecting where a person has been added to a shot is all about the lighting. Purnell stands on the far right of the photo, apparently evenly lit from the left-hand side. But his colleagues appear to be lit from above and to the right. We might also note that Purnell is standing uncomfortably close to Kevin Corscadden. An even closer inspection reveals that the cut-out around Purnell's hair – where he's been removed from his original background – is incomplete. A true Photoshop disaster.

Error level analysis

For an insight into the technical work behind detecting faked images, visit www.errorlevelanalysis.com,

which claims to help detect elements that have been added to a photo. Every time you save an image as a JPG, you lose a tiny amount of detail. Over time these small losses add up,



and eventually it should be possible to tell if two images have been blended into one, if one picture has been saved more times than another.

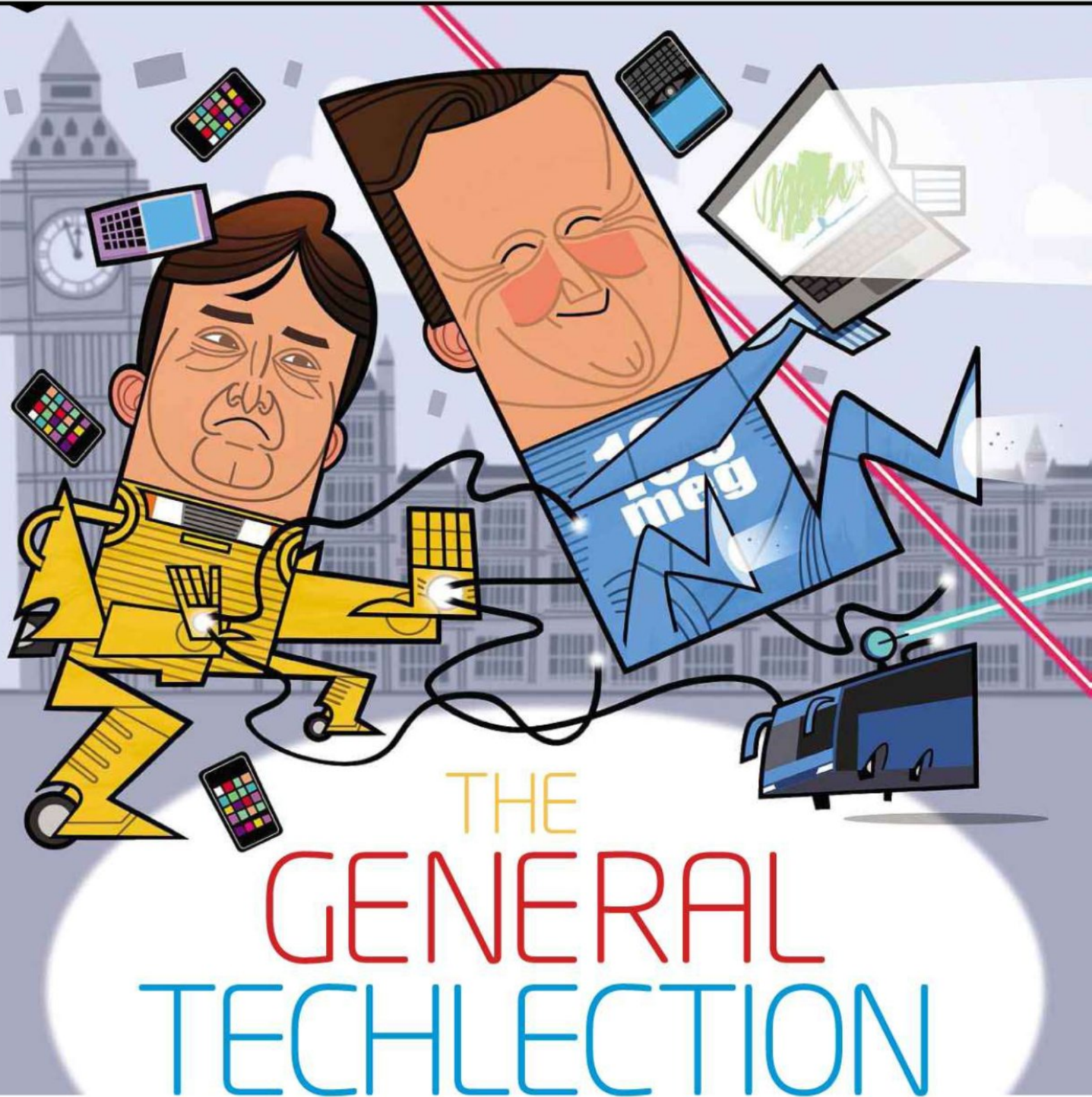
There are all kinds of reasons the car-crash of a composition below would lose you your job at a picture desk, and it's clear that the hurriedly added person wasn't standing there when the shutter release was pushed. But a little technical analysis can help. Errorlevelanalysis.com processes an image by saving it again, then compares the old image to the newly saved one and determines how much detail has been lost and from where. The key is the brightness of different parts of the image. If an image is returned and is

uniformly bright (or dark), it suggests that little or no manipulation has happened. In the first, person-less print there are only a few highlights – largely on the finely detailed twigs on the right-hand side.

This is largely theoretical: many of the images we ran through the tool suggested Photoshop tampering when there was none, while other images came back looking relatively clean when in fact new elements had been introduced, so it's clear you couldn't build a criminal case around it. However, this image demonstrates the potential. Pay attention to the dark-blue squares covering the jacket – this chunky, square texture isn't found elsewhere in the image, and is indicative of a part of the image that has been saved with a different level of compression than other parts of the photo.



The chunky squares on the jacket suggest it wasn't in the original.



THE GENERAL TECHLECTION

BARRY COLLINS REVEALS THE TECH POLICIES OF THE MAJOR PARTIES
AND DISCOVERS WHY DIGITAL MIGHT HELP DECIDE THE ELECTION

Before politicians board their battle buses for this year's General Election, there's a new subject they're going to have to rehearse sound bites for: technology. For the first time in British political history, subjects such as broadband, file-sharing and access to computers in the home are appearing on election manifestos.

While no-one is pretending that pre-election pledges on broadband speeds are likely to hold as much sway over voters as the faltering economic recovery, fiddled expenses, or Gordon Brown's short fuse, the fact the major parties are even talking about technology is indicative of its potential significance at the ballot box.

Illustrations:
David Lyttleton
www.davidlyttleton.com

Technology is a potential vote-winner in other ways too. The 2010 General Election will see the debut of social networking services such as Twitter and Facebook on the campaign trail, as MPs and candidates slip the spin doctors' shackles and communicate directly with the electorate – risking everything on an unguarded comment that could make its



way round the internet faster than the most rapacious virus.

Here we're going to examine the digital policies of Britain's three main political parties to help you decide who deserves an X on your ballot paper, and reveal what impact technology could have on the campaign itself. Prepare for Britain's first General Techlection.

Tech front and centre

There's no doubt that technology now pervades even the highest echelons of government. Since the last General

Election in 2005, we've seen the appointment of two Ministers for Digital Britain, and the subsequent publication of the Digital Economy Bill. When even Lord Mandelson spends hour upon hour in the chamber debating the finer points of disconnecting illegal file-sharers, you know technology has splashed down in the political mainstream.

The parties also view issues such as broadband speeds as potential vote-swingers. A few months after the Government pledged to bring nationwide connections of 2Mbps/sec by 2012 and

The types of tweeting MPs

Politicians of all persuasions have jumped on the Twitter bandwagon. Here we profile the different types of political twitterer from across the parties.

The attack dog

@johnprescott

The former deputy PM is characteristically bombastic with his frequent tweets.

Typical tweets:

"My message to Ashcroft. Pay back ten years of tax or leave the Lords. You made a promise and you broke it. Pay up or get out #cashcroft"

"So this is the CHANGE we'd get with Cameron. His school had 3 toilets. 1 gents, 1 ladies & 1 for chauffeurs!"

The web 2.0 politician

@carolinelucas

The savvy Green Party leader knows how to build a successful Twitter campaign.

Typical tweets:

"Outraged that state-owned RBS has announced £5.8bn losses, but still pays £1.3bn in bonuses? Send message to Chancellor <http://bit.ly/9rKBSC>"

"Just launched survey on website to gauge priorities of people in #Brighton. If you live in B.Pavilion, pls fill it in! <http://bit.ly/b6UUGU>"

The cuddly Conservative

@nickherbertmp

The shadow environment secretary delivers warm, slightly cloying tweets.

Typical tweets:

"Just met Brian May. What a great guy. I've done my back in and he helped me out of my chair! Not every day you get assisted by a rock legend."

"Sir Stuart Rose & his team at M&S just told me their eco 'Plan A' has saved £80m thru efficiencies - lean & green!"

The dutifully dull

@ChrisHuhne

The prominent Lib Dem updates Twitter only once a week, and it's thin gruel.

Typical tweets:

"@ChrisHuhne is visiting the Quilley School of Engineering in Eastleigh this morning."

"@ChrisHuhne will be meeting with Trevor Phillips for a briefing on the work of the Equality and Human Rights Commission later today."

announced a £6 per year tax to pay for next-generation high-speed networks, the opposition went one further, promising to deliver nationwide 100Mbps/sec broadband by 2017. In the same way as the parties use the number of bobbies on the beat and hospital beds as pre-election tempters, they're now bandying around broadband speeds. "In the 19th century, we built the railways; in the 20th century, we built the motorways. In the 21st century, let's build the superfast broadband network," said shadow chancellor George Osborne, announcing the new policy on the BBC.

The internet is also the driving force behind a new political force: the UK branch of the Pirate Party, which counts reform of the copyright and patent law for the internet age among one of its three core policies. The Pirates plan to field up to ten candidates across the country, although party leader Andrew Robinson admits its target is modest.

"Our target is simple and realistic – to raise our profile," he said. "We are well aware that we won't storm to power in a first-past-the-post election, so we're treating it as a learning experience, as well as the most cost-effective way there is to make the public aware of our existence and our policies."

Election watchers are equally sceptical that technology policies are going to prove decisive for all but a slim minority of voters. "It isn't something we've noticed coming up in our polls," said Dr Roger Mortimer, head of political research at Ipsos Mori, echoing the views

of fellow pollsters YouGov. "There are only two or three big issues that register with voters – things like the economy and crime," Mortimer added, although he did concede that fringe issues such as technology could help sway an undecided voter.

Social vote-winning

If technology policies won't be enough to shift the pendulum on the swingometer, technology itself might be. When Britain last went to the polls in May 2005, Facebook was still Mark Zuckerberg's university project and Twitter hadn't even been invented. Now, both are widely used by politicians to reach out directly to voters.

Politicians from the Prime Minister (@DowningStreet) to celebrity candidate




Esther Rantzen (@Esther4luton) are attempting to woo voters with 140-character missives. But giving politicians unfettered access to the public is a risk as well as an opportunity, according to Britain's best-known political blogger, Iain Dale.

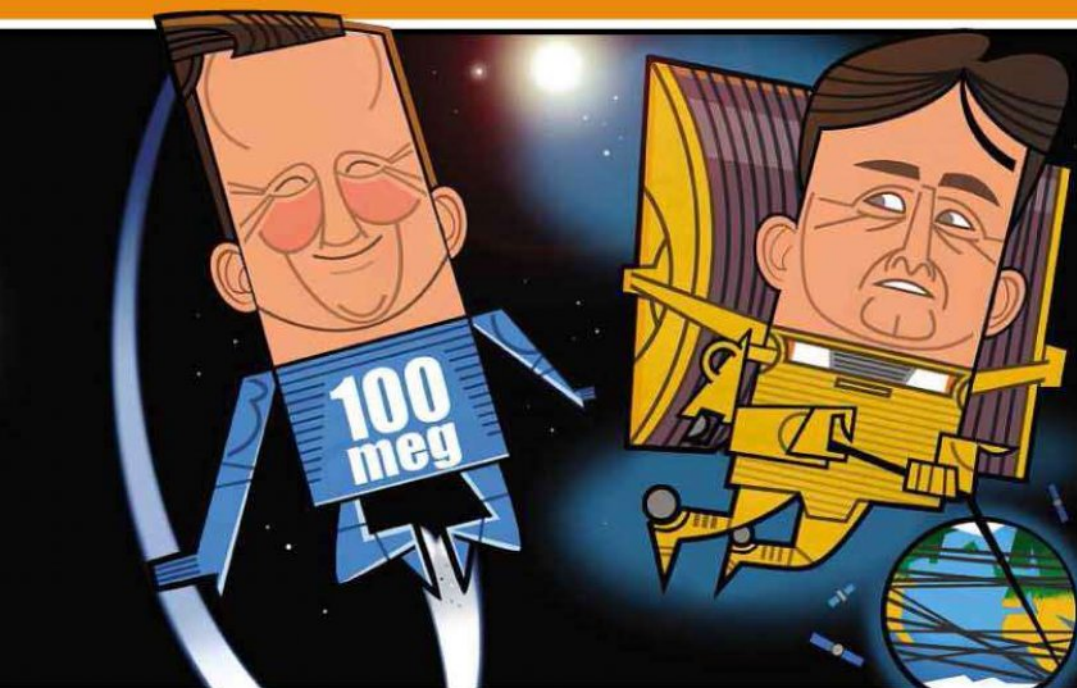
"In some very marginal seats Twitter could have an outcome, where you have a majority in the hundreds," he said, before swiftly qualifying his prediction: "If they use it properly."

"The main effect could well be negative, where candidates use blogs or Twitter in a way they think is helpful, and they have a rush of blood to the head and say something really stupid that gets national media attention."

Dale cites the example of Labour MP David Wright, whose Twitter account



The Tech Manifestos	Next-generation broadband	The broadband divide
Labour 	The Government outlined its plans to pay for next-gen broadband in the Digital Economy Bill. It proposed a 50p levy on all landlines starting from later this year, which will raise around £1.2bn for a fund to bring high-speed broadband to the "vast majority" of areas by 2017. In addition, the Government has promised that all homes will have "super-fast broadband" by 2020.	Labour has pledged to deliver universal 2Mbps/sec connections (although exactly what that means is a matter of some debate) by 2012. It plans to use the £200 million left over from the digital television switchover fund to deliver grants for companies such as BT to improve speeds in rural areas. It recently established a committee to distribute the funds.
Conservatives 	The Conservatives have said they'll scrap the 50p broadband charge if they win the General Election. Instead, the Tories have pledged to bring 100Mbps/sec broadband to the "majority" of homes by 2017 using a portion of the BBC TV licence fee and private investment. The shadow chancellor called it the 21st-century version of building the road network.	The Conservatives say they don't object to the Government's "universal service commitment" per se, but would prefer to exhaust private investment options first. The Tories have said they'll force BT to open up its ducts, allowing rivals to lay fibre in BT's underground network. BT has already said it will do this anyway.
Liberal Democrats 	The Liberal Democrats fear that up to a third of homes risk missing out on next-generation broadband if the roll-out is left purely to market forces. "Public investment will undoubtedly be needed if next-gen access is to make real inroads," a party spokesperson told <i>PC Pro</i> , although the party hasn't specified how much or where the money will come from.	"The priority for investment should be those areas where the high-speed broadband market is least likely to reach," said the Lib Dems. Waiting to see which areas are still in the slow lane and investing in those may be "the most economical way of using public funds" but will make rural areas a "less attractive option for businesses and homes," the party added.



described the Conservatives as “scum-sucking pigs”. The MP for Telford later claimed the tweet had been “tinkered with”.

“Politicians are human beings,” said Dale. “They use Twitter to react to something instantaneously, and before you know it they’ve said something quite outrageous. A lot of newspaper journalists spend half their time scouring blogs, Facebook and Twitter for stories just like that. Politics on the internet can be an opportunity as well as a threat, but you have to recognise there will be occasions where it causes you embarrassment.”

Ipsos Mori’s Roger Mortimer agrees that social networking sites are increasingly influential, but to the wrong audience. “The people that kind of

communication connects with most are the people least interested in politics – the young,” he said.

The Obama model

Social networks aren’t the only weapons in the parties’ digital arsenal. With election budgets tighter than ever, the campaign managers are turning to cheaper methods of winning votes. The Tories, for example, have launched an iPhone app that spells out the party’s policies, allows you to make instant donations and includes a rather sinister feature that encourages you to email details of your friends’ voting intentions to Tory HQ. There’s even a “Swing-O-Meter” that shows you what the political map will look like depending on how many votes swing the Tories’ way.

(Not surprisingly, the app developers haven’t considered a swing to Labour.)

“We have lots of new technology already,” beamed a proud Conservative spokesperson, citing Facebook pages and Twitter accounts as other examples. “We’re trying to create a holistic campaign, where we’re trying to talk to as many people as possible.”

The parties are also hoping for a sprinkling of Obama gold dust, after the US president’s online campaign was partially credited for sweeping him into the White House. “The Obama website was done by Blue State Digital, which I believe is involved with the Labour party website now,” said Joe Twyman, research director at YouGov.

Unofficial party sites, such as ConservativeHome (www.conservativehome.blogspot.com), are energising grass-roots activists. Although such sites are preaching to the converted and unlikely to sway voters directly, they could have an indirect impact on the campaign. Twyman, for instance, believes they could influence the news agenda.

Iain Dale predicts party-orientated blogs will have an indirect effect of another kind. “You will get bloggers running negative campaigning, where the parties themselves will try to keep their hands out of it, but behind the scenes encourage the bloggers to do their dirty work for them.”

Britain may be behind the US when it comes to mounting political campaigns online, but it’s still at the cutting edge when it comes to dirty tricks. ■

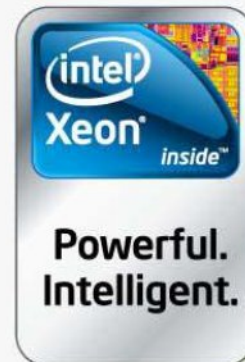
Internet file-sharing	Home computing	The IT industry
The Digital Economy Bill crystallised the Government’s plans to implement “technical measures” against people who persistently share or download files illegally. Such measures could include the blocking of peer-to-peer services, choking broadband connections, and the temporary suspension of broadband accounts.	In January, Gordon Brown announced plans to provide free laptops and broadband to 270,000 families on low incomes. “We want every family to become a broadband family, and we want every home linked to a school,” the Prime Minister said. Government minister Vernon Coaker claimed access to a home PC would boost GCSE grades.	Labour says it will develop a strategy to support the UK economy’s “renewal and future growth”, which includes “improving the skills of our workforce and adapting them to the specialist demands of a modern economy; investment in an effective modern infrastructure; and further innovation in science and technology.”
Shadow secretary of state for culture, media and sport, Jeremy Hunt, has confirmed in the Commons that the Conservatives support moves to temporarily suspend the connections of illegal file-sharers. Tory peers also backed an amendment to the Digital Economy Bill that would force ISPs to block access to sites accused of copyright infringement.	The Conservatives haven’t stated any official policy on boosting access to computers in the home, although Tory MP Mark Pritchard has claimed the Government’s free laptop scheme is open to abuse. “I have been informed by my constituents that there are people that have sold them,” he told the BBC, following the launch of the Government’s scheme.	“We will work to rebuild our broken economy by offering help to the digital and media industries,” the Conservatives state. They aim to make Britain “Europe’s leading hi-tech exporter” by following a blueprint laid out by Sir James Dyson, and help internet start-ups by abolishing tax on jobs created by new firms in the first two years of government.
Liberal Democrat peers tabled the amendment to the Digital Economy Bill that could give courts the power to block sites hosting copyrighted material. “We do not believe in censoring the internet or limiting free speech, but just as shops must be prevented from selling stolen goods, so too we have a duty to limit stealing online,” a Lib Dem spokesperson said.	The Liberal Democrats will try to help more people get online via public libraries, which the party claims are “already doing a tremendous job in helping the digitally excluded” with more than 90% of libraries offering free internet access and training. “We will build on this work by offering library staff the time, skills and materials to train users,” the party said.	The Liberal Democrats claim a lack of equity finance is the biggest obstacle facing IT start-ups, and so they will create Local Enterprise Funds to match local investors with businesses in their region. They also plan to improve IT skills “among more mature workers”, so that they aren’t excluded from the modern workplace.

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PNs: 172631X, 39M4558, 39R6529

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Enterprise

THE ESSENTIAL REAL-WORLD BUSINESS GUIDE

Business bolt-ons bolster Google web apps

Google has launched an apps store for businesses, which sells a range of third-party plugins for its suite of web apps. The Google Apps Marketplace (www.google.com/enterprise/marketplace) brings a variety of business tools – including payroll, project management and CRM apps – to Google's productivity suite, with the search giant hoping third-party developers will broaden the appeal of its online services.

"We're often asked when we'll offer a wider variety of business applications – from accounting and project management to travel planning and human resources management," said Marketplace product manager Chris Vander Mey. "But we certainly can't and won't do it all, and there are hundreds of business apps for which we have no particular expertise."

Applications bought from the Marketplace will use the same login as Google's native apps, removing the need for users to remember multiple usernames and passwords. The apps will also integrate with email, calendars or other data stored on Google's cloud. Installation of apps will be limited to Google Apps administrators.

"The Google Apps Marketplace eliminates the worry about software updates, keeping track of different passwords and manual syncing and sharing of data, thereby increasing business productivity and lessening frustrations for users and IT administrators alike," said Mey.

More than 50 companies, including Intuit and FreshBooks, are offering apps through Marketplace. Software is charged on a per-user or per-month basis, and many apps are free.



SMBs need 8 meg broadband

The Federation of Small Businesses wants ISPs to be "obliged to deliver a minimum and guaranteed connection speed of 8Mbps/sec direct to business premises".

The group claims that a large proportion of its members aren't receiving the speeds they've paid for, which is hampering productivity. "They're being promised a service like a 4Mbps/sec and getting only 1 or 2Mbps/sec, and they [businesses] can't do the things they need to," said a spokeswoman for the FSB.

According to a report conducted by ICM Research on behalf of the FSB, a third of small businesses suffer from an unreliable broadband service, while one in ten said they were considering moving to an area with a faster connection.

The findings bear out the complaints of The Country Land & Business Association, which has long campaigned for faster broadband in rural areas. "We want to be on the same competitive footing [as major towns and cities]," said Douglas Chalmers, director of CLA North.



Dave Mitchell



Since moving the Enterprise Labs to much larger premises, I've become acutely aware of just how much it's costing to run all the servers and associated

network-testing equipment. Previously, my electricity was included in a set office rental fee, which meant I could use as much as I liked and it didn't cost a penny extra.

In the new offices, electricity is metered and charged per month, so running the lab network is costing a great deal more than it used to. I've been vaguely aware of this increase for some time, but it wasn't until I began totting up the utility bill for accounting purposes that I realised just how much my operating costs had increased by.

It finally got me thinking about how much lab equipment we left on unnecessarily. I began to look around the labs and ask "do those desktop PCs really need to be on when there's no-one in the lab? And why is that switch still running when the test it was used for was completed a fortnight ago?"

There was also room for improvement with the lab lighting. Even when it was a bright, sunny day outside we were switching on every one of the 44 striplights in the lab, which was a terrible waste.

By being more aware of wastage and acting accordingly, my utility bills have decreased over the past few months by around 15%.

Managing power usage effectively can lead to big savings, but businesses must also factor this in when purchasing new equipment. That's why we publish the power consumption of all PCs and servers reviewed in *PC Pro* to help with these buying decisions.

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EXCLUSIVE

Dell PowerEdge R210

Management options are extensive, but this server's high noise levels will become annoying in a small office

In the drive for greater energy efficiency, the low-profile rack server is proving to be a valuable ally. We've seen an increasing number of these products over the past few months, and now Dell wants a piece of the action.

The successor to the PowerEdge R200, the latest R210 entry-level rack server targets SMBs with limited rack space, and claims to have the smallest energy footprint of any PowerEdge server. The most significant feature is that the R210 delivers support for Intel's latest "Lynnfield" Xeon 3400 processors.

There are major changes in chassis depth with the R200 stretching back 21.5in, whereas the R210 reduces this to only 15.5in. The R210 also uses a smaller 250W power supply as opposed to the 345W power supply of the R200.

Most of the front panel acts as a grille to improve airflow, but it also sports Dell's four-pack LED diagnostics panel, a pair of USB ports and a DVD drive. The LCD control panel isn't an option for the R210, and if you want the new gun-metal bezel it will cost you an additional £12.

Storage options haven't changed: both the R200 and R210 support a maximum of two 3.5in SAS or SATA drives. If you want better storage and RAID array choices then check out Broadberry's CyberServe X34-RS100 (web ID: 355684), which supports up to four 2.5in SFF hard disks.

The base system uses the embedded SATA controller, which includes Dell's PERC S100 RAID software solution that can be activated from the BIOS to provide support for mirrors or stripes. There's also the PERC S300 firmware upgrade that brings in support for SAS drives. It adds RAID5, although for the R210 this is largely academic.

An unusual feature for a rack server is the eSATA port snuggling in between the USB and video ports at the rear, which offers some useful external storage expansion options. If you don't want to use it, the port can be disabled in the server's BIOS.

Internally, everything is tidy, with easy access provided for both hard disk carriers. The processor is located in the centre of the motherboard and mounted with a solid passive heatsink. Four DIMM sockets sit to one side and support up to 16GB of UDIMM memory.

There's plenty of room for expansion, since the single riser card at the rear supports a half-height, half-length PCI Express card. Should you wish to use the R210 as a virtualisation platform, you'll find an internal USB port for booting the server with an embedded hypervisor. A rack-mounting kit doesn't come as standard, though, and the rails will cost £29.

System cooling is handled via three small fans located in front of the motherboard. Unfortunately, the R210



Everything is tidy inside, with easy access to both hard disk carriers.

← The R210 takes it easy on the power supply.

RACK SERVER

PRICE

£771 exc VAT

SUPPLIER

Dell UK
0844 444 3625

INTERNET

www.dell.co.uk

WARRANTY

3yr on-site NBD

POWER RATING

Idle: 37W

Peak: 108W

takes the award for being the noisiest low-profile rack server we've yet had in the labs: the fans refused to drop below around 8,500rpm. We adjusted the BIOS power-management settings, but even using the custom option for minimum power across the board, we couldn't get them to shut up.

If you can cope with the noise, you'll find the R210 easy on the power supply. Connected to our inline meter, it drew a modest 37W with Windows Server 2008 in idle and 108W with SiSoft Sandra pushing the four processor cores.

Management is a cut above the rest, as you have the option of fitting an iDRAC6 Express or Enterprise controller with both bringing the Lifecycle Controller into play. This delivers Dell's UEFI (unified extensible firmware interface) environment, which offers OS deployment wizards, a driver store, diagnostics and server update tools.

The Express card snaps into a dedicated slot and shares remote management access with the first Gigabit port. You can use a browser to monitor critical components, see just how fast those fans are running, and control the power supply where you can switch it on and off, recycle power, or gracefully close down the OS.

The Enterprise version fits into a different slot on the motherboard and provides a dedicated management port, plus KVM over IP remote control and virtual media services. It has a V-Flash media slot and, when an SD card is inserted, it appears as a boot option and can also be accessed from the host OS.

The R210 also comes with Dell Management Console software, which provides general network systems management. Based on Symantec's Altiris Notification Server, this provides enhanced inventory, system monitoring, remote management capabilities and extensive alerting facilities.

The PowerEdge R210 scores well for value. It's easy on the power supply and offers plenty of remote management options, but the high noise levels make it a poor choice for a small office. **DAVE MITCHELL**

SPECIFICATIONS

1U rack chassis • 2.4GHz Xeon X3430 • Intel 3420 chipset • 2GB 1,066MHz DDR3 UDIMM expandable to 16GB • Dell PERC S100 embedded RAID • supports RAID0, 1 • 250GB SATA hard disk in cold-swap carrier • iDRAC6 Express with Lifecycle Controller • 2x Gigabit Ethernet • PCI-E 2x16 slot • Dell Management Console software

PERFORMANCE

★★★★☆

FEATURES & DESIGN

★★★★☆

VALUE FOR MONEY

★★★★☆

OVERALL

★★★★☆

 An explanation of how we test products for PC Pro Enterprise is on the cover disc



EXCLUSIVE

Broadberry CyberServe X34-104L

The first Xeon 3400 rack server to support SFF hard disks, and it's compact, quiet and power-efficient

Broadberry has been aggressively pitching its rack servers recently, with Dell its main target. Its latest CyberServe rack server continues its battle plan, but it now expands this to encompass HP as well. The X34-104L delivers Intel's new Xeon 3400 Series, but scores over both Dell and HP since neither of these vendors has a rack offering with this processor that also supports hot-swap SFF hard disks.

The X34-104L uses Supermicro's new SC111LT chassis, which provides a quartet of hot-swap SFF drive bays and, at just under 22in deep, will fit in a wide range of rack cabinets. There isn't much else to see at the front, since the centre of the main panel is set aside as a grille for improved airflow.

Power and recessed reset buttons are accompanied by a simple status display. This provides LEDs for hard disk and network activity for both ports, along with power status and a universal information LED to warn of fan and power failures or overheating.

Broadberry has focused on lowering power consumption: along with the reduced requirements of SFF drives, this server is the first we've seen to sport the new 1.86GHz L3426 processor. With a low TDP of 45W, it's considerably more frugal than its 95W counterparts.

The server made an impression in our power tests, drawing just 44W with Windows Server 2008 idling along. Curiously, this idle reading was higher than Dell's R210

(see p114) and Broadberry's own X34-RS100 (web ID: 355684), which both had higher-wattage 3400 processors when we tested them.

However, the results of the test became clearer when we set SiSoft Sandra to work, as with it pushing all eight logical cores to the maximum, consumption peaked at only 83W. In the same test, the R210 and its 2.4GHz X3430 peaked at 108W, while the X34-RS100 and 2.53GHz X3440 combo scored a high of 122W.

The server's Supermicro X8SIE-F motherboard offers plenty of features. It sports Intel's higher-end 3420 chipset, which provides six SATA interfaces and has an integrated RAID controller.

The processor is located in the centre of the motherboard, and the six DIMM sockets to one side support up to 16GB of UDIMM or 32GB of RDIMM memory. We didn't think much of the cooling shroud, as Supermicro insists on using flimsy plastic covers.



The 1.86GHz L3426 Xeon, with its eight logical cores, sits under the plastic cooling shroud.



← At just under 22in deep, there are few rack cabinets this 1U server won't fit in.

RACK SERVER

PRICE
£799 exc VAT

SUPPLIER
Broadberry Data Systems
020 8997 6000

INTERNET
www.broadberry.co.uk

WARRANTY
3yr on-site NBD

POWER RATING
Idle: 44W
Peak: 83W

SPECIFICATIONS

1U rack chassis • Supermicro X8SIE-F motherboard • 1.86GHz L3426 Xeon • Intel 3420 chipset • 4GB 1.333MHz DDR3 UDIMM expandable to 16GB • embedded Intel SATA controller • supports RAID0, 1, 10, 5 and JBODs (Windows only) • 2 x 250GB Seagate Momentus SFF 7.2K SATA hard disks in hot-swap carriers • 2 x Gigabit Ethernet • PCI-E 2 x16 slot • embedded RMM with 10/100 port • Supermicro SuperO Doctor III software. Options: DVD drive, £29 exc VAT

This is made worse by the fact that it's integrated with the mounting bracket for the three small cooling fans, so you have to remove the lot if you want to upgrade memory or change a fan.

The server included a pair of 250GB Seagate Momentus SATA drives configured as a mirror. If you want higher performance then we suggest Supermicro's X8Si6-F motherboard.

Expansion options include a riser card with a PCI Express 2 x16 slot, which can handle a full-height, full-length card. There are two USB ports at the rear, and the motherboard has two internal ones.

Full remote management comes as standard, with the integrated controller providing a dedicated port and web browser access. The latter has seen a number of design tweaks, making it easier to use. It offers plenty of data about all motherboard sensors plus options to issue SNMP traps and email alerts if preset thresholds are breached.

Along with full control over power, remote control is also provided, so you can access the BIOS setup menu and OS via a browser. It supports virtual floppy and optical drive media, allowing you to boot the server from another system and install an OS if required.

For general remote and local server monitoring, the SuperO Doctor III utility provides plenty of operational information on all critical system components. Basic remote control facilities are also provided.

The bundled Intel Matrix Storage Manager provides local management access to the RAID controller where you can view the status of arrays and member drives, remove arrays and create new ones. It also drops an icon into the System Tray, where pop-up messages advise on any array issues.

Broadberry scores a notable first over Dell, HP and IBM by bringing support for SFF hard disks to Intel's low-power Xeon 3400 platform. There's room for only four disks, but the CyberServe X34-104L offers a good overall specification for the price, has a low power demand, and doesn't skimp on remote management tools. **DAVE MITCHELL**

PERFORMANCE	★★★★☆
FEATURES & DESIGN	★★★★☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

An explanation of how we test products for PC Pro Enterprise is on the cover disc



HP ProLiant SL2x170z G6

HP's latest multinode server delivers good rack processing density, but note the limited storage options

HP's move into multinode server production indicates it may have spotted a gap in the server market. Blade server business is good for HP, but although many businesses want to improve processing density in their rack, not all are prepared to invest in this technology

The SL6000 family of ProLiant servers focuses on cost, power efficiency and flexibility, and in this review we look at the top of the range ProLiant SL2x170z G6. It provides two hot-swap trays in its 2U chassis, each kitted out with a pair of Xeon 5500 DP motherboards.

By sharing power, the SL2x170z G6 aims to reduce consumption significantly, and with four servers per 2U of rack height it can squeeze up to 672 Xeon cores into a standard 42U cabinet. At the front of each tray you have a serial port, monitor and pair of USB ports for each server, along with two Gigabit connections.

There's nothing much to see at the rear, since the trays link up to a power backplane behind which is a bank of four powerful cooling fans. The review system came with a single 750W supply, and there's room for another.

Each tray is held in place with a single release catch. Slipping one out shows that the two motherboards are arranged side by side and are both cabled through at the back to a small power distribution board on one side.

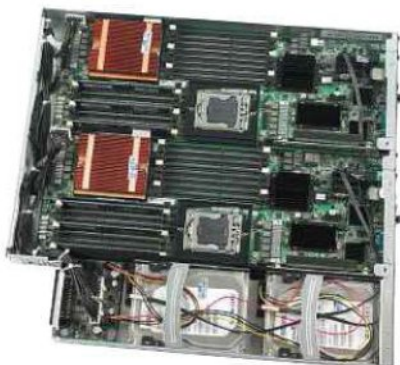
Each node came with a single 2.26GHz L5520 Xeon partnered by 6GB of DDR3 UDIMM memory. A total of 16 DIMM sockets is available, allowing

UDIMM memory to be increased to 24GB per node. Note the L5520 Xeon in the review system supports memory speeds only up to 1,066MHz.

Its general design is good, as the processors are staggered to avoid interfering with each other's airflow, and all major chips have small finned heatsinks. The power cabling is a little messy, but it's held firmly in place with cable ties and doesn't get in the way of upgrade manoeuvres.

The space in front of the power board is used as a storage bay and has room for two 3.5in hard disks. This is the one area where the server comes up short. There's no support for 2.5in SFF hard disks, so you're limited to one drive per node, which makes their embedded RAID controller somewhat redundant.

Initial noise levels on power-up were so loud we involuntarily stepped back in case the server took off. Fortunately, the system settled down to a gentle hum



Each of the two trays is fitted with a pair of Xeon 5500 DP motherboards.

◀ The SL2x170z G6 offers an alternative for businesses that don't want to invest in blade servers.

RACK SERVER

PRICE

£4,759 exc VAT

SUPPLIER

HP 0845 270 4000

INTERNET

www.hp.co.uk

WARRANTY

3yr on-site NBD

POWER RATING

Idle: 242W

Peak: 408W

after a few minutes, but the fans will briefly go into turbo mode whenever a node is powered up or rebooted.

Each node has an embedded Lights-Out 100i controller for remote management, which shares one of the Gigabit ports. Compared with HP's iLO2 controller, its features are basic: from its web interface you can reset the node, power it on and off, and do a hard reset. The status of all critical components can be viewed, and the PEF (platform event filtering) feature allows you to select components and assign actions that will be carried out if they fail. You don't get the power metering or capping tools as provided with the iLO2, but you can upgrade the 100i to add KVM over IP and virtual media features.

We found the remote control upgrade is well worth having, since it comes into its own during OS installation. Each node must be booted with the supplied Easy Setup CD, which provides wizard assistance, but to use a USB optical drive you'll need to drop the mouse since each node has only two USB ports.

We had a problem trying to install an OS on each node, as none of them could see their associated hard disk. The system had been supplied with all drives connected to the sixth SATA port, and we found the solution by moving the drive to the first port. As far as we can see, although each node has six SATA ports, only the first four are active.

The SL2x170z achieves its aims with power frugality. The review system drew 19W in standby, and in idle we saw one, two, three and four nodes draw a total of 90W, 142W, 195W and 242W. Under pressure these figures peaked at 132W, 220W, 312W and 408W respectively. Each node did have a minimal specification, but this is still lower than four separate servers.

The SL2x170z G6 offers an alternative for businesses that don't want to invest in blade servers. It consumes far less power than a quartet of standalone servers and provides a high processing density for racks, although support for SFF drives would improve its storage outlook. **DAVE MITCHELL**

SPECIFICATIONS

2U ProLiant z6000 G6 rack • 1x 750W hot-plug supply (max 2) • 4x server nodes (each with the following spec): 2.26GHz L5520 Xeon • 6GB 1,066MHz DDR3 UDIMM • 160GB SATA 7.2K cold-swap hard disk • HP Smart Array B110i • supports RAID0, 1, 10 • PCI-E 2 x16 slot • 2x Gigabit Ethernet • HP Lights-Out 100i • HP Easy Set-up CD and HP System Management Homepage software. Options: Lights-Out upgrade, £165 exc VAT

PERFORMANCE

★★★★☆

FEATURES & DESIGN

★★★★☆

VALUE FOR MONEY

★★★★☆

OVERALL

★★★★☆



An explanation of how we test products for PC Pro Enterprise is on the cover disc



NetSupport Manager 'Remote Support For Any Environment'



NetSupport Manager has been helping organisations optimise the delivery of their IT support services since 1989 and while the use of Remote Control software is now common place, unlike 20 years ago the diverse range of platforms, protocols and physical assets now in use provide PC Management and Remote Control Software solutions with the continuous challenge of being able to offer support to a variety of configurations.

The success of NetSupport Manager lies in its ability to continually evolve to meet the needs of any environment. Combining comprehensive multi-platform support for Windows, Linux, MAC, Solaris, CE, Pocket PC and Windows Mobile systems with a range of PC Management tools designed to ensure that critical IT infrastructure is available when needed most, NetSupport Manager offers complete compatibility for today's business environment.

Planning for upgrades and the rollout of new technology is now even easier thanks to NetSupport Manager version 11's restyled interface. Auto-Grouping of machines by operating system and platform provides an instant overview of your IT environment, you can even identify which laptops or desktop PCs are powered by Intel® vPro™ technology. Complete integration with Windows 7 introduces Touch Screen compatibility and enhanced Task Bar operations to NetSupport Manager's toolkit.

Be among the first to see new NetSupport Manager v11 at the Service Desk & IT Support Show.



See us at
Service Desk & IT Support Show 2010 - Stand 824
27 - 28 April 2010 - Earls Court, London



www.netsupportmanager.com

email: sales@netsupportsoftware.co.uk telephone: 01778 382270

WAN OPTIMISATION

PRICE
10 devices,
£653 exc VAT

SUPPLIER
SmartShare
Systems
00 45 7020 0093

INTERNET
www.smartshare
systems.co.uk

WARRANTY
1yr RTB

SPECIFICATIONS
Desktop chassis • 2 x
10/100 Ethernet (LAN,
WAN) • Ethernet
management port •
external power supply •
web browser
management

PERFORMANCE
★★★★★
FEATURES & DESIGN
★★★★★
VALUE FOR MONEY
★★★★★
OVERALL
★★★★★

EXCLUSIVE

SmartShare StraightShaper 310

A low-cost WAN optimisation appliance that does a fine bandwidth balancing act straight from the box

Upgrading business internet connections can be expensive, so it can pay dividends to make better use of existing resources. One method is bandwidth management, and Danish company SmartShare Systems offers a range of affordable solutions for SMBs.

The StraightShaper family delivers intelligent bandwidth management that aims to give all users a fair slice of the internet pie. They identify users by their IP address and apply load balancing, so each one is serviced in turn. Integral QoS also identifies timing-critical traffic, such as VoIP, and automatically prioritises it.

SmartShare's download and upload optimisers monitor bandwidth, and in times of plenty allow users to have as much as they want. When bandwidth is tight, the optimisers kick in and make sure each user gets an equal share.

The StraightShaper 310 is licensed for ten IP addresses. All excess users are bundled together as a virtual user and treated as one IP address. The 310



SmartShare's StraightShaper aims to give all your users a fair slice of the bandwidth pie.

software can be upgraded to 320 or 350, which can handle up to 20 or 50 IP addresses respectively.

Deployment is a cinch, since the appliance is completely transparent. We connected it between our LAN and WAN and suffered only a brief interruption to services while we connected cables. The 310 doesn't offer a hardware bypass switch, so if it fails or is powered off then you'll lose your internet connection.

The appliance needs to be where it can see all LAN devices. If you put it in front of a router or gateway performing NAT then all the users on the other side will have the same address and only be considered as one device.

Management is via the dedicated network port or through the LAN port. On first contact with the simple web interface, you need to enter the real upload and download speeds of your WAN connection. You'll find a useful online utility for this at www.speedtest.net, which offers measurements of true upload and download speeds.

We fired up big downloads from five LAN systems and watched the pie charts in the top screen showing them all getting an equal share. These Java apps provide a near real-time status display, although general-usage line graphs were difficult to interpret.

There's no need to manually prioritise VoIP traffic, but if you want it to get the lion's share then select the extra priority tickbox, which will take as much bandwidth as needed to ensure call quality is maintained. User groups allow the appliance to handle traffic coming from different subnets. These define IP address ranges to be considered as a single user, and applying weightings to each one means you can decide what bandwidth resources they can have.

The StraightShaper 310 offers out-of-the-box WAN bandwidth management at a price that will appeal to small businesses. It lacks a hardware bypass, but scores well for ease of use and its ability to handle VoIP traffic automatically. **DAVE MITCHELL**

NAS APPLIANCE

PRICE
Diskless,
£620 exc VAT

SUPPLIER
www.span.com

INTERNET
www.synology.co.uk

WARRANTY
3yr RTB

Synology DiskStation DS1010+

The DS1010+ is packed with network storage features, offers good expansion potential, and is a real speed demon

Along with a new design, the DiskStation DS1010+ from Synology aims to give SMBs plenty of network storage, top file-sharing performance, and expansion potential that puts the rest to shame.

Despite its compact dimensions, the DS1010+'s chassis is well constructed. At the rear you have dual Gigabit Ethernet, eSATA and four USB ports, plus a pair of large but quiet cooling fans.

The drive carriers aren't lockable, but a button stops them popping open. The carriers have mounting holes for 2.5in SFF disks, and with these installed you can drop the fans to a lower speed.

The eSATA port is primarily for servicing Synology's new DX510 five-bay expansion unit. This is a dumb unit designed to present five extra hot-swap SATA drive bays to the main unit.

The Assistant utility prepares the hard disks and installs the OS from the CD, or from wherever you've downloaded the latest firmware. For testing, we added a quartet of 1TB WD GreenPower drives configured as a RAID5 array.

Synology sets standards with its Ajax-based web interface and the new DiskStation Manager 2.2 is slick. It also adds support for WD's advanced format technology, where the 512-byte hard disk sectors are replaced with 4KB sizes.

The DS1010+ supports Windows, Linux and Mac clients, local or AD authentication and user storage quotas. Replicator 3 handles scheduled backup; once a full copy has completed, it secures new files and modifications on-the-fly.

You can use the appliance as a web server, publish pictures with the Photo

EXCLUSIVE

Enhance Technology UltraStor RS8 IP-4

An affordable IP SAN appliance with plenty of redundancy, huge expansion potential, and good target access controls

US storage specialist Enhance Technology is making eyes at the UK, and aims to whet our appetite with an IP SAN appliance offering top performance and features at a low price. Its UltraStor RS8 IP-4 is a pure iSCSI appliance supporting eight SAS/SATA hard drives and more RAID array types than you can shake a stick at.

It has four independent iSCSI Gigabit data ports. Plenty of redundancy is on tap, with a pair of 300W power supplies and three hot-plug blower fan modules. The multiple data ports mean you can use Microsoft's MPIO for creating redundant, load-balanced paths to storage volumes.

The controller's SAS port allows up to four extra RS16 JS 16-bay storage units to be daisy-chained from the main unit. Go for the latest 2TB drives and raw capacity can go as high as 144TB.

The appliance has a backlit LCD panel and control pad for basic operations, but we went straight for web management via its dedicated network port. The web interface is easy to use: a quick-start



The UltraStor can expand with your needs, right up to 144TB via daisy-chained extra units.

option offers to set up all the drives and will suggest the optimal RAID array.

The appliance was supplied diskless, so we installed three 146GB Fujitsu 15K SAS drives in a RAID5 array. Each array is a volume group (VG), so you can mix different drives and have multiple arrays.

Within these VGs you can create user data volumes (UDVs), which are iSCSI virtual drives. Each VG can contain multiple UDVs of varying capacities. Access controls are good, as each UDV can be assigned to specific iSCSI host initiators, or wildcard entry makes them

available to all. CHAP authentication can also be applied on a per UDV basis.

It supports multiple iSCSI nodes that can be assigned to specific LAN ports and associated with selected UDVs. You can decide precisely which LAN ports your iSCSI targets will be presented on and choose the hosts that can see them.

We created four targets and assigned them to dedicated nodes. They were then assigned to their own LAN port. We logged a quartet of servers running Windows Server 2008 and equipped with dual Xeon 5500 or Opteron 2356 processors into individual LAN ports on the appliance, to give each one a dedicated Gigabit connection and iSCSI target.

The Iometer utility reported a healthy 110MB/sec throughput for one server, and adding a second saw this jump to 220MB/sec, showing no contention for resources. This continued with the third server, where we saw a cumulative raw read throughout of 325MB/sec. Only adding the fourth server saw the appliance start to wilt, but cumulative read throughput still settled at an impressive 400MB/sec.

The UltraStor RS8 IP-4 shows clearly that high-performance IP SANs are within SMBs' budgets. Redundancy and target access controls are good, it's easy to configure and it flies in the performance stakes. **DAVE MITCHELL**



ISCSI APPLIANCE

PRICE
Diskless,
£1,950 exc VAT

SUPPLIER
Enhance Technology
00 1562 777 3488

INTERNET
www.enhance-tech.com

WARRANTY
2yr RTB

SPECIFICATIONS
2U rack • Intel XScale IOP dual-core processor • 1GB 667MHz DDR2 cache memory expandable to 2GB • 8 x hot-swap SAS/SATA hard disk bays • supports RAID0, 1, 3, 5, 6, 10, 30, 50, 60, JBOD and hot-spares • 4 x Gigabit data ports • management port • SAS expansion port • 2 x 300W hot-plug power supplies • 3 x hot-plug fan modules • web browser management

PERFORMANCE

★★★★★

FEATURES & DESIGN

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

Station and use Download Station to copy files from remote locations using BitTorrent, HTTP or FTP.

The firewall allows you to apply rules to traffic on either network port and to selected IP addresses. Rule creation is simple: define services with port numbers, deny or allow the traffic, and apply the rule to a port.

The Surveillance Station is licensed for up to 16 IP cameras and includes motion detection and automatic recording. We tested with an Axis 216FD camera and could view its live feed from the separate web interface, and schedule recording.

The DS1010+ is fast, with Iometer reporting raw read and write throughputs



Compact and well built, the DS1010+ hit speeds of 80MB/sec in our real-world tests.

of 112MB/sec and 110MB/sec. Real-world performance is good too: drag and drop copies of a 2.52GB



video clip from a Fujitsu RX330 S1 dual-Opteron 2356 server with a RAID5 SAS array returned speeds of 80MB/sec and 67MB/sec.

FTP speeds were even better

using FileZilla, with speeds of 96MB/sec and 92MB/sec. It supports up to ten iSCSI targets and, for raw read throughput, Iometer reported average speeds of 109MB/sec.

Along with excellent performance, the DS1010+ offers a cornucopia of storage features. It's well built and the matching DX510 eSATA expansion unit allows capacity to be increased. **DAVE MITCHELL**

SPECIFICATIONS

1.67GHz dual-core processor • 1GB 800MHz DDR2 • 5 x hot-swap SATA drive bays • supports RAID0, 1, 5, 6, hot-spare and JBODs • 2 x USB 2 • 2 x Gigabit eSATA • internal power supply • Synology Assistant, Download Redirector and Data Replicator 3 software

PERFORMANCE

★★★★★

FEATURES & DESIGN

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

ENDPOINT SECURITY

PRICE
Management Suite
1yr, 1-99 users; £50
per endpoint (exc VAT)

UPGRADE
Included in
maintenance
contract

SUPPLIER
e92plus
020 8274 7000

INTERNET
www.cyberoam.co.uk

REQUIREMENTS
Management Server:
Windows 2000/SP4
upwards • Agents:
Windows 2000
upwards (Windows
Vista/7 32-bit only) •
Options, 1-99 users per
user/year: Device
Control, \$10 • Data
Protection, \$27 • Asset
Management, \$10 •
Application Control,
\$10 (all exc VAT)

EASE OF USE
★★★★★

FEATURES
★★★★★

VALUE FOR MONEY
★★★★★

OVERALL
★★★★★

Cyberoam Endpoint Data Protection 3.2

Cyberoam takes endpoint control to the next level with a remarkable range of security features

Cyberoam made an impressive entry into the UK security market last year, with its CR15i UTM appliance (web ID: 255646) grabbing a place on the *PC Pro* A List. It's now turned its attention to endpoint security.

Its Endpoint Data Protection (EDP) software is split into four modules, with the device control option handling workstation ports and devices. Application control determines what software users can run, while asset management provides full inventory and vulnerability assessments.

The data protection module applies encryption to removable storage devices, runs shadow copies of data being transferred to removable devices, and controls file transfers for IM and email. The Management Suite covers all modules, but you can choose any as they all run from the same console.

EDP comprises a central server, console and client agents. Take care if you're installing the server on Vista, 7 or Server 2008, as the wizard tries to load MSDE, which isn't supported. You have to install SQL Server Express 2005 manually before loading the server.



The audit tab displays basic details about each system on the network, including bar charts showing active applications.

A separate utility is used for agent deployment. Although it displays all discovered systems, it can't tell what OS is on each one. The EDP console displays all systems in the left pane, and you can create and populate custom groups using drag and drop. The audit tab offers basic details about each system such as the installed OS, computer name, uptime and logged-in user, as well as graphs of active applications.

To create a policy, select the system or group and pick either the basic or

advanced policy tab. The console can show AD users and allows a restricted set of policies to be assigned to them, but not system policies.

Basic policies control access rights to system operations and settings. These can prevent users loading features such as the Control Panel and Task Manager, and block access to Registry editing and System Restore.

Device policies restrict access to ports. As with DeviceLock (web ID: 350582), EDP can block unwanted USB storage, optical and network devices, but allow the use of human interface devices.

We used the application control module to stop users loading P2P apps such as BitTorrent, and with EDP's advanced policies we could control file transfers over IM. You can also control email attachments, limit access to specific document types and determine printing privileges.

The asset management module provides critical patchlists and endpoint vulnerability assessments, while the event log provides real-time views of IM chats and allows you to look at all received email and attachments.

Cyberoam's EDP offers plenty of controls and is easy to manage. If you want better integration with Active Directory we suggest DeviceLock, but if you want controls for applications, IM and email plus inventory and change management, Cyberoam EDP should be your first port of call. **DAVE MITCHELL**

MESSAGING PLATFORM

PRICE
Five users, £283 exc
VAT; £18 per user
thereafter (in five-
user packs)

UPGRADE
N/A

SUPPLIER
Kerio 01223 202130

INTERNET
www.kerio.co.uk

Kerio Connect 7

Its ease of use makes Kerio's improved messaging solution a serious contender for company email systems

When a company renames a well-known product, the danger of confusing customers has to be weighed against any benefits that might come from the new name. Kerio has taken that risk by renaming Mail Server to Connect 7, but this reflects that it's more than just an email server; like Exchange, it offers a multitude of collaborative features too.

It can also cope with organisations with teams in multiple locations. Kerio's support for a range of platforms has always been a strength, and Connect 7

boosts this further with support for Apple's address book server in OS X 10.6 and others with CardDAV support for synchronising address books.

Connect 7 can work across multiple servers on multiple domains, so you can share schedules, mailing lists and free/busy information. One neat addition is the Message Submission Service, which is a secure system for sending email via SMTP – but over port 587 (the default SMTP port 25 is often blocked in hotels, so sending emails can be tricky).

Better support for multisession IMAP is now included too. Phones such as the iPhone send IMAP commands in parallel over multiple sessions rather than one at a time, which improves performance if your mail server can handle it. Kerio Connect also offers over-the-air synchronisation for Windows Mobile, Symbian and BlackBerry devices.

BlackBerry support is via the third-party add-in, NotifyLink. It's disappointing that this connectivity wasn't built in; relying on a third-party product could bring compatibility problems in the future.

The administration pages are now fully web based, which again makes remote management easier, rendering the previous console application unnecessary. This administration web

SecurEnvoy SecurAccess 5.3

A simple, cost-effective solution for two-factor authentication that's far easier to manage than standard passwords

SecurEnvoy aims to offer an easily managed authentication solution by using something most remote workers already have. SecurAccess can use any mobile phone to allow pass-codes to be issued via SMS. It can also issue pass-codes via email, but SMS is its primary mode of communication.

It was one of the first products to offer these services, and this latest version adds some welcome new features. First is support for any LDAP directory server, allowing SecurEnvoy to integrate with Active Directory and eDirectory, as well as many others.

It supports multiple LDAP domains at no extra cost, and you can use your own Radius server or the built-in version. It can also help you migrate away from tokens, as it forwards these requests to the token server until they expire or have been revoked.

We installed SecurEnvoy on a Windows Server 2003 R2 system. It took just a few minutes to select an LDAP directory server, provide its address and enter details of an administrative account. During this phase you can also enter details of other LDAP servers.



SecurAccess is very easy to deploy and manage, and supports multiple LDAP servers at no extra cost.

GSM modems are supported, but for testing we opted for a web SMS gateway service. SecurAccess supports all the main providers.

SMS network queue delays are handled by a preloading feature where users are sent their first pass-code when they register. After they've authenticated, the next one is sent ready for use. Inboxes are kept under control as new SMS messages overwrite previous ones.

A new on-demand service is aimed at users that authenticate infrequently. After logging in with SecurEnvoy, they're sent an SMS with a one-time PIN. Once they've read it, the message is removed from their mobile automatically.

Multiple one-time pass-codes in SMS texts can be useful for users who need to access the company network but can't get a signal. Day codes also avoid the need to send out new codes each time a user authenticates, as these are issued at specific times and remain valid for a set time.

The In Case of Emergency (ICE) feature handles secure access in a situation where the main premises are inaccessible.

All members of ICE will be sent new pass-codes, allowing them to access services running from a remote site.

We found SecurAccess easy to use, especially with the help of the deployment wizard. This four-step process asks for a default pass-code type, ICE membership options and a domain. We then searched for undeclared users and deployed SecurAccess to them using either their mobile or email. When users first log on to the portal you can get them to provide their mobile numbers; it emails them their first PIN, then requests their mobile number when they log on and adds it to their profile. SecurAccess is easy to deploy and manage, and is good value compared with many of the alternatives. Two-factor authentication just doesn't get any easier than this. **DAVE MITCHELL**

TWO-FACTOR AUTHENTICATION

PRICE
From 50 users,
£1,250 per year
exc VAT

UPGRADE
Included in
maintenance
contract

SUPPLIER
SecurEnvoy
0845 260 0010

INTERNET
www.secureenvoy.
co.uk

REQUIREMENTS
NTS Windows Server
2003 or 2008 with IIS
• SMS modem or SMS
gateway provider

EASE OF USE
★★★★★

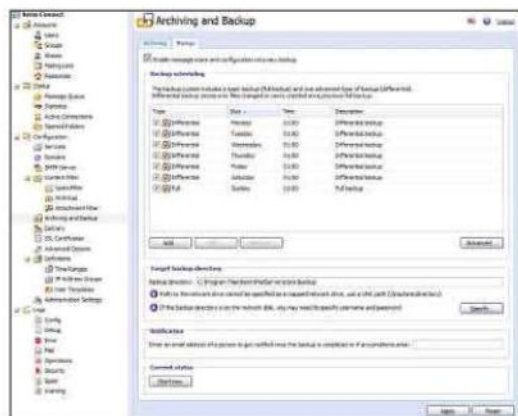
FEATURES
★★★★★

VALUE FOR MONEY
★★★★★

OVERALL
★★★★★

application is easier to follow and understand than, for example, Gordano's, one of Kerio's competitors. There are fewer tab dialog boxes within each other, the headings are more logically laid out and it's easier to find the option you're looking for.

Connect 7 has all the usual features you'd expect of such a messaging system, with antispam built in and antivirus an optional extra: you can install your own favourite or opt for McAfee for an extra charge of around £15 exc VAT per user. One new feature that will please overworked administrators is the ability to delete old email items automatically according to your company's policy.



Connect 7's all-important backup routines are built into the easy-to-use administration web application.

Kerio holds its own against the big boys in the areas of multiple servers, mobile messaging and full collaboration

in terms of features, performance and price. For 50 users, for instance, Kerio costs £1,173 exc VAT per year, compared to £2,274 for Gordano Messaging Suite (web ID: 206628) and £3,240 for Exchange.

Installation is easy too. You can examine the various log files in the web tool so that diagnosis of any problems with DNS and suchlike can be found quickly.

Previously, when comparing Kerio's offering against Gordano and Exchange, we felt it was more suited to smaller numbers of users. This is no longer the case, and with its easy setup and versatility Connect 7 is now a heavyweight contender. **MARK NEWTON**

REQUIREMENTS
Windows 7/Server
2008/Vista/Server
2003/XP/2000 •
Mac OS X • Linux

EASE OF USE
★★★★★

FEATURES
★★★★★

VALUE FOR MONEY
★★★★★

OVERALL
★★★★★

Real World Computing

PRACTICAL ADVICE FROM IT CONSULTANTS

Advanced Windows Jon Honeyball

The choice is yours

AS MICROSOFT FINALLY GETS AROUND TO OFFERING USERS A CHOICE OF BROWSERS, JON HONEYBALL WONDERS IF THE ODDS ARE STILL IN INTERNET EXPLORER'S FAVOUR

The arrival of the browser chooser at www.browserchoice.eu finally brings "closure" (as they say in therapy land) to a particularly unpleasant period in Microsoft history. It was released only recently, although it was agreed between Microsoft and the EU many months ago. The chooser enables you to decide whether you'd prefer to use a web browser other than the default, Microsoft's Internet Explorer, in your copy of Windows. This solution offers you a heap of browsers to choose from, many of which I have to confess to never having heard of. The big five are present, of course – Google Chrome, Mozilla Firefox, Apple Safari, Opera and Internet Explorer 8 – but on the second page (if you scroll the list far enough) you'll find Maxthon, Sleipnir, Avant Browser, K-Meleon, FlashPeak, GreenBrowser and Flock.

The main page containing the big guns is randomly laid out, and on it you'll find information about each browser. Not only that, but it lets you install one or more browsers on your system, which obviously leads to the question of "which shall I install?" The answer to that depends a great deal on how you use the web, and on your degree of interest in the whole, rather stale, debate about web browser compatibilities and whether or not you think it's a good idea to have access to the source code. The problem is that much of this decision-making will be based on emotion, previous upsets and vindictive behaviour, rather than on logic.

If you're happy with IE and it does everything you want (and not too much of what you don't want), my recommendation would be simple: stick with IE. If you want something that will really tweak Microsoft's nose then go for Google Chrome, which is a fascinating platform that offers lots of capabilities. But then you'll have to reconcile your choice with another ongoing unpleasantness that seems to be afflicting Google and its products at the moment. Would you simply be jumping out of the incompetent and lazy Internet Explorer frying pan into the "do evil, but claim you didn't" fire of Google?



JON HONEYBALL
Computer journalist and consultant specialising in both client/server and office automation applications. Email jhoneyball@woodley.side.co.uk or read his blog at www.pcpro.co.uk/blogs/jonhoneyball

What about Firefox? Well, this is a solid and interesting browser that has a lot of fans, myself included, so let's tick the Firefox box. Apple's Safari is a lovely thing too, but it follows the individualistic Steve Jobs groove by being somewhat odd in its strict standards compliance, which can cause pages to render incorrectly. But it's a nice browser, so let's tick that one too. Opera? I have friends who swear by Opera, but rather too many of them have ponytails for my liking. But hey, let's Just Say No to hairstylists and add that to the list too. As for the second-tier brigade, since I haven't heard of any of them and I suspect you haven't either, let's just pass on them for the time being.

Pressing the right buttons will garner an interesting mix of browsers, with a wide range of capabilities including many useful add-ins that can significantly enhance your browsing, but before moving on to those there are a couple of caveats that need to be addressed. First, you'll only get to see the Browser Choice add-in on Windows Update if you live within the EU. Second, it will be ticked for automatic download *only if Internet Explorer is still your default browser*. If it isn't, then the program concludes that you've already chosen another browser and hence don't require any help in choosing.

Assuming you can download the Browser Choice application, which will be located at `c:\windows\system32\browserchoice.exe`, then when you fire it up it will pop up a dialog with a title of "An important choice to make: your browser". There's also some text that explains how to choose a browser and what will happen once you've done it. There's a web-style OK button but no equivalent Cancel, and there's absolutely no Microsoft branding on this dialog box, or any other indication that this is a kosher system-update-installed item. Some of my colleagues have reported how home users, when faced with this anonymous dialog, have become convinced that there's some sort of virus or worm at work (clearly, these were well-trained and mature home users, because most of the ones I meet seem to be quite happy to



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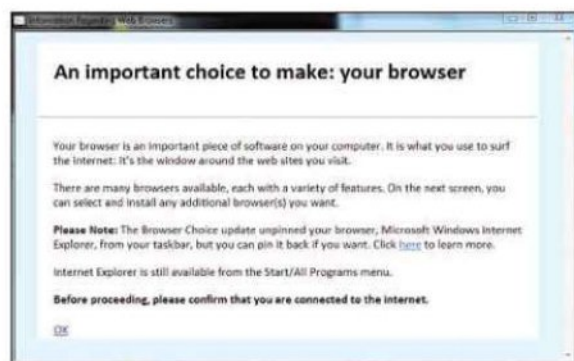
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click Yes or OK on Satan's own dialog with total insouciance). These sensitive users, who are used to watching out for problems on their computer, aren't at all happy with this dialog.

Maybe Microsoft had to make it this way. Maybe Microsoft thinks it's all right, because all its users will already know about the browser choice issue. This could only be true in some weird alternative reality where people discuss such things every day over their morning latte, and to be honest, I'm disappointed with Microsoft's behaviour here. It would have taken no effort at all to brand the dialog box in such a way that users would be happy to click it and there was no possibility of confusion over its origins. It's almost as if Microsoft had been forced into this whole browser choice thing against its will and is still smarting about it, but that can't be true because it would be too childish.

The other small problem is that it appears that the ordering of the choices on the first screen of browsers may not be as random as Microsoft would like to claim. Various websites have done significant statistical testing and discovered that there's a much higher than expected probability of IE ending up in the fifth slot on the page. Whether this is by accident or design is difficult to prove; clearly, it would be a little too obvious if IE ended up as the first choice every time, but maybe there's some psychological research that suggests that being at the end of a list is almost as good as being at the top?

It would be easy enough to concoct all sorts of paranoid theories along these lines, but my favourite explanation has to be that someone decided it would be a good idea to consult the Excel team for a randomising algorithm. (Long-term readers may recall my withering damnation of Excel's statistical functions some years ago, reporting on work done by serious statistical gurus who had found gaping holes in Excel's maths.)

Flash blockers

But let's get back to the browser choice. There's a very good reason to move away from IE now, and that is Flash. I should admit before going any further that I've had a somewhat rocky

Choice cuts:
note the lack of
Microsoft
branding.

relationship with Adobe over the years, and have complained loudly about its rapacious pricing model, which ensures that UK customers pay through the nose for products compared to US customers. Adobe's response was that providing support for UK customers was more expensive, an excuse that simply doesn't stack up. Furthermore, I've reported my profound dislike of Adobe's outright refusal to support US-sourced products in the UK, which reinforces the worst sort of market manipulation. Then there's the fact that I'm far from happy about some of the bizarre user interface designs that Adobe foists upon its users. And finally, would someone point me in the direction of a 64-bit version of Flash, so I can run my browser in pure 64-bit mode please? Apart from these, I have no complaints.

Well, there's a solution to the Flash problem and it's quite simple: don't run Flash. One of the delights of browser platforms such as Firefox, and now Chrome, is that they support add-ins, and by far the most useful of these are the Flash-blocking tools. These don't kill off Flash entirely, but replace Flash objects on a web page with grey rectangles; if you want to play a particular Flash item then you just click on the rectangle to activate it. I've found significant benefits from blocking the auto-running of Flash items, both on my desktop PCs and more especially on my laptops. Visiting a few mainstream websites can load up your machine with a dazzling array of Flash widgets showing all sorts of unnecessary blinking, winking, writhing, scrolling advertorial nonsense that just chews up processor time and hammers your battery.

Of course, there are sites where Flash is so integral to their operation that you have to leave it running, but these aren't too difficult to spot – if you see a page that contains nothing but a big grey box that doesn't do anything until you click on it, that's a clue. So click on it, and use the site as intended. However, I'm just heartily sick of Flash being splashed around

Tests show
that the order of
the browsers isn't
totally random.



as a vehicle for unnecessary advertising eye-distractions, and taking control of it is a fine idea.

Figures recently released by Apple show that Flash is responsible for by far the largest number of app crashes on the OS X platform. It isn't hard to see why Apple is so against allowing Flash on the iPhone and iPad, given the likely impact on battery life and hence overall user experience. Despite Adobe's push for Flash to become the universal choice, it isn't because of the stance taken by Apple, and this seriously dents the possibility of Flash becoming a totally web-wide control platform. The same is true of Microsoft's Silverlight, which also attempts to be cross-platform.

By the way, may I just point out that Silverlight 4 on Windows will allow access to the COM (OLE Automation) interfaces, so it will be possible for a Silverlight application to control other Windows-based applications? And while I can understand the desire to make this work in the abstract, can I also suggest it's a really bad idea? First, Silverlight applications are supposed to be cross-platform, so any Silverlight app should work on any platform, provided you have the current run-time of Silverlight installed. Second, the whole thing smells of a stitch-up by some group, like the Office people wanting to do things in Silverlight but finding it too hard, and hence falling back on the adage "if security is too hard, punch holes in the firewall till it works". If this is the case, it would be a shame.

As "classic" as the Dodo

I'm somewhat peeved to discover that my barely-a-few-months-old Windows Mobile phones are already effectively dead in the water. I have two touchscreen phones from Acer and HTC and an HTC slider, all of which run either Windows Mobile 6.5 or 6.1, but none of them appears to have an upgrade path to 7. Worse still, none of them even has an upgrade path to 6.5 from 6.1. And today I heard the news that HTC's HD2, the love object for iPhone haters, isn't going to be upgradeable from 6.5 to 7. Of course, significant platform changes may require hardware support to make them work – this is clearly understood – and if your new platform requires a touchscreen then a slider phone without a touchscreen becomes a bit of a chocolate teapot.

However, I fear that isn't the end of the matter. Microsoft has managed to allow a situation to arise where it isn't responsible for providing upgrades to OEM vendors for these phones, so even though a 6.5.3 version of the OS is available, because there isn't an install package from my phone vendor I'm pretty well stuffed unless I want to try to hack the upgrade on to the phone myself. This mess simply won't do, and rumours suggest that Microsoft is going to get much closer to the upgrade engines for Windows Phone 7 mobiles.

If true, that would be a step in the right direction, even though it's a little too late for me. Let's be clear here: Microsoft has in effect abandoned its entire Windows Phone strategy and started again from scratch. Apparently, my 6.x phones are now deemed to be "classic" editions, which is marketing speak for saying "Screw you". Microsoft needs to realise that Windows Mobile 7 is now its only chance of getting back into the game, but that those of us who have today's products are going to be somewhat annoyed by this total platform reset, even if we do understand its necessity. Future support has to come from Redmond and cut out the middlemen.

CRANKY

Some folks say that HTML5 is the real way forward, and that programming platforms such as Flash and Silverlight are simply vendor-specific attempts to continue locking people in. That's hard to argue with, but maybe I'm just getting old and cranky.

More compatibility

Another recent Windows Update file that landed on my test desktop computer can be found at <http://support.microsoft.com/KB/976264>. This details an update to the Windows Compatibility system. Essentially, Microsoft tests a huge pile of third-party (and own brand) software looking for compatibility problems. Usually, these are just sloppy programming items that the developers have left in the application, such as checking for a specific OS version but not accepting that there could exist anything later than Windows XP, for example.

The Windows Compatibility subsystem basically allows Windows 7 to lie to specific applications in various ways, so that helpers can enable the application to run. The list of applications affected by this update is significant and runs to many pages. For most applications the solution is listed as "Enables the application's functionality", which doesn't tell us much about what was required. However, if you're running one of these applications, it will be a welcome improvement.

To be honest, I'm in two minds about the desirability of application-specific workarounds. The unfortunate reality is that far too many apps are badly written, and providing workarounds for them simply condones, if not actually encourages, sloppy programming. On the other hand, if you're a punter who has bought a specific application that, for example, worked just fine under Windows XP but falls over under Windows 7, then your position will be clear: you want a workaround *now*. If the original software vendor won't support its app (maybe because it's no longer in business), then it falls back on Microsoft to provide such support infrastructure. However, I can't help feeling that this results in a lot of crud surviving when it should have been eliminated by natural selection. Then again, I've always been critical of the logo requirements, and this is just another facet of the same thing.

De end of defragging?

My test desktop machine has had a very hard life recently, with lots of software being installed and uninstalled, some of which was beta code, some of which had to be forcibly ejected before it would leave the machine. I've also been running a beta of Norton 360 4 on this machine, in which I'd scheduled a regular tune-up that included a complete defrag, a procedure that appears to launch the built-in defragger to reorganise my hard disk into a more sensible data layout. Since this hard disk was only lightly filled, there was plenty of space for it to do its work. Having uninstalled the now expired beta of Norton 360, I checked the drive's fragmentation using the built-in tool, and to my delight it reported that the drive was now 0% fragmented. Being of a curious (not to say suspicious) nature, I downloaded a trial version of O&O Defrag and ran that on the machine, and

that told me that the drive was 1.13% fragmented. Now I'll accept that 1.13% isn't so far away from 0%, but it isn't 0%.

I allowed O&O Defrag to do its stuff, while marvelling at its detailed user interface, and of course at the end of the job I couldn't tell any difference between the drive's performance before or after these defrags, because it was regularly getting defragged in the background anyway. With the move to solid-state storage, will all of this nonsense finally fade away? I hope so, because its time has come and gone. ■

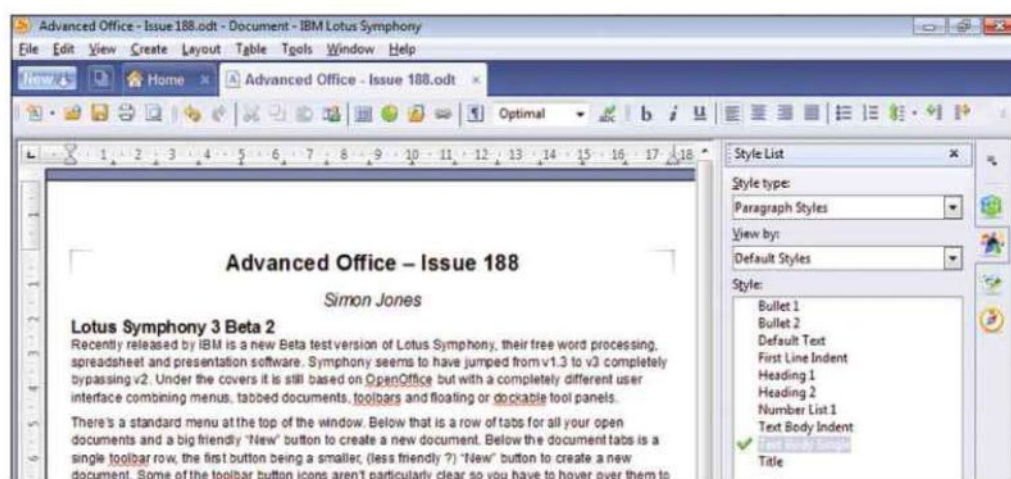
↓ Defragging could hopefully soon become a thing of the past.



Advanced Office Simon Jones

In with the new

SIMON JONES GIVES HIS VERDICT ON LOTUS SYMPHONY 3'S OVERHAULED USER INTERFACE, AND THEN FINDS A WAY TO GET SOCIALLY CONNECTED



Play guess the icon in IBM Lotus Symphony: what is that wizard's hat with things flying out? Oh, it's the Style List!

paragraph options such as font name and size, bold, italic, underline, bullets, numbering, spacing and indentation, while the Style List shows styles in alphabetical order. There's no preview of what each style looks like, so you must double-click to apply it to know what it does. There are buttons at the bottom of the pane to create a new style or modify an existing one, and modifying brings up a dialog with 13 different tabs – the options are laid out fairly logically, but its sheer complexity can be daunting. Happily,

you can also update a style based on the formatting of selected text, so you can make changes visually in the document and then save them to the style.

The Clip Art pane offers a fantastic array of fancy bullets – including coffee beans, pebbles, popcorn – but nothing else; no search facility, just an ability to select a category (or “theme”, since both terms are used interchangeably) and to import an image or folder of images. A link at the bottom of the pane called “Get Clip Art Online...” opens a web-based Clip Art gallery *inside* Lotus Symphony: yes, there's a web browser built into the application. Why? In this Clip Art gallery you can search, browse and select from a reasonable range, but when you click the Download button you're just given a zip file containing your choices to save or open, and that's it. There's absolutely no help in getting these chosen images into your Clip Art gallery or document – you have to extract the zip file to somewhere, click Create | Graphic from File... on the menu, or find the Create Graphic button on the toolbar (if you squint hard it looks a bit like a tree and a sun, although the tree is just nine green pixels so you might miss it). You can't drag and drop files straight from the zip into your document, but you can once the images have been unpacked.

The Navigator pane shows a useful list of all the headings, tables, graphics and other elements in your document, and enables you to jump directly to any one of them. There are also tools to move to the next or previous in any of the lists, and to set which outline levels to show.

Using Symphony

Writing in Lotus Symphony is pretty much like using any other word processor: it's reasonably responsive but it does like to second-guess what you're trying to type, offering suggestions that can be a little distracting as a string of irrelevant part-words

IBM recently released a new beta-test version of Lotus Symphony, its free word-processing, spreadsheet and presentation app. Oddly, Symphony appears to have jumped at a stroke from version 1.3 to 3, bypassing a version 2. Under the covers it's still based on the OpenOffice code, but fitted with a completely different user interface that combines menus, tabbed documents, toolbars and floating or dockable tool panels. There's a standard menu at the top of the window, below which appears a row of tabs showing all your open documents, with a big friendly “New” button at the left to create a new document.

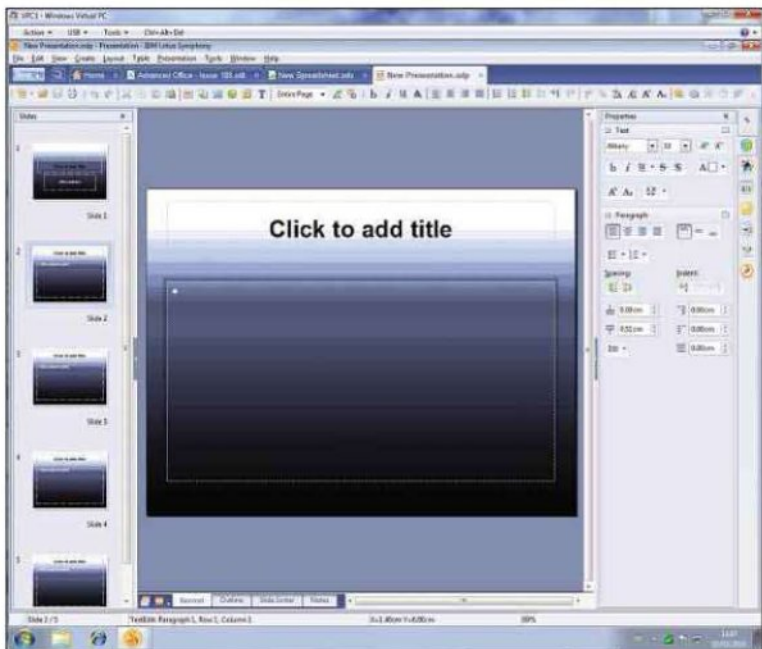
Below the document tabs lives a single toolbar row, the first button on which is another, smaller New button for creating documents. Some of the toolbar button icons aren't particularly clear, and they have no textual titles, so you must hover over them to see the tooltip to find out what they do – they're the normal 16x16 pixels, but a lot of empty space around them makes them feel smaller. Below the toolbar is a ruler, and then finally the document text you're working on.

To the right are the dockable tool panes, with their own tabs down their right-hand edge so you can flick between them. Regrettably, despite plenty of unused space, you can't dock the Properties pane at the top right and the Style List at bottom right – you see just one of them unless you drag the other off to the left. Doing anything remotely complicated means launching a modal dialog, yet there's wasted space below the 32 tools on the Properties pane, and 14 of those 32 tools are duplicated on the toolbar at the top. You feel that the designers of this UI could have used space better, putting more options on the Properties pane, reducing duplication and making the pane resize more sensibly (resizing either reveals more blank space or cuts off half the icons).

The word processor Properties pane shows basic text and



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pop up before you finish typing. After a while, it learns which words you use frequently and starts suggesting what you've typed before – including misspellings, which is irritating – and you press Enter to accept a suggestion. This might be helpful for someone who isn't a good typist, but I found it annoying and spent a fruitless five minutes searching File | Preferences... to turn it off, before discovering it was actually under Tools | Instant Corrections....

The default font is Arial, used for all body text and headings, and at the default 12pt and single-spaced this looks large and cramped. The optional 115% line spacing greatly improves readability, as does changing to a more modern font such as 11pt Verdana or Calibri. While formatting a document I found myself switching between the Properties and Style List panes frequently, which is distracting because they're slow to redraw. The options for laying out text are adequate, but why are useful features such as automatic widow-and-orphan control turned *off* by default, and why aren't heading styles marked "keep with next"?

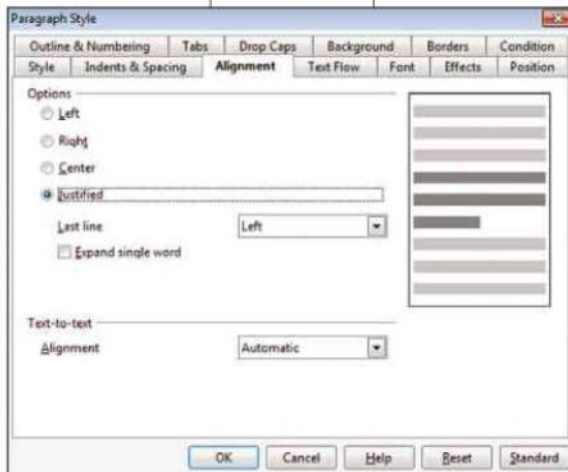
Symphony will check your spelling as you type but it won't check your grammar, not even finding instances where you've typed two spaces between words. It can create tables of contents, indexes and such-like, but the dialogs used to create these items are so fiendishly complex they will give even word-processing geniuses the screaming heebie-jeebies.

Inserting an image – or "creating a graphic" as Symphony calls it – is relatively straightforward, but the editing options are limited to positioning, wrapping text, flipping and resizing. To keep the aspect ratio as you resize you must use the Graphic Properties dialog, as simply dragging the handles will squash or stretch it. You can add borders or background colours, but only via the dialog. A task pane would have been better, where you could alter properties and see the changes immediately.

There are many right-click context menus, but some of their options are

↑ **The presentations module has busy dark backgrounds and boring Arial everywhere, plus duplicated icons and lots of unusable space.**

↓ **There are modal dialogs for everything and each one has more tabs than the last.**



obscure or not logically placed – cut, copy and paste, for instance, come last despite being the most often-used commands. In many cases, an aggressive tooltip will cover up the context menu and make it difficult to see where to click. Some other context menus are just too big: right-click a paragraph and choose Font Name, and it lists *every* font installed on your PC, which under Windows 7 with a 1,920 x 1,200 monitor takes up the entire height of the screen just to show fonts "A" through "I" (you get a little scroll-down arrow, but it will only reach "MS UI Gothic" before giving up the ghost). There are just too many fonts for a pop-up menu, and you can't use it to select Trebuchet or Times New Roman, but have to switch to the Properties pane.

Having all your documents appear as tabs in the same application window may feel neat and tidy to some people, but it isn't too good if you want to work on two presentations at the same time, or write about a presentation, or copy paragraphs from one document to another. You'll end up constantly flicking to and fro between documents, since there's no way to view more than one document at a time. You can't even launch a second instance of Symphony, since attempts to do so are intercepted and return you to the original instance.

The presentations module definitely works best on a wide screen, and with the Slide Thumbnails pane on the left and the Properties, Animations or Transitions pane on the right, you'll need a widescreen monitor to have any editing space in the middle. It has a good range of slide layouts, and the animation and transition effects are adequate, if not stunning. However, the slide templates – which set the fonts, colours and backgrounds – look very tired indeed, with a preponderance of dark or busy backgrounds and virtually every one employing the Arial font throughout. Editing any properties beyond the few that appear on the task panes again means a trip through a modal dialog with 13 or 14 different tabs.

The spreadsheet module is much the same, in that while the basic features are all there, it isn't easy to use by current standards. The Properties pane lets you set the font and alignment of the text, and even lets you rotate text so you can have your headings at 45 degrees, but there's no way to set background colour or cell borders without delving into yet another many-tabbed dialog. The same style list, clip-art and navigator panes are provided, along with a long list of functions whose effects are described in mind-numbing lack of detail. For example, "TTEST: Data_1; Data_2; Mode; Type - Calculates the Ttest" – that's the full extent of the description presented. You'll have to do a manual search of the help text yourself to find out that "Mode" can be 1 or 2 (one-tailed or two-tailed) and that

valid values for Type are 1, 2 or 3 (paired, homoscedastic or heteroscedastic). Even then you're probably none-the-wiser as to what a Ttest actually is, or whether you might be interested in the result. (It's Student's t-test, a statistical operation that yields the probability that both of two data samples come from the same underlying set of values, based on whether they have the same mean.) Double-clicking on a function name inserts it into the current cell, along with the names of its parameters, but good luck working out what you're meant to do next.

Charts are basic but functional, with a wizard to guide you through setting up the initial plot, but after that you have to rely

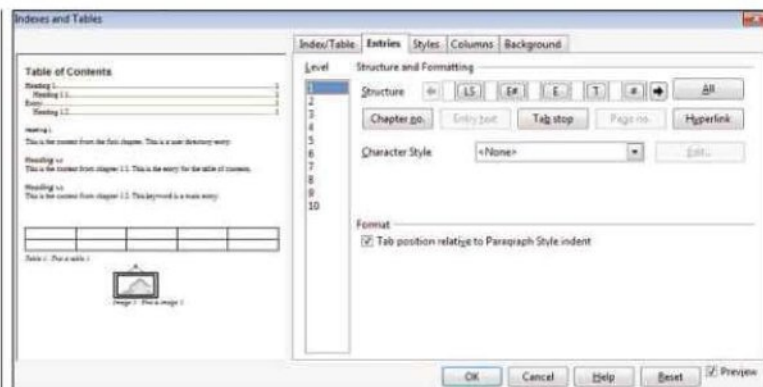
on more of those tabbed dialogs to edit it. Chart rendering is smooth, if not particularly fast, and the default colour scheme is colourful and not too garish. Data Pilot, Symphony's equivalent to an Excel Pivot Table, is powerful and easy to use, but it's a pity that PivotTables from Microsoft Office files aren't automatically translated into Data Pilots.

Bear in mind that this software is still in beta test, so you can expect there to be some problems, but while I've not seen too many screen painting artefacts, and it's generally stable, the Known Issues list reads like that old joke, Patient: "Doctor, doctor – it hurts when I do this. Doctor: Well don't do it then". Here's a typical example: "Issue Documents with big WMF Pictures are loaded very slowly. **Workaround** Please avoid using big WMF pictures in documents."

After about the third time of being told "Well don't do it then", you get a bit bored and wish they'd come up with some better workarounds that don't involve either refraining from that action or upgrading your operating system.

To sum up then, Lotus Symphony 3 has some good new features – and for a free office suite it's better than some. I really want to like it as a competitor to Microsoft Office, but there are still too many things that are difficult or just not well enough implemented. Take the matter of file formats: Symphony 3 uses ODF 1.2 as its default file format and implements it well, which is hardly surprising given that it's based on OpenOffice. However, IBM boasts that Symphony is compatible with Microsoft Office 2007 and 2010 file formats, by which it means that it will open Office 2007 and 2010 files and attempt to render their contents. It doesn't always do this successfully, though, and it doesn't tell you whether or where it had problems, but just displays a dire warning that "some" formatting "may" not be shown properly, and that you can't save the file in the same format. So yes, Symphony can *read* Microsoft Office OOXML files but it can't *write* them, and that's only half the job done in my book. If IBM software can't write OOXML, and Microsoft software writes ODF that can't be read by Symphony or OpenOffice (the current situation with Excel 2007), then it looks like we're still years away from meaningful interoperability.

I've tested Symphony by opening simple, moderate and complex Microsoft Office documents, and while all the *major* text and graphic components do seem to be translated, they're not always formatted correctly, even allowing for the different feature sets of the two apps. Nor do items always end up in the right places. An even moderately complex Word 2007 document could take a few hours to tidy up after opening in Symphony. I've seen blank tables of contents, images overlapping, centred text where it should have been left-aligned, wrong fonts, wrong line or paragraph spacing, charts as graphics, blank charts; the list goes on. If you're creating your own documents, and you have the time to wrestle with a less-than-friendly UI then



↑ **Creating a table of contents – what on earth do you do now? Even the help isn't much help.**

Symphony isn't too bad, but if you need ease of use or compatibility with documents created in other applications then OpenOffice, Microsoft Office and even Ability Office are superior options.

Outlook Social Connector beta refreshed

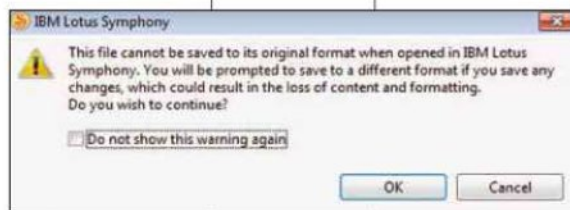
In mid-February, Microsoft released an update to the Outlook Social Connector. This is the add-in that will provide connectivity between Outlook 2010 and social networking sites such as LinkedIn, Facebook, MySpace and with the social networking functions of SharePoint. This allows you to get updated details about your contacts such as pictures, addresses, what they're up to and so on, direct from these sites and see the

updates in the People pane whenever you read an email from that person. Microsoft also revealed that the People pane and the Social Connector would be available in Outlook 2007 and 2003, as well as 2010.

Now, before you rush off and download the add-in, some words of caution. First, if you're currently testing the Office 2010 Beta, you *must* uninstall the Social Connector add-in that was distributed with the beta *before* you install this update. That means running the Office 2010 Beta setup again and modifying the installed components to remove the add-in. If you fail to do this, Outlook will refuse to start and you'll have hours of frustration trying to fix it. When the company first released this update, it buried this gem too far down in the installation instructions, and many people were caught out. Second, the updated Social Connector only works with the 32-bit version of Office 2010 Professional Plus, not with the 64-bit version or the Home & Business edition. Office 2003 and 2007 users can try it out regardless of which edition they're running. Third, the only providers that work with the updated Social Connector are MySpace and LinkedIn. If you're not a member of LinkedIn or MySpace, there's no benefit. Providers for Windows Live and Facebook are still "coming soon".

Finally, after you've installed the Social Connector and the providers for LinkedIn and MySpace, don't expect to see data immediately. It should start to trickle in over the next few hours and days. If you're not seeing the data after a couple of days, you might consider rebuilding your Windows Desktop Search index, which is what drives the data into the People pane. In Outlook 2010, this is found at File | Options | Search | Indexing Options | Advanced.

The updated version of Outlook Social Connector and the providers for the different social networks are available at www.pcpro.co.uk/links/188advoff1



↑ **Symphony will have a stab at opening OOXML files, but won't save them.**

ICONIC

When designing small icons, avoid drop-shadows, 3D effects and borders: with only 16x16 pixels, every one counts. Don't be tempted to just shrink a larger icon but rethink it, ditching objects you can do without and resizing smaller ones so they remain recognisable. Check out Axialis Icon Workshop as a good design tool, at www.axialis.com/iconworkshop



Microsoft Outlook's Social Connector reckons Barry Collins is very well connected.

Play it again, VS

MARK NEWTON RUNS HIS CODE BACKWARDS IN MICROSOFT'S VISUAL STUDIO 2010, AND FINDS A FRIEND IN SMARTERSTATS

The big news for those developing with Microsoft technologies is the release candidates of Visual Studio 2010 and .NET 4. While I've mentioned these products before, they were only betas, but now they have a licence that allows use in live environments – for those of us who need to produce working code in order to eat. Since both Studio and .NET 4 happily coexist on the same PC as their predecessors, there's little reason not to download them and play.

What do these versions offer? I covered some of their new features back in issue 184, but there's an impressive further enhancement to the debugging capabilities in Visual Studio. Many of us can remember the bad old days of web development, when the only way to check variable values was by printing them to a web page: halting execution to step through your code – as in a “proper” programming system – was just a dream. It took years for web developers to gain capabilities similar to those of desktop developers, but to a large extent Visual Studio 2010 redresses that deficit. Its debugging capabilities remain similar no matter which platform you're developing for, and if you're thinking “so what?”, this isn't actually the case with many current web development tools. The very latest version of one market leader still has no real debugging built in (I can't name the product – I'd have to kill you; at least I *think* that's what the NDA says...).

One very useful new feature in Visual Studio 2010 is the ability to set a breakpoint, then step back to a previous point and re-run the code from there; we've had this in Visual Basic since version 3, but it's been missing from ASP and ASP.NET. How many times have you single-stepped through an application's code, only to pass the critical bit and have to go back and run it again? Or perhaps to re-run the last few lines, with a different value in one of the variables? Visual Studio 2010 makes this possible through IntelliTrace.

I don't like to write about stuff I haven't tried myself – just in case the marketing boys became over-excited – so I decided to give this a whirl. I installed Visual Studio 2010 Ultimate and opened a website I've just finished (after making a backup), marked a line of code as a breakpoint, and then started the web application

The ability to move back through your code is a first for web developers.



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often working with
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from a victorian railway
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Web Applications is written on alternate months by Mark Newton and Kevin Partner. Mark specialises in Microsoft technologies, while Kevin focuses on topics such as PHP, MySQL, Apache and Flash.

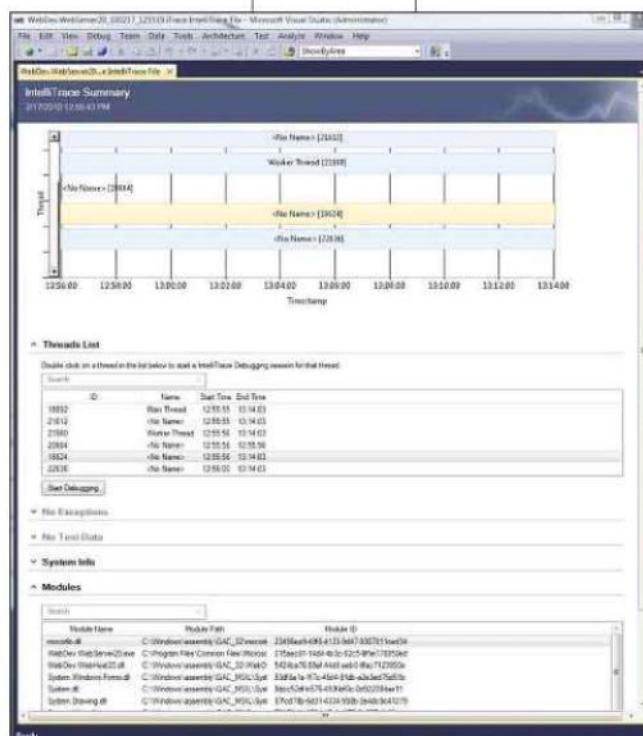
running with debugging turned on. When the application stopped at the breakpoint I single-stepped through a couple more lines, then dragged the yellow arrow pointer indicating the currently executing line back a few lines, then single-stepped forward again as normal. The feature just worked straight out of the box, despite my reading on certain blogs that getting it to work is tricky.

There are a couple of settings you can tweak to vary the level of data collected by IntelliTrace: at the lesser levels not all the properties of every object are captured, while at the highest level the performance of your application may be affected. You can also change variable values at any point, so you can test your code against them without having to run the whole application from the start. We've had these abilities in Visual Basic (but not C++) for some years now, but to have them for web application development is a serious aide to productivity, and Microsoft deserves high praise for trying so hard to make web application development that bit easier.

IntelliTrace achieves all this magic by generating an iTrace file. Taking this iTrace file and running it through either Visual Studio or the new Microsoft Test and Lab Manager (MTLM) enables faults and bugs to be easily reproduced, which will be a huge boon in larger development environments, where alpha testers can submit their iTrace files to programmers who will be

able to reproduce the faults easily and examine all the variable values at the time of the fault. You don't even need Visual Studio to be running to produce these iTrace files, as there's a command line tool called `INTELLITRACE.EXE` that can create iTrace files for importing into the developer's Visual Studio at a later date.

However, a couple of important points of which to take note. First, the size of these iTrace files has to be restricted, so that the space on your hard disk isn't completely eaten up. The upper limit is changeable, as is the location of the file, which by default on a Vista machine is kept in C:\ProgramData\Microsoft Visual Studio\10.0\TraceDebugging\. The second point is that these files are automatically deleted when you close down Visual Studio, so remember to make a copy if you need to send them to MTLM, or pass them on to someone else for examination. When you load an iTrace file into Visual Studio, a view



will be presented of all the threads that are running in your app, enabling you to re-run the program's execution and study the status of the various modules loaded. You can also examine each step of the debugged program. Having the ability to replay events such as this should make it much easier for others to fix code that isn't working as expected.

Squeeze your HTML

Once you have your code working, here's a tip to help improve the speed of your website – switch on HTTP compression. With this facility turned on at the web server end, any browser that's capable of receiving compressed HTTP (which nowadays is most of them) will receive a compressed data stream whenever it requests a web page. This speeds up the display of pages enormously, particularly when working over poor internet connections.

To switch on HTTP compression in Internet Information Services 6 just open the IIS manager, right-click on "web sites" and select Properties. Just note that this setting is server-wide by default, so will apply to all the websites hosted on that server. When the Properties dialog box comes up, select its Services tab and then "compress application files" under the HTTP compression option. You can set it not to be site-wide by entering the command line:

```
adsutil set w3svc/filters/compression/parameters/
HoDoStaticCompression false
```

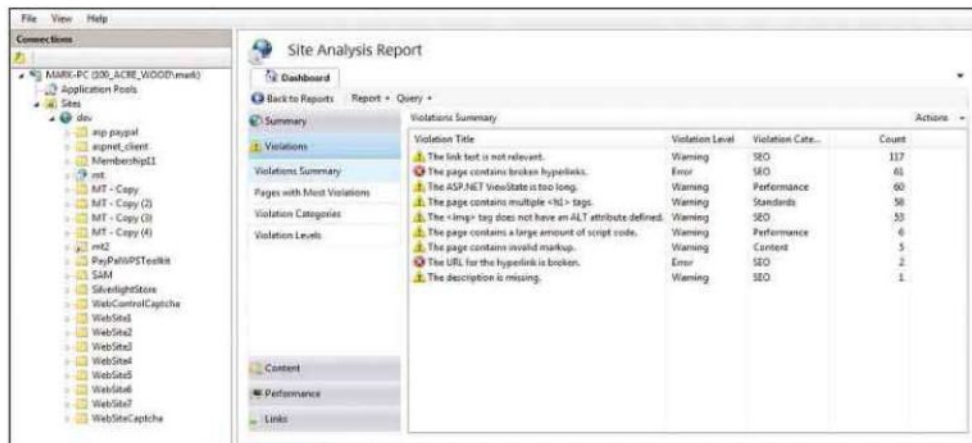
If you don't have full remote access to your server – as might be the case if it's hosted remotely – then so long as you're a member of the Administrators group on that server, you can set this option via a command line. Just open a command window and type:

```
cscript adsutil.vbs set w3svc/filters/compression/parameters/
HoDoDynamicCompression true
```

Of course, exactly what difference HTTP compression will make to your website speed depends on its relative proportions of HTML and graphics, but since ASP.NET controls can generate a lot of HTML, you should see a significant improvement by setting this option.

Block the hackers

As most of you will be aware, the current version of Microsoft's web server is Internet Information Services 7, and it was while conducting research for something else entirely that I came across a set of extensions for this product. The extensions are written by Microsoft and so may have only a few security holes, and are probably safe to use (but don't install any you don't need – just in case!). There are several interesting extensions offered and all are free, but the one that caught



↑ **SEO Toolkit** analyses your website like a search engine would and reports any issues it finds.

my eye was a beta of a Dynamic IP Restriction extension. This monitors requests coming into your web server and blocks any that match certain patterns of attack, as well as stopping brute-force cracking of passwords. Anything that puts another layer of protection between your website and the hackers can't be a bad thing.

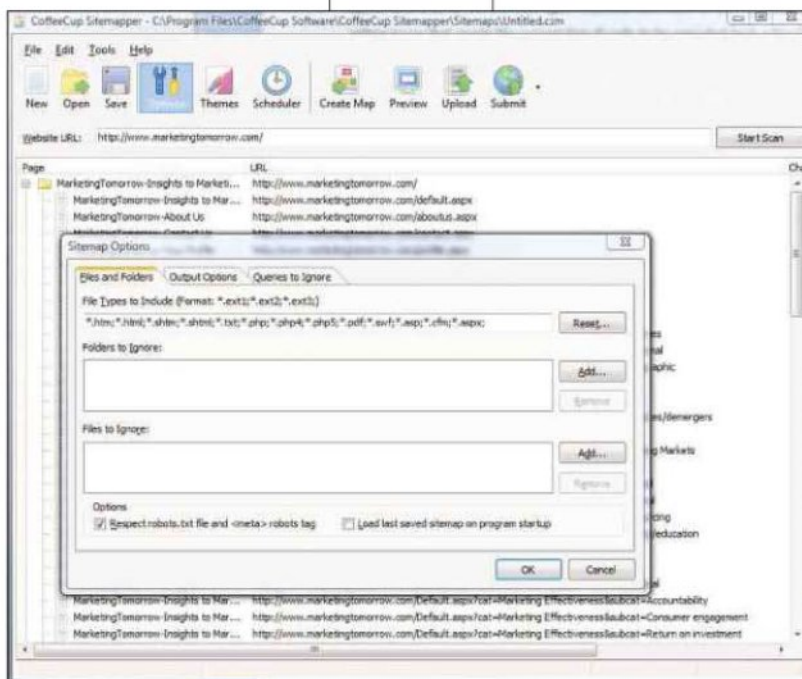
While all the extensions are worth taking a look at (www.iis.net/expand), there's one that isn't really an IIS extension but a very useful tool nonetheless, and that's the Search Engine Optimization Toolkit (www.iis.net/expand/SEOToolkit). This free tool will trawl over a website in a way similar to a search engine spider, and report back to you any errors it finds in your HTML that might lower the ranking of a particular page. I tried this out on a new site of ours, and it reported that the <h1> tag was being used in more than one place on the page, and that since search engines interpret the contents of the <h1> tag as a description of the page, the confusion may affect its ranking. This is an easy mistake to make, and one that's just as easily fixed. While such errors may not make that big a difference to your ranking, it certainly won't hurt to fix any obvious ones.

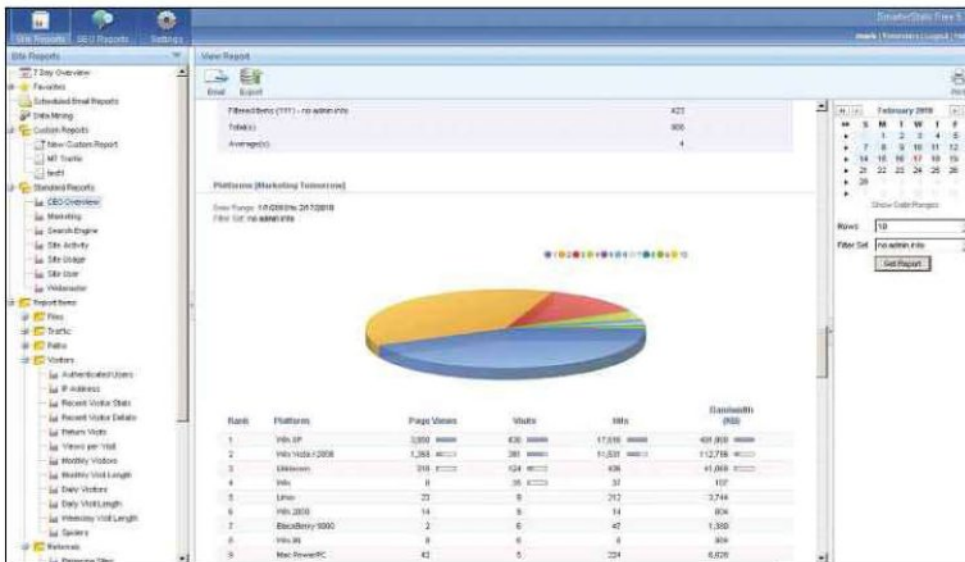
Coffee and sitemaps

One way to make sure search engines index your site correctly is by providing a sitemap for them to use to find the pages. A

sitemap in this context isn't primarily intended as something that visitors to your site use to locate pages – rather than trying to traverse the site via your horribly broken navigation system – although it can be used in this way. Rather a sitemap intended for search engines is a specially crafted XML file. You can create your own sitemap manually, but it's very tedious indeed for anything but the smallest of sites. I have in the past created a sitemap by building a dynamic page that generates an XML sitemap on-the-fly, for a site with a large number of changeable items held in a database. The majority of normal

↓ **Once the correct file extensions are entered, CoffeeCup produces perfect XML or HTML sitemaps.**





revenues, and hence can't justify the larger licence fee, so we needed to look for something different.

Our PHP-speaking cousins have several free or low-cost open-source options available to them, but I was sure that there must be something available for .NET, and after a bit of a search I came across a particularly stunning web log analyser called SmarterStats (www.pcpro.co.uk/links/188webapps1). This not only analyses your web logs but creates tables and graphs from the resulting data, and you can schedule it to mail these reports to you on a regular basis. You can also create custom reports, so that your clients can have the data presented to them in a clear and concise way. All this is very good, but things get better still when you start to play with the

websites lie somewhere in between these two extremes, and a tool that can help with the creation of a sitemap would be a welcome addition.

Just as I was pondering this problem for a new website, an email from CoffeeCup arrived in my inbox about just such a product. CoffeeCup is a company that's been in the business of producing HTML editors for as long as I can remember (since 1996, actually) and its products are usually very good – and well priced too. Bearing this in mind, I downloaded CoffeeCup Sitemapper (www.coffeecup.com/sitemapper), pointed it at my new ASP.NET website and off it went – and failed to do anything at all.

A quick look at its options showed a list of the file extensions that it would include in its search, which was quite comprehensive, but was missing the all-important ASP.NET ASPX extension. Adding a new entry for *.ASPX, and then re-running the "create map" option generated an XML sitemap, which after a quick visual check I uploaded to the site and then told Google and Bing about – both search engines were happy with its format and verified it. This tool may not be rocket science, but it does the job and saves you hours, so it's easily worth the \$29 that CoffeeCup is asking for it – and yes, I did pay up.

SmarterStats really are quite smart

Of course, the work doesn't end once your site is up and running; it's important to monitor the traffic to your site. Many people use Google Analytics for this, which is a free web-based traffic-monitoring system. It requires you to place a bit of code on every page that you want Google to track, and while this works well, it's somewhat limited – in particular, it's of no use for finding out detailed information about what requests the server is actually receiving. These requests are usually written into the web server's log files, and they can be a big help in fixing bugs and detecting attacks on your web server.

To inspect these log files it's normal to use a log analyser program, since decoding thousands and thousands of lines of log files is more than most sane humans can endure. In the past, we've used Webtrends to do this, and this program automatically creates web pages full of pretty graphs of site activity for our clients. But Webtrends has recently changed its licensing policy, and now charges based on the amount of traffic and hence the number of entries in a log file. This model doesn't work well for very active sites that don't generate any

↑ SmarterStats produces the reports you need to help monitor your website's position on the search engine.

SEO reporting section of the program, where you can enter a list of keywords and ask the system to check each of them against the web.

This is an extremely useful exercise to perform *before* you embark on an AdWords (or similar) campaign, where you're buying a particular keyword for your adverts to appear under. Another section in this research area of SmarterStats is "competitor suggestions": once you've provided it with a list of keywords about your site, it goes off to the web and returns a list of your possible competitors – you can then select five of these and the system will generate reports of how your site performs against them in the search-engine rankings. This is all useful stuff, but it doesn't stop there – another feature of this software is data mining. Using this option you browse to some file held on the web server and then select a series of questions from a dropdown menu, which lets you see who's visited this file, where they came from and where they went to, as well as lots of other questions about any single web page or file.

The graphs that SmarterStats draws are done using Silverlight, and so the whole application looks very smart and modern. The way the program generates the reports is by importing the web server log files into a SQL Server database, and then querying this to compile the reports: reporting this way is far quicker than trying to report from the log files directly. SmarterStats also provides a web front-end for selected users to view and generate the reports.

While you can run SmarterStats on the live web server, I wouldn't recommend this if you're going to allow your users to generate their own reports, since this could put an extra load on the server. SmarterStats can sit on a dedicated server and suck in the log files via a variety of methods from your web servers. SmarterTools (www.smartertools.com) is the vendor of SmarterStats, which comes in two versions: Pro and Enterprise (which has scheduled emailing of reports, plus custom reports, and is the version that I'd recommend). The free offering is in fact the Enterprise version limited to a single site, and upgrading from it is pretty reasonable, at \$499 for 50 sites, going up to a 30,000-site licence for \$9,999. If you're looking for an easy-to-use web analysis tool to run on your .NET servers, this could well be it. I'm currently trialling it on a new server/website that's just launched, and so far it's working very well. If initial impressions continue, I shall be purchasing a licence in the near future. ■

W3C

A tool such as the SEO Toolkit can help make sure that your website is as W3C compliant as possible. Another way to ensure this is via aides such as code hinting and IntelliSense, while you're actually writing the code.

Online Security Davey Winder

Please Rob Me

DAVEY WINDER PRAISES THE HARSH LESSONS DISHED OUT BY THE PLEASE ROB ME WEBSITE, AND DOES THE MATH WHEN IT COMES TO DATA PROTECTION



Regular readers will know I'm an advocate of online privacy, but one who also encourages sensible use of social networks. So you might be surprised to learn that when a group called Forthehack launched the Please Rob Me website (<http://pleaserobme.com>), I thought it was quite a good idea. Bear with me while I explain further.

What this site does (or *did* if it's been pulled by the time you read this) is republish data posted on Twitter by users of the Foursquare friend-finding social guide service. When people check in to Foursquare they're asked whether they want to share their current location with friends, and whether they want that information disseminated via Facebook or Twitter. Many people choose to do just that, the idea being that if your friends and other Foursquare/Twitter users know where you are, the greater the chance you can meet up. What Forthehack did was grab Twitter posts from such Foursquare users and republish it, pointing up when they left home and suggesting their house is therefore currently empty. I approved of their action because it helped to highlight – in a hard-to-ignore way – the danger in people using geo-location services to tell the world where they currently are and what they're doing. While it might be nice to notify your closest friends of your precise location, it isn't such a great idea to share that information with absolutely anyone.



DAVEY WINDER

Award-winning journalist and small-business consultant specialising in privacy, security and usability issues. Contact davey@happygeek.com and follow Davey on Twitter: [@happygeek](https://twitter.com/happygeek).

I'm not having a pop at Foursquare, which is an interesting service that actually takes privacy seriously, but rather at the culture of personal information-sharing that's sprung up – particularly around social networking sites. If the publicity surrounding Please Rob Me forces people to think about what they do when they publish their location, even if they decide to bear the risk, then it's okay by me. I could automatically publish my location via the GPS built into my iPhone and the Twittelator app I use to access Twitter, but I choose not to because I don't want everyone to know my exact location at all times, and the reason is to protect my privacy and property. I wouldn't leave my house with a sign on the front door stating that I'm off to the flicks and will be back around 11pm either.

Forthehack also argues that danger lies in publicly telling people where you are "because it leaves one place you're definitely not... home". It sums up the madness by pointing out that on the one hand we often leave lights on when we go on holiday, while at the same time we tell everyone online that we've arrived at the airport. It would seem that even the people behind Foursquare kind of agree, as the official blog notes that "location is sensitive data and people should be careful about with whom and when they share it", insisting that the company does "everything we can to make sure that our users know with what people and social sites they are sharing their location".



knowledge of what has been done, the greater will be his power of knowing what to do”, and if ever a sentiment ought to be applied to data protection issues then this is it. What a shame so many people choose to ignore it.

Knowledge is like an ostrich's head

Recent research from InvisiView media illustrates exactly what I mean, showing that far from people grasping that knowledge is power, they prefer to treat knowledge the way the ostrich proverbially treats its head – by burying it in the sand. This research was looking specifically at the problems of data theft and email

Doing the math

Thanks to Mark Twain (or Disraeli, or Dilke) we know there are three kinds of lies: “lies, damned lies, and statistics”. I was reminded of this as I read report after report, study after study and research paper after research paper that all claim to reveal the truth about data protection and online security, but no two could agree on the figures they quoted. This comes as no great surprise to one who's been a technology journalist for some 20 years – after all, no two of them actually study exactly the same group of companies, nor talk to exactly the same people.

So when you see a Symantec report claiming that 100% of enterprises suffered a cyber loss last year, you have to bear in mind that what it actually means is that 100% of those 2,100 enterprise CIOs, CISOs and IT managers from large businesses across 27 countries who were surveyed in January 2010 said that they'd experienced a loss during 2009. Not that you should let statistical granularity get in the way of the impact of this finding – all of more than 2,000 enterprise IT bigwigs admitted to cyber loss, which is a pretty shocking number from whichever angle you look.

I take a “wisdom of crowds” approach to security surveys nowadays, by which I mean that I read every one that comes my way so that after a while I get a feel for what they reveal about the security landscape as a whole, rather than allow myself to be influenced by the headline numbers in any one report. In effect I'm averaging the numbers produced by dozens of them in any one month. This is something that I encourage those at the data protection coalface to do as well, and I appreciate that it represents something of a turnaround for me. A few years ago, right here in this very magazine, I all but wrote off security trend reports as a waste of time because no two of them could agree on anything.

Thankfully, the security research business has grown up, and the approach that security vendors take when it comes to producing such reports has matured as well. They're less marketing-driven and more pragmatic in their content (with a few exceptions, of course). While their actual figures vary – for the reasons mentioned above – if you view them as a research “cloud”, then their percentage precipitations show a fairly reliable trend. It was quite definitely Benjamin Disraeli who said that “the more extensive a man's

↑ Please Rob Me uses blunt humour to put across a serious message.

↓ Location-aware services have negative as well as positive uses.

usage in business, and presented two statistics that jumped out of the screen at me: 30% of those asked admitted to sending confidential data in either the body of an email, or as an unencrypted attachment, while at the same time 98% of them insisted that it's vital to protect confidential information. Sure the company that produced this research is in the business of selling a data protection product, and so you might simply write off these numbers as PR fluff.

However, having spoken to enough employees from companies of all sizes and having read enough reports from other sources, I know that the underlying trend suggested by this study stands up, which is more than the maths does when it comes to data protection: people insist that protecting data is important yet admit that they don't bother to do so. One in four people considered the risk of sensitive data falling into the wrong hands too small to worry about, and 13% were actually happy to take that risk anyway. Given that most people aren't stupid, and that the people surveyed were clued up enough to understand the implications of data loss, I find this kind of “ostrich and sand” attitude frankly stunning, and what's worse is that I encounter it far too regularly.

Bean-counter madness

I've even been told by one SME bean counter, having been asked to assess his business security setup and make suggestions for improvement, that in his expert opinion the cost of implementing my improvements far outweighed the potential risk of any loss caused by not properly securing the data in question. Christ on a bike, is this guy serious? He actually used the phrase “in my expert opinion” when dismissing my consultation document. This guy is an expert in accountancy, not security, and I'm guessing that's why the firm called in a security consultant rather than just asking said bean counter for his opinion. So screwed up were the business processes at this place that the final word on what got done rested with the accountant.

This isn't just sour grapes on my behalf, as I was paid for producing my document whether or not its recommendations were implemented, and if they're implemented I won't get any additional commissions or backhanders – I'm not in the business of recommending



contractors or vendors to carry out the upgrades. I simply point out what needs attention. But when an accountant with no real understanding of data security can play a game of risk with customer information, intellectual property and other sensitive data, it makes me wonder just how screwed up the security maths is at many businesses these days, recession or not.

Take a look at yet another study regarding the risk of data loss for large enterprises (those with more than 1,000 employees), which was published by Proofpoint recently. This one questioned 220 companies and discovered that as regards exposure or loss of data, 27.4% had been affected over intellectual property, 32.8% over customer data, and 33.8% concerning other sensitive data. Those are high percentages to be simply factored out of the risk equation, don't you think? Or how about the rather compelling (at least to bean counters) findings of some privacy and information management research gurus at the Ponemon Institute, which suggest that the *average* cost of a data breach to the average business is £64 per customer record exposed. Actually, if you filter out the public sector figures that were somewhat lower at £54 per lost record, the true cost to the private sector alone is closer to £69 per compromised data item. Back in 2008 this figure was £60, and the year before that a meagre £47, so the cost of losing data is increasing steeply at the same time that businesses are spending less on securing that data. Ostrich; head; sand.

Sticking with statistics

Bear with me, as I'm going to stick with these security statistics and reports for a while longer. Any report that employs the word "honeygrid" to catch my attention is likely to succeed, because I'm a sucker for geeky language. You may be wondering what a honeygrid is, and I'll tell you – it's a collection of honeypots, of course. Actually, honeypots connected to reputation systems linked by an advanced grid-computing network. In the case of the State of Internet Security report from Websense Security Labs, it relates to its ThreatSeeker Network that scans around 40 million websites and 10 million emails for malicious code every hour. To put that another way, it's scanning more than a *billion* items of online content every day.

Under my notion of consulting the "wisdom of crowds", this report is therefore one that's rather difficult to ignore, and it's harder still to ignore its headline figure that suggests 95% of User Generated Content (UGC) is either spam or malicious. Of course, UGC is that which drives Web 2.0, or as it's now called, the Social Media. I help to run a large global IT support forum with more than 700,000 members, and as such I get to see a lot of UGC in the form of forum posts, news story comments and code snippets. While our team of moderators deals with quite a lot of spam and scam postings every day, if these constituted anywhere approaching 95% we'd have packed up and retired from that particular business a long time ago. Perhaps it's the fact that we require people to register before they can post that makes the difference, but certainly the amount of spam we filter out accounts for no more than 5% by volume of all traffic, turning that 95% figure on its head.

This honeygrid also looked at email and revealed that during the second half of 2009, some 81% of emails scanned contained a malicious link. I have no trouble accepting that number: if you feel brave, take a dive headfirst into your spam folder and browse the foulness therein. If it's anything like mine it will be filled to overflowing with malicious links, as pretty much every spam message these days comes with one, almost as if it had become compulsory. There's more and more pharmacy spam in there, and a lot less of the sexually explicit



↑ Search Twitter for "sexy female" to reveal both porn and porn spammers if you aren't easily shocked.

stuff that I used to get. Perhaps the spammers have a clever algorithm that tracks my age and tells the spambot not to bother sending me any more penis enlargement now I'm officially an old geezer. Or maybe it's that the porn scam industry – and most porn spam is also a scam, rather than a genuine desire to share sexually explicit material with complete strangers – has moved elsewhere.

Porn scams on the move

The CA Malware Analysis Lab tells me that the Trojan Porn Dialler has returned, this time targeting mobile phone users. Who can forget the porn diallers of old, which fooled dial-up modem users into connecting to a hidden offshore number and thus racking up huge premium-rate phone bills by viewing explicit images via a custom viewer they'd willingly downloaded. Now this scam is back, using malware written in Java 2 Micro Edition that sends text messages to premium-rate numbers once the victim has installed some adult application or other that promises free porn or free adult messaging. As soon as this downloaded application is fired up, it subscribes to a premium-rate service and the phone bill starts adding up.

The porn scammers have also turned to the social networks in high numbers, very high numbers indeed. Symantec tells me that 92% of the adult phishing scams that it sees nowadays are taking place on social networking sites. New medium, same old premise, and one that amazingly still seems to work. Those porn dialler scams of old worked on the basis of sex plus greed – free porn if you download our gallery viewer software. Well the new scams exploit exactly the same greed factor, promising free porn but actually redirecting you to one of those damnable fake antivirus sites that continue to blot the online security landscape. Other scams ask users to input personal credentials in exchange for free porn downloads. Seriously folks, I'd have thought that everyone would know by now that if you want free porn, all you have to do is turn off the SafeSearch feature when using Google Image Search.

Oh, and don't be taken in by complete strangers who send you Direct Messages on Twitter claiming to be sexy young ladies who want to meet you because your Tweets are so funny and interesting. They aren't sexy young ladies, they're fat Russian villains after your Twitter credentials, which they'll try to grab by presenting you with a fake Twitter login screen when you follow the reply link to their message. The same goes for other Twitter DM scams doing the rounds, which say things like "u look funny here" or "this is funny", while their links redirect you to login data-harvesting sites using third-party redirects that appear to the end user as (fairly) genuine URLs. The advice is obvious: if a stranger, no matter how sexy, sends you a link in a Twitter message, just delete it and don't click it. Simples innit. ■

ATTACK!

The latest global State of Enterprise Security study from Symantec claims an astonishing 100% of enterprises suffered "cyber loss" during 2009, with a whopping 75% experiencing "cyber attack" at an average cost in excess of \$1.3 million per year. Meanwhile, 42% insist that security is their number one concern, ahead of terrorism, natural disaster and traditional crime.

Mobile & Wireless Paul Ockenden

Curse of the black spot

PAUL OCKENDEN INVESTIGATES OPTIONS FOR THOSE PLACES WHERE THE MOBILE NETWORKS DON'T QUITE REACH, AND ALSO LOOKS AT RIM'S NEW ENTRY-POINT BES



What do you do when your home or office is situated in a mobile reception blank spot, or in a place where receiving a signal involves standing on the washing machine with one leg on the fridge and your head pressed against the ceiling? Either situation is an impossible way to run your business life, and with the advent of mobile clients for social networks, such a lack of signal may adversely affect your social life too. Of course, you could simply change network, selecting the one that offers the best signal for your location, but for people with a company-supplied mobile phone that isn't even an option, since you usually have to take what you're given. Perhaps you live or work in a location where there isn't the faintest signal from *any* of the mobile networks: such places do exist, especially in remote coastal valleys. Changing networks wouldn't make a jot of difference there, so what do you do in a situation like that?

Actually, there's a host of things you can try, but the one I urge you *not* to try is installing a cheap mobile phone booster or repeater. You'll find several UK companies selling these on eBay or Google, but none of them mention that using such devices is totally illegal. It's one of those peculiarly British law mess-ups that makes it legal to sell repeaters, legal to own them, but not legal to use them! Check www.pcpco.co.uk/links/188mob1, where Ofcom says "Repeater devices transmit or re-transmit in



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the cellular frequency bands. Only the mobile network operators are licensed to use equipment that transmits in these bands. Installation or use of repeater devices by anyone without a licence is a criminal offence under Section 8 of the Wireless Telegraphy Act 2006. Any person found guilty of installing or using such devices without a licence would be liable on conviction to a fine of up to £5,000 and/or up to 51 weeks' imprisonment." Given this clear and unambiguous prohibition, I find it amazing that various forums are littered with people discussing their use of repeaters within their homes and small offices, some even posting photos of how they've installed the kit. They might as well post a picture of a £5,000 cheque made payable to HM Court Services.

Luckily, you have several legal options, the first being to use Voice over IP (VoIP) to make and receive calls from your black spot, which of course involves having a wireless network, a smartphone with Wi-Fi capability, and some kind of VoIP client software. Some phones (notably Nokia's higher-end devices) have VoIP built in and properly integrated into their operating system, but for others you'll need to download and run a VoIP app. With most of these applications you'll struggle to seamlessly route calls direct to the phone when you're within mobile signal range and via VoIP when you're not, and even if you find a system that does provide this functionality, it will

probably involve changing your mobile number to route incoming calls via a third-party.

As an alternative, forget VoIP and use one of the “find me” single-number providers that ring round a programmed sequence of numbers to locate you – mobile, office, home and so on. The problem is that unless you regularly update them to try your current location first, they give a shifty and, frankly, unprofessional impression to callers as they ring around all your different numbers. (Some VoIP providers offer a similar system.)

Not sounding too good so far, is it? Luckily, not all black-spot remedies are clunky or illegal – I’ve recently started testing some better solutions and will report back more fully in a few months’ time. Probably the most mature of these is UMA (Unlicensed Mobile Access) over Wi-Fi, and the only network that currently offers it in the UK is Orange. It requires a phone that has Wi-Fi and is also UMA-enabled, which to date – considering only mainstream models – restricts you to half-a-dozen BlackBerrys, a few Nokias, and odd models from Samsung, HTC and LG. I’ve been doing my own UMA test using a BlackBerry Bold 9700 and a Nokia 6310.

The way UMA works is brilliantly simple: if you have a suitable phone and it has a Wi-Fi connection (via any provider, not just Orange broadband), your calls will be routed over the wireless network instead. The phone normally gives priority to UMA traffic, so dialled calls will go out over your broadband connection, although you’re able to change the preferred network if needed. If you’re an Orange customer who lives or works where there’s weak mobile reception, UMA is a great option, and it’s free apart from the cost of the call, which goes onto your mobile bill as normal.

Another option currently being trialled in the UK by T-Mobile – which hasn’t launched yet – employs a device called Cel-Fi from Nextivity. I shouldn’t really compare this to those illegal mobile phone repeaters, but in simplistic terms that’s what it does: a unit installed in your loft (or wherever you get maximum signal) locks onto the signal from a particular network and transmits it wirelessly to a unit in your main living/working space. It employs a very short-range transceiver operating in the normal mobile frequency band, so your phone instantly sees a five-bar connection, and since the kit is supplied by – and locked down by – the mobile network, it’s legal to use in the UK.

Finally, and perhaps most interestingly, there’s a device known as a “femtocell” available from Vodafone. This used to be called the Vodafone Access Gateway, but has recently been re-branded with the more market-friendly name of Sure Signal. At its heart it employs UMA technology, but unlike Orange’s system it doesn’t require a special handset or Wi-Fi. Plug the unit into your network – probably your broadband for home and SME users – and it presents itself as a miniature 3G mast that will work only with pre-registered phones (controlled via a web interface), so your neighbours can’t make calls over your connection. You can sit in the deepest basement in the middle of nowhere and Sure Signal will give you a solid 3G connection you can use for both voice calls and data. Although it’s probably prohibited by all kinds of laws and Ts&Cs, I reckon it may also work if you took it abroad with you.

There you have it, three very different options from three of the major UK networks, each with its own strengths:

The Nextivity Cel-Fi is a fully legal mobile phone repeater.

➔ **Orange has recently started a marketing push on its UMA-enabled phones.**



with UMA there’s nothing else to buy or install, it just works; the Nextivity repeater is like a souped-up version of those illegal gadgets you find on eBay, only better designed and legal to use in the UK; and finally, Vodafone’s Sure Signal box can be used with any (Vodafone) 3G phone – even in places where there’s no mobile signal at all. The main benefit with all three is that you don’t need to change your mobile number, which is really important in a business environment.

I’m going to give them all a thorough workout and report back in a few months’ time. In the meantime, if any of you are using UMA, femtocells or *legal* repeaters, please let me know how you’re getting on, and of any tips or tricks I can pass on to readers of this column. And if you currently use an illegal repeater or booster, keep an eye out for men in uniform...

Not so Tru

Many moons ago (issue 168, to be precise), I wrote about VoIP provider Truphone, which had bought the global-roaming company SIM4travel and planned to integrate their two systems. The idea wasn’t just that you’d have a single phone number that worked for both VoIP and mobile calls, but you’d also be able to roam across most of the main UK networks using a single SIM.

As such it would have been the perfect solution to the mobile black spot problem, using your Wi-Fi at home or in the office, and roaming on the strongest available network when out and about. At that time, Truphone’s PR person claimed that the system would roam across all the UK networks apart from 3, and that when you left your home or office, your handset would switch from Wi-Fi to the Truphone SIM and you’d rarely be without service wherever you went. The very words were: “So, if there’s cell coverage, you’ll have access.” It all sounded too good to be true – and it seems that it was.

Truphone has now launched its SIM card, called Truphone Local Anywhere (<http://localanywhere.truphone.com>), and the testing I’ve done so far suggests that it’s locked to Vodafone’s network in the UK. In fact, Truphone appears to have entered into a Mobile Virtual Network Operator (MVNO) contract with Vodafone, which means the network shows up on your phone as “UK Truphone”, but is essentially a rebranded version of Vodafone – in exactly the same way Virgin rebrands T-Mobile’s network or Tesco Mobile does with O₂’s. It’s a shame the original promise of cross-network roaming in the UK didn’t come true, because it would have



↑ **Vodafone provides a femtocell solution to mobile black spots.**



been brilliant, and I still think there's a gap in the market for someone to offer that service on a sensible tariff.

But what of the Local Anywhere SIM itself? Once I got past the disappointment of it not living up to the original promise, it actually isn't a bad product – as you move around within the UK or the USA (at the moment, but they're looking to add more countries soon) you'll automatically get a local dial-in number; better still, if you happen to be in the USA and need to dial a US number, you'll pay only for a local call. On some UK networks, that would cost you a couple of quid a minute.

Even within the UK, you'll find that Truphone Local Anywhere offers pretty good international call rates to major business destinations such as Hong Kong, Australia and the USA for 8p per minute, where on a standard UK business contract you'd pay £1 or so. For me, number portability would be a concern for business use (it currently doesn't support it), but for someone heading off for a gap year or an extended holiday to the USA, the Truphone Local Anywhere SIM would be a good investment.

Express yourself

I wrote a few months ago about the two connectivity options for BlackBerry users, either BIS or BES. To complicate things RIM has released a new version of BES aimed at SMEs called BES Express, and to confuse things further still there used to be a previous product called BES Express (which I've written about here from time to time). The new offering is something quite different, so please forget everything you previously knew about BES Express. I'll call it BESX from now on.

The headline news is that this BESX software is free, there are no CAL requirements, and your BlackBerry client phones only need BIS accounts with a mobile phone network, rather than the more expensive BES connection needed for a traditional BlackBerry Enterprise Server. Of course, RIM doesn't want to totally cannibalise its high-end corporate sales, so this new software does come with certain restrictions.

First, it supports only 35 IT policies as opposed to the 450 plus of the full product, but the 35 offered are a sensible selection that cover most of the normal SME security needs. That includes stuff like password control, remote wiping, control of the camera, Bluetooth and Wi-Fi, and more. Although it's a cut-down version, much of the good stuff from BES 5.0.1 is in there, including the web-based admin facility, full HTML email support, remote file access, remote folder searching, follow-up flags and so on. BESX lacks some of the other grown-up facilities found in the full product: it doesn't offer high-availability features such as automatic failover to a standby server, and it can't talk to GroupWise, Domino, or older versions of Exchange Server. Another limitation is that it doesn't support over-the-air activation, at least not for BIS-connected devices (although confusingly, I've discovered that wireless activation *does* work if your phone contract has a full-fat BES connection enabled). For BIS-enabled devices you'll need to activate the device via a wired connection, which probably isn't too bad if you have everyone working from a single office, but a bit of a pain if you're trying to manage a fleet of remote users.

Even so, I think a lot of small companies will find that BESX suits them just fine, and even in larger corporations we may start to see mission-critical users staying on a



↑ **There's no UK roaming, but Truphone's Local Anywhere SIM is still an interesting product.**

MERGER

It looks very likely that the T-Mobile/Orange merger will go ahead. I know people who work for both networks and they're excited about the prospects. I wonder how long it will be before we see roaming between the two networks enabled as an interim measure?

↓ **RIM's new BES Express allows you to do grown-up push email and data for a lower price.**

traditional BES, but low-level users (especially those personally liable for their devices) being migrated over onto BESX. Not only would that reduce the CAL costs, but it also means you can run the devices on a lower monthly tariff. As I write, this BESX has been out for only a day, but I can report that it downloaded and installed without any problems. As always, I'll keep you informed over the coming months if I hit any snags or come across any handy hints and tips.

Windows Phone 7 Series

Finally for this month, I thought I'd offer you a few of my initial thoughts about Microsoft's Windows Phone 7 Series announcement (see pcpro.co.uk/links/188mob2 for PC Pro's coverage). First, at least from what we've been shown so far, it looks like rather a good operating system. Perhaps its lack of multitasking is something to gripe about, but the iPhone manages okay with the same limitation (I'm not so sure about the iPad, but that's a whole other story). I like what I've seen of the user interface, and its deep social-media integration is a great idea. What pleases me most, though, is that in all of the screenshots I've seen there's been no trace of any vestigial bits of Windows Mobile 6.x, which surely has to be a good thing.

Windows Phone 7 Series looks so different from what has come before it that I can't help but think that it really deserves a new name and a 1.0 version number. Most old Windows Mobile apps won't run on this new operating system, and none of the current phones can be upgraded to run it (as Jon Honeyball so

bitterly notes in his column this month). It really does represent a "start again from scratch" approach, which is probably Microsoft's last chance to make it in the phone arena.

I know Microsoft likes to announce early, but one worry must be that Windows Phone 7 Series has been revealed (in some detail) ten months before the first phones will hit the shelves, and I wonder whether that will give the competition time to steal and improve on its best bits before Microsoft even gets any devices to market? ■



Open Source Ian Wrigley

Script it with Sikuli

IAN WRIGLEY DISCOVERS AN OPEN-SOURCE SCRIPTING TOOL THAT MIGHT JUST MAKE YOUR LIFE - AND HIS - THAT LITTLE BIT EASIER

I came across a fascinating open-source project the other day that promises to make life just a little bit easier for me, and perhaps it will for you too. It's a totally cross-platform automation tool from the User Interface Design Group at MIT, with a really cool user interface (which isn't too surprising, given its august provenance) and the ability to script things that have been hitherto unscriptable.

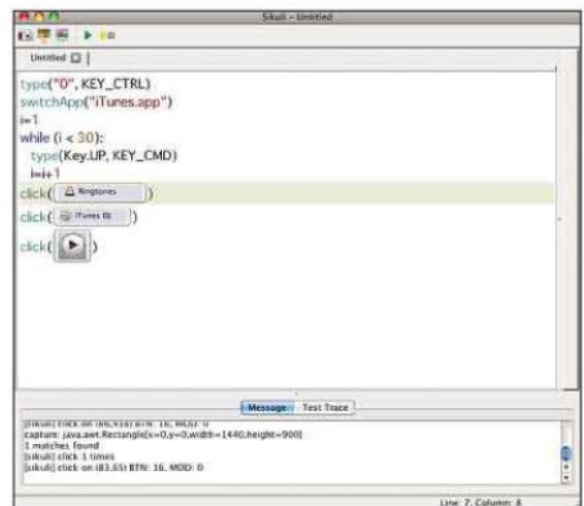
One of the main problems with scripting systems such as AppleScript is that they require at least some co-operation from the application itself. In the case of AppleScript, the application must implement and publish a scripting dictionary, while tools such as Visual Basic can only do so much and they have great difficulty with predominantly graphical user interfaces. The open-source Project Sikuli aims to solve that problem, focusing very much on enabling you to script even a totally graphical UI.

To demonstrate just how neat it is, take a look at the screenshot (right), which shows a script I created to start playing iTunes. You'll notice it isn't a typical scripting language, because there are actually graphical elements right in there among the scripting commands. That's where Sikuli differs from other scripting languages I've seen: you define the actions it should perform by screen-grabbing the interface elements you want it to manipulate. On a Mac, this grabbing function is mapped to <Command-Shift-2>, and when you press that key combination the screen will darken so that you can select a region, at which point the region is pasted into the IDE (integrated development environment).



IAN WRIGLEY

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Sikuli is a clever way to automate even a wholly graphical interface: just cut and paste commands as you see them.

Let's step through this script line by line:

- 1 The first thing I need to do is move to the Space where I have iTunes running. OS X employs the concept of "Spaces", or virtual screens, and I have iTunes running on my 10th Space, which I can get to by hitting <Ctrl-0>, so I tell Sikuli to type that. Then I switch to iTunes to make it the foremost application.
- 2 Now I want to make sure the volume is all the way up. Although Sikuli can be made to drag elements such as the volume slider, I had problems making it work in all cases – the slider seems just too small for it to recognise reliably. So I used the alternative method, which is to increase the volume using <Command-Up Arrow>, and I need to do this several times to make sure the volume is at its maximum, so I just loop around and do it 30 times. (If you're a Python programmer, you might recognise that WHILE loop construct: it turns out that Sikuli Script, the scripting language Sikuli uses, is based on Jython, a Java implementation of Python, so all the regular constructs such as loops are available.)
- 3 Once I've turned up the volume, I need to make sure that the iTunes DJ playlist is selected. Again, though, my initial attempts weren't terribly successful. My first version of the script just had Sikuli click directly on the iTunes DJ icon, but if that icon was already selected it would be highlighted, and the graphics recognition engine couldn't match it because I'd asked it to click on the *unhighlighted* version. There may well be an elegant workaround for this that I haven't discovered – it's still relatively early days for me with Sikuli – but I opted for a brute-force and ignorance approach (always my favourite) by having Sikuli first click on a playlist I knew couldn't possibly be selected, namely Ringtones, and only then to click on iTunes DJ.

Open Source is written on alternate months by Ian Wrigley and Simon Brock.

HIPPIITY HOPPITY PHP

Facebook is, as everyone knows, a massive website that serves some nine billion people every second, or something like that. It's almost certainly the world's largest PHP-based website and it deals with a huge volume of traffic. Over the past couple of years, some engineers at the company have been working on ways to speed up the site's performance, and the result is HipHop, a PHP-to-C++ translator that the developers say halves the CPU usage compared to using straight PHP via Apache. Its effect is to enable them to serve far more pages using the same hardware. What's really nice is the company has released HipHop as open-source software.

HipHop isn't for everyone, and not even for everyone who runs a website written in PHP. Most sites just don't need that sort of optimisation. For most people, the performance bottleneck isn't actually the web script itself but is more likely to be the database, since most people's MySQL (or whatever) installations are horribly unoptimised. But if you're running a site on multiple web servers, and you're sure that you're already getting the best performance you can out of your database, then HipHop may well be worth checking out.

facebook

The project takes a very different approach to the other PHP optimisers out there, in that it doesn't actually optimise the PHP code at all but instead takes your PHP script as it is and converts it to C++ code, which you then compile using the GNU g++ compiler. Those of you who are developers will understand just what a massive effort this is: HipHop accepts pretty well all of the PHP language (it's based on PHP version 5.2 at the moment, with a 5.3 version coming), bar a few esoteric and seldom-used functions, and converts it into a totally different language, C++. That it can be done at all is impressive, but that it works so well – given that it was written by a small coding team – deserves high praise indeed.

Facebook is now using HipHop on its live site and has released the code for others to use and improve. This is a great example of a company that was built on open-source technologies (such as PHP) being a good open-source citizen by giving back to the community – long may it continue to do so. In fact, Facebook has been open-sourcing a great deal of code over the past few years, including patches to increase MySQL performance and Cassandra, a distributed database, for which it deserves more kudos.

4 Finally, I have the script click on the Play button, and the music starts. I saved the script to my desktop as an executable, and now any time I want to start iTunes I just need to double-click on it.

Sikuli is a clever piece of software. At the heart of it is a graphics recognition engine that finds the pictorial element you're looking for whenever the script runs. You can fine-tune it by adjusting the "sensitivity" of the matching – if you double-click on an image in the IDE, a window will appear that shows you the current screen plus all the regions that your captured image would match, and by moving the sensitivity slider you can adjust it until only the area you're interested in is selected.

Now this "play iTunes" script is hardly groundbreaking, as the same effect could be achieved manually in just a few clicks, but already people are using Sikuli to do some far more advanced things than this. For instance, there's a demo on YouTube of someone using it to export music from Logic Pro into a new movie file, then using QuickTime player to email the

↓ The Sikuli blog lists many example projects, including this script to search Picasa photos and start a slideshow.

file using the Share function. Another script automates an entire Coda workflow (Coda is a web development tool), uploading new versions of the pages to a website, and there's even a demo of Sikuli playing a game of Bejewelled.

It's true that creating the scripts in the first place can be a little tricky, especially while you're still getting the hang of the language (and since I'm not a Python programmer, getting used to that language's various – let's be kind and call them "idiosyncrasies" – took me a while). But once you do get into the groove it's remarkably easy to do some really quite sophisticated things. If you find that you're performing the same repetitive tasks over and over again, this program may well save you huge amounts of time.

For example, the first demo on the Sikuli site shows how to change your machine's IP address, which isn't particularly exciting unless you have to do that every day when you move your laptop from home to the office, in which case you'll find it a massive relief. While the scripting language is based on Python, it includes many extra features such as moving the mouse to a particular place on the screen and clicking, typing values into dialog boxes, and searching for a visual element based on some other element. For instance, if there are multiple sliders on a page, you could find the one you want by identifying a label to the left of it, then tell Sikuli to look for a slider to the right of that label. Clearly, a lot of thought has gone into this product, and it's improving with every new release.

One criticism I do have is that the documentation could do with being beefed up quite a bit: it currently consists of a few examples, a few How-Tos, and a rather limited command reference that details the Sikuli extensions to the Python language. The command reference isn't awfully clear in places, and several times I had to resort to web searches to find out how to do various things. However, these web searches pretty well always paid off and found me the information I was looking for, so don't let this put you off the project as a whole.

I've been through plenty of scripting tools in my time, all the way back to QuickKeys in the early days of the Mac, and Project Sikuli is the first one in a very long time that's really caught my interest. It's a totally new way to think about automating some



of your workflow, and even non-programmers should be able to pick up its basics quite quickly, given how visual everything is. I'll admit that I haven't tried it on a Windows machine yet, but the reports I've read say that it works well on that platform too, although the screengrabs throughout the project's web pages demonstrate clearly that much of the development team is Mac-centric (which I, of course, wholeheartedly applaud!). And with that, I'm off to work on a script that involves automatically ripping portions of DVDs, something my company does for a PR client and which will save the person who's responsible for that job about 30 minutes every time he has to do it.

Ubuntu Enterprise Cloud and M/DB

Regular readers will know I'm a fan of Amazon's EC2 cloud computing environment, which allows you to use just as much computing power as you need. You can launch and release new servers on demand, paying only for the time you've used them and the connection bandwidth. Partly thanks to services such as this, cloud computing has become a huge growth area, and many companies now rely on the cloud for data storage and configurable processing power. But what if your business requirements preclude using a public cloud such as EC2? Perhaps that's because data privacy regulations, or your own internal regulations, forbid storing your data on any sort of public infrastructure. Does that mean you can't have the benefits of cloud computing? Well, no, because several organisations have started offering software solutions that enable you to run your own cloud, and one of these is Ubuntu, in the shape of the Ubuntu Enterprise Cloud (UEC).

UEC is based on the standard Ubuntu Linux distribution, one of the most popular around, and on top of this runs Eucalyptus, the software that permits you to configure and manage the machines in your cloud. Eucalyptus and UEC itself are great examples of how companies are managing to produce open-source products yet still remain in business: UEC comes from Canonical, the company that manages Ubuntu Linux, and which can provide paid-for support and tools for UEC if you don't want to go it alone. Eucalyptus is available as either a free version (which is what UEC uses) or a paid version from Eucalyptus Systems. Eucalyptus has an Amazon-compatible interface, so several of the tools that people have developed for EC2, such as S3 (Amazon's Simple Storage service for data) and EBS (Elastic Block Storage, "virtual disks" for EC2 instances) will work in a Eucalyptus cloud without problems. The company does say that the way things are implemented beneath the surface is almost certainly different from the way Amazon does things, but Amazon is notoriously close-lipped about its architecture.

One thing that Eucalyptus – and therefore UEC – doesn't provide is a version of Amazon's SimpleDB, which is a database alternative we mentioned in passing in issue 184 when we were talking about the NoSQL movement. It's a key-value store that's fast and scalable. UEC didn't provide anything like that at first, but after that issue of *PC Pro* hit the newsstands, Rob Tweed from the English software company M/Gateway Developments emailed *PC*

Pro to let us know about M/DB, the company's open-source implementation of a SimpleDB-like product. A couple of weeks later he told us that the UEC Image Store, a repository of machine images that can be used with UEC, now includes an M/DB image, which makes it very easy to set up an M/DB instance in your cloud.

M/DB's API (application programming interface – the way your programs interact with the product) is identical to Amazon's SimpleDB, which is great since it means you can develop and test your applications on your own machines before you start paying for SimpleDB. It also solves one of the real problems I've had with SimpleDB, and one of the reasons I've never used it "for real" in any project yet: the worry about lock-in. If you develop anything complex that relies on SimpleDB you're always going to have to deploy it on Amazon's cloud infrastructure, and while I've absolutely no worries that EC2 will disappear any time soon, I'd still rather not be tied to one provider forever. Now that M/DB is available, if you choose to move your hosting somewhere else at a later date, you won't need to worry about having to rewrite your software to use an alternative database: simply use M/DB on your new servers.

We'd have been interested in M/DB regardless of its provenance, but the fact that it's been developed by a British company makes us even happier to mention it. If you're thinking of developing for EC2 and SimpleDB, M/DB gives you the comfort of avoiding vendor lock-in even if you don't plan to use it immediately. Well worth checking out.

WebKit wins

WebKit is the open-source engine used in, among many other browsers, Safari and Google's Chrome. It's one of the two leading open-source browser engines, the other being Gecko, which powers Firefox. While Gecko is still very popular, WebKit is the one making all the news at the moment and the one chosen for Chrome, Palm's webOS, and now finally a new BlackBerry browser that's been recently previewed.

WebKit is an amazing example of how open source is being used by big companies to reduce their time-to-market while creating standards-compatible products. The WebKit project was started when Apple forked the KHTML engine, which was being used by the Konqueror browser, and incorporated it into the first version of Safari. WebKit has come on leaps and bounds since then, and now appears to be the de facto choice for anyone who wants to build a product incorporating a web browser (which, let's face it, means everyone). The fact that BlackBerry's new browser and the upcoming iPad's Mobile Safari browser will, like that of the iPhone, be WebKit-based, only helps to cement its position as the key browser engine. ■

LINKS

Project Sikuli

<http://groups.csail.mit.edu/uid/sikuli>

M/DB

www.mgateway.com/mdb.html

Ubuntu Enterprise Cloud

www.ubuntu.com/cloud/private

HipHop for PHP

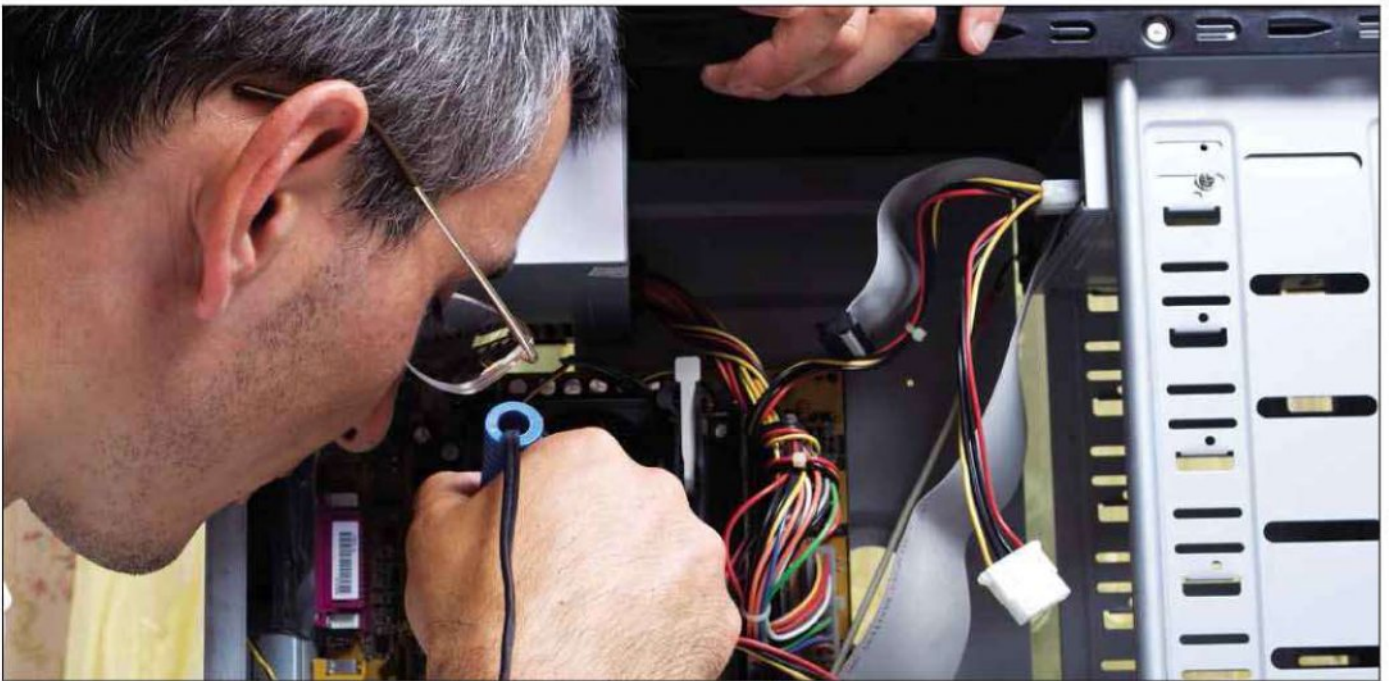
<http://github.com/facebook/hiphop-php>



Networks Steve Cassidy

Shabby chic

THEY MAY ATTRACT SOME FUNNY LOOKS, BUT STEVE CASSIDY ARGUES THAT AN ANCIENT LAPTOP AND A TABLET PC ARE ESSENTIAL REQUIREMENTS FOR A NETWORK ENGINEER



I'll let you into a little secret: when you have a network engineer in who starts taking everything to bits, there's a very simple way to evaluate how good he is. Look at his laptop: if it's shiny, new and adorned with all manner of wireless antennas, webcams and the like, then he probably isn't quite as *au fait* as the guy who carries something battered and scratched from the 1990s in the boot of his car.

Naturally, I wouldn't propose this as a reliable benchmark were I not capable of achieving a passing grade myself. Only last week, while fiddling with various switches, I hauled out my personal laptop of last resort, a Toshiba Tecra 8000. While waiting for its venerable hard drive to spin up and its familiar and haunting angle-grinder sound effect to fill the room, I realised that this wretched instrument isn't far short of its 12th birthday.

Pretty much every serious network person has a machine such as this: a laptop that still has the well-proven RS232 serial connector on its backplate, a sturdy port that doesn't try to be clever or present itself via additional dongles, nappies, adapters or other superfluous add-ons that can be lost, broken (or, in the worst-case scenario, may snap the port itself off the edge of the motherboard).

Much of the core networking kit still needs to be initially configured via a serial communications port, where you stick a nine-pin serial lead – of the right gender/pin-out – into a laptop running HyperTerminal, then choose a baud rate (if you can



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remember what one of those is) and watch the network switch through this connection as it starts up. If you're very wise or incredibly lucky with your choice of cable, baud setting, laptop and terminal software, then it's easy-peasy. The switch will start to show you something complicated, intimidatingly important-looking, utterly devoid of clues, graphical niceties or anything redolent of the modern world of Twitter, smartphones and Flash animation.

Lucky numbers

That old aphorism concerning luck – “the more I practise, the luckier I get” – applies in spades to the network wrangler's choice of laptop. Far too many machines can't keep up quick conversations with a serial host, and lots more simply refuse to comply with the more arcane settings regarding flow control, nor can they correctly manage a flow control event when one crops up. This is all a strong argument for sticking with an old machine that was built back when serial ports still mattered to other people besides network wranglers. I've found only one recent exception to this rule that's worth mentioning, and that's HP's nc6320. This machine is new enough to have a high-resolution screen and a fast processor, but old enough to have a serial port tucked away at the back of the right-hand side of its case. So far it has talked to everything that my old Toshiba talks to, and I can get a seven-hour battery life using the HP nc6000-series clip-on travel battery.

This is the aspect of networking that causes my inbox to fill up quicker than any other. People who are sufficiently confident to cross-compile millions of lines of source code, or to re-analyse terabytes of SQL data, will collapse into a quivering heap when presented with the blurb that accompanies the typical network switch. It's an arcane business, they insist, and no sensible information systems worker should have to struggle with any of this stuff. I've recently been having an online spat with a group of guys who were absolutely certain that the best possible strategy towards modern networking gear is to leave it all well alone. There's nothing left to fiddle with, they maintained, which means that there's nothing left to go wrong.

If that assertion holds water, explain why, after I received a new Netgear GS724TR and plugged a Netgear ReadyNAS NV+ into it, my very first experimental changes to the switch configuration resulted in the rate at which data came off that humble NAS box doubling at a stroke? Yes, you read that right: a few minutes with my trusty and wizened laptop resulted in file-copying speeds jumping from 12Mbps/sec to 30Mbps/sec, and it made even more substantial gains for my project of the day down in the basement (see *Keep taking the tablets*, p142), because before the change that machine would crash, while after the change it ran perfectly.

This crucial alteration – which I made by plugging in my old laptop and signing in to the GS724TR's management interface at its default IP address and subnet – was merely to turn on Flow Control (FC). This is an area of the Ethernet specification that falls under the heading of “features that manufacturers still argue about”. It's simple enough to describe FC as allowing a device to request that the flow of packets to it be stopped, and that such a request passes through all intervening switches right back to the originator. It's far from simple, though, to establish whether or not the device you're dealing with actually implements flow control, and if it does whether it reports faithfully what setting is currently in use or simply agrees with another device's interpretation of that same setting. Intel offers a suitably terse and non-obfuscated definition, along with some useful screen pictures of how to manipulate the settings in a very typical switch command interface, at www.pcpro.co.uk/links/188networks

The cost of doing nothing

I guess that those guys who promote the “leave it all alone” philosophy would say at this point, “what the hell, the whole point of Ethernet is that it allows for dropping packets, that's what the standard is all about. Can't understand a particular packet? Chuck it away then!” Of course, it's precisely that sort of behaviour that underlies almost all the performance disasters I encounter in people's networks, and all too often the cost of a piece of kit at one end or the other of the link is less than the cost of my time to figure out why it isn't working.

So why bother fiddling? It's worth bothering, simply put, because whenever you fiddle with a bit of network kit, the results of your work will be with you for a long time. I suspect that most companies leave at least five years between major network refresh activities, and longer than that in many cases. So it isn't the cost of the kit, or even the cost of my time; it isn't

even the cost of everyone else's time who had to hang around down the pub while the fiddling was taking place. No, it's the cost of everyone in the company who uses that network's wasted time, integrated over the whole lifecycle of the network.

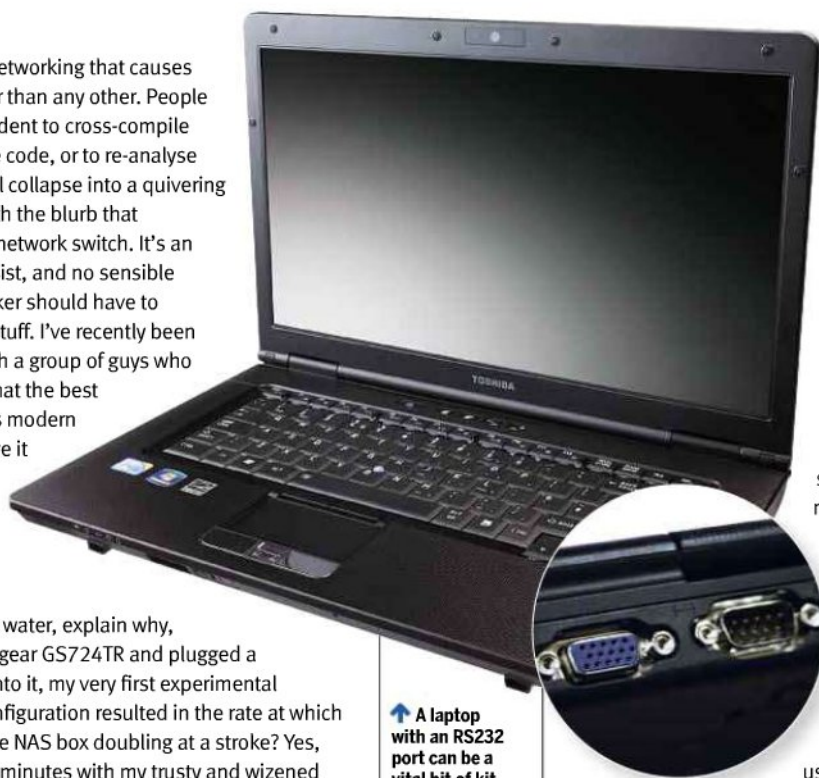
To put some simple numbers to that waste, let's say that my example here, tuning that ReadyNAS NV+ and its configurable switch, happened in a company with 25 users. The throughput of that NAS server went up from 12MB/sec to more than 30MB/sec. Assume that these 25 users all have work that lives on the NAS box, so halving their waiting time has a powerful effect on their productivity. Okay, perhaps it doesn't quite double their work rate. Let's say that these 25 people each edit 50 documents a day, each of which used to load in six seconds but now loads in three, then that tuning exercise has saved your company 25 people x 50 docs x 3 secs x 5 weekdays x 52 weeks x ten-year lifespan or about 9.75 million seconds. That's 112 days, or ten days off per year the network remains in use. That's someone's holiday, just from a single tickbox setting.

Age against the machine

This sort of improvement is why the savvy network man keeps an old laptop hidden somewhere in a case; a machine that isn't used for anything but connecting to weird pieces of kit; a machine that conforms to their IP addressing scheme or serial communications default settings without interrupting anything else. That may seem a small matter, but consider this: how many modern laptops have you encountered that come with some overly smart network location manager? One of those annoying add-ons that presumes to do a better job than XP, Vista or Windows 7's own network facilities for leaving one LAN and visiting another. All such utilities are designed to help out

with the normal working life of an end-user's laptop, as he/she skips between work and home, via train or airport. Almost all the stuff they're designed to sweep under the carpet is precisely the stuff that the network person needs exposed.

Take DHCP, for example. Almost every working LAN has a DHCP server, but we network people rarely get called to operate on *working* LANs. Any add-on that freezes for two to three minutes before timing out, while it searches for a non-existent address server, won't be found on my wrangler's laptop. The type of idiot-proofing that's increasingly plonked on top of a “locked down” desktop domain



↑ A laptop with an RS232 port can be a vital bit of kit.

↓ A little tinkering doubled speeds to a Netgear NAS box.

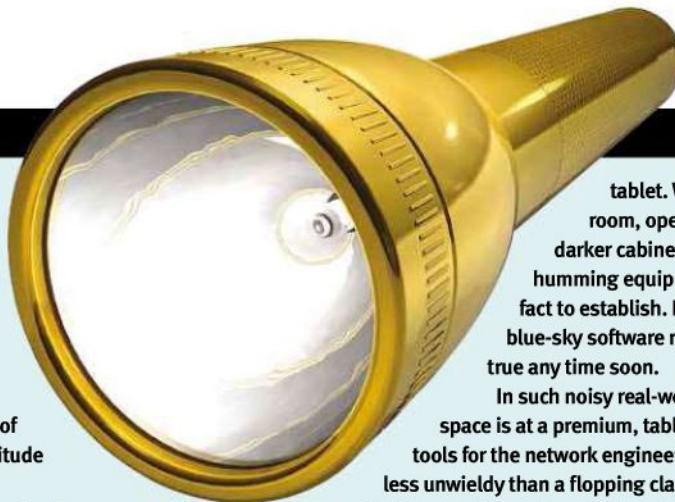




KEEP TAKING THE TABLETS

I received some funny looks at a recent *PC Pro* editor's get-together when I mentioned how people use their mobile phones as torches when they're scuffling around the back of a server cabinet, but nothing like as funny as the looks I've had when turning up to do a bit of server room work with a tablet PC in my bag. I actually own one myself, an ancient Fujitsu 5020, and for the past couple of weeks I've been playing about with a Dell Latitude XT2 for this same role.

Tablet PCs do actually have their uses for network people inside server rooms, even though it might seem crazy to think that way – but then I do spend a lot of time in clients' server rooms, as does Jon Honeyball. That's why we got such a giggle out of VMware when we said we wanted "Wi-Fi VM host machine radar" for our tablet PCs. That means an application that bleeps and flashes on the screen of the tablet once it approaches the particular host server that's running the guest VM you're currently controlling from the screen of said



tablet. When you're in a darkened room, opening the back of an even darker cabinet filled with 300kg of loudly humming equipment, this can be a useful fact to establish. However, I don't think our blue-sky software requirement will be coming true any time soon.

In such noisy real-world environments where space is at a premium, tablet PCs become very useful tools for the network engineer. Their one-piece format is less unwieldy than a flopping clamshell laptop, and in such situations you're pretty unlikely to be touch-typing anyway, so tapping their onscreen keyboard with a finger or pen to enter an IP address is no real hardship.

Having just had to do some heavy reconfiguring at a site whose computer room is basically a potting shed on the end of some optic fibre, I can tell you most emphatically that it's really handy to lean a tablet in the two-inch gap between servers while wriggling out through the rat's nest of cables like Houdini.

member PC is just the sort of thing that stands in the way of the low-level bodging required to get in and tweak your LAN switch. Connecting is an arcane process no matter how you look at it. You need to work out whether that blank box in front of you comes with its own IP address that you have to slave to, or (more common among the smaller devices) it uses a setup CD that looks for the MAC hardware address of the switch to help you get into it. For some reason, people become very worried when they have to change an IP address.

A change of address

Let's revisit the basics briefly. Yes, changing an IP address on your laptop can cut you off from the rest of the planet, so don't open the online help for your product and then flip the IP address on the control panel. Either download the help first or refer to it on another machine.

I know there are temptations such as multiple IP configurations in XP and later. In theory, you ought to be able to stay on the switch via one network card (usually the wired one) and on the internet via the other (wireless, or embedded 3G modem), but I've wasted far too much time – because it turns out that the switch's web-based management interface can't survive this kind of treatment – for it to be worth bothering. Yes, if you change the IP address of the device you're working on to bring it into line with the rest of your LAN so you can stop messing about with a laptop, then 99 times out of 100 it will vanish from control until you move across to the same subnet to catch up with it again. And yes, this will frequently mean closing your browser and opening it again, because bits of the web interface assume they can carry on talking to the old address. You'll be punished if your choice of browser happens to differ from the one the switch's developers used, so it pays to keep all the usual suspects loaded on your toolkit laptop just in case. Yes, everyone who does this often enough will, on a bad day, spend around 30 minutes fumbling about having forgotten some fundamentally simple step involved in changing IP addresses (while

DUH!

Tablet PCs are rather less useful if you use Telnet or HyperTerminal a lot. I've made an idiot of myself from time to time by trying to tap with the stylus on character-mode menu options presented by these ancient teletype-style interfaces. That would be a very cool thing to get working in Windows Tablet Extensions, at least for we network persons!

↓ This Netgear switch is a paragon of friendliness compared to some.

trying to hide their puzzlement). Yes, that means the single most useful fact to keep in mind when you set about this procedure is how to perform a factory reset on the switch, so you can get back to the starting point and not have to display your absent-mindedness to everyone who's watching.

Switch hitting

Be aware that not all switches are created equal when it comes to this kind of process. The GS724TR is a paragon of friendliness compared to the other two switches lurking around my basement this month, a Dell PowerConnect 2716 and a Cisco Catalyst 3750. Plug in the 2716 and you'd think it was one of those awful N-way devices bought off a trestle table at a computer fair for £20. What it needs to bring it up into the big league is a paper clip. On its front panel there's a tiny little hole into which you insert said straightened-out paper clip, preferably just after you turn on the power switch, then wait a while until it flips modes over to being "managed" and grabs an address from your DHCP pool. Then you can delve into it and set up its port parameters, watch for bad connections and all that good stuff (and if you learn how to palm the paper clip like a professional conjurer then nobody will see it, and they'll all think you can perform miracles).

In the case of the Catalyst, you need to be a genuine miracle worker to get into it at all, especially if someone has already set a password. This procedure depends on having the right blue Cisco serial lead, then watching the switch like a hawk as it starts up, hovering over HyperTerminal waiting for it to ask whether to boot into maintenance mode or not. Assuming you did manage to spot that fleeting prompt, you're allowed to write to the switch's flash file system, which means you can rename the old password files. Another reboot and you can get into a menu that lets you pick from a variety of ways of booting. This isn't so much a network switch as a mainframe computer that occasionally deigns to work like a network switch and shovel your data around; just the kind

of device that makes our network engineer and his old laptop feel like a worthwhile investment! ■



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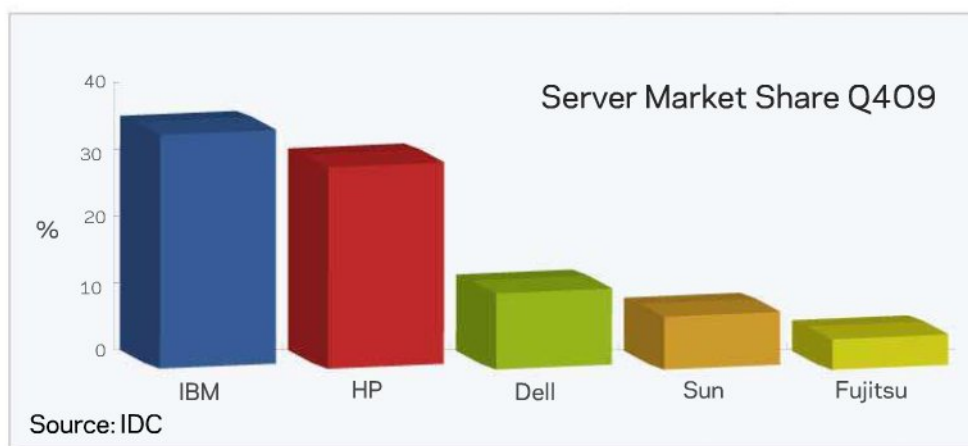
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Does size matter?

HE HASN'T SOLD OUT TO THE CORPORATES, BUT JON HONEYBALL ARGUES THAT IT CAN SOMETIMES PAY TO STICK WITH THE BIG PLAYERS, WHILE DAVID MOSS SETS UP A VPN



Figures for the last quarter of 2009 show that IBM and HP account for around 65% of the server market between them.

reasons for choosing something from a different vendor in your particular context, and I'd applaud such an independent decision if taken in the right logical spirit. Just don't ever forget that "no-one ever got fired for buying IBM, HP or Dell".

Given our increasing reliance on an ever more fractured and virtualised infrastructure, I think that the question of choosing a manufacturer is becoming even more important. For example, if you're looking to buy a SAN for your organisation and you already have, for the

Some interesting figures have just been released by the research company IDC, which recently evaluated server sales from 2008 through to the last quarter of 2009. In terms of both revenue and market share, it's clear that the two big players in this marketplace are IBM and HP, with IBM slightly ahead. Between them, these two companies hold somewhere in the region of 65% of the total market for server systems, which is a considerable achievement. Dell is in third place with just 11.5%, followed by Sun on 8%, although what's going to happen in that position given the acquisition of Sun by Oracle, plus uncertainty about its server hardware in future, is anybody's guess. Fujitsu trails in fifth position with a market share of 4.6%, and the remainder is made up of all the other players put together.

Why are these figures interesting? Well, the size of the vendor should be an important consideration when it comes to choosing hardware. It's obvious that the biggest vendors have the most resources, and usually this means their products often work together better (although that isn't always true). It also means that they should be able to afford the most testing, although even here caveats apply.

For many years now, I've been a fan of HP's server hardware, simply because it was the first brand to catch my attention as one that pushes hard towards continually improving its quality and specification. I've since been happy enough with the Dell hardware at many of my clients' sites, and IBM figures in those too, but for some reason I can't really explain I just seem to get on well with HP for my own server room; Dell is my second choice and IBM lies third, which shows you that perception and reality don't always coincide.

When you consider that these first three players have 77.4% of the market between them, it suggests that you'd need to have pretty good reasons to go with anyone else. I'm not saying that such reasons don't exist – there might very well be good



JON HONEYBALL
Computer journalist and consultant specialising in both client/server and office automation applications. Email jhoneyball@woodley.co.uk or join him in the PC Pro conference on Cix.



DAVID MOSS
Consultant, developer, IT writer, ICT co-ordinator and techie, specialising in the Windows client/server and desktop arenas. Email dmossm@gridleys.co.uk or join him in PC Pro's online conferences.

sake of argument, HP servers in place, then there's a lot to be said for going with HP for the storage too. There may well be several vendors that offer what appears to be better bang for your buck, but will this saving feel so good when you're trying to sort out some tricky incompatibility at 3am with a screwdriver gripped between your teeth?

Older and wiser

I can almost hear your reaction now: "Uh oh, Jon's gone all old and grey-haired, he's sold out to the big boys... Where's the champion of the little guy, the small system builder we used to know?" Maybe I have grown older, but I've become wiser too, because risk reduction is an essential part of the business process for choosing server-side hardware nowadays. One of my clients recently told me they had come to the view that their newly installed, fully virtualised solution (running on HyperV) is now so resilient that it's become almost a bricks-and-mortar part of their business.

I found this hugely satisfying to hear, because it means that we can at last truly separate the software and end-user functions from the underlying hardware plumbing, whereas up until now we'd had to construct all sorts of unpleasant workarounds to ensure that things kept going. Today, hardware failure should – and can, when implemented correctly – have zero impact on your business processes. And this isn't only a matter of choosing the right brand of hardware and infrastructure, because, as always, people and processes are the key to an effective solution.

Having paid all due reverence to these industry pieties, though, I can't fudge the simple fact that all the best-running solutions I see are those that run on a single brand of hardware, with only one vendor to shout at. This means that all the drivers are available, the hardware works, and you have just one place to get all the updates from – and if it's one of those top three

vendors then they're also hard at work ensuring you're putting best-of-breed monitoring plugins for their hardware subsystems into your overall systems management infrastructure.

As we move steadily toward self-balancing, self-monitoring and self-healing server platforms, it will no longer be adequate for hardware vendors to vacillate over the availability of such crucial components. When the top three vendors have 77.4% of the worldwide market share by value, is it really wise to go to second- or third-tier vendors? If you really feel you must, be absolutely sure you're not compromising your ability to separate hardware church from application/services state in all your future infrastructure investment.

One last point. You may be thinking about blade servers as a good way to fit more processing power into limited rack space, but perhaps you're not sure whether this is the right way to go. The numbers, according to IDC's research, are quite interesting. Overall, blade servers account for about 21% of x86 server revenue: HP is number one with 52.4% of revenue, and IBM is in second place on 28.4% revenue share. If you're looking for blade servers then it seems that HP is certainly the top dog. If asked, I'd certainly put HP's blade servers at the top of the tree, with consequences that trickle down into your other decision areas.

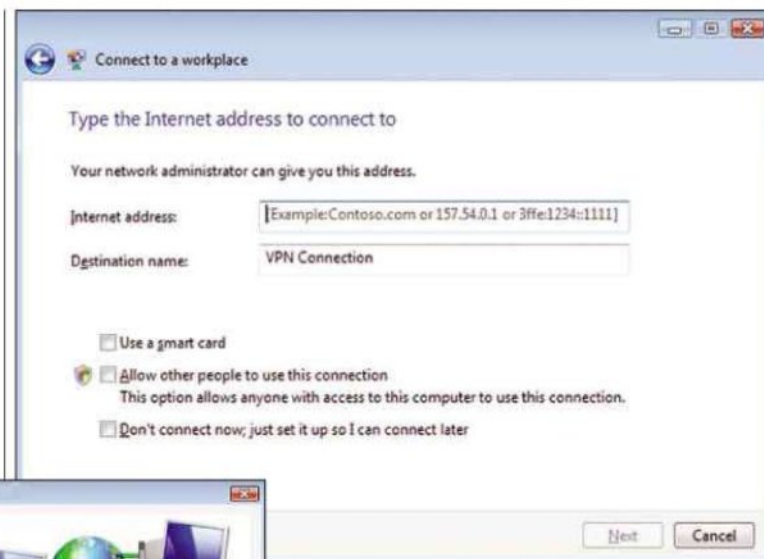
Virtualisation redux

I must confess that I've had to put my virtualisation epic on hold for a month or two. The recent loss of my father, coupled with a need to move both house and business premises, has totally nuked my available playtime recently. But be assured that the whole HyperV infrastructure is ready to rock and I'm very much looking forward to visiting the Microsoft Management Summit in Las Vegas. Hopefully, it will have its latest and greatest systems management tools on display there, and I can then push towards a fully integrated and virtualised Windows Server infrastructure running on HyperV.

The business move is going to be most exciting, as I'm upgrading my machine room from being hung on the end of two bonded ADSL lines to becoming a state-of-the-art datacenter on the floor below my new offices. The result promises to be data shock all round – suffice to say, my initial testing suggests a download from Microsoft that currently takes eight hours will take around eight minutes at the new site. Such a step up really does change your perceptions. For a while now I've been pointing out that if you live in a large conurbation then it's quite likely that you can rent massive bandwidth in fibre connectivity for very little money. Of course, this is a point-to-point solution, but it really works if you decide to place your servers at a remote datacenter. If your link is fast enough, then bouncing live VMs across the fibre to and from the remote site changes the whole equation for disaster recovery. **JON HONEYBALL**

The VPN room

While the old Remote Desktop Connection (RDC) tool is handy for remote troubleshooting and suchlike, sometimes you need a secure, encrypted tunnel in which to work, and that means a Virtual Private Network (VPN). Setting one up was the task I was presented with the other day, and it conveniently coincided with a couple of emails I'd received recently from readers who'd tried doing this without much



Supply the connection with the IP address or the name of the server to which you want to connect, and you're good to go.

success. Here, then, is my tested method for setting up a VPN server on Windows Server 2003.

Open the Network Connections dialog and select "Create a new connection". When the wizard opens, click on Next and choose "Set up an advanced connection". Accept the highlighted option "Accept incoming connections" and also the highlighted option to "Allow virtual private connections".

Selecting this option means that the system will modify your firewall so that your system can work with incoming packets via VPN, and you may also receive a warning message that says that the Windows Firewall/Internet Connection Sharing service isn't turned on, and that it will need to be turned on if you want to do this.

If you'd never intended the Windows firewall to be on because you're running a different one – perhaps inside your router – this may seem a nuisance, but don't worry about it; the service will start up but the firewall won't because it defaults to the "Off" state, and it's useful to have the service running since it shows you exactly which ports need to be set up for the VPN to work. I find this a useful tool for training purposes, even when I have no intention of ever enabling the firewall locally, because it's quite easy to mess up port settings and having a known good set to look at is a valuable resource.

Having done that, you can now choose who you want to be able to access the computer via the VPN. This is done on an account-by-account basis, or you can use previously created groups. After that, select the networking software that must be enabled for the incoming connections to work, which means leaving the default selections alone and moving on.

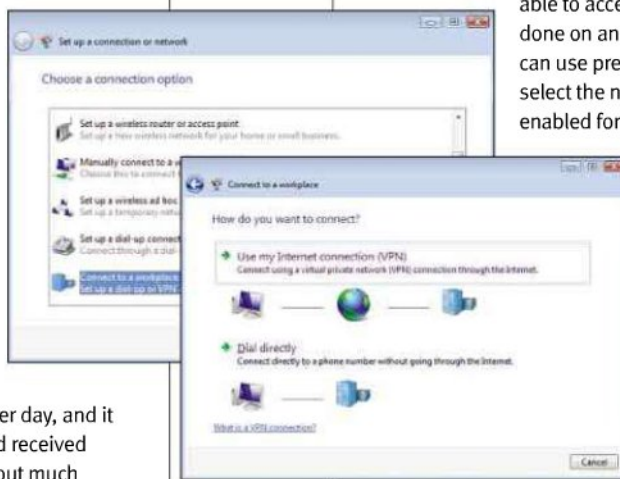
The top selection is of course the TCP/IP protocol, which can be set up to provide addresses to connecting computers via Dynamic Host Configuration Protocol (DHCP).

Unless you're dialling in via a phone number, you'll be using your internet connection to connect to the VPN.



Fire up the connection, enter your details and your encrypted tunnel will be ready for use.

Setting up a connection to the VPN server via Windows Vista.



Alternatively, you can opt for a range of specified addresses, or you can even let the calling computer specify its own address. To do these things, highlight the TCP/IP entry in the “Networking software” list and click on its Properties button. You’ll notice that this is also where you enable or disable permission for people who dial in to access your Local Area Network (LAN).

Once you’ve checked the properties of the various protocols you’ve enabled, click on Next once more and you’ll be rewarded with the Finish button. Hit that and you’ll see that you have a new network connection called Incoming Connections. Right-click on this new connection and you’ll see three tabs on a properties dialog, labelled General, Users and Networking.

The checkbox that puts an icon in the notification area isn’t enabled by default, but I personally like to see what’s going on, so I make this the first thing to set up. If you’re using the internal firewall then all the settings will have been done for you, but if you’re not and you need to set up a firewall in your router, for example, then here are some port settings that you might find useful:

File and Printer Sharing: TCP 139 and 445, UDP 137 and 138

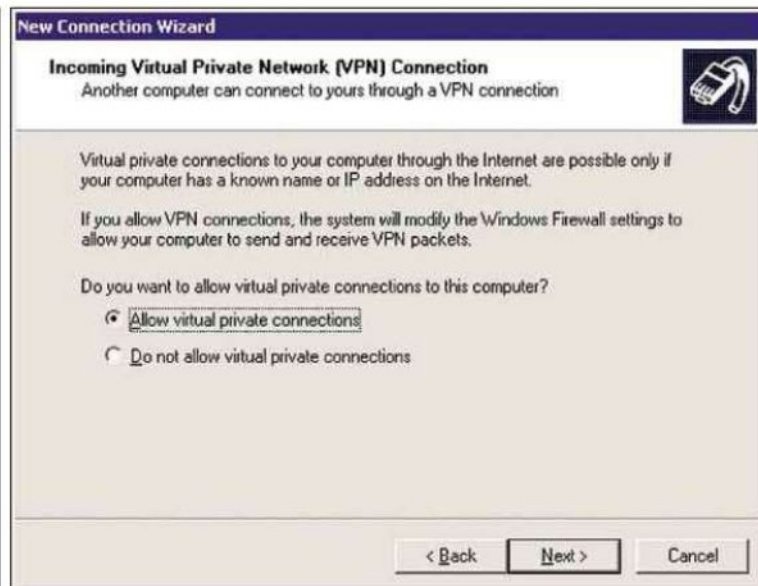
IPsec: UDP 500

L2TP: UDP 1701

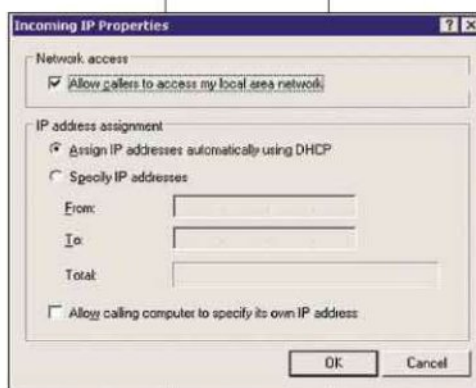
PPTP: 1723

Remote Desktop: TCP 3389

The next job is to test the VPN, so you’ll need to set up a client system from which to try to access the server. I use Windows Vista in this example, but if you use a different version of Windows the steps are easy to work out. Go to the Network and Sharing Center and click on “Set up a connection or network” in the left-hand pane. Scroll down when the connection dialog appears and choose “Connect to a workplace (Set up a dial-up or VPN connection to your workplace)”, then click on Next. You’ll have the option to “Use my Internet connection (VPN)” or to dial directly; the VPN option is the default, so just click on it. You’ll now be asked to specify an IP address or server name to connect to, give the connection a name, decide whether you want to use a smart card, allow other people to use the connection and not connect now but just set it up, so you can make the access attempt later on.



Setting up a server for VPN connections with the wizard automatically adds exceptions to the firewall.



Use the IP Properties dialog to assign IP addresses to incoming systems.

If everything is set up properly you’ll be able to make the connection, but if something isn’t set up correctly then obviously you won’t. As you can imagine, there are quite a few of things that could go wrong and I can’t even begin to mention them all here, but one message that often appears and tends to cause people problems is the “806 error”.

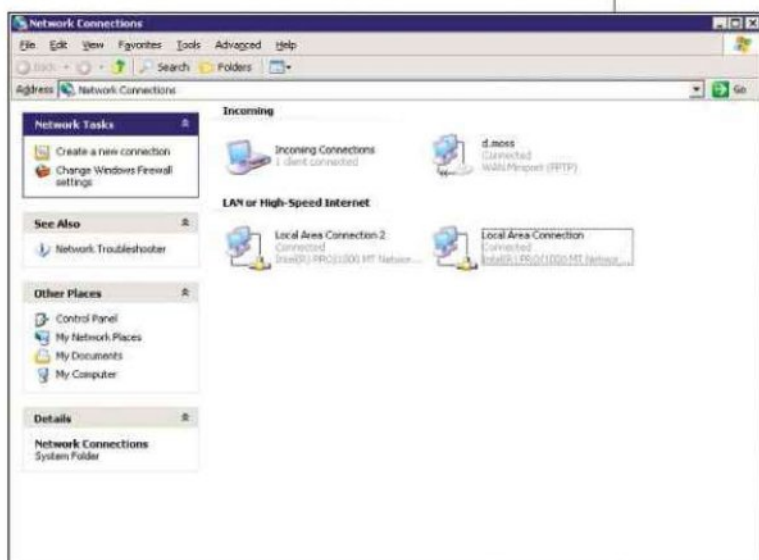
You’re told that an 806 error has occurred and that while a connection between you and the VPN server has actually been created, it hasn’t been possible to complete it. The message then tells you more, but what it all boils down to is that your VPN server hasn’t been set up to allow Generic Routing Encapsulation (GRE) protocol packets to pass through. You’re then told to make sure that protocol 47 (GRE) is enabled.

Wrong port in a storm

It’s at this point that things start to go pear-shaped, because a lot of people then go into the firewall settings and enable port 47 in TCP. When that doesn’t work, they go in and enable UDP 47 too, and when that doesn’t work they start hitting the internet, and stumble into what the Temptations used to call a “Ball of Confusion”.

GRE isn’t a port, it’s a protocol, and it’s more commonly referred to as PPTP passthrough. Generally speaking, if you used the wizard to set up your system for VPN and you’re still seeing this message, it means that something else on your network is intercepting the VPN process. The most common cause I’ve found for this is that the router has also been configured to use VPN, and it thinks that it is responsible for PPTP passthrough.

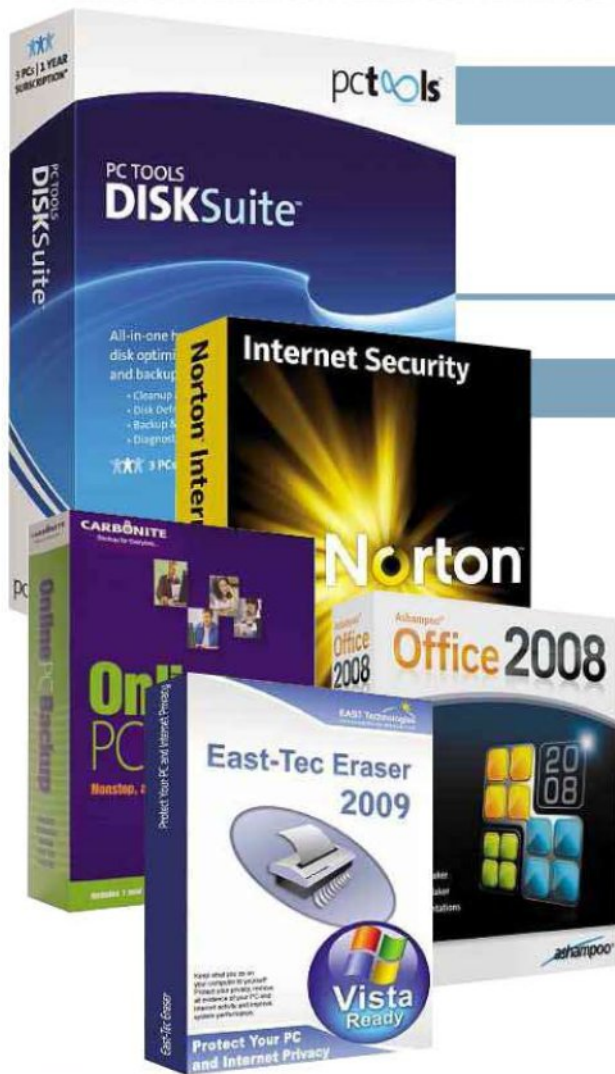
Of course, many routers can be set up to act as perfectly usable VPN servers, but you don’t want both to be running at the same time. This hit me the other day when I created a VPN connection on a server and then found I couldn’t access it. Fortunately, I remembered that the router had previously been set up for VPN traffic – and sure enough, when I looked at it the checkbox for PPTP was still enabled on the router. Have fun connecting and I’ll see you all next month. **DAVID MOSS**



With incoming connections correctly set up, you can see that d.moss has now connected via the WAN Miniport using PPTP.

Cover disc

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COVER DISC JUNE 2010

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All the programs on this month's cover disc can be accessed from the PC Pro browser. If Autorun is disabled, insert the disc into your drive, use the Windows Run option and type d:\pcpro.exe where d: is the letter of your optical drive.

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→ **PC Tools Disk Suite** will keep your hard disk operating at peak performance.

DESCRIPTION
Hard disk management

REQUIRES
Windows Vista/XP/2000

INTERNET
www.pctools.com

INFORMATION
Full product originally sold for £34 (£40 inc VAT); requires online registration



PC Tools Disk Suite

KEEP YOUR HARD DISK RUNNING SMOOTHLY

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PC Tools Disk Suite goes further by also offering backup and encryption.

On the clean-up side, Disk Suite scours the entire drive and targets temporary files, caches, items in the recycle bin and any specific folders you'd like cleaned.

Then, Disk Suite's advanced defragmentation engine optimises the

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Two more options help protect both your hard disk and the data stored on it. A backup service can compress and encrypt your precious files, then back them up to the destination of your choice, whether that's a remotely accessed PC, local flash drive or external hard disk.

The repair service, meanwhile, can perform file system and surface scans to identify symptoms of possible data corruption, and fix them where possible. It can also identify and fix errors in your PC's boot record.

PC Tools is offering *PC Pro* readers the chance to claim a 20% discount across its broad range of software. To take advantage of this offer – which ranges from titles such as PC Tools Internet Security Suite and Privacy Guardian to Registry Mechanic and Spyware Doctor – visit www.pctools.com and use the code PCPRO0610 when prompted.

→ The huge breadth of features means your PC should be protected from all sides.

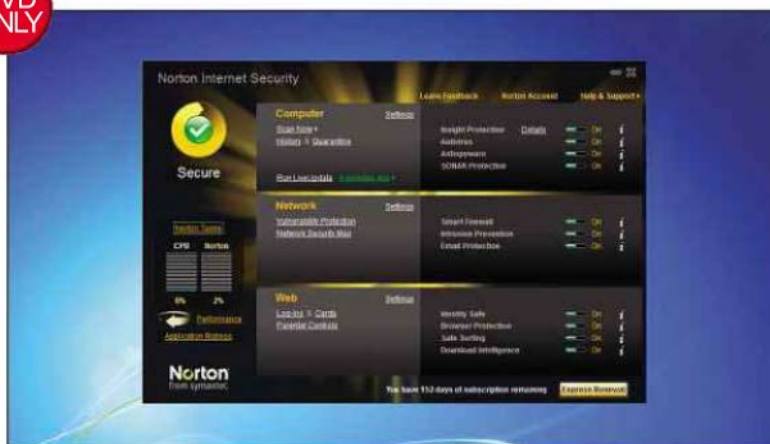
DESCRIPTION
Security suite

REQUIRES
Windows 7/Vista/XP

INTERNET
www.symantec.com/en/uk

INFORMATION
180-day trial; requires online registration

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Norton Internet Security 2010

PROTECT YOUR PC WITH OUR A-LISTED SECURITY SUITE

Norton Internet Security 2010 is *PC Pro*'s A-Listed security champion, and now you can try it for a generous six months without paying a penny.

As we noted in our review (web ID: 351781), Symantec's latest suite offers a

vast range of features to keep your PC safe. In addition to conventional signature-based scanning, it uses a three-pronged approach to analyse the origin, behaviour and reputation of potential viruses – and it works. In our

independent tests, Norton detected 98% of our malware samples.

The suite also includes a fully featured firewall to ensure your PC is completely cloaked from potential attackers, plus built-in browser protection to flag up untrustworthy sites and phishing attacks. With a password manager and one-click secure logon, you needn't worry about your passwords being spied on either.

Despite its extensive range of features, Norton still manages to keep its memory footprint surprisingly low, and by default scans are carried out while your PC is idle, so your system is protected but not bogged down. The suite even includes system monitoring tools, so you can view exactly what impact Internet Security 2010 is having on your system.

This full version of Norton Internet Security 2010 offers six months of top-class protection, and it's easy to extend this licence: simply use the link from within Norton to access your account, where it's possible to purchase one-year, three-PC subscriptions for £34 (£40 inc VAT) and two-year deals for £64 (£75 inc VAT).

Ashampoo Office 2008

A POWERFUL AND EASY-TO-USE FREE OFFICE SUITE

Ashampoo Office 2008 is a highly capable alternative to Microsoft Office. It consists of three applications: TextMaker, a word processor; PlanMaker, a spreadsheet tool; and the self-explanatory Presentations. The interface will be familiar if you've used Microsoft Office or OpenOffice.org, so it's easy to get to grips with all the tools.

And it's a broad range. TextMaker offers table tools, image integration and labelling, header, footer and page setup utilities, alongside all the formatting

options you'd expect from a fully fledged word processor.

PlanMaker is just as powerful. All the popular formulae are instantly available, and with advanced table-drawing tools you can express your data in whatever way suits you. Finally, Presentations can be used to create professional designs within minutes.

All three of Ashampoo's applications are compatible with Microsoft Office 2003 files, allow PDF document exports, and can even be run from a USB stick.

DVD ONLY



Presentations, PlanMaker and TextMaker offer everything you expect from an office suite.

PC Pro readers can upgrade to Ashampoo Office 2010 – which includes support for Microsoft Office 2007 files, a huge range of new tools and effects, and numerous other improvements – for just £20 (£24 inc VAT) instead of the usual £34 (£40 inc VAT).

DESCRIPTION
Office suite

REQUIRES
Windows Vista/XP

INTERNET
www.ashampoo.com

INFORMATION
Full product originally sold for £34 (£40 inc VAT); requires online registration

Carbonite Online Backup 3.7

PROTECT AND PRESERVE ALL YOUR PERSONAL FILES

Local backups are useful, but for convenience and peace of mind, nothing beats a cloud-based copy of your data. That's why we've been recommending Carbonite's online backup service for more than a year, and this month we bring you a free six-month trial.

Beginning the backup process is easy: simply install the software and register for your free six-month trial. Your PC will be automatically scanned for photographs, documents and other personal files, which will then be quickly uploaded to Carbonite's secure servers.

If you need to back up other files and folders, you can customise Carbonite's scanning, so files of any type can be scanned and uploaded automatically. Every file is encrypted before it's uploaded, and if a file has been modified in the past three months, you can recover older versions of the data.

One neat feature of Carbonite is the way you can confirm at a glance that your files have been backed up: a green dot on a file or folder's icon indicates that it's already been processed, while a yellow dot signifies that backup is pending.

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Carbonite Online Backup automatically protects your files.

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DESCRIPTION
Backup tool

REQUIRES
Windows 7/Vista/XP, broadband connection

INTERNET
www.carbonite.com

INFORMATION
Six-month subscription worth \$27; requires online registration

East-Tec Eraser 2009

COVER YOUR DIGITAL TRACKS WITH THIS POWERFUL TOOL

Your computer is a goldmine of personal information, from social network logins to bank details. If you're selling a PC, or concerned that a laptop may be lost or stolen, you don't want that information to be recoverable – and that's where East-Tec Eraser comes in.

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for your actions to be traced. You can also pick specific drives and folders and have them securely erased in seconds.

There's also round-the-clock protection from East-Tec's Privacy Guard, which works in the background to ensure sensitive data isn't left hanging around.

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If there's sensitive data on your PC, East-Tec Eraser can quickly remove it.

including Outlook, Windows Live Messenger, Winamp, LimeWire and ICQ.

If you're concerned about your personal information being used by others, or your identity being stolen, then East-Tec Eraser is the perfect program to cover your tracks.

DESCRIPTION
Data eraser

REQUIRES
Windows Vista/XP/2000

INTERNET
www.east-tec.com

INFORMATION
Full product originally sold for £25 (£30 inc VAT); requires online registration

In Depth

GET MORE OUT OF YOUR PC WITH OUR COMPREHENSIVE ADVICE

Technical Support David Moss

Questions & Answers

DAVID MOSS AND THE PC PRO TEAM ANSWER YOUR TECHNICAL QUESTIONS

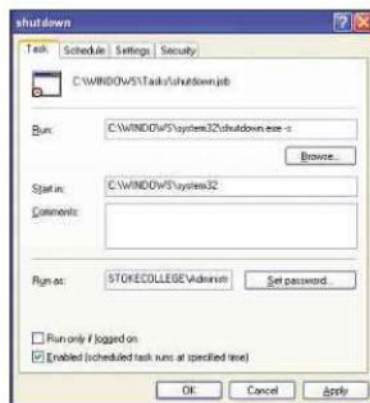
Scheduled shutdown

Q I'm running Windows XP Home SP2 and would like to be able to shut down my PC at certain times. But when I schedule a shutdown, it doesn't run. I suspect that this may be something to do with permissions, but it doesn't work even when I give my credentials in the form \\workstationname\username.

Anthony Jones

A As you say, it might be a permissions issue, but by default the SeShutdownPrivilege is granted to all administrators, backup operators, power users, and users. Still, it's worth checking. Open up the Control Panel and go to Scheduled Tasks, then right-click on the Shutdown task to get to its Properties dialog. Check on the Task tab that the task is actually enabled, then look on the Security tab and make sure your account is in there. If it isn't, then you'll need to add it. You might also want to make sure that the checkbox labelled, "Run only if logged on" isn't ticked. There's a "Run as" window too, so you can always try to set that to use an administrative account and see if that helps.

You should also note that the \\computername\username format is normally used for remote actions: this could be confusing Windows, since SeRemoteShutdown is available only to administrators. Since you're a local user, try omitting the opening backslashes. If you were on a domain, I'd recommend using \\domainname\username, but that doesn't apply in your case.

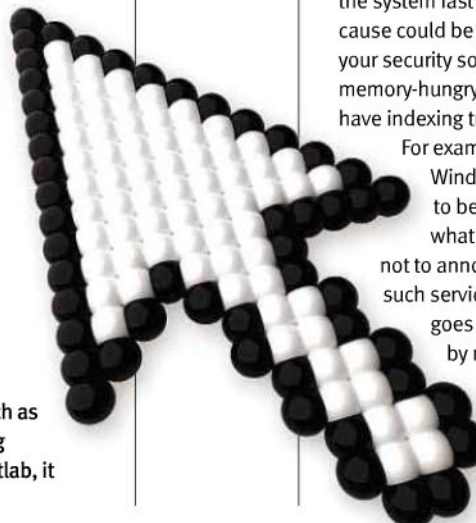


There's a handy document online that talks about User Rights and which accounts are able to do what within a Windows XP system. You can see it at www.pcpro.co.uk/links/188qa1

David Moss

Long wait for mouse pointer

Q I have a Dell Latitude D620 with a 2GHz dual-core processor and 2GB of RAM. For a long time I've had a problem where simple mouse-click actions, such as opening a new tab in Internet Explorer, opening a folder in Windows Explorer, or changing a directory, all bring up the "busy" pointer for anywhere from two to more than ten seconds. Yet when the PC is actually engaged in a task such as editing a document or running large math calculations in Matlab, it seems to perform very well.



CONTACT

Email your queries to David and the team at techsupport@pcpro.co.uk. Please include your full name.

Note: Unfortunately, only selected questions can be answered via the pages of PC Pro.

I have Symantec antivirus running, and I periodically run Spybot and AdAware checks, but these have no effect on performance. I also recently had a complete system refresh in which my local IT people reinstalled Windows XP Professional and Office 2003.

Apparently, they had to do this using the original CDs, since some report "non-standard hardware" prevented them reloading the system via Ethernet.

Richard Barton

A Dell systems usually have a recovery partition (often, but not always, accessible by pressing <Ctrl-F11> at startup), which can restore the PC to the original factory setup. Your report of "non-standard hardware" makes me wonder whether your engineers did a clean installation of Windows, and possibly installed an Ethernet driver that wasn't the correct one for your system. It would be worth looking on the Dell support site and ensuring you have the right drivers. There should also be a driver disc supplied with your system, and most Dell systems come with support software too, which can be used to help diagnose problems.

As to what is making your system slow down, it could be many things. Since the system seems to respond okay when engaged in a task, the problem may stem from a background process that isn't giving up its hold on the system fast enough. The root cause could be the combination of your security software plus other memory-hungry processes. Do you have indexing turned on and running?

For example, I find Microsoft Windows Desktop Search 4 to be quite reluctant to stop what it's doing quickly enough not to annoy me. Try disabling all such services, and if your problem goes away you can isolate it by re-enabling them one at a time.

You can experience problems with the Windows Registry too, but that tends to

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be an issue that builds up over time, and if you've recently had a clean installation it shouldn't be a problem at this time. It would be worth getting your IT people to run a Registry checker just to make sure there's nothing untoward there.

David Moss

Importing to Windows Live Mail

Q My wife has a new Windows 7 machine, but she has important emails saved on her previous XP computer. I've tried to find out if it's possible to transfer the emails from Outlook Express to Windows Live Mail with no success. Is it possible and, if so, how?

Peter Hobson

A It's easy to do, but don't feel bad about being unable to find the function you need – it's hidden away in one of those infuriating secret menu bars, which becomes visible only when you press the Alt key on your keyboard in Windows Live Mail. Once you've made the menu appear, importing your old emails becomes a simple matter of opening the File menu and selecting Import | Messages...

You'll also need to copy the emails themselves across from the XP machine. These are stored by Outlook Express as a collection of files with DBX extensions, one for each mail folder plus a master index named FOLDERS.DBX. You can find the location of these files by opening the Outlook Express Tools menu, selecting



Options | Maintenance, and clicking on the Store button. Copy the files to a location that's accessible from your Windows 7 PC, then navigate to it when prompted by the Windows Live Mail import wizard. Job done.

Darien Graham-Smith

Can't remove components

Q I'm using Windows XP SP1 with all available updates and Norton Internet Security 2007. I'm trying to remove Windows Messenger from my system using the Add/Remove Windows Components wizard, but it fails with error code 0x7e, saying that ZONEOC.DLL is missing. I've searched my XP installation CD for this file, but to no avail.

→ The ZONEOC.DLL file is part of a set of files used by Zone.com, now MSN's Gaming Zone.

It may be a coincidence, but at around the time this happened I installed an update to Megger's PowerSuite Pro electrical testing application. After the update, the program failed to function, so I had to revert to a previous version. Is this likely to have caused the problem?

Brian O'Neil

A Your troubles could be connected to Power Suite Pro, but I'd be surprised if they were: ZONEOC.DLL is a Microsoft file related to MSN Gaming (which used to be called Zone.com).

I couldn't say why it's chosen to bother you now, but the first thing to try is upgrading your system to the latest service pack, SP3, which has been around a long time and fixes a great many problems.

Before doing this, though, I suggest you back up all the data on your system, preferably twice to different media. Be sure to allow plenty of time for the update, since once you apply SP3 you'll discover that you'll get a whole host of new system patches. The precise time it takes, and the number of updates you get, will depend on how fast your internet connection is, and whether you're updating Microsoft Office as well as Windows. Once SP3 is installed, you may well find that the updated version of Power Suite Pro works too.

READER'S TIPS INSTALLING ADOBE ON 64-BIT

A follow-up to a problem reported by Graham Barnes in issue 185. Mr Barnes was trying to install Adobe Creative Suite CS3 on 64-bit Windows Vista, but the installer kept complaining that it was unable to find a file named ADOBEPDF.DLL. A helpful reader named Ian Hunter writes to point out that the installer's complaints can be quelled if you direct it to the folder named PROGRAM FILES (X86)\ADOBE\ACROBAT\XTRAS\ADOBEPDF\AMD64\, which contains a copy of the requisite file. "Worked perfectly for me," says Mr Hunter. "I can only assume the installation routine doesn't like either 64-bit or the path name." Thanks for the tip.



If patching doesn't solve the problems you're experiencing, your best bet is a complete restore of your system to its original state. Hopefully, your system came with a recovery CD or a hard disk partition. If it didn't, and you're not happy performing a manual reinstall yourself, you could see if the people who sold you the system in the first place can help you out, or find a local computer shop. Backups will of course be essential, since the hard disk should be reformatted before reinstalling the OS and applications.

David Moss

Upgrading a mobile CPU

Q I'd like to upgrade my 2.1GHz Intel Core 2 Duo T8100 processor to a 3.06GHz T9900. However, my Intel PM965 chipset only supports front side bus speeds up to 800MHz, while the T9900 uses a 1,066MHz bus. Would the T9900 work with this chipset, and would there be any benefit to using it rather than (say) a T9500, rated at 2.6GHz with an 800MHz FSB?

Christian von Arnim

A We wouldn't normally recommend that people attempt to upgrade their laptop's CPU. For one thing, laptops aren't generally designed to be user-upgradeable, so getting at the processor socket will probably be a major disassembly job, voiding any warranty you have and possibly

involving specialist tools. Then there's the question of heat dissipation: laptops have limited cooling capabilities, and faster CPUs tend to run hotter than slower ones, so upgrading could make the system unstable. Finally, the BIOS may only support a limited range of CPUs, and if that doesn't include the one you want to use, you're out of luck.

To answer your specific question, though, the PM965 chipset doesn't officially support the T9900, so it's likely the machine would simply refuse to boot if you installed one. If your BIOS is clever it might be able to get the chip running, but, as you suspect, the 800MHz FSB would reduce its effective clock speed to 2.3GHz. So if you're set on a new CPU, the T9500 is clearly a better bet.

Darien Graham-Smith

Mixing XP and Windows 7

Q I look after a computer network for a small charity run by volunteers. We use Windows XP and run mainly Microsoft Office applications, plus a special debt advice program called PGdebt. Now we need to add three PCs to the network and I must decide whether to stick with XP or go for Windows 7. I'm leaning towards the latter, so that when our existing kit has to be replaced, we'll be up to speed. But this depends on being able to use Windows 7 in

parallel with XP for now, since we can't afford to upgrade our current hardware at the moment. Any advice would be gratefully received.

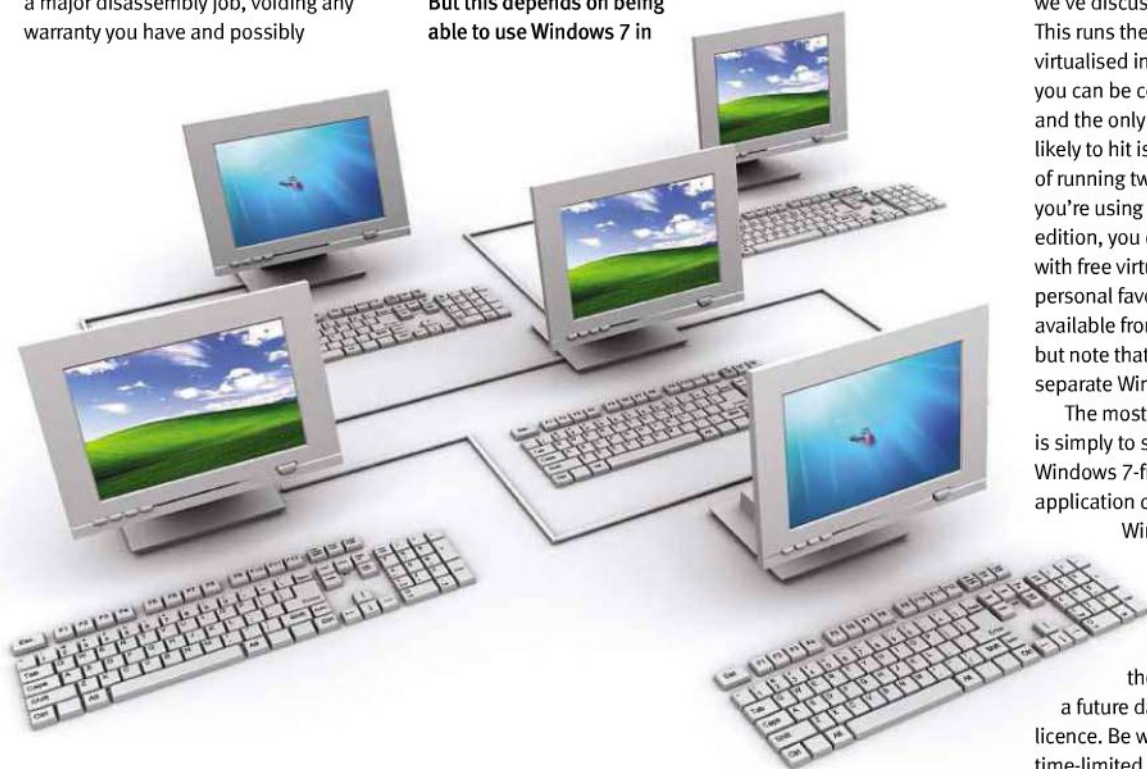
David Fox

A You shouldn't have any problem adding Windows 7 PCs to your network, nor running mainstream applications such as Microsoft Office in a mixed XP/7 environment. The obvious question is whether PGdebt will work on Windows 7, and the product website is a little unclear on this point. Happily, the developer assures me that it will. So as long as you're personally ready to start supporting Windows 7 machines, I see no reason not to go for it.

But you're not the only network administrator whose organisation relies on specialist software, and not everyone will be lucky enough to have an officially supported upgrade path. What can be done in such cases? Well, you could try running your applications under Windows 7 regardless. Most software that works on XP can be used on the newer OS, thanks to the Compatibility Troubleshooter that automatically clears up issues with permissions and version numbers. Not everything is guaranteed to work, though, and obviously if you go down this route you may not be eligible for technical support.

If you're using the Professional or Ultimate edition of Windows 7, you may prefer to use the XP Mode feature, which we've discussed before at some length. This runs the application within a full virtualised instance of Windows XP, so you can be confident it will run properly, and the only technical issue you're likely to hit is the strain on your system of running two OSes concurrently. If you're using a different Windows 7 edition, you can get a similar effect with free virtualisation software (my personal favourite being VirtualBox, available from www.virtualbox.org) – but note that this route requires a separate Windows XP licence.

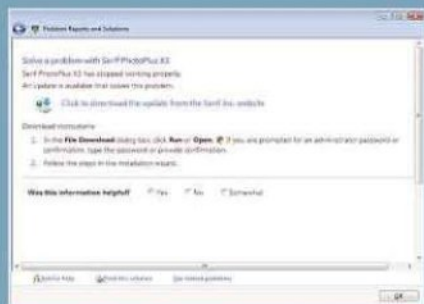
The most conservative solution is simply to stick with XP until a Windows 7-friendly version of your application comes along. Helpfully, Windows 7 Professional and Ultimate come with downgrade rights that allow you to install XP in the first instance, then move up to Windows 7 at a future date without needing a new licence. Be warned, though, it's a time-limited offer: Microsoft has decreed that downgrading to XP will



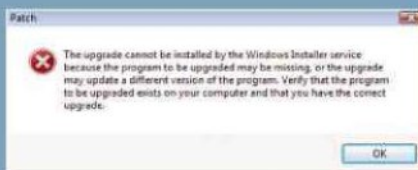
DAVID'S TIPS MICROSOFT TO THE RESCUE?

At some stage or another, most people running Windows Vista will encounter a message telling them that Microsoft has found a solution to a problem on their system, and that they should click on the link to see what the solution is. This isn't a scam; it's a potentially useful feature, although sooner or later I'm sure someone will try to create a program that impersonates that function and leads you somewhere nasty.

For me, the message popped up after I'd



I have a problem, and Microsoft seemingly has a solution... or does it?



The Windows Installer service is having none of it. But is 13.0.1.011 or 13.0.1.11 the more up-to-date version?

been having problems with Serif PhotoPlus X3, which was steadfastly refusing to open any image files at all. I clicked on the link and, lo and behold, I was invited to follow a link to the Serif site to download a patch. Wonderful news. I dutifully followed the link, downloaded the patch, and installed it.

Well, that is to say, I attempted to install it. The Windows Installer had other ideas, complaining that the patch was for an earlier version of the software. The filename of the patch specified version 13.0.1.011, while I was running version 13.0.1.11 of the software.

Was this the same version presented differently, or an earlier version? Or a later

one? It does make you wonder how the Microsoft system works. If the patch really was for a different version, I shouldn't even have been offered it in the first place.

In the end, I found the patch I needed by clicking "Check for updates" within the application itself, making me wonder whether Microsoft needs to update Serif or the other way round. At least Windows did alert me to the existence of a potential fix, but evidently Microsoft's problem-solving system isn't quite there yet. *David Moss*



Serif has an update available – straight to 13.0.2. Happily, I have no more problems with PhotoPlus X3.

only be supported until April 2011 or until Windows 7 SP1 is released – whichever comes first.

Darien Graham-Smith

Mysterious error message

Q My wife recently got a new Toshiba laptop with 64-bit Windows 7. Everything is excellent, except for two problems. First, when Windows starts up an alert appears on the screen stating that "an internal error has occurred, please contact to our support team" (sic). There's no error number or other information. I've tried updating all the system drivers, but this hasn't removed the problem.

The second problem is a printer one. I have an Epson R300 on my XP PC, and in the past my wife has used it over a network. Before getting the new laptop, I checked the Epson website, which indicated that a driver was available for 64-bit Windows 7 – but I've been unable to connect to it over the network. I've contacted Epson support and it tells me that the driver will only work with a USB connection on Windows 7 and not over a network. I don't want to have to replace the printer, so is there any way out of this problem, even for just basic printing?

John Colles

A A quick web search reveals a handful of reports of that mysterious, ungrammatical alert popping up on Windows 7 laptops – but no-one seems to know what causes it. One thing you could try is investigating which process is producing the alert. Next time the error appears, don't click OK, but open the Task Manager by pressing <Ctrl-Shift-Esc>. In the Applications tab, you'll hopefully see an entry for the offending window. If you right-click on it and select Go To Process, you'll see the name and description of the process that spawned it, which may give you a lead. Sorry, I can't provide a more definitive answer.

There's better news on the printer front. The Epson Stylus Photo R300 certainly can be used over a network with 64-bit Windows 7 – I've done it myself, using the standard drivers built into the OS. I got it working by simply opening the Network view in Windows Explorer, browsing to the host PC, then double-clicking on the shared printer to install it.

If that doesn't work for you, it suggests a larger problem with your file- and printer-sharing setup. Is your user account on the new laptop definitely authorised to connect to the XP computer? If not, the simplest solution is to create a new user on the XP

system with a username and password to match your Windows 7 ID. If for any reason you're not able to browse to the XP system from the Windows 7 one, you can try connecting to it directly by clicking in the address bar of an Explorer window, and entering its name with two backslashes before it (for example, \\computename). If that doesn't get things working, open the Network and Sharing Center, click on Troubleshoot Problems, and work through the Shared Folders troubleshooter.

Darien Graham-Smith

Q In issue 184 (see p13), there's a small article in the news section on Office 2010 Starter Edition that says, "Microsoft has revealed further details of Office 2010 Starter Edition, the stripped-down version that will ship with new PCs".

I've just purchased a new Windows 7 PC but I can't find this software anywhere, should it be in my new computer, and if so where?

Stan Cannon

A Sorry, Stan, we should have been clearer: Office 2010 Starter Edition will start shipping after the release of Office 2010 around June this year.

David Fearon



Create a **desktop media player**

WITH THE HELP OF MICROSOFT'S PROGRAMMING TOOLS, IT'S EASY TO ADD VIDEO AND AUDIO PLAYBACK TO YOUR APPLICATIONS. HUW COLLINGBOURNE EXPLAINS ALL

Years ago, PC manufacturers used to make a distinction between "business PCs" and "multimedia PCs". Only the latter came with sound cards, video graphics hardware and speakers. These days

even low-end PCs are packed with such luxuries, and we all expect to be able to play music and video at the click of a mouse.

But how do you go about adding multimedia playback capabilities to your

own programs? Not so long ago, programming multimedia was a complex and arcane process. With the advent of .NET 3.x and the Windows Presentation Foundation (WPF) framework, things have become much simpler. The WPF

provides classes and components that hide much of the complexity. In fact, you can create a simple media player without writing any program code at all. And you can create a player of some sophistication in just a few dozen lines of code.

In this series, we'll explain how to use the audio and video classes of the WPF and .NET to build a professional-quality media player. This month, we'll look at the basic building blocks required to play and control sound and video tracks in your own applications.

The play's the thing

With the help of the WPF you can create a very simple media player tool in a matter of moments. In Visual Studio, start a new C# WPF Application project. Then, from the Controls section of the Toolbox, drop a MediaElement control on to the form. Making sure the MediaElement control is selected, go to the Properties panel and enter as its "source" property the full path to a media file; for example, an audio file such as `rtx C = { TEBv C or` or a video file such as `rtx : WSE { V CEE DD v C`. Press <Ctrl-F5> to compile and run the program. The form will pop up onscreen. If the media is audio, it will start playing and the form will remain empty; if it's video, it will be displayed inside the MediaElement control.

If you've ever tried playing media files in a WinForms application, you'll appreciate how much simpler the WPF makes this. However, in this very simple project, our media player is extremely limited. To make it useful we need to provide ways of controlling playback with some stop, start and pause buttons. First, though, let's take a closer look at the MediaElement control, which supplies the essential features of our WPF media player.

The MediaElement class can be used to access the video and audio playback features supplied by Windows Media Player. It requires the .NET framework 3, 3.5 or 4, the Windows Presentation Foundation and the Media Player 10 OCX. If you have an old version of the Windows Media Player, be sure to install the latest release before compiling our projects.

The sample code of this month's projects can be found on the cover disc (look in the Editorial section) in the solution named `MEDIAPLAYER1.SLN`. To try the media player described above, select the MediaPlayer1 project in the first indented branch of the Solution Explorer,

right-click and select "Set As Startup Project". Then press <Ctrl-F5> and listen to our sample audio file. If you want to try this with your own audio or video files, just change the path name in the media element's "Source" property.

XML-rated

If this is the first time you've worked with the WPF, you'll see that its design environment is significantly different from the traditional Windows Forms designer. The most important difference is that the layout information is stored in a variety of XML called XAML. You can add or alter properties using either the Properties panel or by editing the XAML code itself.

In the Solution Explorer, set Player2 to be the startup project and load the file `WINDOW1.XAML` into the designer. We've added a number of controls to this version of the media player. There are buttons to start, pause and stop the playback, and sliders to adjust the volume, speed, balance and the position of the track being played. Once again, we've supplied a sample track (a video this time), but you can change the Source property if you wish to play a different media file.

Since we're going to allow user interaction to control media playback, its `LoadedBehaviour` property must be set to Manual in order to control the playback interactively. If you set the behaviour to Play and then try to stop it at runtime, the program is likely to crash.

The C# code associated with this design is stored in the file `WINDOW1.XAML.cs`. The event-handler methods that are executed in response to specific events such as mouse-clicks are specified in the XAML code, but you may find it easier to create event-handlers automatically by double-clicking events listed in the Event pane of the property window. Let's look at the most important event: the one that plays a track. This is how the event-



↓ The same underlying technology used by Windows Media Player supplies the features for our own media player, so be sure you have the latest version of Media Player installed.



handler is declared in the XAML of the Pause button:

```
Click="PauseBtn_Click"
```

Now if you turn to the C# code, you'll see this is the event-handler function:

```
private void PauseBtn_Click( object sender,
RoutedEventArgs e ) {
    mediaEl.Pause();
}
```

Here, `mediaEl` is the name of the MediaElement on the form and `Pause()` is one of its built-in methods. The other buttons similarly call `Play()` and `Stop()` methods. There are a few other complexities that need to be handled when playing a track, which we'll look at shortly. First, however, let's take a look at the sliders on the form.

Sliders

The WPF slider component can be aligned either vertically or horizontally by setting its `Orientation` property. The volume slider is the only one in our application that has a vertical orientation. Each slider has a user-defined minimum and maximum value, which we're able to use when we want to alter some value of the MediaElement. The volume slider has a minimum and maximum of 0 and 1 and the default value is 0.5. That matches the range of values of the `Volume` property, which is 0 when silent and 1 when at full volume. So, to change the playback volume when the slider is moved, we just create a method to handle the `ValueChanged` event and add this code:

```
STNp v E S .TE VS : E N S v S
```

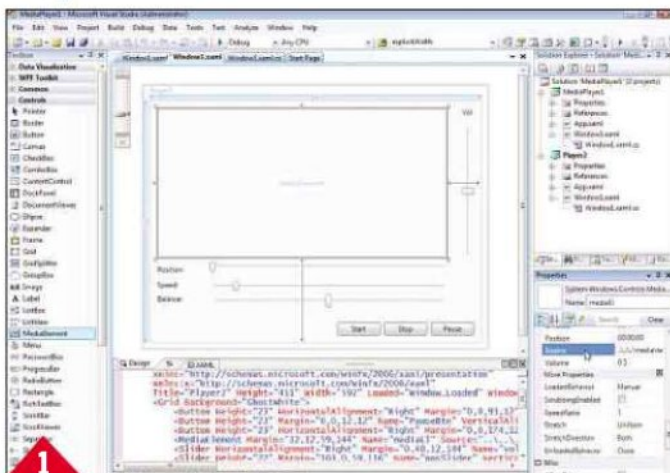
Setting the playback balance and speed in response to slider changes is done in much the same way. The main differences are found in the value ranges assigned to each slider. The balance slider has a minimum of -1 (the left speaker) and a maximum of 1 (the right speaker), with its default being 0 for equal balance, while the speed slider goes from 0 to 10 with a default of 1.

Setting values for the position slider isn't quite so straightforward, since the playback position is relative to the actual length of the loaded track. We therefore need to calculate the maximum value of the slider when a media track is loaded. Our `mediaEl_MediaOpened()` does this by assigning to the slider the total track size in milliseconds:

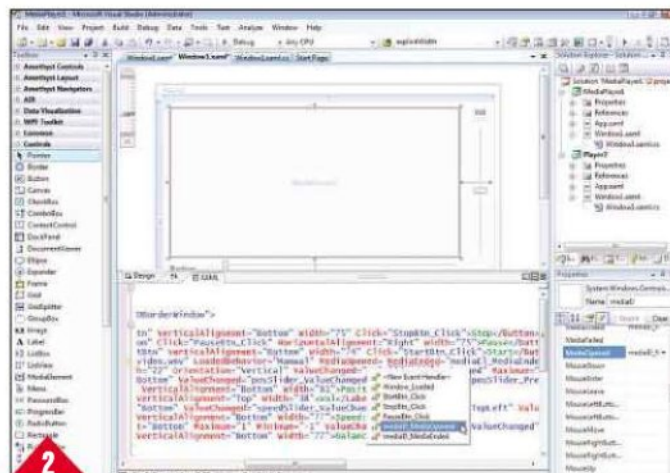
```
posSlider.Maximum = mediaEl.
NaturalDuration.TimeSpan.
TotalMilliseconds;
```

The `Position` property of a MediaElement is an instance of the `TimeSpan` class, and we need to convert the millisecond value indicated by the

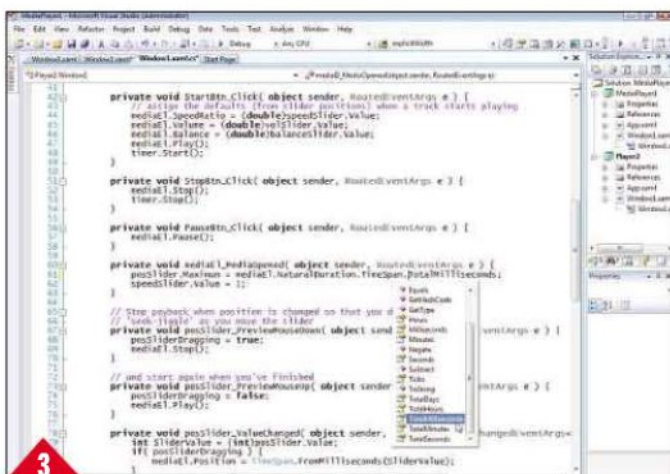
WALKTHROUGH Building a desktop media player



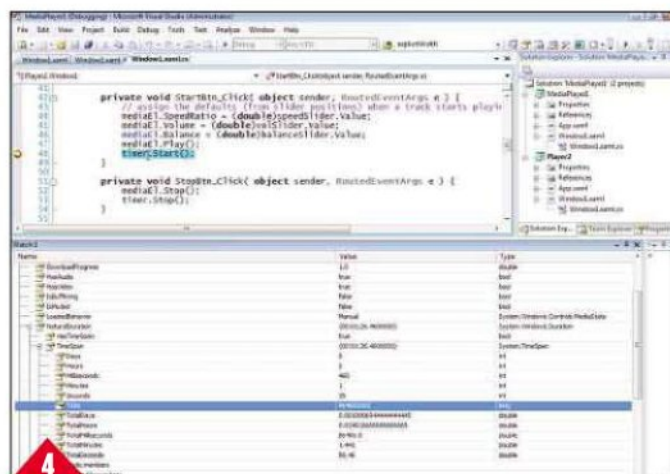
For our MediaPlayer projects we'll be using the WPF framework for .NET, which supplies more media-specific features than Windows Forms. At the heart of our media is the MediaElement component, which we've dropped onto a form in Visual Studio.



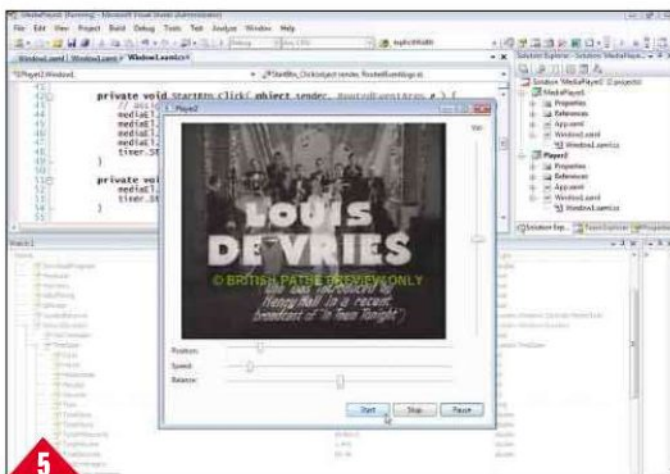
User interfaces are defined in XAML (an XML-based formatting code) displayed in a window beneath the design area. To add properties and event-handlers, you may either use the Properties panel at the right or edit the XAML code as we're doing here.



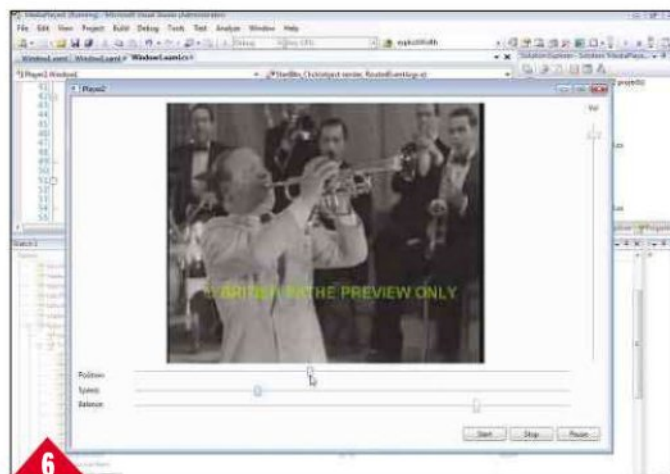
The C# code is contained in a "code behind" file associated with the XAML file. In both XAML and C#, you can use the IntelliSense system to provide auto-completion lists of relevant identifiers and members. Here, we're coding the MediaOpened event-handler.



To get a deeper understanding of the inner workings of the MediaElement class, put a breakpoint on the code in StartBtn_Click(). Press F5 to debug and, when it starts, you can drill down into the MediaElement to view its properties such as TimeSpan.



This is what our media player looks like when it runs. Here, we've loaded a sample video and clicked the Start button to begin playing. As it plays, the Position slider constantly updates to show the current playback position in the video.



When you expand or contract the window, the video resizes automatically. Here, we've moved the sliders to increase the volume and speed, set the balance to favour the right-hand speaker, and searched for a position midway through the video clip.

slider into a TimeSpan object before we can assign it. This is how we do that in posSlider_ValueChanged():

```
int SliderValue = (int)posSlider.Value;
mediaEl.Position = TimeSpan.
FromMilliseconds(SliderValue);
```

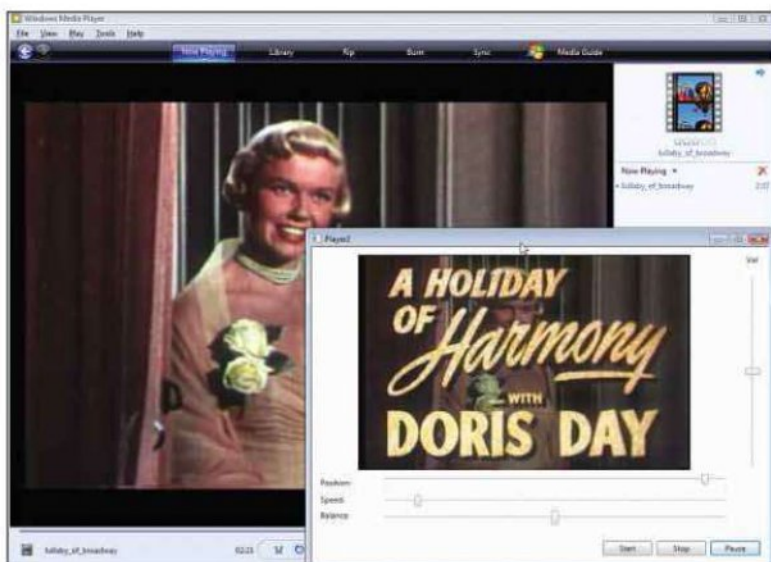
When you drag a slider to seek a specific position in a video clip, the video may jitter as the playback tries to keep up with the changes. To avoid this, we want to stop playback when the user interacts with the slider. At first sight it isn't obvious how to do this, since although the slider control has various MouseDown events listed, if you try to set up an event-handler for them you'll find they never execute. That's because the slider "grabs" these events itself, and you'd need to allocate a custom event-handler in code to bypass this.

It turns out there's a simpler solution, however. There are "preview" mouse-up and mouse-down handlers that execute before the default handlers. We've created methods for these events, which stop playback when the mouse-down event occurs over the slider and start playback when the mouse-up event occurs.

Ideally, the position slider shouldn't only be used to assign a position; it should display and constantly update the current position as the track plays. There's no simple property or method that can do this, so we have to program this behaviour from the ground up.

We've done this by creating a DispatchTimer object, called timer, with a 100-millisecond tick interval and assigning an event-handler to its Tick event. Since this is a non-visual object, we've had to assign the event-handler in C# code:

```
timer.Tick += new EventHandler(timer_
Tick);
```



MEDIA FORMATS AND CODECS

here please

The WPF MediaElement can play media files in a number of formats, including MPEG, MP3, WMV, AVI and WAV. In fact, if Windows Media Player can play a file, so can the MediaElement. Even so, there may be times when a file in an apparently supported format won't play. To fix this, you may need to download a specific codec.

To understand what's going on here, you need to know a bit about the way in which media files are implemented. Essentially, a media file is considered to be formed from two component parts: the container and the codec. The container is what we might normally call the format (MP3 or WAV, for instance), while the codec is a program that handles the encoding and decoding of the stream of data in the container. The media is encoded when the file is saved and decoded when it's played.

Codecs are used to optimise media data – typically, by compressing it to save disk space or to speed up its transfer when streaming music or video across the internet. Some codecs lose some of the original information in the process of

compression, while others retain all the original data. Many of the most widely used codecs lose data and are called "lossy" codecs. Often this data loss isn't significant, as it isn't perceptible by most viewers or listeners – that is, assuming the codec does the job it was intended to do!

Different codecs lose different types of information, depending on the nature of the media with which they're working. A codec used with video containing lots of action may lose some colour information but retain motion information. Another codec (for a narrated video, say) may lose some audio information but retain high-quality visual information.

Windows Media Player will warn you if you're trying to play a file without the appropriate codec, and may try to find and download one for you. If you're missing some codecs or you think some codecs are out of date, you can download the Codec Installation Package from Microsoft at www.pcpro.co.uk/links/188codec. However, the latest version of Windows Media Player will install the most popular codecs automatically.

At each tick, this event-handler updates the slider to reflect the current playback position of the media:

```
posSlider.Value = mediaEl.Position.
TotalMilliseconds;
```

There's one more problem, however. We now have a situation in which the timer updates the slider, but the user may also decide to update the slider interactively. We need to ensure that when the user moves the slider, the timer's tick-handler doesn't try to move it back again. We've declared a Boolean, posSliderDragging, which is set to true when the user is using the slider (that is, a mouse-down click was detected in PreviewMouseDown) and false otherwise (on PreviewMouseUp). The



timer_Tick() method tests this variable and updates the slider position only if it's false – that is, if the user isn't manually updating the position.

Finally, when the user plays a track, all its relevant properties need to be set to match the slider positions. The StartBtn_Click() method does this. The end result is that we now have a media player capable of playing audio and video with adjustable balance, speed, position and volume settings.

The Speed Slider shows tick-marks to indicate speed increments. These are added by assigning a value to the TickFrequency property. Here, the value 1 causes 11 ticks to be shown – from position 0 up to the maximum value, 10. If you want to halve the tick markers, you'd set TickFrequency to 2. If you want to double their number, set TickFrequency to 0.5.

Sliders, in common with most other WPF controls, come with a large number of properties that can be used to alter both their behaviour and their appearance. For example, you can set properties to change their background colour or opacity. Later in this series, we'll be looking at more radical ways of styling WPF applications.

While this media player is already quite a capable program, it's missing one vital feature: there's no way for the user to select new media files or create playlists of favourite tracks. We'll be adding those features next month. ■

← Our media player should be able to play any audio or video that Windows Media Player can play. Here, we catch the PC Pro editor watching one of his favourite films.



Uncovering the secrets of USB 3

DAVID FEARON LOOKS AT THE BRAVE NEW WORLD OF USB 3, WHICH IS JUST BEGINNING TO TRICKLE ON TO THE MARKET

It's been a decade since USB 2 was released in April 2000. It's held up pretty well over the years, with its 480Mbps/sec speed giving a maximum of around 50MB/sec data transfers in real-world use. But with even mobile hard disks now able to outstrip that data rate, and HD camcorders producing tens of gigabytes of data per shoot, the time has come for something faster.

Speed

USB 1.x gave a maximum transfer rate of around 12Mbps/sec. USB 2 increased that to 480Mbps/sec. In USB terminology, the 12Mbps/sec rate is known as Full Speed and 480Mbps/sec as Hi-Speed. The new version multiplies that by ten to give a new SuperSpeed mode, with an impressive 4.8Gbps/sec maximum raw throughput. After accounting for protocol overhead,

that translates into a maximum real data-transfer rate of around 400MB/sec, giving more than twice the bandwidth of the fastest solid-state hard disks and beating the current-generation eSATA hard disk interface by a fair margin.

The engineering challenge

Trying to shove 4.8Gbits/sec down the same physical cables and connectors as USB 2 isn't possible: they were originally designed for data 4,000 times slower. But backwards compatibility with the estimated six billion USB 1 and USB 2 devices on the market is essential. The answer to that conundrum is a cunning piece of engineering.

Last month, we saw that USB 1 and 2 interfaces transmit and receive data using two wires in what's known as a differential pair. The USB 3 connector standard maintains those two original signalling pairs in a physically compatible connector, but the USB 3 part of the equation comes into play via an extra two pairs of differential signalling wires. So the USB 3 interface consists of a completely independent set of USB 2 connections, plus an extra new interface that carries SuperSpeed USB 3 data. The extra connectors then piggy-back on the old-style plugs and sockets, allowing cross-connection with both via a clever physical design. This means that, with one or two restrictions (see *Compatibility*), you can plug a USB 1 or USB 2 device into a USB 3-capable port and it will still work, or a USB 3 device into a USB 2 port and it will automatically run at USB 2 speeds.

Telling the two apart

PCs and motherboards are appearing with both USB 2 and USB 3 interfaces on-board (see *photo below*). Since the connectors look almost identical, there needs to be a way to differentiate



between the two. The industry has settled on a simple convention: USB 3 ports and connectors are blue.

The connectors

The photo above shows two type A (downstream) connectors on the left: an old USB 2 connector on the far left, and a USB 3 one next to it. You can see that the outer dimensions are identical, as are the front-most electrical contacts. But if you could look towards the back of the inner part of each connector, you'd see the difference. Set back inside the shroud of the USB 3 connector is a set of five extra raised conductors: four for the two differential pairs for SuperSpeed transfer, and an extra shield conductor.

Compatibility

The new system isn't completely transparent in its compatibility, but it's pretty good considering the challenge involved. Old-style USB cables can be plugged into newer USB 3 devices and will always work – but not at USB 3 speeds, because they lack the SuperSpeed-channel connectors.

Type A (downstream) USB 3 plugs will also plug into non-USB 3 devices, such as the ports on the back of a PC, and

↑ The square type B “upstream” USB 3 plug isn't compatible with old upstream devices, but that will rarely matter in practice.



← The blue colour distinguishes the new USB standard from the old.

again work at USB 2 speeds. The only combination of connection that doesn't work is connecting a new USB 3 type B plug into a USB 2 type B socket (this is the squarer type you're likely to find on an external 3.5in hard disk or a printer). That's because the new SuperSpeed conductors for type B are slung underneath the old-style shape, not recessed backwards as in the type A connectors – look at the photo of the type B connector and this should make more sense.

The upshot of all this is simpler than the description: USB 3 devices are always backward-compatible with old cables, but not necessarily forward-compatible if you have a new USB 3 A-to-B cable and an old USB 2 device. In practice, the lack of type B compatibility isn't a problem: you can carry your external USB 3 hard disk around with its USB 3 cable, and connect it to any PC's type A connector, with the ability to run at USB 3 speeds if the PC in question has USB 3 ports, and USB 2 speeds otherwise.

The only real downside of USB 3 is that the extra conductors make the cables themselves thicker and less flexible than their older counterparts. The USB 3 cables we've seen so far are all around 6mm in diameter, compared to half that or less for USB 2.

USB 3 power

One of the main reasons for USB's initial success back in the 1990s wasn't to do with the interface as such – it was the fact that it also carries power to devices, leading to a raft of gadgets that don't actually use the USB data interface at all, but simply take advantage of USB as a cheap, standardised power supply. Since it's so widely used, USB 3 ups the power rating. USB could provide a maximum of 500mA at 5V – a total of 2.5W – to one device. USB 3, however, nearly doubles the maximum power in data-transfer modes to 900mA for a total of 4.5W.

It adds up to what looks like a very robust interface that's unlikely to be superseded by any new kid on the block for a very long time to come.

Devices

Inevitably, the first USB 3 devices are external hard disks, since they're best able to take advantage of the extra bandwidth. Drives have already appeared from Buffalo (web ID: 355048) and Western Digital, with more on the way. Camcorders are likely to be the next candidates for a USB 3 upgrade later this year. ■

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Mass Effect 2

An epic story beautifully told, and a bold experiment in gaming, Mass Effect 2 is a stunning achievement

Genre doesn't mean much when it comes to video games. BioShock 2, Borderlands and Call of Pripjat all wore a shooter's skirt, but frilly RPG underwear lurked beneath. In contrast, the original Mass Effect skipped cross-dressing and went straight to the operating table, splicing the genres at the genetic level. The result was a thing of awkward beauty, occasionally satisfying, but some way short of being any good.

Now BioWare has turned its attention to making its space-opera work, and the results are a revelation. Let's begin with combat – the Achilles heel of Mass Effect. Borrowing heavily from Gears of War's cover-and-shoot mechanic, your character zips between cover spots, popping out to unleash a spray of bullets, before being forced to retreat under a hail of fire.

Depending on your choice of character class, there's a selection of powers to play with, allowing you to resurrect a fallen friend, or yank enemies into the air to be shot at like hovering human piñatas. It's tight, thrilling stuff that makes the original game's combat look like a practical joke.

BioWare has been particularly bold in paring back the RPG elements. Gone are the inventories, loot, armour types and augmentations. The clumsy process of looting bodies and then selling unwanted trinkets at the nearest interstellar Asda has been simplified. Pickups are either upgrades, minerals required to complete an upgrade or a medkit. If you already have an ample supply of these things the game cuts to the chase and gives you cash, which can be used to buy armour and weapon upgrades.

Character classes, experience points and levels

Combat in Mass Effect 2 is only one of the major improvements.



remain, but they're there solely to improve your ability to kill things. And yet, while Mass Effect 2 has thrown out much of the RPG bath water, the baby never hits the floor. This is a game about choices; often difficult choices with unhappy endings. Make no mistake, Mass Effect 2 is darker

than the devil's dancing shoes. Within five minutes you're bumped off, and ten minutes after your resurrection you'll have joined an organisation called Cerberus – xenophobic terrorists hell-bent on securing humanity's hold on the universe. We're not going to say much more, because the plot is one of the game's great joys, but from script to setting to voice acting, Mass Effect 2 is up there with the best celluloid science fiction. It's filled with wonderfully acted characters, each with a rich backstory and compelling personal traits.

Mass Effect 2 is the perfect sequel. What was broken in the original has been removed and what remains has been perfected. BioWare's awkward beauty has blossomed, and she's stunning. **STUART TURTON**

REQUIREMENTS

2.6GHz Intel Core 2 Duo or equivalent AMD CPU
• 2GB RAM • ATI Radeon HD 2900 XT, Nvidia GeForce 8800 GT or better recommended
• DirectX-compatible sound card and drivers
• Windows 7/Vista SP1/XP SP3

OVERALL





BioShock 2

Thanks to a compelling story and superb setting, BioShock 2 almost equals its stunning predecessor

How do you make a sequel to one of the decade's best games? That was the problem placed before 2K Marin with BioShock 2, and at first glance you'd be forgiven for thinking the studio had decided to play it safe.

Set in the crumbling underwater empire of Rapture, BioShock 2 once again tasks you with either saving or exploiting the Little Sisters – small children, brainwashed to collect Adam, a drug on which Rapture's citizens depend.

While returning to Rapture may provoke a sense of déjà vu, the decaying city remains one of the most impressive backdrops in modern gaming. Ryan Amusements, for example, is full of dilapidated theme park rides and silhouetted mannequins, while Pauper's Drop is a down-trodden slum haunted by Splicers – residents of the city who've been warped into aggressive enemies by their Adam addictions.

Thankfully, genetic modifications allow you to freeze, ignite or even levitate these foes, and it's now possible to use powers and guns at the same time, allowing you to dole out huge amounts of damage to enemies unwise enough to get in your way. The weapons have been tweaked, and all manner of armaments can now be upgraded to inflict more damage or hold more bullets.

Despite the pleasure

BioShock's excellent gameplay and graphics will draw you in for hours.

of reacquainting yourself with Rapture, BioShock 2's ponderous, plot-light start makes the opening section of the game a chore, but you'd be wise to persevere because fantastic pacing, plot and design ensure that BioShock 2 soon comes into its own.

Credit for this goes to Sofia Lamb, the psychotic psychologist who now owns Rapture and manipulates Little Sisters. The chilling audio messages littered throughout the city reveal how Lamb brainwashed residents and is now preventing you from rescuing Eleanor – the Little Sister you were tasked with protecting ten years previously and, coincidentally, Sofia's daughter.

The cast of characters is superb throughout, from the sinister Eleanor Lamb and her manipulative mother, to her conflicted ally Grace Holloway and freedom-fighting Brigid Tenenbaum. The voice acting is near-flawless, injecting each character with plenty of personality and sending chills down the spine on a regular basis.

Your character has changed too: while you spent the original game playing as an estranged child of Andrew Ryan, the sequel sees you inhabiting the body of a prototype Big Daddy. While it's a major change on paper, its impact is variable. While it's now possible to adopt and use Little Sisters to harvest Adam from downed enemies, the foes that proved formidable in the first game – even other Big Daddies – are just as tough here, despite your new-found status among them.

The music and sound effects are fantastic: creaking doors, dripping pipes and eerie musical twangs work well to unnerve, and you'll spend plenty of time listening to the haunting ramblings of Splicers as you try to pinpoint their positions. The score has been recorded by a 60-piece orchestra, which adds depth to the already vivid location.

Get past the slow opening act and it's clear that 2K hasn't rested on its laurels. The already excellent gameplay remains largely unchanged, but the fantastic plot, expert design and atmosphere ensure that we're more than happy to dive back into Rapture.

MIKE JENNINGS



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OVERALL

★★★★★

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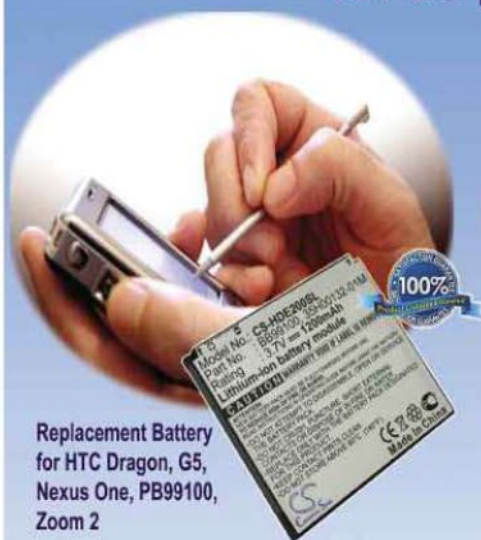
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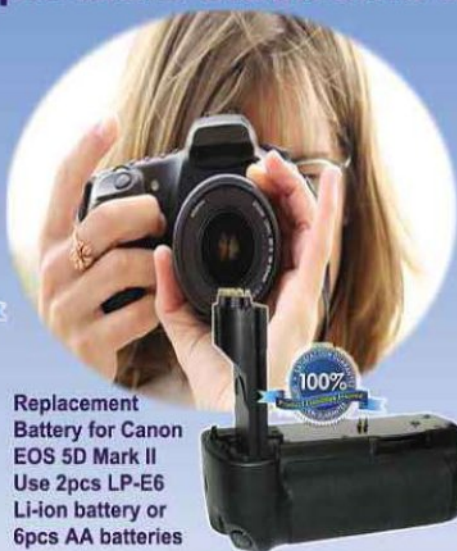


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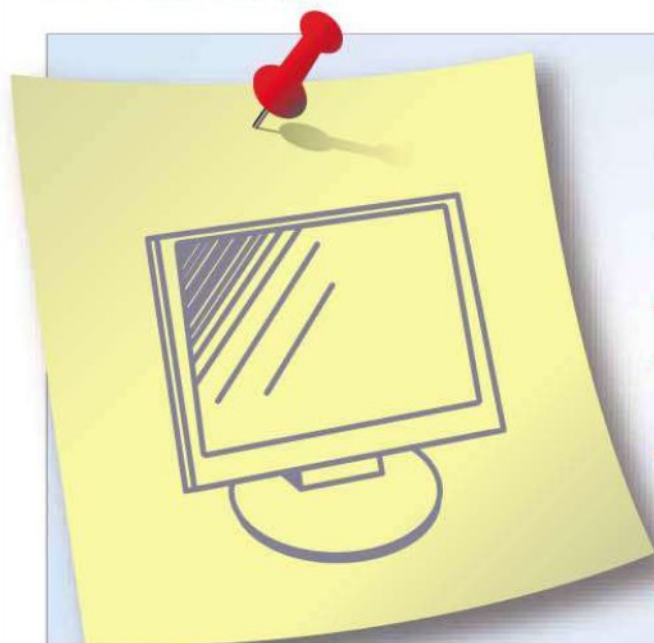
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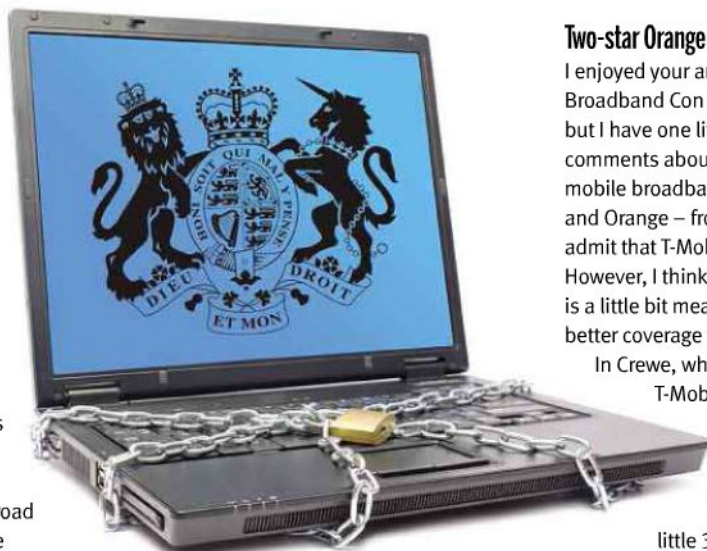
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Technical and buying advice can't be given by telephone

Government gripes

Davey Winder should try to find out what the Government's information security strategy actually is before he lampoons it as "laughable" (*see issue 186, p137*). He starts out by rightly observing that absolute security is an impossible dream, but fails to recognise that, in an organisation as large as HMG, some of the incidents will almost inevitably be major ones. Would he dismiss the Government's road safety strategy as laughable because another 50 people died on the roads last week? So what would *he* do? Most security incidents are the result of simple, avoidable mistakes, but, of course, the media will be there to sell copy from as many of them as they can.

Yes, there's much more work still to be done and every incident is highly regrettable, but the right policies are largely in place. The hard part is to communicate those policies to the information workers at the coalface, and to get them understood and followed by civil servants and contractors working under pressure and with ever-dwindling budgets. Every large organisation has exactly the same problem, but it's bigger in HMG because HMG is bigger. It isn't



Could the Government be doing more to prevent massive data losses?

government information security strategy that's laughable, but Davey Winder's analysis of it. PHILIP LE RICHE

Davey Winder, contributing editor, responds:

The key point in my article is that the Government is repeating the same fundamental mistakes, year after year. For starters, it's moving data unnecessarily, which introduces risk. What's more, that data is unencrypted and swapped using USB memory sticks! It's a procedural problem, not a communication problem.

Two-star Orange

I enjoyed your article on the Mobile Broadband Con (*see issue 186, p96*), but I have one little criticism on your comments about Orange. I received two mobile broadband dongles – T-Mobile and Orange – from my company, and I'll admit that T-Mobile has faster speeds. However, I think giving Orange two stars is a little bit mean because it has far better coverage than T-Mobile.

In Crewe, where I usually am,

T-Mobile gets around 2Mbps/sec and Orange 1.2Mbps/sec, but where I live, in the countryside with very little 3G coverage, T-Mobile

doesn't connect, while Orange receives a 0.2Mbps/sec connection, which is good enough for a bit of web browsing. This is especially good when I'm travelling on trains or as a passenger in a car, as my signal rarely drops, whereas it nearly always drops with T-Mobile. DAVID LUKIC

eBook envy

I don't understand the scepticism around eBooks, especially the idea that by embracing the future we have to abandon the past. I'm an avid reader,



BLOG BITES

Follow the musings of *PC Pro* at www.pcpro.co.uk/blogs

Panorama's investigation into the file-sharing habits of teenagers enraged online and features editor Barry Collins to such an extent that he vented his fury on the blogs. However, his anger wasn't aimed at the teenagers, but the parents letting their kids run riot on the internet. It seems a fair few of our readers agreed with him.

“I don't have children, but if I ever do I'll be watching them like a hawk when they start using the internet.”

Mr Flynn

“Parents need to get up to speed on the things their kids do, and kids need to value things like music again.”

Ed

“Far more worrying these days is who they're talking to, or rather, who they think they're talking to online.”

Stevia

“Exerting basic parental control? I wish that would happen, not just in relation to ICT but simple common manners and common sense.”

Mviracca

“I pay for music I like and keep. However, how would I be exposed to the variety without file-sharing? It's similar to swapping records.”

Richard Smith

“There's no escaping the fact that downloading music is illegal. Stop kidding yourself that you have some kind of moral right to do it.”

DringyA

and it took me some time to take the eBook plunge, fuelled mainly by my wife's constant nagging about the number of books in the house and the reduced storage space resulting from retirement.

But, just because I've bought a Sony PRS-505 that doesn't mean I've abandoned traditional books altogether. I still buy proper books, but I'm now more discerning about which ones. By embracing new technology I've saved a few trees, gained the ability to store hundreds of books without taking up half the house, and can now go on holiday without carrying half of WHSmith with me.

Hopefully, UK book publishers will soon catch up with their US counterparts in the number of eBooks they offer, because current publishing restrictions prohibit myself and others in the UK from purchasing directly from the USA where the range is vast.

Please don't dismiss progress because it's challenging. If an old traditionalist like me can change, so can you. **DAVID TAYLOR**

Cloud confusion

All we hear these days is how great cloud computing is going to be for businesses, but most people have poor ADSL speeds, and having everything online would be a nightmare. Imagine shooting a movie in Full HD and then having to upload that to the cloud to be edited – you'll be there for hours.

I work in the support industry, and we receive many calls a week from clients telling us they have no internet. It can take hours to restore a connection. Currently, this is an inconvenience for the company as it can't receive emails, but it can still access all its documents and work goes on. If these companies stored all their data online and exclusively used online software, they wouldn't be able to function. I can understand why Microsoft is pushing Azure and Office Web Apps, but can we afford to be totally dependent on the cloud? **RHYS JENKINS**

Where's the WinMo love?

I'd been looking forward to the smartphone shootout (see issue 186, p68) but found myself extremely irritated by the theme that "if it runs Windows Mobile 6.5,

PC Pro takes great care to compare Windows Mobile phones with others objectively.



STAR LETTER Windows 7 fumbles fonts



Windows 7 is a worthy successor to Windows XP, but a lack of effective font management continues to be a major weakness. The built-in Windows fonts and any others that are included with applications, such as Microsoft Office or Adobe Creative Suite, are always installed in the Windows Fonts folder. The user has absolutely no control over this behaviour.

Windows Vista and Windows 7 install with 200 fonts. Office 2007 adds a similar number and Scientific Word, which I use for technical documents, adds another 200. This means that upon installing Windows 7 and the few apps I use, my fonts folder already contains in excess of 500 fonts – which appear in a pop-up box that's extremely difficult to use.

A better solution would be to keep each application's fonts in their own folder. Font selection dialogs could then show folders instead of a long list of all installed fonts. **AVON ATHENS**

Tom Arah, contributing editor, responds: As a designer I tend to come at the issue from the opposite direction, in accordance with the famous principle "whoever dies with the most fonts wins".

However, I agree that scrolling through hundreds of typefaces to find the one you're after isn't ideal – although some applications make life simpler by presenting recently used fonts at the top of the list. Personally, I'd like a system whereby serif, sans, monospaced, cursive, decorative and symbol fonts were automatically grouped, and selecting one narrowed down your choices to similar typefaces. There are font managers such as Printer's Apprentice that let you manually manage installed fonts, but it's true that Windows 7's marginally improved font handling was a missed opportunity.



This month's Star Letter wins an Eizo FlexScan 22in monitor. It's suitable for the office or home, and presents a cost- and space-saving alternative to 24in models. Visit www.eizo.co.uk

we don't care how great it might be, it ain't getting a recommendation".

This sort of attitude completely disregards HTC's sumptuous Sense UI, and the ability to implement tweaks and access extremely capable mods courtesy of XDA developers – something not yet possible with the iPhone or Android. Alongside, you get proper integration with Outlook for contacts/calendar, and you don't have to install iTunes on your PC.

It has a slightly steep learning curve, but I managed to have it set up exactly as I wanted within three days. This might be too long for some, but what's the point in having a smartphone if you can't adjust it to your preferences? **RIZWAN MALIK**

Jonathan Bray, reviews editor, responds:

We take great care to compare all phones we test carefully, and objectively assess their practicality, features, performance, value for money and ease of use before deciding on awards. Plus, as we explain in our Labs buyer's guide pages, overall scores are calculated from these assessments and measurements, which makes it quite difficult to fudge a result or take an anti-this or anti-that stance. I am, in fact, a long-time supporter of Windows Mobile and HTC's UI tweaks – but we have to be strictly objective.

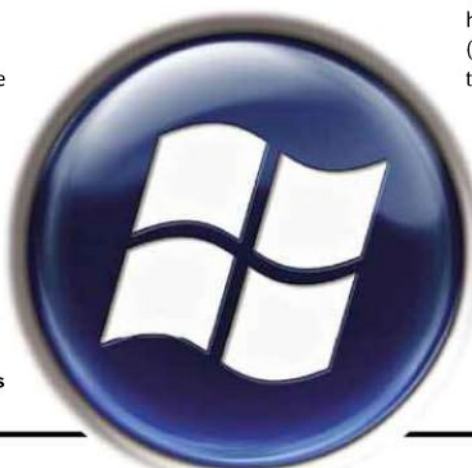
The 3D fad

While I don't always agree with Jon Honeyball's views in his Epilog column, his comments regarding 3D television (see issue 186, p178) were bang on the money.

3D has been around since the 1950s and hasn't caught on despite numerous attempts over the years. This recent push towards 3D is nothing more than a means to stop pirates with video cameras in cinemas, and I find it frustrating that even our television channels are being forced to jump aboard the bandwagon. This technology is a massive waste of time. **PHIL RUTTER**

CABLE TO ADSL

In your recent article on wireless routers (see issue 187, p85), you referred to the difficulty of connecting a cable router to an ADSL connection. For those who have an old Sky Netgear DG834 wireless router lying around, the answer is very simple. These routers have a hidden configuration page at 192.168.0.1/setup.cgi?next_file=mode.htm, which allows them to be set as a simple modem. The router can then be configured to do the logon and provide the DHCP addresses. **SIMON JOHNSTON**



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Next month

COMING SOON IN ISSUE 189

IN FEATURES

Time to switch to fibre broadband?

BT's beginning to roll out its high-speed fibre broadband across the country, bringing connection speeds of up to 100Mbps/sec. Is it time for you to switch? We compare all the packages – both fibre and ADSL – on offer from ten leading ISPs, to help you get the best broadband possible.



Mile-high computing

From the software that powers fighter jets to computers that keep commercial planes in the air, we crawl under the cockpit to uncover the myriad technology behind today's aircraft.



What ever happened to the Micro Men?

From Spectrum legend Sir Clive Sinclair to the man who designed the BBC Micro and is now mapping the human brain, we profile the British computing pioneers of the 1980s and find out what's happened to them since.



IN LABS

Core i3 PCs

Intel's Core i3 CPUs have introduced the budget PCs to power beyond their wildest dreams. We challenge manufacturers to put together a full PC system based on the technology for less than £599 exc VAT. The result is a selection of super-cheap PCs that won't buckle under pressure.



On sale in WHSmith and newsagents from 13 May

22in monitors

Small screens are on their way out, and 22in TFTs are rapidly becoming the size of choice for consumers and system builders alike. We gather and test a massive range of 22in screens, ranging from £100 budget models right up to specialists costing enough to make grown men weep. Most are affordable, some are stylish, all are high resolution, and there will be award winners for every wallet size.



Please note that Labs and features are subject to change.



How will companies cope with the text message explosion, wonders Jon Honeyball

If the current generation is so proficient at communicating by SMS, what are we doing to harness this expertise?

“

I recently ran across some figures that caused me to sit back in my seat in astonishment. On Christmas Day 2009, some 441,805,870 text messages were sent in the UK, according to the Mobile Data Association. Four hundred and forty-one *million* text messages.

You might have thought that this was the highest number in one day in 2009. But no. For New Year's Eve and New Year's Day 2009/2010, the figure was 874,033,799. That's knocking on for one billion messages in a day.

The figures for the whole year are quite staggering too – in 2009, approximately 96.8 billion texts were sent in the UK. Video and picture messaging was almost non-existent by comparison at only 601 million for the entire year, which puts it at roughly 0.6% compared to plain SMS. Text messaging is growing at a staggering rate too – in 2007, the total number of SMS messages was 56.9 billion, and thus it's nigh-on doubled in only two years.

These figures shocked me simply because I rarely use SMS. And neither do my friends, most of whom, naturally, are in the “old fart” age bracket of 30 to 50. My usage is probably in the range of ten to 20 text messages per month. If I want to communicate with a friend, I telephone or send them an email. I send vastly more emails from my iPhone than SMS messages, probably by a factor of ten or more.

But the reality is there's a whole generation where SMS is their primary mode of digital communication. One exasperated parent recently told me that the only way to engage with her teenage son was via SMS, despite them both living in the same house.

Why do I bring up these numbers? Well, first it's a good reality check. There's no harm in reminding ourselves just how rapidly the most basic and unsophisticated of technologies can gain a foothold, and then spread like wildfire. Second, it's clear there are many users who are sending thousands of messages per month. And given the relatively small penetration of smartphones in this market, I'd assume these are being sent via T9-mode standard phone keypads.

This leads to a number of intriguing questions. If this generation is so proficient at communicating by text message, what are we doing to harness this expertise and experience? Should we be looking at user interface devices for the workplace that can

be used in T9 mode? Can this class of user type faster on a phone keypad than with a conventional “old-skool” keyboard?

Worse still, as this generation continues to seep into the workplace, what are we doing to manage SMS within the business environment? There are many areas where we've had to take control of social-networking technologies and then force them to work through our own proxy servers. This is to ensure communications can be logged, traced and so forth. I remember consulting at one financial operations room in the City some years ago, where I decided it would be a good idea to disconnect all the social networking traffic from the staff desktops. They were chatting away to each other, in various firms across town. Some had streaming radio feeds. One user even had live webcam feeds from ladies of extremely dubious morals straight to his desktop. It took only a few clicks on the management console of the firewall to disconnect almost everything, instantly provoking heads to pop up over the office partitions, like a family of meerkats, all wondering what had happened. Today, it's easy to grab all the MSN chat server traffic, for example, by using the various Microsoft communications servers.

That's all very fine for IM, but what will happen to this new generation hooked on SMS? We can give staff mobile phones and even pay the bills, but do we have centralised and traceable SMS transmission logging? The answer appears to be no.

I can't think of an IT system I've seen recently that takes SMS into the purview of the business IT function. And I can't see how we're going to integrate this “new” problem area into the IT management space when we have such a bad set of solutions today. Yes, tools such as Microsoft's communications technologies can help, but where is the killer server application that can weave together a phone conversation that moves onto IM and then into a conference call with video, and then via email onto an SMS follow-up? Be in no doubt this is a difficult problem, but solutions must be possible.

Maybe the answer is for businesses to set up their own virtual mobile service provider, to ensure that all SMS traffic goes via company-controlled (if not company-owned) core services. So far there seems little will to do this, but be in no doubt – SMS isn't going away, and we ignore it at our business peril.

”

Jon Honeyball is a contributing editor to PC Pro and writes the Advanced Windows column (see p122). He's srsly gr8 at SMS, LOL. Read his blog at www.pcpro.co.uk/blogs/jonhoneyball

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