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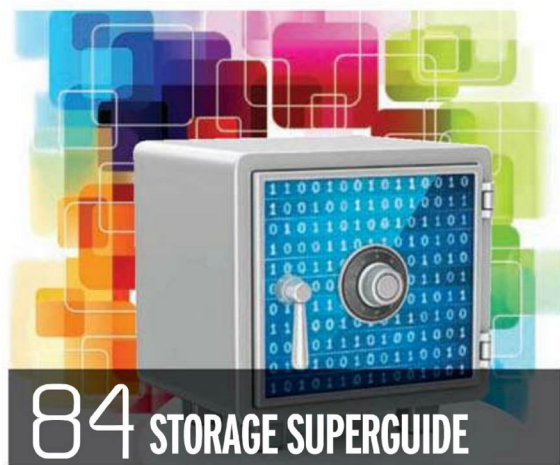
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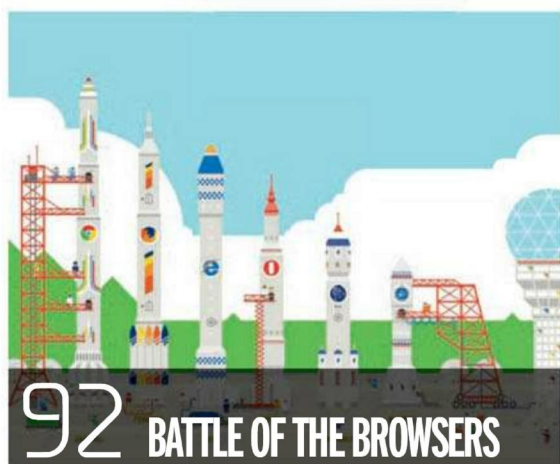
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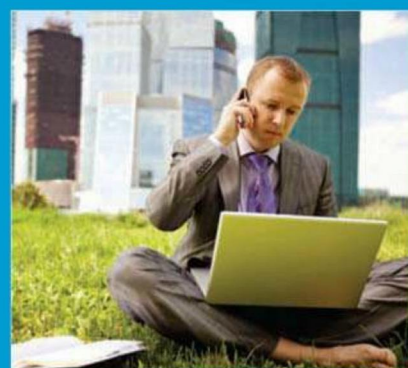
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MATT EGAN

"My name's Matt. And I don't back up"

It's a shocking admission for the editor of the UK's best-read tech mag to make, but one that's true for all too many of us. We show you why - and how - you should safeguard your data

To watch a young child interact with a technology device is to glimpse all our digital futures. To digital natives - those who have never known a world without always-on internet - PCs and laptops are no different from smartphones, tablets and TVs: portals via which to access a world of content and information via the web (find our latest laptop and PC group tests on pages 58 and 76).

Watch even a very young child accessing web TV via a touchscreen smartphone and you'll have to concede that, in the long term, few households will rely upon a single desktop tied to a phone socket in a spare bedroom.

Not to say there aren't many such households today, or indeed there's anything inadequate about such a setup. But tech-savvy households exist somewhere on a sliding scale between single PC that uses wired internet for email and web browsing, and those wirelessly connected homes where myriad devices are used to create and consume everything from music and movies, to emails and spreadsheets.

This means that we are creating and storing vast amounts of data. Photos, documents, music and movies - to be a regular internet user is to rack up gigabytes of important digital files. And because we

take photos, purchase media and write email from a bewildering variety of devices, the resulting files are scattered wherever we roam.

A recent poll of *PC Advisor* readers, which attracted nearly 4,500 votes, asked 'How much storage is in use on your primary PC?' (see tinyurl.com/7j5p9ps). Intriguingly, the most popular answer, with more than a third of the vote, was 'More than 1TB'. And that figure is just the start. If we were to ask how much storage they used in total, I'm not sure many people could honestly answer.

For instance, I can quantify how much of my own home PC's hard drive is used, but I would also have to consider my work desktop, and the smartphones and tablets I regularly tout. Then there's Gmail and my work email, both of which are stored on remote servers. I buy media from both iTunes and Google Play, and share photos via apps and services, online and local...

I couldn't even begin to ascertain how many servers my personal data utilise, never mind how much data I have. Which is just a long-winded way of me admitting that I don't really back up. (And by 'don't really' I mean 'don't'.)

This is, I accept, a shocking admission for the editor of the UK's best-read technology magazine to make. It's not that I don't appreciate the risks, or feel I have nothing to lose, it's just that, well, I have so much data, in so many places, the idea of a neat, scheduled backup feels impossible.

But I am wrong. Backing up is not hard to do and, sooner or later, I will pay for my casual nature. We have a guide to tell you exactly how to back up everything to everywhere, from your own hard disk to cloud storage or a friend's PC. Turn to page 84. Should your backup require local storage, our NAS drive test on page 66 showcases the best network storage. ☒

PC ADVISOR

Editor Matt Egan matt_egan@pcadvisor.co.uk
Reviews Editor Andrew Harrison andrew_harrison@pcadvisor.co.uk
Features Editor Jim Martin jim_martin@pcadvisor.co.uk
Managing Editor Marie Brewis marie_brewis@pcadvisor.co.uk
Art Editor Dominik Tomaszewski dominik_tomaszewski@pcadvisor.co.uk
Staff Writer Chris Martin chris_martin@pcadvisor.co.uk
Online Editor David Court david_court@pcadvisor.co.uk
Forum Editor Peter Thomas moderator@pcadvisor.co.uk
Helproom Editor Paul Monckton helproom@pcadvisor.co.uk
Games Editor Alec Meer games@pcadvisor.co.uk

» PCADVISOR.CO.UK
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Contributors

Mike Bedford, Ben Camm-Jones, Martyn Casserly, Jackie Dove, Rob Enderle, Megan Geuss, Santhie Goundar, Rosemary Hattersley, Cliff Joseph, Robin Morris, Ian Paul, Agam Shah, Simon Williams, Erez Zuckerman

Advertising

Advertisement Manager Tom Drummond tom_drummond@idg.co.uk
Senior Account Manager Russell Kearney russell_earney@idg.co.uk
Account Manager Mike Fletcher michael_fletcher@idg.co.uk

Production

Head of Digital Production Richard Bailey richard_bailey@idg.co.uk

Marketing

Marketing Manager Ash Patel ash_patel@idg.co.uk
Marketing Software Manager Letitia Austin letitia_austin@idg.co.uk
Marketing Executive Laura McEwan laura_mcewan@idg.co.uk
Subscriptions Customer Services pcadvisor@subscription.co.uk

Online

Online Development Manager Adrian Black webmaster@pcadvisor.co.uk
Web Developer Victor Chong junior_developer_adam_dougal@idg.co.uk
Web Developer Dominik Koscielak junior_developer_john_copsey@idg.co.uk

Accounts

Financial Director Chris Norman chris_norman@idg.co.uk
Credit Controller Dawnett Gordon dawnett_gordon@idg.co.uk
Purchase Ledger Clerk Lyn McNicol lyn_mcnicol@idg.co.uk
Management Accountant Parit Shah parit_shah@idg.co.uk

Publishing

Publishing Director Simon Jary sj@idg.co.uk
Managing Director Kit Gould kit_gould@idg.co.uk

Subscribe online:

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Browser wars

The web browser you use is a very personal choice, with plenty of pros and cons for each (see *Battle of the browsers*, page 92). Our Facebook fans would appear to agree with our top picks, favouring Google Chrome and Mozilla Firefox. However, **Ndumiso Dominic Mncwango** found fault with our criticisms of Chrome: "I'm surprised that you list plain design as a con for Chrome, because it's one of the reasons I like it. Some browsers are just too cluttered," he wrote.

Virgin under attack

When we revealed that Virgin Media's website had fallen foul of an Anonymous DDoS attack after it blocked illegal file-sharing site The Pirate Bay, **Israr Ahmad** had little sympathy for the company. "DDoS attacks can be dealt with using minimal network security," he wrote.

It is NOT an iPhone

When Samsung launched its Galaxy S3 smartphone, it was inevitable that people would compare it to the hugely popular Apple iPhone (tinyurl.com/7edtm98). But that doesn't mean they should, wrote *Anonymous*: "I'm sick of seeing people describing the Galaxy S range as a 'contender for beating the iPhone'. First, this implicitly suggests the iPhone is the one that sets the standards, when its own are no longer anything spectacular. Second, the S3's sheer size means it's aimed at a separate market. It will be interesting to see whether Apple will follow suit."

Angry Birds milestone

Rovio's popular mobile game, Angry Birds, has reached one billion downloads, as we reported at tinyurl.com/bu493xd. Seems it isn't popular only with the younger generation either: "I've just bought Angry Birds Rio and Space. This grandma doesn't have a fancy mobile phone, but I can now play on the PC, and it should amuse my grandchildren. I couldn't see the little pigs on the phone app, but on my PC monitor it's as clear as day," wrote *Beryl Russell*.



Proud to be a pirate

The British High Court ruled in May that The Pirate Bay infringes copyright on a massive scale, ordering a number of UK ISPs to block access to the illegal file-sharing site (see tinyurl.com/8xLezub). "I'm a pirate and proud of it," wrote *Chris Beynon*. "Does it stop me going to the cinema or buying an album? No. Does it stop me from wasting my money on a film that should have been relegated to a supermarket bargain bin? Yes. Does it allow me to listen to foreign music that most people will never have heard of? Yes. Until these companies come up with a reasonable price plan for their services, there will always be pirates."

Flagged: Star letter

Forget piracy, let's tackle spam

Broadband ISPs have begun blocking access to The Pirate Bay to curtail the illegal downloading of copyright media. Hang on a minute - I thought the industry died when audio cassettes were released. Nope, must have been those nasty VHS tapes. Nope, still going strong. Recordable TV boxes, iPods, smartphones and CD/DVD/Blu-ray discs have all come in and the industry is still going. It's bloated and becoming more creatively bankrupt by the year.

Why aren't we taking such draconian methods to combat at least some of the 46 billion spam emails that are sent over the

internet everyday, which costs the economy £130bn a year? There are many things more worthy of our time and money. *RM_1138*

Matt Egan, editor, replies: The industry got digital wrong, but it is now possible to legitimately purchase digital media, and usually at less than half the price of a hard copy.

Spam is a curse, but it's more difficult to prevent a botnet pumping out spam than it is to ask ISPs to block a website. That spam should be of a higher priority than the illegal dissemination of content is your opinion, but irrelevant to the case in hand.



Our Star letter writer wins a 128GB Crucial m4 SSD with Data Transfer Kit, worth £126. For your chance to win, tell us your thoughts on the latest tech issues:

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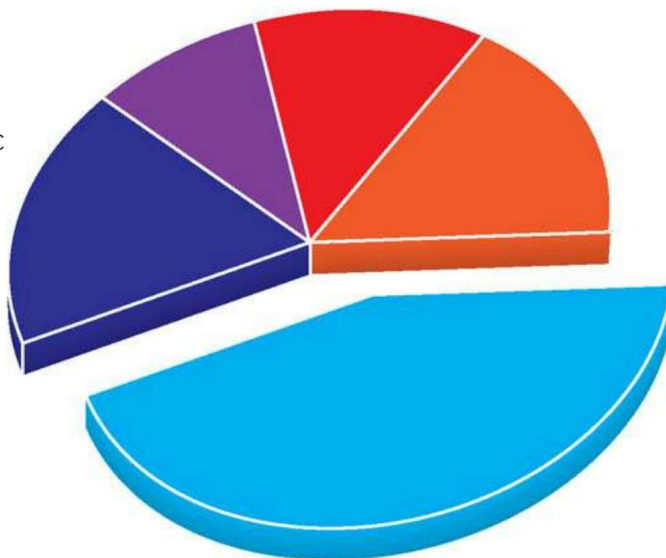


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Will you upgrade to Windows 8?

- **13%**
Yes, when it launches
- **17%**
Yes, when I buy a new PC
- **44%**
No, I'm sticking with what I've got
- **18%**
No, my next OS won't be Windows
- **9%**
Don't know



tinyurl.com/cmLe2yu

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AVG Android antivirus

In the previous issue you advised readers how to install AVG Antivirus on an Android smartphone or tablet in the How to section, then noted that better options were available in your group test. It would help readers if your authors sang from the same hymn sheet. *Edwin Dobinson*

Jim Martin, features editor, replies: While our group test concluded that better antivirus products are available for Android than that provided by AVG, it wasn't one of the worst-performing antimalware apps in our round-up, and certainly offers better protection than you would receive with no antivirus installed at all. The advice given in our How to section applies to all Android users, and the steps in our workshop could be applied to any antivirus app. However, we do see how its mere presence here could be misconstrued as a recommendation that you install this product.

Virgin broadband speed throttled

I was most surprised to read *Virgin throttles broadband speeds by up to half* in the July issue (page 13), having already pointed out

that the online version of your story was incorrect. The 50 percent speed reduction and download/upload limits quoted apply only to subscribers of Virgin's 30Mbps and faster packages, while those with 10- and 20Mbps subscriptions are in fact subject to an up to 75 percent throttle.

Since the download limit for these slower packages is just 1.5GB between 4- and 9pm, customers would be unable to stream a full-length movie from Netflix or LoveFilm without being penalised. It takes a good stable connection of at least 3Mbps to stream HD content without serious lag and buffering issues, so it's worrying that a 10Mbps service could be cut down to just 2.5Mbps. *Maccyroo*

Correction

In last month's group test of Android antimalware apps, we erroneously stated that MYMobileSecurity MYAndroid Protection Antivirus required credit-card details before a three-day trial could be started. In fact, it is possible to register for the limited trial from an Android smartphone without entering any personal payment information. ☒

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Favourite websites

WhiteTruckMan kicked off a debate over forum members' favourite sites at tinyurl.com/d3honh5. There weren't too many surprises on his list, with Google, BBC News, PCA (of course), IMDB, The Mail Online, eBay, Halifax and MoneySavingExpert all making an appearance. He also recommended Dilbert (dilbert.com) for "a little light relief in the rat race of life", and the Ordnance Survey site (ordnancesurvey.co.uk).

Both **fourm member** and **Condom** recommended Al Jazeera for news. "I got into the habit of watching Al Jazeera while overseas, since BBC News 24 never reported on any UK news. Its website is also pretty good," wrote **Condom**.

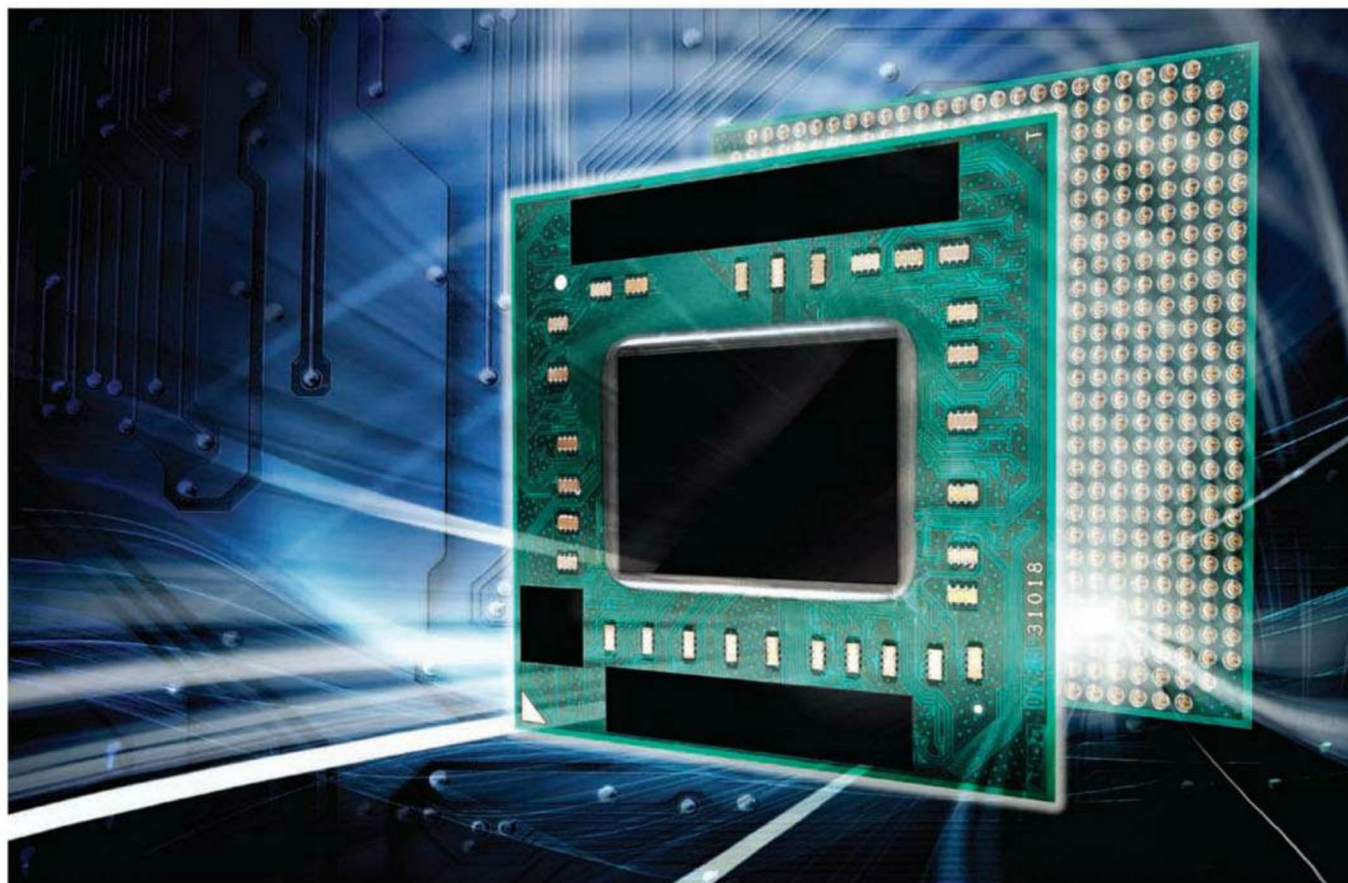
john bunyan added the Met Office (metoffice.gov.uk) for "the best and most detailed weather forecasts", the CIA's The World Factbook (tinyurl.com/2b2kg9) for country-specific information and statistics, plus UpChucky.com for listening to old tracks on a Jukebox.

BT recommended Simon's Cat (simonscat.com) for more light relief.

alan14 alerted us to some less well known gems in the form of Den Of Geek (denofgeek.com) for movie and TV news from a geeky angle, and FantasticFiction.co.uk as "a type of IMDB for books".

Of course, we can't forget Wikipedia, recommended by **Matt Bell**.





AMD LAUNCHES A-SERIES TRINITY APUs

Takes on Intel's 'Ivy Bridge' processor family with 12-hour battery life and performance gains

AMD has released its second-generation Accelerated Processing Units (APUs). The A-Series APUs, codenamed Trinity, are aimed at laptops, PCs and embedded hardware. AMD's latest processors will come in dual- and quad-core variations and rival Intel's third-generation Ivy Bridge Core chips.

Chris Cloran, corporate vice president at AMD, said: "The latest OEM notebooks, ultra-thins, all-in-ones and desktops based on the new AMD A-Series APU enable the best video and gaming experiences, highly responsive performance with AMD Turbo Core, and accelerate an ever-increasing range of productivity and multimedia applications - in sleek, stylish designs at price points that make sense."

AMD says Trinity processors offer double the performance per Watt when compared to their predecessors, an improvement that was built into their design from the ground up. Eyeing up the Ultrabook market, the firm said the power-optimised Piledriver

processor core can offer up to 12 hours of battery life in laptops.

The lowest-power dual-core A-Series chip has a thermal design power (TDP) of 17W; the quad-core version has a TDP of 25W. Laptops with these processors are identifiable by an aluminium-style 'Vision Technology' sticker.

Like Intel with Ivy Bridge, AMD has focused on Trinity's graphics performance. AMD says Radeon HD 7000-series graphics are aimed at gamers, and allow Trinity chips an up to 56 percent improvement over the previous generation.

Trinity is also the first APU to offer EyeFinity technology without the need for a discrete graphics card. There's support for DirectX 11.0 and 1080p gaming, too.

"Our second-generation AMD A-Series APU is a major step forward in every performance and power dimension, allowing users to enjoy a stunning experience without having to give up the things that matter to them most. This experience

doesn't stop at mainstream notebooks. It carries over into affordable ultra-thin form-factors featuring the latest in AMD Radeon graphics," said Cloran.

The firm boasts a growing accelerated application ecosystem, including superior web browsing. AMD said that more than 100 applications and games are now accelerated by its APUs.

Trinity APUs are said to be well positioned to take advantage of the transition to the Windows 8 OS, too.

"We are excited for the introduction of the second-generation AMD A-Series APU and are confident it will continue the great work Microsoft and AMD have done on the A-Series APU," said Aidan Marcuss, Microsoft's senior director of Windows Business Planning.

The second generation of A-Series Trinity APUs are available in a record number of designs from companies such as Acer, Asus, HP, Lenovo, Samsung and Sony, the firm said.

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MICROSOFT DETAILS FOUR WINDOWS 8 EDITIONS

Simplified product range to make buying and upgrading easier

Microsoft has announced that Windows 8 will come in just four different flavours.

The firm's next OS is due to launch later this year, when it will be available in four versions: Windows 8, Windows 8 Professional, Windows RT and Windows 8 Enterprise. The move dramatically simplifies the range of options available compared with previous versions.

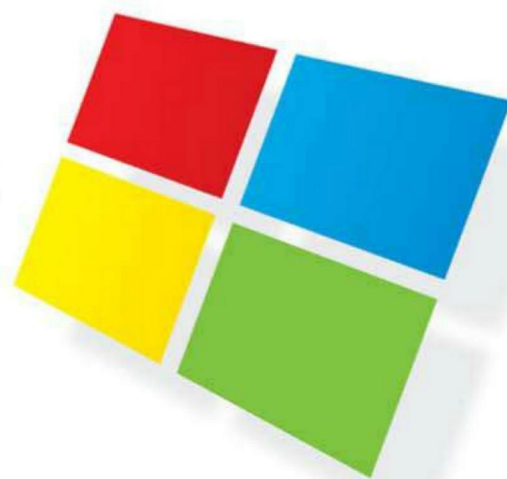
Customers currently using Windows 7 Starter, Home Basic and Home Premium will be able to upgrade to Windows 8 or Windows 8 Professional. However, those using Windows 7 Professional and Ultimate will be able to upgrade only to Windows 8 Professional.

"We have worked to make it easier for customers to know what edition will work

best for them when they purchase a new Windows 8 PC or upgrade their existing PC," said Microsoft.

PCs and tablets running x86 processors can run Windows 8 and Windows 8 Pro. The latter is designed for tech enthusiasts and business/technical professionals, offering encryption, virtualisation, PC management and domain connectivity.

Microsoft has renamed the version it created for ARM CPUs Windows RT, which has led to some consumer confusion. This edition will be preinstalled only on ARM-powered PCs and tablets. It will include touch-optimised desktop versions of Word, Excel, PowerPoint and OneNote. Microsoft Office will not come bundled with Windows 8 or Windows 8 Pro, however.



Windows RT will not include Windows Media Player, nor will it support software written for x86 processors.

Google launches Google Drive online storage service

5GB of storage for your photos, video and documents • Seamless operation with other Google services

Google has officially launched Google Drive, its foray into cloud storage.

Consumers can get 5GB of free storage in which to stash their photos, video and documents. They'll also be able to use the space to collaborate with others, since Drive is the new name for Google Docs.

If 5GB isn't enough space you can buy more, up to a maximum 16TB (25GB costs \$2.49 a month; 100GB costs \$4.99 a month). Paid Google Drive subscribers automatically get a 25GB Gmail upgrade.



Google Drive is accessible via a web browser, as a downloadable desktop program or as a mobile app.

The Google Drive service is designed to work seamlessly with other Google apps. For example, you can attach a photo stored on the drive to a Google+ posting. You'll soon also be able to do the same thing with Gmail.

Google is making the drive an open platform to encourage the creation of third-party apps. This means you'll be able to, for example, send faxes and edit video directly from the drive.

Turn to page 110 for our step-by-step guide to using Google Docs.

Facebook opens its own store for mobile and web apps

Brings together the best mobile and web apps from Google Play, Apple's App Store and more



Facebook has launched an App Center that shows off the best available apps.

The App Center opened in May. It features mobile and web apps, and includes Apple's App Store and Google Play. It's accessible via Facebook's mobile apps and the desktop site.

Facebook said: "For the more than 900 million people that use Facebook, the App Center will become the new central place to find great apps."

As well as a place to discover apps across multiple platforms, the App Center allows developers to promote apps with the app detail page - this is like a profile page for an individual app.

Facebook intends to maintain a premium look and feel about its App Center. It has pledged to give pride of place to well-designed apps, while leaving out those with poor user ratings.

O2 announces 150Mbps 4G

O2 has announced it recorded speeds of up to 150Mbps during its recent 4G trial. That makes it 50 percent faster than the 100Mbps it previously claimed for the trial. However, most people taking part managed speeds between 20Mbps and 50Mbps. The network has been tested on the 2,600MHz spectrum in central London with around 1,000 participants.

MORE: tinyurl.com/7exbbjo



UK broadband speed drops

The UK average broadband speed dropped in the final quarter of 2011, according to a report. The figures detailed in Akamai's *State of the Internet* report showed that the UK's average broadband speed dropped by 3.5 percent to 4.9Mbps. Blighty came in 25th in the global rankings, with Holland topping the European countries.

MORE: tinyurl.com/7jdjpfj

EE launches 4G campaign

Everything Everywhere (EE) has launched an online campaign for the launch of 4G mobile internet in the UK. The firm behind Orange and T-Mobile has opened 4GBritain.com to raise awareness about 4G and gather support for it to be rolled out as soon as possible. EE has also released research stating the benefits will include a £75bn boost to the economy.

MORE: tinyurl.com/d4qjyL2

JOHN LEWIS LAUNCHES BROADBAND SERVICE

Offers straightforward choice of broadband packages, with no hidden fees

John Lewis has branched out into broadband internet provision.

The department store's home broadband is available in three packages and starts from £11 per month. It said the service replaces the Waitrose and Greenbee broadband products and has no hidden fees or activation costs.

Adam Brown, telecoms manager at John Lewis, said: "This move complements the range of services and products we offer - over 80 percent of our consumer electronics sales are Wi-Fi-enabled, and we know our customers want the same honest and trustworthy experience from their internet provision as they



would expect from any product they buy from us."

The Standard package is the cheapest at £11 per month, but customers must also pay £13.50 per month line rental. The Standard package offers a download speed up to 16Mbps with a 20GB monthly cap.

An Unlimited package offers the same 16Mbps connection speed but with no restrictions on how much data you can download. The Unlimited package costs £18 per month, plus line rental.

John Lewis' top-end Fibre service costs £25 per month. It offers speeds up to 38Mbps and a 100GB monthly usage limit.

"John Lewis Broadband gives customers transparent pricing on a range of broadband and phone packages, with no hidden terms and conditions. You get a simple 12-month contract, with no hidden catches, and the excellent customer service that we are renowned for," said Brown.

ZEN INTERNET DOUBLES FIBRE-OPTIC BROADBAND SPEED

Zen Internet has doubled its customers' potential download speeds to 76Mbps.

The news comes shortly after BT doubled the connection speeds associated with its Infinity broadband package to 76Mbps downloads and 19Mbps uploads. However, unlike BT's customers, Zen Internet subscribers will not have to sign a new contract to get the boost.

Andrew Saunders, head of product management and

marketing at Zen Internet, said: "We believe that we have the strongest portfolio of fibre-optic broadband products in the UK."

"Having worked with BT since the initial fibre-optic broadband trials, we have a hands-on experience of the technology that other providers cannot match, and the latest, most up-to-date information on progress and future plans."

In May, subscribers to the independent internet service

provider's Fibre Active, Fibre Pro, Fibre Office and Fibre Office Plus packages were automatically upgraded to the faster line.

The only package to be left out of the upgrade is Zen's entry-level Fibre Lite deal, which will continue to offer 38Mbps downloads and 9.5Mbps uploads.

Zen Internet has no fair-usage or traffic-management policies, and doubled its data caps in March.

80Mbps BT broadband available for 10m in UK



300Mbps fibre-optic connections expected in 2013

BT's 80Mbps fibre-optic broadband service is available to 10 million premises in the UK, with the fibre-to-the-cabinet (FTTC) technology rollout months ahead of schedule, according to the telecoms giant.

BT is also set to make fibre-to-the-premises (FTTP) broadband available in all fibre-enabled areas from spring 2013. Homes and businesses will then benefit from speeds of up to 300Mbps.

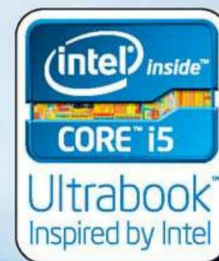
The firm believes that a 90 percent fibre-optic footprint would ensure the UK is a European leader in super-fast broadband. The current average speed in the UK is 7.6Mbps.

BT is investing £2.5bn in bringing fibre-optic broadband to two thirds of the UK by 2014.

The company claims it has recruited hundreds of engineers to help with the fibre rollout. ☐

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Why the office is key for Windows 8 tablets

People are taking their own smartphones and tablets to offices around the world and that, Rob Enderle explains, may be good news for Windows RT

Windows RT (the version of Windows 8 that will run on ARM-powered devices) is targeted at iPad users who are bringing that product into work every day, according to a blog post from the president of Microsoft's Windows division, Steven Sinofsky (see tinyurl.com/6ufn565).

iPads are hugely popular, since they offer excellent email and office support, as well as being great web-browsing and multimedia devices for the living room. Microsoft has mostly been missing out on this trend, and wants to rectify that with Windows RT.

IT departments and Windows

Prior to Windows 98, Microsoft OSes generally came into businesses with their users. IT departments didn't embrace Windows and control its movement until the Windows 2000 launch, when the Millennium

Bug forced IT departments to take control of who was using what, and where.

Microsoft's tight focus on IT departments created a disconnect with consumers with their PCs and, prior to Windows Phone 7, their phone platforms. As a result, Microsoft has seen its OS market share decline, particularly on smartphones and especially as iPads have come along without a credible Windows challenger. If you consider smartphones are handheld PCs and tablets are touchscreen PCs, its market share is estimated to have dropped from above 90 percent at the beginning of the last decade to 40 percent.

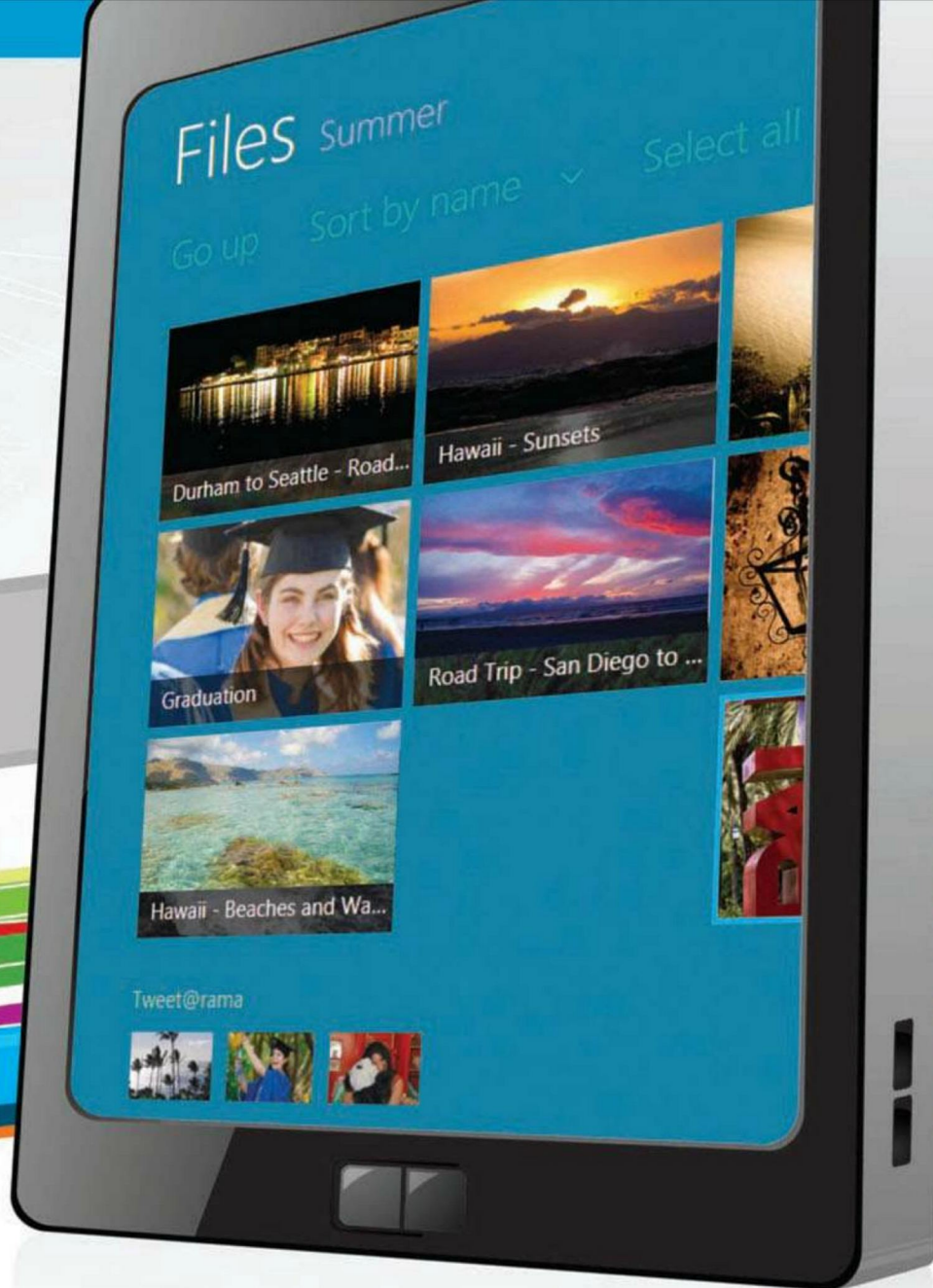
IT departments and Apple

While Microsoft embraced IT professionals and businesses much more closely over the past decade, Apple ignored it. Steve Jobs, on his return to Apple, shifted the company's

focus away from business customers and discontinued many related product lines. This allowed Apple to better target the consumer market. The rest is history - iPod, iPhone and iPad sales have catapulted Apple past Microsoft in both valuation and mindshare.

However Apple's consumer-driven approach has left it vulnerable in critical areas such as security. For instance, Microsoft addressed the recent Flashback malware in three weeks; it took Apple three months. By then, 600,000 machines had been infected, leaving Eugene Kaspersky to suggest that Apple's security is 10 years behind Microsoft's. Because the user is responsible for installing patches and updates on Apple devices, this could be disastrous for business.

Microsoft's focus on security, combined with its 90 percent share of the laptop and



“

Windows RT may be the only Windows 8 version that penetrates offices in significant numbers

”

desktop PC market, makes it a better fit for businesses and the IT professionals that administer them - and Redmond's recent developments may finally help it address its tablet and smartphone shortcomings.

Windows RT: a game-changer?

Unlike other Windows 8 products, Windows RT steps away from the Windows legacy code base and is largely focused on tablets and other mobile devices. Like Apple iOS and Google Android, Windows RT users will add applications largely through app stores. However, Windows RT devices are designed to be centrally managed; IT departments can deploy network access controls to keep tabs on user behaviour.

It helps that Metro, Microsoft's new tile-based interface, is picking up traction on smartphones. Nokia's Lumia 900 has sold

out in a number of stores and reviews have generally been positive, suggesting buyers are growing to like the simpler interface (see page 23). Most of the negative reviews on Windows 8 are tied to the non-ARM version and appear connected to issues either using Metro on PCs without touch functionality or having to switch between two interfaces. Windows RT uses Metro only and thus has most of what people like and none of what they find annoying about Windows 8 when it's delivered in a touch-enabled product.

With its cutting-edge interface, lack of legacy code, tablet-form-factor and lower price, Windows RT devices may be a serious rival to the iPad. Users and IT departments also get the tablet most like a PC, thanks to its management tools, built-in Microsoft Office applications, stronger security and the ability to run cloud sessions.

Initially, Windows RT will offer far fewer apps or accessories than iOS or Android. Users and developers have largely been unable to test Windows RT - but they couldn't test iOS or Android before they came out either, so the Windows RT experience is no different to that of the tablets on the market today.

Aside from keyboards and cases, though, tablets aren't heavily accessorised, and tablets still trail smartphones in sales. As long as Microsoft has some strong core tablet apps, it shouldn't have a problem.

Ultimately, IT departments probably won't officially include Windows RT in their Windows 8 deployments. Businesses are likely to skip the OS, much like they skipped Vista. Nonetheless, Windows RT may be the only Windows 8 version that penetrates offices in significant numbers. ☐

Mozilla cries foul over Windows 8 & Firefox

Mozilla has complained that Internet Explorer will be the only browser on Windows RT allowed to run in the traditional desktop environment. Ian Paul explains what's going on

Microsoft is giving Internet Explorer an unfair advantage in Windows RT (the version of Windows 8 for ARM-based devices) that is the "first step toward a platform lock-in", according to the Mozilla Foundation. The group behind the open-source Firefox browser has complained that Internet Explorer will be the only browser on Windows RT allowed to run in the traditional desktop environment.

That means Internet Explorer will be able to integrate with Windows RT in ways that competing browsers can't, giving it a leg up in terms of speed, stability and security, said Mozilla's general counsel, Harvey Anderson.

Mozilla also suggested that Microsoft may be flirting with antitrust violations by freezing out other browsers from the OS, echoing issues that sparked the software giant's antitrust battle with the US government more than a decade ago.

What is Windows RT?

Windows RT is the version of Windows 8 designed primarily for ARM-based touch tablets, but is also expected to arrive on lightweight laptops. Windows RT will have two user interfaces: a touch-friendly Metro interface and a traditional Windows 7-style desktop. It's similar to Windows 8 for x86 chips, but the two OSes differ in how they handle applications.

How does Windows 8 handle apps?

Windows 8 will have three application types: Metro, classic desktop and Metro-style enabled desktop browsers (MEDB). Mozilla is working on a MEDB version of Firefox that allows users to install the browser once and run it on both the Metro and desktop interfaces. However, Windows 8 will allow only the default MEDB to run in the Metro interface - you can't run Firefox in Metro if Internet Explorer is the default browser.

What about Windows RT?

Windows RT will focus on Metro-style apps optimised for touch devices and cloud services such as SkyDrive. But there will also be a traditional desktop to run programs such as Microsoft Word, Excel, PowerPoint



and OneNote (all four are bundled with Windows RT), Windows Explorer and the desktop version of Internet Explorer. Legacy Windows desktop apps will not run on Windows RT.

Windows RT does not have an equivalent MEDB class of apps, according to Mozilla's director of Firefox Asa Dotzler. MEDB apps on Windows 8 can access powerful application programming interfaces (APIs) that browsers need "to deliver modern capabilities and performance", Dotzler said. Third-party browsers on Windows RT will not be getting the same access to those APIs as Internet Explorer and, "Without that access, no other browser has a prayer of being competitive with Internet Explorer," Dotzler said.

Who cares about Windows 8 for tablets anyway?

It's not clear whether ARM-based Windows devices are going to be an important factor when Windows 8 is released later this year. Previous reports claimed that five or fewer

ARM-based Windows RT devices would be available at launch. And market research firm NPD DisplaySearch predicts that Windows RT tablets will grow slowly during the first five years, from 1.5 percent of all tablets sold worldwide to 7.5 percent by 2017.

So whether Mozilla will miss out by not being on equal footing with Internet Explorer on Windows RT is up for debate. Nevertheless, Microsoft's actions, if accurate, could give the company an unfair advantage if Windows RT becomes a popular option for consumers and device makers. And Microsoft's actions could bring up antitrust problems for the company in the US and Europe, according to Mozilla.

The irony, of course, is that Microsoft's original antitrust problems in the late 1990s and early 2000s were sparked by how the company bundled Internet Explorer with Windows. But until Microsoft has had a chance to explain don't count on history repeating itself just yet. Microsoft has not responded to a request for comment. ☒

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PC makers quiet over Windows 8 upgrades

A wave of Windows 7 PCs just became available, but how easy will it be to upgrade them to Windows 8? Agam Shah investigates

The first wave of PCs with Intel's Ivy Bridge third-generation Core processors is now available running Windows 7, but PC makers are keeping quiet over how easy it is to upgrade the PCs to Microsoft's forthcoming Windows 8 OS.

Windows 8 is expected to be released later this year, although Microsoft hasn't specified an exact date. Analysts have said that Windows 8 may come out around October, and a Consumer Preview of the OS is already available for download.

Dell is currently unable to disclose what Windows 8 upgrades would entail on any of the company's hardware, according to a spokeswoman. The company has signed a non-disclosure agreement with Microsoft. Meanwhile, Samsung didn't respond to our requests for comment, and Acer said it could not comment on the topic at this time.

Microsoft is also declining to comment on Windows 8 upgrade paths, but a spokesman said the company will "have more to share at a later time".

Microsoft plans to release multiple versions of the new operating system, including Windows 8 and Windows 8 Professional for x86 PCs and tablets, and Windows RT for ARM-powered devices.

Microsoft didn't support direct upgrades to Windows 7 from XP, which attracted

criticism since users were required to back up their data and reload programs. Upgrades to Windows 7 were also constrained on Vista, limited to specific versions of the OS.

New systems

PC makers usually launch new laptops when chips are released by Intel or AMD. Recently released Ivy Bridge laptops include Dell's Alienware gaming series and Samsung's Series 7 Gamer. The laptops run Intel's high-end Core i5 and i7 processors, which deliver 15 to 20 percent CPU performance improvement and up to two times better 3D graphics than Intel's Sandy Bridge (second-generation) Core processors.

Hundreds of lower-priced mainstream laptops with Intel's Ivy Bridge processors are expected to start shipping in June. Meanwhile, Intel rival AMD expects cheaper laptops running its Trinity chips to start shipping this quarter. The laptops will run Windows 7 until Windows 8 is released.

Microsoft may come forward with details of a program that would allow customers to buy Windows 7 with upgrades to Windows 8 by June or July, when laptops start shipping for the back-to-school buyers, said Nathan Brookwood, principal analyst at Insight 64.

"Microsoft is sensitive to the issue of stalling the market," Brookwood added.

"I suspect the issues of getting access to an upgrade of Windows 8 at the cost of, say, a CD will go away pretty soon."

The problem at hand

The question of upgrading to Windows 8 is complicated and will be different for those who want touch capability and those who don't, Brookwood said.

Windows 8 has a touch interface, and the mainstream laptops released over the next couple of months may not have touchscreens. Buyers may wait for Windows 8 tablets or Ultrabooks with touchscreens, which could appear around the time of the Windows 8 release.

Initial touch-enabled laptops and tablets could be priced at a premium, Brookwood said. Budget buyers may have to wait even longer for prices to drop to get Windows 8.

Windows 8 will also work on mobile devices with ARM processors. Users could buy ARM-based laptops or tablets, and Windows RT will come with Office 15 software, which could attract buyers. Software running on x86 and Windows RT may be incompatible as the OSes are designed to run on different instruction sets.

"If you're going back to school and don't need to run legacy applications, Windows RT may be interesting," Brookwood said. ☐

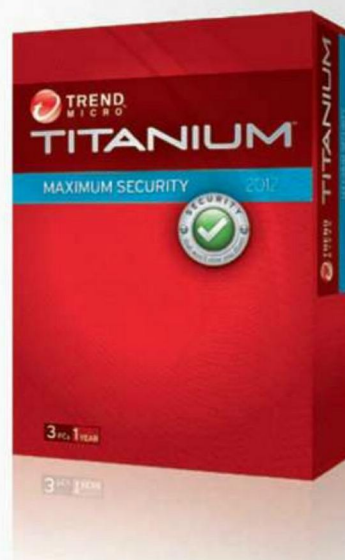
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Windows Phone beats Android & iPhone, yet few buy it

Despite critical acclaim and cheap phones, few people want a Windows Phone, writes Ian Paul

During Microsoft's recent Smoked by Windows Phone challenge, Microsoft-powered devices were almost always faster at completing everyday tasks compared to Android and iPhone handsets. But even the fastest Windows Phone can't change the fact few people are buying Windows smartphones.

Despite critical acclaim and cheap phones, few people want a Windows Phone. Its market share may be slipping faster than that of its predecessor, Windows Mobile.

Microsoft wrapped up the Smoked by Windows Phone promotion by claiming Windows Phone devices beat more than 50,000 challengers in 36 countries. During the challenge, your smartphone would participate in a head-to-head race against a Windows Phone to complete a basic task, such as uploading a photo to Facebook, searching for movie times or checking the weather forecast. Microsoft claimed a 98 percent win rate.

The fix is in

Smoked by Windows Phone was accused of being an unfair challenge, with Microsoft trying to wrangle one defeat by a Samsung Galaxy Nexus into a win, citing a technicality. Tech writer Sahas Katta took his Galaxy Nexus into a Microsoft store and was challenged to look up the weather in two different cities. Katta had two weather widgets on his Android home screen, and had set up his phone to bypass the lock screen

- all he had to do to win was turn on the phone. Microsoft staff complained that he had to show the weather in two states, but later apologised and offered Katta his prize after the tech media picked up the story.

Tech website The Verge also tried the challenge, but claimed Microsoft was selecting tasks that favoured Windows Phone features, such as the social-networking and search baked into the platform.

No escape

Despite Microsoft's best efforts, its new smartphone platform isn't popular with all consumers. In fact, Windows Phone appears to be less popular than Microsoft's ageing Windows Mobile platform, according to Nielsen. The metrics firm said that during the first three months of 2012, Windows Phone had a market share of 1.7 percent in the US, while Windows Mobile had 4.1 percent. The top smartphone OSes in the US are Android (48.5 percent), iOS (32 percent) and BlackBerry (11.6 percent).

NPD Group backed up Nielsen's figures, citing a market share of just 2 percent in the same period, but more recent figures from comScore bumped up the figure to 4 percent by not differentiating between Windows Mobile and Windows Phone devices.

Meanwhile, Microsoft's biggest Windows Phone partner, Nokia, recently reported its smartphone sales declined more than 50 percent during the first quarter of 2012 compared to the previous year. And LG has said it doesn't plan to make new Windows Phones because no-one is buying them. It said the total units of Windows Phone sold in the global market is not a meaningful figure.

Microsoft doesn't appear to be giving up on its smartphone platform just yet, however. The next version of Windows Phone is expected to offer deep integration with Windows 8, Microsoft's forthcoming touchscreen-optimised operating system for PCs and tablets, which could help popularise Windows Phone. Cheaply priced devices such as the Samsung Focus 2 could also help the struggling smartphone platform battle back into relevance.

For the moment, however, no matter how you look at it, consumers are not buying Windows Phone handsets - even with devices such as the Nokia Lumia 900 grabbing headlines. ☒



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The stylish 58.4 cm/23" Full HD flatscreen i2353Fh with its super-slim 9.6 mm profile fascinates business and home users alike. But it is more than just a design-statement: The innovative IPS panel and a high dynamic contrast ratio (50,000,000:1) ensure a realistic colour reproduction and crisp images with finest details. Two HDMI ports offer a multitude of options for connecting high-definition sources. Enjoy this pretty package full of great inner values!



Ultra-slim profile



Discreet touch controls



Inputs in the stand avoid cables hanging from the display



How Intel aims to crack the smartphone market

Agam Shah explains how Intel will release smartphone processors based on new manufacturing processes to improve performance and battery life

Intel recently entered the smartphone market, but the company is not sitting still: it plans to quickly release chips that improve performance and power efficiency.

Intel detailed its upcoming smartphone processors at an investor meeting in Santa Clara, California in early May. Over the next two years the company will release chips based on new manufacturing processes that bring longer battery life and improve performance on smartphones.

Back in 2010 Intel showed an LG smartphone based on an Atom processor, but no smartphones using the chip were released. However, in April Lava International began shipping the first Intel Inside smartphone, the Xolo X900, which ended years of Intel's struggles to enter the smartphone market.

The mobile chip market is dominated by ARM, whose processors ship in around

95 percent of handsets. Intel's CEO Paul Otellini said although Intel is a new entrant in the smartphone space, it could take away market share from ARM.

Chip development

Intel is taking a two-pronged approach with development, with one forthcoming chip focusing on high-performance smartphones and the other on low-end models.

Later this year Intel will release a high-performance Atom Z2580 smartphone chip, which will have a dual-core processor and 4G LTE capabilities. The chip will provide twice the performance of the company's current single-core Atom Z2460, which is found in Xolo's X900 3G smartphone. Both are made using a 32-nanometre process.

Next year Intel will release a low-power Atom processor codenamed Merrifield for



high-end smartphones. The chip will have a new processor design and graphics core, and deliver a more "immersive experience" than today's smartphones, said Mike Bell, general manager of Intel's Mobile and Communications Group. "It's a retooled part from the ground up," Bell said.

The Merrifield processor will be made using a 22-nanometre process, which will bring significant performance and power-efficiency improvements.

For low-end smartphones, Intel will release an integrated chip made using the 22-nanometre process next year. The chip will be a follow-up to the current Atom Z2000 chip, which runs at 1GHz but is not yet being used in smartphones.

By 2014, Intel will release chips made using the 14-nanometre process, although further details are not available.

Otellini said the smartphone chip development over the next two years will go at twice the pace of Moore's Law, which states that the number of transistors in a chip doubles every two years.

"We're increasingly bringing the best of Intel technology to mobile devices -- phones and tablets," Otellini said. ☐



HP Sleekbooks to take on Ultrabooks

Alongside HP's recently announced Envy Ultrabooks came a new aggressively priced thin-and-light brand of laptops known as Envy Sleekbooks. Agam Shah reports

With Ultrabooks exclusively running Intel processors, HP has unveiled a line of AMD-powered ultra-thin laptops known as Sleekbooks. The Sleekbooks, which use the latest AMD processors, come with 14- and 15.6in screens and start at £549. By comparison, HP's Envy Ultrabooks run Intel Ivy Bridge chips, and have screens of the same size as the Sleekbooks, but start at £649.

The Envy Ultrabooks and Sleekbooks are no thicker than 19.8mm, and weigh from 1.8kg. The thin-and-light laptops' batteries last between eight and nine hours.

HP couldn't put AMD chips into its Ultrabooks, since the designs are exclusive to Intel, said Dean McCarron, principal analyst at Mercury Research. So HP built Envy Sleekbooks for AMD chips.

Low-cost premium laptops

Ultrabooks – a new class of thin-and-light laptops backed by Intel – have been praised for their design but criticised for their high prices, which can run to more than £1,000. AMD has said users don't need to pay a premium for ultra-thin laptops, and that it wants to enable similar designs to Ultrabooks at a much lower price.

HP's thin laptops come as Intel and AMD release faster chips that provide longer battery life. Intel has started shipping third-generation Core processors, aka Ivy Bridge, while AMD will soon announce new laptop and desktop chips codenamed Trinity.

The aggressive pricing of Envy Sleekbooks could be AMD's way to lure buyers away from the more expensive Ultrabooks, McCarron said.

"The price is a continuation of what we've seen in the past: AMD tends to price laptops

aggressively," McCarron said. "What all this is underscoring is the evolution of laptops. Guess what, they are getting thinner."

Differences in design

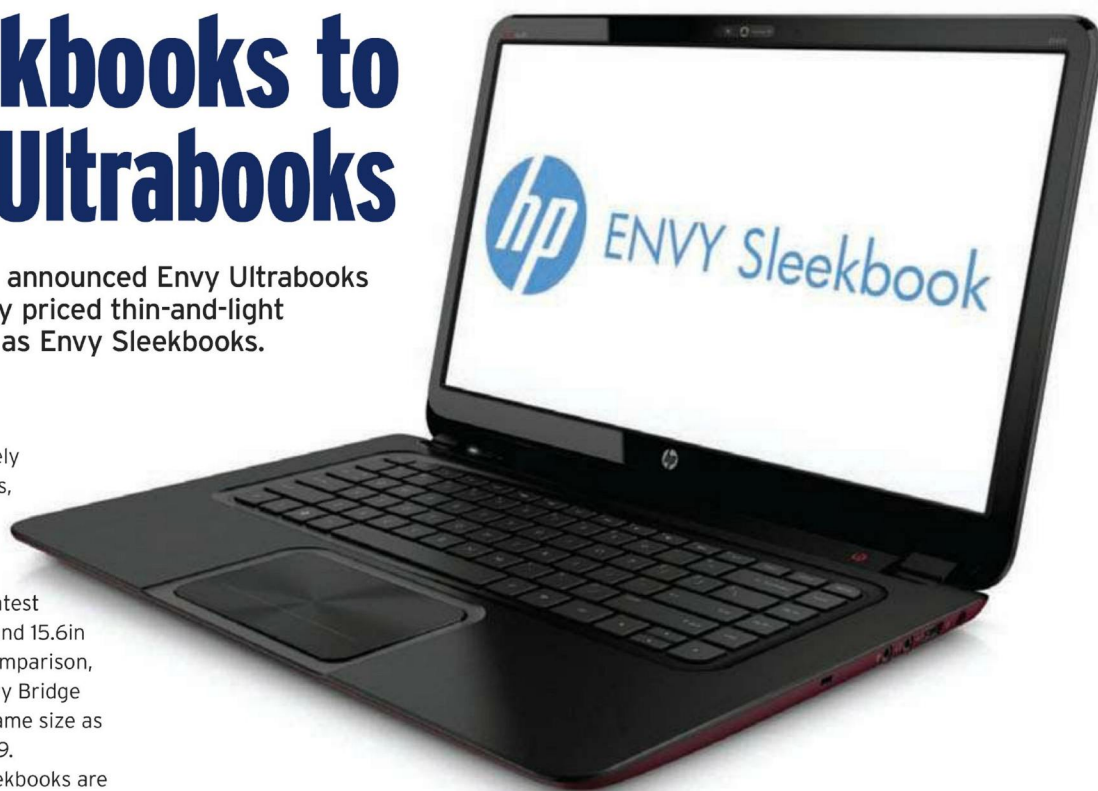
There are size and weight distinctions between HP's Envy Ultrabooks and Sleekbooks. The Ultrabooks feel lighter than the Sleekbook laptops, although both are extremely thin and lightweight.

The Ultrabooks are also slightly thinner, to meet specifications set by Intel, said David Conrad, director of product marketing at HP. Intel states that Ultrabooks can't be more than 21mm thick.

But Sleekbooks are comparable to the Ultrabooks on battery life, and are said to run to between eight and nine hours.

The Ultrabooks also have some additional features over Sleekbooks, Conrad said. The Ultrabooks boot more quickly, have anti-theft features typically baked into Intel's latest Core processors, and can also resume from standby more quickly.

Intel in the past has said Ivy Bridge Ultrabooks will also blend in tablet-like features such as touchscreens, but HP officials declined comment on when such models would be introduced.



Smaller Ultrabooks

HP has also announced additional Ultrabooks for consumers and enterprises with screen sizes between 11.6- and 14in.

HP's new Envy Spectre XT is a 13.3in Ultrabook that's only 14.5mm thick and weighs just 1.4kg. The laptop has 128GB of solid-state storage and a choice of Intel's Ivy Bridge third-generation Core processors. The Spectre is said to offer up to seven hours of battery life.

The Spectre XT is a thinner and lighter cousin of the Spectre 14, which was introduced earlier this year. The Spectre 14 has features including wireless audio and near-field communication (NFC).

There is also a healthy demand for Ultrabooks in enterprise and HP is building up the product portfolio, said Scott McCammon, worldwide product manager at the firm. The company currently offers the Folio 13 Ultrabook (reviewed on page 60).

HP has also announced a top-of-the-line EliteBook Folio 9470M Ultrabook, which has a 14in screen and offers nine hours of battery life. An optional slice battery gives the laptop 20 hours of battery life. It weighs 1.6kg and is 19mm thick. The Ultrabook is priced from \$1,149 and will ship in October. ☐



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PC PRO A LIST

	Line	DECT	3G	WiFi	VoIP
Vigor 2110n	Cable		■	■	
Vigor 2110Vn	Cable		■	■	■
Vigor 2710n	ADSL2+			■	
Vigor 2710Vn	ADSL2+			■	
Vigor 2710VDn	ADSL2+	■		■	■
Vigor 2750Vn	VDSL		■	■	■

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NEWPRODUCTS

Chris Martin rounds up some of the best new releases from tech manufacturers



Samsung Galaxy S III <<

Smartphone

The Galaxy S III is Samsung's flagship smartphone. It features an Exynos 4 Quad 1.4GHz processor, a 4.8in Super AMOLED screen, an 8Mp camera and up to 64GB of storage. The S III has S Voice speech recognition and eye-tracking technology. Head to tinyurl.com/cq4fm7x for our review of the S III.

£499 inc VAT (16GB, SIM-free)

samsung.com/uk

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>> Bowers & Wilkins P3

Headphones

The P3s are more affordable than Bowers & Wilkins' P5s, but have been tuned by the same engineers.

The design features ultra-light acoustic fabric and memory foam for comfort. An optional cable comes with a remote control and microphone for use with devices such as smartphones.

£169 inc VAT

bowers-wilkins.co.uk



Asus Transformer Pad 300 >>

Tablet

The Pad 300 follows the original Asus Transformer tablet. It's a 10.1in Android 4.0 Ice Cream Sandwich model with a detachable keyboard dock. The Transformer is powered by an nVidia Tegra 3 quad-core processor, yet an extra battery in the dock means it can keep going for up to 15 hours.

£399 inc VAT (32GB)

uk.asus.com



<< Nikon D3200

Digital SLR camera

The easy-to-use D3200 features a 24.2Mp DX-format CMOS sensor and a step-by-step photo-taking guide. This digital SLR can record 1080p video, which can then be edited on its 3in LCD. Images can be wirelessly transferred to an Android smartphone or tablet using an optional adaptor.

£649 inc VAT
nikon.co.uk

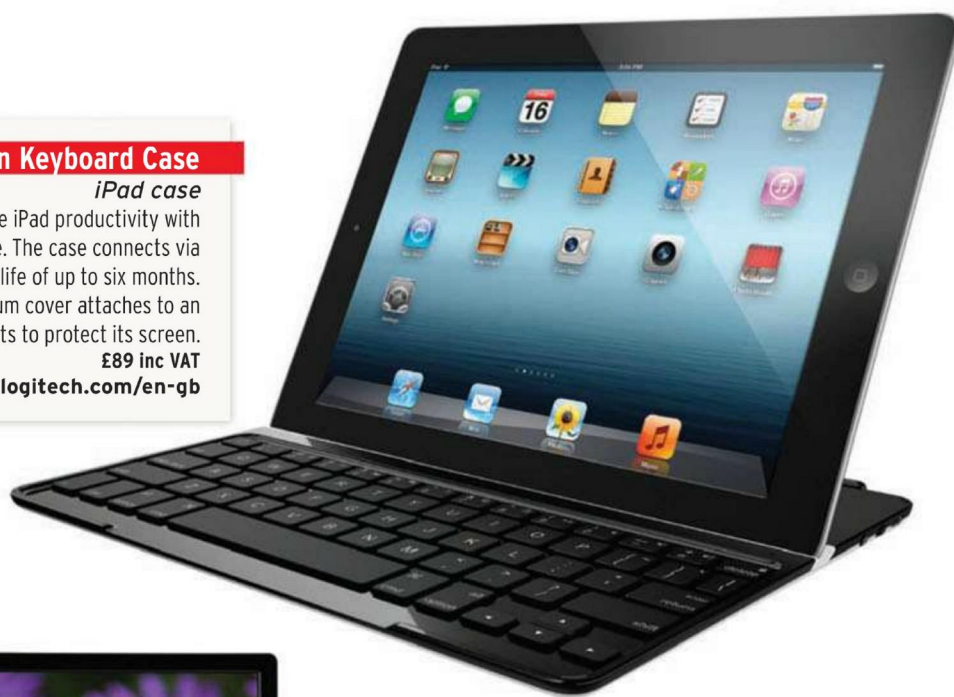
>> Logitech Ultrathin Keyboard Case

iPad case

Logitech aims to improve iPad productivity with the Ultrathin Keyboard Case. The case connects via Bluetooth and has a battery life of up to six months.

The Logitech's aluminium cover attaches to an iPad via magnets to protect its screen.

£89 inc VAT
logitech.com/en-gb



Acer G6 <<

Monitor

Acer's super-slim G6-series monitors are primed for home entertainment, with up to full-HD (1920x1080) resolutions and response times as low as 2ms. They're available in six screen sizes, ranging from 19in to 27in, and use eco-friendly white LED-backlighting technology.

Price TBC
acer.co.uk

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» Sony Vaio T Ultrabook

Ultrabook

The Vaio T is Sony's first laptop designed to adhere to Intel's Ultrabook spec. It comes in two sizes, 11- and 13in, both with an aluminium shell. Sony touts a battery life of up to nine hours for models wielding SSD storage.

Price TBC
sony.co.uk



Motorola Razr Maxx ^

Smartphone

The Razr Maxx is a new version of the Razr Motorola launched last year with enhanced battery life - the company touts 17.6 hours of talk time. The handset is 8.9mm thick with a 1.2GHz dual-core processor and a 4.3in Super AMOLED screen.

£430 inc VAT (SIM-free)
motorola.com

» ViewSonic PLED-W200

Projector

The PLED-W200 weighs in at just 420g and fits easily into the palm, making it extremely portable. This pocket-sized LED projector offers a 1280x800 (WXGA) native resolution. It has multiple video inputs, built-in speakers and an SD Card slot.

£399 inc VAT
viewsoniceurope.com/uk



EchoStar HDT-610R Ultra Slim Box <<

Personal video recorder

With its slender 14mm aluminium chassis, EchoStar says the Ultra Slim Box the world's slimmest PVR. With a 500GB hard drive inside, it's able to pause, rewind and record programmes on Freeview+ HD channels. It has an HDMI output and a twin tuner.

£259 inc VAT
echostar-europe.com ☒

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*Cost comparison: One year BT Retail ISDN30e with 10 channels and 100 DDI quota plus CLIP - £190.80 per month. Spitfire SIP SDSLM 2MB 1:1 with backup ADSL circuit, 10 SIP Voice over IP trunks and 100 DDIs - £94.00 per month. Saving over 50% per month with guaranteed ISDN30e call quality and backup circuit. **Offer available for limited time only, conditions apply.



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Ver-tex (vur-teks): noun, singular.

- 1.) The highest point
- 2.) Anatomy: the crown of the head
- 3.) Astronomy: a point in the sky towards which a star stream appears to move
- 4.) Computer Technology:
 - a. the pinnacle of storage performance: *Vertex offers a superior computing experience.*
 - b. continually sets the bar for SSDs each year
 - c. the culmination of SSD expertise, obsession, and evolution
 - d. does not follow the lead of another to obtain greatness; trailblazer



Four years in the making, the OCZ Vertex 4 Solid State Drive Series redefines the modern day computing experience with enhanced performance and endurance. Ingeniously engineered to deliver industry-leading file transfer rates and superior system responsiveness, the fourth generation Vertex Series was designed to unleash ultimate productivity, gaming, and multimedia applications like no other storage solution.



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No strings attached

As computing tech all around us steadily shrinks in size, our need for more outboard storage expands. You can fit only so much expensive flash storage into a phone, tablet or even a laptop.

Solid-state drives, such as the latest-generation Intel 520 Series (reviewed on page 43), may give incredibly quick file access, but their limited capacity pales next to the huge hard disks that even laptops can now pack. A 1TB internal laptop disk can be found for around £80; an SSD of the same size is a £2,000 option. If you have £500 to spare you might find a 512GB version.

Until we routinely pack 2TB of storage in our smartphone – and even after that point – there'll be a pressing need for outboard personal data storage. That repository of data should be on tap at home, work and all places between.

The easy way to make way for more photos, video and whatnot is to plug a big external hard disk into your existing PC. Until relatively recently, that would have been choked by the wire used to connect the two. Now that we have USB 3.0 and Thunderbolt, the speedblock moves back to the storage media itself. So what do you get when you combine big storage – say, two 4TB hard disks, accelerated by the magic of Raid – with the world's fastest desktop interface? Turn to page 40 to find out with the G-Technology G-Raid with Thunderbolt.

Direct-attached storage such as the G-Raid is ideal for mixing maximum capacity with maximum speed. There are more scenarios that instead benefit from network-attached storage, though. The NAS drive is the way forward for sharing files and documents among colleagues in a business network, or streaming your Blu-ray and DVD collection to the screen of your choice at home.

It's a shame, then, that in the entry-level NAS category such devices can crawl in speed – especially when you come to copy files into them. If you want a NAS drive to approach the responsiveness of internal hard drives, you'll need a decent processor inside, which takes us out of the realm of budget consumer boxes with low-power ARM chips and into that of pricier SMB units.

Thankfully, you no longer need to be a network maven to administer such always-on storage; the best devices will even walk you through the initial setup. And now, some make a reality the



easy access of your data when you're away, opening up the possibility of a genuine personal cloud.

In our NAS drives group test (page 66) we assess four worthy multi-bay units. They may be promoted to business users, and are priced well above consumer toys, but if you're serious about living the digital life you should invest in a solid NAS drive.

Up to and beyond eleven

We review six mid-priced laptops on page 58, although anyone seeking the bleeding edge should wait a short while longer. Intel may have launched desktop Ivy Bridge to great fanfare in April, but the real treats should be the mobile Ivy Bridge chips, due in June.

As well as reducing the oh-so-crucial power consumption (since real all-day battery life is still pending), they'll also usher in enough integrated graphics horsepower to comfortably drive quad-resolution displays. Retina-like screens on PCs will soon be massive.

Yet also sneaking in, almost under the radar at the moment, is the next big thing in wire-free links for laptops. The forthcoming 802.11ac standard promises gigabit speed – cue salt-pinch, on standby – but should mean that a laptop can network almost as quickly as when it's plugged into a gigabit LAN.

For my next laptop, I'm awaiting the perfect storm of faster processor, longer battery life, spectacular non-reflective HiDPI display and genuine gigabit connectivity. With no strings attached. ☒

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Prices

All prices are RRP's quoted by the manufacturer or distributor and include VAT. Prices are intended as a guide and products are not guaranteed at our quoted price. PC Advisor's recommendations are for guidance only. The publisher takes no responsibility for purchasers' decisions.

£652 inc VAT

Contact

■ fit-pc.co.uk

Read more

■ tinyurl.com/cdt9Lcm

Specification

1.6GHz AMD G-T56N dual-core Fusion APU; Windows 7 Professional; 4GB DDR3 1,333MHz RAM; 250GB 2.5in 5,400rpm SATA HDD; AMD Radeon HD 6320 graphics; AMD Inagua motherboard; 2x USB 3.0; 6x USB 2.0; 2x eSATA; HDMI; DisplayPort; gigabit ethernet; 36W external AC adaptor; 160x190x36mm; 1.2kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



DESKTOP PC

CompuLab Fit-PC3 Pro

The Fit-PC3 Pro is not your standard compact computer, looking something like a cross between a broadband router and a steak griddle. Its die-cast solid-metal casing is a giant passive heatsink, with no cooling fans required.

Despite its odd design, we like the Fit-PC3. It's extremely compact, but no featherweight at 1.2kg. There's easy access to internal components through the underside.

CompuLab has managed to squeeze in an impressive number of ports: there are four USB 2.0 on the front alone, plus a tasty selection of ports at the rear.

Turn around the Fit-PC3 and you'll find two more USB 2.0 ports, two USB 3.0, two eSATA, HDMI, gigabit ethernet, full-size DisplayPort, RS232, line-in and line-out, and two antenna connections. The audio jacks even feature Toslink connections.

The Fit-PC3 is powered by a 1.65GHz AMD G-T56N dual-core Fusion APU. Our Pro sample also

came with 4GB of DDR3 RAM. This combination resulted in a rather slow 56-point score in WorldBench.

Nevertheless, the Fit-PC3 felt adequately speedy in everyday tasks, whether we were browsing the web or working in the preinstalled Windows 7 Professional OS. We watched a 1080p YouTube video and recorded the CPU usage at less than 20 percent, pointing to solid hardware acceleration of its video decoding.

For graphics the Fit-PC3 lists an AMD Radeon HD 6320 integrated GPU. In our basic Fear test we recorded a disappointing 23fps average. Crysis failed to run, so we instead turned to Stalker: Call of Pripyat. Here, the Fit-PC3 managed 14fps at 1280x720, Medium detail. Gamers clearly won't be best-served by this machine.

The Fit-PC3 is exceptionally eco-friendly with its low power consumption. The machine idled at



just 8W, peaking at a still-low 26W during our graphics testing. The Fit-PC3 certainly won't make its presence felt on your electricity bill.

We never found the Fit-PC3 to get too hot to the touch, and the machine is silent, in effect, thanks to its fanless design. The only noise you'll hear is a faint whirring from the 2.5in SATA hard disk. Our sample had a Samsung 250GB 2.5in 5,400rpm SATA hard drive.

Verdict

The Fit-PC3 Pro offers a unique and innovative design in a compact and durable casing. It has almost everything you could want in the way of connectivity. It's by no means an over-achiever in performance terms, though, and it comes with a relatively high price tag.

✉ Chris Martin

£799 inc VAT

Contact

■ yoyotech.co.uk

Read more

■ tinyurl.com/6trfbak

Specification

3.4GHz Intel Core i5-3570K (overclocked to 4.4GHz); Windows 7 Home Premium 64bit; Asus P8Z77-V Pro; 8GB DDR3 1,600MHz RAM; 60GB Intel SSD; 500GB SATA HDD; OCZ 550W PSU; Gigabyte Luxo X10 case; Enermax CPU cooler; Asus GTX 560 Ti with 1GB video memory; 6x USB 3.0; 2x USB 2.0; HDMI; DisplayPort; 22x DVD ±RW DL drive

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



DESKTOP PC

YoYoTech Warbird XTi

The Warbird XTi is baked from a similar recipe to the Warbird Dark Iron (tinyurl.com/7aztos8), adding spice in the form of Intel's third-gen Ivy Bridge processor. Taking pride of place is an Intel i5-3570K quad-core chip, overclocked to 4.4GHz.

One of the claimed advantages of Ivy Bridge is reduced power consumption. The Warbird showed a slight improvement over the Sandy Bridge-equipped Dark Iron, and consumed around 2W less when idling - 98W, rather than the 100W gobbled up by the Dark Iron. The Warbird consumed 272W under load in our Crysis test.

Running non-stop for two days, the radiated heat was minimal. This is a feather in the cap for Ivy Bridge, but some credit must also go to the wealth of cooling inside the case: three 120mm fans line the top and side, and the bulky Enermax cooler protects the CPU.

Noise levels are reasonable for a gaming system. We recorded 12dB above ambient during Crysis.

There isn't much room left inside; you can just reach the 8GB of RAM, but upgrading this allocation will be tricky - the single spare slot is obscured by the CPU cooler.

YoYoTech has plumped for Asus' P8Z77-V Pro motherboard, which benefits from a versatile user interface, Wi-Fi Go and control over network traffic.

Four USB 3.0 and two USB 2.0 ports are found at the rear, with two more USB 3.0 up front. The PC also boasts HDMI and DisplayPort connections, while the graphics card features DVI and Mini-HDMI.

Two storage drives include a 60GB Intel 520 Series SSD and a 500GB Seagate Barracuda HDD. These are joined by a Samsung SH-222AB DVD writer.

While the i5-3570K is an efficient chip, it offers little extra in terms of raw speed. We recorded 201 points in WorldBench 6, whereas the Dark Iron managed 199. This may be due to the less aggressive overclocking of its i5-3570K processor.



The Warbird XTi doesn't have the fanciest graphics - its Asus GTX 560 Ti is a mid-range graphics card. In Crysis, the Warbird XTi hit 72fps at 1080p, Low detail, and 42fps at Very High detail. This amounts to a 3- to 5fps increase over the Dark Iron.

Verdict

This system isn't appealing simply because it houses an Ivy Bridge processor, it also has a good mix of components. The case is well cooled, the graphics and drive options are adequate, and the Warbird XTi ticks most of our boxes without extravagant pricing. ✉ Robin Morris

Price TBC

Contact

■ samsung.com/uk

Read more

■ tinyurl.com/cq4fm7x

Specification

1.4GHz Exynos 4
Quad (ARM Cortex-A9)
processor; 4.8in Super
AmoLED (1280x720)
touchscreen; Google
Android 4.0.4 Ice Cream
Sandwich; 2G (GSM/GPRS/
EDGE), 3G (HSPA+ 21Mbps);
LTE 4G option to follow;
8Mp autofocus with flash
and BSI (1080p video);
1.9Mp HD recording
@30fps; 802.11a/b/g/n;
GPS/Glonass satnav; NFC;
Bluetooth 4.0; 16/32/64GB
internal flash storage;
MicroSD slot;
2,100mAh battery;
136.6x70.6x8.6mm; 133g

SMARTPHONE

FIRST LOOK: Samsung Galaxy S III

Samsung's Galaxy S III is the most anticipated Android phone to date, and could give the iPhone a run for its money. The S III launches at the end of May; we grabbed a first look at the UK press launch.

The S III's design is similar to its S II predecessor, but more rounded with smooth curves. A hardware Home button is sited between touch-sensitive Back and Menu keys. The S III is available in a dark blue or white plastic chassis, with a rather flimsy rear cover.

The S III is 8.6mm thin, and weighs just 133g. It's comfortable to hold, with a thin bezel helping to reduce its girth. However, at 71x137mm, this huge smartphone will demand much finger stretching.

Samsung's Exynos 4 Quad processor powers the phone. This 32-nanometre chip uses ARM's Cortex A9 quad-core architecture; Samsung cites performance capabilities exceeding 1.4GHz. Compared to other Android phones, performance felt silky smooth.

For internal storage, Samsung emulates the iPhone 4S' 16-, 32- and 64GB options, in this case expandable through a MicroSD slot. The display is a 4.8in Super Amoled at 720x1280 resolution. It's stunning, but slightly lacking in brightness.

Wireless charging helps differentiate the Samsung from the competition. Connectivity comprises 802.11n Wi-Fi, Bluetooth and MicroUSB, plus near-field communications (NFC) technology.

Google's Android 4.0 Ice Cream Sandwich platform is coupled with an improved take on Samsung's TouchWiz interface overlay. You also get very good S Voice software, which is similar to Apple's Siri.

Direct Call allows you to call the person you're texting simply by lifting the phone to your ear. AllShare Cast promises to let you push whatever's onscreen to a TV.

Smart Stay is designed to track your eye movement, preventing the phone's display from entering standby mode during use.



An 8Mp rear camera is joined by a 1.9Mp forward-facing camera, which can record HD video at 30fps.

The camera app launches quickly. There's a 20-shot burst mode, as well as Best Shot, which takes eight photos and selects the superior version. Samsung says the S III's camera has zero shutter lag, and it can also recognise your friends' faces. **Chris Martin**

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£199 inc VAT

Contact

■ viewsoniceurope.com

Read more

■ tinyurl.com/7u6z6kv

Specification

1GHz Vimicro VC0882
ARM Cortex A8; 9.7in IPS
capacitive touchscreen
(1024x768); Google
Android 2.3.1 Gingerbread;
512MB RAM; 4GB storage;
802.11b/g/n; Bluetooth 2.1;
1.3Mp front camera;
MicroUSB; Mini-HDMI;
MicroSD; headphone
jack; stereo speakers;
microphone; 20Wh
lithium-polymer battery;
242x189x9.7mm; 603g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



TABLET

ViewSonic ViewPad 10e

The ViewPad 10e is ViewSonic's latest crack at the tablet market. The budget device takes many of its specs from the iPad, but is sold at half the price of Apple's latest tablet.

In terms of size and shape the 10e matches the iPad, bar a couple of millimetres. It's slightly lighter than its rival, at 603g.

The design is rather plain, with three touch-sensitive buttons on the front. The plastic rear houses a pair of speakers, while many of the buttons and ports are found along the top edge. We weren't keen on the spring-loaded on/off slider, which was frustrating in use.

Our sample had a cracked case, and the flimsy plastic rear was too easily detached from the chassis. Nevertheless, the build quality is reasonable for a £199 tablet.

ViewSonic has taken another leaf out of Apple's book with a 9.7in in-plane switching capacitive touchscreen with a 1024x768-pixel resolution. That 4:3 aspect ratio is unusual; most Androids use 16:9.

This panel delivers a decent picture, but is slightly lacking in brightness. Importantly, the image quality remained strong from all viewing angles in our tests.

Overall performance doesn't match that of rival tablets, however. The 10e's interface was sometimes smooth, but more often than

not frustrated us with its jerky transitions and slow loading times.

Notably, the ViewPad uses Google's Gingerbread smartphone operating system, rather than the Honeycomb or Ice Cream Sandwich platforms optimised for tablets. ViewSonic has applied an optional ViewScene 3D interface to compensate. A carousel-style arrangement allows for up to 15 home screens. You can also organise apps into folders and select from a handful of ViewSonic widgets.

There's no dedicated app for Google Play, with third-party software instead downloaded from 1Mobile Market – an independent online shop with a limited choice. You can, of course, access Google Play online, but it's one of those features you take for granted in rival Android tablets. Similarly, you'll have to manually install the respective versions of Google Maps, Gmail and YouTube on the ViewPad 10e.

Connectivity is a relatively strong point for the ViewPad. The tablet supports MicroUSB, 802.11b/g/n Wi-Fi and Bluetooth 2.1. A Mini-HDMI port also lets you hook it up to a TV or monitor.

There's just 4GB of storage, although a MicroSD slot allows you to supplement this allocation with a further 32GB.



The ViewPad is also lacking on the photography front, with no rear-facing camera for snaps. A 1.3Mp front-facing cam is useful for video chat, but is awkwardly placed at the tablet's top-right side.

ViewSonic claims a 5-hour runtime for video playback. We found that the battery quickly drained when the tablet was used for gaming or web browsing. After 8 hours of light use only around 50 percent capacity remained.

Verdict

ViewSonic hypes the ViewPad 10e as a high-performance entertainment tablet, but this isn't a view we share. The plasticky build is a given at this price, and the 10e compensates with a good screen and useful connectivity. Ultimately, though, it falls down on performance. Chris Martin

27in MONITOR

Acer V273HL

In its imposing rectilinear chassis, with a large 27in display, multiple inputs and built-in speakers, the Acer V273HL is a general-purpose display with an emphasis on functionality rather than style.

As the largest of Acer's V-series of desktop monitors, this 27in model is well-suited to those who want a large, no-nonsense display that's easy to read and comfortable to use.

The V273HL comes in a rather hefty-looking yet functional case. Its design is aimed at business users, although gamers will also appreciate its fast 5ms response time and widescreen visuals.

The monitor is supported by a very basic snap-on stand, which

tilts forwards and backwards by 5 degrees. It isn't height-adjustable.

The TN panel performs well, but it suffers from the usual problems associated with the technology. In particular, it has reduced viewing angles, making it less suitable for tasks such as photo or video editing.

You'll be able to watch full-HD video via the VGA, DVI and HDMI ports, and listen in via the built-in stereo speakers. However, the digital ports and speakers are optional, so check the spec before you buy.

A row of mechanical control buttons sits at the bottom right of the screen. It's difficult to read their legends, but they are simple enough to navigate by touch. The onscreen

menu is very simple, presenting only the options applicable to the current screen mode (Eco, Standard, Graphics, Movie or User).

The Acer V273HL is a bright display, which achieves good contrast levels without resorting to its dynamic contrast feature. Rated at 300cd/m², we measured a slightly higher 314.8cd/m². The checkerboard test recorded a contrast ratio of 850:1.

The Acer covered 98 percent of sRGB and 76 percent of Adobe RGB, with an average deltaE error of 0.94.

We're not keen on hyped dynamic contrast specifications, so the V273HL's claimed dynamic contrast ratio (DCR) of 100,000,000:1 caused

£220 inc VAT

Contact

■ acer.co.uk

Read more

■ tinyurl.com/7j3no55

Specification

27in; 1920x1080; 16:9; TN
panel; tilt-adjusting stand;
white LED backlight;
250cd/m²; 5ms response
time; VGA; DVI; HDMI;
644x445x195mm; 6.88kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



£129 inc VAT**Contact**■ viewsoniceurope.com**Read more**■ tinyurl.com/86jf4w2**Specification**

23in monitor; 1920x1080 resolution; 16:9 aspect ratio; 0.265mm pixel pitch; IPS panel technology; tilt-adjusting stand; white LED backlight; anti-glare coating; 250cd/m² rated brightness; 1,000:1 rated contrast; 20,000,000:1 (dynamic); 178/178-degree (H/V) viewing angles; 14ms response time (typical); VGA; DVI-D; Vesa 100 mount; 3-year warranty; 548x426x201mm; 3.63kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**23.6in MONITOR****ViewSonic VX2336s-LED****PC ADVISOR
RECOMMENDED**

The scramble to produce affordable high-quality 23in in-plane switching (IPS) monitors continues apace. This latest model from ViewSonic is one of the most affordable yet, bringing wide viewing angles and top-quality graphics to the masses.

If you're more interested in editing photos and video than playing games or typing, you should seriously consider a display such as ViewSonic's VX2336s-LED - especially at a price as low as £129.

Housed in an inexpensive-looking yet moderately stylish enclosure, the 23.6in IPS panel at the heart of the VX2336s-LED delivers superb colour. This colour quality doesn't shift or dim as your eyes scan the surface of the screen, nor when you move your head. This makes for a more accurate rendition of images and can reduce eye strain.

ViewSonic has pared down the features to the basics. It's all about delivering the best image quality, and to get it at this price you'll be going without speakers, HDMI ports and USB hubs. You do get VGA and DVI-D inputs, however.

A simple tilting stand is fitted, which can be removed if you want to make use of the Vesa 100 mount.

ViewSonic has updated its onscreen menus for the first time in years, which makes the monitor more straightforward to configure.

Our calibration results revealed accurate colours. While the results weren't the best we've seen from a budget IPS display, the ViewSonic stands head and shoulders above any twisted nematic (TN)-based panel, which counts as a success in our book.

Rated at 250cd/m², the white LED backlight in this monitor isn't as bright as the most powerful we've seen. Not much more is needed for a non-multimedia display, of course, provided that you'll be working reasonably close to the monitor.

We found some minor, but measurable, colour and brightness uniformity issues, with the top of the screen appearing slightly dimmer than the bottom. This isn't something you'll notice through casual observation, though.

The colour accuracy was otherwise very good indeed. A matching test of 48 coloured swatches produced an error level well below the threshold of human vision - it's pretty much spot-on.

The ViewSonic's contrast ratio was measured at 710:1 in the black/white checkerboard test. It could reproduce 97 percent of the sRGB and 75 percent of the Adobe RGB gamut. The average colour error was 0.55 deltaE.



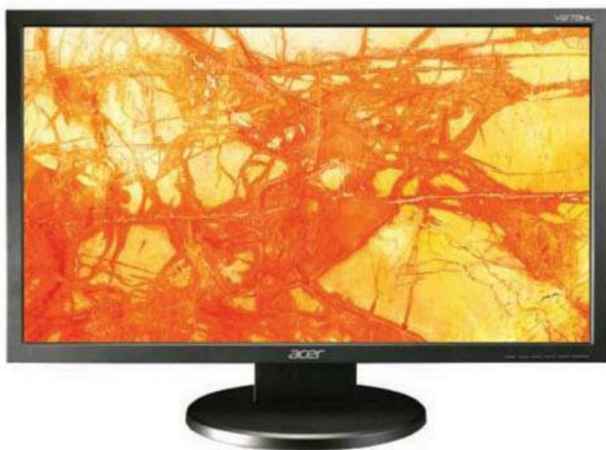
The ViewSonic's power consumption at maximum brightness (233cd/m²) was 31W, which fell to 17W at 120cd/m².

Overall, the performance of this monitor leaves TN displays standing. It isn't up to the standard of some competing IPS panels we've tested but, for the price, it's really rather amazing.

The rated response time of 14ms is on the slow side for hardcore gamers, but the vast majority of users won't even notice.

Verdict

The ViewSonic VX2336s-LED offers outstanding value for money and will be snapped up by anyone who wants decent image quality on a budget. It's not a multimedia monitor and comes without speakers and an HDMI port, but if you want to edit photos or video it's a very fine choice. **Paul Monckton**



some eyebrow raising. The simple fact that it's switched off by default is proof enough that it's nothing to get excited about.

We enabled DCR to watch some movie clips. It did make a small amount of a difference, but most of the time it's rather subtle and not worth bothering with.

Viewing angles are often an issue with TN panels, and the Acer is no different. While there's certainly a sweet spot where the best viewing experience is achieved, this display performs reasonably well from most horizontal viewing angles. Vertical angles remain an issue, though, and if your work often causes you to move your head to peer more closely at a section of the screen, you'll probably notice shifts in brightness. The V273HL isn't suited to critical design work.

However, the overall colour accuracy is good and it's uniformly reproduced across the surface of the screen. Text is also clear and sharp.

Considering that it has a large 27in panel, the Acer's power consumption was low. We measured 24W at maximum brightness and just 14W at 120cd/m².

Verdict

The Acer V273HL is a bulky but sturdy monitor. Its panel performs well, given the limitations of TN technology. It comes with a trio of handy inputs and built-in speakers, making it a good display for all uses except critical photographic and video work. **Paul Monckton**

£720 inc VAT

Contact

■ g-technology.com

Read more

■ tinyurl.com/cxef6mh

Specification

8TB external storage;
2x 4TB Hitachi Deskstar
7K4000; 2x Thunderbolt;
external 12V DC power
adaptor; 235x130x85mm;
2.43kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

HARD DRIVE

G-Technology G-Raid with Thunderbolt 8TB

PC ADVISOR
GOLD



G-Technology majors on building external storage products in premium enclosures. The G-Raid is one such product. It's a smart aluminium unit, closely modelled on the now-classic Power Mac and Mac Pro design, replete with a wraparound aluminium sheet cover and perforated ends and sides.

Now the G-Raid is available with the world's fastest interface for desktop computing: Thunderbolt.

As the name betrays, the G-Raid contains more than one disk - two, in fact - that can be configured in a Raid format to increase either speed or reliability.

The best performance is available in a Raid 0 configuration, where data is striped between the two disks. This provides storage capacity that is the sum of the two disks inside, but it's at the expense of any data security. If one of the two disks should fail, you'll lose all your data.

An alternative is Raid 1, which mirrors data between disks. This provides the best security against data loss, although the total storage is equal to that of one disk.

We reviewed the 8TB version, which includes two 4TB Hitachi 3.5in disks. You can also find the G-Raid in 4TB and 6TB flavours.

Unlike some professional storage products, including G-Technology's own earlier eSATA/FireWire 800 version of the G-Raid, the G-Raid with Thunderbolt includes no built-in hardware Raid controller. The volume configuration is instead achieved through OS X's Disk Utility.

Build and features

The G-Raid's build quality is superb, and a fitting tribute to Apple's industrial design. From the front, a white LED glows to indicate power. At the back is a DC socket, a stainless-steel power button, a Kensington lock slot and two Thunderbolt ports. The G-Raid can sit in a chain of up to six Thunderbolt devices. Missing from the drive are USB and FireWire.

Unlike the single-disk versions of G-Technology's drives, this double-stacked unit also adds a small cooling fan to keep the disks from overheating. In our tests this ran relatively quietly, and didn't intrude much above the sound of

the disks themselves. And despite their high-specification 7,200rpm spindle-speed rating, even the Hitachi Deskstar 4TB drives inside were not conspicuously noisy.

Performance

As a high-performance piece of machinery, we tested the G-Raid in its default Raid 0 state. It delivered more than we've come to expect from two-drive HDD solutions.

As the host Mac may have some influence on the performance of software Raid setups, we used highly specified computers for testing: a MacBook Pro 15in (Early 2011) with a quad-core 2.2GHz Intel Core i7, and a Mac mini (Mid-2011) with a dual-core 2.7GHz Intel Core i7 processor and an Intel 520 Series SSD.

Our original tests were made with the QuickBench tool for OS X, which reported uncannily fast performance. With speeds exceeding 500MBps, it became obvious that due to the software Raid configuration we were seeing the speed of the disks' buffer cache, which couldn't be disabled in a simple synthetic benchmark setup.

We turned to real-world data-transfer tests instead, and here the G-Raid continued to turn in remarkably good results.

A test folder comprised a 23.3GB rip of a Blu-ray film. This was transferred from the Mac mini to the G-Raid in 71 secs, suggesting an average write speed of 329MBps.

Copying the directory back to the Mac to test the drive's read speed took 76 secs, which is equivalent to around 307MBps.

To duplicate the same file on the G-Raid, as a test of its simultaneous read/write speeds, took 150 secs, producing an average overall speed of 156MBps.

A pair of disks in Raid 0 configuration typically give around a 50 percent speed boost over a single drive. With speeds exceeding 300MBps, it's possible we were still seeing the work of the disk memory cache. However, these were real transfer tests, which suggest that these are real benefits that can be found from this drive.

Mirror, mirror

Returning to QuickBench, we measured performance of the G-Raid when configured in Raid 1. This should reveal the performance of a single drive, without the accelerated benefit of striping between two disks.

Here, our lab tests suggested strong read and write speeds of up to 177MBps.

In our data-transfer test, the Blu-ray folder was read in 140 secs and could be written to the drive in 142 secs, giving real-world transfer speeds of around 167MBps.

Verdict

Relatively quiet in use, the G-Technology G-Raid with Thunderbolt is a powerhouse in both capacity and performance. With that huge 8TB of storage on offer, accessible at speeds consistently exceeding 200MBps, the G-Raid offers the capacity to satisfy just about any media professional. Andrew Harrison

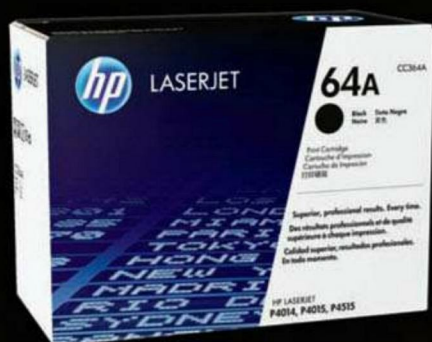


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£280 inc VAT

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■ uk.asus.com

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Specification

AMD Radeon HD 7870;
2GB GDDR5 RAM;
1,010MHz core clock;
1,210MHz memory clock
(4,840MHz DDR effective);
400MHz Ramdac;
256bit memory interface;
1,280 stream processors;
80 texture units; 32 ROP
units; 20 Compute Units;
PCI Express; 2x 6-pin
power connectors;
DirectX 11.1; DVI; HDMI;
2x Mini-DisplayPort;
2-year warranty

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



GRAPHICS CARD

Asus Radeon HD 7870 DirectCu II

The AMD Radeon HD 7870 sits in between the 7900 and 7700 series. For those who want something with more grunt than the mainstream 7700, but can't stretch to the 7900, the 7870 should be ideal.

The 7870 is in effect a cut-down 7970. It features 2GB of GDDR5 RAM rather than the 7970's 3GB. The 7870's standard 1,200MHz memory clock has been raised to 1,210MHz in this Asus edition. With the quadrupling effect of GDDR5 memory, the effective figure is 4,840MHz and some way down on the 7970's 5,500MHz. The memory interface has dropped to 256bit, and the memory bandwidth of 154.9GBps is adrift of the 7970's 264GBps.

The core clock is higher, though, and the Asus' 1,010MHz is an improvement on the 925MHz speed of the 7970. That means the 7870's pixel fill-rate of 32.3GPps is higher than the 7970's 29.6GPps.

Overall speed will be reduced. While the number of ROPs are unchanged from the 7970, there are

fewer texture units (80 vs 128), and the texture fill rate of 80.8GTps is significantly down on the 7970's 118.4GTps. Stream processors have been cut from 2,048 to 1,280.

The 7870 is reasonably light on power. While the 7970 consumes in excess of 225W, the 7870 requires 175W – just 5W ahead of the GTX 670 reviewed below.

In our real-world benchmarks, the 7870 was put in its place by the GTX 670, despite that card costing only £50 more. While the GTX 670 is very competitive against the 7970, the 7870 lags behind.

In BattleForge, while the GTX 670 and 7970 fought it out with figures of 79- and 80fps at 1680x1050, the 7870 managed only 71.3fps.

At the game's higher resolutions of 1920x1200 and 2560x1600, the 7870's figures fell to 59.4- and



41.2fps, while nVidia's GTX 670 recorded a faster 66.8- and 45.9fps.

In Crysis, the 7870 delivered 42.6-, 33.7- and 22.6fps across the three resolutions respectively, failing to stack up against the GTX 670's 47.9-, 39.4- and 25.8fps.

In Stalker, its results of 79.2-, 71.3- and 49.5fps were again far behind those of the GTX 670.

Verdict

The Asus 7870 finds itself up against the brand-new nVidia GTX 670, and on that score it's a loser. The latter card may be more expensive, but for an extra £50 you get far better performance and an improvement in power consumption. The 7870 is resigned to being second-best in its category. **Robin Morris**

£330 inc VAT

Contact

■ nvidia.com

Read more

■ tinyurl.com/crdw78j

Specification

nVidia GeForce GTX 670;
2GB GDDR5 RAM; 915MHz
core clock; 1,502MHz
memory clock (6,008MHz
DDR effective); 400MHz
Ramdac; 256bit memory
interface; 1,344 stream
processors; 112 texture
units; 32 ROP units; PCI
Express; 2x 6-pin power
connectors; DirectX 11;
2x DVI; HDMI; DisplayPort

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



GRAPHICS CARD

nVidia GeForce GTX 670

PC ADVISOR
RECOMMENDED

nVidia's 690 is armed for speed, but its £900 price will prove prohibitive for most users. This 670 comes in at a more affordable price of £330, and still provides fantastic performance.

The 670 is based around the same GK104 technology that fuels the GTX 680. It offers rather less in silicon spec, although the differences are surprisingly small.

The memory clock is identical, with both 670 and 680 content with 1,502MHz, boosted to 6,008MHz through the quadrupling effect of GDDR5. The two come with 2GB of RAM, and a 4GB version of the 670 is expected to follow.

The reduced 256bit memory interface was a disappointment in the GTX 680, but it's less conspicuous on the cheaper 670.

The 670 boasts the same 192.5GBps bandwidth as its bigger brother. This is well clear of the HD 7870's 154.9GBps (above).

The core clock is a less impressive 915MHz. While this is adrift of the GTX 680's 1,006MHz,

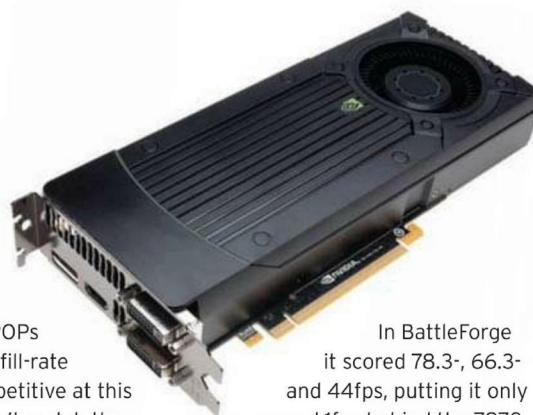
overclocked versions of this card offer up to 967MHz.

Texture units have been cut from 128 in the 680 to 112, although 32 ROPs remain. The texture fill-rate of 102.5GTps is competitive at this price, although it can't match the 118.4GTps of the HD 7970. Stream processors have seen a cut too, from 1,536 to 1,344.

We recorded 170W power consumption, which is impressive for such a powerful graphics card. This compares well to the 7870's 175W.

The GTX 670 is relatively quiet, and noise may be reduced further with custom cooling solutions.

Priced halfway between the 7870 and the 7970, the GTX 670 leans more toward the 7970 and even beat it in one of our tests. In Stalker: Call of Pripyat, its 90.1-, 79.2- and 57.1fps at 1680x1050, 1920x1200 and 2560x1600 were 0.5fps faster.



In BattleForge it scored 78.3-, 66.3- and 44fps, putting it only around 1fps behind the 7970.

In Crysis, though, the two cards were neck and neck. The 670's figures of 47.9-, 39.4- and 25.8fps were never more than 0.3fps behind.

For all practical purposes these cards are equal in terms of speed.

Verdict

Almost identical in performance to the AMD Radeon HD 7970, despite costing £30 less, the standard nVidia GTX 670 offers fantastic value. It's also lighter on power – by around 55W – and quieter. It's not cheap, but it's clearly the card to buy for excellent framerates if your budget is below £400. **Robin Morris**

£260 inc VAT**Contact**

■ intel.co.uk
 Read more
 ■ tinyurl.com/d3e6kxu

Specification

240GB SSD; SATA 6Gbps;
 2.5in; available in
 60/120/180/240GB;
 SandForce SF-2281
 controller; 25nm MLC
 Nand flash; <1 sector/10
 16 bits UBER; 1.2 million
 hours MTBF; 5-year
 warranty; 100x70x7mm;
 84g

Build: ★★★★★
 Features: ★★★★★
 Performance: ★★★★★
 Value: ★★★★★

**SSD****Intel 520 Series 240GB**
PC ADVISOR
RECOMMENDED

The Intel 520 Series sits near the top of the company's range of SSDs, promising sequential read/write performance of 550- and 520MBps, and up to 80k write IOPS. This is a latest-gen SATA 6Gbps drive for the enthusiast and power user.

For the 520 Series, Intel is licensing controller technology from SandForce, one of the leaders in this key component of every SSD. But the SandForce SF-2281 controller's firmware is Intel's own, which is likely to result in better reliability. Intel is also using some of the latest 25-nanometre MLC Nand flash chips.

Rather than adopting a 9.5mm form, the 520 Series is available in 7mm height - recommending itself to ultraportables that require the thinnest storage. Our sample had a removable plastic spacer to bring it up to 9.5mm.

The SSD chassis is made from thin pressed aluminium, which isn't as luxurious as many premium models, but makes for a very lightweight drive at just 84g.

In the flattering Atto benchmark, the Intel 520 could reach 525MBps for sequential writes and 558MBps reads. These results are identical to another SandForce SF-2281 SSD we tested, the Kingston HyperX 240GB (reviewed at tinyurl.com/3n7284w).

Similar results were spotted in CrystalDiskMark 3.0, too. Here the Intel measured 475- for reads and 305MBps for writes, against the Kingston's 492- and 308MBps.

Those subdued write performances are well below the advertised figure of more than 500MBps; this is because the SandForce controller achieves its blazing write speeds with compressible data only.

At the small file level, the Intel 520 Series showed 4kB read/writes at 36/99MBps. When we increased the queue depth to 32, the 520 Series recorded 229/265MBps.

In the AS SSD benchmark we measured read IOPS up to 62k and write IOPS to 59k. This is close



to the results from the Kingston, which instead favoured writes over reads, measuring 53k read and 60k write.

These are all excellent figures, if short of the fastest SATA 6Gbps SSD we've seen - the Corsair Performance Pro (reviewed at tinyurl.com/braynsc) hit 69- and 62k read and write IOPS respectively.

Verdict

The Intel 520 Series is a leading SSD for enthusiasts. Its SandForce controller runs conspicuously slower than competing chips in sequential write speeds, but maintains excellent IOPS performance. Intel's tweaked firmware bodes well for stability and long-term reliability.

✉ **Andrew Harrison**

Philips Blade 2
239C4QHSB
**NEW**

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- SmartContrast 20,000,000:1 for incredible rich black details
- VGA and 2 x HDMI input connectivity
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- VGA and 2 x HDMI input connectivity

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**NEW**

Price
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Features:

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- VGA, DVI-D and HDMI connectivity
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■ elgato.com

Read more

■ tinyurl.com/7tt2nbh

Specification

Freeview TV tuner for iPad; DVB-T receiver; 3.5-hour battery life; 50x90x13mm; 70g



iPAD TV TUNER

Elgato Tivizen

For those times when you don't want to miss live sporting events but can't get to a TV, the Tivizen lets you catch the action on your iPhone or iPad - no web connection required.

The Tivizen is small enough to carry in your pocket, lasts around 3.5 hours between charges, and has a tiny built-in aerial that picks up Freeview in strong-signal areas.

The box connects to your iOS device (the fourth-generation iPod touch is supported as well as the iPhone and iPad) via Wi-Fi, and it's simply a case of downloading the free Tivizen app, connecting to the device's Wi-Fi network, launching the app and then watching TV.

Initial setup is straightforward, with a wizard guiding you through the search for channels. The interface is well designed, with four options on the main screen: Live TV, Recordings, TV guide and Settings.

The live TV interface allows you to swipe left or right to switch to the next or previous channel, or you can tap the channel name at the top to

display a scrollable list of channels for fast switching. A status bar tells you what's on now and next, the battery level and Wi-Fi strength.

Playback controls are displayed above this - a slider allows you to rewind through the timeshift buffer, even if you've switched channels. Unlike Hauppauge's lookalike myTV 2GO, the Tivizen automatically buffers live TV so you can always rewind. With the myTV 2GO, you have to tap the pause button before beginning timeshifting.

You can set the size of the buffer in the settings - the default is 100MB, but you can increase it to 2GB. The options also allow you to set a password for the device's Wi-Fi connection but, more usefully, you can enable Home Network mode which forces the Tivizen to connect to your wireless router when you're at home. This means you don't have to sacrifice internet access when you're watching TV.

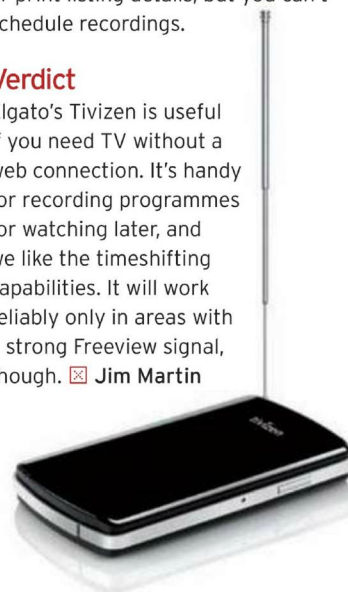
The Tivizen allows background recording so you can use other apps

on your device while recording. You must leave audio playing, though.

Elgato's TV guide is good and resembles TVGuide.co.uk's app. On the iPad it shows 11 channels at once, with 3 hours in the timeline. Buttons let you skip days, and jump to the current time. You can email, tweet or print listing details, but you can't schedule recordings.

Verdict

Elgato's Tivizen is useful if you need TV without a web connection. It's handy for recording programmes for watching later, and we like the timeshifting capabilities. It will work reliably only in areas with a strong Freeview signal, though.  **Jim Martin**



£109 inc VAT

Contact

■ amazon.co.uk

Read more

■ tinyurl.com/cozdfso

Specification

6in E Ink screen; 600x800; 16-colour greyscale; touchscreen input; web browser; Wi-Fi; 4GB internal storage; headphone port; mono speaker; text-to-speech; audiobook support; MP3 playback; landscape/portrait screen mode; 172x120x10.1mm; 213g



E-BOOK READER

Amazon Kindle Touch

The Kindle is synonymous with e-book readers. Its latest Touch offering is closer than ever to toppling the Sony Reader from the top of our e-book reader list.

The new touchscreen is well implemented and responsive, with onscreen information quickly redrawn. It supports pinch-to-zoom and has a handy portrait/landscape toggle option, too.

Tapping anywhere but the top of a page lets you progress through a book. Click top-right to return to the main menu or adjust the text size and sync options. The latter checks whether you were reading the same book on another device and jumps to whatever page you last saw.

The Touch was unfazed as we darted between pages of a test e-book, and between the device's standard page view and maximum zoom.

The subtly rubberised overlay on the rear aids grip and adds protection. We'd like a slightly narrower frame, though.

Importing titles you've already read is straightforward. Type in your login credentials and they appear almost instantly if you're online. Purchasing books, newspaper and magazine subscriptions is possible through Amazon 1-Click ordering. You can preview sample pages and chapters of many titles.

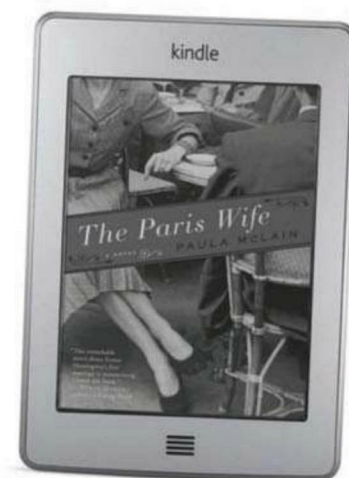
We downloaded several classic titles with accompanying audio files for free. The WhisperSync background downloader delivered each tome in around 3 seconds.

There's 4GB of internal storage to play with and you can 'share' literary finds via email and Facebook.

A 3G model (£169) lets you sync and update your library without having to find a Wi-Fi hotspot.

Navigation isn't seamless. We got caught up in a loop in which pressing the Home button was unresponsive, leaving us stranded within the browser. Images and rich media remain a sticking point.


Audio is poor from a single speaker at the bottom. It's useful if



your eyesight is poor, but text-to-speech is crude and rather rapid, although you can slow it down.

Amazon says half an hour's use per day should result in the battery lasting for two weeks at a time.

Verdict

Both the Kindle Touch's hardware and navigation won us over. With solid Kindle Store integration, near-instant book downloads and a usable web browser, this is the best Amazon e-book reader so far.  **Rosemary Hattersley**

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PHOTO EDITOR

Apple iPhoto

£2.99 inc VAT

Contact

■ apple.com/uk

Read more

■ tinyurl.com/dy5kfjd

System requirements

iPhone 4S/4/iPad/iPad 2;
iOS 5.1 or later

PC ADVISOR
RECOMMENDED



Two years after it introduced the iPad, Apple has released a version of iPhoto designed specifically for mobile devices. The iPhoto app is a full viewing, editing and sharing tool for the iPad and the iPhone.

iPhoto is well worth the wait. It doesn't match the Mac program feature for feature, but its overall functionality is so similar that desktop users will instantly recognise the app's conventions.

The program works on the iPad 2 and iPhone 4 or later, but not on the iPod touch. The iPad and iPhone interfaces are similar, and the subtle variations between the two work in the user's favour.

The iPhone edition lacks only two functions that are available on the iPad: the magnifying Loupe tool and Coaching Tips. The Loupe tool lets you enlarge discrete parts of an image, while Coaching Tips are labels that identify each of the tools and functions. Both would overwhelm the smaller screen of the iPhone.

General look and feel

iPhoto opens up to a neutral grey background with four tabs: Albums, Photos, Events and Journals. Various bound-book albums sit atop glass shelves.

You can view photos in one-, two- or three-column grids on either side of the screen. To remove the grid and see one photo, just tap it.

Hobbyist feature specialities

iPhoto offers a multitude of features that will delight photographers. Like its namesake on the Mac, the mobile version of iPhoto doesn't pretend to be a professional editing program.

There are tools and controls for non-destructive cropping and straightening, fixing exposure and colour, and for applying special effects. An Auto-Enhance button is a one-stop shop. Maintenance tasks, such as flag, favorite and hide photo, are all here, too.

The app automatically reduces the resolution of



photos synched via iTunes. So a 12Mp shot captured on a standalone camera will arrive as a 3Mp image. This is acceptable for online viewing.

To edit images at their full resolution, you must import them from the camera's memory card using Apple's Camera Connection Kit. iPhoto doesn't support Raw photos, and like the desktop version it doesn't accommodate images larger than 19Mp.

Icon-based interface

The interface is intuitive, with all actions accomplished via multitouch gestures. It took less than 15 minutes to access each of the many features and controls, without needing to read Apple's documentation.

The app is driven by unlabelled icons at the top and bottom of the screen, with a large viewer in the middle. A circle with a question mark inside serves up a screen full of contextual coaching tips that explain the operation of each control. In default mode, you see general tips; in Edit mode, you see tips that relate to editing controls.

As you tap on each of the individual controls - Crop & Straighten, Exposure, Color, Brushes and Effects - additional animations give visual clues as to how you should proceed. Eight labelled brushes spring up from the bottom menu. Choosing one of these lets you use your finger to brush edits on to your picture.

The right side of the screen has a Gear icon that links to additional controls related to the tool in use.

You can view up to 12 images side by side by tapping and dragging them into the viewer. To remove photos from the viewer, just tap, hold and swipe down.

Image-matching technology lets you find similarly composed images; double-tap on a photo and all similar ones will appear in the viewer. A double-tap lets you view your image pixel for pixel at full resolution. Batch editing is possible, too.

Subtleties and permutations

If you've never used a histogram and you have no intention of doing so now, an Exposure slider is an effective alternative.

Tapping directly on the image sometimes brings up onscreen touch controls that correspond to the slider in the menu. For example, the Color control features a menu consisting of Saturation, Blue Skies, Greenery, Skin Tones and White Balance. You can slide the controls with your fingers to apply changes to a part of the image, or adjust the entire image.

The colour module offers sliders to increase the saturation, enhance greens and blues, and preserve human skin colour.

Thanks for sharing

Multiple options for sharing photos and albums are available via the Share button. The button opens into a pane containing 10 choices, including social sites. You can email and print your images, create a slideshow with music, or send photos to iTunes on your computer.



Alternatively, you can beam your images from one iOS device to another over a Wi-Fi or Bluetooth connection, where they'll show up in the other device's Camera Roll.

iPhoto for iOS introduces Journals to share groups of photos with friends via the web. You post your Journal via iCloud and publish it to a web page with a private URL.

Extremely cool things

A double-tap brings an image to full resolution and two fingers pressed on an image brings up a Loupe to magnify three times. Placing your fingers in the loupe and twisting clockwise with your thumb and forefinger magnifies further.

A Skin Tones slider lets you colour-balance photos based on skin. Preserve Skin Tones lets you continue to work with saturation and colour corrections, without distorting these tones. This worked well in our testing.

The Effects module operates on a beautiful fan metaphor that offers all the program's effects in

an easy-to-see animation. Artistic, Vintage, Aura, Black & White, Duotone and Warm & Cool each have up to nine different effects that you can tap and choose or slide to adjust.

Minor issues

Almost every time we edited an image in iPhoto, the app paused to update the library with a dialog box and progress bar, which it sometimes took up to 10 seconds to complete. The program's artistic effects are very nice, but some, such as the Oil Paint and Watercolor effects, aren't adjustable.

Syncing, organising and deleting photos from various albums and events can get unwieldy. These tasks are based on where the photo was derived and what you did with it. With iPhoto, you may be able to immediately hide an image, but you won't be able to directly delete it if you synced it from your iTunes library or altered it in the app.

If you took an image with your device, you have to go to the

Camera Roll to delete it. If you derived it by syncing to your computer, you have to remove it via your computer. You can't rearrange images in albums or events either, nor change their order onscreen.

Verdict

Aside from being drop-dead gorgeous, with swift animated operation, iPhoto has a huge number of functions and it's easy to use. You won't regret spending money on this app. **Jackie Dove**



GAME

Football Manager Handheld 2012

£6.99 inc VAT

Contact

■ footballmanager.com

Read more

■ tinyurl.com/d28e674

System requirements

Android 2.2/iOS 3.0
or later

The world's most popular football-management simulation, Football Manager 2012, is now available for Android and iOS in Football Manager Handheld (FMH) 2012.

Covering a choice of leagues in 12 countries, FMH is a cut-down version of the Windows behemoth. The detail remains, in player rosters and club histories, but fans shouldn't expect the same experience here.

We can live with a more stripped-down in-match window. 3D footballers are replaced by circles, like Gary Neville's board on *Monday Night Football*. We don't miss squad numbers, or having to register players. But during the match your players adapt to set formations at the drop of a hat, which takes away some of the tactical skill. And that does point to one big miss: training.

In the full version you have to train your teams to play different formations, and tailor the regime for each player. Not here. In FMH you assign your players to one of a handful of set programmes.



You can't appoint or sack backroom staff, nor speak to players to boost morale. Reserves remain a greyed-out mystery, unless you demote a disaffected player.

FMH is designed to make selecting a squad straightforward. The ability to use drag-and-drop gestures to pick your team is refreshing, and beats mobile versions of Championship Manager.

The mobile tweaks aren't always successful, though. Rarely does clicking a player or club name take

you to a page of details about said man/team: you have to hit the details icon in the screen corner.

Verdict

Football Manager Handheld is the best port of a football-management sim we've played. Don't expect a rival to the Windows version. But if you want a sim for Android or iPhone, Football Manager Handheld 2012 is the game for you. It's good-looking, instantly playable, and mildly addictive. **Matt Egan**



OPERATING SYSTEM

Ubuntu 12.04 Precise Pangolin

Free

Contact

■ ubuntu.com

Read more

■ tinyurl.com/79ywgrq

System requirements

700MHz Intel/AMD processor; 384MB RAM; 5GB drive space; 1024x768 display

Usability: ★★★★★

Features: ★★★★★



Precise Pangolin is the latest Ubuntu release from Canonical. Compared to its predecessor, Oneiric Ocelot, 12.04 has less to offer in ground-shaking interface changes. The big overhaul's already happened, this time last year with Natty Narwhal and its Unity interface. Two updates later, and Unity has seen a modicum of polishing, a new way to interact with the system, and various other nips and tucks.

Installation

We tried Precise Pangolin on a Dell Vostro V13 laptop and as a virtual machine (VM) in VirtualBox 4.1 under OS X. Canonical has developed a very easy and approachable setup procedure, and lets you run the full OS from a USB stick, then install at leisure from the booted Ubuntu.

We selected the option to load third-party software during installation, and found a working Adobe Flash plug-in was included, although hardware acceleration wasn't enabled.

On a Windows PC, you're offered the chance to import documents and settings from an incumbent Microsoft Windows installation.

All the essential hardware in our Dell laptop worked flawlessly following installation. For laptops, though, the crucial issues of power management and standby responsiveness could be improved.

Features

Ubuntu comes with various productivity and entertainment apps preinstalled, and these tend to cycle from OS update to update. This time around, it's showtime for Rhythmbox, which replaces the Banshee music player, with the office suite LibreOffice already having edged out OpenOffice.

It's not quite finished, but the new **HUD** feature shows promise



UBUNTU 12.04 shows a tidier System Settings panel with new additions

The most novel feature in this new build is the Unity head-up display (HUD). This lets you jump to a specific function within an application not by using the mouse, but by starting to type the function's name into the search field. You activate Ubuntu's HUD with a short tap of the Alt key.

For example, if you're surfing in Firefox and want to jump to your browsing history, start to type H, I, S and you'll see various options listed: History, Show All History; Tools, Clear Recent History...; View, Sidebar, History and so on. Select the desired result with the cursor, press Return and you're there.

It's a neat idea that keeps your hands on the keyboard rather than reaching for the mouse, but it has some usability issues.

To start, not all programs are compatible; notably, Canonical's choice of cornerstone office suite, LibreOffice, doesn't respond to the HUD control interface. We hope to see this functionality appear in subsequent versions, but until then it's a sorely missed trick.

Perhaps more fundamental is the issue of asking the right questions. Assuming HUD did work in LibreOffice, and you wanted to switch off annoying auto-complete functions, how would you find the option if you didn't know the correct name? An experienced user may know to search with the keyword 'auto-complete'. A newcomer may not know the right terminology but, by hunting under drop-down menus, they might chance upon the likely looking auto-complete option and investigate it further.

It's not as typing-critical as a command-line interface, thanks to fuzzy logic that can 'guess' your

words, but the HUD is a sidestep from the purity of the graphically led interface.

Under the lens

Ubuntu 12.04 has a feature that homes in on certain content type from the main desktop Unity search bar. The last entry of the five (Home, Applications, Files & Folders, Music Collection, Videos) is the new Video Lens. Not only will this look through your internal drive for film content, but online too. Specifically, it consults resources such as YouTube, BBC iPlayer and Vimeo.

The feature works well, and lets you quickly plough through, for example, thumbnails of YouTube videos, without the distractions of the regular web-browser view.

We noticed other small tweaks to the user interface, which all contribute toward making Precise Pangolin a more wholesome OS experience. The System Setting panel is rendered larger, with an extra option labelled Privacy. With Ubuntu 12.04, Canonical has added a background logging system (Zeitgeist) to help it catalogue files and system usage. The Privacy panel lets you manage this, or switch it off if you prefer.

Verdict

The Unity interface alienated many users who prefer the older desktop Gnome or KDE shells, but the interface is slowly evolving into something more usable. Once the HUD is truly integrated into essential applications, we may see how well the quick-find feature can maintain productivity. Ubuntu still has new-look growing pains, but Precise Pangolin is definitely worth your close attention. **Andrew Harrison**

GRAPHIC DESIGN

CorelDraw Graphics Suite X6

£479 inc VAT**Contact**■ corel.com/uk**Read more**■ tinyurl.com/cxdkrzk**System requirements**

Pentium 4/AMD Athlon 64/Opteron processor or better; Windows Vista/7; 1GB memory; 1.5GB drive space; 1024x768 display; Internet Explorer 7.0 or later; DVD drive

Usability: ★★★★★

Features: ★★★★★

Value: ★★★★★



CorelDraw X6 is a powerful graphics suite, and a worthy opponent for Adobe Illustrator and InDesign. The latest version adds several compelling features, including a vector-graphics editor.

The suite has six main components: CorelDraw; Capture for taking screenshots; Connect for managing digital image assets; and PowerTrace and Photo-Paint for creating and editing raster graphics. Website Creator is available as an optional download.

Additionally, Bitstream Font Navigator is included for managing fonts, and PhotoZoom Pro 2.0 is a plug-in to enlarge digital images. To get more from the suite, Corel offers online training videos.

Also included in the suite are 350 professionally designed templates, from business cards to web graphics and sales and marketing materials.

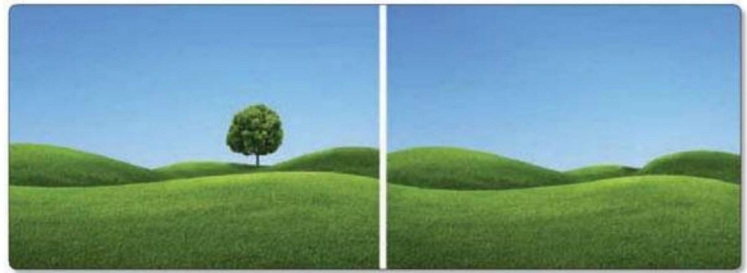
CorelDraw X6

New and improved CorelDraw features in X6 include a better Object Properties bar, a new styles engine and docker, colour styles and colour harmonies.

Typographers should be impressed by improved OpenType font support and new layout features. A thousand OpenType fonts are included in the package.

The Object Properties docker now shows all properties in one long list, subdivided into sections. Previous CorelDraw versions arranged object properties (Fill, Outline, corner radius and so on) as separate tabs, which often makes navigation cumbersome.

CorelDraw X6 maintains the tabs on top but, when you click one,



SMART CARVER lets you quickly and easily remove objects from an image

it just scrolls down to where the properties group sits in the new all-in-one bar. It's not a huge change, but it does help usability.

A more obvious upgrade is CorelDraw's introduction of colour styles. These make it possible to change fill- and outline colours for several objects at once, even if they aren't grouped or linked in any other way. Better yet, you can group colours into harmonies, and change an entire group of colours together, while maintaining their relative contrast levels. This means you can change the colour palette for an entire composition in seconds.

CorelDraw X6 also introduces four creative vector tools: Smear, Twirl, Attract and Repel. Each lets you morph vector shapes in interesting ways and responds to pen pressure. We tested them with a trackball, and found them fun and easy to use.

We were able to easily create fluid, organic shapes that looked more like freeform raster creations than vector objects, but still maintained all the properties and flexibility of the vector format.

Previous CorelDraw versions included morphing tools, such as

the Envelope tool, but these four new brush-based tools make object morphing faster and more intuitive.

CorelDraw X6 now features a native 64bit version for Windows, which felt stable and speedy on our Windows 7 x64 system. Corel says X6 makes better use of multicore CPUs for improved copy/paste, export and printing performance.

Corel Photo-Paint X6

Moving on to Corel Photo-Paint, the most interesting new feature is Smart Carver. This lets you remove unwanted objects from photos and adjust their aspect ratio using seam carving. Here, you just paint over the object you'd like to remove and run the Smart Carver; once it's done, the object is no longer there. The technique works best with isolated objects on a uniform background, such as clouds, rocks and sea.

We tested Smart Carver by editing an image taken at the beach, removing a bag that was lying on the sand. The result was excellent, and there was no evidence of manipulation. In another test, in which we tried to remove a signpost from an image with a background of sea and blue sky, a visible seam meant the result was unusable. Both tests were very slow to render, though, at around five minutes.

The full suite includes 50GB of free online storage for one year.

Verdict

CorelDraw Graphics Suite X6 is an incremental upgrade for an already excellent graphics suite. With the possible exception of the Smart Carver, Corel has avoided gimmicky features and focused on areas that can boost productivity, including a new style engine and native 64bit support. **Erez Zukerman**

There's improved **OPENTYPE** support in the latest version of Corel's powerful graphics package



ANTIVIRUS

AVG Anti-Virus Free Edition 2012

Free

Contact

■ avg.com

Read more

■ tinyurl.com/bLfhh8j

System requirements

1.5GHz processor;
Windows XP/Vista/7;
512MB RAM; 1GB drive
space

Usability: ★★★★★

Features: ★★★★★



AVG was the first company to offer free antivirus protection, with a paid-for full suite also available. The free version is ad-supported, but you can switch off the ads.

An overview panel offers five protection tools, plus three optional utilities. Anti-Virus is the core module, offering protection against viruses, spyware, worms, Trojans and malicious adware.

LinkScanner scans links in your browser's search results to prevent you inadvertently stumbling upon a dodgy site. It also provides protection from drive-by threats.

E-mail Protection scans your incoming mail for spam and phishing attacks, while Anti-Rootkit keeps an eye out for low-level rootkits. Finally, Identity Protection uses heuristics to protect against identity theft.

AV-Test assessed AVG's free antivirus product earlier this year, awarding it 14/18 points overall. Break this down and there are some impressive results - only in the removal of malicious components of test malware did AVG fall down, scoring 10 percent lower than the average antivirus product.

Its overall protection score was 4.5/6, with AVG scoring slightly below average on zero-day malware protection in one of the two test months, but on or above average everywhere else.



AVG ANTI-VIRUS FREE offers set-it-and-forget-it security at zero cost

AV-Test found a very small impact on system resources, and noted that it slowed down the test PC by just 3 seconds - the average is 10 secs.

In our own usage tests, AVG Free performed pretty well. It needed 34 mins 58 secs to scan our 50GB basket of test files, and reportedly checked 178,044 individual files. This gives a scan rate of 84.9 files per second, a middling performance among the 2012 security suites.

We transferred a 1GB file with the program running in the background in 40 secs; during a scan, the time required increased by 130 percent to 1 min 32 secs. You may want to schedule scans to occur overnight or when you're away from the PC.

The optional utilities include a PC Analyser, which is the detection component of AVG PC Tuneup. This can be used to analyse and rectify

problems with the Windows Registry and clear out junk files. The first fix is free; thereafter, you'll need to subscribe to the module.

Family Safety, also optional, enables search filters, anti-bullying and real-time alerts, while LiveKive provides an online storage and sharing service. All three services require individual subscriptions.

Verdict

AVG 2012 offers set-it-and-forget-it security. Given that it's also free, there's little excuse for anybody to not have decent security software installed on their Windows PC. In both our own and AV-Test's analysis, AVG proved to be a full-strength anti-malware application, with a good feature set and a handful of potentially useful optional extras.

✉ Simon Williams

MAINTENANCE UTILITY

Avanquest PC Speed Maximizer 3.0

£26 inc VAT (1 PC)

Contact

■ avanquest.com/uk

Read more

■ tinyurl.com/c8jj99a

System requirements

Windows XP/Vista/7;
64MB RAM; 10MB drive
space

Usability: ★★★★★

Features: ★★★★★

Value: ★★★★★



Avanquest continues to acquire a variety of Windows PC maintenance utilities. PC Speed Maximizer (PSM) is designed to streamline your machine and squeeze out extra performance. Version 3.0 has a number of new or improved features, including Registry backup and restore, customised scans, plus the ability to remove Flash cookies and produce optimisation reports.

The lightweight program downloads and installs in seconds. The main control screen is a simple five-tabbed affair, offering Home, Registry, Clean Up, Optimize and Settings. For many people, the big green Start Scan button on the Home tab will be all they need.

A full scan of our test machine took 32 seconds, and PSM then offered to fix 807 Registry errors, 1,087 temporary register values, 238 temporary internet files, 56 cookies, 524 residual files and 11 invalid shortcuts. The program took 1 min 7 secs to fix them all, but it didn't keep a log for us to check what it had done.

The figures look impressive, but bear in mind that some 'problems' are anything but. Cookies, for example, have their uses if you regularly visit the same websites, where they can remember your login details and preferences. However, tracking cookies allow firms to keep an eye on your activities.

If you'd prefer not to use a one-click fix, the various tabs offer individual performance tweaks. Registry issues can be dealt with on the Registry tab, for example, which allows you to customise the scan by excluding areas you don't want the software to probe.

PSM can back up the Registry, too - if any changes it makes prove to be damaging, you can restore the Registry to its previous state.

The Clean Up tab offers several of the options included in the one-click fix, but also lets you modify Windows' Startup list. This determines which applications and utilities are allowed to automatically launch when Windows boots up;

SECURITY SOFTWARE

Malwarebytes Anti-Malware Free 1.61

Free

Contact

■ malwarebytes.org

Read more

■ tinyurl.com/cng57y6

System requirements

1.5GHz processor;
Windows XP/Vista/7;
512MB RAM; 1GB drive
space

Usability: ★★★★★

Features: ★★★★★



Malwarebytes Anti-Malware isn't designed to be a full-blown antivirus suite; rather, it's complementary software that can help to detect and remove stubborn infestations.

Scans must be manually started (a paid-for version includes a scheduler and real-time protection against malware). Ideally, the software should be run on a regular basis, but it's also useful when you suspect there may be a problem.

Tabs offer access to the various aspects of the program. The Scanner tab is where most of the work is done. Here you can set off a Quick Scan or a Full Scan. You can select the drive on which you wish to perform a full scan, but you can't narrow down the options to a folder tree or individual file.

Updates can be manually downloaded and applied on the Updates tab, while the Quarantine tab houses any malware captured by the program. Infected files can be permanently deleted or restored to their previous state.

Malwarebytes generates a log file for every scan, which it stores for reference. These can be accessed via the Logs tab, while the Ignore List enables you to exclude certain files from a scan.

A Settings tab is self-explanatory, while More Tools lets you securely delete locked files.

**MALWAREBYTES** acts as a second line of defence for your computer

We scanned our usual 50GB basket of test files on both an SSD-equipped laptop and a desktop PC. The laptop completed a quick scan of 180,231 files in 3 minutes 4 seconds, at a rate of 980 files per second. The full scan examined 226,201 files, at 236 files per second.

On the desktop, Malwarebytes scanned 189,365 files in 21 mins 49 secs, giving a scan rate of 144.6 files per second. This is slightly faster than any of the full antivirus suites we've tested, but the library of malware signatures to which it's comparing files may be smaller than that of a full-blown suite.

We also timed how long it took to copy a 1GB file with a scan running in the background, and found a slow down of around 180 percent. Malwarebytes places a noticeable drain on system resources, but

you're unlikely to be working in another program during its on-demand-only scans.

AV-Test hasn't evaluated this program for its malware-catching abilities, but Malwarebytes can be run aside other antivirus products as a second line of defence.

Chameleon technology uses a second PC to install the software if your primary machine is already infected, then runs a malware scan.

Verdict

Malwarebytes Ant-Malware can be a very good secondary tool for investigating suspected malware infestations, but it shouldn't be used in place of a real-time antivirus scanner. The free version requires manual operation, but is well worth having in your PC security toolkit.

☒ **Simon Williams**

**PC SPEED**

MAXIMIZER offers to optimise your Windows PC for the best performance

removing entries for programs you no longer need can shorten system startup times. It doesn't appear to be possible to undo any changes made here, however.

After running the scan and fix processes, we ran three tests to gauge the performance increase. First, we found that the Windows startup time had been reduced from

3 mins 30 secs to 2 mins 36 secs, a reduction of 35 percent. The shut down time was not affected, though.

The time required for a quick antivirus scan using the F-Secure security suite preinstalled on our test computer dropped from 1 min 15 secs to 1 min 1 sec, showing a performance increase of 23 percent.

These results prove that this maintenance utility can improve performance, although not by a huge amount.

It's slightly odd that searching for PC Speed Maximizer returns user comments querying whether the program is suspicious and claiming that it's difficult to remove. These refer to version 2.2, but

are still concerning. However, we have rarely seen a program with a lighter footprint than PSM 3.0, nor one that's as easy to uninstall. The program's own uninstaller removed all traces of PSM from our PC.

Verdict

PC Speed Maximizer 3.0 can remove Registry and file clutter and increase a Windows PC's speed - but, in our experience, it doesn't boost performance by a significant amount. If your past system maintenance has left something to be desired, you may notice more of an improvement than our tests would suggest. At £26 it's rather pricey, though. ☒ **Simon Williams**

GAME

Oil Rush

£11 inc VAT

Contact

■ oilrush-game.com

Read more

■ tinyurl.com/cr92wme

System requirements

2GHz processor;
Windows XP/Vista/7/Mac
OS X/Linux; 1GB RAM;
3GB drive space; nVidia
GeForce 8600/AMD
Radeon HD 2600 or
better; 256MB VRAM;
DirectX 9

OVERALL



Oil Rush is a sci-fi strategy game about warring for precious resources and speedboat factories on the high seas of a drowned future-Earth.

While falling into the build'n'bash familiarity of traditional real-time strategy games, Oil Rush eschews individual control of your legions of boats, jetskis, planes and helicopters. Instead, you order 25-, 50- or 100 percent of your units to bounce from fixed node to fixed node, each of which automatically builds and replaces units - praying you've sent enough to overwhelm enemy forces.

You also need to build and upgrade turrets at the nodes you control. Neither of these systems is novel, but the combination of the two builds to a frantic strategy game.

It's a game of constant movement, ushering forces this way, then ordering half of them back the other, all the while hopping from node to node. A slow trickle of experience points unlocks upgrades, such as increasing unit defence or



OIL RUSH is a sci-fi strategy game in which you battle for resources

temporary powers such as hobbling enemy unit construction.

You'll spend little time looking at the main screen, even though it's full of attractive explosions and jaunty sci-fi boats. The bulk of the game is played with the mini-map on the bottom, which marks what belongs to who, what's in contention and what units are at which nodes.

The only time you use the main screen is to place and upgrade turrets. You can activate a cinematic camera and watch the action, though.

The singleplayer game's glacier-slow plot and play-for-the-day voice acting doesn't help, in this regard.

Oil Rush is at its best in skirmish maps against AI or in multiplayer mode, where you have free access to all the units and turrets and none of the distractions of the sleepy plot and silly acting.

Verdict

Oil Rush is a smart and tight fusion of two different types of strategy game. **Alec Meer**

GAME

Risen 2: Dark Waters

£34 inc VAT

Contact

■ risen2.de

Read more

■ tinyurl.com/c6pzj9t

System requirements

2.1GHz dual-core
processor; Windows XP/
Vista/7; 2GB RAM;
5.5GB drive space;
nVidia GeForce GTX
8800/AMD Radeon HD
3870 or better; 512MB
VRAM; DirectX 9.1;
web connection

OVERALL



A name and a fantasy setting are all Risen 2 shares with its 2009 predecessor. While that was a strange, cruel and ambitious roleplaying game, Risen 2 sails close to action-gaming conventionality.

Tasks and quests are completed in a fixed way. There's rarely an option to overcome obstacles without resorting to combat, and the storyline doesn't offer much.

Risen 2 is bloated, over-long and obsessed with plot-resolving mystic items of legend. It doesn't know when to shut up and get on with it.

The game takes in the region of 40 hours to complete, depending on how much time you spend on quests. There's also a lot of conversations that involve watching characters with semi-static faces and a limited repertoire of animations.

The writing isn't bad, there's just too much of it. Less talking would have made for a tighter, more dramatic game as well as freeing up cash for better setpieces. As it is, the ratio of being entertained to being



RISEN 2 is bloated and long, with too much time wasted on menial chores

bored is way off, with far too much time spent listening or performing menial chores.

Combat difficulty is all over the place, too. Despite a fascinating skill tree, the more interesting abilities, such as having a pet monkey to steal stuff for you, come at the expense of basic aptitude with swords and guns. Experience points and cash don't flow freely, so if you pour into Cunning or Voodoo what you do get, you'll find you're easy prey. A recent patch has addressed the

peril somewhat, but there's still a disjointedness between the action movie plotting and the stop-start frenzy of the fighting.

Rather than the usual fantasy swords and spells tropes, Risen sticks tightly to piratical stereotypes.

Verdict

Risen 2 isn't a disaster, but it's a game in need of editing. Its developers knew where they wanted to go with it, but didn't quite make it there. **Alec Meer**



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PRINTER

HP TopShot LaserJet Pro M275

£250 ex VAT
£300 inc VAT

Contact

■ hp.com/uk
Read more
■ tinyurl.com/84zn9bd

Specification

Printer with 3D photography facilities; 600x600dpi print resolution; quoted print speed: B=17ppm, C=4ppm; actual print speed: B=12.2ppm, C=3.4ppm; USB 2.0; ethernet; 802.11b/g/n; 150-sheet input tray; 128MB memory; 84 scalable TrueType fonts; 20,000-sheet monthly duty cycle; toner cost: B=£40, C=£42 x 3; print yield (pages): B=1,200, C=1,000 x 3; 468x409x270mm; 13.kg

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



At first glance, the M275 laser printer appears to have a carrying handle bolted on to its top. Closer inspection reveals this adjustable frame to have a 3D camera built-in.

The roof of the printer comprises a white podium. Place an object on to the podium, manoeuvre the camera into place and, three flashes (and six shots) later, the M275 creates a 3D image of the object.

It's not true 3D, but the resulting pictures look more rounded and less two-dimensional than is typical. Creating and printing a 3D image took 46 seconds.

Whether or not the effect satisfies may depend on the subject matter. In tests anything below 50mm in height tended to work well, although you'll need to experiment with the camera angle. Tall objects created less satisfactory results, and the HP struggled to properly focus on anything above 150mm.

Neither was the colour always as accurate as it might be. A bright orange Jaffa Cakes box appeared yellow, for instance. It's also very easy for light reflections to create artefacts. The quality is good enough to take shots of documents, although you'll struggle with anything that doesn't lie flat - a book with a thick spine, for example.

Whether many users will make frequent use of this feature is questionable. Much has been made of its suitability to eBay, allowing sellers to capture better images of their auction items. For the majority of us, though, the HP's 3D facilities are likely to remain of limited use.

The TopShot can also operate as a scanner and a copier, and you can fold down the camera frame and remove the podium to reveal a compact but well-built printer. Set into the base is a sturdy 150-sheet input tray, but the 50-sheet output tray is flimsy - don't rely on the M275 for large print jobs.

Plenty of connectivity options include 802.11b/g/n Wi-Fi and 10/100 ethernet, plus USB 2.0.

A Smart Install feature is useful, letting the HP install itself on your PC without recourse to a driver disc.

A bright touchscreen is nicely implemented, and lets you quickly and easily select the M275's many features.

The M275 is an adequate text printer, and produced pages at 12.2 pages per minute (ppm). Characters were cleanly defined, although the text was a little thin.

The HP struggled with graphics, produced at 3.4ppm. A dark and gloomy colour palette cast almost everything in fog, even after we tweaked its settings.

The running costs are high, at 3.3p for text and 12.6p for colour.

Verdict

The M275 is an interesting prospect, but we suspect the 3D feature will prove to be a short-term fad - eBay sellers may be the exception. Remove the 3D feature and you have a proficient - but not outstanding - printer for business or home office use. Robin Morris



ACCOUNTING SOFTWARE

Xero

£12 ex VAT/month
£14.40 inc VAT/month

Contact

■ xero.com
Read more
■ tinyurl.com/c3zc45w

Specification

Windows/Mac OS X/iOS/
Android/BlackBerry/
Windows Phone; web
connection

Usability: ★★★★★
Features: ★★★★★
Value: ★★★★★



Xero bills itself as the ideal online accounting solution for small- to medium businesses, letting them manage transactions in real time.

An additional smartphone app, Xero Touch for iPhone, Android, BlackBerry and Windows Phone, lets subscribers manage their business accounts on the go.

Simplicity is key to this online accounting package. You're instantly able to see bank balances, recent sales, money coming in or out, and expense claims on the dashboard.

The dashboard features five tabs, covering Accounts, Reports, Adviser, Contacts and Settings.

The Contacts tab lets you deal with customers, suppliers,

employees and more, while the Settings tab is for managing general settings and inventory items. Here you can also set up account codes, with simple descriptions for income and expense accounts.

The Reports tab generates various reports that offer an overview of how the business is doing in real time, including profit and loss reports, a balance sheet, the age and amount of outstanding debts, and so on.

The Accounts tab is for managing business bank accounts, debtor and creditor amounts (with graphical/pictorial analysis), employee pay runs and expense claims, and fixed assets.

Some sections have an optional 'Getting Started' message explaining briefly what each section is for and how to use it.

Xero is suitable for all users, keeping things straightforward for the business owner with little experience in managing accounts, while also including functions for those with more experience. It will suit finance-trained entrepreneurs and even bookkeepers and accountants in practice.

The Adviser tab contains additional functions for the more accounts-experienced types, whereas the inexperienced can leave the accounts-management functions under this tab to their accountant.

£316 ex VAT
£380 inc VAT

Contact

■ epson.co.uk

Read more

■ tinyurl.com/dyw94rw

System requirements

Printer/scanner/copier/fax; 4800x1200dpi print resolution; print speed: B=16.1ppm, C=8.0ppm; 1200dpi scanner optical resolution; USB 2.0, ethernet; 2.5in TFT; 384MB memory; PCL6/PCL5c/PS3/ESC/P-Raster; cartridge costs: B=£24, C=£22 x 3; print yield (pages): B=2,400, C=2,000; 460x420x341mm; 13.8kg

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★

PRINTER

Epson WorkForce Pro WP-4595 DNF

The WorkForce printer line-up marks Epson's continued efforts to replace the traditional office laser printer with inkjet technology.

Inkjets have in the past been unpopular with business users, due to their less well-defined text, sluggish performance and high running costs. Epson aims to remove these inefficiencies, while retaining the ability to produce vibrant colour.

The WP-4595 DNF is a high-spec version of Epson's WP-4535 DWF (tinyurl.com/c82fy6k). It costs more, but a number of extra features make it appealing for business use, including additional memory and strong control language emulations.

The two printers are similar in appearance, more closely resembling lasers than inkjets. This WP-4595 is by no means small, and it's heavy, too. Some of this bulk can be explained by the inclusion of scan, copy and fax facilities.

The WP-4595 retains the robust and versatile scanner lid of its predecessor, which is suitable for thick brochures or books. You also get a sturdy ADF, which allows the Epson to double up as a photocopier. The range of colours it covered in our test scans was impressive.

The control panel is packed with options, but the navigation system

does a good job of guiding you through the process.

The 2.5in LCD is also useful.

As standard, the WP-4595's paper-handling facilities are broadly similar to those of the WP-4535. The dual sources comprise a front-mounted 250-sheet tray, with another 80-sheet feeder tucked away to the rear. An optional 250-sheet tray can be bolted on, bringing the input capacity to 580 sheets - a figure few lasers can beat.

Ethernet capabilities are built-in although, unlike the WP-4535, the WP-4595 omits Wi-Fi connectivity.

The WP-4595 is better equipped than its predecessor when it comes to emulations of printer control languages, though. If you need PCL6 or PCL5c, for instance, choose this model over the WP-4535. It also has more memory, with 384MB against the WP-4535's 128MB.

The extra memory makes for slightly improved speed. This Epson reached 16.1ppm in its fastest text mode (up 0.7ppm). Its 15.1ppm standard mode is more likely to be used, in which the Epson is still fast and produces reasonably crisp text. But even the highest-quality 2.8ppm mode can't beat the best lasers.

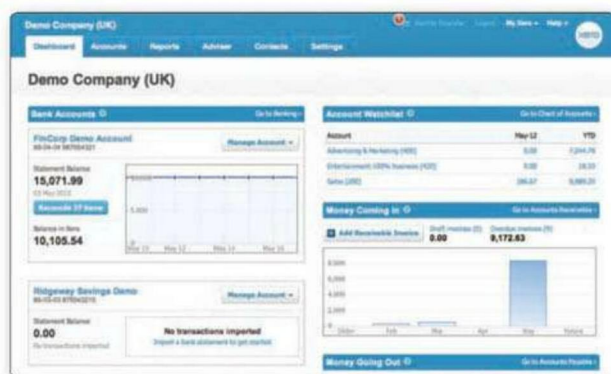


The WP-4595's colour printing capability is strong. Its middle two speeds of 8- and 7.3ppm are faster than those of the WP-4535, but only by 0.5ppm. We like the balanced image it produced, and the colour is very pleasing, even if it doesn't boast the most intense of palettes.

Like the WP-4535, the WP-4595 is extremely cheap to run. It'll set you back around 1p and 3.3p for black-and-white and colour prints respectively. Few lasers can compare on this front.

Verdict

At £380, Epson's WP-4595 is much more expensive than the £190 WP-4535. In fact, the latter remains a very appealing deal at that price. The WP-4595's extra memory makes it ideal for those who run complex print jobs, or for whom strong printer control language emulations are required. **Robin Morris**



Indeed, when posting or editing a manual journal, for example, a message helpfully pops up recommending that 'only your accountant or bookkeeper create journals, unless you have experience managing your general ledger'.

The Adviser section also contains the tools necessary to

fill in and file your VAT return online, create annual accounts to be filed to Companies House, and export general ledger transactions.

However, Xero doesn't have any corporation tax or self-assessment capabilities. Separate tax software would be needed for these, although you can add on certain other services, such as payroll, CRM or inventory management, from one of Xero's software developer partner firms.

Prices excluding VAT for the online solution start from £12 per month for the simplest small businesses - freelancers and small property investors, for instance - to £19 per month for most small- and

medium-sized businesses. Pay £24 per month for small- and medium-sized businesses that bank or transact in foreign currencies.

Verdict

Xero is an easy-to-use, reasonably priced cloud software solution, which will be useful for a variety of small- to medium businesses. A mobile app is also useful for managing your finances on the go. Xero is suitable for both novice and experienced users. However, the only business tax it supports is VAT, so corporation tax, payroll and self-assessment will have to be dealt with by a secondary or by a tax adviser. **Santhie Goundar**

WIRELESS ROUTER

DrayTek Vigor 2850Vn

£191 ex VAT
£230 inc VAT

Contact

■ draytek.com/uk
Read more
■ tinyurl.com/d5qswb3

Specification

ADSL2+/VDSL2 wireless modem router; 2.4GHz and 5GHz wireless bands (non-concurrent); 802.11a/b/g/n; 2x3:2 wireless configuration; WEP/WPA/WPA2; 4x gigabit ethernet LAN; up to 4x WAN ports (VDSL, ADSL, cable modem and 3G); IPv6 compatible; fixed-line POTS and VOIP telephony, two phone connectors (with splitter); port forwarding, QoS; ethernet and Wi-Fi VLANs, VPN, content/web filtering, FTP server, SSH and HTTP access to web interface; 1x USB 2.0; 2-year warranty; 241x166x44mm

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

★★★★★

The 2850Vn is the second router we've reviewed that natively supports BT's Infinity broadband, which uses the VDSL standard. AVM's Fritzbox 7390 (reviewed at tinyurl.com/3qujzbx), is another VDSL router, but slightly cheaper at £210. Both routers also work with ADSL and ADSL2+, and a splitter is included in the box for simultaneously connecting to VDSL and ADSL lines.

In fact, the 2850Vn can support up to four internet connections simultaneously and apply load balancing, or use the extra connections as failovers.

One of the four LAN ports doubles as a gigabit WAN port, while the third WAN connection is through a USB port, to which you can attach a compatible 3G dongle. If necessary, you can use a 3G dongle as your main connection to the web.

If that's not required, you can attach a USB printer and share it across the network, or plug in a USB drive and allow up to six users to access its contents via FTP.

Windows NTFS-formatted disks aren't supported (only FAT16 and FAT32), so the Vigor is no substitute for proper network-attached storage. At least it has a USB 2.0 port, unlike a previous model, the Vigor 2830 (reviewed

at tinyurl.com/3vawhsz), which inexplicably had only a USB 1.1 port.

Two extra ports for analogue phones are found on this 'Vn' model (the 2850n omits them). You can connect two phones to the lefthand RJ11 port (a splitter isn't included), which can be used for both VoIP and standard landline calls (you dial #0 if you don't want to make a VoIP call).

The second RJ11 port is for the connection to your analogue line. Using the wireless router's web interface, you can set rules so that local calls are routed via your analogue line and international calls via VoIP, for example.

Complicated setup

The web interface includes a quick setup wizard, but the remainder of its functions are designed to be used by a system administrator who knows what settings to change - little in the way of help is offered.

However, here you'll find more features than most small businesses will need, including an SPI firewall, content filtering, web filtering, SMS alerts, dynamic DNS, multiple private LAN subnets, up to four VLANs and up to 32 virtual private network (VPN) tunnels.

To Infinity...

Configuring the 2850Vn for use with BT Infinity isn't easy, and the setup process isn't helped by the fact DrayTek doesn't provide any instructions. We had to ask tech support how to do this, and were instructed to 'tag' the VLAN of WAN1 with an ID of 101 and then enter the username and password supplied by BT for our broadband account. With BT's kit - the Home

Hub 3 and separate Openreach modem - setup is simply a case of plugging in the device.

The Vigor 2850Vn is a neater solution, though, since it replaces the two BT devices and power supplies with a single product.

Performance

We tested our nominal 76 megabits per second (Mbps) connection with Speedtest.net and recorded an average 37.9Mbps with the Openreach modem and 37.7Mbps with the DrayTek.

Upload speeds were the same with the Vigor as the Openreach modem, averaging 6.4Mbps.


The 2850Vn's Wi-Fi features are better than the Home Hub 3's, though. There's a guest portal with a customisable landing page, and you can create four SSIDs with different security. One SSID could be used for employees who need access to the LAN, while another could provide mere internet access.

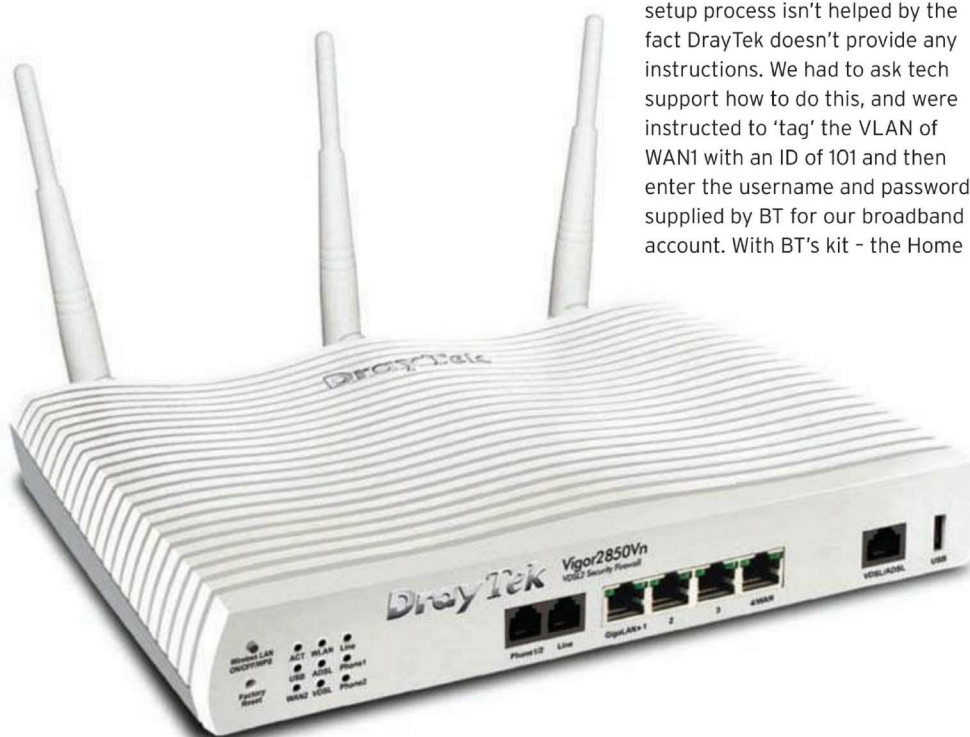
A WPS button on the front of the router makes it easy to connect clients that support the standard. At the rear are three detachable antennae, which can be replaced with higher-gain versions if you require greater range.

The 2850Vn supports both 2.4GHz and 5GHz Wi-Fi, but not simultaneously. Using a standard Intel 802.11n radio (WiFi Link 5100 AGN) in 2.4GHz mode, we saw decent speeds of 51.2Mbps at 2m and 40.8Mbps at 10m. In 5GHz mode, we recorded some impressive transfer speeds: 120Mbps at 2m and 111Mbps at 10m.

If you want to get the best transfer speeds, the optional Vigor N65 USB dongle costs £35. This has a WPS button, making it simple to connect it to the 2850Vn. Note that this model is not listed as vulnerable to a security flaw in the WPS standard published last year.

Verdict

The DrayTek Vigor 2850Vn has good Wi-Fi performance and just about all the features you could want for a small business router. It would be even more attractive if it could use both 2.4GHz and 5GHz radios simultaneously.  **Jim Martin**



£116 ex VAT
£140 inc VAT

Contact

■ canon.co.uk

Read more

■ tinyurl.com/6ob9dj4

Specification

Printer/scanner/copier;
4800x1200dpi print
resolution; print speed:
B=9.7/9.7ppm, C=5.5ppm;
1200x2400dpi scanner
resolution; USB 2.0;
802.11b/g/n; ethernet;
Apple AirPrint; memory
card slot; 100-sheet input
tray; 2.4in screen; ink
costs: B= £18, C=£18; print
yield (pages): B=600,
C=400; 2-year warranty
458x385x200mm; 8.8kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



PRINTER

Canon Pixma MX515

Canon's Pixma MX515 is a reasonably stylish and extremely versatile multifunction printer.

It's not the smallest of MFPs, thanks to a 30-sheet ADF built into the top. The control panel is busy, with a multitude of buttons plastered across the front. A 2.4in colour screen isn't touch-sensitive.

Many an inkjet compromises on the paper-feeding mechanism, but the MX515 proved to be robust throughout our testing. The input feed is quoted for use with up to 100 sheets. We think this is optimistic, but the Canon should comfortably handle 80 sheets.

The top-mounted ADF relegates the output feed to the MX515's base, and finished prints are ejected from a space just above the input feed.

The MX515 offers 802.11b/g/n wireless and USB 2.0 connectivity. Crucially, for a business printer, it also supports ethernet for wired networks. The Pixma can even be tweaked to offer Bluetooth, with the purchase of an optional adaptor.

As a scanner we found the MX515 highly capable, with good attention to detail and a decent range of colours.

Interestingly, Canon's claimed print speeds exactly match those recorded by our benchmarks. In its fastest mode, text was produced at 9.7 pages per minute (ppm). Text here isn't of the highest quality, however, with many smudged characters and banded text.

The 8.1ppm middle mode eliminates this banding, although text remains slightly fuzzy. Even in the Canon's highest-quality mode, in which pages were produced at 1.9ppm, the character definition is slightly uneven.

Auto duplexing is supported, although the drop in speed is significant. Should you want to print double-sided pages, you'll find the top speed of 9.7ppm falls to a more sluggish 4.7ppm.

The Canon fares better on graphics. The fast and middle modes



hit 3.2- and 2.3ppm respectively. In the medium mode the rather level-headed colour palette strikes a nice balance - not too intense and glowering, but neither is it overly bright. At highest quality, results on photographic paper are very good.

The MX515 offers affordable running costs: 3p and 4.5p for mono and colour prints respectively.

Verdict

The reliable MX515 worked well in our tests, although we aren't impressed with the text quality. A price drop is necessary for us to be able to recommend this printer over its rivals. **Robin Morris**

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Mid-range laptops

A huge choice of laptops sits in the fertile middle-ground between budget and high-end portables. Ben Camm-Jones tests six laptops priced between £699 and £1,000

All sorts of laptops are available for less than £1,000, from ultraportables to big-screen entertainment-focused machines. Choosing the right one depends on whether you want something for work or leisure - or both - and if it needs to be portable enough to take on your travels.

For office use a decent keyboard is essential, while road warriors will prioritise long battery life and light weight. It's also worth considering the screen quality if it's to be used in a variety of environments - the trade-off for the rich colours of a glossy panel tends to be distracting shine. Anti-reflective coatings can provide a suitable compromise between matt and gloss finishes.

If you'd rather have power than portability, a desktop replacement may be more suitable. A larger chassis affords more space for the fitting of high-performance components and can allow for better heat management, keeping the audible whirring of fans to a minimum.

Ultraportable laptops with 11- to 13in screens are becoming increasingly popular in this price range. Intel is sponsoring laptop makers to build thin-and-light Windows PCs under the Ultrabook moniker. Such laptops are relatively fast, with low-power dual-core processors and solid-state storage.

You're unlikely to find more than 128GB of solid-state storage in a sub-£1,000 laptop. You can supplement this provision with an external hard drive; plump for one of the latest USB 3.0 models to take advantage of the faster transfer speeds. For hard-disk-based home-entertainment laptops, look for at least 500GB for storing your photos, video, music and more.

Intel's Core i3/i5/i7 processors have become the standard for most laptops, particularly ultraportables. AMD also makes mobile processors, which offer faster integrated graphics than Intel's current Sandy Bridge generation of Core processors (faster mobile Ivy Bridge chips may be here by the time you read this) but can't match them for application performance and energy efficiency. If you have a low budget, buying an AMD-based laptop may be the cheaper option.

If you're more serious about gaming, you'll need something with a little more grunt inside, such as nVidia's GeForce GT 555M or an AMD Radeon M graphics processor.





Photography by Dominik Tomaszewski



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

**PC ADVISOR
BEST BUY**

ASUS N55SF-S2276V

£699 inc VAT • uk.asus.com • tinyurl.com/7bf2osf

At 2.81kg, this Asus laptop is bordering on desktop-replacement territory and too heavy to be routinely carried around. It isn't the prettiest model in our round-up either, yet it has a very good set of specifications and a reasonable price tag.

The Asus' best feature is its screen. Its anti-glare matt finish means you'll experience none of the dazzle associated with gloss panels, yet the colours are deep and rich. Text and images are sharp, too, with the Asus packing 1600x900 pixels. Our only gripe is with the polished plastic screen bezel, which is infuriatingly shiny.

This entertainment-focused laptop has excellent audio credentials, with Bang & Olufsen-branded stereo speakers providing good sound quality even at high volumes.

Graphics are handled by an nVidia GeForce GT 555M, which is a real class act. We recorded 106fps in Fear at Maximum detail - considerably more than you need to make the game playable. Smooth frames are also important in video playback, of course, and the Asus is the only laptop in our group to include a Blu-ray drive. It's also remarkably quiet in operation.

The Asus proved the best of the bunch in application performance. It scored 122 points in our WorldBench 6 real-world speed test, putting it 10 points clear of its nearest rival. Perhaps not surprisingly, then, it trailed the pack in terms of battery life. Its 4.5-hour runtime is still usable, however.

Asus has provided enough ports to meet most of your connectivity needs, with VGA and HDMI for hooking up external monitors or projectors, and four USB ports - two of them USB 3.0.

Where this laptop falls down is in its keyboard, which has been squashed down to accommodate the speakers. Enough room remains for a sizeable touchpad, but the addition of a numeric keypad means some crucial keys are smaller than we'd like.

VERDICT: Asus UK supplied us with an obsolete model, but the similarly specified N55SL-52012V is available at around the same price with a 500GB hard disk. An impressive specification list is rounded off with strong performance and a very usable screen. Sound quality is also very good.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

HP FOLIO 13

£899 inc VAT • hp.com/uk • tinyurl.com/6vbmnmj

Intel is pushing a new category of thin-and-light laptops, known as Ultrabooks, with a blueprint that's remarkably similar to that of Apple's MacBook Air. HP is one of the first vendors we've seen to come up with something that offers great battery life and a build quality to rival the Air.

With a 1.6GHz Intel Core i5-2467M processor, 4GB of RAM and a 128GB SSD, HP's Folio 13 put in the second-best performance of the group in our WorldBench 6 test, where it scored 112 points. It's the Folio's battery life that really impressed us, though, and the HP ran to 7 hrs in our testing. That's even longer than the MacBook Air.

The 1.49kg Folio is adorned with the sort of looks that could inspire jealousy. There's a brushed-metal top and a smart keyboard, plus a rubbery black finish on the laptop's underside that aids grip.

The keyboard isn't just a looker either - all the important keys are situated where you'd expect to find them and very little scrimping on their size is evident. The one-piece touchpad is also well proportioned.

The Folio isn't for everyone, though, and predictably not gamers. The integrated graphics provided only 13fps in Fear at Max detail.

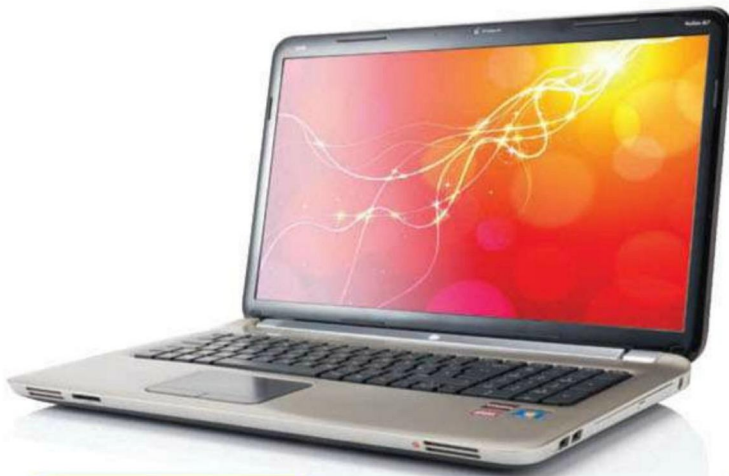
We were also disappointed with the screen finish. We've got no complaints about its deep, rich colours, but the panel's polished glass front makes it incredibly reflective. The Folio will prove difficult to comfortably use in many lighting conditions.

The display suffers the same problem as the Toshiba Z830-series laptops - too wide a bezel both above and below the screen, due to the use of a 16:9 widescreen panel in a chassis built for 16:10. An inlaid glass screen more effectively hides the mismatch here.

One of the HP's two USB ports supports the USB 3.0 standard, while an HDMI connection will be useful for hooking up an external display or console. Both 802.11b/g/n wireless and gigabit ethernet wired connections are possible. There's no optical drive, though.

An SD slot lets you add removable memory cards, which could help supplement the laptop's storage capacity of 128GB.

VERDICT: The Folio 13 is HP's first attempt at an Ultrabook, and we think it's largely got it right. The screen is disappointing, but this smart laptop performs well and keeps going for hours on end.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

HP PAVILION DV7-6101SA

£700 inc VAT • hp.com/uk • tinyurl.com/79ds9u6

It's still relatively unusual to see laptops with 1TB hard drives, and the HP Pavilion could be right up your street if you have large storage demands. In fact, the dv7-6101sa has several impressive specifications on paper, including a generous helping of 6GB of DDR3-1,333MHz RAM. Unfortunately, its performance leaves a lot to be desired.

As the only contender in this group test to use an AMD processor, the HP has a 2.1GHz A4-3310MX APU. This dual-core chip is short on grunt for competing with Intel's Core i5 chip, and is outclassed even by the firm's four-year-old Core 2 Duo-series processors.

Only the Core i3-powered Toshiba Portégé scored fewer points than this HP in our WorldBench 6 speed test. Its 84-point tally is 16 points below that of its next-fastest rival and 38 off the leader.

The benefit of AMD APUs are instead found in their integrated graphics capabilities. Whereas an Intel-based model such as the HP Folio 13 scored just 13fps in Fear at Maximum detail, its AMD-based sibling was able to muster a playable 46fps. Hardcore gamers will be better served by the Asus N55SF-S2276V, however.

Battery life isn't bad at 5 hrs 6 mins, and a match for the Samsung NP530U4BL, but some way off the best on test. Given the laptop's 3.14kg weight, you're unlikely to lug it about in any case.

On the plus side is the HP's design. Not only does it look nice, with a brushed-metal finish and a modern interior, but it's been reasonably well put together, with a robust-looking chassis.

A huge 17in screen offers good colour depth and sharp images, but its glossy screen will dazzle in direct light. It packs in the same number of pixels as the 15.6in Asus, which means its 1600x900 resolution doesn't stretch to a full-HD image.

A Beats Audio-branded speaker system offers usable sound quality, although the Asus does a better job with its Bang & Olufsen setup. We found distortion audible at high volumes.

A tray-loading optical drive handles the usual plus-and-minus DVD-recording formats, as well as dual-layer media.

VERDICT: While the £700 price is inviting, this HP Pavilion is bigger and slower than most laptops. Nevertheless, it's a viable low-cost desktop replacement with some entertainment features and plenty of storage.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

SAMSUNG NP530U4B

£799 inc VAT • samsung.com/uk • tinyurl.com/7cf7xp4

Samsung's NP530U4B is relatively lightweight, but somewhat different to most so-called 'Ultrabooks' we've seen - not least because it has an optical drive and a 500GB hard drive.

In keeping with its Ultrabook name, this Samsung laptop is not completely devoid of solid-state silicon. There's 16GB of flash storage built into the Seagate Momentus XT hard disk, on to which data regularly accessed by the system is stored. You get some of the benefits of SSD storage, while having more room for file storage.

The 14in screen's matt finish is a boon for usability. We also like the Samsung's keyboard, which has well-spaced keys and dedicates ample room to those deemed most important. There's also a large touchpad at the front of the chassis.

The handy provision of three USB ports is decent for an Ultrabook, and two support USB 3.0. There are video ports for VGA and HDMI, an SD Card reader, plus a port for gigabit ethernet, which can be closed off when not in use to preserve the laptop's sleek lines.

This laptop's main problem is that it will inevitably be compared to Samsung's other Ultrabook line-up, the Series 9. Faced with this tough competition, the Series 5 doesn't come out smelling of roses. Its grey plastic chassis not only looks dull when set against the metallic Series 9, but also runs very hot on its bottom left side.

The Samsung is heavier than most Ultrabooks, at 1.77kg, and thicker. This we can forgive, given the benefits provided by more storage and an optical drive. But we can't forgive its performance.

A 1.6GHz Intel Core i5-2467M processor and 4GB of DDR3 RAM really should have put in a better showing in our WorldBench 6 test than the Samsung's 100-point score attests. This laptop isn't tragically slow, but we'd expect most modern Intel-based laptops to score in excess of 110 points.

Its 7fps score in our Fear gaming test (Maximum detail) is also pretty sluggish, while we might expect longer than 5-hour battery life from a laptop designed to be highly portable.

VERDICT: The price is reasonable and the screen is good, but we were disappointed by the NP530U4B's performance. Nevertheless, it's worth considering if you need more storage and an optical drive.

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TOSHIBA PORTÉGÉ Z830-10P

£959 inc VAT • toshiba.co.uk • tinyurl.com/82gcvje

Toshiba has a number of Ultrabooks on the market, and all are based on the same chassis design. The Portégé Z830-10P is one of its lower-spec models aimed at business users. This version takes a 1.4GHz Intel Core i3 processor, whereas most of its rivals favour a 1.6GHz or faster Core i5 chip. Performance is therefore less impressive – something that isn't reflected by Toshiba's pricing.

Indeed, the Toshiba Portégé scored just 81 points in WorldBench, making it the slowest in our round-up. It also performed rather poorly in our Fear gaming test, where its Intel integrated graphics could muster only 16fps at Maximum detail.

Battery life is good, though. We recorded 6 hrs 43 mins in MobileMark 2007, putting the Toshiba just 17 mins behind the leader.

The Portégé's functional design won't be to everyone's taste. The Z830 series has a huge bezel above and below the screen, making it look like a product of the 90s.

The keyboard is reasonable, although the Return key is small. It is backlit, though, making it easy to use in the dark. We like the ability to quickly turn off the touchpad using a dedicated button, and the Power switch is separated from the main keyboard.

The screen has a matt finish, so reflections aren't a problem, although the colours look muted. More concerning, though, is how flimsy the lid appears to be – you can see the display wobble back and forth as you type.

The connectivity options are good, and include dual-band 802.11a/b/g/n wireless. Many of the Portégé's ports are situated out of the way on the back edge of the laptop.

Importantly, for business users, the Toshiba runs Windows 7 Professional and is very light and easily portable, at just 1.09kg.

VERDICT: The most expensive model in our round-up, the Toshiba Portégé Z830 is remarkably similar to the Toshiba Satellite Z830. However, it packs less memory and has a slower processor than its sibling, resulting in slower speed but longer battery life. Given that it has a cheaper CPU than the Satellite, all we can see to justify the price hike is the installation of Windows 7 Professional.



TOSHIBA SATELLITE Z830-10U

£899 inc VAT • toshiba.co.uk • tinyurl.com/7wtkm8g

The Satellite Z830-10U is identical to the Portégé Z830-10P, save for a small 'Satellite' logo at the bottom left of the keyboard. Inside, the componentry tells a different story. Despite being the less expensive of the two Toshiba Ultrabooks, this Satellite has a more powerful processor and an extra 2GB of DDR3 RAM.

Indeed, whereas the Portégé runs a 1.4GHz Intel Core i3-2367M, the Satellite takes a faster 1.6GHz Core i5-2467M. Performance is significantly better here, and the Satellite scored 106 points against the Portégé's 81 in WorldBench 6. It also scored six points more than the Samsung, which runs the same processor but has less RAM.

This additional power sips a little more juice from the battery; while the Portégé was able to endure 6 hrs 43 mins in MobileMark 2007, the Satellite could last only 6 hrs 10 mins. That's still a useful amount of unplugged runtime, however.

As with its sibling, the Satellite's Intel integrated graphics were able to manage only 16fps in Fear at Maximum detail; gamers will certainly want to look elsewhere.

With the two laptops built using the same chassis design, the Satellite shares many of the Portégé's faults – the flimsy lid and colour-muted screen being the most significant.

However, it has many of its plus points, too – the backlit keyboard is very usable, even if its rectangular keys just look wrong. And both laptops are impressively quiet in operation.

There are ports aplenty, including full-sized ethernet, VGA and HDMI, as well as three USB ports – one of which is a USB 3.0 connection for faster transfer to compatible drives. This is something you'll need to consider with only 128GB afforded by the SSD.

The Toshiba is among the lightest Ultrabooks available, at 1.09kg, making it incredibly portable. You won't want to carry around this laptop without a decent case to protect it, though – it's too fragile.

VERDICT: The Toshiba Satellite Z830-10U costs less than the Portégé Z830-10P and has better hardware specifications. Business users will have to swallow the difference to get Windows 7 Professional. For anyone else, the Satellite is the better option of the two Toshibas.

Conclusion

Ultraportable laptops often trade storage and other key elements for portability, but not so the Samsung NP530U4B. Not only does this laptop sport a 500GB hard drive with a 16GB SSD built-in, but it also has an optical drive. It's not the most portable Ultrabook we've seen, though, and it runs too slow and too hot for our tastes.

Impressive on paper, but unable to make the grade, is HP's Pavilion dv7-6101sa. This laptop has a huge 1TB hard drive and offers reasonable graphics performance, but it disappointed in WorldBench.

The two Toshiba Z830-series laptops are nigh on identical, differentiated mainly by their choice of processor and OS. Inevitably, this has a knock-on effect on performance and pricing, too. The Satellite came out on top in our tests, although the Portégé, which runs Windows 7 Professional, may appeal to business users.

The HP Folio 13 is a smart ultraportable and would be even more attractive if it was £200 cheaper. It has good battery life and relatively quick speed, but also a reflective display.

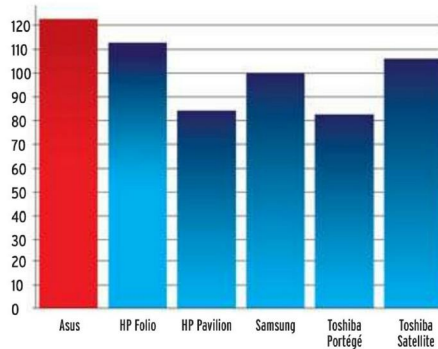
The Asus N55SF-S2276V is the clear winner in our group test, although this model has now been discontinued. However, the N55SL-S2012V is available for the same price with a smaller hard disk, and any similarly specified N55 variant is worth investigating.

But if you're looking to buy the best laptop under £1,000 today, we'd advise seeking out one out with an as-yet unreleased Intel Ivy Bridge processor. These should introduce even better battery life and improved graphics. Alternatively, if you're after a bargain, use those chips' arrival as a means to seek a discounted price on any Intel laptop with last year's Sandy Bridge processor inside.

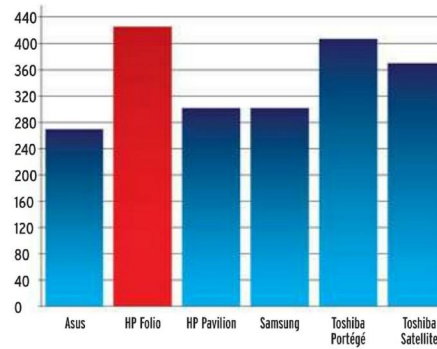
	ASUS £699 inc VAT ★★★★★ PC ADVISOR BEST BUY	HP £899 inc VAT ★★★★★	HP £700 inc VAT ★★★★★
Product name	N55SF-S2276V	Folio 13	Pavilion dv7-6101sa
Part code	N55SF-S2276V	BON00AA#ABU	LS690EA#ABU
Processor	2.4GHz Intel Core i5-2430M	1.6GHz Intel Core i5-2467M	2.1GHz AMD A4-3310MX APU
Screen size and type	15.6in matt LED-backlit	13in glossy LED-backlit	17.3in glossy LED-backlit
Resolution (pixels)	1600x900	1366x768	1600x900
Operating system	Windows 7 Home Premium 64bit	Windows 7 Professional 64bit	Windows 7 Home Premium 64bit
RAM	6GB DDR3-1,333MHz	4GB DDR3-1,333MHz	6GB DDR3-1,333MHz
Storage	640GB 5,400rpm HDD	128GB SSD	1TB 5,400rpm HDD
Graphics	nVidia GeForce GT 555M, 2GB VRAM	Intel HD Graphics 3000	AMD Radeon HD 6515G2, 1GB VRAM
Video out	HDMI, VGA	HDMI	HDMI, VGA
Audio	Stereo speakers, headphone jack, mic	Stereo speakers, headphone jack, mic	Stereo speakers, headphone jack, mic
USB	2x USB 3.0, 2x USB 2.0	1x USB 3.0, 1x USB 2.0	2x USB 3.0, 2x USB 2.0
Firewire/eSATA	N/A	N/A	N/A
Optical drive	BD-ROM/DVD±RW	N/A	DVD±RW DL
Wireless	802.11b/g/n, Bluetooth 3.0	802.11b/g/n, Bluetooth 3.0	802.11b/g/n, Bluetooth 3.0
Ethernet	Gigabit	Gigabit	Gigabit
Card slot	SD Card reader	SD Card reader	SD Card reader
Other features	Webcam	Webcam	Webcam, fingerprint reader
Battery	60Wh lithium-ion (removable)	60Wh lithium-ion (non-removable)	60Wh lithium-ion (removable)
Battery life ¹	4 hrs 28 mins	7 hrs 0 mins	5 hrs 6 mins
WorldBench 6 score ²	122	112	84
Fear score (Max) ³	106fps	13fps	45fps
Dimensions	379x261x35.5mm	319x220x18mm	416x275x35mm
Weight	2.81kg	1.49kg	3.14kg
Warranty	2 years	1 year	1 year

¹Tested using the BAPCo MobileMark 2007 Productivity benchmark ²For an explanation of WorldBench 6 see page 82 ³Tested using Fear's built-in frame-measurement tool, at Maximum detail

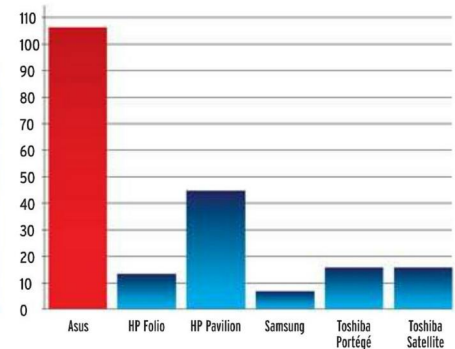
WorldBench 6 score



Battery life (mins)



Framerates in Fear (Max detail)



SAMSUNG £799 inc VAT ★★★★★	TOSHIBA £959 inc VAT ★★★★★	TOSHIBA £899 inc VAT ★★★★★
NP530U4B	Portégé Z830-10P	Satellite Z830-10U
NP530U4B-A01UK	PT224E-00H00MEN	PT22LE-00F004EN
1.6GHz Intel Core i5-2467M	1.4GHz Intel Core i3-2367M	1.6GHz Intel Core i5-2467M
14in matt LED-backlit	14in matt LED-backlit	14in matt LED-backlit
1366x768	1366x768	1366x768
Windows 7 Home Premium 64bit	Windows 7 Professional 64bit	Windows 7 Home Premium 64bit
4GB DDR3-1,333MHz	4GB DDR3-1,333MHz	6GB DDR3-1,333MHz
500GB 5,400rpm HDD + 16GB SSD	128GB SSD	128GB SSD
Intel HD Graphics 3000	Intel HD Graphics 3000	Intel HD Graphics 3000
HDMI, VGA	HDMI, VGA	HDMI, VGA
Stereo speakers, headphone jack, mic	Stereo speakers, headphone jack, mic	Stereo speakers, headphone jack, mic
2x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0	1x USB 3.0, 2x USB 2.0
N/A	N/A	N/A
DVD±RW DL	N/A	N/A
802.11b/g/n, Bluetooth 3.0	802.11a/b/g/n, Bluetooth 3.0	802.11a/b/g/n, Bluetooth 3.0
Gigabit	Gigabit	Gigabit
SD Card reader	SD Card reader	SD Card reader
Webcam	Webcam	Webcam
46Wh lithium-ion (non-removable)	46Wh lithium-ion (non-removable)	46Wh lithium-ion (non-removable)
5 hrs 6 mins	6 hrs 43 mins	6 hrs 10 mins
100	81	106
7fps	16fps	16fps
333x230x21.5mm	316x227x16mm	316x227x16mm
1.77kg	1.09kg	1.09kg
1 year	1 year	1 year

NAS drives group test

Network-attached storage is an essential part of our digital lives. Bring a NAS device into your home or office, and you can make a single multi-disk NAS work even smarter for you. Andrew Harrison reviews a powerful quartet of four- and six-bay NAS drives



Photography by Dominik Tomaszewski

Computing is getting smaller and more mobile. Laptop hard disks are increasingly replaced with solid-state storage, which accelerates performance at the expense of capacity. There has never been a better time to employ network-attached storage (NAS) and store your data online.

At the medium- to large-business level, NAS solutions can now house entire virtual machines (VMs), with individual PCs as clients that log into a centrally managed virtual PC. But for most people, whether you're a consumer, enthusiast or small

business, a NAS drive is fundamentally a central repository to securely keep on tap your gigabytes – even tens of terabytes – of essential data.

In the office, that could be business databases or collaborative projects, while for most home installations it's more likely to be media files. A NAS drive is the

perfect home for archives of stored music and photos, as well as video files captured from TV, DVD and Blu-ray.

Performance

Performance is all about good read and write speeds. While a hard disk mounted inside your PC can copy files and play video with ease, the same isn't always true when that disk is network-attached. A fast processor is the gateway to ensuring the server software running on the NAS can quickly juggle data on demand.

Look for good write speeds. Good read speeds are easier to find, but a slow NAS will dawdle with file writes and keep you waiting, and waiting, to copy over big files. Demand at least 40MB per second (MBps) for sequential writing; the best units will reach and exceed 100MBps.

Rather than simply choosing the fastest processor, which will hit you hard in the pocket, you may like to consider power

consumption. A faster NAS will cost you more to run, and often require more and louder cooling during operation.

Ease of use

You'll use an admin interface, accessible through your web browser, to install the NAS on your network. These vary in complexity and ease of access, for both essential and deeper functions.

Some admin interfaces are text-heavy, but a graphical approach can simplify administration duties for less tech-savvy users. When there are so many possible features peripheral to the core task of file serving, you'll need all the skilled interface design you can find to make your storage investment really work for you.

Features you need

All modern NAS drives now include at least one gigabit ethernet port. Unless you have a 10Gb router and a switch that handles link aggregation to your compliant dual-port NAS, the effective speed limit of your storage will be inside the 1Gb network window – around 115MBps in practical terms.

The more bays the merrier. Dual-bay enclosures allow only Raid 0, which is good for speed but offers poor data security, or Raid 1, which halves your available storage space and undermines performance. With four bays or more, a whole world of useful choices become available. Most common is Raid 5, which forms a parity array and stripes data across three or more disks. This enhances read/write performance, while simultaneously affording one disk's breakdown without you losing everything.

Six-bay NAS drives make future expansion easier, and sacrifice less space to redundancy data. For home media use, every modern NAS includes server software that enables the sharing of photos, video and audio to a UPnP-compliant client such as flat-screen TV.

Security camera recording is also possible on all the units tested here. If you need to use this function, check to see whether your camera is supported.



OMEGA STORCENTER PX6-300D

£1,300 inc VAT • go.iomega.com • tinyurl.com/7at8ha5

Iomega is known as a supplier of desktop storage products, most famous of which was its Zip drive technology in the 1990s. Today, the company is the consumer-facing division of enterprise-storage heavyweight EMC, after it bought Iomega four years ago.

The StorCenter px6-300d is billed as a server-class NAS drive for business, and is typically supplied pre-stuffed with enterprise hard drives. In the £1,300 sample we tested, six 1TB Hitachi disks were fitted. Iomega also sells the unit with up to six 3TB disks, giving you 18TB of unformatted storage, or you can buy the px6-300d as a diskless chassis for around £550.

Disks are stacked horizontally through the unit's front, with a perforated plastic hinged door to cover the drive bays. The StorCenter can be configured in Raid 0, 1, 5, 6 or 10 or Jbod (just a bunch of disks) modes, with the option for a hot spare to maintain operation if one disk fails.

Hardware features

A large LCD and two push buttons provide basic information about the state of the Iomega NAS drive, including the used and free storage capacity, the IP address and the current time and date. One USB 3.0 port also faces the front.

At the back are two 80mm fans to draw in air across the disks. Two gigabit ethernet ports are available, which can be configured for load balancing and dual-link aggregation (802.3ad), as well as failover. Two more USB 2.0 ports feature here, too. Rather than being used for additional storage, a more likely use of one of these ports would be for an UPS unit, which can instigate a controlled shutdown following the loss of mains power.

What looks very much like a PCI expansion slot is also found on the rear panel, but Iomega provide no documentation for its use.

Powering the StorCenter is a dual-core 1.8GHz Intel Atom processor, with a generous 2GB of DDR3 memory. Despite its large case, Iomega was unable to find room for an internal power supply. A large 120W external power brick is supplied.



The StorCenter's overall construction is to a high standard, with a metal chassis and a plastic fascia and door.

Initially supplied with 2TB Hitachi Deskstar 7K3000 hard disks, Iomega replaced these with six 1TB Hitachi Ultrastar A7K3000 enterprise disks before our testing.

Software features

As a business-ready NAS drive, the Iomega carries certification for an array of virtualisation solutions, including Citrix XenServer, VMware vSphere and



Microsoft Windows Server. As with many small- to medium-business (SMB)-level NAS drives, you can also configure the unit for video surveillance. Up to 10 IP cameras can be connected, with support for Axis, Bosch and Panasonic models. Other brands can be used, but will require manual configuration.

Iomega's graphical admin interface is simple to navigate, and we found it straightforward to manually set up the NAS drive. Consumer-friendly features include active share folders, such as a Facebook share. Any photos dropped into this will be automatically uploaded to your Facebook account.

Performance

The dual-core processor at the heart of the Iomega allowed for speedy file transfers, if not the fastest in our group test.

As with all the NAS drives here, the Iomega's read speeds with files above 1MB were constrained more by the gigabit interface than the NAS drive or its disks. We saw sequential read speeds exceed 110MBps for 6MB and greater data sizes.

Write speeds were good, with the Iomega managing 16.5MBps for 1MB data, rising to 48MBps for 10MB, and peaking at 56.5MBps with the largest 100MB data.

Power consumption was commensurately higher, given that the NAS spins six rather than four disks and employs a dual-core Intel rather than ARM processor. The StorCenter consumed 22W when idle, with power consumption peaking at 50W when the NAS was under load during our benchmarking.

VERDICT: Strong support for enterprise-server and virtualisation packages, along with other useful business credentials, enable us to recommend the Iomega StorCenter as a relatively cost-effective storage solution for small-business use. Consumer add-ons make the unit of interest for home use, too. Its read/write performance is decent, if not the best in our group test.

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NETGEAR READYNAS PRO 6

£1,900 inc VAT • netgear.com • tinyurl.com/84jd226

Netgear needs little introduction as a network-hardware brand that straddles consumer and business markets. Its ReadyNAS Pro 6 sits more squarely in the latter camp, bristling with features that let it integrate into business environments.

The ReadyNAS Pro 6 distinguishes itself from most NAS drives that rely on lower-power processors by fitting a regular desktop PC-class Intel chip. Most models we see in the SMB class use an ARM or netbook-class Intel Atom CPU. While the choice may seem extravagant, it should afford the Netgear decent performance, at the cost of higher power consumption.

Like the Iomega, a door swings out, hinged at the left, to allow access to a horizontally stacked array of six drive bays. But like the two-bay Netgear ReadyNAS Duo v2 (tinyurl.com/bmsdr74), the solid all-metal construction is let down by poor craftsmanship – in this case, a warped door that refused to stay closed.

Hardware features

Netgear offers a choice of storage bays across the same ReadyNAS Pro line (two-, four- and six-bay). That's not so unusual, but here you can also select between standard enterprise hard disks and cheaper desktop disks. The latter models are identified in the product code with a D suffix, such as RNDP6610-200D. Sysadmins and power users looking to configure their own storage should note that Netgear doesn't supply the ReadyNAS Pro in diskless form.

On the unit's front is one USB 2.0 connection for impromptu data dumps, and there's a faster USB 3.0 port on the rear. Two fans on the Netgear's rear panel – a large 120mm unit above and a smaller 80mm type below – keep the disk and processor temperatures in check. Two gigabit ports are also available, for either failover or link aggregation to enhance throughput.

The Netgear is the only NAS drive in this group test to feature an internal power supply, adding to its professional credentials.

A front-mounted display adds a touch of class not seen elsewhere – this is an OLED panel, whose light-blue glow is complemented by

an LED-lit main power button.

Our test sample was fitted with six 1TB enterprise-class disks from Western Digital.

Software features

The Netgear has the most old-fashioned admin interface here. That won't be an issue for experienced sysadmins, but it makes the NAS less inviting to network newbies. Even experienced users may have to dive into the documentation to understand Netgear's misdirected attempts to simplify disk configuration, however.



The default configuration is Netgear X-Raid2, which allows extra disks to be added to expand capacity; you can also use Netgear Flex-Raid, which is really just a posh way to say standard Raid 0, 1, 5, 6 or 10 modes, with an option for volume expansion. In real-world use, we can't see how this differs from, say, Qnap's standard Raid setups with options for Raid migration.

The Netgear's setup process is unusually complex, since you can't configure Raid through the standard admin browser interface that's used to tweak all other parameters. Instead you must use a special app, Netgear Raidar Utility, which is available for Mac, Linux and Windows platforms and coded in Java.

Performance

The six 1TB WD disks, driven by a full-fat Intel dual-core processor, didn't disappoint in the performance stakes. The Netgear was the clear leader in large-file write speeds in our benchmarks.

Like all other NAS drives in this group, it could comfortably meet gigabit speeds for large file reads. And in write performance, the Netgear also proved to be the fastest unit – at 1MB it could write at around 17MBps, rising to 50MBps for 10MB data and 85.5MBps for 100MB data.

For our power-consumption tests, we stressed the Netgear ReadyNAS with the Blackmagic Disk Speed Test, where we noted that even larger data chunks (1-5GB) could sustain 110MBps, in both directions – a good result.

When idle the Netgear slurped 40W (5W more than the Qnap TS-419P II under load), and up to 84W in active use.

VERDICT: Netgear's six-bay ReadyNAS Pro 6 is a sterling NAS drive, with professional features and performance to match. The admin interface is tricky to use, and our sample was let down by a warped door that wouldn't stay closed, but the Netgear is otherwise very solidly built in its full-metal jacket.

QNAP TS-419P II

£425 inc VAT • qnap.com • tinyurl.com/72n4gbn

Taiwanese Qnap is a relative youngster, founded in 2004, but it has already carved itself a deep niche as a supplier of dependable network-storage products for home and business use.

The Qnap TS-419P II is a subtly improved version of the last four-bay Qnap NAS we reviewed, the TS-419P+ (tinyurl.com/3zk5Ljg). The only difference here is a new 2GHz Marvell ARM processor, up from the TS-419P+'s 1.6GHz CPU, which itself was an upgrade from the 1.2GHz chip in the original TS-419P. Qnap says it will also upgrade the USB 2.0 ports to USB 3.0 this May.

In our experience of Qnap products, the hardware is the initial stand-out feature – solid metal cabinets with quality engineering throughout. This home/SOHO four-bay model misses out on the lockable bay doors found on Qnap's SMB products, but the hardware layout is otherwise consistent across the range.

With its single-core ARM processor, the Qnap runs efficiently and generates little heat or noise, but lacks the raw power for heavy-duty file-serving jobs. When idling with the disks spun down, it drew just 11W of power through its external power supply block. This rose to a still-reasonable 35W with our Hitachi Deskstar disks busying themselves with our benchmark tasks.

Hardware features

A two-line backlit LCD relays basic but useful information about the state of the drive. From here, you can quickly check the unit's current IP address, read error messages and even start the setup process for a virgin system. LEDs above each bay denote activity, or when a disk has fallen out the Raid. One front-mounted USB port allows easy transfer of data from a USB drive to the NAS or vice versa.

At the back are two more USB connections, plus two faster eSATA ports for auxiliary hard drives. You can set backup jobs to such external disks, synchronising internal data to outboard storage, through the web-based admin interface.

Two gigabit ethernet ports allow the NAS to connect to two virtual networks or provide failover, but there's no option for dual-line aggregation to increase performance.



Software features

Disk configuration options comprise Raid 0, 1, 5, 6, 10 and Jbod linear. You can also build a Raid array with global spare disk, and bitmap volumes to assist data integrity.

The TS-419P II includes the usual file-sharing protocols of CIFS, AFP and NFS, for Windows, Mac and Unix/Linux systems.

**PC ADVISOR
RECOMMENDED**

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



Qnap has added a Twonky UPnP media server and iTunes server, and more recently VPN services and antivirus scanning.

The QPKG Center is a mini-app store, from which you can download packages such as WordPress, Squeezebox and a Transmission bittorrent client. MyCloudNAS 1.2 lets you share files outside the local network even though they are stored locally on the NAS.

Qnap's TurboNAS 3.6 firmware has an interface that's been broadly unchanged for several years. Its mix of graphics and text is relatively easy to navigate, with a fixed sidebar on the left of the window for links to each module and service. Powerful features such as rsync (a Unix file/folder synchronisation app) allow reliable backups to another Qnap or other rsync-compatible NAS drive.

An administrator can check system resources in a real-time graph, or view a table of running processes.

Our only gripe is the inability to set power-down times for external connected hard disks.

Performance

With the slowest processor (2GHz) and lowest RAM quota (512MB) in this group, we didn't expect to get the fastest performance from the Qnap. However, it's more than capable for home and SMB use.

In our sequential read speed tests, the drive was easily able to approach gigabit ethernet speeds for files exceeding 6MB size, and even 256kB files read at 91MBps.

Write performance is, of course, the casualty of underpowered NAS systems, and here the Qnap betrayed its more budget-friendly price point. Down at 1MB level, files were copied at just 12.5MBps, rising to 30MBps for 10MB-sized data. Maximum writing speed topped out at 40.5MBps with 100MB data.

VERDICT: Qnap's four-bay NAS drive is the cheapest in our round-up, at £425 without disks, but it will ably form the hub of a versatile and capacious online storage system.

SYNOLOGY DS412+

£520 inc VAT • synology.com • tinyurl.com/6uuL4de

Synology has been in the NAS business for a dozen years now and has a wide range of models, from single-bay home table-top units to 12-bay and rackmount storage drives.

The DiskStation SMB range includes eight units, recognisable by a + suffix that denotes enhanced performance for busier workloads. The DS412+ is a development of the DS411 and DS411j, but adopts a new case design that suggests it's built for business use.

In place of 1.6GHz or 1.2GHz processors in the former models, the DS412+ takes a dual-core 2.13GHz Intel Atom chip - the same that Synology fits into its DS1511+ and DS1812+ five- and six-bay units.

The DS412+ echoes the build quality of Synology's other products, with a predominantly lightweight plastic construction. In place of a sturdy metal chassis and hinged doors are plastic bay trays and a pop-off plastic frontpiece. And the Synology is the only NAS in this group to omit any form of illuminated display.

Hardware features

As well as having one of the fastest processors you'll find in a NAS up to medium-business size, the DS412+ is well served in connectivity options. Two gigabit ethernet ports can be configured for link aggregation, if you have a compliant switch with 10Gb ports. This explains how Synology has been able to boast top read- and write speeds exceeding 205- and 182MBps respectively.

As well as a USB 2.0 port at the front, Synology has provided two USB 3.0 connections at the rear. Equally useful for hooking up a high-speed external drive is an eSATA port.

The power supply is external, a chunky 100W block, while two 92mm fans keep the four disks cool in operation. Synology lists the processor stage as passively cooled.

The plastic boxwork may not imbue the DS412+ with the same business-class feel as other NAS drives, but the choice of construction makes this unit quieter. This is helped by such neat touches as rubber grommets around the disk-mounting screws, which conspicuously reduce frame vibration being transmitted through the case. The result is the quietest NAS in the group.

A line of green LEDs indicate disk activity, while a Status LED tries unsuccessfully to emulate the slow pulsing effect of Apple hardware when idle.



Software features

We've found Synology to have the most attractive and easy-to-use firmware in the business. The latest DSM 4.0 package brings the admin interface even closer to the

**PC ADVISOR
BEST BUY**

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



appearance of a fully fledged modern PC OS, with its inclusion of a handy system monitor panel to the right, and individual modules that move with animations to the top-mounted dock when minimised.

It may look simple, but the smart interface successfully skins a very powerful set of options. There are the usual file-share protocols of CIFS, AFP, NFS and FTP, plus WebDAV, and a host of business virtualisation packages (VMware, Citrix and Microsoft). Synology exCloud makes it straightforward to allow remote access to the drive, but Synology also takes security seriously. A default installation, for instance, disables all guest access, and a firewall and Auto Block help to keep out unwanted visitors.

More fundamentally liberating can be Synology's SHR Raid system, which allows disks of disparate sizes to create one volume.

In the negative column, the use of Synology's rsync backup function to another NAS drive results in a myriad of files and directories labelled '@eaDir' to be scattered throughout the volume.

Performance

The Synology's read speeds were fast in our tests, reaching 100MBps with small 512kB files, and rising to our gigabit network's maximum of 112MBps with all data above 20MB size.

All-important write speeds were excellent across a range of file sizes, plateauing at around 70MBps in our tests. From 1MB and 10MB files, we saw write speeds of 20MBps and 54MBps respectively. The Synology was the second-fastest NAS in the group overall, beaten only by the Netgear ReadyNAS with its desktop processor.

Yet the DS412+ also has one of the lowest power consumption figures, idling at just 15W with its disks spun down.

VERDICT: Like Qnap, Synology is a Taiwanese brand that specialises solely in NAS technology - and it shows. The DS412+ is an extremely capable NAS that will have a very broad appeal. It also has superb read/write performance and a best-in-class interface.

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Conclusion

There were no losers in this round-up - all four NAS drives worked very well in our tests. The Iomega StorCenter px6-300d is a good all-rounder. It's expensive when bought with six disks, but offers better value with none, at £550. It provides usefully quick file-copy performance and a wealth of features for use in a business environment.

If performance is the goal, the Netgear ReadyNAS Pro 6 delivers. It's not the most intuitive to set up but, once it's running, you'll find it fast and capable. Material quality is decent, but would benefit from better quality control during assembly.

The Qnap is the cheapest unit on test, but it offers all the essential features of

a powerful NAS drive. Build quality and economy are its stand-out assets. For more modest duties, its ARM processor is all you'll need to serve up data on-demand.

The Synology DS412+ struck the best balance between economy and performance, with excellent read/write performance in an attractive, quiet and well-featured chassis. We also found it the easiest to manage through Synology's approachable and thoughtfully designed DSM interface.

How we test

Where NAS units were supplied with disks, these were left in place for testing; the two diskless drives were fitted with

four 2TB Hitachi Deskstar 7K3000 disks (HDS723020BLA642). These are 7,200rpm SATA 6Gbps drives, with a 24x7 availability rating, and are well-suited to NAS apps.

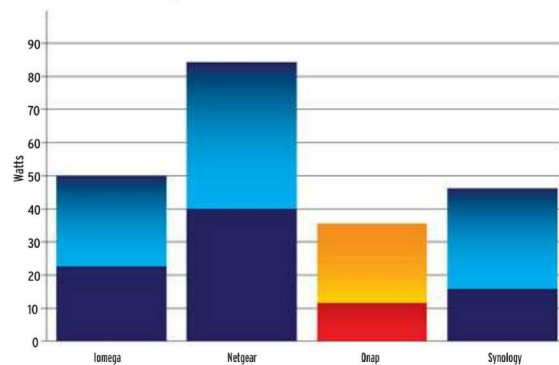
All NAS units were configured to use a Raid 5 array, allowing us to test performance in the most common setup.

We tested on an isolated local gigabit network with a DrayTek 3900 router, Netgear gigabit switch and Cat 6 cabling. Read/write performance was measured with QuickBench on a MacBook Pro, using AFP for its improved large-file sequential performance. The power consumption was recorded at idle with disks spun down, and with the system under load. ☒

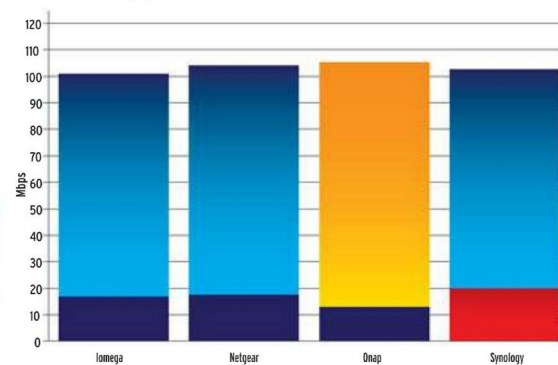
	IOMEGA £1,300 inc VAT 	NETGEAR £1,900 inc VAT 	QNAP £425 inc VAT  PC ADVISOR RECOMMENDED	SYNOLOGY £520 inc VAT  PC ADVISOR BEST BUY
Product name	StorCenter px6-300d	ReadyNAS Pro 6	TS-419P II	DS412+
Product code	35659	RNDP6610-200	51000-023002-RS V1.0	DS412+
Number of drive bays	6	6	4	4
Processor	1.8GHz Intel Atom D525 dual-core x86	2.66GHz Intel Pentium dual-core x86	2GHz Marvell 88F66282 single-core ARM	2.13GHz Intel Atom D2700 dual-core x86
Memory	2GB DDR3	2GB DDR2 (ECC)	512MB DDR3	1GB DDR3
Ethernet	2x gigabit	2x gigabit	2x gigabit	2x gigabit
USB 2.0 ports	2x rear-facing	1x front-facing	1x front-, 3x rear-facing	1x front-facing
USB 3.0 ports	1x front-facing	1x rear-facing	N/A	2x rear-facing
eSATA	N/A	N/A	2	1
Cooling fan(s)	2x 92mm	1x 120mm, 1x 90mm	1x 90mm	2x 92mm
Power supply	External 19V/6.32A	Internal	External 12V/10A	External 12V/8.33A
Firmware	3.2.3.15290	Raidiator 4.2.19	Turbo NAS 3.6.1	DSM 4.0-2228
iSCSI	Yes	Yes	Yes	Yes
Mobile apps	Iomega Link ¹	Genie, ReadyNAS Remote, RS Cloud ¹ , ReadyNAS Surveillance	Qmobile, Vmobile, Qfile ¹	DS file, DS audio, DS photo+, DS finder, DS camDS photo
Power consumption (idle)	22W	40W	11W	16W
Power consumption (load)	50W	84W	35W	47W
Dimensions	257x176x270mm	170x250x285mm	177x180x235mm	165x203x233mm
Warranty	3 years	5 years	2 years	2 years
1MB file copy (read)	101.5Mbps	104Mbps	105Mbps	102.5Mbps
1MB file copy (write)	16.5Mbps	13.5Mbps	12.5Mbps	20Mbps
10MB file copy (read)	111.5Mbps	111Mbps	110Mbps	111.5Mbps
10MB file copy (write)	48Mbps	50Mbps	30Mbps	53.5Mbps
100MB file copy (read)	111.5Mbps	111.5Mbps	106Mbps	112Mbps
100MB file copy (write)	56.5Mbps	85.5Mbps	40.5Mbps	67Mbps

¹iOS only

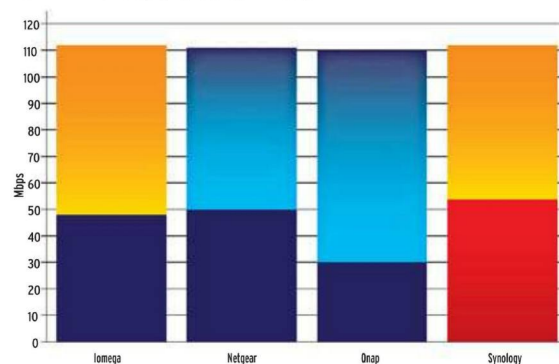
Power consumption (idle/max)



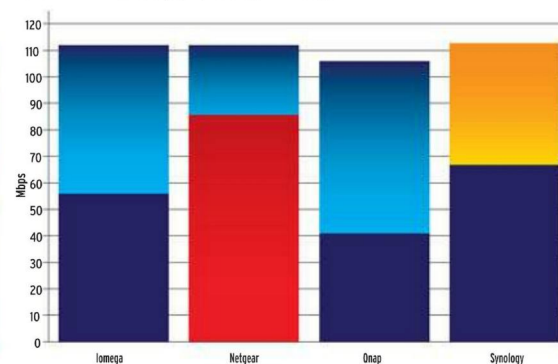
1MB file copy (read/write)



10MB file copy (read/write)



100MB file copy (read/write)



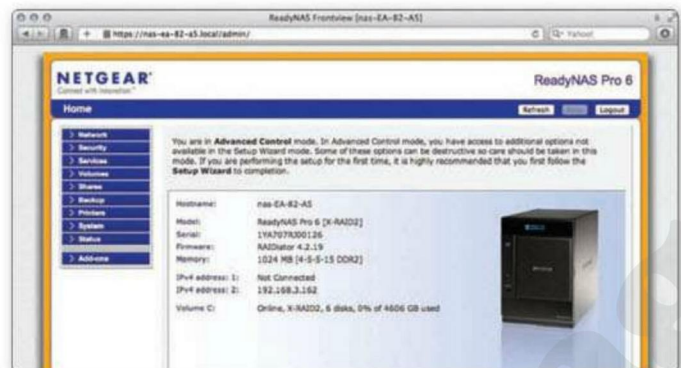
■ Max power consumption/Write speeds
■ Idle power consumption/Read speeds
■ Best max power consumption/Write speeds
■ Best idle power consumption/Read speeds

Admin interfaces

Most of your interaction with a NAS is not with the hardware directly, but through a software interface. A great graphical user interface will pay dividends in how much you can get out of your network storage.



IOMEGA packs a lot of facilities into its graphics-heavy interface



NETGEAR has a less inviting interface, but plenty of pro features



QNAP: Dig into the sidebar to find more features than you need



SYNOLOGY's interface resembles a complete PC operating system

Business desktop PCs

Paul Monckton looks at six desktop PCs primed for productivity, with conservative styling and pricing to suit your office requirements

General-purpose business computers aren't designed to produce the ultimate performance, multimedia or graphics power. Built for productivity, their main requirement is to run office applications such as your word processor, spreadsheet and email client, along with some web browsing. We expect conservative styling and competitive pricing, preferably below £500.

Provided you have sufficient RAM, almost any modern CPU will provide enough power for low-level administrative tasks. An exception here would be Intel's Atom processor, which barely has enough grunt to run Windows smoothly. Intel's dual-core i3 chips should provide ample performance for general use and come with integrated graphics, saving you the cost of buying a dedicated card.

AMD's Llano series of processors, such as the A8-3850, offer good value for money, but with performance shifted toward graphics processing rather than general-purpose computing. Performance scores in WorldBench 6 are therefore considerably lower for AMD-than Intel-based PCs at any given price.

A GPU integrated to the computer's CPU will provide enough graphics power for business applications, so don't waste money by adding a dedicated graphics card to your specification unless you're running a multiscreen setup.

The motherboard won't need the latest features, although some spare memory slots may prove useful if you decide to add RAM later. If you want an Intel processor, the low-cost H61 Express chipset should provide all you need for a basic office PC. Some sort of power-management and fan-speed control can also boost energy efficiency and help to create a more peaceful working environment.

A 4GB memory allocation is ample, with even 2GB likely to be sufficient. We'd expect to see only a standard processor cooler fitted, although better fans can help to keep down office noise levels.

In a typical networked business environment there will be storage available on the LAN, so you're unlikely to need a large hard drive. A 500GB drive will be ample unless your business involves storing a lot of video or other large media.

Wireless keyboards and mice can cause issues in the workplace due to interference. A wired kit is advisable, while quiet-typing keyboards can be less distracting to others.

For small businesses with just one or two Windows PCs, you may be tempted to save money by opting for Windows 7 Home Premium over the Professional edition. Don't go down this route if you need to run older software designed for Windows XP. Note, however, that

the Windows XP Mode available in the Professional edition places additional demands on the processor and memory, so it's worth investing in both if you'll be making frequent use of this feature. Look for a quad-core CPU and 8GB of RAM.

Windows 7 Home Premium also lacks the network backup and restore option and the ability to join Windows workgroups. Expect to pay an extra £50 for Windows 7 Professional.

Always pay close attention to the warranty offered with your PC. A longer period is preferable, but the terms are particularly important. When you're relying on your PC for the running of your business, an onsite arrangement can save you considerable time and money. Also check to see whether the vendor will collect faulty systems for repair or if you're expected to return them at your cost.





ARBICO FX4130 OFFICE PC

£500 inc VAT • arbico.co.uk • tinyurl.com/crtc8m8

The sober matt black exterior of Arbico's FX4130 Office PC is as visually unobtrusive as the sound emanating from its case. This quiet, compact system should fit comfortably into any office environment.

Its quiet operation is due to the pairing of a quiet Xigmatek Apache CPU cooler with an Ace Ecco 250 sound-dampened case.

Powered by a quad-core AMD FX-4100 processor running at 3.6GHz, we'd expect this PC to turn in the slowest WorldBench 6 score of all those in our round-up. But our 128-point estimate (see page 82) is evident of sufficient performance for general office tasks.

There's 8GB of system RAM fitted, which is typical in our group test and more than you're likely to need for running productivity software. You also get a fast 500GB SATA hard disk, which will prove ample if networked storage is available on the office LAN.

A wired Logitech MK120 keyboard and mouse set is provided by Arbico, which is the same budget combo offered by many of its rivals here. Usefully, it has a spill-resistant keyboard and quiet-typing keys.

On paper, the system looks well priced at £500, particularly given that the Professional edition of Windows 7 is preinstalled, offering Windows XP Mode and improved networking options for business use. However, we'd like to see a monitor and Microsoft Office software included at this price. While you may not need the extra performance and hard-drive capacity of the £549 Chillblast Fusion Obsidian, our Best Buy system is available for just £464 when supplied without a monitor.

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



VERDICT: Quiet and capable, the Arbico FX4130 Office PC delivers adequate performance for business work and is constructed with sound-damping materials that minimise any disturbances to colleagues. Windows 7 Professional is included in the price, but you can pay less elsewhere and get a better specification and faster performance – you won't need it, but it makes sense to get the most for your money. You'll also need to factor in the cost of a monitor.

CHILLBLAST FUSION OBSIDIAN

£549 inc VAT • chillblast.com • tinyurl.com/cnoaLaz

Featuring the 3.4GHz Intel Core i5-3570K Ivy Bridge quad-core CPU, Chillblast's Fusion Obsidian streaks ahead of the competition in raw performance. With a WorldBench 6 score of 176 points, you can be sure that this PC will chomp through heavy workloads with ease.

Packed with 8GB of DDR3 RAM and a 1TB hard drive, this PC combines the latest processor technology with plenty of disk space and a memory complement that won't need upgrading for some time. Ivy Bridge chips also consume less power than their predecessors, which is worth considering if you want to save energy costs in an office full of PCs. That said, it isn't the most energy-efficient machine in our round-up.

The motherboard is a vintage model in comparison to the CPU, featuring the H61 chipset used with second-gen Core processors. Ivy Bridge processors work just fine in these older boards, provided that the correct Bios has been installed, and the new features you miss out on as a result aren't needed for a business PC in any case.

No graphics card is required, since the integrated HD 4000 GPU does a good job by itself. It's capable of driving multiple monitors, and the Chillblast offers unbeatable transcoding performance.

The Fusion Obsidian features locking case nuts, designed to stop employees (or anyone else) from messing around with its insides.

The £549 price includes a high-quality 22in Asus VE228T full-HD monitor. It's considerably better-looking than the cheap AOC F22+ favoured by Eclipse and also delivers a superior picture. If you'd

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

**PC ADVISOR
BEST BUY**



prefer to select your own display, the system can be purchased at a reduced price of £464 inc VAT.

VERDICT: The Fusion Obsidian combines a long-term favourite budget motherboard with the latest Ivy Bridge processor technology to turn in superb performance at an excellent price. It comes with a very good display, a fast and capacious hard drive and tamper-proof locking nuts to keep the components secure.

CYBERPOWER ESSENTIAL 3000

£799 inc VAT • cyberpowersystem.co.uk • tinyurl.com/c5tewec

The Essential 3000 stands tall in its sleek black Cooler Master Silencia 551 case. Its front drive bays are hidden behind a polished door, lending the PC an imposing appearance. It also features a top-mounted USB 3.0 port and a convenient SD Card reader.

Such luxurious touches are over-indulgent in a business system, where the emphasis would be better placed on value for money and ease of access. We'd also like to see better sound-damping - despite being housed in a 'silent' case, this machine is rather noisy. Of course, the extra space available inside and some good cable management eases maintenance work.

The CyberPower's quad-core AMD FX-4170 runs faster than Arbico's FX-4100 at 4.2- rather than 3.6GHz. The PC therefore delivers slightly faster performance - we estimate that it would achieve around 135 points in our WorldBench 6 speed test (see page 82) - but lags the Chillblast and Palicomp speed demons.

Only the Arbico consumes more power than this PC - we recorded a maximum draw of 174W, and 55W when idle. The CyberPower was very slow to complete the transcode test, taking 10 times as much energy too. Given the amount of noise generated in operation and the inferior performance and energy efficiency of this system, it's difficult to justify the £799 price.

CyberPower has preinstalled Windows 7 Professional and Office Home & Business 2010. The latter alone adds £150 to the price, although you can buy the machine without this software.

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★☆☆
Overall	★★★★★



The Essential 3000 also comes with the largest monitor in our round-up, at 23.6in, whereas many of its rivals expect you to purchase this peripheral separately.

VERDICT: At first glance this system seems outrageously expensive, but it bundles Microsoft Office, Windows 7 Professional and a large monitor. The Arbico is quieter, but this machine is faster, if some way behind the Intel-based systems on test.

ECLIPSE EBIZ I321R755

£599 inc VAT • eclipsecomputers.com • tinyurl.com/cvfkrrz

Using a pair of monitors can significantly improve productivity, so Eclipse has included two 21.6in monitors with its eBiz system.

It's the least powerful of the Intel-based PCs in our round-up, with a dual-core Intel Core i3-2100 processor running at 3.1GHz, yet it still performed faster than either of the quad-core AMD machines systems in WorldBench 6, where it scored 139 points.

If you run multithreaded applications such as Photoshop, you might find a quad-core AMD-based PC to be faster. But for general office use, the dual-core eBiz has surplus performance.

The PC has 8GB of RAM and a 1TB hard disk, although its drive spins slower than that of the Chillblast. Like that PC, it pairs its slower processor with an Asus P8H61-M LE/USB motherboard.

The Core i3 chip has integrated Intel HD Graphics 2000, and Eclipse has included a dedicated AMD Radeon HD 7750 graphics card with 1GB of video memory to provide the extra oomph necessary for running multiple monitors.

The system is constructed inside a very basic system case. It's a far cry from the comparatively smart CyberPower, but does the job.

While the two-monitor setup is ideal for business use, the displays themselves leave a little to be desired. The AOC F22+ is a low-cost option that makes the dual-head configuration more affordable, but it has a relatively thick bezel. The stand, which runs the full width of the display, consumes a lot of desk space and isn't height-adjustable. The AOC provides inferior image quality to the Chillblast's Asus.

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



Windows 7 Home Premium is included, which is ill-suited to many office installations but keeps down the price somewhat.

VERDICT: The dual-monitor configuration of the eBiz i321r755 could provide a boost to productivity, although we'd recommend selecting a superior display to the AOC F22+. The Eclipse is the slowest of the Intel-based machines in our round-up, but its performance when running general office tasks is more than adequate.

PALICOMP PHOENIX FLASH

£399 inc VAT • palicomp.co.uk • tinyurl.com/btd7k9t

Palicomp has achieved a killer price for its budget office system. Intel's 3.3GHz Core i5-2500K, which ruled supreme in our charts only a few months back, provides a huge amount of quad-core power. It's outpaced only by Chillblast's Ivy Bridge chip, although its 164-point score in our WorldBench 6 speed test reveals more than adequate performance for general-office and productivity tasks.

No graphics card is supplied, since the CPU's integrated Intel HD Graphics 3000 does a fine job on its own. Palicomp has also managed to squeeze into its small budget 8GB of DDR3 RAM and a 500GB hard drive. The latter offers just half the storage capacity of some PCs here, but is capacious enough for the job at hand - particularly if networked storage is available on the office LAN.

The Cooler Master Elite 300 system case is overly spacious, given the diminutive proportions of the motherboard. Palicomp provides a cheap-feeling wired keyboard and mouse combo from Cherry.

At just £399, it's no surprise to find that no monitor is included, but even our Best Buy Chillblast is still some £65 more expensive when its display is removed from the equation. One area in which Palicomp has cut back on costs is with the installation of the Home Premium rather than Professional version of Windows 7.

The Palicomp is also bundled with the free OpenOffice productivity software, Ahead Nero and AVG Free antivirus.



If you're specifically looking for a high-performance system then the Palicomp's strongest competition comes from the Chillblast Fusion Obsidian, which outpaces this PC across the board.

VERDICT: The Palicomp Phoenix Flash has a powerful specification for not a lot of money, but it omits a monitor, a decent keyboard and mouse, and Windows 7 Professional.

	ARBICO £500 inc VAT ★★★★★	CHILLBLAST £549 inc VAT ★★★★★ PC ADVISOR BEST BUY	CYBERPOWER £799 inc VAT ★★★★★	
Model name	FX4130 Office PC	Fusion Obsidian	Essential 3000	
Processor	3.6GHz AMD FX-4100 (quad-core)	3.4GHz Intel Core i5-3570K (quad-core)	4.2GHz AMD FX-4170 (quad-core)	
Monitor	N/A	21.5in Asus VE228T (1920x1080)	23.6in HKC 2412A (1920x1080)	
RAM	8GB DDR3	8GB DDR3	4GB DDR3	
Storage	500GB Seagate 7,200rpm SATA 6Gbps	1TB Seagate 7,200rpm SATA 6Gbps	500GB WD 7,200rpm SATA 3Gbps	
Power supply	650W Ace	500W EZCool	450W WinPower	
Motherboard	Asus M5A78L M/USB3	Asus P8H61-M LE/USB3	Asus M5A78L-M	
CPU cooler	Xigmatek Apache	Standard Intel cooler	Standard AMD cooler	
USB	2x USB 3.0, 4x USB 2.0	2x USB 3.0, 8x USB 2.0	3x USB 3.0, 5x USB 2.0	
Graphics card	Asus nVidia GT 430, 1GB VRAM	Intel HD Graphics 4000	AMD Radeon HD 3000	
Sound	Onboard	Onboard	Onboard	
Speakers	N/A	Built into monitor	Built into monitor	
Optical drive	24x Sony DVD±RW	24x Sony DVD±RW	24x Sony DVD±RW	
Operating system	Windows 7 Professional 64bit	Windows 7 Professional 64bit	Windows 7 Professional 64bit	
Bundled software	None	Ahead Nero, Microsoft Office 2010 Starter Edition, AVG Free	Microsoft Office Home & Business 2010	
Case	Ace Ecco 250	Cit Shade	Coolermaster Silencio 551	
Keyboard and mouse	Logitech MK120 (wired USB combo)	Logitech MK260 (wired USB combo)	Logitech MK120 (wired USB combo)	
Extra features	N/A	Anti-tamper locking case	Soundproofing, SD Card reader	
WorldBench 6 score ¹	128 (est)	176	135 (est)	
MediaEspresso time	7 mins 32 secs	1 min 39 secs	13 mins 52 secs	
Power consumption (Idle/Max/Efficiency)	63W/163W/73,676J	39W/97W/9,603J	55W/184W/153,088J	
Warranty	2-year return-to-base (labour only)	2-year collect- and-return	3-year return-to-base (labour only)	

¹AMD FX processors are unable to complete one of the sub-tests in WorldBench 6

PC SPECIALIST MPC-2100**£539 inc VAT** • pcspecialist.co.uk • tinyurl.com/ct9zr4j

This small-form-factor PC will take up very little space on your desk. A modest In-Win BM643 case is custom-fitted with an equally tiny 160W power supply. In our tests, it drew just 22W when idle and 55W at its peak – the CyberPower requires this amount when idle.

Of course, with a dual-core 3.3GHz Intel Core i3-2120 installed, the PC Specialist going full-tilt isn't as speedy as some of the competition here. However, with a WorldBench 6 score of 154 points it's faster than any of the quad-core AMD-based PCs in our round-up, and even Eclipse's 3.1GHz Intel-powered system. It's certainly powerful enough to handle any productivity task thrown at it.

The PC crams in 4GB of DDR3 RAM and a 1TB SATA hard disk, while a 120GB Intel 300-series SSD works in conjunction with the Intel DH67CF motherboard to improve system responsiveness.

Like all our review systems this PC is supplied with a built-in DVD±RW drive, but the slimline version designed to fit into this case is a 22x – rather than 24-speed model. You also get a multiformat card reader – for its size, the MPC-2100 is feature-packed.

No dedicated graphics card is fitted, so you'll have to make do with the simple Intel HD Graphics 2000 processor built into the Core i5 CPU. In the unlikely event that you need more graphics power than this provides, a 16x PCI Express slot is available on the motherboard – although space here is exceedingly tight.

**PC ADVISOR
RECOMMENDED**

PC Specialist has included both Windows 7 Professional edition and Office 2010 Starter Edition, but the price is rather high when you consider that no monitor is supplied.

VERDICT: The MPC-2100 is a mini-powerhouse. It's small enough to sit on your desk, so the optical drive and ports are always within reach. Performance is adequate and feels even speedier thanks to an SSD.

ECLIPSE £599 inc VAT ★★★★★	PALICOMP £399 inc VAT ★★★★★	PC SPECIALIST £539 inc VAT ★★★★★ PC ADVISOR RECOMMENDED
eBiz i321r775	Phoenix Flash	MPC-2120
3.1GHz Intel Core i3-2100 (dual-core)	3.3GHz Intel Core i5-2500K (quad-core)	3.3GHz Intel Core i3-2120 (dual-core)
2x 21.6in AOC F22+ (1920x1080)	N/A	N/A
8GB DDR3	8GB DDR3	4GB DDR3
1TB Seagate 5,900rpm SATA 3Gbps	500GB Seagate 7,200rpm SATA 6Gbps	1TB Seagate 7,200rpm SATA 6Gbps + 120GB SSD
450W unbranded	450W WinPower	160W Power Man
Asus P8H61-M LE/USB3	Asus P8H61-M LE/USB3	Intel DH67CF
Standard Intel cooler	Standard Intel cooler	Standard Intel cooler
3x USB 3.0, 6x USB 2.0	3x USB 3.0, 6x USB 2.0	2x USB 3.0, 7x USB 2.0
AMD Radeon HD 7750, 1GB VRAM	Intel HD Graphics 3000	Intel HD Graphics 2000
Onboard	Onboard	Onboard
N/A	N/A	N/A
22x Samsung DVD±RW	24x Sony DVD±RW	8x Sony DVD±RW
Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Professional 64bit
Microsoft Office Starter Edition 2010, Norton antivirus	Ahead Nero, OpenOffice, AVG Free	Microsoft Office 2010 Starter Edition
Generic 437-16 series	Cooler Master Elite 330	In-Win BM643
Logitech MK120 (wired USB combo)	Cherry combo	Logitech K200 (wired)
N/A	N/A	Small-form-factor case, multi-format card reader
139	164	154
8 mins 37 secs	2 mins 54 secs	3 mins 28 secs
43W/93W/48,081J	38W/100W/17,400J	22W/55W/11,440J
1-year return-to-base	3-year return-to-base	3-year return-to-base (labour only)

>> How we test and our conclusion

Conclusion

Our group test covers a variety of PCs built with the office in mind, from the quiet Arbico to the blisteringly fast Ivy Bridge-equipped Chillblast Fusion Obsidian.

You don't need a huge amount of power to run office software, but it seems silly to pay the same amount for a slower system. Performance should be carefully balanced with power consumption, of course, and here our Best Buy Chillblast proved itself to be an excellent contender. The Fusion Obsidian also has the best warranty terms.

Palicomp's Phoenix Flash is another fast performer, albeit one based on an older Sandy Bridge processor to keep down costs.

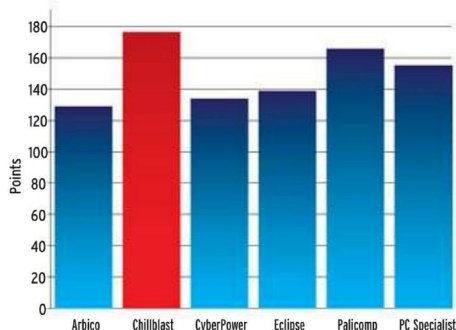
Eclipse's dual-monitor setup may boost productivity, although we aren't keen on the vendor's choice of display. Like Palicomp, Eclipse has also plumped for the Home Premium rather than Professional edition of Windows 7 to come in on budget.

Smaller systems can be easier to move from desk to desk and squeeze into a cramped office. PC Specialist's small-form-factor MPC-2120 is a good example, balancing performance and features well. It's a little expensive considering the components found inside, but you also get a 120GB SSD, Windows 7 Professional and Microsoft Office 2012 Starter Edition.

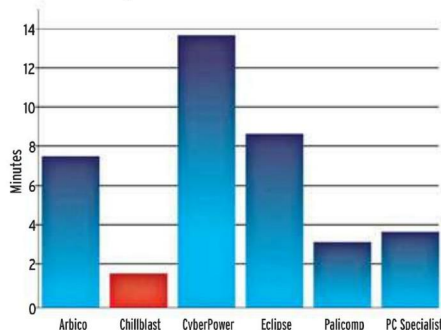
We'd like to see more emphasis placed on the quality of peripherals. For maximum productivity, a keyboard should be comfortable to type on and the monitor crisp and clear. Logitech keyboard-and-mouse combos have been supplied with four of the PCs here; they're good, but there's room for improvement. We also recommend a digital monitor connection.

Most of these PCs are at the higher end of what we would like to see price-wise, but with a few judicious customisations you may be able to specify a less expensive version - perhaps by opting for a smaller hard drive or a slower processor.

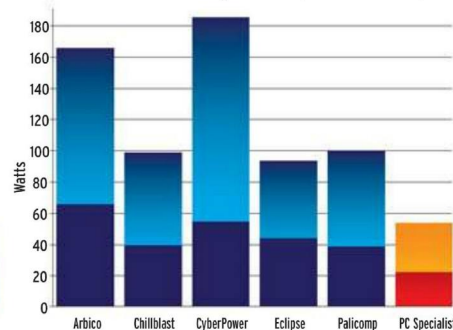
WorldBench 6 score



MediaEspresso time



Power consumption (idle/max)



How we test

The *PC Advisor* Test Centre evaluates each PC in a number of ways.

Application performance

Core system performance is measured using the WorldBench 6 real-world benchmark. This customised test suite runs actual Windows applications, mimicking how a PC is used in day-to-day life.

The workload includes tasks such as editing Microsoft Word documents and Photoshop images, compressing files, browsing web pages and encoding video. Select tasks are then run simultaneously to test the PC's multitasking capabilities.

Results are combined to produce a numerical score relative to a baseline PC (2.4GHz Intel Core 2 Duo E6600; Windows Vista Home Premium 32bit; 2GB DDR2 RAM; nVidia GeForce 7900 GS; 2x WD 320GB in a striped Raid 0 array). This baseline PC scores 100 points in WorldBench 6.

AMD FX processors are unable to complete one of the sub-tests, so we've estimated scores for these PCs.

In round-ups of office PCs, we don't publish gaming test results. But the graphics

processor can now often be levered into improving other aspects of performance.

Transcoding performance

We set each PC the task of converting a batch of 1080p Mpeg4 video clips for use on the iPad and recorded how long it took to complete. We used CyberLink's MediaEspresso software.

This software is able to make use of hardware-accelerated decoding and encoding built into graphic cards and CPUs with integrated graphics-processing capabilities. These techniques can often shorten conversion times by a factor of 10. Multiple CPU threads are also fully exploited.

Finally, we calculated the total energy required to transcode our batch of 16 files.

Overclocking

Currently, we allow overclocking of the processor only in dedicated gaming computers. All other components are run at their stock speeds, with the exception of factory-overclocked graphics cards, which are designed and sold with bolstered speeds.

Power consumption

We measure the power consumption of each PC while it's idling at the desktop and has settled down after booting up.

Subjective assessment

It's not all about performance. We also pay close attention to the physical characteristics of the PC, its noise output and its build quality, delving inside the system case and taking note of important features such as the quality of components used, cable management and air flow.

Good-quality peripherals are also important, and where these are supplied we pay particular attention to details such as the ergonomics of the keyboard and mouse as well as the quality of the display.

Support

Differences in warranty terms can affect our verdict. Obviously, longer warranties are better, but we also look at the terms and conditions - specifically whether faulty systems must be returned to the vendor at your own cost, and whether both parts and labour are included. ☒

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BACKUP SUPERGUIDE

With your data stored on various devices, backup can be a chore you'd rather put off until another day. Mike Bedford explains how to put in place a proper backup strategy that will ensure your precious photos and documents stay safe

Some of us have never experienced a hard-drive failure, but we are the lucky ones; figures suggest that the probability is a lot higher than you might think. A recent study by Google found an 8 percent chance of impending drive failure in hard disks older than two years. And those of us who have suffered data loss know only too well the importance of making regular backups.

It's not only a disk crash for which you should prepare. Take a laptop out of the house and it's at risk from accidental damage, loss or theft. The hardware can be replaced, but the same can't necessarily be said for the data stored within.

Add to that the risk of careless users accidentally deleting important files, and your valuable data isn't nearly as secure as you'd like it to be.

The solution is simple, yet many PC users continue to ignore the importance of backing up their data. Figures suggest 35 percent have never backed up their PC,

while 51 percent do so less than once a year. But lose your data and, without a backup, it's gone for good.

The term 'data' is rather impersonal, so let's bring it closer to home. Without a proper backup strategy in place, you risk losing irreplaceable items such as the photos of your children as babies, your wedding, your first home, family holidays, pets and relatives who are sadly no longer around - and that's just for starters. You risk losing the project or coursework you've spent months working on, your entire music and video library, passwords for your online accounts, locally stored email, and potentially much, much more.

If you're worried that it's too much of a hassle to set up regular backups, we'll prove you wrong. Over the following pages, we'll provide practical guidance that will make backup less arduous, less expensive, and more effective. Now there's no excuse not to safeguard your data.



BACKUP BASICS

Backups and archives are often confused. A backup is a copy of files that you're actively working on; an archive is a copy of files that are largely static, but to which you still want to refer. By recognising this fundamental difference, the amount of time you spend making backups - and the amount of media required - can be reduced.

An archive might be created and never altered. For example, last year's holiday snaps are unlikely to be changed, so you can squirrel these away and waste no time backing them up over and over again (see *What backup isn't*, right).

However, you'll need to back up on a daily or weekly basis any files that you frequently edit. Such files might include spreadsheets of the household expenses or company accounts, folders containing email and other correspondence, presentations, company or club newsletters, and the like. By regularly backing up these files, any data losses will be minimal.

It's up to you to decide at what intervals to schedule your data backups, although businesses might consider daily backups best practice. For most home users, a weekly schedule is likely to be sufficient.

The best backup system will involve more than one copy of your important data. Should you suffer a drive crash while performing a backup to an external hard disk, you might be left without a full copy of your data. But by using two (or more) 'generations' of media, and alternating your scheduled backups between them, you can reduce the risk of data loss.

Using multiple generations of backup media can also buy you more time when it comes to spotting missing files. Should an important file become corrupted or accidentally deleted by another user, you'll be able to restore it from your backup only until it's overwritten by the next scheduled update. With a single backup copy you might have a one-week window in which to spot and remedy the error; with two drives you might have a fortnight.

Add an online storage service to the mix, as we detail on page 88, and you'll increase your file-recovery chances further still. Unlike with local backups, there's no need to worry about deleted files or failed disks - but they aren't without their own issues. After all, what happens if the company goes bust or your web connection goes down?

What backup isn't

If there's anything worse than not backing up your data, it's thinking that you've taken adequate precautions and later discovering that you have no means of recovering your files. It's therefore important to recognise some of the things that don't constitute a reliable means of backup.

Top of our list is synchronisation software that automatically duplicates your files on a separate hard disk, computer or online, as well as Raid-configured hard drives that mirror data from one disk on to another. Both can protect your data in the event of a disk crash, and synchronisation software can also prevent you losing files if your PC is stolen, but accidentally delete an important file and recovery won't be possible.

The best synchronisation software will be able to offer up previous versions of files and deleted items, but it's not something you can take as a given for every such service. There will also be a time limit as to how long previous versions are available - typically a month - so you'll need to spot the error quickly. Synchronisation remains a useful service, but it should be viewed as a complementary rather than a standalone backup solution.

Obsolete archives

The danger with archiving static data is that the media you use can quickly become obsolete. If you have old footage stored on video tape, music on vinyl or audio cassette, and documents on floppy disk, finding a device on which to enjoy them can be tricky. File formats, too, can become obsolete. Review your archived data on an annual basis to ensure it keeps up with the technology times.

Also important is the longevity of your chosen backup media. Nothing will last forever, and not even the longest manufacturer guarantee should be sufficient for you to entrust it with the sole responsibility of looking after your irreplaceable data.



LOCAL BACKUP

Faster broadband and unlimited data plans are making online storage services a more feasible backup medium, but most people still tend to back up locally. Several types of media cater for local backups, with the most common being an external hard disk, an optical disc – CD, DVD or Blu-ray – or a USB flash drive for smaller backups.

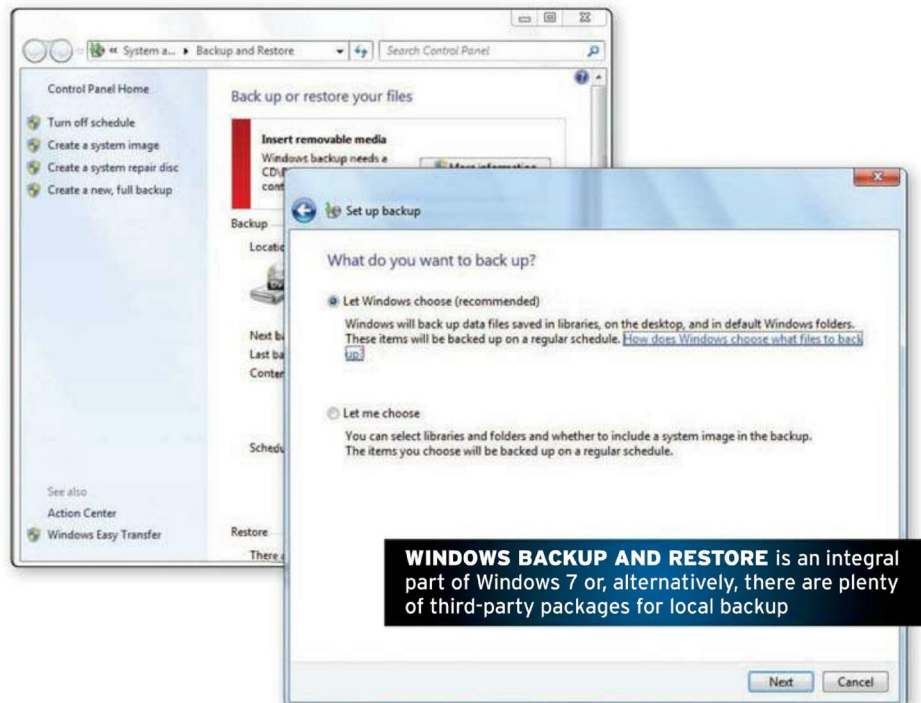
Optical discs are the most cost-effective medium – 4.7GB DVD-R discs bought in bulk cost less than 50p each, making them slightly cheaper per gigabyte than a typical 500GB hard drive. They aren't the most convenient medium, however. For example, you can't schedule backups to occur overnight, since you'll be too busy sleeping to swap over the discs.

It's important to consider the longevity of your chosen medium when archiving data. A hard disk will probably be reliable for five years, but is prone to mechanical failure, while a USB flash drive might last 10 years, but is more likely to be misplaced.

Exactly how long your data will survive on optical media depends on a number of factors – not least on luck. Whether the disc is re-writable, which company manufactured it and the environment in which it's stored will all have an effect. Stored under optimum conditions, optical discs could potentially last a century, although some have been reported as unreadable after just two years. As a guide, under normal conditions a CD- or DVD-R might last between five and 20 years. Note that heat, abrasion and oxidation can reduce this lifespan.

Regardless of how long the disc itself continues to be readable, a working CD, DVD or Blu-ray is no good without the hardware to read it. Will optical drives be around in 100 years? Almost definitely not. Periodically update your archives to utilise the latest media to be on the safe side.

You should also give some thought to where you store your backup drive or archive



WINDOWS BACKUP AND RESTORE is an integral part of Windows 7 or, alternatively, there are plenty of third-party packages for local backup

media. If the house burns down or floods you could lose the original and all your copies. And if a burglar gets away with your PC, they might just grab the attached external hard drive, too. Consider storing your backups in a fireproof safe or at neighbour's house.

Backup software

You can create local backups or archives within Windows, simply by dragging-and-dropping files on to your backup drive. However, dedicated backup software can make the job easier, less time-consuming and provide additional features.

Windows Backup and Restore is built into Windows 7. Click Start and type **backup** into the Search bar to find it. This is a perfectly capable backup utility, but we've listed some features to look out for if you'd prefer to use a third-party tool.

Good backup software should be able to schedule backups to occur automatically at regular intervals. This is useful if you leave an external drive connected to your computer, but the backup will fail if you disconnect the drive.

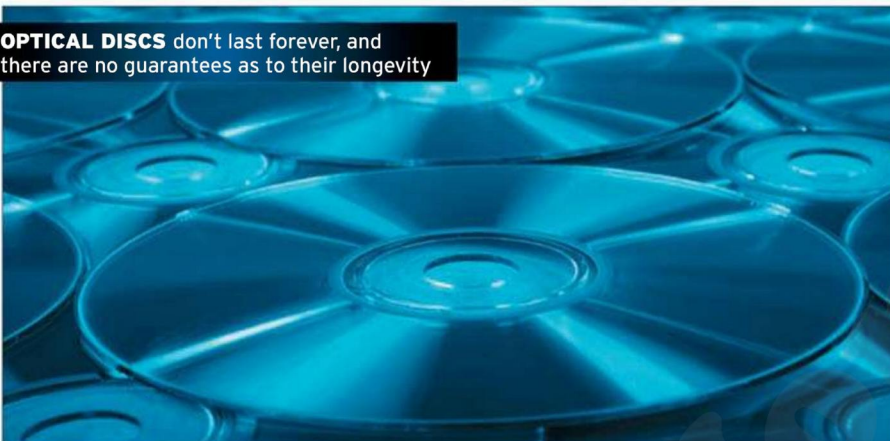
Scheduled backups aren't suitable for use with optical discs, since you'll need to be present to manually swap over the media. However, dedicated backup utilities can simplify the process of backing up to disc, automatically splitting up the files and folders to make full use of each disc's capacity. The utility might create a single file that can be read only within that program, or it may include native support for Windows.

Incremental backups can reduce the time it takes to back up your PC by updating only the files that have changed since your last backup. Compression can also reduce the time required as fewer data is written.

Some applications are able to back up files as you're working on them (known as locked files), and system-wide settings and preferences, including browser bookmarks, save-game files, contacts and email.

Disk imaging lets you create a clone of your entire hard drive, letting you quickly return to an identical Windows environment following a disk crash. However, such backups are time-consuming and require high-capacity media. Some might instead consider a drive crash as good a time as any to start afresh with a clean installation of Windows. If you go down this route, be sure to have your program licence keys to hand.

OPTICAL DISCS don't last forever, and there are no guarantees as to their longevity



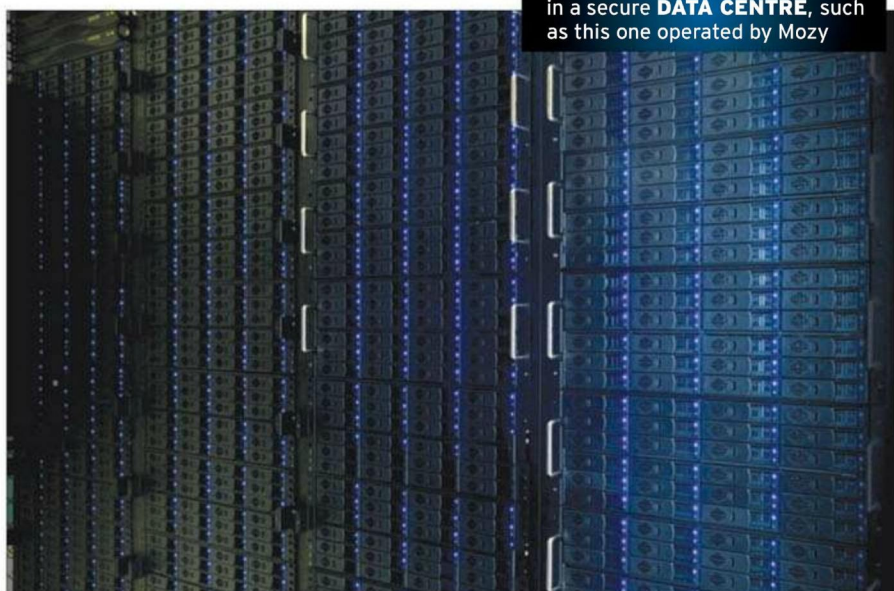
ONLINE BACKUP

There's a lot to be said for backing up your data to the 'cloud' (large servers offered by online storage companies, accessible through a web portal). With fast broadband connections available in large parts of the UK, and many ISPs offering all-you-can-eat data, cloud storage can be both fast and easy to use. You don't need to worry about your chosen data medium becoming obsolete a few years down the line, and the storage of your data on multiple servers in multiple locations rules out the threats posed by flood, fire and theft. Even better, your data is accessible to any web-connected PC that has access to your login credentials and the necessary software installed.

Of course, there are some drawbacks to cloud storage. The service will be as reliable only as your own internet connection for a start. Worse, there's no guarantee that your service provider won't go bust - if it does, what happens to your data? You should also ask yourself whether you'd feel comfortable not only sending your private data across the internet but storing it on someone else's servers.

It pays to choose a company with a good track record. Look out for companies with ISO 27001 accreditation, which is an international data security standard that covers the potential loss of data and unauthorised access. Most reputable companies employ encryption, which means the prying eyes of backup-centre staff and anyone else who could potentially intercept

CRASHPLAN differs from most online services in that it allows you to back up to a friend's PC as well as its own servers



Data stored online will be saved in a secure **DATA CENTRE**, such as this one operated by Mozy

your files as they're sent across the web will be unable to view their contents.

We've said that large parts of the UK have access to fast broadband, but you mustn't forget about the Final Third. If you have a slow web connection, or perhaps are still using dial-up, online backup is not for

you. It's also worth noting that the speeds quoted by ISPs are download speeds, but it's the typically much slower upload speeds that are important here. If you don't have an unlimited data plan, be careful not to exceed your allowance.

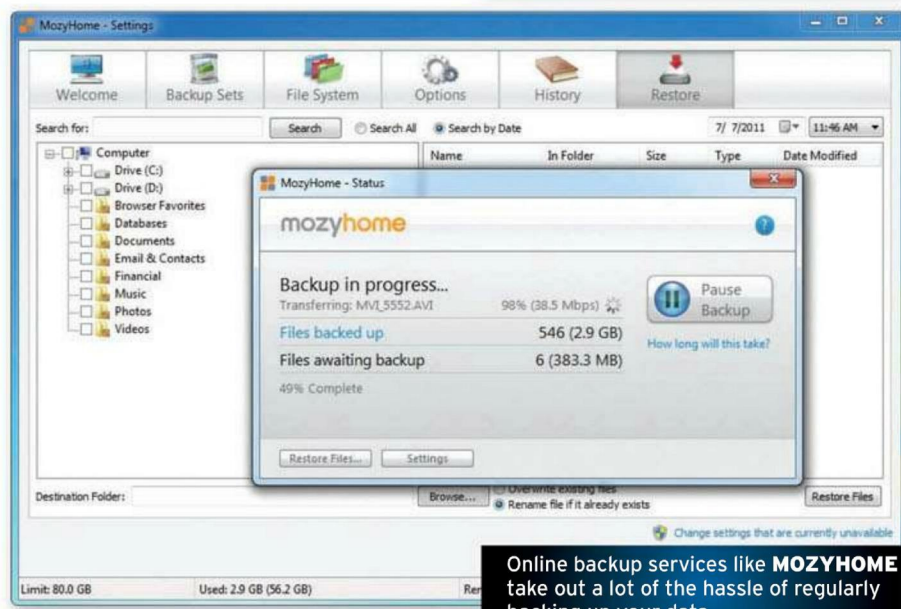
The cloud provides a useful home for your backups, but it's perhaps best used in conjunction with a local copy of your data. Most services offer subscriptions starting from around £5 per month, although the price will vary depending on the storage capacity offered and features available.

CrashPlan

A particularly interesting online backup service is CrashPlan. It allows you to back up your system to its own online servers for a fee, or you can save money by opting to store those same files on the PC of a trusted friend or family member for free. Read our guide to CrashPlan at tinyurl.com/cp73myw.

A third backup option allows you to make use of a local drive. In this way, CrashPlan offers you the best of both cloud- and local-storage worlds. You can access your files from any PC with a web connection, and your data is distributed across multiple destinations to safeguard it from theft, fire, flood and accidental damage.

If your chosen friend isn't keen on letting you consume such a large chunk of their hard-drive capacity, hand them an external USB or NAS drive to connect to their router or offer to repay the favour. While storing your data on a friend's PC is unlikely to be as safe as it would on the servers of a reputable online storage company, it's unlikely that your PC, your friend's PC and the backup company will all go bust simultaneously.



Online backup services like **MOZYHOME** take out a lot of the hassle of regularly backing up your data

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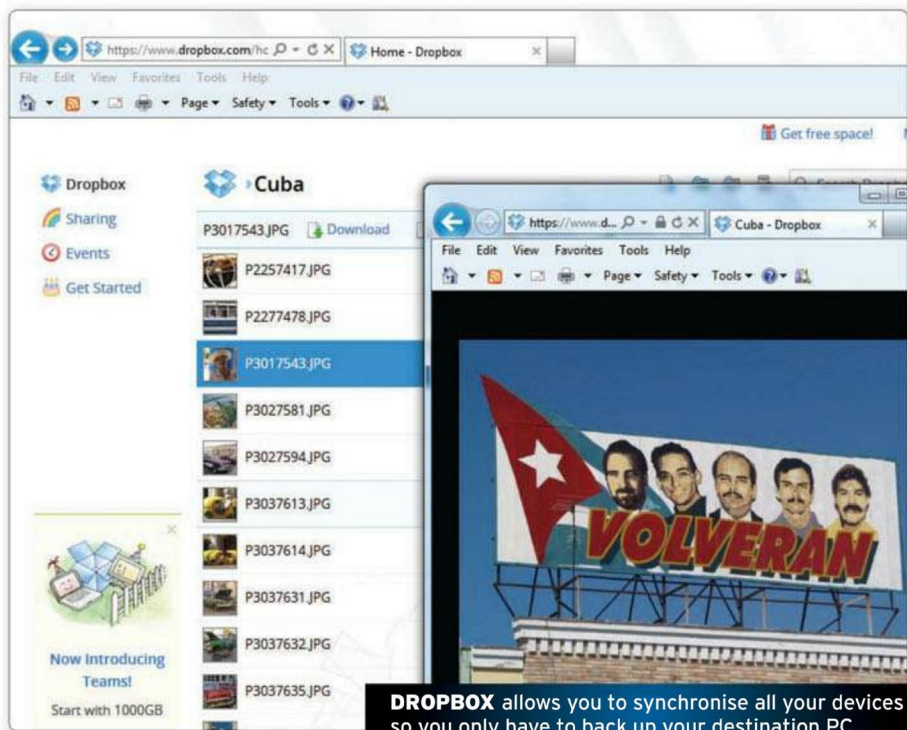
The days when your precious data was stored on a single desktop PC are long gone. Now, your family probably has more than one PC, a couple of laptops, plus an assortment of handheld devices, such as smartphones and tablets. It's important to give some thought to how you should back up the data on all your devices, with the least amount of effort.

Multiple desktop or laptop PCs that are used by different family members are easy enough to deal with. Our recommendation is that you handle each machine separately, backing it up as and when is appropriate for each user. However, in buying backup software or subscribing to an online backup service, it pays to shop around for a deal that allows several family members to use the software or the online service.

Cross-platform backups

Where it gets trickier, though, is when you bring smartphones and tablets running platforms other than Windows into the mix. While it's still possible to back up each device independently (see *Apple iCloud*, below, for advice on backing up iDevices), you may find yourself devoting more of your time to backing up data than you'd like. Thankfully, there's an alternative that's more convenient and possibly cheaper.

If you're already using synchronisation software to ensure that you have the same version of each of your files on each of your devices, backing up your desktop PC will secure any data stored on your other devices, too. If you don't have synchronisation set up,



DROPBOX allows you to synchronise all your devices so you only have to back up your destination PC

it's well worth the effort - and not only to ease backup. Synchronisation software lets you access and work on the latest version of a single document from any computer.

The software works by copying your files between devices whenever a web connection is active. For Windows there's the SyncToy utility, a free download available from tinyurl.com/82hsq8n. We also like Dropbox, a web-based synchronisation service that

offers 2GB of storage with a free account (you can gain more by referring friends).

Dropbox also works with Apple and Android devices, with a free app available to download from the App Store and Google Play. Android users can also enjoy a free Box account, which offers 5GB of free storage, as does Google Drive. We explain how to use the Box app to store files from your Android device in the cloud at tinyurl.com/c6by78p.

Apple iCloud

iCloud is commonly thought of as a cloud-based synchronisation service for the iPhone, iPad, iPod touch, Macs and even Windows PCs, allowing your mobile devices to be automatically backed up to your Mac or PC. However, iCloud also provides a useful online backup facility for users of an iPhone, iPad or iPod, which they can utilise without relying on a Mac or PC for backup storage.

The first 5GB of online storage is free; if you need more you can pay an annual subscription of £14 for an extra 10GB, £28 for 20GB or £70 for the maximum of 50GB.

If you haven't already signed up to Apple iCloud, you should be aware that your mobile devices must be running iOS 5.x and Macs require OS X Lion 10.7.2 or later.

iCloud automatically backs up certain types of data on your mobile device, provided that backup is enabled and the device is connected to the internet via a Wi-Fi connection. You can also choose to backup manually at a time of your choosing. Your free or paid-for storage can be used to back up photos, device



iCLOUD lets you back up your Apple devices to a PC or Mac

settings, app data, email, contacts, messages and ringtones, plus you have unlimited online storage for apps and media purchased from the iTunes Store, App Store or iBookstore.

Don't forget that you can use iTunes to back up everything on your device for free, no matter how much data is involved. The disadvantage of this method, of course, is that you could still lose the backup if your hard disk fails.



CONCLUSION

We've looked at how to back up locally, we've considered the options for backing up online, and we've explained the pros and cons of the two approaches. However, we've stopped short of telling you which method and service to use, since everyone's requirements will be different. For example, whether you have 2GB or 2TB of data to back up will seriously influence your choice.

An online service is ideal for backing up small amounts of data, but impractical and potentially expensive if you have a slow web connection and a large amount of data to upload, or your broadband package is capped.

Most people will benefit from backing up both locally and online. This doesn't mean that you'll necessarily back up everything in both ways. If you want to be able to access and work on documents wherever you are, it makes sense to store them online. Photos

and video are perhaps more usefully archived to an external hard drive or NAS, which will offer faster access to your media and be cheaper than the web.

In making your decision, remember that the online approach removes concerns of media obsolescence and, if you choose a reputable company with ISO 27001 accreditation, the security of your data is all but assured. On the other hand, there are no guarantees that your service provider will stay in business for the long term, and you'll have to entrust its security to others.

If you've been reluctant to give backup the attention it deserves, we hope we've demonstrated that it isn't as time-consuming and expensive as you might have feared. Your efforts will pay off the moment your hard disk fails, you suffer a virus attack or you lose your pride and joy. ☒

Restoring data

Everyone hopes they won't suffer a hard-disk crash, but it pays to know in advance how to restore files from your backup should you find yourself in that position. The exact procedure will differ depending on whether you've backed up locally or online, and on which software or service you've used, but the principles are the same.

If you've created a disk image and suffered a catastrophic loss that makes Windows unbootable, boot your PC from your recovery disc. (You'll probably have to burn this disc in advance, so be sure to carefully label and store your backup.) Finally, run the imaging software to restore the complete hard drive, Windows, applications, data and all.

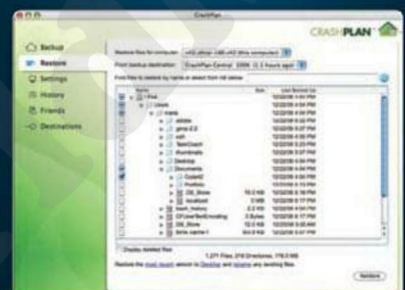
If your loss was catastrophic, but you hadn't created a disk image, you'll need to reinstall Windows and your applications, including your backup and restore software, and then use that software to restore your data files from the backup.

If you've lost files, but Windows still boots and your applications are accessible, you can jump straight to restoring your files from your backup.

Here's a brief overview of how to restore files with CrashPlan.

Run CrashPlan on the PC to which you want to restore files and click on the Restore tab. Because CrashPlan allows you to backup several PCs, select the name of the PC from which your files were backed up. Now choose the source of the backup. This may be CrashPlan Central, a friend's computer or a local hard disk.

Next, in the list of files and folders, check or uncheck boxes to select exactly what you want to restore. You may also want to alter the options for whether CrashPlan should replace or rename duplicate files. Click Restore to complete the process.



FEATURE

BATTLE OF THE



BROWSERS

Not all web browsers are created equal. Some are faster; some are more versatile; others are especially secure. Megan Geuss tests six leading browsers to learn where each one excels... and fails

**BEST
BROWSERS
FOR ANDROID**
PAGE 98



Everyone needs a browser but, with so much choice, deciding which one is the best for you can be difficult. It's tempting to stick with Internet Explorer if you've always used it, but you'd be missing out on better performance and a myriad of add-ons if you don't look further afield.

We put the latest versions of six browsers through their paces, paying attention to speed, safety, features and add-ons.

Among the PC browser contenders, Google Chrome narrowly captured the crown as the top performer overall in our tests, thanks to speedy JavaScript rendering and page-loading times, excellent security tools and a respectable array of add-ons and features. Mozilla Firefox finished a close second, processing HTML 5 graphics faster than any other browser and sporting a huge library of add-ons.

RockMelt, the browser built on Google's Chromium framework that comes integrated with Facebook, was the surprise third-place finisher. We expected the browser's Facebook integration and social-reading sidebar to slow its performance but, in our hands-on testing, RockMelt worked faster than most of its rivals. Plus, it permits you to share links and chat with friends on Facebook, without having to go directly to the social network.

Internet Explorer earned a rather low score for its features: it doesn't offer themes for your browser and you can't sync favourites unless you use Windows Live Mesh. Nevertheless, it offers more security options than most competing browsers, and it processed HTML 5 code quickly.

Opera distinguished itself with blazing page-load speeds and a great mobile browser, but it came up short in HTML 5 processing. Safari didn't perform especially well in any of our benchmarks; its redeeming quality is the solid security it provides.

Bear in mind that each browser behaves differently depending on the hardware setup, the speed of the internet connection and the modifications you make to your browser.



GOOGLE CHROME 17.0

BEST OVERALL

chrome.google.com

- + Lets you close slow or frozen pages without restarting the browser
- + Sandboxed design helps prevent malware
- No integrated RSS reader
- Plain design

We reckon Google Chrome is the best browser overall, thanks to its ease of use, numerous extensions and add-ons, and superb performance. Chrome should meet most people's needs.

Chrome's minimalist design isn't eye-catching, but its lean toolbar leaves more room for viewing web pages. And what Chrome lacks in flashiness, it certainly makes up for in performance. Google's browser shone in our JavaScript test, leaving its competitors standing. Many popular websites use JavaScript because it makes them more immediately responsive and interactive. JavaScript-heavy pages behave better in Chrome than in other browsers.

Chrome also performed admirably in our speed test, loading an image-heavy page in less than 4 seconds. This lightning-fast speed comes from a brilliant feature new to Chrome 17.0 that lets the browser start loading the URL you type in the address bar before you press the Enter key.

To complement its impressive performance, Google's browser has some worthy features that others lack. For starters, Chrome runs tabs as separate processes. If one crashes, the entire browser won't go down with it. If your online wanderings take you to a foreign-language website, Chrome will recognise the language and offer to translate it for you in a matter of seconds. The translations, powered by Google Translate, aren't particularly accurate, but they can at least give you a basic idea of what the page is about.

Chrome is also one of the most secure browsers here, because it's sandboxed: the plug-ins that Chrome uses access information only within the browser itself. Sandboxing prevents malware that uses plug-in exploits from spreading via Chrome through your PC.

Owners of smartphones or tablets running Android 4.0 will appreciate the ability to sync their Chrome bookmarks and web history to those mobile devices. You can customise Chrome with web apps, themes and extensions to suit your preferences.

Chrome's built-in web store simplifies searching for and installing browser add-ons. The add-ons range from simple (an Evernote plug-in, for example), to complex (full games such as Angry Birds and Bastion). And, unlike in Firefox, you don't need to restart your browser every time you install a new extension or app.

On the down side, Chrome lacks an integrated RSS reader, which means you'll have to sort out your own approach to handling multiple RSS feeds.



FIREFOX's extensions are a boon for customisers (next page)

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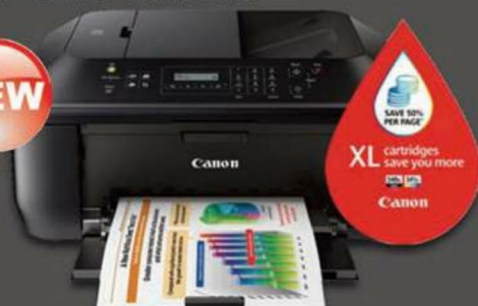
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MOST VERSATILE

mozilla.org

- + Superb HTML 5 performance
- + Thousands of available add-ons
- Slow page loads
- Too many add-ons can bog down the browser

Mozilla's browser has been around for nearly a decade, but it's still spry. In the six versions following its dramatic version 4.0 redesign in March 2011, Firefox has undergone a few chiefly cosmetic changes. The bulky toolbar is gone, replaced by a row of tabs on the top of the window, and the bookmark bar is hidden by default. You can change the default settings via the options, but the simplified interface works well – especially on smaller displays.

Firefox's biggest advantage over its rivals is its vast library of add-ons, which you can use to customise your web browsing and make Firefox infinitely more useful. Not surprisingly, the more add-ons you install, the slower Firefox will be to start up and run. And some add-ons can turn Firefox into a memory hog, slowing down your system.

Firefox led the pack in our HTML 5 tests, and it finished third in handling JavaScript, easily outperforming Opera, Internet Explorer and Safari. On our test machine, Firefox was the second-slowest browser at loading web pages, taking 9.67 secs to load



an image-heavy page; the fastest browsers, Chrome and Opera, took only 3.79 secs to load the same web page.

Firefox is a relatively full-featured browser. You can save frequently used web services as App tabs, which are permanent tabs that Firefox saves in the browser. Think of them as bookmarks in tab form. If you're a power user who often leaves tons of tabs open, Firefox will allow you to collect the tabs into manageable groups – a handy feature for keeping your entertainment tabs separate from your work ones, for instance.

If you use Firefox at home and at work, Firefox Sync will sync your history, bookmarks and preferences across computers, and will even sync with the Firefox Mobile app on Android. Firefox has a pop-up filter and supports private browsing. The browser's malware protection will warn you if you happen to encounter a fraudulent

website, and its updater ensures that your plug-ins have the latest security patches. Firefox will work with most security software that you have installed on your PC, using the software to scan downloads for malware.

FACEBOOK ROCKMELT 0.9

rockmelt.com

- + Makes communicating with Facebook friends easy
- + Automatic synching between computers
- + Pages and JavaScript load briskly
- Facebook sign-in required to get the most out of this browser
- Extensions and add-ons are scarce

RockMelt was built on the Chromium browser framework, so it looks and acts a lot like Chrome; nevertheless, it's designed to appeal to social-media fanatics. You have to sign in through Facebook to use most of its features, and RockMelt collects data on your browsing habits – although the developers say they won't share that data with any third parties, including Google and Facebook.

The Facebook sign-in process enables RockMelt to sync settings and bookmarks automatically through your Facebook account among computers and other devices running RockMelt's iOS app (no RockMelt app is available for Android yet).

What fans love about RockMelt will undoubtedly drive others crazy. A thin strip located on the right side of the browser

How the web browsers stack up

BROWSER	Rating	Speed ¹	Security	Sync/mobile sync	Themes	RSS reader
1 Google Chrome 17.0	★★★★★ SUPERIOR	VERY GOOD	Sandboxing, URL domain highlighting, Instant Updates, default pop-up blocking, private browsing	✓ ✓	✓	✗
2 Mozilla Firefox 10.0	★★★★★ VERY GOOD	VERY GOOD	Plug-in checker, private browsing, default pop-up blocking	✓ ✓	✓	✓
3 Facebook RockMelt 0.9	★★★★★ VERY GOOD	VERY GOOD	No third-party access to your browsing data (despite Facebook sign-in), private browsing	✓ ✓ (iOS only)	✓	✓ ²
4 Internet Explorer 9.0	★★★★★ VERY GOOD	FAIR	Scans downloads, website and content fraud filter, tracking cookies website blocker, cross-site scripting protection	✓ (Windows Live Mesh only) ✗	✗	✓
5 Opera 11.61	★★★★★ GOOD	GOOD	URL domain highlighting, private browsing within individual tabs, website fraud scanner	✓ ✓	✓	✓
6 Apple Safari 5.1.2	★★★★★ GOOD	FAIR	Sandboxing on Lion, private browsing, default pop-up blocking	✓ ✓ ³	✗	✓

¹The speed score, on a five-point scale, is an aggregate of results from WebVizBench HTML 5 Benchmark tests, V8 JavaScript benchmark tests, and a timed page-load test using a static, graphics-heavy page from a local server. A score of 5 would mean that the browser was fastest in all three speed tests. ²Apps on RockMelt's Edges function as an RSS reader. ³With iCloud account.

window displays your Facebook friends' icons, and indicates their availability to chat. By clicking a friend's icon, you can chat in the browser window without having to switch back and forth between Facebook and your other tabs. On the left side of the browser window, you can choose 'apps' for different websites that notify you of newly posted content. If the information at the edges of the browser window becomes distracting, you can silence the visual noise by clicking the bell icon in the top-right corner.

RockMelt has some other potential drawbacks. The browser will add any link that you click in the lefthand bar to your Facebook timeline unless you turn off the behaviour in the browser's preferences. Also, many extensions that work in Chrome don't function in RockMelt. The company is working with developers of good Chrome apps to produce RockMelt-compatible versions. Currently there are about 200.

The fledgling browser outperformed Chrome at processing HTML 5, finishing third behind Firefox and Internet Explorer. It took second place in our JavaScript benchmark, only slightly behind Chrome; and it was again the runner-up in loading our static, image-heavy page, with a very good time of 4.15 secs - less than half a second behind Chrome and Opera, which tied for first place.

INTERNET EXPLORER 9.0

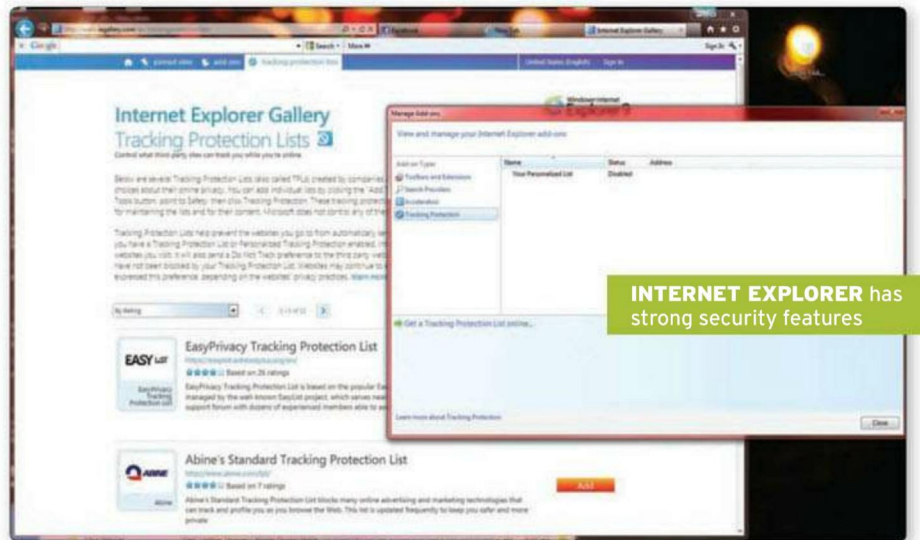
BEST SECURITY

beautyoftheweb.co.uk

- + Fast HTML 5 processing
- + Good security features
- No themes or automated bookmark synching
- Managing tabs can be difficult

Internet Explorer has long lagged behind other browsers in terms of features and ease of use. But the ninth version of Microsoft's browser offers a few functions that are at least as good as those the competition offers.

Especially noteworthy are some great new privacy features, including the ability to block sites from cataloguing your browsing habits. Internet Explorer permits you to block



sites individually or to rely on a Microsoft-assembled list of sites that have a history of tracking visitors after they leave the page.

Microsoft has also embedded its Application Reputation app in version 9.0 to scan downloads and warn you if a downloaded file is dangerous. And the browser offers built-in cross-site scripting protection, which scans sites for certain types of malicious code and stops such scripts before they can damage your PC.

Internet Explorer finished second in our HTML 5 benchmark test and, as more websites move toward that graphics-friendly web standard, Microsoft's browser will look even better. It didn't do as well in our other performance tests, however. It finished last in processing JavaScript and also took the most time to complete our static-page load tests (with an average time of 11.21 secs).

The browser's general appearance is much improved over earlier versions. At long last you can move tabs between different browser windows, and the settings and favourites tabs are easier to find. There's still no native feature for synching bookmarks, but you can import and export favourites as usual. With no themes and no in-browser spelling-check feature, Internet Explorer 9.0 isn't the most fun or work-friendly browser available, but at least you can install an extension that provides the spelling check.

OPERA 11.61

opera.com

- + Pages load very quickly
- + Unique browsing experience with widgets
- Not HTML 5-friendly
- Fewer security options

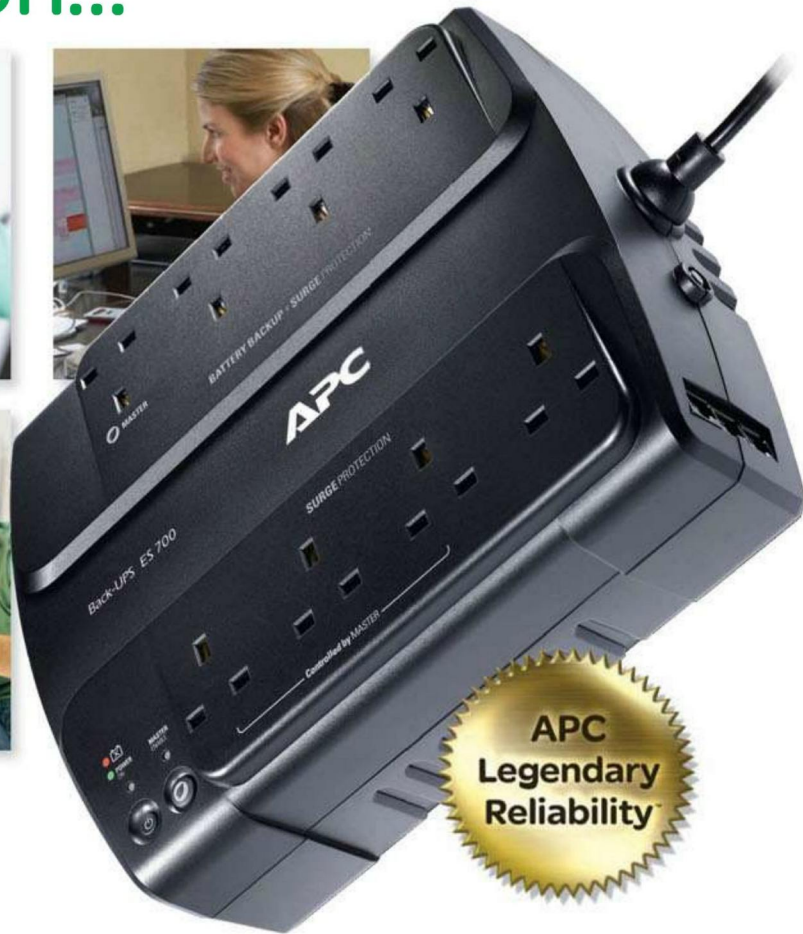
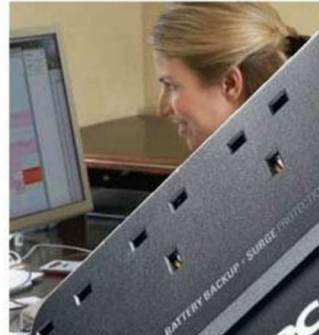
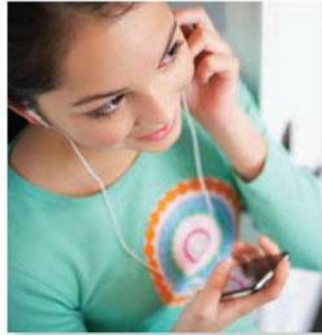
For internet users who prize speed above everything else, Opera Software's Opera should be the browser of choice. The user interface looks like a more polished version of Internet Explorer 9.0: the tabs rest at the top of the browser window, with the bookmarks and other buttons tucked away inside a pop-out menu. The interface takes some getting used to, and it isn't as customisable as Firefox's.

Opera tied with Google Chrome as the fastest browser in our page-load test; it loaded a static, image-heavy page in 3.79 secs. Opera also handled our JavaScript benchmarks reasonably well, earning the fourth-best score. But it struggled in our HTML 5 tests, finishing behind all its rivals except Safari. One HTML 5 site that we visited ended up crashing the browser. The second time we visited the site, the page did load but several elements were broken. Ironically, Opera Software was the browser maker that originally proposed HTML 5 as an internet technology.

Opera makes a few extensions and add-ons available to users in the form of widgets. These are tiny applications that you can download from Opera's web store and run on your desktop as separate programs. Opera doesn't have to be open for the widgets to work, but they won't start up unless you have the browser installed. Widgets range from simple games to RSS feeds, and Opera's staff reviews all widgets that users can download from the store to ensure that they're safe.



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JIM MARTIN



Cutting costs

It's great when you start using a brand-new computer. Everything feels responsive and programs launch with a spring in their step. Fast-forward a few months, though, and the story can be very different. Hard drives can become clogged with programs and documents, and Windows can take an age to boot. There is a solution, and on page 114 we show you how to use an optimisation utility to get your PC into shape.

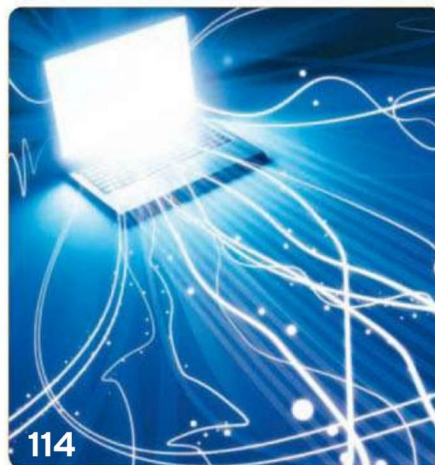
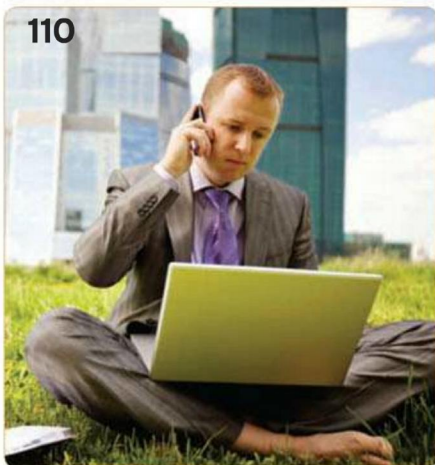
Alternatively, if you're fed up with Windows, you could always ditch it in favour of Ubuntu. You can find out more about this free Linux OS, and how to install it, on page 102.

These days, there are plenty of good-value mobile phone deals. If you've been on a tariff for a while, it's worth checking whether you can get more for your money. On page 116, we explain how to transfer your existing phone number to a new contract or pay-as-you-go SIM.

With budgets tight, Microsoft Office may be out of reach for some readers. Google Docs is a basic but effective online office suite that's free to use. It's even possible to collaborate on documents in real time with others. Turn to page 110 to find out more.

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QUICK TIP: INSTALL NEW SOFTWARE THE EASY WAY

Whether you've just bought a new computer, or have reinstalled Windows on an older machine to clear out the clutter, you'll want to quickly install the software and utilities that you use every day. For this task, there's no tool better than Ninite (ninite.com).

Ninite is a website that lets you install a load of useful free software simultaneously, with no user intervention required. Simply head to the site and tick the boxes next to the software you wish to install. You'll find an extensive list of the latest versions of applications, including Google Chrome, Dropbox, Evernote, Mozilla Firefox, Adobe Flash, Apple iTunes, K-Lite Codex, Microsoft Security Essentials, Microsoft Silverlight, Skype, Steam, uTorrent, VLC, .Net and 7-Zip.

Once you've finished choosing your programs, click the Get Installer button at the bottom. The site sends you a tiny executable file that, when you run it, will download all the selected applications from their original sources and install them with default settings, with no user intervention required. It doesn't install toolbars and other extra junk that can



sometimes tag along with free applications, and it's smart enough to grab the 64bit versions if you have a 64bit OS.

You'll have to tweak some of the applications' default settings and potentially dump a few unwanted desktop icons, but Ninite is still an enormous timesaver. ☑

Free computing with Ubuntu

If your PC or laptop is running out of steam, now's the perfect time to give Linux a try. **Jim Martin** explains how to get started with the most popular version: Ubuntu

Windows is great but, after a while, it can get cluttered up with too many programs and become intolerably sluggish. Backing up your files and reinstalling the OS can help, but an alternative is to try the free Ubuntu OS.

Ubuntu is one of many Linux distributions, but it's arguably the most polished, most compatible and best supported - around 20 million people use it on a daily basis. The latest version, discounting beta releases, is 12.04 Desktop LTS. This is a one-size-fits-all version that will run on anything from a humble netbook to a top-end desktop with multiple monitors.

Like Windows 8's new Metro interface, Ubuntu's Unity desktop is able to scale from low-resolution screens right up to the highest resolutions offered by PC monitors, while retaining the same look.

Take Ubuntu for a spin

You can test-drive Ubuntu within Windows by browsing to ubuntu.com/tour/en and choosing either the guided tour or to show yourself around.

Ubuntu looks a lot like OS X, with a status bar running across the top of the screen. A program dock appears on the left and



scrolls when you hover your mouse cursor near the top or bottom. It comes with lots of preinstalled software, including the excellent LibreOffice, a decent photo manager, the Firefox browser, an email client and more.

Crucially, the Ubuntu Software Centre lets you download thousands of free applications. These are all user-rated, just like in Apple and Google's respective app stores, so you can get an immediate idea of which are the best programs to try.

A new feature is the Ubuntu One online backup service. You get 5GB of free storage for backups, music streaming and synching across multiple computers. You can still install and use your favourite applications, though; if you're already a Dropbox user, for example, you can

simply install the application from the Ubuntu Software Centre.

Easy installation

If you've tried Linux (or even Ubuntu itself) before, but were put off by the confusing interface, difficult installation or lack of hardware support, it's well worth giving it another try now. Most popular hardware is supported, so you shouldn't have any problems with peripherals such as your webcam or Wi-Fi not working.

We installed Ubuntu on an Asus Eee PC 901 netbook and found that even the keyboard shortcuts for volume and brightness worked first time. The drivers were correctly installed for Bluetooth and wired and wireless networking, too.

Apart from the fact that Ubuntu is free, the main reason many people choose it is for its performance. The minimum requirements of 64MB of RAM and 5GB of hard-drive space mean just about any computer should be able to run the operating system. ☐



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Tech Help

HOW TO INSTALL UBUNTU LINUX

If you like the look of Ubuntu and want to try it your laptop or PC, download the Desktop version from ubuntu.com. Click the Download link in the menu at the top, then click the Ubuntu Desktop link. Use the drop-down menu to select the version you want. It's best to go with the default settings unless you have a reason not to. The file is around 700MB.

Other links on this page explain how to run Ubuntu alongside Windows; there are also instructions for how to burn an install CD or create a bootable USB flash drive.

We recommend using a 4GB USB flash drive and downloading Universal USB Installer (tinyurl.com/7onc9d4). Run the utility and ensure you select the appropriate version of Ubuntu from the list. Point the utility to the location of the ISO file on your hard disk and select the correct drive on which to install the OS.

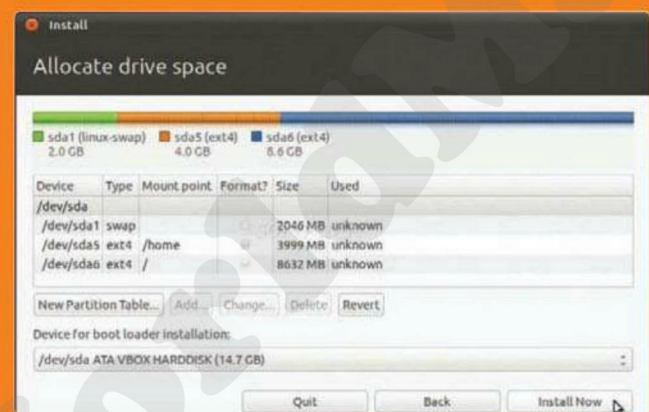
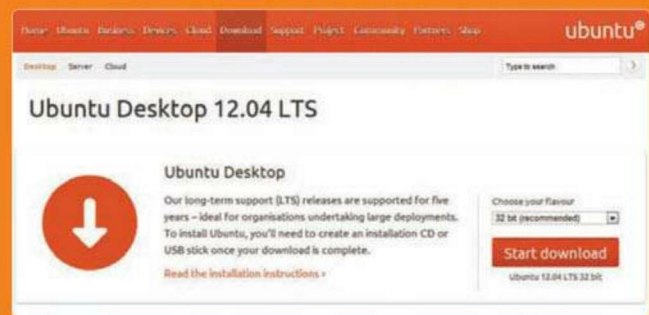
Make sure you've backed up the files on the flash drive, since the process will erase them. Similarly, back up any files on the computer on to which you're installing Ubuntu, even if you plan to install it as a second OS.

Once all the files have been written to the USB drive, you can insert it into a free port on the PC. If the computer doesn't boot from the flash drive, you'll need to change the order of the boot devices in its Bios. Enter the Bios by pressing Del, F1 or another key that's specified at boot time.

Follow the onscreen instructions when Ubuntu loads - it will detect if another OS is present and provide options for how to install Ubuntu. If you want to get rid of Windows and make Ubuntu your only OS, we recommend choosing the 'Something Else' option and deleting the Windows partition on your hard drive. You'll also need a 'swap' area, which should be double the capacity of your computer's memory (see tinyurl.com/d757r65).

During the installation, you'll be asked for a few details, including your location, language, username and password. It's advisable to have your computer connected to a network, and you'll be prompted to choose a Wi-Fi connection if no ethernet cable is present. This ensures the latest updates are installed.

Once installation is complete, remove the flash drive and press Enter. Your PC will restart and launch Ubuntu. Head to the Software Centre (click the shopping bag icon in the dock) to install your favourite applications, including Chromium (the Ubuntu version of Google Chrome), Skype, Dropbox and others.





YOUR QUESTIONS ANSWERED

Expert computing advice

Paul Monckton tackles readers' hardware and software conundrums

SIGNED OUT

Q Frustratingly, my Windows XP PC automatically signs me out when it's inactive for only a few minutes. The Power Settings Control Panel suggests I have 20 minutes before the system enters standby mode, but I'm logged out long before then. *Johnno*

This isn't a power settings issue, Johnno, it's a screensaver one. Your system is set to enter standby mode following 20 minutes of inactivity, but the screensaver is clearly configured to kick in much sooner. There is also a security option in XP that requires you to enter your password each time you exit screensaver mode.

To change this behaviour, right-click an empty area of the desktop and select Display Properties. Click the Screen Saver tab in the window that pops up. Increase the time specified in the Wait field, then disable the box next to 'On resume, password protect'. Click Ok to save your changes.

WHERE IS THE | SYMBOL?

Q I need to use the vertical bar (|) character on my keyboard, but it shares its button with the grave accent (`) and the not sign (~). Pressing the button on its own produces the grave accent, while simultaneously pressing Shift produces the not sign. How do I use the third character on this key? *Bturner*

This is a job for the little-used Alt Gr key, which is usually found immediately to the right of the Spacebar. You should be able to



simply press and hold Alt Gr as you tap the character's button to access the | symbol. However, you may find this produces an underscore (_); many UK keyboards transpose the two characters in Windows. If this is the case, you'll need to press Shift and the backslash (\) together to get |.

While we're discussing Alt Gr, you may like to know that you can use it to type frequently used characters, such as an acute e (é), by pressing Alt Gr, E, and the copyright symbol (©), with Alt Gr, C. Most modern keyboards place the Euro symbol (€) on the same button as the number 4 - even if it's not labelled as such on your keyboard, you should be able to access using Alt Gr, 4.

International keyboards will use Alt Gr to access many other special characters. If you don't have an Alt Gr key, you can achieve the same effect by pressing Ctrl, Alt together. One exception is Ctrl, Alt, E, which

sometimes produces an ¢ rather than é, depending on the application in use.

If you're using Microsoft Word 2003 or later, there are additional keystrokes you can use to type commonly used characters, thanks to the built-in AutoCorrect feature. For example, if you want to type a degree symbol (°) without having to go via the menu system, you can type Ctrl, @ and then press the Spacebar. AutoCorrect will turn this into a degree symbol. Note that you usually need to press Shift to access the at (@) symbol, which shares its button with the apostrophe ('); if this is the case, you'll instead need to press Ctrl, Shift, '.

If there's another symbol you frequently use, you can create a custom AutoCorrect entry that will replace specified text with that symbol. To configure this, you'll first need to type the required symbol into Word - if you can't find it on your keyboard, try copying and pasting it from the web, using the Symbols menu on the Insert tab, or using the charmap utility. Highlight the symbol and open the AutoCorrect Options menu (click the Office/File button and choose Options, Proofing; in older versions of Word you should look in the Insert menu).

You should now see an empty box labelled 'Replace', and a box labelled 'with' that contains the symbol. Enter into the Replace field a word that you're unlikely to use in your documents or even the character's name. Click Add, Ok. When you next type this word into Word, AutoCorrect will replace it with the desired symbol.

STACK OVERFLOW ERROR

Q I get the error message 'Stack overflow at line:158' each time I send an email through my webmail client. The messages seem to get through, but how can I stop the error message from appearing? *Raysophie*

You aren't alone in experiencing this problem, Raysophie. It appears to be associated with Compatibility Mode in Internet Explorer. Disabling this (or enabling and then disabling it if it isn't currently enabled) may resolve the issue for you.

Yahoo recently posted a message that its engineers have resolved an issue with similar symptoms, so if you're using Yahoo as your webmail client then you may find that the problem has already been fixed.



WHERE IS THE | SYMBOL?

DELETING CONTACT HISTORY

Q The address field is often empty when I go to sign into Hotmail. If I click in this field, a drop-down list of all the email addresses ever entered here appears. This saves me time, but it isn't ideal from a security viewpoint. I can't see an entry in the settings menu to switch off this history. Can you help, please? *Frybluff*

This sort of information is filled in by your web browser's Auto-Complete function. How you manage this function will depend on the browser you're using.

Using Internet Explorer as an example, press the ALT button to bring up the File menu (if it isn't visible) and click Tools, Internet Options. Select the Content tab and click the Settings button in the section marked AutoComplete.

In here are various options for which types of data you would like the browser to present Auto-Complete suggestions. You can turn off any you don't want to use to improve your security. Turning off Forms should disable the function you mention. You can also delete previous Auto-Complete information by clicking the button marked 'Delete AutoComplete history...'

Another option is to use an application such as CCleaner (tinyurl.com/d48bcx6). This allows you to simultaneously delete Auto-Complete history and many other types of saved data across multiple browsers. Look on the Windows tab for Internet Explorer, then enable 'Autocomplete Form History'. Also select 'Saved Form Information' on the Applications tab for any other web browsers you may use. This information will be deleted when you click Run Cleaner. Note that this will also delete other saved form data you may have stored.

When you compose a new message in Hotmail and enter the email address of your recipient, a similar Auto-Complete function helps you to fill in their contact details. This information isn't stored on your computer by your browser – it comes from Hotmail itself.

This can be problematic if Hotmail suggests the wrong recipient or misspells their email address following a previous incorrect entry. You can't turn off this function entirely, but you can change the settings so that it suggests only the email



DELETING
CONTACT
HISTORY

addresses for recipients stored in your Hotmail contacts list.

Click Options, then choose More Options from the drop-down menu. Find the section labelled Customising Hotmail and click 'Advanced privacy settings'. Two configuration options are given for Auto-Complete suggestions, with the second restricting suggestions to people you've explicitly added to your contacts list.

IMPORT FAVORITES INTO FIREFOX

Q I've been using Internet Explorer, but I'd like to start using Firefox. How can I import my Favorites from Internet Explorer into Firefox? *Johnnyrocker*

This is very simple. If you haven't yet installed Firefox, you'll be given the option to import your Internet Explorer data as part of the installation process.

This process will import your bookmarks, browsing history, passwords, options and other miscellaneous data. You could also import these data from Google Chrome if it's installed on your machine.



IMPORT
FAVORITES
INTO FIREFOX

On the assumption that you've already installed and been playing around with Firefox, you'll need to search for the import option in the browser's Library. You can access the Library by going to the History menu and selecting 'Show All History', or by entering the Bookmarks menu and selecting 'Show All Bookmarks'.

At the top of the Library window is a button labelled 'Import and backup'. Click this and select 'Import data from another browser'. You will now be able to choose to import data from Microsoft Internet Explorer or Google Chrome.

Click Next and follow the instructions, selecting which data you wish to import. Your Internet Explorer Favorites will now be found in Firefox's Bookmarks menu under 'From Internet Explorer'.

If you've been using another browser, such as Apple's Safari, you can import your bookmarks by first exporting them from your old browser in HTML format. You can then use the Firefox Library to import the bookmarks as an HTML file. This process won't copy over any settings, cookies or browsing history, however.

CPU USAGE AND FAN NOISE

Q I have a one-year-old Packard Bell desktop PC with a Pentium dual-core CPU and 3GB of RAM. If I have only one web page open and nothing else, CPU usage fluctuates between 0- and 5 percent. The fan is on, but it's very slow and quiet. I trade foreign exchange during the week and have two platforms open; during busy hours the CPU usage can be between 50- and

Continues >>

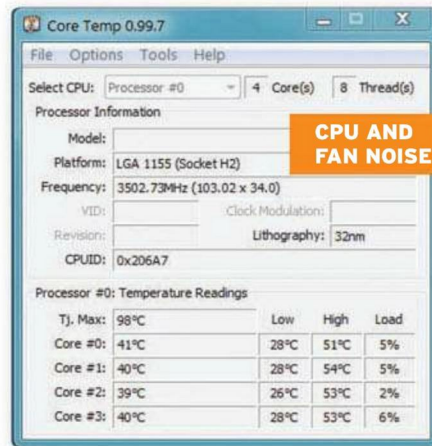
75 percent, and the fan is on constantly, spinning very fast and loudly. I close down all other applications to reduce the load on the processor, but there are still lots of processes using a small percentage of the CPU. I'm worried about the machine overheating. If I were to upgrade the PC, should I be looking for more RAM, a larger hard drive or a faster CPU? *Bturner*

It's normal for your CPU fan to increase in speed and volume when the PC is under load. It's probably no cause for concern unless this has started to happen only recently. If the PC used to be much quieter and is getting progressively louder, you may find that a significant amount of dust has built up inside the machine over time, causing the fan to have to work much harder to force cooling air through the system.

Check any vents and fans visible from the outside for dust. If you're confident about looking inside your PC, then you should also remove the case door and check the CPU cooler and fan. A can of compressed air can help clean out any inaccessible areas. Do make sure that the PC is switched off when you do this, since these cans can often spray out a little liquid propellant along with the compressed air. This will evaporate very quickly, but you don't want it making contact with any live components.

What's more important than the fan speed is the temperature of your PC's internal components - the processor in particular. You can use a software application to monitor the temperature sensors on your PC's motherboard, such as Core Temp (free; alcpu.com/coretemp).

This will provide you with a wealth of system information, as well as real-time



temperature readouts. You can find the safe operating temperatures for your processor by searching ark.intel.com. Typically, CPUs can handle running at around 60°C.

If your processor temperature is within safe limits, but the level of fan noise is uncomfortably high, you may like to consider replacing the CPU cooler with a third-party model. You can usually find quieter and more efficient coolers than the one supplied with your PC, but there may be physical constraints on which coolers can be installed - some enthusiast coolers are very large indeed.

Another option is to install some adhesive sound-absorbing material inside your PC case. Quiet CPU coolers, sound-absorbing material and compressed air dusters can be purchased from many outlets, including quietpc.com.

If you have a laptop or all-in-one PC we wouldn't recommend opening the case, especially if your PC is still under warranty. Try blowing out some dust from the vents, and if the situation doesn't improve you may need to have it professionally serviced.

MONITOR RESOLUTION ISSUE

Q I have paired a 19in Hanns-G monitor with a Windows XP laptop over VGA for several years now, running at 1400x900. I recently turned on my computer to find the screen resolution had changed and I could no longer select a widescreen aspect ratio. I've tried a factory reset, changing the VGA cable, refreshing the graphics and monitor drivers, altering the refresh rate, uninstalling and reinstalling the drivers in Safe mode, and rolling back the machine using System Restore. I've even specified a 1400x900 default resolution in the Registry, and tried the monitor with both Vista and Windows 7 computers. Nothing works! *Beatnik*

Plug and Play monitors announce their resolution capabilities to your connected computer by means of a protocol called DDC. If, for some reason, this information isn't reaching your PC, then the computer will make some assumptions about the monitor's capabilities.

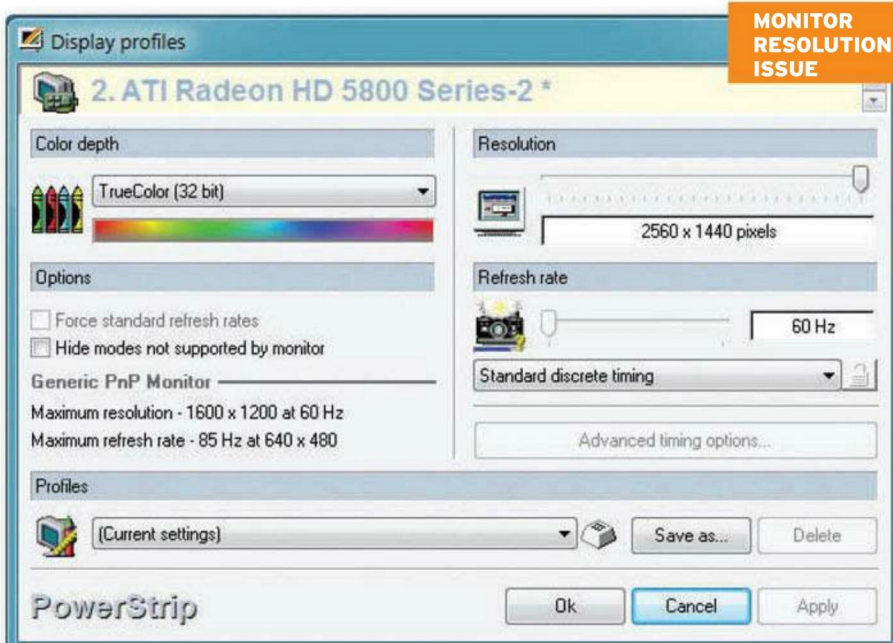
These assumptions can often be wrong, frequently resulting in the type of problem you describe. Since the same thing is happening on multiple PCs, it's likely that the problem lies with either the monitor or its connecting cable.

The first thing to check is whether the monitor has an option in its menu to turn off the DDC function. It's not universally supported, but some displays have this function lurking deep within the onscreen menu system. When DDC is disabled, the display won't function as a Plug and Play device and your PC should be free to select any video resolution.

If Windows is using the generic Plug and Play monitor driver, it will restrict you to selecting only the resolutions explicitly enabled by the monitor. If the monitor is providing the wrong information, you can often override it by selecting a monitor driver that explicitly supports the resolution you require.

If neither of these options fix your issue, you may be able to create a custom resolution using your graphics card driver software. Alternatively, you can try a utility such as PowerStrip, available for free from tinyurl.com/mtq2q, which will provide comprehensive control over custom resolutions for a variety of different graphics cards. Using this utility you should be able to force your system to output the required resolution, regardless of what the monitor is telling your PC.

Another way to disable DDC is to physically remove pin 12 from your VGA cable. We'd suggest finding an old, spare cable if you want to try this method.



PCI EXPRESS X1 GRAPHICS CARD

Q I'd like to add a second display to my PC, which has only one monitor output. I've looked inside and the only expansion slot available is a single PCI Express x1 slot. Can I use this small slot for a graphics card? *Mark Emery*

Contrary to popular belief, you can use the spare PCI Express x1 slot for a graphics card, although you shouldn't expect a level of performance suitable for gaming. However, for general 2D application use, it should work just fine.

The best choice for you will depend partly on what graphics processor is currently installed. We would suggest sticking with the same GPU manufacturer if possible, since this can avoid you having to install multiple graphics drivers that can conflict with each other.

So, if you have an AMD CPU with integrated graphics, go for an AMD Radeon HD graphics card; if you have nVidia graphics built-in, then go for an nVidia GeForce graphics card.

It may be preferable to disable your integrated graphics and use two outputs from a dedicated graphics card to drive the separate monitors. In this way you can avoid having two graphics drivers installed. An example of an nVidia card would be a GeForce 210, such as this one from Club3D (tinyurl.com/c68tdrr).

The same company also makes a PCI Express x1 edition of the Radeon HD 4350 (tinyurl.com/ca8dm6j). Most PCI Express x1 slots won't physically allow you to insert the larger connector of a x4, x8 or x16 card, but some are built with open-ended sockets that do. In these cases, it may be possible to use a standard PCI Express x16 card in your x1 slot. It won't offer the usual level of physical



PCI EXPRESS X1 GRAPHICS CARD

stability provided by the locking mechanism of a full-length socket, however.

If you don't have room even for a PCI Express x1 card, or would prefer not to have to open up your PC case, you can try a USB graphics card. These provide a VGA or DVI output. This will provide reduced performance and image quality, but greater flexibility and an easier installation.

RSS FEEDS IN OUTLOOK

Q I want to subscribe to the BBC Spanish Language RSS feed to receive a Spanish phrase each day. This feed is offered at bbc.co.uk/languages/spanish. However, when I click the Subscribe button it just opens a new page with a list of words. I have some other RSS feeds that work fine in Outlook 2010, but this feed does not appear anywhere. I'm running Windows 7. What am I doing wrong? *Dirty Dick*

The feed you're trying to add is a standard XML feed. When you click on the subscribe link, your browser is displaying the raw XML code rather than automatically subscribing Outlook to the feed.

To subscribe to this feed in Outlook, open your email client and click File, Account Settings. Select the RSS Feeds tab and click the New button in the window that pops up.

Head back to the BBC website. Rather than left-clicking the Subscribe button, right-click it and select Copy shortcut. (This instruction is for Internet Explorer users; if you use Google Chrome or Mozilla Firefox, choose 'Copy link address' instead.)

Back in Outlook, paste the link into the 'New RSS Feed' box. Click Add to subscribe to that feed.

DATA RECOVERY

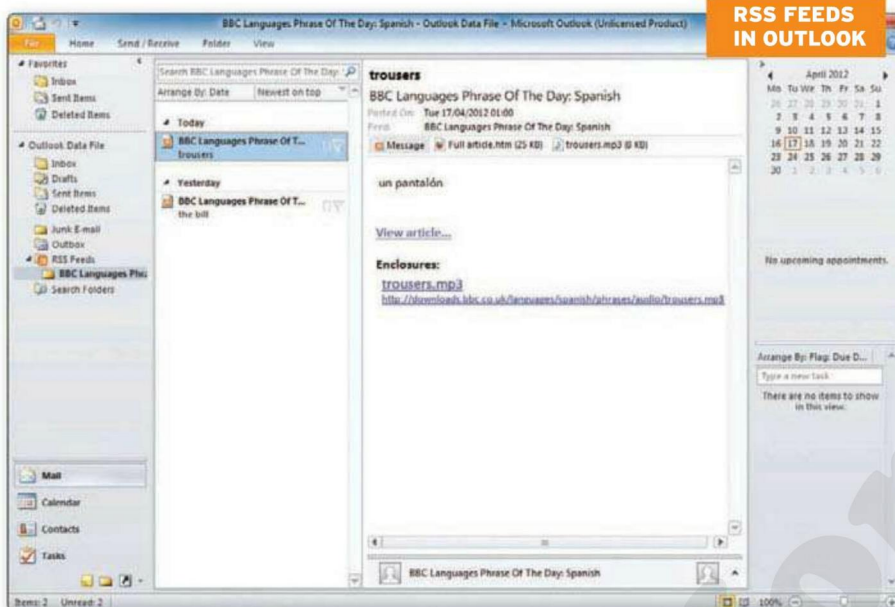
Q My PC's hard disk appears to have died. The machine is a few years old, but has been running fine and I haven't installed any new hardware or software. When I turn on the computer I get the message: 'Operating system not found'.

I know a bit about PCs and Windows, and thought it could be a problem with the Master Boot Record. I booted from my Windows XP CD and used the Recovery Console to attempt to rebuild the OS. The plan was to use the fixmbr command, but I was stopped in my tracks when the Recovery Console reported that it couldn't find a hard disk.

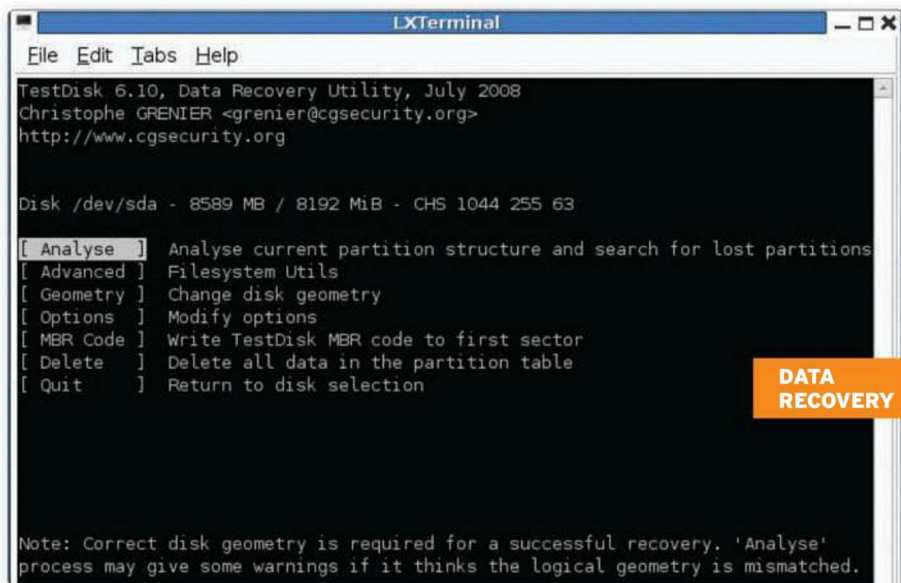
Oddly, the Bios shows that the hard disk is still connected to the PC and it clearly has power. When I removed the case's side panel I can hear the disk whirring away as normal, with none of the ominous clicking sounds you might expect to hear from a failing drive.

I want to get the data back, but I can't afford to send my drive to a data-recovery firm. *James Duncan*

Continues >>



RSS FEEDS IN OUTLOOK



From your description, it sounds as though your hard drive is okay. We suspect that the partition information may have been lost, however, which would explain why the Windows Recovery Console reports that no hard drive can be detected.

Even better news is that you may be able to solve the problem using a free recovery tool called TestDisk. It's a Linux tool but, as you can't boot into Windows, that's not a problem. Use another computer to download a Live distribution, which includes TestDisk. (Live distributions are Linux OSes that run directly off a CD or USB flash drive.)

One distribution you might like to try is Knoppix (tinyurl.com/2azs), which comes with TestDisk. Burn the ISO to a CD, or use a tool such as the Universal USB Installer (tinyurl.com/y87u7aq) to boot your PC. Run TestDisk from a terminal window and follow the instructions provided. For a step-by-step walkthrough of how TestDisk works, see tinyurl.com/4x9cjt.

Alternatively, connect your hard disk to a working PC and run the Windows version of TestDisk. It's the same command line tool, with little difference between its operation in Windows and Linux. ☒

CONTACT US

Email your Helproom questions to helproom@pcadvisor.co.uk. Please use 'Helproom' as the subject header and give your full name, the operating system you're using and other product details. We will let you know by email if your query has been selected for inclusion in these pages. If your query is urgent, you may find it useful to visit our forum at pcadvisor.co.uk/helproom.

Helproom aims to give you the best assistance possible. But, given the

limitations of this type of advice, we can't guarantee what we say will work and we can't accept responsibility for any damage arising as a result.

Always back up your system before you make any changes, including software installations.

Please note that we are unable to respond to letters or telephone requests, but we will endeavour to answer queries submitted by email or via our Helproom forum.

For more PC help go to:
pcadvisor.co.uk/helproom



SEARCH THE PC ADVISOR FREE ONLINE HELPROOM



The PC Advisor online Helproom contains an indispensable database of answers to common questions regarding all aspects of PC problems. This ranges from general Windows issues to problems with specific apps, and covers all types of PC hardware and software, including system components and peripherals.

Alternatively, you can ask for help from the experts on our online forums. Sign up to be a registered user - which is free - and then browse to one of the discussion forums. In the Helproom your first stop should be the searchable database of frequently asked and previously answered queries. With more than 1.5 million forum posts, you'll almost certainly find your answer in this archive of queries - just enter a few keywords.

If our online database can't solve your problem, try posting a question in the Helproom forum, where more than 200 queries are answered every day. The forum is manned by our team of Helproom Angels, who are ready and willing to lend a hand with anything from system crashes to virus alerts.

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Online ● Print ● Mobile ● Digital

Cloud collaboration



Martyn Casserly introduces Google Docs, an online office suite that can meet all your productivity needs and supports real-time collaboration in the cloud



There was once a time when the first piece of software most people installed on their PC was Microsoft Office. Without Word, Excel or PowerPoint, any kind of work-related tasks were non-starters. Simple jobs, such as keeping track of the family finances or writing documents to share with others, became problematic if you strayed from the Microsoft path.

Today, we have other options – software that provides all the essentials at reduced or no cost. One such free service is Google Docs, which has some rather nifty tricks up its virtual sleeves.

We say virtual because, like all things Google, Docs lives online. Google even stores your work on its servers, so you can access your data wherever you have an internet connection.

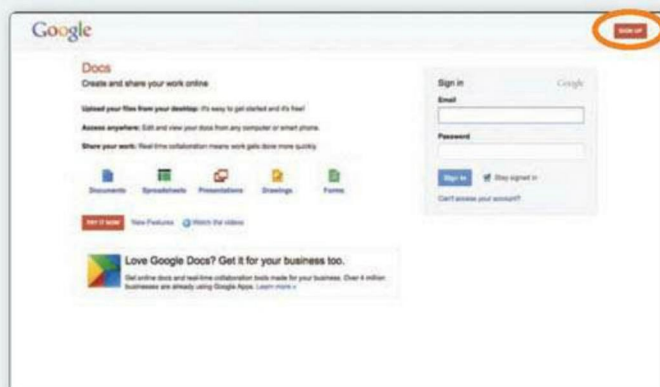
Docs is a fully functional office suite, with a word processor, spreadsheet and presentation package, plus specialised applications for creating forms, drawings and tables. Due to its online nature, it's also possible to share and collaborate on a document in real time.

You can create a document from scratch within the software, or upload an existing one from your local drive. You can then invite collaborators, and watch as they make changes in front of your eyes.

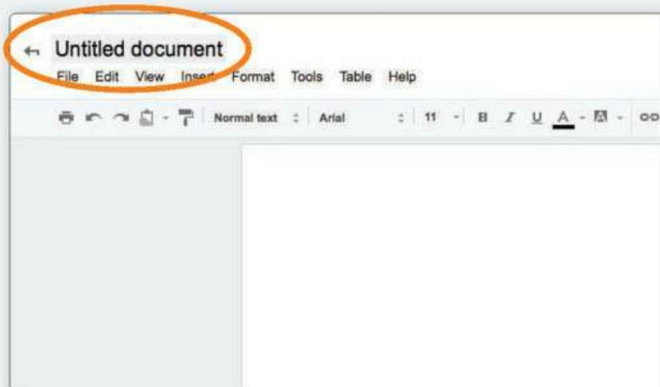
With the recent changes to its privacy policy, all Google's services are accessible via a single user ID. If you already use Google+, Gmail, Google Calendar, Picasa, or any of the search giant's other services, you're already set up to use Docs. Otherwise, you can create a free account and begin using the service immediately – just visit docs.google.com.

If you're yet to dabble in the cloud, it can take a little while to get used to the idea of your data not being stored locally (although you can download anything you create). Google takes security and confidentiality very seriously, since the success of its business is reliant on trust. Provided that you keep your password safe and enable extra measures such as 2-step verification (see how at tinyurl.com/7t3qhe6), you've little to fear.

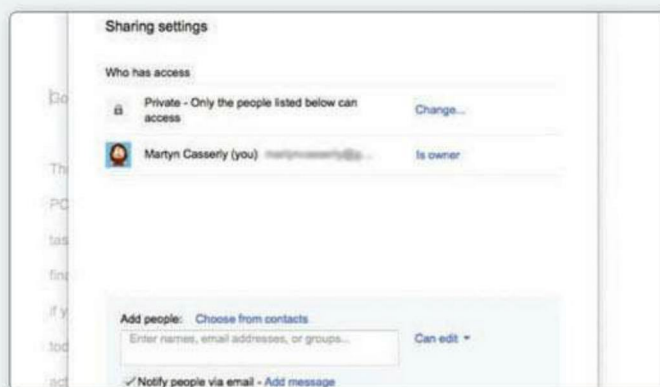
GET STARTED WITH GOOGLE DOCS



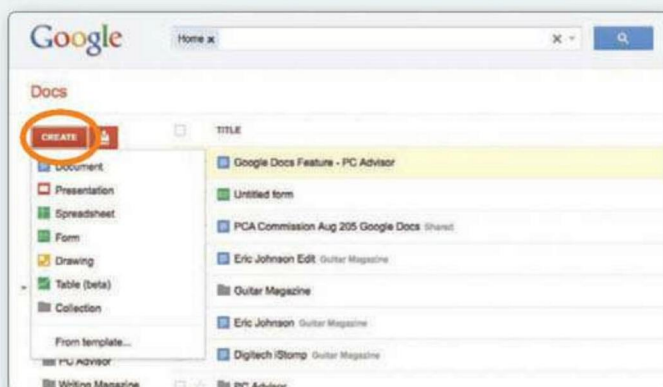
START Head to docs.google.com. If you already have a Google account, enter your usual login credentials and you'll be taken directly to the Docs home screen. Otherwise, you can create a free account by clicking the red Sign Up button.



4 Opt to create a Document and you'll be presented with a blank page on which to type. The first thing to do is give your new document a name. Click the 'Untitled document' text at the top of the page and enter something more appropriate.



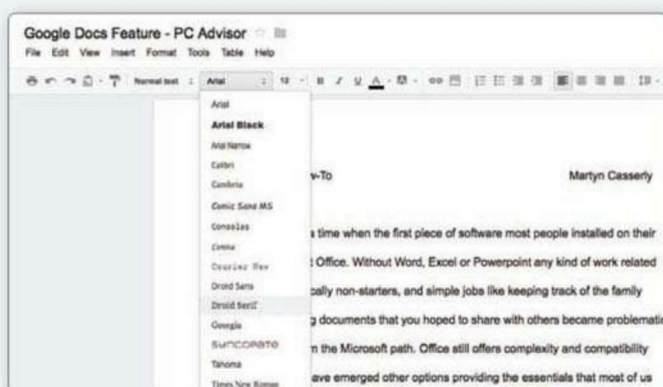
7 Completed documents can be left in the cloud, saved to your hard drive (use the File, Download as menu and select an appropriate file type), or shared with selected friends. For the latter, click the blue Share button and add the names of your contacts.



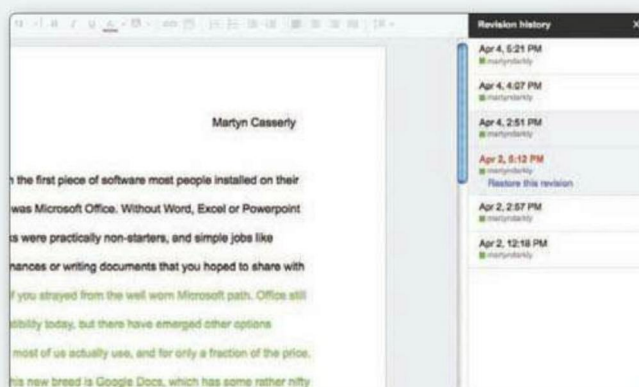
2 From the Docs home page you can begin a new document by clicking the red Create button on the lefthand side of the screen. A drop-down menu appears which allows you to choose the file type: document, spreadsheet, presentation and more.



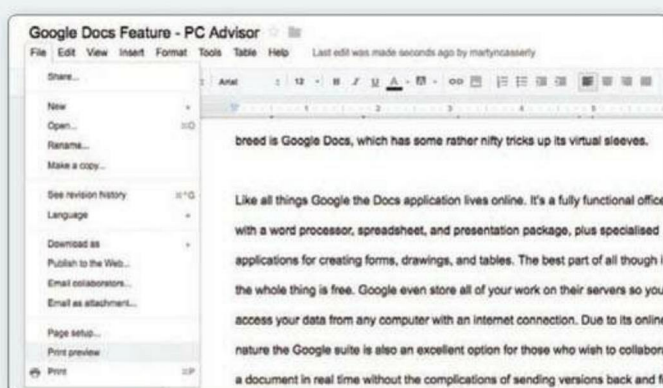
3 If you'd rather upload an existing document from your hard drive, click the red Upload icon next to Create. Most common office file formats are supported, and there's a useful feature that lets you extract text from PDF files.



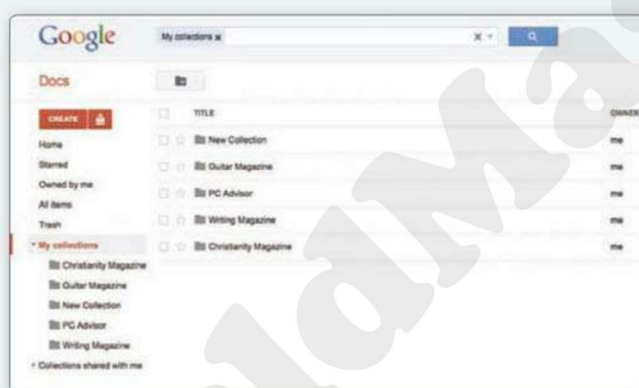
5 Docs' word processor may have a Spartan look, but all the functions you'd expect - formatting, printing, tables and hyperlinks - are available in the main toolbar. There's also an Equation toolbar available for those who need it.



6 Any changes you make to a file are automatically saved, which means you won't lose data if your PC crashes or web connection goes down. You can revert to a previous version by selecting 'See revision history' from the File menu.



8 Selecting the File, Print command will cause Docs to create a PDF of your document, which you can then open in Adobe Reader and send to your printer. The exception is Google Chrome, in which the Print option lets you print directly to a printer.



9 As the number of documents stored in your Google Docs account grows, the ability to organise them will become essential. Select My Collections on the home screen, then click the Add folder icon. Give the folder a name and drag files to it. ☒

COLLABORATING ON A DOCUMENT

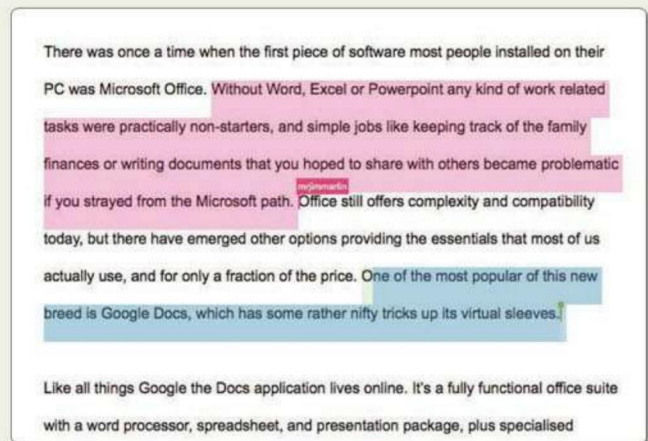
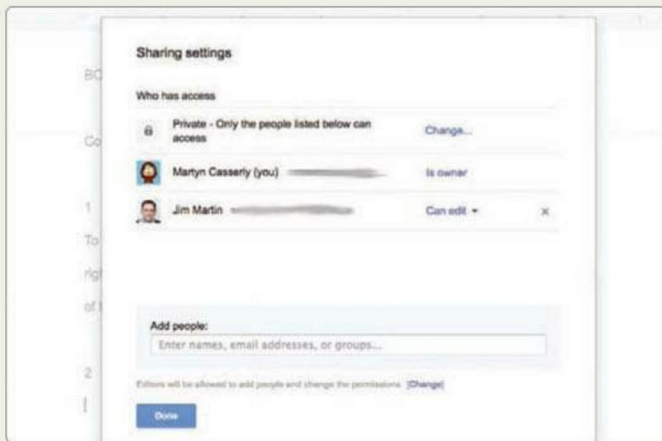
If you've ever tried to work collaboratively to create a document, you'll understand the headaches involved. First, there's the initial draft, which you email to your cohorts, swiftly followed by emails containing comments, amended versions of the document, and amendments to the amendments. It's easy to become overwhelmed. Thankfully, Google Docs' allows several people to work concurrently on a document.

When you create a document, you become the 'owner', and can share it with up to 200 people. Of these, 50 can work simultaneously. You'll be hard-pushed to find yourself in a situation whereby these limits are overly restrictive.

You can also dictate what access privileges are granted to individual collaborators. For example, if a few select people are allowed to edit your document, you can grant them this privilege in the

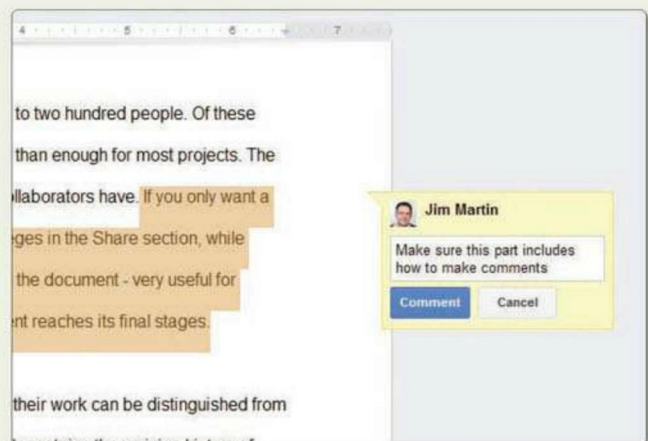
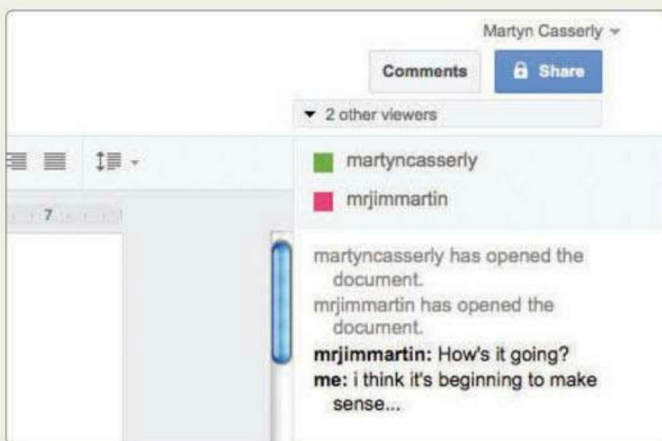
Share section. Other collaborators might be permitted only to view or comment on the document, which can help you control the number of amendments.

Each contributor's amendments are colour-coded, helping you to distinguish their comments from those of other collaborators. Google also retains the revision history, allowing you to go back and see when changes were made, then undo them if necessary.



START To begin real-time collaboration on a document, click the blue Share button in the top-right corner of Google Docs. This opens a window in which you can enter the email addresses of the people you wish to invite.

2 A collaborator will need to accept your invitation to begin working on the document. To avoid confusion as to who's making changes when several people are involved, Docs tags with the user's name and colour-codes any changes they make.



3 If you want to discuss ideas for the document, query something with your colleagues, or share a relevant link, clicking the Other viewers drop-down menu below the Share button opens up a Google Talk-style chat box.

4 As the document is stored online, collaborators can add comments at any time by clicking the Comments button. They can also comment on specific parts of the document by highlighting them, then right-clicking and choosing Comment. ☒

WORKING OFFLINE

The advantages to working online are obvious. No longer are your documents or presentations locked to one machine, and are liberated to freely roam wherever internet connections abound. But if you should find yourself somewhere Wi-Fi isn't available, such as on a train, a plane or in a log cabin out in the sticks, the weaknesses of the cloud become immediately apparent.

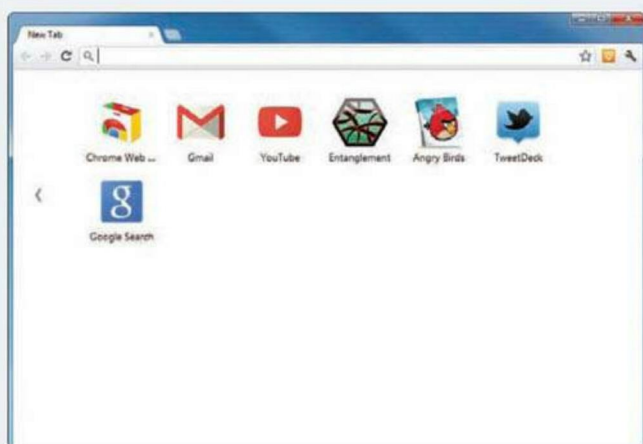
Google offers the facility to view your documents offline via the Google Docs

Chrome web app (launch Chrome, click the Web Store icon and search for the app), but this is restricted to your most recent creations and doesn't allow editing.

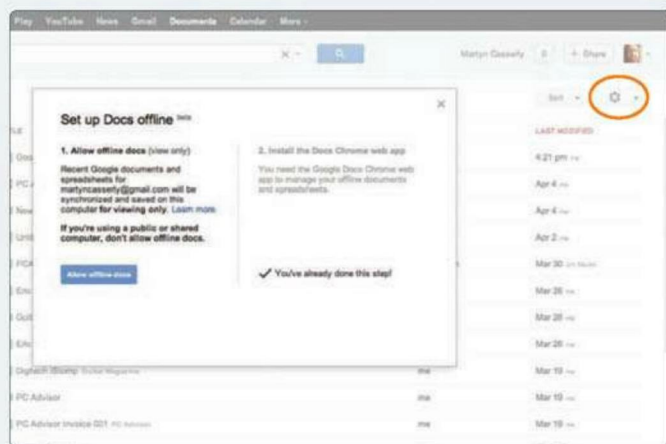
A more traditional way around this problem is to download the files you wish to work on and then open them in a desktop office suite, such as Microsoft Office or the free LibreOffice (tinyurl.com/89tL69k). Google Docs supports an excellent range of file formats for export, including ODT, PDF,

RTF, Word, Text and HTML, most of which LibreOffice handles very well.

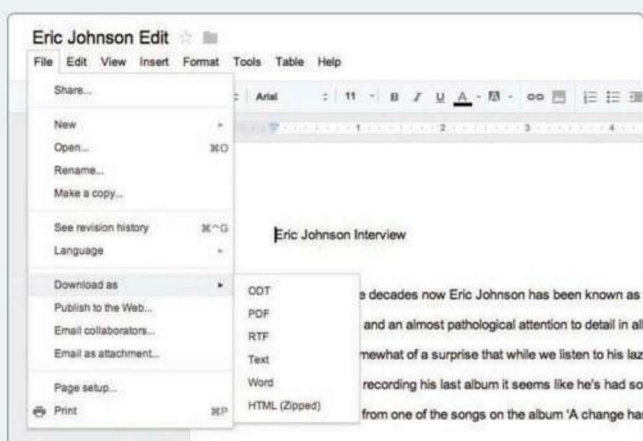
If you're working on an iPad then emailing the documents to the device and opening them in Pages is probably the best, if not the most elegant, solution. Android tablet owners can use similar methods with apps such as QuickOffice Pro or Kingsoft Office to take their work on the road. It's not an ideal workaround, though, so fingers crossed Google will address the issue soon.



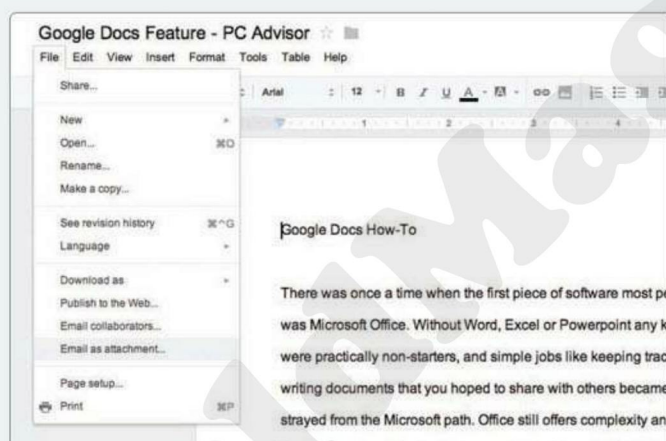
START Download Google Chrome (tinyurl.com/7jn7xc2) if you don't already have the browser installed. Launch the software, then click the Web Store icon (click on Apps at the bottom if you can't see it). Search for Google Docs.



2 To set up offline viewing within the Chrome app, click the gear icon at the top-right of the home screen. Select 'Set up Docs offline'. Click the 'Allow offline docs' button and your latest documents will be copied to your hard drive.



3 If you want to edit or continue to work on your documents then you'll first need to download them to your hard drive. Select File, Download as, then choose whichever format best suits your desktop office software.

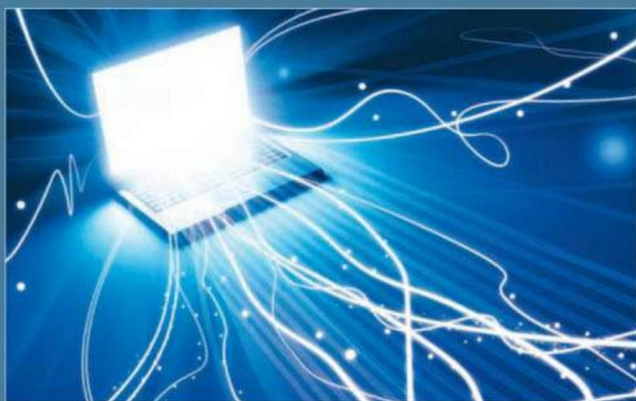


4 For tablet users, an alternative solution is to send your documents via email. Click File, 'Email as Attachment'. Remember to open each document on your tablet while a Wi-Fi connection is available to ensure they are stored locally. ☒

Give your Windows PC a performance boost



A fragmented hard drive and junk files can slow down your system over time. Cliff Joseph explains how to optimise your PC with Performance Toolkit



We often hear people complain that their PC is getting old and slow. But while a PC might look slow in the face of newer models, a well-maintained system will continue to work at the speed it was capable of on the day you bought it.

There are several reasons a PC might run slower than expected. Two of the worst culprits are a fragmented hard disk and a messy collection of startup programs.

Files deleted from a hard drive leave behind gaps that are later filled by the OS with fragments of new files. While this helps to cut down on wasted storage space, the drive mechanism will have to keep moving back and forth to locate your files, slowing access times.

Startup items are the programs that launch with Windows. If you've got a large collection of these, you may be kept waiting a significant amount of time for the computer to boot.

Both problems can be fixed within Windows, which includes tools for defragmenting your hard disk and specifying what programs launch at startup. However, a tune-up program

such as PC Tools Performance Toolkit can simplify these tasks for novice users.

Performance Toolkit can also perform some optimisation tweaks that Windows can't, including the ability to clean up the Registry. The Windows Registry is a complex file that stores all the settings for the many different programs on your PC.

Over time the Registry can become cluttered, and performance is curtailed as your machine has to work harder to sort through the settings. Cleaning out the Registry can speed things up.

Performance Toolkit can also securely delete files, making them irrecoverable by specialist software.

Many alternatives to Performance Toolkit exist, including several free tune-up tools. However, the program's £39 price includes 12 months of updates and a three-user licence, enabling you to keep all the machines in your home or office operating at peak performance. The cleanup and optimisation process we outline in the following tutorial is largely the same for rival vendors' programs.

CLEAN UP YOUR PC FOR OPTIMUM PERFORMANCE

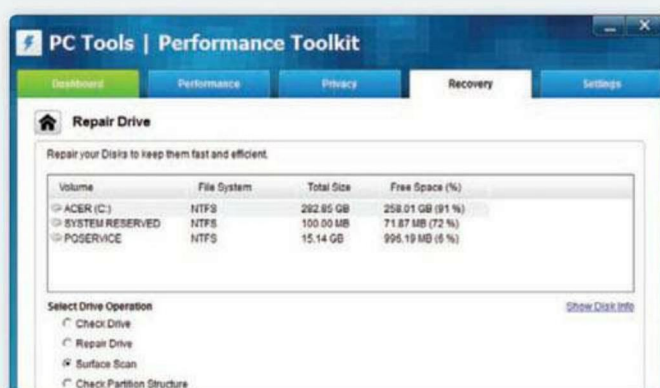


START

When you launch PC Tools Performance Toolkit you'll be presented with the program's main dashboard. This provides an overview of the state of your PC. There's a System Health dial, plus boot-time and user-history statistics.



4 Click the Privacy tab, which includes options for erasing your browsing history and information stored by other programs. Prevent file recovery by 'shredding' (securely deleting) specific files and 'bleaching' (securely wiping) the free space on your hard disk.



7 Another useful option on the Recovery tab is the Repair Drives facility. This scans your hard disk and will detect and repair any problems before they get out of hand. You can analyse both files stored on the hard drive and the disk's integrity.



2 Start with the Performance tab, which includes tools for defragmenting your hard disk and selecting which programs start with Windows. Disable each in turn - if something important stops working, fixing it will be a simple case of reversing the setting.



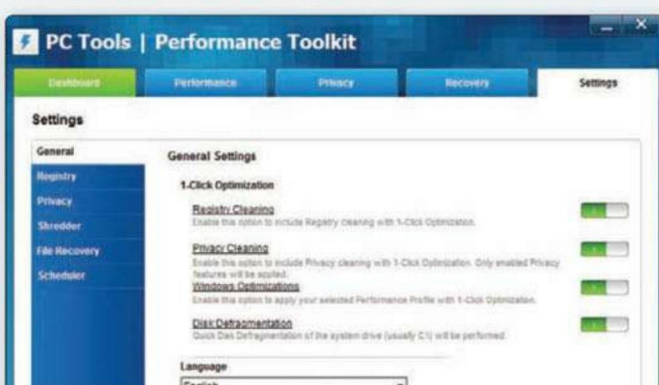
3 One of Performance Toolkit's most useful functions is its ability to scan and clean the Windows Registry. This can become bloated with redundant files over time, so cleaning out and slimming down the Registry can speed things up.



5 Manually erasing your browsing history and cookies is possible through the web browser itself, but Windows also stores a lot of information about how we use it. Performance Toolkit allows you to delete this information, too.



6 The Recovery tab allows you to restore photos or other files that you've accidentally deleted. You can also claw back some storage space by locating duplicate files, and restore an older version of the Registry.



8 Some of the options on the Settings tab are best left to advanced users, but it's worth enabling 1-Click Optimization for certain tasks. Disabling the quick disk defragmentation will speed up the process, and you can run a more in-depth defrag later.



9 After running each of the available tools, the System Health dial on the dashboard should be pointing into the green area. A list of steps you can complete to achieve this will otherwise be given. Our laptop's boot time was reduced from 35 to 16 secs. ☑

Take your mobile number with you



If you've been on one contract for a long time, you could be getting better value elsewhere. Jim Martin explains how to transfer your number to a new operator



Many of us are guilty of simply paying our mobile phone bill month after month without checking whether we could be getting better value elsewhere. Often, this is because it's wrongly assumed that making the switch is complicated and time-consuming, and that we'll have to ensure all our contacts have our new number. Provided that you're not locked into a contract, it's free to transfer your number.

First, you'll need to search for a new contract or pay-as-you-go (PAYG) deal. This could include both a phone and SIM, or just the SIM if you want to keep your existing handset. Whether you're moving from a contract to a PAYG deal, or vice versa, is irrelevant: the process for transferring your mobile number to a new operator is the same.

Bear in mind that the new SIM will have a different number, which will be replaced with your phone number when the transfer takes place. Hold fire on ordering the SIM or phone, though, since your current provider may be willing to match the deal.

If you're coming to the end of your contract, check

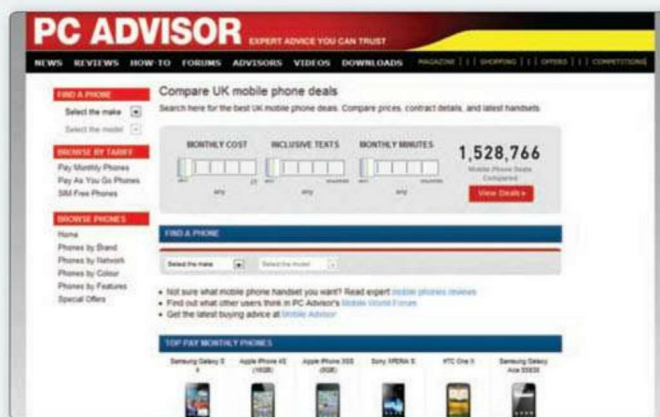
the small print to find out how much notice you need to give the operator to leave its network. Even after the contract finishes, you may be required to give in writing a 30-day warning of your intention to cancel.

Mobile operators are legally obliged to provide the porting authorisation code (PAC) necessary for transferring your mobile number within two hours, but they will typically take this opportunity to convince you to stay with the network.

With your PAC in hand you can order the new SIM. Depending on where you buy it from, you may be able to enter the PAC or say that you will be keeping an existing number as part of the sign-up process.

If you can, choose a day for the transfer when you don't need to rely on your phone. There is likely to be a short gap in service in the time between the old SIM being switched off and the number being activated on the new one. Of course, you can start using your new SIM as soon as it arrives, but be sure to tell people that it's only a temporary number.

SWITCH TO ANOTHER MOBILE PHONE PROVIDER



START

Use a comparison engine to find the best mobile phone deal. Browse to pcadvisor.co.uk/mobile-phone-deals if you want to get a new handset as part of the package. If you'd prefer to keep your old handset, comparison sites such as simonlycontractdeals.co.uk will help you find a SIM-only deal.



4 If you haven't already done so, order your new SIM or mobile phone package now. If you're ordering a SIM, make sure you specify whether you need a micro SIM for your handset - the iPhone 4 and 4S require this format, for example. If you forgot to do so, you can always create your own (see tinyurl.com/6vbtwdx).

USEFUL NUMBERS

Here are the numbers you need to call from your mobile to get a PAC from each of the five main networks:

- 3: 333
- O2 - Pay Monthly: 202
- O2 - Pay And Go: 4445
- Orange - Pay Monthly: 150
- Orange - Pay As You Go: 450
- T-Mobile: 150
- Vodafone: 191



2 If you've been able to find a deal with a new operator that's better suited to your needs, give your current mobile provider a call and request a PAC. Have a pen and paper handy in case the number is given to you over the phone, but most networks will send it in the form of a text message.



3 The PAC should be in the format ABC123456 and is valid for 30 days. A PAC isn't tied to a particular person or address, so if you don't want to transfer your existing number to a new mobile phone deal you can give the code to a friend or family member for them to use the number.



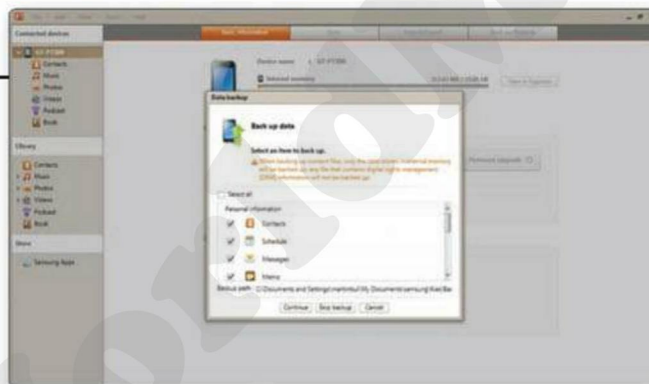
5 While you're waiting for your new smartphone or SIM to be delivered, call the new network provider's customer services and tell them you want to keep your current number. You'll need to give them the PAC, and they will do the rest. Make sure they tell you when the number will be switched over.



6 On the day of the transfer, insert the new SIM into your phone and turn it on. Reboot it periodically to check whether the transfer has completed. It shouldn't take more than 24 hours, and can be over in as little as a few minutes. Typically, you'll be without service for an hour or two. ☒

BACK UP YOUR CONTACTS

You can continue to use your old SIM until the day of the transfer, but be sure to back up any contacts and text messages stored on the SIM if you don't want to lose them. If it's not possible to export the contacts from your phone to your computer using the software bundled with your handset, jotting them down by hand is an alternative solution. It's also worth paying a visit to your mobile operator's high-street shop, since they can usually copy the contacts and SMS messages for you. Once the number transfer happens, the old SIM is deactivated and won't work in any phone. Make sure you use up any remaining credit or you'll lose it.



Create a vector logo for your business



Mike Bedford explains how to create a vector logo with which people will associate your business, with easy-to-use consumer graphic-design software



Corporate identity is often inextricably linked with a company logo. Take the famous red and yellow Shell image. Whether it appears on a letterhead, a business card or a petrol station, few people would not immediately link it with the Shell oil company. Your firm, club or charity may never achieve the same worldwide recognition, but a good logo will establish your corporate identity among your clients, members, or the local community.

Perhaps you've never had a logo, or maybe your existing design is looking dated. Here, we provide practical advice on how to create a new one. We'll show you how to recreate the Arrows Haulage logo pictured above, and you can use the same principles to design and draw your own logo.

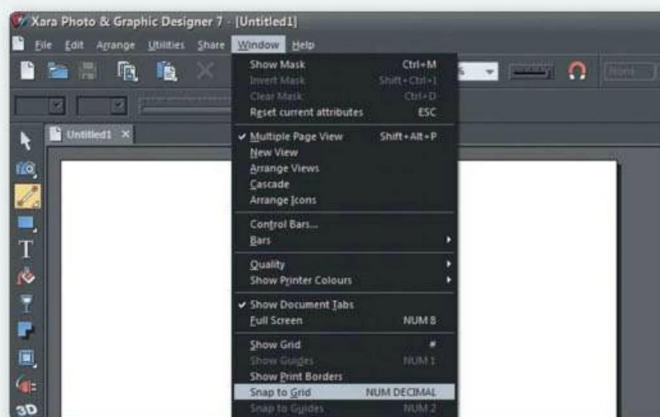
You may already have a graphics package that came bundled with a digital camera; in addition to photo editing, it probably provides a painting facility. For logos, though, drawing software, also known as a vector graphics package, provides a better solution. Let's look at the differences.

Photo-editing software works with pixels, so is often referred to as a bitmapped or rasterised graphics package. If you draw a line, the software works out which pixels lie along that line and writes them to your image. That's fine, provided that you always use the image at or below its original size. However, if you try to expand the logo, each pixel gets larger and you'll start to see jagged edges.

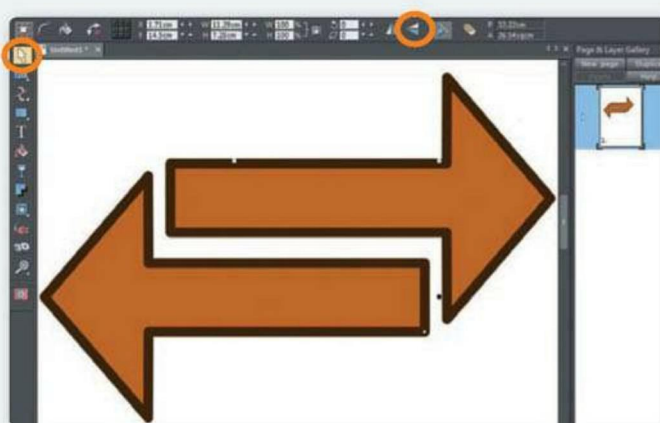
If you draw a line using a vector package, all that's saved to your image is the positions of each end of the line. This is converted to pixels only when the image is inserted into a document, and the conversion process takes into account the size of the image so that you always see it at an appropriate resolution. In other words, you'll see only smooth lines. The same applies to rectangles, circles, text and pretty much anything else you might include in your logo.

We're using Xara Photo and Graphic Designer 7.0. It costs £69, but you can download a fully functional free trial from tinyurl.com/bogq93y.

CREATE A VECTOR LOGO IN XARA PHOTO & GRAPHIC DESIGNER 7.0



START Start Xara and close the Getting Started document. In a new blank document select 'Snap to Grid' from the Windows menu. This forces objects to be positioned on an invisible grid, which helps to keep lines straight and furniture evenly spaced. We'll use Xara's default grid spacing.



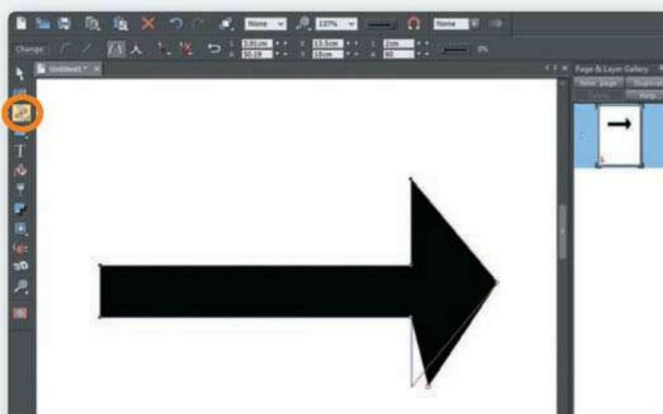
4 Choose the Selector tool and click on your arrow, then select Edit, Copy Shape and Edit, Paste, Paste Shape. This places an identical arrow onscreen. Click the Flip Horizontally icon in the Infobar (immediately below the Standard control bar), then drag it to its correct position relative to the first arrow.

WHAT MAKES A GOOD LOGO

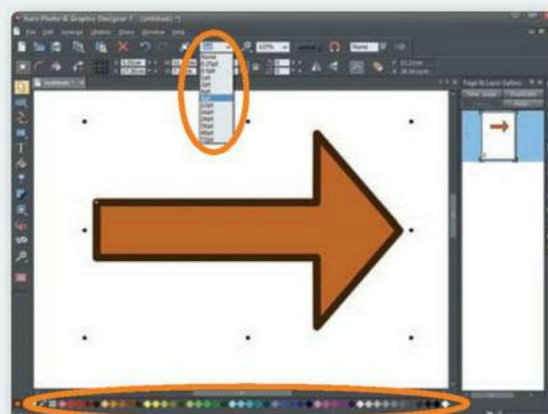
We've shown above that it's easy to draw a logo, but half the battle in creating a new logo is coming up with a good idea. It sounds obvious, but you'll probably find it easier to do this by trying out some ideas on paper before designing them on your PC.

The first rule in logo design is to keep it simple. It's a cliché, but less really is more. The less complicated your design, the more likely the general public is to remember it.

You don't have to use much in the way of graphics - the wording alone can be enough, given sufficient imagination, as the BBC's logo adequately demonstrates. If you decide to use more in the



2 Select Drawing tools (third down in the toolbar), then choose the Shape tool from the fly-out menu. Draw a large arrow in the workspace by clicking where each of its corners should be. The shape is automatically filled in when you return to the starting point. You can edit the shape by dragging the corners.



3 Click on a coloured diamond at the bottom of the screen to change the fill colour; hold down the Shift key as you do so to alter the outline colour. You can adjust the thickness of the outline by choosing 8pt as the line width in the Standard control bar (immediately below the menu bar).



5 Select the Text tool from the toolbar. Click on the page and type 'ARROWS'. Now click on the text with the Selector tool to enlarge the text and drag it into place. Select a colour using the diamonds at the bottom of the screen, and change the font in the Fonts Gallery. Do the same for the word 'HAULAGE'.



6 Save the logo in Xara's proprietary format for subsequent edits; also export it (File, Export) in a format suitable for use in your business documents. We recommend using a format with lossless compression, such as PNG. Be sure to select a suitable pixel resolution for your document. ☑

way of graphics emblems, though, try to take your inspiration from the name of your organisation. Again, keep it simple.

Returning to the Shell logo as an example, the design is stylised rather than being an accurate representation of a scallop shell. The rule of simplicity applies to your choice of colours, too. Using just one or two colours not only provides a catching and uncluttered design, it also keeps down printing costs.

In fact, if you're going to be using a professional printing service, it might be a good idea to discuss your options with staff there, who can help you to avoid the cost of four-colour printing that would be necessary to accurately reproduce some shades.

Finally, while we don't suggest that you copy other organisations' logos, running a Google search for 'classic logos' should provide some useful inspiration.



Sharing the best of the web with friends



Pinterest is a digital corkboard that lets you share with others the online items you rate. Rosemary Hattersley explains how to use the latest social-media craze



Visit PC Advisor's Pinterest boards at pinterest.com/pcadvisor

Facebook, Twitter and a personal blog or website are obvious ways of sharing online items that you rate. And now there's Pinterest, a social tool that acts as a digital corkboard.

Pinterest offers a different slant, in which peer ratings are important. You indicate your admiration of other pinners' taste by following them or adding their pinned items to your own board. These items stay pinned to your page until you remove them.

The site is based around interest boards that you contribute to, create and share, and Pinterest provides a selection of popular topic boards to get you started. The more pins you acquire, the higher your Pinterest ranking. To see what's popular, check out the Popular link on the home page.

Like Twitter, you can follow or unfollow any other Pinterest member. If you've linked your Pinterest account with

Facebook rather than Twitter, it's 'Likes' that you're after.

Pinterest is an invite-only beta website, yet it already has more than 12 million members – most of them female in the US, and male in the UK.

Pinterest invited craft and fashion bloggers to try out the service when it was in closed beta, and there's still a big focus on homespun choices such as family, home, DIY and crafts, fashion and cooking. Other interests, such as technology, cars and science, are listed at the bottom of the home page. You can add your own Pinterest category, too.

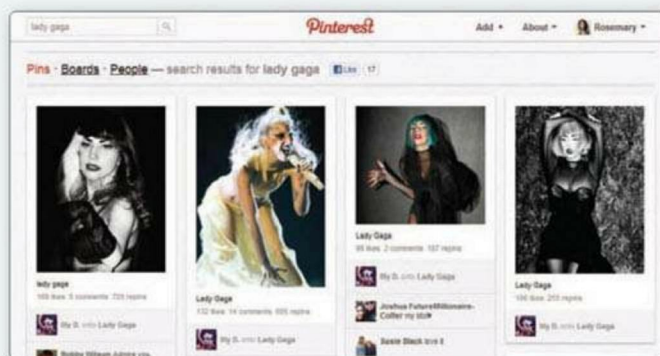
As the site develops and new members with different interests join, these listings will change. As with all things social on the web, from Digg to YouTube to Twitter, Pinterest is user-driven and shaped by its members' likes.

What you pin is a public, permanently accessible log of what interests you and how you value the web.

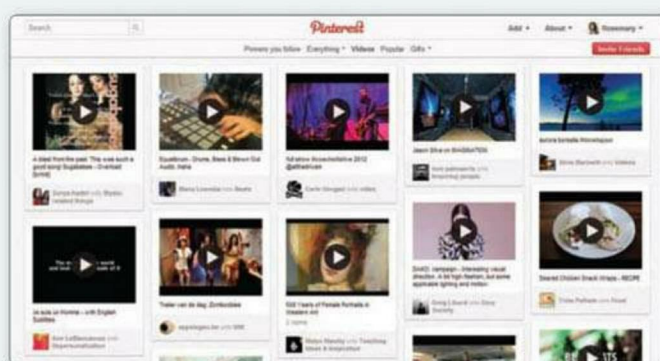
GET STARTED WITH PINTEREST



START Request a login at Pinterest.com or accept an invitation from a friend. Your email address and a password are all you need. Click on any of the preset boards and follow those that interest you. The Find friends link is a good starting point for finding and sharing pins with like-minded Facebook and email friends.



4 If you find something you like on someone else's board, click to 'repin' it to your own Pinterest board. This also has the effect of raising the profile of both the item and its original pinner. You can also share Likes and links via Twitter and Facebook by optionally sharing your repin.



7 Video can also be shared on Pinterest, and channels for each are listed at the top of the page. You can also use Pinterest to market your products and to showcase your talents to potential employers. Items for sale are listed under Gifts by rough price range. Note that when you type in a figure it will appear in US dollars.



2 The easiest way to start interacting on Pinterest is to add a bookmarklet for each of your boards in your web browser. These are tiny applications that allow you to quickly add stumbled upon items to your Pinterest stash. In Safari and Chrome, for example, you just drag the 'Pin It' link to the bookmarks bar.



3 Another useful tool native to Pinterest is Search. It's possible to lose hours to browsing Pinterest boards due to their visual appeal and the way they seamlessly lead on to each other. If you want to find something specific - attractive business card ideas, for example - head straight for Search.



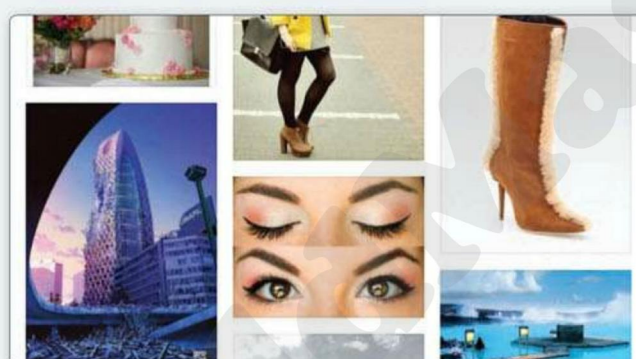
5 Click Pinners you follow at the top of the screen to see their latest updates. You can curate your own Pinterest boards, too. Click on something you like. If it doesn't fit neatly into one of the boards you're following, scroll down to the bottom of the Repin menu and click in the field to create one of your own.



6 To improve your standing on Pinterest - or simply share items you like - you need to pin original items. Pinterest etiquette dictates that the original pinner gets the credit for repins. Click the Add button on your profile, choose 'Add a pin', then copy the pertinent page link. You can also upload images.



8 As with any website, you should be wary of the links you click. Dodgy photos and phishing are rare, but Pinterest provides a reporting tool to the right of each entry for alerting moderators to nudity and pornography, malicious comments, graphic violence, hateful speech and symbols, spam and more.



9 Once you're following a few pinners and have several boards, it can be hard to keep up with the new entries. For desktop use, Pinterest is easy enough to control via a browser. On the road, an app is ideal for uploading and sharing pins. There's a Pinterest app for iOS, and Pinsensation for Android and Windows Phone. ☑

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Agnitum Outpost Security Suite Pro FULL PROGRAM (SIX-MONTH LICENCE)

ONLINE
REGISTRATION
REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 205\Agnitum Outpost Security Suite Pro and open the install file

Online registration required:

head to tinyurl.com/6Lphqwn and enter the code FUMCS-MBBS-KKC4C-CWG4W-WDGZA
Offer ends 4 July 2012

System requirements

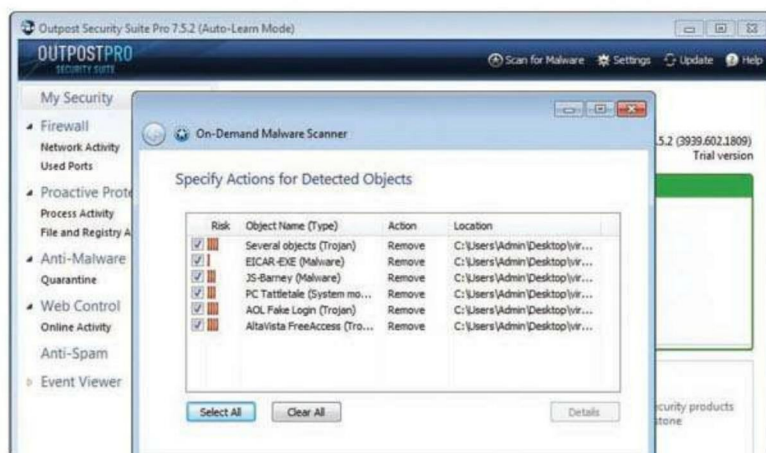
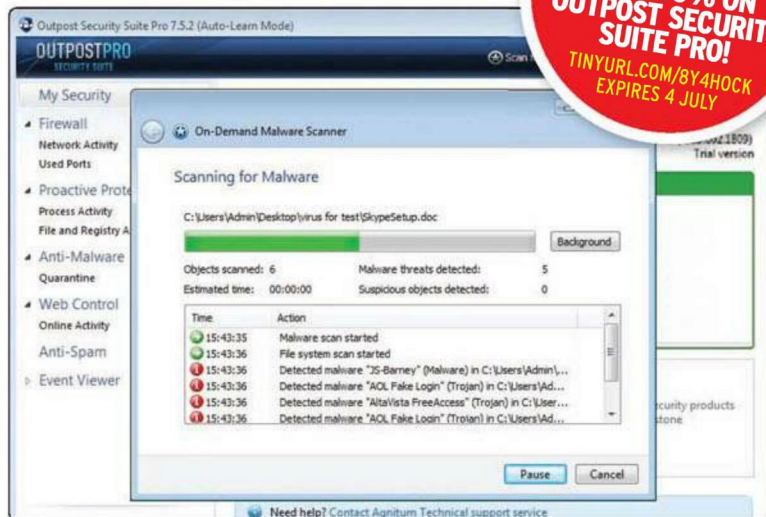
450MHz processor;
Windows 2000/Server 2003/XP/Vista/7;
Windows Mail/Outlook Express/Outlook; POP3/SMTP/IMAP; 256MB RAM, 200MB drive space

Outpost Security Suite Pro includes antivirus, antispyware, a firewall and antispam to deliver all-round proactive protection. On- and offline malware prevention and powerful web-control tools deliver robust yet lightweight PC security.

The latest version is less resource-hungry and is enhanced with SmartDecision, SmartScan 4.0, an improved anti-malware engine, clipboard and screen protection, USB virus protection, PDF filtering and more.

Features

- Program and application guard
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- Combined antivirus and antispyware for all-in-one malware defence
- Proactive protection module blocks zero-day threats
- File and folder lock restricts the viewing of sensitive data
- Web control protects your PC from web-borne threats
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Soda PDF Standard

FULL PROGRAM



Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 205\ SodaPDF Standard Edition and open the install file

Online registration

required: follow the links during installation. Offer ends 4 July 2012

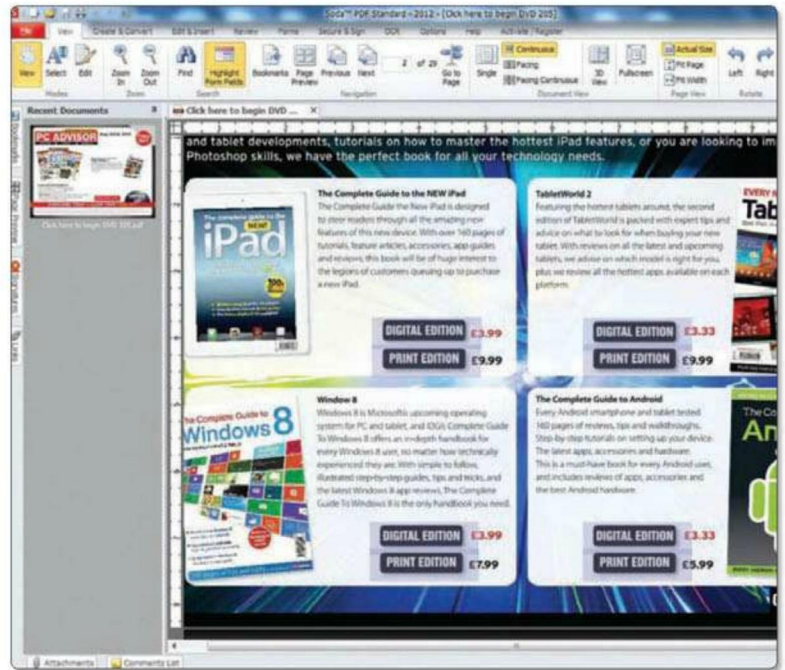
System requirements

Windows XP/Vista/7;
1GB RAM (512MB XP);
100MB drive space

Soda PDF Standard is an easy-to-use tool designed to simplify PDF creation and management. It's equipped with all the tools you need to open, edit, create, convert and print PDFs. Its intuitive interface means you'll be mastering PDFs in no time.

Soda PDF Standard is fully compatible with any PDF, no matter in which software it was created - your PDFs will always display correctly. Choose from several viewing modes, including full screen, facing and 3D View.

Create PDF files with ease from more than 300 file types. Soda PDF can create PDF files from scratch, from templates or from other file formats. You can also edit files within the program. By eliminating the need to use multiple programs, Soda PDF helps you to work faster. ☒



1-abc.net File Encrypter 5.0

FULL PROGRAM



Installation details

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Online registration

required: head to tinyurl.com/c8sLho8. Offer ends 4 July 2012

System requirements

Windows XP/Vista/7

There are many reasons why you should encrypt your files and personal data, but many of us think it's just too complicated to bother with. File Encrypter simplifies the process, so all you have to do is add it to your file list and click Encrypt Now. To decrypt the file, just select it and choose Decrypt Now.

Features

- Easy-to-use interface
- Encrypt and decrypt files on a hard drive, floppy disk or USB stick
- 10 encryption methods (Simple HEX Encoding, Caesar-3, Caesar-9, Simple XOR, Extended XOR, Advanced Encryption Standard (AES), Blowfish, Twofish, Serpent and MARS)
- Can encrypt data to a self-extracting .exe file
- Logs encryption history
- Installable on USB sticks, floppy disks and re-writable media ☒



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Ashampoo

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Go to My Computer. Right-click the DVD icon and open the disc. Select Files 205\Ashampoo Slideshow Studio 2012 and open the install file

Online registration required: follow the links during installation. Offer ends 4 July 2012

System requirements
Windows XP/Vista/7;
512MB RAM; 160MB HDD

Ashampoo Slideshow Studio 2012 lets you create cool slideshows you can enjoy with family and friends.

You can add descriptions to your images and background music to a slideshow. You can also change each photo's display length and more.

When you're happy with the slideshow, Ashampoo produces a WMV file of your efforts.

Features

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- Guidelines help to align images



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SIX-MONTH LICENCE

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Installation details

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System requirements
Windows XP/3003/2008/
Vista/7; 512MB RAM
(256MB XP); 50MB
drive space

Speed up a slow Windows system with the award-winning Auslogics BoostSpeed. Run the program once a week to remove clutter, fix Registry errors and defragment your hard drive. BoostSpeed will also optimise Windows settings for your computer's unique configuration, improving your internet speed and reducing Windows startup and shutdown times.

Features

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- Free up space
- Software control
- System tweaks
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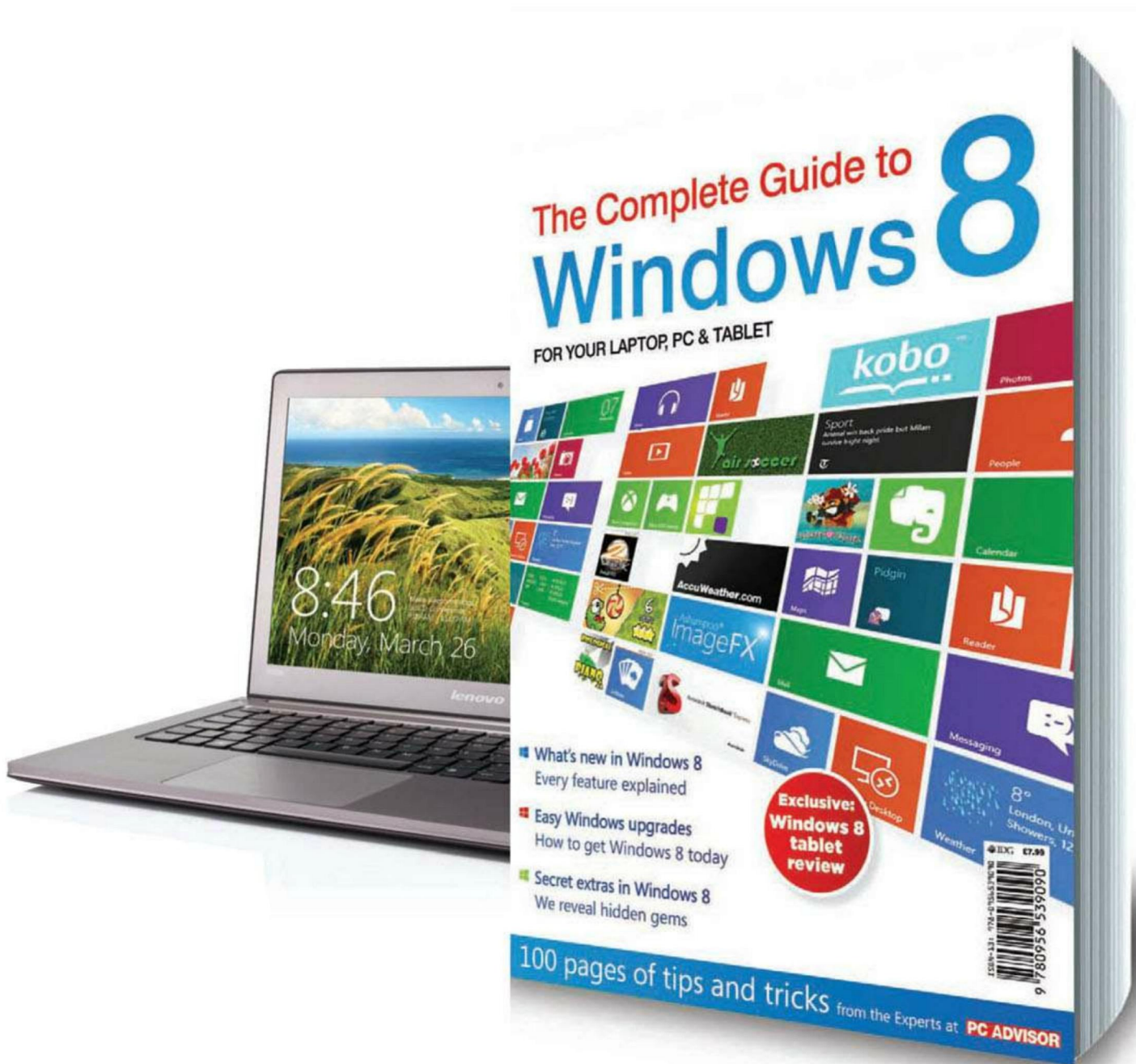
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Netbooks



Laptops



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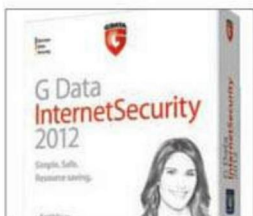
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Flat-panel displays

Prices

Laptops

Laptops up to £600
£601 to £1,000
£1,001 and over

Printers

Printers under £150
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Graphics cards under £150
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Netbooks	1	2	3	4	5
	Samsung NC110	Kogan Agora Pro	Samsung NS310	Acer Aspire One Happy 2	Dell Latitude 2120 Advanced
Price	£260 inc VAT	£300 inc VAT	£320 inc VAT	£250 inc VAT	£598 inc VAT
Website	Samsung.com/uk	Kogan.co.uk	Samsung.com/uk	Acer.co.uk	Dell.co.uk
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	1.5GHz Intel Atom N550	1.3GHz Intel Pentium SU2700	1.5GHz Intel Atom N550	1.66GHz Intel Atom N570	1.5GHz Intel Atom N550
RAM	1GB DDR2	2GB DDR2	1GB DDR3	1GB DDR3	2GB DDR3
Storage	250GB hard drive	500GB hard drive	250GB hard drive	250GB hard drive	320GB hard drive
Screen size	10.1in	11.6in	10.1in	10.1in	10.1in
Screen resolution	1024x600 pixels	1366x768 pixels	1024x600 pixels	1024x600 pixels	1366x768 pixels
Graphics	Intel GMA 3150	Intel GS40	Intel GMA 3150	Intel GMA 3150	Intel GMA 3150
Video memory	N/A	N/A	N/A	N/A	N/A
Wireless	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	10/100Mbps	10/100Mbps	10/100Mbps	10/100Mbps	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	3x USB 2.0	3x USB 2.0	3x USB 2.0	3x USB 2.0	3x USB 2.0
FireWire	×	×	×	×	×
Thunderbolt	×	×	×	×	×
DisplayPort	×	×	×	×	×
HDMI	×	✓	×	×	×
DVI	×	×	×	×	×
VGA	✓	✓	✓	✓	✓
eSATA	×	×	×	×	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Windows 7 Starter 32bit	Ubuntu Linux 11.04	Windows 7 Starter 32bit	Windows 7 Starter 32bit	Windows 7 Pro 32bit
Bundled software	None	None	None	None	Microsoft Office Starter 2010
Fear (Max detail)	Not tested	Not tested	Not tested	Not tested	Not tested
Battery	48Wh lithium-ion	31Wh lithium-ion	Three-cell lithium-ion	42Wh lithium-ion	56Wh lithium-ion
Battery life	7 hrs 52 mins	2 hrs 22 mins	3 hrs 41 mins	Not tested	6 hrs 24 mins
WorldBench 6 score	36	N/A ¹	37	32	33
Dimensions	259x180x28mm	290x195x26mm	275x188x31mm	259x185x24mm	265x187x23mm
Weight	1.2kg	1.3kg	1.1kg	1.3kg	1.3kg
Warranty	1 year return-to-base	1 year collect-and-return	1 year return-to-base	1 year international	1 year collect-and-return
Verdict	<ul style="list-style-type: none"> Attractive styling Excellent battery life Only DDR2 RAM Non-reflective 10in screen 	<ul style="list-style-type: none"> Above average screen size 2GB RAM Runs Ubuntu not Windows Battery life very poor Hi-res matt screen 	<ul style="list-style-type: none"> 1GB DDR3 RAM Only 250GB hard drive Glossy screen Low battery life Expensive for the spec 	<ul style="list-style-type: none"> Good overall build quality Glossy screen Adequate performance A little hot in use Difficult to access innards 	<ul style="list-style-type: none"> Business netbook 2GB DDR3 RAM Average performance Windows 7 Professional Solid battery life
FULL REVIEW	TINYURL.COM/7QZAPKM	TINYURL.COM/43MN2OB	TINYURL.COM/444SKTX	TINYURL.COM/7D4ZP3C	TINYURL.COM/7WNFF7T

¹Not tested. Note: WorldBench 6 works only in Windows

>> Buying advice



Netbooks

A light, compact chassis is a mini laptop's main asset. Portability, lengthy battery life and a low price tag are these modest machines' main selling points.

Processor: Intel's Atom is a popular processor. It consumes little power and gets the job done. Just don't expect massive processing muscle.

Storage: Netbooks usually come with 160GB or 250GB hard-disk drives. Some have solid-state drives instead. Smaller, less fragile and quieter, these are also expensive and you'll have to settle for far less capacity.

Memory: Most netbooks come with 1GB of RAM, but you can upgrade to 2GB for around £20 (see tinyurl.com/yerjwpc). A

smaller complement than found in more capable machines, this is just sufficient for single tasks.

Wireless: 802.11b/g was standard on netbooks, sometimes with Bluetooth, but most new models now also support the faster 802.11n standard. As they are designed to be used on the move, the faster wireless technology comes in handy when copying large files.

Sub-£600 laptops	1	2	3	4	5
	Lenovo G570	Samsung RV511	Lenovo IdeaPad S205-1038	Lenovo ThinkPad X121e 3045	MSI CR650
Price	£490 inc VAT	£510 inc VAT	£330 inc VAT	£492 inc VAT	£500 inc VAT
Website	Lenovo.com/uk	Samsung.com/uk	Lenovo.com/uk	Lenovo.com/uk	Uk.msi.com
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	2.1GHz Intel Core i3-2310M	2.53GHz Intel Core i3-380M	1.6GHz AMD E350	1.4GHz Intel Core i3-2367M	1.6GHz AMD E350
RAM	6GB DDR3	6GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3
Storage	640GB hard drive	640GB hard drive	500GB hard drive	320GB hard drive	500GB hard drive
Screen size	15.6in	15.6in	11.6in	11.6in	15.6in
Screen resolution	1366x768 pixels	1366x768 pixels	1366x768 pixels	1366x768 pixels	1366x768 pixels
Graphics	AMD Radeon HD 6370M	nVidia GeForce 315M	AMD Radeon HD 6310M	Intel HD Graphics 3000	AMD Radeon HD 6310M
Video memory	1GB	1GB	N/A	N/A	N/A
Wireless	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	4x USB 2.0	3x USB 2.0	3x USB 2.0	1x USB 3.0, 2x USB 2.0	3x USB 2.0
FireWire	x	x	x	x	x
Thunderbolt	x	x	x	x	x
DisplayPort	x	x	x	x	x
HDMI	✓	✓	✓	✓	✓
DVI	x	x	x	x	x
VGA	✓	✓	✓	✓	✓
eSATA	x	x	x	x	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	2x BD-ROM, 8x DVD ±R, 4x DVD ±RW, 8x DVD-ROM	8x DVD ±R, 4x DVD ±RW, 8x DVD-ROM	N/A	N/A	8x DVD ±R, 4x DVD ±RW, 8x DVD-ROM
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Pro 64bit	Windows 7 Home Prem 64bit
Bundled software	None	None	None	None	None
Fear (Max detail)	32fps	33fps	18fps	13fps	19fps
Battery	48Wh lithium-ion	48Wh lithium-ion	48Wh lithium-ion	54Wh lithium-ion	48Wh lithium-ion
Battery life	5 hrs 1 min	5 hrs 15 mins	5 hrs 38 mins	6 hrs 15 mins	5 hrs 42 mins
WorldBench 6 score	96	105	53	72	54
Dimensions	377x250x35mm	382x256x34mm	290x168x29mm	289x208x24mm	383x250x38mm
Weight	2.6kg	2.4kg	1.5kg	1.57kg	2.3kg
Warranty	1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year return-to-base
Verdict	<ul style="list-style-type: none"> • Blu-ray drive • Adequate performance • Can play some games • Capacious hard drive • Heavy 	<ul style="list-style-type: none"> • Good performance in WorldBench 6 • Large hard disk • Light gaming potential • Reflective screen 	<ul style="list-style-type: none"> • Extremely portable • More powerful than a netbook • Glossy screen • Rather slow 	<ul style="list-style-type: none"> • Business portable • Excellent matt screen • No optical drive • Relatively lightweight • Good battery life 	<ul style="list-style-type: none"> • Good sound quality • Comfortable keyboard • Not great for games • Weak processor • Expensive
FULL REVIEW	TINYURL.COM/6FZZ4XE	TINYURL.COM/5TVT8AE	TINYURL.COM/6G5EKQK	TINYURL.COM/7R5WOAR	TINYURL.COM/5TRK7F4

All the models currently in our chart support 802.11n.

Operating system: Windows 7 Starter Edition is now standard, with slightly reduced performance compared to Windows XP. Some earlier netbooks instead ship with a Linux operating system. All those we've tested have struggled with Vista, but Windows 7 will run on an Atom processor.

Display: Netbooks' small screens and low resolutions, plus the lack of dedicated

graphics, mean they don't lend themselves to video playback or gameplay. However, most netbook screens are adequate for sending emails, web browsing and word processing.

Keyboard: Cramped keyboards go with the territory, and it's useful to try out typing on a netbook before you buy it. The keyboards on netbooks with smaller than 9in screens will make touch typing impossible. Watch out for non-standard layouts; mini laptops often sacrifice dedicated function keys.

Extras: To keep down cost and weight, mini-laptop manufacturers tend to compromise heavily on extra features – don't expect to get a CD/DVD drive, a FireWire port or an ExpressCard slot, for example. You'll usually find three USB ports, but they may be crammed together tightly, which can make plugging in two devices side by side tricky unless you use a USB hub or an extension cable.

£1,001+ laptops	    				
	1	2	3	4	5
	Apple MacBook Air 13.3in	Dell Latitude E6420 ATG	Rock Xtreme X685-i5-2540M	Apple MacBook Pro 15in	Toshiba Portégé Z830-104
Price	£1,449 inc VAT	£1,293 inc VAT	£1,229 inc VAT	£1,849 inc VAT	£1,099 inc VAT
Website	Apple.com/uk	Dell.co.uk	Rockdirect.com	Apple.com/uk	Toshiba.co.uk
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	1.8GHz Intel Core i7-2677M	2.8GHz Intel Core i7-2640M	2.6GHz Intel Core i5-2540M	2.4GHz Intel Core i7-2760QM	1.7GHz Intel Core i5-2557M
RAM	4GB DDR3	4GB DDR3	6GB DDR3	4GB DDR3	4GB DDR3
Storage	256GB SSD	128GB SSD	500GB hard drive	750GB hard drive	128GB SSD
Screen size	13.3in	14in	15.6in	15.4in	13.3in
Screen resolution	1440x900 pixels	1366x768 pixels	1920x1080 pixels	1440x900 pixels	1366x768
Graphics	Intel HD Graphics 3000	Intel HD Graphics 3000	AMD Radeon HD 6990	AMD Radeon HD 6770M	Intel HD Graphics 3000
Video memory	N/A	N/A	2GB	1GB	N/A
Wireless	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n
Ethernet	N/A	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 2.0	3x USB 2.0	2x USB 3.0, 2x USB 2.0	2x USB 2.0	1x USB 3.0, 2x USB 2.0
FireWire	×	×	×	×	×
Thunderbolt	✓	×	×	✓	×
DisplayPort	✓	×	×	✓	×
HDMI	×	✓	✓	×	✓
DVI	×	×	✓	×	×
VGA	×	✓	×	×	✓
eSATA	×	✓	✓	×	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	8x DVD ±R, 2.4x DVD-RW, 4x DVD+RW, 8x DVD-ROM	6x BD-ROM, 8x DVD ±R, 2.4x DVD-RW, 4x DVD+RW	8x DVD ±R, 2.4x DVD-RW, 4x DVD+RW, 8x DVD-ROM	N/A
Extras	HD webcam, multitouch trackpad, backlit keyboard	Webcam, fingerprint reader	Webcam, fingerprint reader	HD webcam, multitouch trackpad, backlit keyboard	Webcam, fingerprint reader
Operating system	Mac OS X 10.7 Lion	Windows 7 Pro 32bit	Windows 7 Home Prem 64bit	Mac OS X 10.7 Lion	Windows 7 Pro 64bit
Bundled software	iLife 11	None	None	iLife 11	None
Fear (Max detail)	17fps	17fps	275fps	98fps	Not tested
Battery	50Wh lithium-ion polymer	60Wh lithium-ion	76Wh lithium-ion	77.5Wh lithium-ion	50Wh lithium polymer
Battery life	6 hrs 20 mins	6 hrs 24 mins	2 hrs 30 mins	5 hrs 11 mins	6 hrs 8 mins
WorldBench 6 score	130	155	124	133	117
Dimensions	325x227x17mm	352x241x35mm	376x256x43mm	364x249x24mm	314x226x17mm
Weight	1.3kg	2.7kg	3.1kg	2.6kg	1.1kg
Warranty	1 year return-to-base	3 years onsite	3 years onsite	1 year return-to-base	1 year return-to-base
Verdict	<ul style="list-style-type: none"> • Thunderbolt, DisplayPort • Very strong performance • 256GB SSD • Exceptional build quality • Lengthy battery life 	<ul style="list-style-type: none"> • Rugged build quality • Fantastic general speed • Lacklustre for gaming • Long battery life, given the performance 	<ul style="list-style-type: none"> • Great performance • 2GB AMD Radeon graphics • Incredible gaming machine • Very poor battery life • Wonderful glare-free screen 	<ul style="list-style-type: none"> • Multitouch trackpad • Good battery life • Thunderbolt connectivity • Solid unibody chassis • Quad-core power 	<ul style="list-style-type: none"> • Great range of ports • Easy to carry around • Not particularly attractive • Slightly overpriced
FULL REVIEW	TINYURL.COM/729FHEZ	TINYURL.COM/CBA725B	TINYURL.COM/BTZO97	TINYURL.COM/6LRTACR	TINYURL.COM/6NDX26W

>> Buying advice



£1,001+ laptops

Invest £1,000 or more in a laptop, and you can be reasonably sure of getting a high-quality PC.

Sometimes that money will be spent on getting a thin-and-light laptop, with good performance to boot. Alternatively, you may prefer a rugged laptop that's able to withstand wear and tear on the road, or a performance-first

high-powered workstation.

Whatever your need, accept no compromises in build quality.

The best laptops should offer very good screens. Beware of glossy shiny panels that allow distracting reflections in certain lighting conditions.

Ultraportables may have up to 256GB of solid-state storage, but won't have an optical drive or GPU.

Workstation laptops will have faster - often quad-core - CPUs and a mobile graphics processor.

Rugged laptops are engineered for strength, at the expense of light weight and sleek design. Look out for milspec standard ratings, such as MIL-STD-810G.

You'll find a wide range of ports, high-grade components and extras.

READ MORE: TINYURL.COM/CC3KBMM

Family PCs	1	2	3	4	5
	Chillblast Fusion Longbow	PC Specialist Fusion FX-41	Arbico eXcel 2568HD	Eclipse Matrix i323R685	Quiet PC Nofan IcePipe A40-Z77
Price	£799 inc VAT	£649 inc VAT	£849 inc VAT	£699 inc VAT	£1,124 inc VAT
Website	Chillblast.com	Pcspecialist.co.uk	Arbico.co.uk	Eclipsecomputers.com	Quietpc.com
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.4GHz Intel Core i5-3570K	3.6GHz AMD FX-4100	3.3GHz Intel Core i5-2500	3.3GHz Intel Core i3-2310	3.3GHz Intel Core i5-2500K
RAM	16GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3
Storage capacity	1TB HDD	1TB HDD	1TB HDD, 60GB SSD	1TB HDD	120GB SSD
Motherboard	Asus P8H77-M Pro	Asus M5A78L-M	Asus P8Z68-V LX	Asus P8H61-M LE	Gigabyte GA-Z77-D3H
CPU cooler	Standard Intel cooler	Standard AMD cooler	Standard Intel cooler	Standard Intel cooler	Nofan CD-100A
Power supply	700W Cit	450W FSP	500W Cooler Master	650W EZCool	400W Nofan
Screen	23.6in Asus VS247H	23.6in Edge 10 M240	23.6in Hanns-G HH241H	23in AOC E2350SDA	N/A
Screen resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	N/A
Graphics card	AMD Radeon HD 6850	Powercolor Radeon HD 7750	AMD Radeon HD 6870 OC	AMD Radeon HD 6850	Intel Graphics HD 3000
Video memory	1GB	1GB	1GB	1GB	N/A
Wireless	802.11b/g/n	802.11b/g/n	N/A	802.11b/g/n	N/A
USB	2x USB 3.0, 6x USB 2.0	2x USB 3.0, 4x USB 2.0	2x USB 3.0, 6x USB 2.0	2x USB 3.0, 6x USB 2.0	4x USB 3.0, 4x USB 2.0
Media card slot	✓	✓	✗	✗	✗
Sound card	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	2x Logitech S220	2x Logitech S220	2x Logitech S120	2x Logitech S220	N/A
Case	Cit Vantage	PCS Enigma Piano Black	Revoltex 67	Unbranded model 437-16	Nofan CS-30
Keyboard	Logitech Cordless MK260	Microsoft Optical Desktop 400	Logitech Cordless MK260	Microsoft Optical Desktop 400	Microsoft Wired Desktop 600
Optical drive	Samsung Blu-ray/DVD combo drive	Samsung Blu-ray/DVD combo drive	LG Blu-ray/DVD combo drive	LG Blu-ray/DVD combo drive	Samsung SH-S222 DVD drive
Operating system	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Bundled software	Free utilities	Office 2010 Starter, BullGuard	CyberLink PowerDVD	Office Starter 2010, BullGuard	N/A
Crysis (Low/Medium)	156/109	104/68	161/113fps	122/84fps	37/19
WorldBench 6 score	189	134 (estimated)	175	151	177
Warranty	2 years collect-and-return	3 years RTB (1 year parts)	1 year return-to-base	1 year return-to-base	2 years collect-and-return
Verdict	<ul style="list-style-type: none"> Ivy Bridge technology Superb performance Great feature set includes 16GB of memory and a capable graphics card Strong display 	<ul style="list-style-type: none"> Appealing price tag Good features for the money Speed figures not the highest in our tests Lengthy warranty 	<ul style="list-style-type: none"> Fantastic gaming machine Top-notch all-round Windows performance SSD is fast, but the 60GB of storage needs management Speakers and peripherals not the best 	<ul style="list-style-type: none"> Cheapest Intel system here AMD systems are better for tasks that benefit from multiple CPU cores Solid gaming capabilities Capable all-round list of components 	<ul style="list-style-type: none"> Completely silent operation Strong overall performance Fast but small-capacity SSD, with no HDD to supplement storage needs High asking price
FULL REVIEW	TINYURL.COM/CALEP8W	TINYURL.COM/CWKY96A	TINYURL.COM/BUS9XJP	TINYURL.COM/CPJR64T	TINYURL.COM/CFJ4J2

>> Buying advice



Family PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

A family PC needs to offer decent performance in every area, able to cater for the needs of each individual - but there are some areas where you can cut costs.

If you're not itching to play the latest games, opt for integrated rather than dedicated graphics. AMD processors are more adept in this regard, while Intel CPUs offer faster application performance.

Intel's Core i5-3570K will form the core of a powerful home PC, although the older Core i5-2500K may be offered at lower cost and supports easy overclocking.

Consider 4GB of RAM and a 500GB hard drive as the minimum; both are easy to upgrade later.

Screen quality is crucial, with the best displays using IPS tech. A Blu-ray drive will help make the most of a 23.6in full-HD monitor.

For Skype, watching films and listening to music, decent speakers and a webcam are essential.

READ MORE: [TINYURL.COM/BL4UREB](http://tinyurl.com/bl4ureb)

Gaming PCs					
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3	4	5
	Chillblast Fusion Talisman	Quiet PC Serenity Z68 Gamer Xtreme	PC Specialist EnForcer-X	CyberPower Cobra	Yoyotech Warbird Dark Iron CS
Price	£1,299 inc VAT	£1,550 inc VAT	£1,379 inc VAT	£1,999 inc VAT	£979 inc VAT
Website	Chillblast.com	Quietpc.com	Pcspecialist.co.uk	Cyberpowersystem.co.uk	Yoyotech.co.uk
Build rating	★★★★☆	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.3GHz (4.9GHz) Intel Core i5-2500K	3.3GHz (4.7GHz) Intel Core i5-2500K	3.3GHz (4.6GHz) Intel Core i5-2500K	3.4GHz (4.6GHz) Intel Core i7-2600K	3.3GHz (4.6GHz) Intel Core i5-2500K
CPU cooler	Thermolab Trinity	Zalman CNPS20LQ	Titan Fenrir	Advanced water cooling	Enermax ETS-T40 Cooler
Memory	8GB DDR3	8GB DDR3	16GB DDR3	16GB DDR3	8GB DDR3
Storage	30GB SSD + 1TB 3.5in HDD	60GB SSD + 1TB 3.5in HDD	80GB SSD + 1TB 3.5in HDD	128GB SSD + 1TB 3.5in HDD	60GB SSD + 500MB 3.5in HDD
Power supply	700W OCZ StealthXtreme	630W Nexus	650W Corsair TX650	Not specified	500W
Motherboard	Asus P8Z68-V	Gigabyte GA-Z68X-UD3H-B3	Asus P8Z68-V/GEN3	Asus P8Z68-V	Asus P8Z68-M Pro
USB	2x USB 3.0, 8x USB 2.0	3x USB 3.0, 7x USB 2.0	4x USB 3.0, 8x USB 2.0	2x USB 3.0, 8x USB 2.0	2x USB 3.0, 14x USB 2.0
Screen	24in Asus VS247H (1920x1080)	Not supplied	24in Iiyama E2473HDS (1920x1080)	24in AOC E2436VWA (1920x1080)	24in ViewSonic VA2448-LED (1920x1080)
Graphics	3GB Asus Radeon HD 7970	3GB Sapphire HD 7970	1.25GB Palit GeForce GTX 570	3GB Powercolor HD 7970	1GB Asus GeForce GTX 560 Ti
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Connectivity	Gigabit ethernet	Gigabit ethernet	Gigabit ethernet, Bluetooth	Gigabit ethernet, Bluetooth	Gigabit ethernet
VGA	x	✓	✓	x	✓
DVI	✓	✓	✓	x	✓
HDMI	✓	✓	✓	✓	x
DisplayPort	✓	✓	x	x	x
FireWire	x	✓	✓	x	x
eSATA	✓	✓	x	✓	✓
Case	Cooler Master Elite 430	AeroCool X-Predator Evil	Cooler Master Storm Enforcer	Cooler Master 690 II	Fractal Design Arc
Keyboard & mouse	Trust GXT 18 keyboard, Chillblast mouse	Not supplied	Razer Arctosa, Razer Death Adder ReSpawn	Razer Lycosa, Razer Death Adder	Microsoft Wireless Desktop 800
Optical drive	BD-ROM/DVD±RW	DVD±RW	DVD±RW	BD-R/DVD±RW	DVD±RW
Operating system	Windows 7 Home Premium	Windows 7 Home Premium 64bit	Windows 7 Home Premium	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Extras	None	Fan-speed control, choice of four case colours	Nero 9.0 Essentials, Logitech H350 USB Headset	MS Office 2010 Starter, soundproofing	BullGuard Internet Security
WorldBench 6 score	203	203	217	217	199
Gaming performance ¹	107/65/59/112fps	103/65/59/110fps	78/47/37/78fps	105/65/58/100fps	67/39/30/66fps
MediaEspresso time	4 mins 27 secs	4 mins 47 secs	4 mins	5 mins 34 secs	4 mins 5 secs
Power Consumption ²	96W/290W	60W/257W	119W/310W	125W/330W	100W/256W
Warranty	2 years collect-and-return	2 years return-to-base	1 year return-to-base	3 years return-to-base (parts)	1 year return-to-base
Verdict	<ul style="list-style-type: none"> Maximum overclocking gives fantastic performance High-quality 24in Asus VS247H monitor Average system case and cooling 8GB of RAM 	<ul style="list-style-type: none"> Superb gaming performance Towering but practical case Extremely quiet No monitor, keyboard or mouse supplied 	<ul style="list-style-type: none"> Very fast WorldBench 6 performance Gaming performance decent, but not great Tidy casing No Blu-ray drive 	<ul style="list-style-type: none"> High price tag Very strong performance in all areas Watercooling setup Keyboard and mouse worth £125 alone 	<ul style="list-style-type: none"> Low price tag Very decent performance for the money The main hard drive is a mere 500GB Many features better suited to general use rather than gaming
FULL REVIEW	TINYURL.COM/88QE2ZG	TINYURL.COM/7PDJ52L	TINYURL.COM/84Q7VYF	TINYURL.COM/827QEY2	TINYURL.COM/7AZTOS8

¹Tested in Crysis at 1080p, High (no AA)/V High (no AA)/V High (16x AA)/Stalker: Call of Pripyat at 1080p, Ultra ²Tested when idle and in Crysis

>> Buying advice



All-in-one PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

Gaming PCs put performance and upgradability before subtlety and quiet operation. Many run overclocked CPUs to eke out every bit of available speed.

Intel's Core i5-2500K is a popular choice of CPU, but will require a decent cooler and beefy PSU. The HyperThreaded i7-2600K is slightly faster, but dearer.

Cooling is essential for stability. Liquid-cooling systems, dust filters, fan-speed controls and good cable-management can aid airflow.

Most important of all is the graphics card; vendors will often

skimp on storage, networking and other features and throw all their budget at the graphics card.

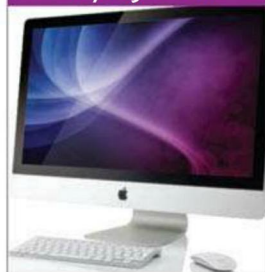
AMD's Radeon HD 7970 delivers unparalleled performance - but at a price. Cheaper solutions include the nVidia GeForce GTX 560 Ti.

Look for wired peripherals and a headset. Good warranty terms are crucial for overclocked PCs.

READ MORE: TINYURL.COM/CZXH443

All-in-one PCs	1  PC ADVISOR BEST BUY	2  PC ADVISOR RECOMMENDED	3 	4 	5 
	Apple iMac 27in 2.7GHz	Asus ET2700INTS	Packard Bell oneTwo L i5871	Toshiba Qosimo DX730-10U	HP Touchsmart Pro 610
Price	£1399 inc VAT	£1,399 inc VAT	£950 inc VAT	£999 inc VAT	£1,200 inc VAT
Website	Apple.com/uk	Uk.asus.com	Packardbell.co.uk	Toshiba.co.uk	Hp.com/uk
Build rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	2.7GHz Intel Core i5-2500S	2.5GHz Intel Core i5-2400S	2.5GHz Intel Core i5-2400S	2.5GHz Intel Core i5-2450M	3.2GHz Intel Core i5-650
RAM	4GB DDR3	6GB DDR3	4GB DDR3	6GB DDR3	6GB DDR3
Storage capacity	1TB hard drive	2TB hard drive	1TB hard drive	1TB hard drive	1.5TB hard drive
Screen	27in IPS glossy	27in glossy	23in TN glossy touchscreen	23in TN glossy touchscreen	23in glossy touchscreen
Screen resolution	2560x1440	1920x1080	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Graphics card	AMD Radeon HD 6770M	nVidia GT540M/Intel HD 2000	Intel HD Graphics 2000	Intel HD Graphics 3000	AMD Radeon HD 5570M
Video memory	512MB	1GB	N/A	N/A	1GB
Wireless	802.11a/b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	✓	✓	✓	✓	✓
Bluetooth	✓	✗	✗	✓	✓
USB	4x USB 2.0	2x USB 3.0, 3x USB 2.0	2x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	2x USB 3.0, 4x USB 2.0
FireWire	✓	✗	✗	✗	✗
Thunderbolt	✓	✗	✗	✗	✗
HDMI	✗	✓	✗	✓	✓
Media card slot	SD/SDHC	SD	SD	SD	SD/SDHC/MS/MS Pro/xD
Max disc speeds	8x DVD±R, 4x DVD±R DL, 8x DVD-ROM	6x BD-ROM, 8x DVD±R, 6x DVD±R DL, 8x DVD-ROM	8x DVD±R, 4x DVD±R DL, 8x DVD-ROM	6x BD-ROM, 8x DVD±R, 4x DVD±R DL, 8x DVD-ROM	4x BD-ROM, 8x DVD±R, 6x DVD±R DL, 8x DVD-ROM
Extras	Webcam, wireless keyboard	Remote control, webcam, wireless keyboard	Remote control, webcam, TV tuner, wireless keyboard	Remote control, webcam, TV tuner, wireless keyboard	Webcam, wireless keyboard, TV tuner, Beats Audio, remote
Operating system	Mac OS X 10.7 Lion	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Power consumption	67W (idle), 180W (under load)	47W (idle), 114W (under load)	51W (idle), 84W (under load)	35W (idle), 44W (under load)	67W (idle), 112W (under load)
Crysis (720p)	133fps	99fps	29fps	39fps	72fps
Crysis (1080p)	12fps	6fps	Not tested	Not tested	36/22fps
WorldBench 6 score	147	140	137	133	122
Dimensions	650x517x207mm	660x508x233mm	557x421x299mm	561x190x439mm	584x103x450mm
Weight	13.8kg	13.4kg	8kg	8kg	11.8kg
Warranty	1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year collect-and-return	1 year return-to-base
Verdict	<ul style="list-style-type: none"> Peerless design and build quality Fantastic high-quality 27in screen Great general and gaming speed OS X operating system 	<ul style="list-style-type: none"> Good-quality 27in panel Decent performance Rear design is ugly and impractical Not as good overall as iMac 	<ul style="list-style-type: none"> Good speed TV tuner welcome addition for multimedia Touchscreen not as effective as it might be Plenty of software 	<ul style="list-style-type: none"> Lots of memory and hard-drive space TV tuner Blu-ray drive Superior sound system Perfect for HD movies 	<ul style="list-style-type: none"> Solid performer Generous 23in screen Nice Beats Audio sub-system Blu-ray playback TV tuner Two USB 3.0 ports Bulky design
FULL REVIEW	TINYURL.COM/7THNXU8	TINYURL.COM/7ZTAQH7	TINYURL.COM/7WSLOEK	TINYURL.COM/7AQL5CY	TINYURL.COM/69TVUKZ

>> Buying advice



All-in-one PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

All-in-one PCs build into a large (21- to 27in) monitor all the components they require to run, making them an excellent and stylish solution for saving space.






However, with limited internal space for cooling, all-in-one machines tend to include less powerful components than traditional desktops. Expect to find integrated or laptop graphics processors and mobile CPUs inside.

All-in-ones aren't usually easy to upgrade, but many are pre-packed with Wi-Fi, Bluetooth, speakers and even Blu-ray players.

Touchscreen displays are likely to become more usable once Windows 8 is released. If you buy one now, ensure the image quality hasn't been compromised and that it's sufficiently responsive to touch.

The quality of the supplied keyboard and mouse (usually wireless) is critical. TV tuners and HDMI ports are welcome additions.

READ MORE: [TINYURL.COM/87VW5KJ](http://tinyurl.com/87VW5KJ)

Media PCs	1  PC ADVISOR BEST BUY	2  PC ADVISOR RECOMMENDED	3  PC ADVISOR RECOMMENDED	4 	5 
	Chillblast Fusion Avatar	Apple Mac mini	Quiet PC Zeno NT-H67	Cryo PC Alto	Arbico Zippy X35 HD
Price	£799 inc VAT	£896 inc VAT	£1,444 inc VAT	£1,038 inc VAT	£549 inc VAT
Website	Chillblast.com	Apple.com/uk	Quietpc.com	Cryopc.co.uk	Arbico.co.uk
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.4GHz Intel Core i5-2500K	2.53GHz Intel Core i5-2520M	3.3GHz Intel Core i3-2125	2.5GHz Intel Core i3-2100T	1.6GHz AMD E-350
RAM	8GB DDR3	4GB DDR3	8GB DDR3	4GB DDR3	4GB DDR3
Storage capacity	60GB SSD + 2TB 3.5in HDD	500GB 2.5in HDD	1TB 2.5in HDD	60GB SSD + 2TB 3.5in HDD	1TB 3.5in HDD
Motherboard	Asus P8H67-M Pro	Apple Mac mini board	Gigabyte GA-H67N-USB3-B3	Gigabyte GA-Z8MA-D2H-B3	Asus E35M1-I Deluxe
CPU cooler	AC Freezer 7 LP cooler	Custom active cooler	Zeno heatpipe cooling	Passive cooler	Integrated fanless cooler
Power supply	BeQuiet	85W Delta Electronics	1,000W Zeno	460W Seasonic fanless	150W integrated
Graphics	HIS AMD Radeon HD 6570 with 1GB video memory	AMD Radeon HD 6630M with 256MB video memory	Intel HD Graphics 3000	Zotac nVidia GeForce GT 430 passive-cooled	AMD Radeon HD 6310
TV tuner	Peak Dual Tuner Freeview	None	Black Gold BGT3600	Black Gold BGT3595	Compro E750
Wireless	802.11n	Dual-band 802.11n	x	x	x
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	x	✓	x	x	x
USB	2x USB 3.0, 6x USB 2.0	4x USB 2.0	2x USB 3.0, 4x USB 2.0	4x USB 3.0, 6x USB 2.0	2x USB 3.0, 6x USB 2.0
Ports	S/PDIF, HDMI, DVI, VGA	S/PDIF, HDMI, FW800, TB	S/PDIF, HDMI, VGA	S/PDIF, HDMI, DVI, eSATA	S/PDIF, HDMI, DVI
Case	Silverstone SST-ML03B Milo	Apple Mac mini unibody	Zeno NT-TX2000	Zalman HD503	Arbico Zippy Black Case
Keyboard and mouse	Logitech MK260	Bluetooth Keyboard, Magic Trackpad	Microsoft Wireless Desktop 3000	Not supplied	Logitech K400
Remote control	✓	✓	✓	x	x
LCD screen	x	x	x	✓	x
Optical drive	BD-ROM/DVD ±RW	SuperDrive DVD ±RW	BD-ROM/DVD ±RW	BD-ROM/DVD ±RW	BD-ROM/DVD ±RW
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Media card slot	✓	✓	x	x	x
Operating system	Windows 7 Home Prem 64bit	Mac OS X 10.7 Lion	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit
Media software	WMC, CyberLink PowerDVD	iLife	WMC, ArcSoft TotalMedia	WMC, ArcSoft TotalMedia	WMC
Crysis (Low/Medium)	118/62fps	77/48fps	45/20fps	Not tested	24/12fps
MediaEspresso time	7 mins 43 secs	8 mins 33 secs	3 mins 14 secs	Not tested	37 mins 7 secs
WorldBench 6 score	172	123	141	120	57
Power consumption	39W	10W	36W	50W	27W
Warranty	2 years collect-and-return	1 year collect-and-return	2 years collect-and-return	3 years return-to-base	2 years labour only
Verdict	<ul style="list-style-type: none"> Great value TV tuner 8GB DDR3 RAM Incredible performance in WorldBench 6 Excellent graphics handling Can be overclocked A little noisy Limited remote control features 	<ul style="list-style-type: none"> Beautifully compact Great for graphics Good performance No DVD drive Very low power consumption Quiet and elegant 	<ul style="list-style-type: none"> Blu-ray drive included Silent, fanless operation Best multimedia playback of group Dual digital TV tuners Stylish Zalman case Expensive 	<ul style="list-style-type: none"> Media-centre controls Passively cooled, fanless design Dual digital TV tuners 2GB storage Upgradable Doubles as hi-fi when PC power off Difficult to operate 	<ul style="list-style-type: none"> Low-cost media centre with Blu-ray drive Compro dual digital TV tuner Tower design not very living room-friendly Fans are noisy Low power consumption Useful remote control Wireless keyboard
FULL REVIEW	TINYURL.COM/8843U87	TINYURL.COM/88GUG5H	TINYURL.COM/7S2ZWXD	TINYURL.COM/30PHWHD	TINYURL.COM/82XD4FQ

GLOSSARY: FW800: FireWire 800 TB: Thunderbolt WMC: Windows Media Center

>> Buying advice



Media PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

You can use any PC to create a media centre, but a quiet system is preferable. It's important to strike a balance between power consumption and performance -

not only will the PC probably be left switched on for long periods, but a high-performance processor will generate large amounts of heat, and cooling that chip can involve noisy whirring fans.

Fanless systems can be built using large passive heat sinks or heat pipes, although you can find ultra-quiet tweakable fans if fitting one is unavoidable.

SSDs have no moving parts, making them silent in use. They're expensive, mind, so consider setting up a NAS elsewhere in your home for extra storage.

A TV tuner is desirable; you'll need a dual-tuner to watch and record shows simultaneously.

Also look for a Blu-ray drive and a wireless keyboard and mouse.

READ MORE: TINYURL.COM/CGFOD2K

Chillblast.com

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- Samsung Blu Ray / DVD-RW Combo Drive
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- Radeon 6570 1GB Graphics Card
- 60GB SATA III Corsair Solid State Drive
- 2000GB SATA III 7200rpm Hard Disk
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- BeQuiet 530W Power Supply Unit
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- Asus P8H61-M LE/USB3 Motherboard
- 8GB PC3-10666 DDR3 Memory
- Intel HD4000 Graphics Card
- 1000GB SATA III 7200rpm Hard Disk
- Sony 24x DVD RW Drive
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- All systems come with 2 year warranty!

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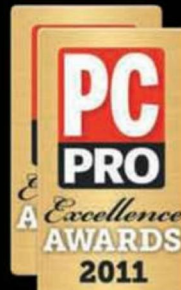
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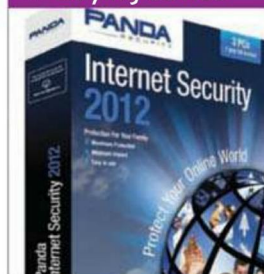


Internet security suites	    				
	G Data IS 2012	Norton IS 2012	Bitdefender IS 2012	Kaspersky IS 2011	Trend Micro Titanium IS 2012
Annual price	£34 inc VAT	£49 inc VAT	£29 inc VAT	£39 inc VAT	£39 inc VAT
Licence terms	1 PC, 1 year	1 PC, 1 year	1 PC, 1 year	1 PC, 1 year	3 PCs, 1 year
Website	Gdatasoftware.co.uk	Uk.norton.com	Bitdefender.co.uk	Kaspersky.co.uk	Uk.trendmicro.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Signature-based detection	100 percent	99.9 percent	100 percent	99.3 percent	97.5 percent
Malware blocking (full)	100 percent	100 percent	96.2 percent	100 percent	92.3 percent
Malware blocking (partial)	N/A	N/A	0 percent	N/A	3.8 percent
Clean-up of malware	60 percent	50 percent	90 percent	60 percent	70 percent
On-demand scan speed	109 secs	68 secs	116 secs	71 secs	93 secs
On-access scan speed	116 secs	154 secs	265 secs	280 secs	314 secs
Interface design	Good	Very good	Superior	Very good	Very good
Verdict	<ul style="list-style-type: none"> Excellent detection rates Good value Low impact on resources Confusing interface 	<ul style="list-style-type: none"> Good all-rounder Fast scan times Clean interface Flagged some false-positives 	<ul style="list-style-type: none"> Impacts system resources Very strong malware blocking and removal Intuitive interface 	<ul style="list-style-type: none"> Strong block rate Above-average scan times Can affect PC performance Interface needs tweaking 	<ul style="list-style-type: none"> Set-it-and-forget-it security Flagged some false-positives Reasonable scan speeds Ideal for novice users
FULL REVIEW	TINYURL.COM/7CZT5XB	TINYURL.COM/CVVDWUR	TINYURL.COM/75H3WUK	TINYURL.COM/6UEHPMW	TINYURL.COM/7QTBP6

GLOSSARY: • IS: Internet Security • SOS: Small Office Security

Antivirus software	    				
	Norton AntiVirus 2011	Bitdefender Antivirus Pro 2011	G Data AntiVirus 2011	Kaspersky Anti-Virus 2011	Trend Micro Titanium AV+ 2011
Annual price	£39 inc VAT	£24 inc VAT	£34 inc VAT	£39 inc VAT	£39 inc VAT
Licence terms	3 PCs, 1 year	3 PCs, 1 year	3 PCs, 1 year	3 PCs, 1 year	3 PCs, 1 year
Website	Norton.com	Bitdefender.co.uk	Gdatasoftware.com	Kaspersky.co.uk	Uk.trendmicro.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Signature-based detection	98.7 percent	97.5 percent	99.4 percent	95.7 percent	98.4 percent
Malware blocking (full)	96 percent	68 percent	84 percent	88 percent	88 percent
Malware blocking (partial)	0 percent	20 percent	4 percent	4 percent	8 percent
Clean-up of active malware	80 percent	80 percent	80 percent	80 percent	80 percent
On-demand scan speed	121 secs	126 secs	111 secs	103 secs	187 secs
On-access scan speed	272 secs	327 secs	336 secs	310 secs	249 secs
Interface design	Very good	Very good	Very good	Very good	Very good
Verdict	<ul style="list-style-type: none"> Smooth user interface Large 'Fix Now' button Moderate impact on system performance 	<ul style="list-style-type: none"> Very good performance for malware removal Average scan speeds Three interface tiers 	<ul style="list-style-type: none"> Strong malware detection, blocking and removal Good user interface, but poorly translated 	<ul style="list-style-type: none"> Well-designed interface Easy to use On-demand single-file scans Impacts PC performance 	<ul style="list-style-type: none"> Set-it-and-forget-it security Cloud-based protection Requires web connection Good performance
FULL REVIEW	TINYURL.COM/4P5YCX	TINYURL.COM/66SK77U	TINYURL.COM/6BFXWCS	TINYURL.COM/6HQA2WB	TINYURL.COM/4HUORV3

>> Buying advice



Security software

Every connected PC should have at least antivirus, antispyware and a firewall, and it's important that each is kept up to date. Avoid installing more than one real-time scanning component.

We work with world-renowned independent security testing lab AV-Test.org to evaluate the effectiveness of security software.

No security software is foolproof, but some are significantly better than others. And factors such as ease of setup, scan speeds, interface design and ability to deal with new threats set them apart.

The best products will offer parental controls, cloud protection, anti-phishing, anti-rootkit, virtual web browsers and keyboards, link

and file scanners, gaming modes, online backup and more.

The best value is usually offered by a three-user licence, but you can save some cash if your household has only one PC.

There are some good free antivirus products but, as in life, you get what you pay for.

READ MORE: TINYURL.COM/7NR8FSM

Tablets	1	2	3	4	5
	Apple iPad (3rd gen)	Apple iPad 2	Asus Eee Pad Transformer Prime	Samsung Galaxy Tab 10.1	Sony Tablet S
Price	£399 inc VAT	£329 inc VAT	£500 inc VAT	£399 inc VAT	£369 inc VAT
Website	Apple.com/uk	Apple.com/uk	Uk.asus.com	Samsung.com/uk	Sony.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Apple iOS 5.1	Apple iOS 5.0	Google Android 3.0 Honeycomb ²	Google Android 3.1 Honeycomb	Google Android 3.2 Honeycomb
Screen size/resolution	9.7in/2048x1536	9.7in/1024x768	10.1in/1280x800	10.1in/1280x800	9.4in/1280x800
Storage/media card slot	16GB/none	16GB/none	32GB/MicroSD	16GB/none	16GB/SD
Connectivity	802.11a/b/g/n, Bluetooth ¹	802.11a/b/g/n, Bluetooth ¹	802.11b/g/n, Bluetooth	802.11b/g/n, Bluetooth ¹	802.11b/g/n, Bluetooth ¹
Processor	1GHz Apple A5X	1GHz Apple A5	1.4GHz nVidia Tegra 3	1GHz nVidia Tegra T20	1GHz nVidia Tegra 2
RAM	1GB	512MB	1GB	1GB	1GB
Claimed battery life	10 hrs	10 hrs	12 hrs	9 hrs	8 hrs
Cameras (front/rear)	0.3/5Mp	0.3/0.7Mp	1.2/8Mp	2/3Mp	0.3/5Mp
Dimensions	241x186x9.5mm	241x186x8.8mm	263x181x8.8mm	257x173x8.7mm	241x174x20-7.6mm
Weight	652g	597g	596g	559g	588g
Warranty	1 year	1 year	1 year	1 year	2 years
Verdict	<ul style="list-style-type: none"> • Breathtaking display • Searing performance • 32GB version recommended • Supports 4G where available 	<ul style="list-style-type: none"> • Exceptional touchscreen • Beautiful design and build • Best selection of apps • 10-hour battery life 	<ul style="list-style-type: none"> • Fast quad-core processor • Excellent Super IPS panel • Stunning battery life • Best Android tablet 	<ul style="list-style-type: none"> • Good real-world battery life • Impressive 10in touchscreen • Plastic construction • 3Mp main camera 	<ul style="list-style-type: none"> • Lightweight design • Scratch-prone chassis • Android Honeycomb 3.2.1 • 16GB memory plus SD card
FULL REVIEW	TINYURL.COM/6MTG9OW	TINYURL.COM/4XV7Q4K	TINYURL.COM/7U67UBN	TINYURL.COM/3LH239C	TINYURL.COM/3TSQKP4

¹3G available at additional cost ²Android 4.0 available

Smartphones	1	2	3	4	5
	Apple iPhone 4S	Samsung Galaxy S II	HTC Sensation	RIM BlackBerry Bold 9780	Samsung Galaxy Nexus
Price	£499 inc VAT	£406 inc VAT	£499 inc VAT	£330 inc VAT	£500 inc VAT
Website	Apple.com/uk	Samsung.com/uk	Htc.com/europe	Uk.blackberry.com	Samsung.com/uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Apple iOS 5.0	Android 2.3 Gingerbread	Android 2.3 Gingerbread	BlackBerry OS 6.0	Android 4 Ice Cream Sandwich
Processor	1GHz ARM Cortex A9	1.2GHz ARM Cortex A9	1.2GHz Qualcomm Snapdragon	624MHz	1.2GHz ARM Cortex A9
Storage/media card	16GB/none	16GB/MicroSD	1GB + 8GB MicroSD	512MB + 2GB MicroSD	16GB/none
Screen size/resolution	3.5in/960x640	4.3in/800x480	4.3in/960x540	2.4in/480x360	4.65in/720x1280
Input method	Capacitive multitouch	Capacitive touchscreen	Capacitive touchscreen	SureType keyboard	Capacitive touchscreen
Connectivity	HSDPA, 3G, Bluetooth, Wi-Fi	HSDPA, 3G, Bluetooth, Wi-Fi	HSDPA, 3G, Bluetooth, Wi-Fi	HSDPA, 3G, Bluetooth, Wi-Fi	HSDPA, 3G, Bluetooth, Wi-Fi
Battery life (talk/standby)	8 hrs/200 hrs	Not specified	8 hrs/285 hrs	6 hrs/408 hrs	18 hrs/290 hrs
Camera	8Mp stills, 1080p video	8Mp, 1080p video	8Mp, 1080p video	5Mp, 720p video	5Mp, 1080p video
GPS	✓	✓	✓	✓	✓
Dimensions, Weight	59x10x115mm, 140g	66x125x8mm, 116g	68x126x5mm, 148g	109x60x14mm, 122g	68x136x7mm, 139g
Warranty	1 year	2 years	2 years	1 year	2 years
Verdict	<ul style="list-style-type: none"> • Superb retina display • Fast graphics • Responsive touchscreen • Siri voice-recognition 	<ul style="list-style-type: none"> • Huge 4.3in AMOLED screen • 16GB memory (expandable) • Shorter battery life • TouchWiz 'Hubs' interface 	<ul style="list-style-type: none"> • Media-centric smartphone • High-resolution screen • Slick HTC Sense interface • HTC Watch 	<ul style="list-style-type: none"> • Qwerty keyboard input • Media player/manager • Secure email platform • Small 2.4in screen 	<ul style="list-style-type: none"> • Uses Android 4 • Large screen • Low performance • Can't navigate one-handed
FULL REVIEW	TINYURL.COM/62TEB9G	TINYURL.COM/3HF6G0D	TINYURL.COM/5W5KC7D	TINYURL.COM/3KJ33GS	TINYURL.COM/7JRSECH

>> Buying advice



Smartphones

The smartphone you choose to use is a very personal choice - while some prefer a small device that slips into a pocket, others prefer a large-screen handset that's better suited to watching video and typing on an onscreen keyboard.

The screen's resolution is just as important as its size. More pixels mean text and photos look

sharper, and more information can be shown onscreen at once.

Unlike Android, iOS doesn't support Flash. However, HTML 5 is slowly replacing the standard, and Adobe has discontinued development of Flash Player for mobile devices in any case. Mobile apps can also allow you to view sites that still use Flash.

Look for a fast processor and decent graphics if you want to play games or watch video.

It's common to see mobile operators offer expensive handsets free with 24-month contracts. It'll usually work out cheaper to buy the handset outright, however, and it won't be locked to a network.

READ MORE: TINYURL.COM/7SK2AS3

Sub-£150 printers		 1 PC ADVISOR BEST BUY	 2 PC ADVISOR RECOMMENDED	 3 PC ADVISOR RECOMMENDED	 4 PC ADVISOR RECOMMENDED	 5 PC ADVISOR RECOMMENDED
		Oki C110	Brother HL-2130	Kodak Hero 5.1	Canon i-Sensys LBP-7010C	Canon Pixma MG4150
Price		£135 inc VAT	£60 inc VAT	£77 inc VAT	£108 inc VAT	£100 inc VAT
Website		Oki.co.uk	Brother.co.uk	Kodak.co.uk	Canon.co.uk	Canon.co.uk
Overall rating		★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Technology		Colour laser	Mono laser	Colour inkjet	Colour laser	Colour inkjet
Max print resolution		1200x600dpi	2400x600dpi	9600dpi	5760x1440dpi	4800x1200dpi
Actual print speed		B=15.8ppm/C=2.5ppm	B=20ppm	B=12.2ppm/C=6.8ppm	B=13ppm/C=3.3ppm	B=8.6ppm/C=3.8ppm
Scan/fax facilities		None	None	1200dpi scans	None	1200x2400dpi scans
Supported interfaces		USB 2.0	USB 2.0	USB 2.0, 802.11b/g/n, cloud	USB 2.0	USB 2.0, 802.11b/g/n
Cost per page		B=3.6p/C=5p	B=3p	B=1.8p/C=3.3p	B=3.8p/C=13.8p	B=2.8p/C=4.5p
Media card/auto duplex		**	**	✓✓	**	✓✓
Input capacity		100 sheets	250 sheets	100 sheets	150 sheets	100 sheets
Dimensions		396x380x275mm	368x360x183mm	422x399x183mm	400x398x223mm	449x304x152mm
Weight		14.4kg	6.7kg	6.3kg	12.3kg	5.7kg
Warranty		3 years	1 year	1 year	2 years	2 years
Verdict		<ul style="list-style-type: none"> Attractive pricing Performs better than an equivalent inkjet No duplex mode 	<ul style="list-style-type: none"> 20ppm mono laser printer Crisp text output 3p per page Cheap for a laser printer 	<ul style="list-style-type: none"> Printer/scanner/copier Lowest cost per print Built-in Wi-Fi Could be faster 	<ul style="list-style-type: none"> Great value colour laser High-quality colour prints Slow colour performance Expensive replacement inks 	<ul style="list-style-type: none"> Good connectivity Decent middle-mode speeds Complex control panel High text running costs
FULL REVIEW		TINYURL.COM/YLNO5RV	TINYURL.COM/4YRRDJM	TINYURL.COM/6S5BW3B	TINYURL.COM/7TLXCBK	TINYURL.COM/6UJBGDJ

£151+ printers		 1 PC ADVISOR BEST BUY	 2 PC ADVISOR BEST BUY	 3 PC ADVISOR RECOMMENDED	 4 PC ADVISOR RECOMMENDED	 5 PC ADVISOR RECOMMENDED
		Kyocera Mita FS-1320D	Kyocera FS-C5250DN	Samsung ML-3710ND	HP LaserJet Pro 400 M451nw	Brother HL-5380DN
Price		£170 inc VAT	£450 inc VAT	£190 inc VAT	£300 inc VAT	£282 inc VAT
Website		Kyoceramita.co.uk	Kyoceramita.co.uk	Samsung.com/uk	Hp.com/uk	Brother.co.uk
Overall rating		★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Technology		Mono laser	Colour laser	Mono laser	Colour laser	Mono laser
Max print resolution		1200x1200dpi	600x600dpi	1200x1200dpi	600x600dpi	1200x1200dpi
Actual print speed		B=26.1ppm	B=24.8ppm/C=18.3ppm	B=28.6ppm	B=14.3ppm/C=9.1ppm	B=23.1ppm
Scan/fax facilities		none	none	none	none	none
Supported interfaces		USB 2.0	USB 2.0, ethernet	USB 2.0, ethernet	USB 2.0, 802.11b/g/n, ethernet	USB 2.0, ethernet
Cost per page		B=1.4p	B=1.2p/C=5.2p	B=1.4p	B=2.1p/C=11.3p	B=1.2p
Media card/auto duplex		✓✓	✗✓	✗✓	**	✗✓
Input capacity		250 sheets	500 + 50 sheets	250 + 50 sheets	250 + 50 sheets	250 + 50 sheets
Dimensions		375x393x250mm	390x523x397mm	366x368x253mm	405x454x322mm	393x384x259mm
Weight		12kg	30kg	10kg	22.8kg	9.5kg
Warranty		2 years	2 years	1 year	1 year	1 year
Verdict		<ul style="list-style-type: none"> No frills business laser Lacks Wi-Fi and ethernet Modest running costs Auto-duplex support 	<ul style="list-style-type: none"> Blistering speed Huge paper capacity Colour printing isn't perfect Hefty 	<ul style="list-style-type: none"> Fast mono page churn Modest running costs Ethernet and USB ports Generous paper trays 	<ul style="list-style-type: none"> Fast for its price Smart Install feature Strong for text Colour costs are high 	<ul style="list-style-type: none"> Economical text printer Good print speeds PIN security Prints are rather faint
FULL REVIEW		TINYURL.COM/6G69UKV	TINYURL.COM/7QMXVZA	TINYURL.COM/75RB5NZ	TINYURL.COM/7D366WF	TINYURL.COM/73UKX62

GLOSSARY: • B: mono • C: colour • ppm: pages per minute

>> Buying advice



Printers

Most printers are inkjet or laser models, and there are colour and mono flavours of each. Lasers tend to be more expensive to buy, but provide better-quality output, particularly where text is involved.

The price you pay instore is only the beginning; also consider the cost of replenishing the ink and paper. Duplexing lets you print to

both sides of a sheet, saving paper but slowing output.

Multifunction printers can save you money if you also require scanning facilities; some models include copy and fax functions, too.






A USB port lets you connect a printer to a single PC, but built-in wireless networking allows it to join a home or office network.

A memory card slot will let you bypass a PC for printing.

Never trust a manufacturer's claimed print speeds; we run our own tests to properly assess each printer's performance.

High-capacity paper trays and auto document feeders are also worth looking for.

READ MORE: TINYURL.COM/BUX9QMO

Blu-ray drives					
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5
	LG BE12LU38	LG BH10LS38	Asus SBW-06C1S-U Slim	Lite-On iHBS212	Buffalo BR3D-12U3
Price	£132 inc VAT	£65 inc VAT	£130 inc VAT	£90 inc VAT	£199 inc VAT
Website	Uk.lge.com	Uk.lge.com	Uk.asus.com	Liteonit.eu	Buffalotech.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Blu-ray speeds	12x -R, 12x -R DL, 2x -RE, 12x -ROM	10x -R, 8x -R DL, 2x -RE, 10x -ROM	6x -R, 4x -R DL, 2x -RE, 6x -ROM	12x -R, 8x -R DL, 2x -RE, 8x -ROM	12x -R, 12x -R DL, 2x -RE, 8x -ROM
DVD speeds	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 12x -RAM, 16x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 12x -RAM, 16x -ROM	8x ±R, 6x ±R DL, 6x -RW, 8x +RW, 5x RAM, 8x ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 12x -RAM, 16x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 5x -RAM, 8x -ROM
Max storage	50GB	50GB	50GB	50GB	50GB
Interface type	USB 2.0, eSATA (external)	SATA (internal)	USB 2.0 (external)	SATA (internal)	USB 3.0 (external)
Label technology	LightScribe	LightScribe	None	LightScribe	None
Software	PowerDVD, PowerProducer	(OEM - add £5 for software)	PowerDVD, PowerProducer	CyberLink Blu-ray Suite	PowerDVD, PowerProducer
Dimensions	163x260x50mm	146x170x41mm	157x142x21mm	146x170x41mm	160x220x50mm
Weight	1.38kg	749g	364g	650g	1.1kg
Warranty	1 year	1 year	2 years	2 years	2 years
Verdict	<ul style="list-style-type: none"> • 12-speed external writer • Side-mountable • Supports eSATA, USB 2.0 • Awkward to carry 	<ul style="list-style-type: none"> • 10-speed internal writer • Attractive front panel • Reliable performance • Very good value 	<ul style="list-style-type: none"> • Super-slim six-speed drive • No power supply required • Portable • Slow but reliable 	<ul style="list-style-type: none"> • 12-speed internal writer • Issues during testing • Noisy during operation • Average with 4x media 	<ul style="list-style-type: none"> • 12-speed external writer • Power supply required • Bulky design • Expensive
FULL REVIEW	TINYURL.COM/8YVFLFP	TINYURL.COM/8YTUJEF	TINYURL.COM/7S3WPV6	TINYURL.COM/65PXHUJ	TINYURL.COM/453BX7L

Wireless routers					
	1 PC ADVISOR RECOMMENDED	2 PC ADVISOR BEST BUY	3 PC ADVISOR RECOMMENDED	4	5
	Cisco Linksys E4200	AVM FritzBox Fon 7390	TP-Link TL-MR3020	Zyxel NBG4615	Edimax BR-6475nD
Price	£120 inc VAT	£190 inc VAT	£40 inc VAT	£60 inc VAT	£60 inc VAT
Website	Linksysbycisco.com	Fritzbox.eu	Tp-link.com/en	Zyxel.co.uk	Edimax.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Standards supported	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n	802.11a/b/g/n
Frequency modes	2.4GHz/5GHz (dual mode)	2.4GHz/5GHz (dual mode)	2.4GHz	2.4GHz	2.4GHz/5GHz (dual mode)
Modem	x	✓	x	x	✓✓✓
USB port	✓	✓	✓	✓	x✓
Firewall	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI
Eco mode	x	✓	x	✓	x
Ethernet ports	10/100 WAN, 4x gigabit LAN	4x gigabit LAN	10/100 WAN/LAN	10/100 WAN, 4x gigabit LAN	Not tested
Throughput (near/far)	226/92Mbps	92/38Mbps	Not tested	94/32Mbps	97/41Mbps
Dimensions	225x160x25mm	226x160x48mm	74x67x22mm	162x106x28mm	134x110x26mm
Weight	335g	not specified	250g	237g	200g
Warranty	1 year	5 years	3 years	1 year	2 years
Verdict	<ul style="list-style-type: none"> • Excellent wireless performance • Dual-band Wi-Fi • Guest login feature 	<ul style="list-style-type: none"> • Supports landline and internet telephony • Dual-band Wi-Fi • USB port 	<ul style="list-style-type: none"> • Portable 3G router • Tiny and lightweight • Mains-/USB-powered • Reliable performance 	<ul style="list-style-type: none"> • Good-value router • Strong Wi-Fi performance • Single-band Wi-Fi • Compact design 	<ul style="list-style-type: none"> • Dual-band Wi-Fi • Poor web interface • Strong performance • Good value
FULL REVIEW	TINYURL.COM/6Z7BDKM	TINYURL.COM/3QUJZBX	TINYURL.COM/85P7R9P	TINYURL.COM/6HACKNN	TINYURL.COM/6XDA648

>> Buying advice



Blu-ray drives

A single Blu-ray Disc holds the equivalent of 35 CDs or five DVDs. It might look like a DVD, but its shorter wavelength and narrow blue laser beam allow it to hold greater capacity. It's the storage method of choice for HD and 3D video content.

External drives are easier to install, portable, and can be shared

between PCs, but they will cost you considerably more than internal models, and may not be as quick.






If you opt for an internal drive, ensure you have enough space inside your PC. Most internal drives use the SATA interface, so check you've got a compatible port.

Look for a drive that also supports several DVD formats, but don't obsess about write speeds.

You should be able to get 16-speed DVD writing, but it's not worth paying more to save seconds.

You may find that the Blu-ray media currently on the market isn't fast enough to enjoy your chosen drive's maximum write speeds. Six-/eight-speed BD-R capabilities are standard, but even six-speed BD-R media is still rare.

READ MORE: [TINYURL.COM/70EPLY6](http://tinyurl.com/70EPLY6)

External hard drives	    				
	1	2	3	4	5
	Seagate FreeAgent GoFlex	WD My Passport Studio	Buffalo MiniStation Extreme	Iomega Prestige	Freecom Mobile Drive Sq
Price	£190 inc VAT	£140 inc VAT	£110 inc VAT	£100 inc VAT	£105 inc VAT
Website	Seagate.com	Wdc.com/en	Buffalotech.com	iomega.co.uk	Freecom.com
Overall rating	★★★★☆	★★★★★	★★★★★	★★★★☆	★★★★☆
Capacity tested	3TB	1TB	1TB	1TB	500GB
Capacity range	1TB to 3TB	500GB to 1TB	500GB to 1TB	1TB to 2TB	500GB to 1TB
Disk size	3.5in	2.5in	2.5in	3.5in	2.5in
Spin speed	7,200rpm	5,400rpm	5,400rpm	5,400rpm	5,400rpm
Transfer speed	94Mbps (USB 3.0)	76Mbps (FireWire 800)	94Mbps (USB 3.0)	94Mbps (USB 3.0)	94Mbps (USB 3.0)
Encryption	192bit	256bit	256bit	256bit	None
Other interfaces	Optional FireWire 800	FireWire 800, USB 2.0	None	None	None
Software	Memo Backup	WD utilities	Backup, RAMdisk	Iomega Protection Suite	Nero BackItUp & Burn
Dimensions	158x124x44mm	126x84x22mm	128x89x18mm	188x124x31mm	120x120x11mm
Weight	1kg	334g	230g	1kg	195g
Warranty	2 years	3 years	2 years	3 years	2 years
Verdict	<ul style="list-style-type: none"> • Fastest write speed • Great value for capacity • Separate storage drive and USB 3.0 dock 	<ul style="list-style-type: none"> • Superbly built • FireWire 800 and USB 2.0 interfaces • AES encryption 	<ul style="list-style-type: none"> • Military-grade rugged design • Lightweight 2.5in drive • Solid 256bit encryption 	<ul style="list-style-type: none"> • Good-value USB 3.0 drive • 256bit encryption • Metal case 	<ul style="list-style-type: none"> • Ultra-compact USB 3.0 drive • No encryption • Energy-saving button • Power-saving mode
FULL REVIEW	TINYURL.COM/BN2Z9ZF	TINYURL.COM/6FAWBNE	TINYURL.COM/CE4Z9YM	TINYURL.COM/D4KALCW	TINYURL.COM/BMVZW3R

Projectors	    				
	1	2	3	4	5
	InFocus ScreenPlay SP8600	Dell M110	Vivitek Qumi Q2	NEC NP43	ViewSonic PJ07383i
Price	£693 inc VAT	£400 inc VAT	£500 inc VAT	£610 inc VAT	£1,129 inc VAT
Website	Infocus.com	Dell.co.uk	Vivitek.co.uk	Nec-display-solutions.co.uk	Viewsoniceurope.com/uk
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★☆
Projection technology	DLP	DLP	DLP	DLP	DLP
Resolution (pixels)	1920x1080	1280x800	1280x800	1024x768	1024x768
Brightness ¹ , Contrast	1,800, 5,000:1	300, 2,500:1	300, 2,500:1	2,300, 1,600:1	3,000, 3,000:1
Image size	300in	80in	30-90in	300in	30-300in
Supported aspect ratios	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:9, 4:3	4:3
Noise levels (dB)	30 (26 eco)	36 (32 eco)	32 (28 eco)	37 (32 eco)	32 (27 eco)
Connections	VGA, HDMI, CM, CP, SV, USB	VGA, HDMI, CM, CP, USB	VGA, HDMI, USB	VGA, SV, USB	VGA, CP, SV, USB
Lamp/lamp life	230W/4,000 hrs	LED/10,000 hrs	LED/30,000 hrs	200W/1,000 hrs	210W/4,000 hrs
Dimensions	326x254x104mm	105x104x37mm	162x102x32mm	246x72x177mm	290x126x254mm
Weight	3.4kg	360g	635g	1.7kg	3.5kg
Warranty	5 years	2 years	3 years	2 years	3 years
Verdict	<ul style="list-style-type: none"> • Smooth video playback • Full-HD resolution • Great contrast levels • Bright, colourful image 	<ul style="list-style-type: none"> • Ultra-small and -light • Good colour • Long-life LED lamp • Remote control costs extra 	<ul style="list-style-type: none"> • Great value portable model • Lightest model here • DLP-Link enables 3D display • Exceptional lamp life rating 	<ul style="list-style-type: none"> • Portable business model • Strong Auto Focus • Customisable settings • Decent image quality 	<ul style="list-style-type: none"> • Ultra-short throw • Gets very warm in operation • Lacks HDMI and DVI • Creston RoomView software
FULL REVIEW	TINYURL.COM/3HQANPV	TINYURL.COM/77S8D6D	TINYURL.COM/3TXMWPK	TINYURL.COM/62W3796	TINYURL.COM/3BW7ZZW

¹Ansi lumens GLOSSARY: • CM: component • CP: composite • SV: S-Video

>> Buying advice



Projectors

Projectors designed for home use don't tend to be as bright as office models - anything offering fewer than 1,000 Ansi lumens will be usable only in a dark room. And don't forget that the brightness drops as the image size increases.

The cheapest home-cinema models offer a 720p resolution, but you'll notice the extra detail

of 1080p when watching Blu-ray films on a large screen.

If you can't place the projector square-on to the screen, look for a model with lens shift. Keystone correction is a cheaper alternative, altering the image digitally, but degrading quality in the process.

A zoom function offers more flexibility over how far from the

screen you can site the projector. If it's to go in a small room, get a short-throw model that produces a large image over a short distance.

DLP projectors offer better contrast and punchier colours than LCD models, but can suffer from the distracting and sometimes nauseating 'rainbow effect'.

READ MORE: [TINYURL.COM/6MTWJX](http://tinyurl.com/6MTWJX)

Compact digital cameras	    				
	1 PC ADVISOR RECOMMENDED	2 PC ADVISOR BEST BUY	3 PC ADVISOR RECOMMENDED	4	5
	Nikon Coolpix S9100	Panasonic Lumix DMC-TZ20	Nikon 1 J1	Samsung MV800	Canon PowerShot G12
Price	£200 inc VAT	£200 inc VAT	£380 inc VAT	£180 inc VAT	£400 inc VAT
Website	Nikon.co.uk	Panasonic.co.uk	Nikon.co.uk	Samsung.com/uk	Canon.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Megapixel rating	12.1Mp	14.1Mp	10.1Mp	16.2Mp	10Mp
Maximum resolution	4000x3000 pixels	4320x3240 pixels	3872x2592 pixels	4608x3456 pixels	3648x2736 pixels
Optical zoom	18x	16x	3x	5x	5x
Maximum aperture	f3.5-f5.9	f3.3-f5.9	N/A	f3.3-f5.9	f2.8-f4.5
LCD size	3in	2.8in	3in	3in	2.8in
Media card	SD/SDHC	SD/SDHC	SD/SDHC	MicroSD	SD/SDHC
Battery/life	1x lithium-ion/270 shots	1x lithium-ion/260 shots	1x lithium-ion/230 shots	1x lithium-ion/not specified	1x lithium-ion/370 shots
ISO range	160 to 3200	100 to 1600	100 to 3200	125 to 3200	80 to 3200
Dimensions	106x35x62mm	105x33x58mm	106x30x61mm	92x18x56mm	112x48x76mm
Weight	214g	219g	274g	124g	401g
Warranty	2 years	1 year	2 years	2 years	1 year
Verdict	<ul style="list-style-type: none"> • Excellent photo quality • Longest zoom range here • 1920x1080-pixel video • Incredible 240fps slow-mo 	<ul style="list-style-type: none"> • Comprehensive menu • Warm, natural colour range • GPS geotagging support • AVCHD or Mpeg video 	<ul style="list-style-type: none"> • Mirrorless semi-compact • Solid construction • Good range of video modes • Deep colours 	<ul style="list-style-type: none"> • Flip-up touchscreen LCD • Limited 5x optical zoom • Better for video than photos • Great panorama mode 	<ul style="list-style-type: none"> • Comprehensive feature set • High dynamic range setting • Ideal step-up from compacts • Easy to use
FULL REVIEW	TINYURL.COM/6E457PY	TINYURL.COM/6XNRWUO	TINYURL.COM/7ZC25FY	TINYURL.COM/83SSNQX	TINYURL.COM/4QHAF66

Compact system cameras	    				
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR GOLD	4	5
	Nikon D5100 (18-55mm)	Panasonic DMC-G3 (14-42mm)	Sony Alpha NEX-5 (18-55mm)	Canon EOS 600D (18-55mm)	Olympus E-PM1 (14-42mm)
Price	£570 inc VAT	£450 inc VAT	£500 inc VAT	£580 inc VAT	£390 inc VAT
Website	Nikon.co.uk	Panasonic.co.uk	Sony.co.uk	Canon.co.uk	Olympus.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Megapixel rating	16.2Mp	16Mp	14.6Mp	18Mp	12.3Mp
Maximum resolution	4923x3264 pixels	4592x3448 pixels	4592x3056 pixels	5184x3456 pixels	4032x3024 pixels
Optical zoom	3x	3x	3.1x	3x	3x
Maximum aperture	f3.5-f5.6	f3.5-f5.6	f3.5-f5.6	f3.5-f5.6	f3.5-f5.6
LCD size	3in	3in	3in	3in	3in
Media card	SD/SDHC/SDXC	SD/SDHC/SDXC	MS/SD/SDHC	SD/SDHC/SDXC	SD/SDHC/SDXC
Battery/life	1x lithium-ion/660 shots	1x lithium-ion/270 shots	1x lithium-ion/not specified	1x lithium-ion/440 shots	1x lithium-ion/330 shots
ISO range	100 to 6400	100 to 6400	200 to 12800	100 to 6400	200 to 12800
Dimensions	124x97x79mm	115x84x47mm	111x59x38mm	133x100x80mm	110x64x34mm
Weight	510g	336g	229g	570g	217g
Warranty	3 years	3 years	1 year	1 year	2 years
Verdict	<ul style="list-style-type: none"> • Excellent stills and video • Suitable for novice and intermediate photographers • Plenty of lenses available 	<ul style="list-style-type: none"> • Great dSLR alternative • Rotating touchscreen • Strong video-capture mode • Very fast autofocus 	<ul style="list-style-type: none"> • Compact • Great performance • Great colour fidelity • Takes clean, sharp shots 	<ul style="list-style-type: none"> • Top-notch photo results • Fully auto/manual modes • Articulated LCD screen • Strong video capture 	<ul style="list-style-type: none"> • Compact camera • Likable art filter modes • High ISO suffers noise • No built-in flash or EVF
FULL REVIEW	TINYURL.COM/6UTE9KK	TINYURL.COM/7JXCJCR	TINYURL.COM/37XOZX5	TINYURL.COM/72STE88	TINYURL.COM/BLMYMJW

>> Buying advice



Compact system cameras

Compact system cameras (or interchangeable-lens cameras) bridge the gap between compacts and digital SLRs. They are ideal for those who want the versatility and quality of a digital SLR, with the ease of use of a compact.

A mirrorless design allows compact system cameras to be smaller than digital SLRs, while the

lack of an optical viewfinder means an LCD is used for composition and review. Large sensors allow them to rival an SLR for image quality.

Compact system cameras are ready to shoot in seconds, and most offer burst modes that capture several frames per second.

Although the camera lens can be swapped, not all will be compatible with your chosen

model. Panasonic and Olympus both use the Micro Four Thirds system, but Sony has its own E-mount system and Samsung uses NX-mount lenses.

Most compact system cameras record HD video, but the quality varies. If this is a priority, choose a model that can record 1080p video and also has a microphone input.

READ MORE: [TINYURL.COM/7DPM3SX](http://tinyurl.com/7DPM3SX)

Sub-£150 graphics cards	1	2	3	4	5
	Sapphire Radeon HD 6850	Sapphire Radeon HD 7750	PowerColor Radeon HD 6790	HIS Radeon HD 6770 IceQ X	Asus Radeon HD 6670
Price	£116 inc VAT	£85 inc VAT	£100 inc VAT	£99 inc VAT	£60 inc VAT
Website	Sapphiretech.com	Sapphiretech.com	Powercolor.com	Hisdigital.com	Uk.asus.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Graphics processor	AMD Radeon HD 6850	AMD Radeon HD 7750	AMD Radeon HD 6790	AMD Radeon HD 6770	AMD Radeon HD 6670
Installed RAM	1GB GDDR5	1GB GDDR5	1GB GDDR5	1GB GDDR5	1GB DDR3
Memory interface	256bit	128bit	256bit	128bit	128bit
Core/memory clock	775MHz/1GHz	800MHz/1,125MHz	840MHz/1,050MHz	850MHz/1.2GHz	800MHz/900MHz
Ramdac	400MHz	400MHz	400MHz	400MHz	400MHz
Stream processors	960	512	800	800	480
Power connectors	1x 6-pin	None	2x 6-pin	1x 6-pin	None
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
DirectX	11.0	11.0	11.0	11.0	11.0
Digital interface	DVI, HDMI, DisplayPort	DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, HDMI, DisplayPort	DVI, HDMI
Warranty	2 years	2 years	2 years	2 years	3 years
Verdict	<ul style="list-style-type: none"> • Powerful card for the price • Good memory bandwidth • 256bit memory interface • Single DVI slot 	<ul style="list-style-type: none"> • Better value for money than the 6790 and 6770 • Uses some 7970 architecture • Light on power 	<ul style="list-style-type: none"> • Playable framerates • Strong memory bandwidth • 6800-series cards faster • 256bit memory interface 	<ul style="list-style-type: none"> • 1GB DDR5 video card • 128bit interface cuts speed • Not very power-hungry • 6790 card is better value 	<ul style="list-style-type: none"> • Great-value video card • 800MHz core clock memory • 128bit memory limits appeal • 6570 card is a better deal
FULL REVIEW	TINYURL.COM/3XRUQW5	TINYURL.COM/7ZB5OE3	TINYURL.COM/6P9B7KZ	TINYURL.COM/6FEQ6AP	TINYURL.COM/3LM8HGE

£151+ graphics cards	1	2	3	4	5
	nVidia GeForce GTX 670	Zotac GeForce GTX 680	XFX 7970 3GB GDDR5	Asus HD 7870 DirectCU II	Zotac GeForce GTX 570
Price	£330 inc VAT	£450 inc VAT	£380 inc VAT	£280 inc VAT	£270 inc VAT
Website	Nvidia.com	Zotac.com	Xfxforce.com	Uk.asus.com	Zotac.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Graphics processor	nVidia GeForce GTX 670	nVidia GeForce GTX 680	AMD Radeon HD 7970	AMD Radeon HD 7870	nVidia GeForce GTX 570
Installed RAM	2GB GDDR5	2GB GDDR5	3GB GDDR5	2GB GDDR5	1,280MB GDDR5
Memory interface	256bit	256bit	284bit	256bit	320bit
Core/memory clock	915MHz/1,502MHz	1,006MHz/1,502MHz	925MHz/1,375MHz	1010MHz/1210MHz	732MHz/950MHz
Ramdac	400MHz	400MHz	400MHz	400MHz	400MHz
Stream processors	1,344	1,536	2,048	1,280	480
Power connectors	2x 6-pin	2x 6-pin	1x 6-pin, 1x 8-pin	2x 6-pin	2x 6-pin
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
DirectX	11.0	11.0	11.1	11.1	11.0
Digital interface	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, HDMI, 2x Mini-DisplayPort	DVI, HDMI, 2x Mini-DP	2x DVI, Mini-HDMI
Warranty	2 years	5 years	2 years	2 years	2 years
Verdict	<ul style="list-style-type: none"> • Almost on a par with 7970 • Low power consumption • Same memory bandwidth as GTX 680 	<ul style="list-style-type: none"> • Fastest single-GPU card • Low power consumption • Better value than HD 7970 • Low on RAM 	<ul style="list-style-type: none"> • Good performance • Not as powerful or as efficient as GTX 680 • Better value than HD 7870 	<ul style="list-style-type: none"> • Affordably priced • Cheaper than GTX 670, but behind on framerates • Modest power consumption 	<ul style="list-style-type: none"> • Now looking dated next to the GTX 670 • Impressive detail rendering • 320bit memory interface
FULL REVIEW	TINYURL.COM/CRDW78J	TINYURL.COM/C6C37Q0	TINYURL.COM/6UZRVXC	TINYURL.COM/BUFMAFF	TINYURL.COM/3UB8U3G

>> Buying advice



Graphics cards

The key feature of a graphics card is its GPU. Produced by AMD or nVidia, this determines the quality of images displayed and their refresh speed. The more powerful the GPU the better, but you can get away with a lesser card by turning down a game's detail levels.

Even those on a budget should be able to get at least 1GB of DDR

video memory. Look for GDDR5 rather than GDDR3 RAM. This in effect quadruples the clock speed (GDDR3 merely doubles it).

The memory interface (or bus) governs how much data can be sent at once, so a 256bit interface lets through twice as much data as a 128bit interface. Graphics cards with the best combination of memory interface size and

clock speed should produce the best performance.

DirectX 11.x support is required for advanced, modern games; cheaper cards lack the firepower to do such titles justice, however.

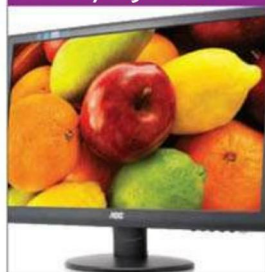
Check that a card will fit inside your PC and you have sufficient connections from the power supply unit before you buy.

READ MORE: TINYURL.COM/7BPUHQE

Sub-£200 flat-panels	1	2	3	4	5
	AOC i2352Vh	LG IPS236V	AOC i2353Fh	Hanns-G HL249DPB	Iiyama ProLite XB2472HD
Price	£139 inc VAT	£152 inc VAT	£145 inc VAT	£119 inc VAT	£190 inc VAT
Website	Aoc-europe.com	Lg.com/uk	Aoc-europe.com	Hannsg.com	Iiyama.co.uk
Overall rating	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★★☆
Screen size	23in	23in	23in	23.6in	24in
Panel type	In-plane switching	In-plane switching	In-plane switching 3D	Twisted nematic	Vertical alignment
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel pitch	0.27mm	0.27mm	0.27mm	0.27mm	0.28mm
Brightness	250cd/m ²	250cd/m ²	250cd/m ²	250cd/m ²	250cd/m ²
Static contrast ratio	1,000:1	1,000:1	1,000:1	1,000:1	3,000:1
Response time	5ms	5ms	5ms	5ms	8ms
Digital connector	DVI, HDMI, VGA	DVI, HDMI	2x HDMI, VGA	DVI	DVI, HDMI
Dimensions	247x185x399mm	549x230x422mm	550x388x188mm	563x211x403mm	570x215x438mm
Weight	3.2kg	4kg	5.6kg	3.8kg	6.2kg
Warranty	3 years	2 years	3 years	3 years	3 years
Verdict	<ul style="list-style-type: none"> • Cheap for IPS panel • Accurate colours • Plain styling • Few extras 	<ul style="list-style-type: none"> • Impressive overall display • Excellent colours • Wide viewing angles • Great value for IPS tech 	<ul style="list-style-type: none"> • Wide viewing angles • Excellent colours • Attractive, slimline design • No DVI connection 	<ul style="list-style-type: none"> • Extremely low price • Pleasing image quality • Low power consumption • Only a TN panel 	<ul style="list-style-type: none"> • Wonderful 24bit colour reproduction • Viewing angles not great • Height-adjustable stand
FULL REVIEW	TINYURL.COM/7HXTVPV	TINYURL.COM/CWMP7M8	TINYURL.COM/7TWLB2A	TINYURL.COM/C95859A	TINYURL.COM/3DYX75Z

£200+ flat-panels	1	2	3	4	5
	ViewSonic VP2365-LED	Philips Brilliance 241P4QPYES	NEC MultiSync EA232WMI	NEC MultiSync EX231W	ViewSonic VP2765-LED
Price	£215 inc VAT	£250 inc VAT	£246 inc VAT	£234 inc VAT	£360 inc VAT
Website	Viewsoniceurope.com/uk	Philips.co.uk	Nec-display-solutions.co.uk	Nec-display-solutions.co.uk	Viewsoniceurope.com/uk
Overall rating	★★★★☆	★★★★☆	★★★★★	★★★★☆	★★★★☆
Screen size	23in	24in	23in	23in	27in
Panel type	In-plane switching	Advanced MVA	In-plane switching	Twisted nematic	Advanced MVA
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel pitch	0.27mm	0.28mm	0.27mm	0.27mm	0.31mm
Brightness	250cd/m ²	250cd/m ²	250cd/m ²	250cd/m ²	300cd/m ²
Static contrast ratio	1,000:1	5,000:1	1,000:1	1,000:1	3,000:1
Response time	6ms	12s	14ms	5ms	25ms
Digital connector	DVI	DVI, DisplayPort	DVI, DisplayPort	DVI, DisplayPort	DVI, DisplayPort
Dimensions	548x433x250mm	565x220x395-518mm	550x220x379mm	540x215x401mm	642x365x474-608mm
Weight	5.4kg	5.9kg	5.8kg	4.2kg	8.5kg
Warranty	3 years	3 years	3 years	3 years	3 years
Verdict	<ul style="list-style-type: none"> • Premium IPS panel • Superb colour reproduction • Wide viewing angles • DVI port only 	<ul style="list-style-type: none"> • Very strong image quality • Excellent viewing angles • Rotate, height adjustability • Four-port USB hub 	<ul style="list-style-type: none"> • High-calibre IPS screen • Impressive colour depth • Poor 14ms response rate • Height/tilt-adjustable stand 	<ul style="list-style-type: none"> • Solid 23in TN flat-panel • Good viewing angles • Display tweaks required • Screen dims when not in use 	<ul style="list-style-type: none"> • Large 27in display • Low resolution for size • Poor viewing angles • Slow response for games
FULL REVIEW	TINYURL.COM/5WMJLR9	TINYURL.COM/6VVODAP	TINYURL.COM/4CQGNVW	TINYURL.COM/45QT68E	TINYURL.COM/86T3PFM

>> Buying advice



Flat-panel displays

You'll spend most of your working day staring at the screen, so it makes sense to choose one that's comfortable to view.

The panel size will largely depend on your budget and amount of desk space, but those measuring 22in and above tend to offer a full-HD resolution. All but the cheapest models also have at

least one digital interface (DVI, HDMI or DisplayPort). VGA (or D-Sub) is an analogue interface, and won't provide as clean a signal.

The panel technology is important. Twisted nematic (TN) is the budget option, offering fast response times but limited viewing angles. Multiple vertical alignment (MVA) and patterned vertical alignment (PVA) screens offer

better viewing angles and higher contrast ratios than TN, but slower response times. Advanced MVA screens are more responsive.

In-plane switching (IPS) panels offer excellent viewing angles, contrast and colour accuracy, but they can be rather pricey.

Get a matt rather than gloss coating for fewer reflections.

READ MORE: TINYURL.COM/6RMBVR6



JIM MARTIN

Does the OS matter any more?

Although there's still rivalry between Windows PC and Mac users, you could argue that it's getting to the point where the OS your computer runs is irrelevant. Web applications are becoming more prevalent and popular, and we're all storing more and more of our stuff online so it's accessible to any of our devices.

Of course, from Microsoft and Apple's perspective, the operating system does matter. Both companies would rather you used their software to browse the web, write emails, edit photos and do everything else you want to do with your computer.

However, these days it's so easy to take a photo on your smartphone, send it to an online storage service such as Dropbox, access that same



There's still a strong argument that the OS does matter. Gaming is one area where Apple's desktop offering is weak, so die-hard gamers wouldn't even consider buying the latest iMac and running OS X on it. Instead, they'll buy or custom-build a Windows machine, complete with a powerful graphics card to run the latest block-busting shoot-em-up, while Mac users have to stand by and wait for the game to be released in the app store.

Talk to any Windows or Mac zealot and they'll tell you that they have something bordering on a personal relationship with their operating system. They know where every option resides and how to quickly get things done using keyboard shortcuts. Sit either down in front of the 'other' OS and they'll be stumped by tasks as simple as changing the wallpaper.

Web apps also have their limitations. It's all very well to say that we'll be exclusively using web apps in the future, but try editing some HD video online. Not only is there a dearth of web apps for video editing, but your internet connection isn't nearly fast enough to transfer this amount of data in real time - nor are the back-end servers powerful enough to handle the processing required.

For now, Google must accept that people aren't ready to ditch desktop OSes, but there's every chance that the situation will change over the next decade. ☒

“ **Windows and Mac zealots have a personal relationship with their OS** ”

file from your desktop PC to edit it, then share it online via your favourite social-networking site. The operating systems involved don't matter.

Similarly, you could create a document in Google Docs on a Mac, then edit or print it from a Windows PC without worrying about any compatibility issues. There are web apps for pretty much every task now: editing photos (Pixlr), sending emails (Gmail), taking notes (Evernote) and even remotely accessing another computer (Join.me).

Google is evidently confident that the OS doesn't matter: it launched ChromeOS, an online-only operating system that consists solely of the Chrome web browser. No data is stored locally, so you can use your login details on any Chromebook (laptops that run ChromeOS) and it will work just like any other: your bookmarks, passwords and everything else are stored in the cloud.

>> Next issue

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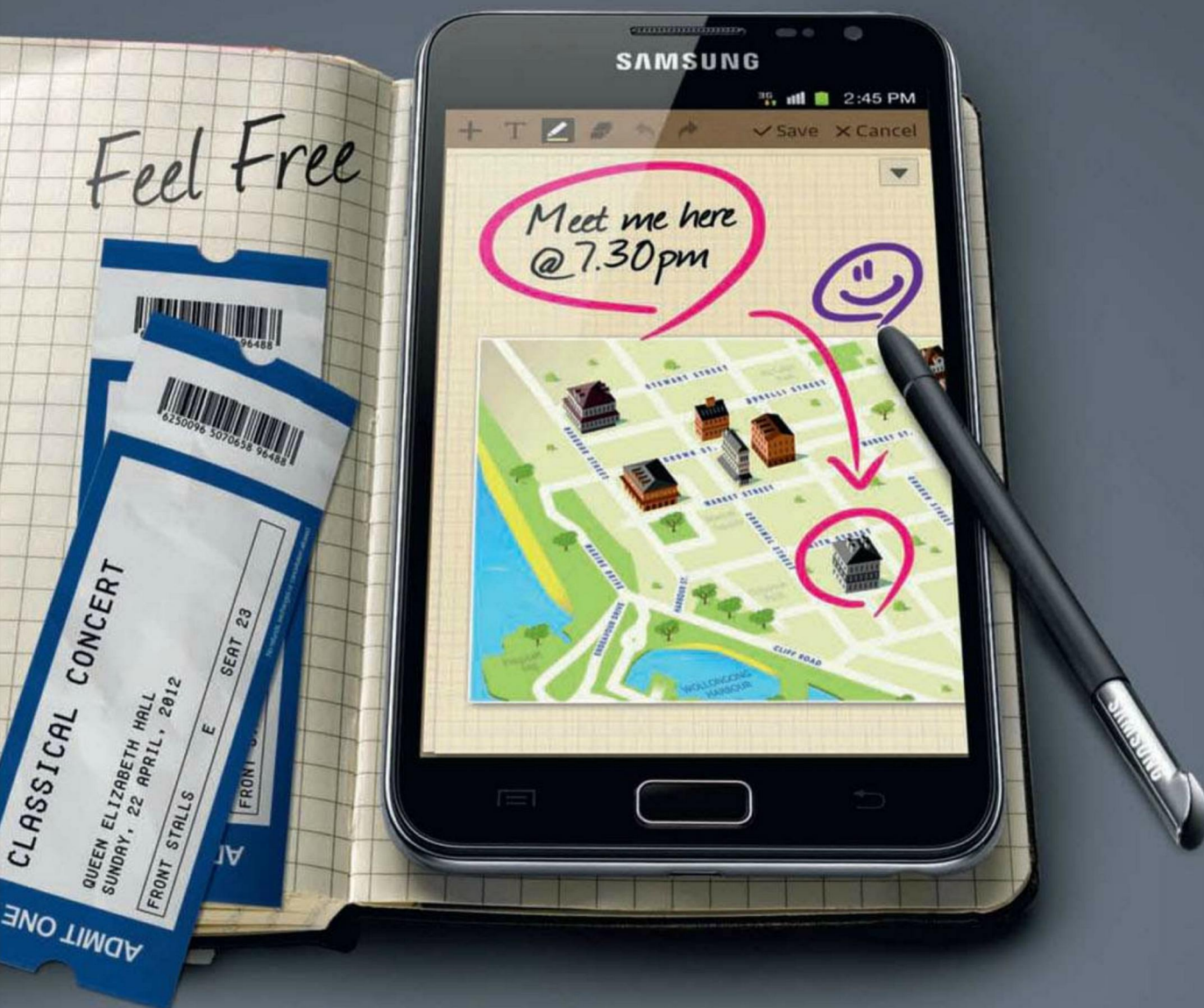
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