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58 Android antivirus group test

We all know about malware in the Windows world, but the question nobody seems to be capable of answering is whether your Android smartphone or tablet is also vulnerable. In conjunction with independent testing lab AV-Test, we've reviewed a staggering 41 Android antivirus apps, and explain in simple terms what threats are lurking out there.

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WELCOME

MATT EGAN

Taking on Apple with design by committee

Apple had a visionary leader; Intel, Microsoft, Google and others have a spec sheet. Is it possible for Ultrabooks to compete with the MacBook Air that inspired them?

Apple is now a $600bn company. How does a once almost bankrupt, niche computer maker make it to gold house and rocket car territory? Apple makes products so beloved of the man and woman on the street that they're prepared to queue to hand over a small fortune. This is because, we are told, its products 'just work'. Apple's wares offer a plug-and-play simplicity that other technology makers would kill for (you can find a few in our reviews section, from page 33).

Apple makes beautiful, game-changing products, and it does so out of step with the rest of the technology world. There have been flops, but Apple's key wins tend to change the game: iPod, iPad and OS X, to name but three. They lock you into Apple's world: technology's largest gated community – safe, secure, clean and expensive. Resistance is futile, but collaboration chic.

> **Apple's key wins tend to change the game. Resistance is futile, but collaboration chic**

A clue to how this happens can be found in Intel's Ivy Bridge launch (see page 16). Intel is promoting Ivy Bridge as the platform for efficiency and portability (with some success, as our tests on page 36 show). The initial rollout of Ivy Bridge contains only quad-core desktop processors, but in early June the laptop chips and the second generation of Ultrabooks will arrive.

Intel has set aside a staggering $300m to promote Ultrabooks. It is determined the Ultrabook will succeed. As ARM gobbles up the mobile market (kickstarted by the iPhone and iPad), Intel is staring at a post-PC world in which desktop products are less relevant. So it's peddling the line that tablets without keyboards are just consumption devices, and portable computers will soon be shrunk down Intel PCs, rather than fattened up ARM smartphones.

None of which will worry Apple, despite its dominance of the ARM-powered tablet and smartphone world. After all, the first 'ultrabook' hit the market in 2008 and was called 'Macbook Air'. Apple couldn't have made the Air without Intel's technology, but it's fascinating to ponder how it is that four years later Intel still has to twist the arms of its partners to get them to create their own thin-and-light PCs.

My hunch is that where the makers of branded Ultrabooks take the best of Intel or ARM's, Microsoft or Google's technology and create products with it, Apple designs something it thinks people will love, then sources the tech to make it happen. It helps that Apple has its own OSes. It doesn't have to worry about complying with Microsoft and Intel's spec, and it knows what the platform is going to look like in the future.

And this happy situation is a result of Apple's near failure before Steve Jobs was brought back on board. Jobs was clearly a visionary, but he returned to a company that had no option but to trust his vision completely, rather than doing what everyone else was doing. In return, Jobs trod the narrow line between megalomaniac and genius, and ended up on the correct side (despite the odd failure).

The challenge for Intel, Microsoft, Google and all those outside Apple's camp is to build by committee amazing products that 'just work', without a singular vision to guide them. ☒

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Reader letters

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No gadgets?

We asked our Facebook fans whether they thought they'd be able to cope without their gadgets for 24 hours. **Brett Nocturnus Caporato** said: "I put my Samsung Galaxy smartphone away for a week as a dare. It's still stored in the box, and I'm now using my old Samsung Tocco handset simply as a mobile phone. I deleted all the social networking apps on my phone and iPod, and disabled the internet connection. My friends know I won't respond to text messages unless they're important. I'm loving every minute of the peace!"

TowayDirect thought its broadband customers might think otherwise, however. "Our customers wouldn't be able to get online. Most of them live in rural UK where traditional broadband cannot reach them. Tooway satellite broadband to the rescue!" wrote the ISP.

pcadvisor.co.uk/news

Windows 8 for business

It may not look like an OS suited to business, but Windows 8 could well make its way to the boardroom, we wrote at tinyurl.com/7sruhgt. *symbolset* disagreed: "Windows Professional and Office combined cost more than a regular PC on which to run them. With so many devices that don't run Microsoft software working well, the need for Windows and Office on the client PC may be coming to an end," he wrote.

Flashback infestation

When we reported that 2 percent of all Macs were alleged to have been infected by the Flashback Trojan, *Maccyroo* took a positive stance (tinyurl.com/d4zbrf2). "Hopefully all those ill-informed people, who often wax lyrical about Macs being safe from malware and not needing security software like Windows systems, will take note," he wrote.

Linux is dead on the desktop

"The desktop OS market is a two-horse race, and Linux wasn't invited to the party," wrote a PCA contributor at tinyurl.com/7nmrp2w. "It might be dead on your desktop, but it's alive and well on mine," reported *Fernando*.

"Even if Linux holds only 1 percent of the market, people like me will continue to find they don't need Windows."

Virgin Media to throttle broadband

Visitors to PCAdvisor.co.uk were up in arms when we revealed that Virgin Media would throttle customers' broadband speeds by up to 50 percent once a usage limit had been hit (tinyurl.com/caevsvs). "Typical Virgin Media, to dangle a carrot about fast speeds, then start moving the goal posts," wrote *Baldfatbloke*.

"This 'metering' is a good idea, but wouldn't it have been useful for this to have been put in place before the broader range of throttling was implemented?" asked *Ian*.

Flagged: Star letter

Don't you want me, Microsoft?

More years ago than I care to remember I bought my first computer. It had a 100MB hard drive and 4MB of RAM, and ran Windows 3.1. Since then I've upgraded my hardware and progressed through Windows 95, 98, ME and XP. Windows 7 required my existing programs to be installed from scratch, so I put off upgrading until I needed a new PC. And now Windows 8 is here but, according to Jim Martin, it's "no fun without a touchscreen". I think I'll be sticking with Windows 7 for the foreseeable future. Why has Microsoft made it so difficult to upgrade to its latest Windows OSes? *James Munroe*

Jim Martin, features editor, replies: Windows 8 is unlike previous versions in the same way that Windows 95 was completely different from 3.1 that came before it. Many people are in the same boat as you, James, and unable to use its touchscreen features.

Windows 8 is in essence two OSes in one: Classic Windows with the old-style desktop, and 'new' Windows with a 'Metro' touchscreen interface. It remains to be seen how many PCs and laptops will gain touchscreens with the release of the OS, but we think many people will use only the Classic desktop with their existing programs.

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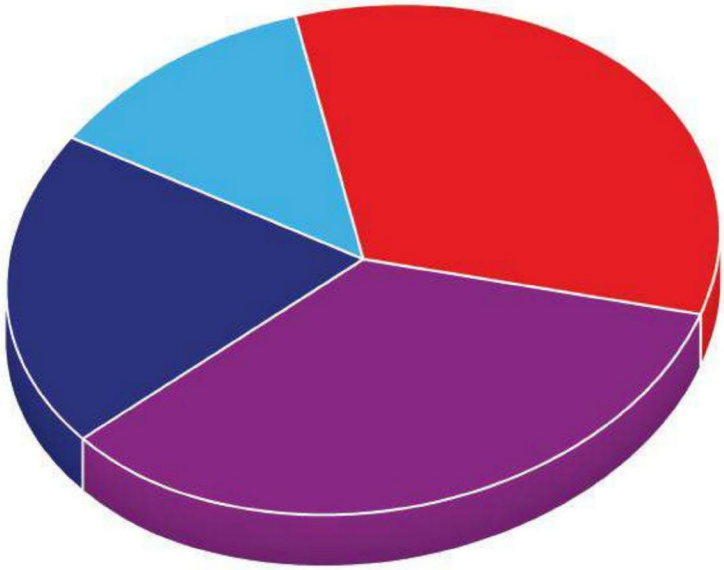

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Not buying it

It irks me when PC shops give customers the hard sell on security software, when free alternatives will do the job just fine. I've used Microsoft Security Essentials since it was released and have never had a problem, even when I inadvertently trawled over a website that was teeming with nasties. And it makes a nice change for a company that charges through the roof for its other software to give away such a decent antivirus program. *John Daly*

Digital daddy

I spend hours sitting in my car waiting for my daughter, so I'm a big fan of mobile entertainment. I was over the moon when Netflix opened its doors in the UK. There I was, halfway through *Ghost in the Shell*, and my daughter arrived. I paused the film, drove home, then settled down in front of the big screen to watch the remainder. No such luck: my connected Sony TV doesn't support the service. Meanwhile, my smartphone doesn't work with LoveFilm. The day when these entertainment services are available across all platforms is long overdue. *Andrew Goodenough*

Only the best will do

The range of electronic products on sale today is amazing, yet people still aren't content with their lot. My friend desperately wanted an iPad 2, but as soon as the third-gen model arrived the old device was considered good for nothing. *Alex Holton*

Lower my bills

I was fascinated by the *Smartphones in 2012: price vs brand* article in your June issue (page 14). Despite the implicit suggestion that I should feel sympathy for big brands such as Sony, LG and HTC, which are seeing their bottom lines squeezed by low-cost Chinese vendors, I found myself wondering why. If Huawei or ZTE can offer me the same product at a lower cost, I'll take it. The maker's reputation is of no importance to me. After all, you don't expect a smartphone to last five-plus years as you might a PC and, since most of us get our handsets free on a monthly tariff, it's the mobile operator that deals with any problems that arise. I'm all for anything that lowers my monthly bill or reduces the price tag enough that I can buy my next handset outright. *Melanie Wainwright* ☒

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Dying a quiet death

With all this talk of Windows 8, some of us may have missed the news that XP was entering its retirement countdown. We asked forum members who were still running the old OS whether this caused them any concern (tinyurl.com/7fm63bq).

alan14: "An XP Pro machine used for recording call statistics has sat behind me in the office for the past five years. Every now and then it reboots after an update, at which point I have to scramble around for the password, then work out which template needs to be loaded into the call-logging software. It'll save me about 30 minutes a month when XP support ends and the reboots stop."

Quickbeam: "I use XP on a netbook, which I'll continue to use until it breaks. It cost nearly £400 new, but sells on eBay for only £40, so I'll get my money's worth."

amonra: "I'll stick with XP for as long as the machine lasts. Why change when it does everything I ask of it?"

WhiteTruckMan: "I've become extremely comfortable with XP over the years. It has its little quirks, but I'm used to them, and I think it's a very user-friendly OS. I wish I could say the same for Windows 7."

Input Overload: "I have XP on a laptop and Windows 7 on a PC. By the time Microsoft ceases support for both I'll have already moved over to Linux; the sooner the better."

Fruit Bat /\o/: "My main PC runs XP and it works like a dream. My Vista laptop has more memory and a faster CPU, yet runs slower."

SB23: "I'm still using Windows XP. As they say, if it ain't broke, don't fix it."

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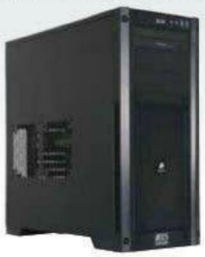

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INTEL LAUNCHES IVY BRIDGE PROCESSORS

Third-generation Core processors offer graphics, media and energy-efficiency improvements

Intel has released its Ivy Bridge family of quad-core processors. The chips are the third generation of Core processors, succeeding the Sandy Bridge range.

The Ivy Bridge line-up consists of 14 PC and laptop processors. Five are Core i5 variations, eight are Core i7 models and one is a Core i7 Extreme Edition chip. Core i3 CPUs will be released later this year.

Intel is using a 22-nanometre (nm) fabrication process for Ivy Bridge, which is a significant jump from the 32nm used for Sandy Bridge. The various improvements afforded by Ivy Bridge focus on graphics, media and energy efficiency.

Intel claims that Ivy Bridge's HD 4000 integrated graphics offers double the performance of Sandy Bridge's HD 3000 solution. Both support DirectX 11.0. Some chips in the range will instead feature HD 2500 graphics, which is said to offer between a 10- and 20 percent performance boost over HD 2000 on a 3D workload.

A suite of visual enhancements includes support for 3D via InTru 3D, better Quick Sync Video and Intel Wireless Display.

"The built-in visuals of the third-gen Intel Core processor eliminate the need for many of the functions provided by a discrete graphics card, reducing power consumption and system cost," said Intel.

In real terms, the upgraded integrated graphics will be able to play the latest games at their default settings and, for the first time, they can support up to three independent displays.

> **Built-in visuals eliminate the need for many of the functions provided by a discrete graphics card**

Power consumption is also improved. Intel said the maximum power draw will be 95W for the quad-core chips and 65W for dual-core. Realistically, both will consume far less in normal use.

And Intel had good news for those hoping to upgrade from Sandy- to Ivy Bridge: the new processors are compatible with the LGA1155 socket used by Sandy Bridge, making for an easy swap.

Core i5 and i7 Ivy Bridge processors feature Turbo Boost 2.0 for improved performance and energy efficiency. Hyper-Threading, which improves multitasking performance, is available only for Core i7, however.

Intel also touts improved overclocking potential for Ivy Bridge, with real-time adjustments, higher CPU multiplier limits and finer DDR frequency control.

For Ultrabooks, Intel's new category of thin-and-light laptops, Ivy Bridge brings a few improvements. Intel believes that Ivy Bridge will bring Ultrabooks into the mainstream. The firm said the processors could enable a tablet-like instant-on and -off experience, along with improved battery life and better security.

Rival chip vendor Qualcomm is making a quad-core version of its Snapdragon S4 processor in the hope that it will get a slice of the Ultrabook pie. See pages 16 and 20 for analysis, and page 36 for our review.

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VIRGIN THROTTLES BROADBAND SPEEDS BY UP TO HALF

Bandwidth-hungry customers to get their hands slapped with temporarily reduced connection speeds

Virgin Media has put into place a traffic-management policy that could see the connection speeds of all its customers – including those on the fastest 50- and 100Mbps packages – temporarily reduced.

In April the ISP announced that it would throttle both download and upload speeds if customers use more bandwidth than is allowed by their package. A 5-hour speed reduction will commence when the cap is surpassed.

Usage is monitored daily between 10am to 3pm, and 4pm to 9pm. Customers downloading between 3.5GB and 20GB of data (depending on their package) during this period will experience an up to 50 percent speed

reduction. Upload performance is also affected, with a 65- or 75 percent slowdown triggered when customers exceed a cap starting at 3GB.

"The policy has been designed to reduce the impact of the top 5 percent of heaviest users on a daily basis. It will reduce the detrimental effect of these customers' extreme usage on network performance and the service other customers receive," said Virgin Media.

The news angered customers who weren't directly informed about the change in policy. However, Virgin Media stressed that customers needn't worry about their usage. It said: "There is no penalty beyond a temporary slowdown if customers use more than a certain amount."

The firm also confirmed that it is developing a utility that will provide customers with various statistics, including a report of their bandwidth usage and a speed-testing tool to check they're getting the performance they expect.

Mobile operators rant over Ofcom's 4G plans

Everything Everywhere has been given an unfair advantage in the 4G field, say Vodafone and O2

Vodafone and O2 have publicly expressed their anger and concern over Ofcom's plans to allow Everything Everywhere to roll out a 4G mobile network this year.

Guy Laurence, CEO of Vodafone, was the first to voice an opinion on the matter. He accused Ofcom of "taking leave of its senses". O2 then joined in, and complained that Ofcom was contradicting its own policy with the move.

Both operators shared the judgement that giving Everything Everywhere permission to roll out 4G using its 1,800MHz spectrum before its rivals would give it an unfair advantage. This goes against Ofcom's aim to deliver a competitive market, they said.

Ofcom made no further statement on the issue in response to Vodafone and O2. However, it did put a slight delay on the rollout by extending the deadline for responses from 17 April until 8 May 2012.

"We have decided to extend this period following requests from stakeholders for more time to respond," said Ofcom.

Whether UK consumers will be able to gain access to a 4G network this year remains to be seen. All eyes and ears are on Ofcom for its final decision.

BT doubles its Infinity 2 broadband speeds to 76Mbps

BT claims the UK's fastest upload speeds, but is still playing catch-up with Virgin Media on downloads

BT has increased the speed of its Infinity 2 fibre-optic broadband product to 76Mbps.

Customers of BT's Infinity 2 broadband will now receive download speeds of up to 76Mbps, which is double the previous 38Mbps connection. However, there is a catch: existing subscribers will need to sign a new contract to receive the boost.

The firm is playing catch-up with Virgin Media, which is upgrading lines to 120Mbps. BT claims to offer the UK's fastest upload speeds, however, up to 19Mbps.

John Petter, managing director of BT Retail's consumer division, said: "Super-fast broadband is helping people enjoy the internet far more than ever before. However, many providers have forgotten about the importance of fast upload speeds."

BT is also boosting the upload speeds of its Infinity 1 package from 1.9Mbps to 9.5Mbps. The firm said the changes will help it to achieve the government's ambition to have the best super-fast broadband network in Europe by 2015.

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O2 to provide free Wi-Fi at McDonald's

O2 has signed a five-year deal with McDonald's to provide free Wi-Fi access in 1,200 of its restaurants. The firm said that the switchover from the previous wireless provider, The Cloud, will take place in time for the Olympics and the Queen's diamond jubilee.

MORE: tinyurl.com/bmsk324

TalkTalk and Orange top Ofcom complaints list

Ofcom has revealed its quarterly telecom complaints report, which shows TalkTalk and Orange in a very bad light having attracted the highest number of customer complaints. TalkTalk was the most complained about ISP for landline- and fixed-broadband services, while Orange headed the complaint list for mobile services. Virgin Media and O2 received the fewest complaints in these categories.

MORE: tinyurl.com/ckra54c

Sky announces Now TV service

Sky has announced a Now TV service that will offer its most popular films and TV programmes over the internet on a pay-as-you-go basis. The streaming service is expected to launch in the summer with access to Sky Movies; sport, entertainment and other content will be added soon after, according to the company.

MORE: tinyurl.com/cqkqypc

THOUSANDS OF MACS HIT BY FLASHBACK MALWARE

'Secure' platform targeted by Trojan • Mac users wait a week for Apple's patch

Security software vendor Dr Web revealed in April that more than half a million Apple Macs had been infected by the Flashback Trojan.

The Russian firm said the malware began to spread in February, and the breach wasn't closed by Apple for a number of weeks. A Dr Web analyst later tweeted that the number of infected units had reached more than 600,000.

"Systems get infected with BackDoor.Flashback.39 after a user is redirected to a bogus site from a compromised resource or via a traffic-distribution system.

JavaScript code is used to load a Java applet containing an exploit. Dr Web's virus analysts discovered a large number of websites containing the code," reported the company.

The exploit saves an executable file on to the infected Mac's hard drive, then goes on to harvest sensitive information, including passwords. "The file is used to download and launch a malicious payload from a remote server," said Dr Web.

As revealed by the firm's map of Flashback infections (pictured left), most of the infected Macs were found in the US and Canada, followed by the UK.

Third-party security vendors released fixes for the issue before Apple, which distributed its patch a week after Dr Web announced its findings. Apple's update is said to remove the most common variants of the Flashback Trojan.

WINDOWS 8 WILL ADAPT TO RETINA DISPLAYS

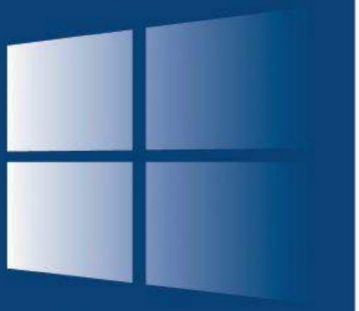
Microsoft has announced that Windows 8 will scale and adapt to large screens with high resolutions and pixel densities.

The firm added that its OS will support resolutions up to 2560x1600, which is higher even than that of Apple's Retina display technology.

Microsoft's Steven Sinofsky said: "Our goal is to support the broadest range of display technologies so PC makers can build PCs or you can use external displays that provide the best experience for your needs."

Microsoft will allow three scaling percentages – 100, 140 and 180 – to ensure that apps will look good no matter the size of the screen on which they're displayed. These equate to 1366x768, 1920x1080 and 2560x1440 screen resolutions.

David Washington, a senior program manager, said: "These scaling percentages are predictable, so developers who provide images for each percentage can easily avoid any blurriness or artefacts due to image stretching."



Game slips in and out of administration

Still a place in the high street for a gaming specialist

High-street retailer Game has had a busy month in April, entering administration after failing to find a buyer and then being rescued at the last minute.

The firm closed down vast numbers of its Game and Gamestation stores across the UK, leaving thousands of employees out of work. OpCapita, a firm that specialises in operational turnarounds in the retail, consumer and leisure sectors, stepped in the following week.

Henry Jackson, Managing Partner of OpCapita said: "We strongly believe there is a place on the high street for a video-gaming specialist and Game is the leading brand in a £2.8bn market."

The 333 remaining Game stores will continue to trade, saving around 3,200 jobs. There are no plans to close further stores. ☒

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Intel launches Ivy Bridge processor family

Intel recently launched the third generation of its Intel Core processor family, promising better graphics, media performance and energy efficiency. Matt Egan explains what it means for PC and laptop users

On 29 April, Intel released to customers 14 new PC processors – the third generation of its Core processor family, more commonly known as Ivy Bridge when combined with 10 new Intel chipsets that launched at the beginning of April. The initial Ivy Bridge launch includes eight Intel Core i7 processors, one Core i7 Extreme Edition chip and five Core i5 products.

The initial launch includes only quad-core processors. This is no value chipset, although Intel promised that less expensive dual-core processors will launch later this year, and Ivy Bridge for laptops will launch in the early summer. Interestingly, although Intel is claiming performance gains for Ivy Bridge, it's focusing more on the areas of graphics and energy efficiency, faster media processing, and the potential for more thin-and-light laptops, or Ultrabooks.

Ivy Bridge's key technological advance is the reduction of the previous generation's 32-nanometre (nm) microarchitecture to a 22nm manufacturing process. This makes Ivy Bridge Intel's first platform built using a 22nm technology. According to the company, this creates extra space to allow for greater performance from less power consumption, and much better integrated graphics capability. (To put this into context, human fingernails grow at 1nm each second; to understand just how small 22nm is, watch how far your nails grow in 22 seconds.)

Improved performance

Intel is claiming six major areas of improvement for Ivy Bridge. 'Smart Performance' is said to offer improved energy efficiency and performance, which suggests that Ivy Bridge PCs should start up quicker, enjoy better network connectivity, and access stored files more quickly.

Intel also suggests that power consumption is lower with Ivy Bridge. It told us that quad-core processors would pull down up to 95W under strain, and dual-core up to 65W – but said these were maximums, and both can go much lower. You can read our initial tests of Ivy Bridge PCs on page 79.

But Intel's major push is for the media experience and 3D performance that Ivy Bridge facilitates. It said that roughly 30 percent more space on the chip is now being given to the graphics subsystem. The new processors are said to offer up to twice the graphics capabilities of Sandy Bridge.

Intel is also boasting about improvements to Quick Sync Video, its dedicated video-transcoding and -conversion hardware codec. It said the native graphics capability of every Ivy Bridge processor is "a significant improvement over Sandy Bridge... roughly equivalent to an entry- or mid-level discrete graphics card". Intel told us, for instance, that the integrated graphics of any Ivy Bridge processor could play out-of-the-box Call of Duty: Modern Warfare 3 at a screen resolution of 1920x1080p.

This isn't great news for graphics card makers, not least because – unlike AMD's CrossFireX technology – Intel processors are unable to combine integrated and discrete graphics systems. Intel told us that its Lucid Virtue technology will allow parallel usage, so both graphics subsystems can handle different tasks at the same time, and promised a new version soon. Included in Ivy Bridge is support for DirectX 11, OCL 1.1 and Open GL 3.1.

> **"Ivy Bridge offers up to twice the graphics performance of Sandy Bridge"**

Ivy Bridge processors also offer more tangible new features. Display enhancements mean that the chipset can natively support three independent displays at HD resolutions. There's also HDMI 1.4A support and what Intel calls 'Premium Audio'. In terms of I/O performance there's standard support for PCIe Gen 3.0, SATA 6Gbps and integrated USB 3.0, as well as broader wireless support.

Integrated security functions include smartphone-like hardware-native anti-theft capabilities, created with partners McAfee, Symantec and Absolut. You can, for instance, set up encryption key exchange for file sharing buried deep in the chipset, potentially making more secure activities such as online banking – provided that you use only a single Ivy Bridge system to access the bank. Anti-theft capabilities allow Ivy

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Bridge users to purchase products from Intel's software partners that allow them to brick stolen laptops, or wipe sensitive data from them.

Although Ivy Bridge works with all Intel 6 Series motherboards built since the turn of the year, it will most often be paired with products from the Intel 7 Series chipset, known as 'Panther Point'. This supports third- and second-gen Core processors.

Intel 7 Series chipsets offer Intel Rapid Storage Technology 11, integrated USB 3.0, support for multiple HD displays and Thunderbolt connectivity as standard, although additional components are required (namely the Cactus Ridge controller that implements Thunderbolt). There's also support for Intel's 'Small Business Advantage' technology, which allows small businesses to manage a shop full of PCs without having to employ an IT expert, 6Gbps SATA connectivity for SSDs and hard disks, legacy PCI support, and what Intel calls 'Storage Power Savings'. The chipset is built using a 65nm process.

Ivy Bridge for Ultrabooks

Intel also outlined some of its plans for Ivy Bridge in Ultrabooks. Although tablets are immensely popular for the consumption of media, Intel believes thin-and-light laptops are required for its creation. Ivy Bridge will also allow second-generation Ultrabooks to start almost instantly from sleep mode.

Like desktop Ivy Bridge chips, the mobile processors will offer Smart Response, a technology in which information that is often required is stored on an SSD, and less frequently called on data sits on a hard disk, increasing response times.

Another Ivy Bridge technology that is particularly relevant to Ultrabooks is Smart Connect, which allows applications to be updated on the fly.

As with quad-core Ivy Bridge processors, the laptop processors will include 'anti-theft' and 'ID-protection' capabilities. ☒

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Apple slammed for not sharing wealth with Chinese workers

Watchdog group SACOM says Apple isn't using its $98bn cash pile to address poor working conditions in the Chinese factories in which its products are made. Agam Shah investigates

Picture: markm49uk, macrumours.com

A watchdog group has issued a renewed call for Apple to address what it considers poor working conditions for factory workers in China, criticising the company for not assigning any of its $98bn cash pile to address the issues.

Students and Scholars Against Corporate Misbehavior (SACOM) said the factories in China continue to underpay and violate labour rights. In a letter to Apple CEO Tim Cook, SACOM said that Apple's failure to assign cash reserves to address the issues "demonstrates the enormous greed and desire for profit of Apple and its executives".

"Apple announced that it would finally share some of its cash reserves with shareholders. It is regrettable that Apple did not show any intention to share the revenue with its production workers, whose labour helped the company become one of the most profitable corporations in the world," SACOM wrote in the letter.

In March this year Apple said it would use its $98bn cash balance toward issuing dividends and repurchasing shares. Apple acquired a substantial cash balance thanks to the success of the iPhone, the iPad and Macs, and Cook said the company expects to continue growing as the mobile markets expand at a fast rate.

SACOM has issued multiple reports over the past few years highlighting the poor working conditions of factory workers making Apple's iPod, iPhone and iPad products. The organisation has alleged contract manufacturers such as Foxconn underpay workers, while exposing them to health and safety risks.

Issues related to the working conditions came under scrutiny again earlier this year following a *New York Times* story that described poor working conditions at Chinese factories operated by Apple contractors. Non-profit organisations such as Change.org are also running campaigns for Apple to make products ethically.

Business decisions

Cook has on multiple occasions defended Apple's record, saying the company takes seriously working conditions in factories that make its products, and is taking every step to hold suppliers responsible.

It's difficult to connect the $98bn cash reserve to resolve the manufacturing issues in China, said James Post, professor in management markets, public policy and law at Boston University.

Apple has a contract to buy finished products from contractors such as Foxconn, and the suppliers are responsible for addressing concerns related to pay, working conditions and other issues. Apple is well aware of the issues, and as a big purchaser of products it can exert control on suppliers to comply with the rules or lose manufacturing and assembly deals. It's already doing this, said Post.

"It's a coincidence that there's this big pile of cash at the time the supply chain issue has arisen. It takes a leap of faith to connect the two," Post added.

An argument can be made that Apple could use its cash reserve and giant profits to pay contractors such as Foxconn extra to address the issues. But from a business perspective, it's naive to believe that Apple would voluntarily pay a higher price to contractors if it's possible to get products at lower prices elsewhere.

Accountability

Apple's decision on how it wants to use its cash reserve may make financial sense, but there has to be accountability in the way Apple products are made, said Lior Malenboim, CEO of Applicasa, a business-as-a-service (BaaS) vendor in the mobile application market. It's about thousands of workers being treated badly, while Apple shareholders and Mac, iPhone and iPad owners sit at home in relative comfort, Malenboim said.

Malenboim suggested in an email sent to journalists that Apple could have changed its public perception by offering a financial sum to improve the lives of the factory workers. Malenboim said 10 percent of the fund could have been used in a health plan for the approximately 230,000 factory workers, and 20 percent of the fund could raise salaries.

"When the product that you're selling is the result of some 230,000 individuals' hard work, those people deserve a fair wage as a human right," Malenboim said. ☒

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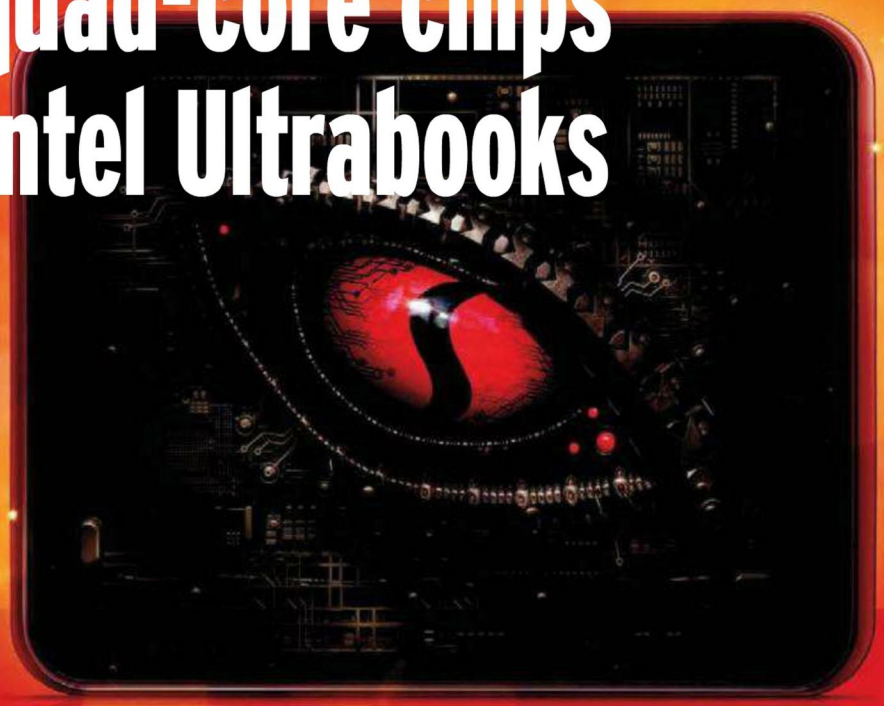
Qualcomm quad-core chips to counter Intel Ultrabooks

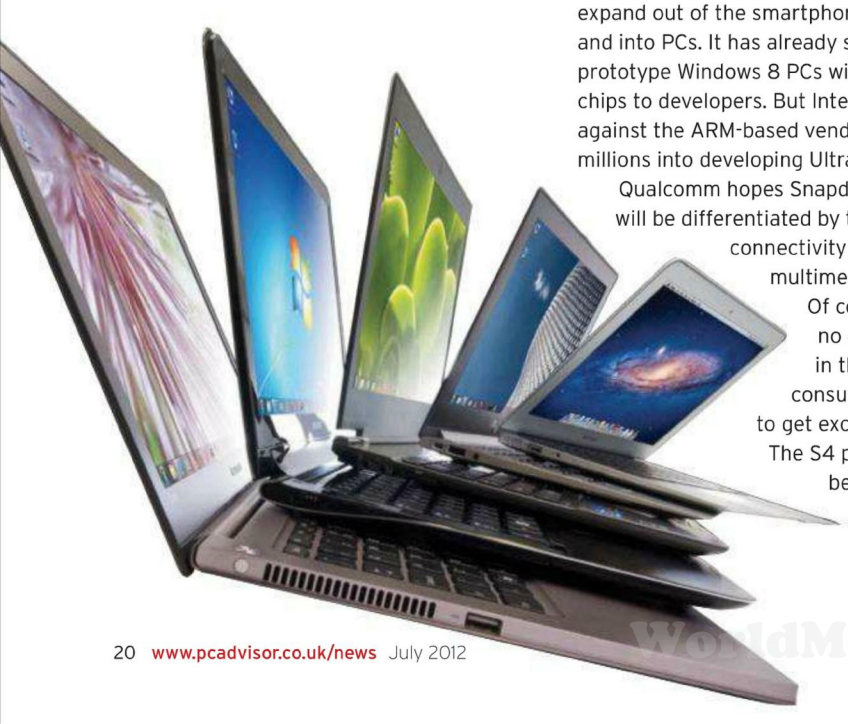
Qualcomm says its quad-core Snapdragon processor will be used in thin-and-light laptops that rival Ultrabooks and the Macbook Air. Agam Shah explains



Qualcomm is preparing a quad-core version of its Snapdragon S4 chip for thin-and-light Windows 8 laptops. The chip maker hopes the processors will steal some thunder from Intel's second wave of Ultrabooks, which is due later this year.

The S4 processors will go into laptops that are thinner and lighter than Apple's Macbook Air, according to Rob Chandhok, senior vice-president at Qualcomm.

"We think much lighter than what Intel calls an Ultrabook," Chandhok said.



The line between high-end smartphones, where Qualcomm's chips are normally found, and laptops has started to blur. The S4 chips will enable smaller laptops with high-resolution screens, longer battery life and always-on connectivity, said Chandhok.

The chips are based on a core from ARM, and include an integrated modem and graphics capable of handling 3D content.

Swapping roles

Just as Intel hopes to make microprocessors for smartphones, Qualcomm is trying to expand out of the smartphone market and into PCs. It has already shipped some prototype Windows 8 PCs with Snapdragon chips to developers. But Intel is moving against the ARM-based vendors by pouring millions into developing Ultrabooks.

Qualcomm hopes Snapdragon laptops will be differentiated by their 4G connectivity and strong multimedia qualities. Of course, with no 4G network in the UK, British consumers have less to get excited about.

The S4 processor will be manufactured using the 28-nanometre (nm) process, improving power efficiency and performance compared to earlier Snapdragon chips. While ARM chips often provide longer battery life, they generally pack less performance than Intel's Core processors.

Qualcomm is also thinking about 64bit support on Snapdragon, but Chandhok couldn't reveal when such a chip would be released. Windows 8 will be a 64bit OS, and ARM has already announced 64bit support with its upcoming ARMv8 architecture.

Having a powerful Snapdragon chip with four CPU cores and multiple graphics cores will make a difference for Windows 8 devices, especially in games. Windows 8 can improve application performance by executing programs in parallel across multiple cores, and Qualcomm is working on compilers to parallelise program execution for everyday applications such as browsers.

"There will be maturation on the software," Chandhok said.

Aside from makers of x86 chips, Qualcomm will compete with ARM-based chip makers nVidia and Texas Instruments, which are also supplying chips for Windows 8 tablets. While many of the basic features will be similar, Qualcomm will try to differentiate its chips by developing software that plays to unique multimedia and cellular connectivity features on Snapdragon.

"In this day and age, the instruction set matters," Chandhok said. ☒

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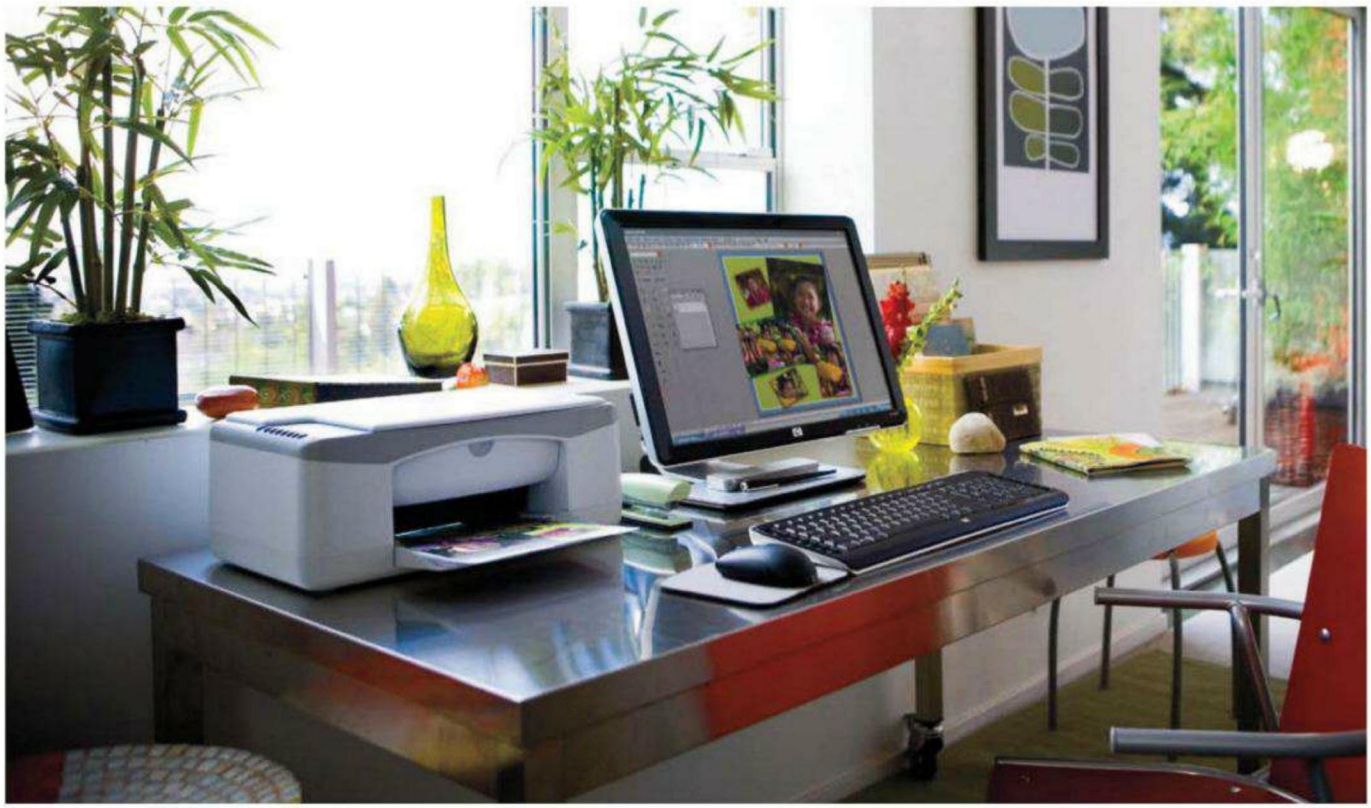

HP to ditch printers and focus on PCs?

Reports suggest that HP will merge its printer division into its PC business to cut costs, adding another twist to its troubled recent history. James Niccolai investigates what's happening at Hewlett-Packard

The writing may finally be on the wall for HP's printer division, with reports suggesting that the firm will merge its printer and PC businesses to cut costs.

HP is expected to announce that it will merge its Imaging and Printing Group into its Personal Systems Group as a way to reduce costs and simplify its business. Under the plan, Vyomesh 'VJ' Joshi, who has run HP's printer business for the past 20 years, will step down, and Todd Bradley, head of the PC group, will run the combined division.

HP has yet to confirm the move, but neither has it denied the rumours. Both Reuters and *The Wall Street Journal*, citing unnamed sources, said the change would be announced imminently.

Blotchy outlook for ink

The move would reflect two realities, industry analysts said: that the market for printers and ink, long the backbone of HP's business, has a dwindling future, and that HP needs to cut costs somewhere to boost spending on research and bring back innovation to the company.

It wouldn't be the first time the company has merged its printer and PC groups. Carly Fiorina did that in 2005, but the decision was reversed by Mark Hurd soon after he replaced her. Hurd reportedly revisited the idea a few years ago, but decided against it.

This time it's different, however. When Fiorina made the move, she put the combined division under Joshi. This time, the man who has driven a good part of HP's profits for more than a decade will leave the company, and the head of the PC division will be put in charge.

That could reflect the fact that the humble PC might have a brighter future than printers, something that seemed unthinkable seven years ago when IBM had just sold its PC business to Lenovo.

"The problem is, this is just a trailing-edge business," said Endpoint Technologies analyst Roger Kay. "Printer sales are declining, ink sales are declining, people just don't print as much any more."

The iPad and the Kindle have made it easier than ever to read documents electronically, he noted, and technologies that allow people to electronically sign documents, from DocuSign and others, have removed a big hurdle to doing away with the printed page.

"The growth just isn't there. And as HP looked out in the future, I think it's not seeing it there either," Kay said.

Printer ink remains one of the most profitable parts of HP's business, but sales in its Imaging and Printing Group have been declining. They totalled $25.8bn last year, a billion dollars less than in fiscal 2005. Over the same period, sales at HP's Personal Systems Group increased about a healthy 30 percent, to $39.6bn.

Analysts don't see things getting any better. The printer market is expected to grow by just 1- to 2 percent in the next few years, said IDC analyst Crawford Del Prete, while PC sales will grow as much as 5 percent. Printer sales are also more sensitive to changes in the economy.

At the same time, HP needs to cut costs, as current CEO Meg Whitman made clear on the company's last earnings call. HP has underinvested in innovation, she said, and must spend more money to stay competitive.

That means freeing up money elsewhere in the business, and rolling two big divisions together could help. Printers and PCs share some of the same components, and there is likely to also be overlap in areas such as manufacturing, sales and marketing.

"Bradley has done a fantastic job in creating a more efficient Personal Systems Group. HP is looking to him to work some of that magic in the printer division," Prete said. ☒

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Samsung Galaxy Note exceeds low expectations

Aggressive marketing, distribution and product design have managed to turn Samsung's smartphone-tablet hybrid into a success against all odds. Mikael Ricknäs investigates

Samsung has shipped 5 million units of its 'smart notepad', the Galaxy Note, surpassing most expectations, according to analysts.

When the Note launched last year, it was seen by many as an ugly duckling, sitting uncomfortably between the smallest tablets and the biggest smartphones with its 5.3in screen. But Samsung has turned it into a success with aggressive marketing, distribution and good product design.

"Compared to what people thought when it was released, Samsung has delivered above expectations," said Neil Mawston, executive director at market research company Strategy Analytics.

CCS Insight's Geoff Blaber agreed: "For a product that many initially thought sat in a no-man's land between smartphones and tablets it has done phenomenally well."

There is an audience that wants pocketable tablet functionality, according to Malik Saadi, principal analyst at Informa Telecoms & Media.

Niche market

The Galaxy Note has a 5.3in Super AmoLED display with a 1280x800-pixel resolution. It can be used as a smartphone or a "smart notepad", according to Samsung. The digital S Pen (stylus) lets users write and draw directly on the screen.

"It's an attractive looking product. It's sleek and shiny, and that seems to resonate with consumers," said Mawston.

The Galaxy Note has also benefitted from a change in usage patterns among consumers. They are making fewer calls and spending more time on the web, according to Roberta Cozza, principal analyst with Gartner.

"The 5.3in screen is cool if you don't mind holding it to your ear when making a call, or using a headset," said Cozza.

Samsung's marketing of the Note is something that analysts also highlight as one reason it's shipped 5 million units.

Samsung's latest publicity stunt shows an elephant using the Note, a juxtaposition that is more flattering to the device when it's held up to such a large ear.

"Samsung has been promoting the Note hard, and the company has pretty deep pockets these days," said Mawston.

The company has become more canny with its marketing as a whole, not just with the Note, according to Blaber. He thinks the Note has been helped by the success of Samsung's Galaxy S II smartphone.

One reason many thought the Note would struggle was because the similarly sized Dell Streak failed. "The Dell Streak had a 5in screen when 3in screens dominated, and that leap was too far for consumers. But now consumers in developed markets are much more familiar with 4in to 4.5in screens, so the jump to 5in is no longer such a chasm," said Mawston.

The Streak wasn't helped by Dell's lack of brand awareness in the mobile space and a bad user experience either. Android simply wasn't ready to be used on a device with a bigger screen, Saadi said.

But just because Samsung has blazed the trail doesn't mean similar products, including LG's Optimus Vu, will become a success.

"Competitors will struggle to reach the kind of volumes Samsung has witnessed," suggested Blaber.

Even if Samsung has managed to turn the Galaxy Note into a success, the company can't rest on its laurels. The Note was supposed to get Android 4.0, also known as Ice Cream Sandwich, during the first three months of 2012, but the upgrade has slipped to the second quarter. Also, the digital pen needs to be improved, according to Cozza. There are some glitches, and it isn't as responsive as it could be, he said. ☒

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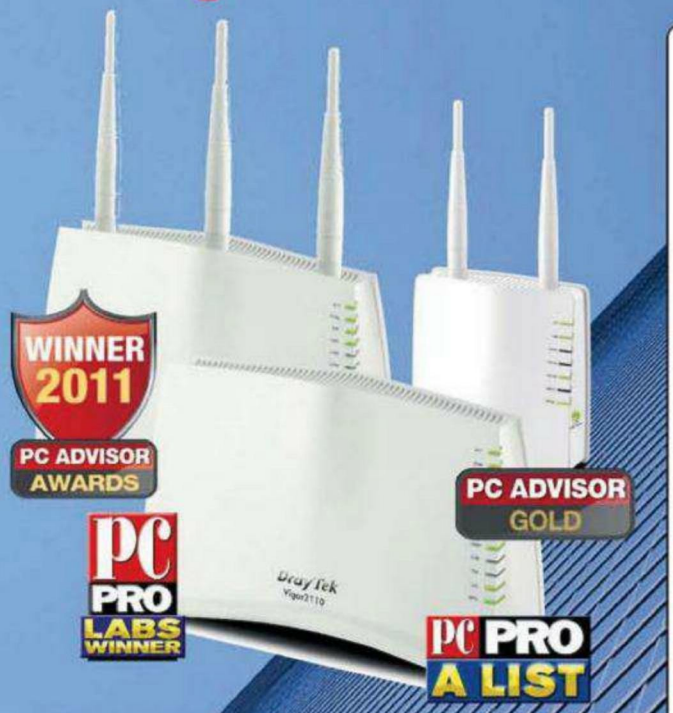

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NEWPRODUCTS

Chris Martin rounds up the hot gadgets topping our technology wish list

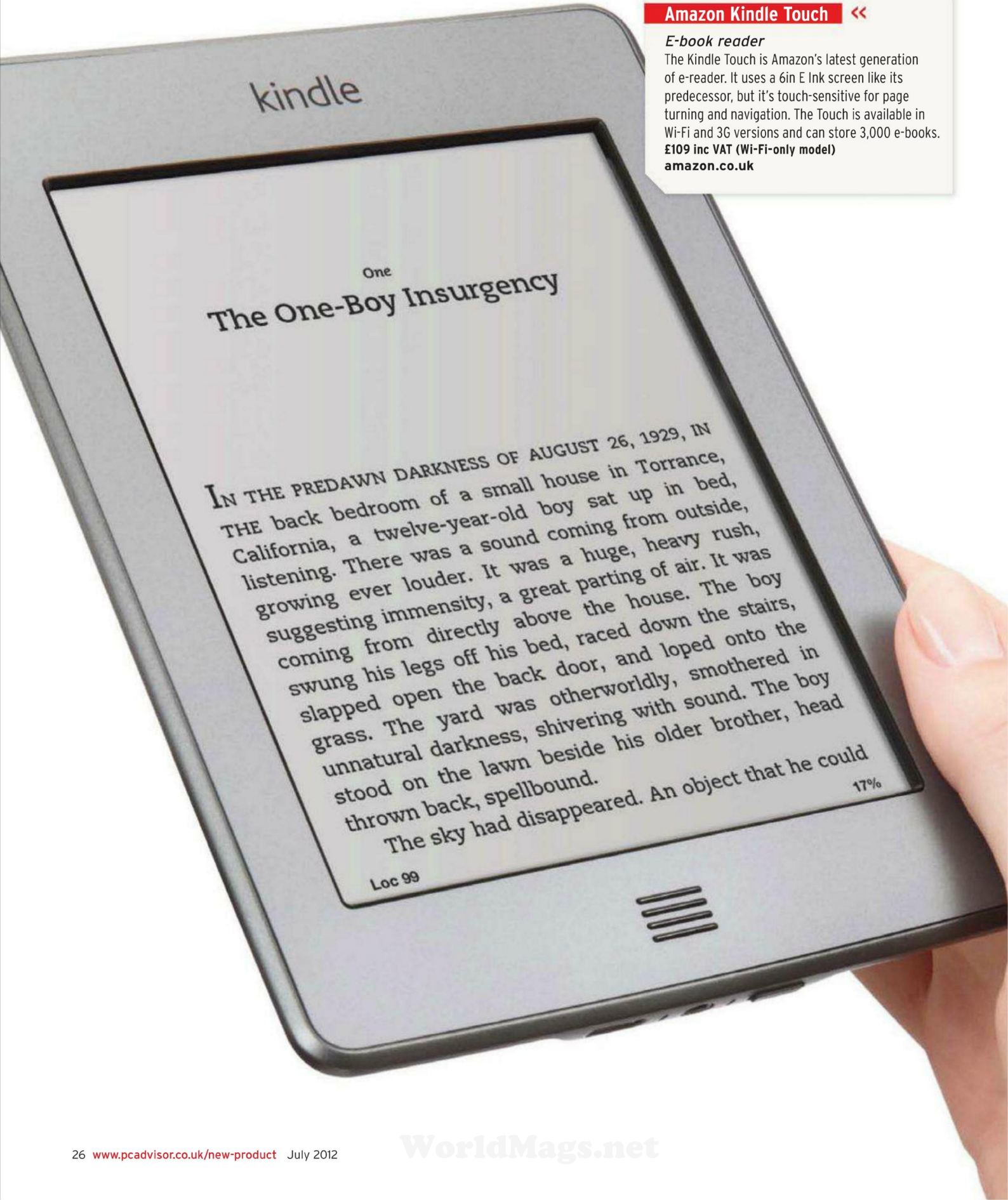
Amazon Kindle Touch

E-book reader

The Kindle Touch is Amazon's latest generation of e-reader. It uses a 6in E Ink screen like its predecessor, but it's touch-sensitive for page turning and navigation. The Touch is available in Wi-Fi and 3G versions and can store 3,000 e-books.

£109 inc VAT (Wi-Fi-only model)

amazon.co.uk



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Sony Vaio E Series 14

Laptop

Vaio E Series 14 laptops feature a wrap-around design in black, white or pink. Each model boasts an Intel Core i3 processor, an AMD Radeon HD 7670M graphics card, 4GB of RAM and a 14in screen. A built-in 1.3Mp webcam supports gesture control.

Around £649 inc VAT

sony.co.uk

SMS Audio Sync by 50

Wireless headphones

Hip-hop artist 50 Cent has entered the headphone game with these Sync cans. They have professionally tuned 40mm drivers, active EQ, onboard controls, a microphone and a dongle, and provide 16bit lossless audio, wirelessly. Rechargeable batteries allow for up to 18 hours of playback.

£299 inc VAT

smsaudiouk.myshopify.com

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G-Technology G-RAID with Thunderbolt

External hard drive

The G-RAID is a stylish aluminium hard drive that offers Apple Macs up to 8TB of external storage. The drive is configured in a Raid 0 array and has dual Thunderbolt ports for maximum performance.

£720 inc VAT (8TB)
g-technology.eu

Sony Xperia Sola

Smartphone

Sony latest smartphone is the Xperia Sola, available in black, red or white. The Sola has a 3.7in (480x854) Reality Display and includes support for near-field communications. 'Floating touch' technology lets you navigate a web page without touching the screen.

Price TBC
sony.co.uk

Panasonic Lumix GF5

Digital camera

The ultra-compact Lumix GF5 offers professional-quality images and full-HD video. Panasonic claims this pocket-friendly camera has the world's fastest autofocus, at 0.09 seconds. The Lumix GF5 has a 12.1Mp Live MOS sensor, a built-in flash and a high-resolution 3in LCD touchscreen.

Around £449 inc VAT
panasonic.co.uk

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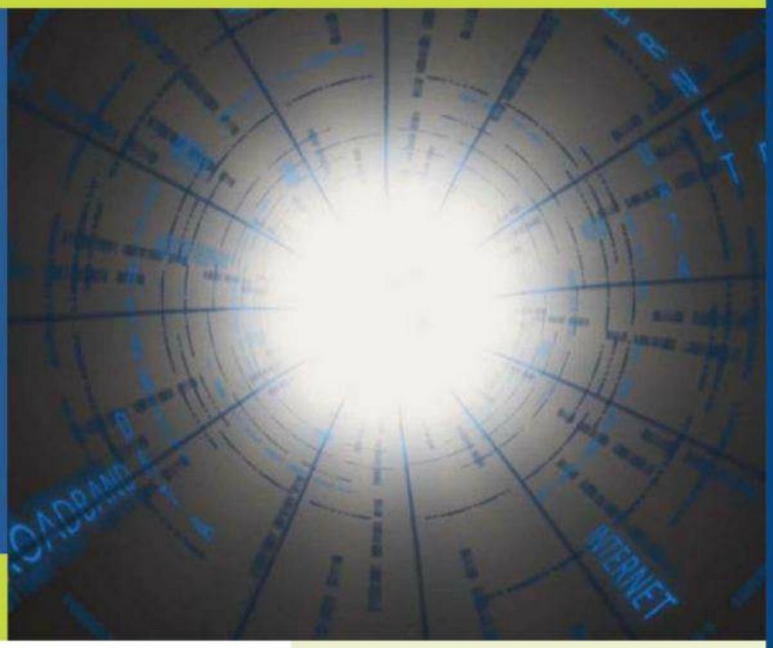

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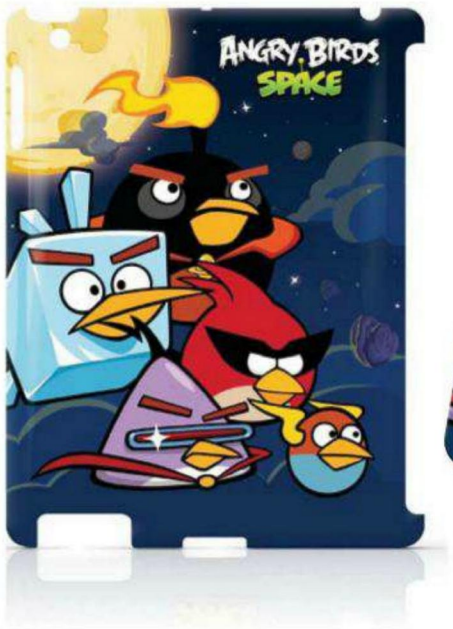
Toshiba Excite 7.7

Tablet

The Excite 7.7 is Toshiba's pint-sized Android 4.0 Ice Cream Sandwich tablet. An aluminium shell conceals a 7.7in AmoLED screen with Gorilla Glass, an nVidia Tegra 3 quad-core processor, GeForce graphics and 16- or 32GB of storage.

Price TBC
toshiba.co.uk



gear4 Angry Birds cases

iPhone and iPad cases

Angry Birds Space is the latest instalment in Rovio's popular smartphone game series; anticipating its popularity, gear4 has come up with these iPhone and iPad cases. The rubber-coated skins are made using an in-mould labelling process, making them more resistant to scratches.

£24 inc VAT
gear4.com

Concrete Hook Case

Laptop case

This handmade Italian leather laptop case has a strong metal frame and a suede lining. Two internal pockets are provided for accessories, while three different straps can be attached for various carrying styles. The Hook Case is available in Antelope Brown, Green Grey, Red Brown and Charcoal Black.

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concretecases.com/en

Logitech UE Air Speaker

Wireless speaker

The UE Air Speaker allows uncompressed audio to be streamed wirelessly over a network. The speaker is compatible with iTunes, iPod touch, iPhone and iPad via Apple AirPlay. Devices can be docked and charged in the traditional way with the retractable draw.

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Freephone toll

Google, the company whose name has become the generic verb for searching the internet, would have you believe it's a benevolent provider of free goodies. Just look at all the cool stuff it gives away for free!

As well as the best search engine in the business, Google gives you free access-anywhere email with Gmail. You can write and share documents online with Google Docs, and Google will also take care of all your calendar needs. It even provides you with a social network for sharing the minutiae of your life with others.

Publishers and webmasters enjoy the free fruit of Google's Analytics, which lets site owners know plenty about each visitor that lands on their own pages. Tracking cookies and JavaScript tricks also give Google the means to then follow these visitors and observe their habits as they move to the next trip-wired Google affiliate.

Fact is, a lengthening list of improprieties means the smoke and mirrors of Google's 'do no evil' slogan are steadily lifting.

Google took Java, Android's programming language, from Sun (now Oracle), and emerging internal company emails acknowledge that Google knew it really ought to pay the licence.

Then there's Google's 'accidental' capture of untold gigabytes of private data when it intercepted and recorded private Wi-Fi traffic with its Street View cars. It was recently fined $25,000 for failing to assist authorities with their inquiries over the matter.

A more punitive fine may be on the cards soon, though, after Google deliberately subverted the cookie privacy mechanism of Safari browsers, ensuring that it could still track Mac users who had opted out of receiving its tracking cookies.

Open the gates!

For plenty of gadget lovers, Google is the outstanding benefactor that provides a free alternative to the iPhone's operating system. For those who appreciate the value of open-source software, Google has even opened the platform for all to see. Hurrah!

And so comes the inevitable warning about Greeks bearing gifts. It's sublimely ironic that Google's mobile phone platform is now the most popular vehicle for Trojans since Odysseus gave the people of Troy their timbered equine present.

Perhaps the biggest bluff, then, is the way many smartphone users have been led into believing that because Android is an open-source system it's thereby better for the user and for freedom. Guess what, it's not that open and I don't think freedom here is better.

Google Android is in essence another clever way to extend the company's reach, putting targeted adverts in front of a heavily profiled mass audience. True, it gives you the freedom to install apps from absolutely anyone – apps that could contain absolutely anything. You'll need to keep up your guard.

One answer might be to run antivirus software on your Android phone. This is frustrating enough in desktop computing and, as the latest lab results from AV-Test have established (page 58), most of the antimalware products available for Android aren't fit for purpose.

Mobile phones are used in distracting environments, and we need assurance of our personal security first and foremost. The average phone owner cannot expected to become an IT sysadmin responsible for locking down the portable computer in their pocket. Even, or especially, when it's 'free'. ☒

PC ADVISOR TEST CENTRE

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23.6in MONITOR

Hanns-G HL249DPB

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£119 inc VAT

Contact
- hannsg.com

Read more
- tinyurl.com/c95859a

Specification
23.6in monitor; 1920x1080 resolution; TN panel technology; white LED backlight; 16:9 aspect ratio; -5- to 15-degree tilt adjustment; 16.7M colours; 250cd/m² brightness; 1,000:1 contrast; 170/160-degree (H/V) viewing angles; 5ms response time; stereo speakers with 2x 1W amp; VGA; DVI-D; Vesa 100 mount; 3-year warranty; 563x403x211mm; 3.78kg (with stand)

Build: ★★★½☆
Features: ★★½☆☆
Performance: ★★★½☆
Value: ★★★★½
★★★★☆

Hanns-G's HL249DPB is a budget 23.6in twisted-nematic (TN) display with very low power consumption and surprisingly good performance.

With its 23.6in LED-backlit panel, the HL249DPB is the largest model in the company's HL9 line. Its slim, minimalist design lends it a rather elegant appearance, although it's clearly not a luxury product.

Setting up the display involves attaching the small tilting stand to a simple and obviously plastic circular base by means of a supplied screw. Alternatively, you could make use of the Vesa 100 mount at the rear, where you'll also find VGA and DVI inputs and a pair of stereo speakers.

The screen has a matt anti-glare finish. A row of five tiny buttons sit under the bezel on the righthand side, letting you quickly adjust the brightness and audio volume without entering the full menu.

The menu system itself is clearly laid out, simple to use and allows you basic control over the colour temperature, picture scaling and dynamic contrast. There's also a control for switching between Video and PC modes, although our review model didn't include the HDMI port required to make this option useful.

If a 24in display is simply too big for your needs, four other models in the range start from 18.5in and £69. All Hanns-G's displays include a three-year warranty. A version without the DVI-D port is also available.

Given the low price of the HL249DPB, we were expecting mediocre performance. In reality, we were pleasantly surprised.

Yes, it's a TN panel, with all the inherent limitations of the technology – most notably restrictive viewing angles. But in all other respects this display performed very well indeed.

We measured a checkerboard contrast ratio of 740:1, which is better than many more expensive monitors can achieve. Colour accuracy and uniformity across the surface of the screen was also very good. In our tests, the Hanns-G covered 94 percent of the sRGB gamut, and 73 percent of AdobeRGB.

The manual states that "you may find slightly uneven brightness on the screen depending on the desktop pattern you use". Our calibration tests did indeed reveal a reduction in brightness towards the lefthand side of the screen. It's a weak point in this display's performance, but won't be noticeable in day-to-day use.

In general use, we were pleased with the output of the HL249DPB – particularly given this monitor's £119 budget price tag.

Power consumption is also exceedingly low for a 24in display. At its maximum brightness, which we measured at 247d/m², the monitor consumed only 18W. This figure fell to a mere 11W at our standard brightness level of 120cd/m².

The monitor is said to be constructed with eco-friendly materials, so it'll continue to be kinder to the environment when the time comes to recycle it.

Verdict

With the HL249DPB, Hanns-G seems to have got everything right. An emphasis on quality and low power consumption makes this display an excellent entry-level model that will outperform much of the budget competition. Photographers and graphic artists will still require a more advanced display but, for general office or home use, you can't go far wrong with this monitor.

☒ **Paul Monckton**

3G ROUTER

Novatel Wireless MiFi 3352

£135 inc VAT

Contact
- novatelwireless.com

Read more
- tinyurl.com/7rdqsnu

Specification
Supports five devices; MiFi OS; 802.11b/g; 2.4GHz; 10m range; WEP/WPA/WPA2; GPS; MicroSDHC slot; 5.6Wh battery; 62x98x15.3mm; 81g

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★☆☆
Value: ★★½☆☆
★★★½☆

The Novatel MiFi 3352 is a compact mobile broadband router that lets you share a 3G data connection with up to five devices wirelessly. An integral battery makes it a truly portable solution, although runtime is limited to just 4 hours or less.

This small device has a smart gloss black front (albeit prone to fingerprints) and a matt rear panel. A fake-chrome trim hosts a MicroUSB power port, a MicroSDHC slot – for 32GB of shared storage – and an on/off power button.

A multicolour LED changes its hue to denote the router's status. In use, we saw only a blinking pink LED as it located a 3G network, and constant pink once connected.

Other colours you might see include: green, for when a 2G network has been located; blue, for a roaming network; cyan, when an SMS message has been received; and red, when the juice is running dry. Further along, a Wi-Fi LED glows blue when the MiFi is transmitting.

The rounded corners of the Novatel's pebble-like build prevent it from causing damage to other items when thrown into a bag.

The MiFi is available SIM-free for around £135, or locked to Orange from £10 per month with 500MB of data. We tested an unlocked device over the Vodafone UK network.

Setup was reasonably simple. You need to remove the rear panel, insert the SIM and battery, then jot down the SSID and encryption key printed on the inside.

We tested the Novatel using a WiFi-only Samsung Galaxy Tab. Having picked up its wireless signal, we launched the web browser and were directed to the Novatel's MiFi interface. We then entered Vodafone's APN details and clicked Connect. By default, you'll need to log into MiFi to connect during each browsing session, although this can be altered in the device's settings.

With the 3352 connected to Vodafone's 3G network, up to five wireless devices could pick up its 802.11g broadcast (note the lack of n) and were instantly online.

WorldMags.net

SET-TOP BOX

Apple TV (third generation)

PC ADVISOR RECOMMENDED

£99 inc VAT

Contact
- apple.com/uk

Read more
- tinyurl.com/7j7yk4x

Specification
1GHz Apple A5 (ARM Cortex A9 SoC) processor; 8GB flash storage; 512MB RAM; H.264/M-Jpeg/Mpeg4 video; MP3/AIFF/WAV/AAC/HE-AAC audio; 802.11b/g/n; 10/100 ethernet; HDMI; Mini-USB; 98x98x23mm; 270g

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★★½
Value: ★★★★☆

★★★★½

Although the late Steve Jobs alluded to the possibility of Apple entering the television market, there's still no sign of an actual Apple TV. Instead, alongside the launch of the third-generation iPad came a modest upgrade to its set-top box, already known as the Apple TV.

The main material difference is the ability to play HD video up to 1080p, whereas the second-gen Apple TV topped out at 720p. You can play content purchased or rented from iTunes, or from another iTunes-equipped PC in your home.

Besides content supplied by Apple, Netflix is now available on the Apple TV. Other portals include YouTube, Vimeo and Flickr. Missing in action are any UK catch-up TV services, such as BBC iPlayer, ITV Player and 4oD.

The iOS-based software has had a makeover, and now sports large tiled icons on the main screen. This software upgrade is also available for the previous model.

The Apple TV unit itself has barely changed. It's still a small black box, less than 4in square. On the back are connectors for HDMI, Toslink digital audio and MicroUSB. To join a network you can use either ethernet or 802.11n Wi-Fi.

The main difference is the processor, upgraded from an Apple A4 to an A5. The new chip is based on the iPhone 4S' dual-core ARM Cortex A9, but operates as a single-core chip here. The system memory has also swelled, from 256GB to 512GB.

There's some flash storage onboard, but it's used only for caching video content.

A small aluminium remote is provided, which has two main buttons and a navigation controller for hopping around menus. It's incredibly easy to use.

There's no App Store access, but you can use AirPlay to mirror the display of an iPad or iPhone over Wi-Fi and then play iOS games. With Mountain Lion, this summer's revision for OS X, a Mac's display will be viewable through AirPlay, too.

HD films downloaded from iTunes are far smaller than the content on Blu-ray discs; neither are they as detailed. The differences are small, but video purists will spot them on a good-quality TV. Audio is limited to compressed Dolby Digital.

The latest film purchases from iTunes cost around £13 in HD, and between £7.99 and £9.99 for standard quality. Note that most films offered in the UK are still only 720p, and we couldn't find any 1080p films to buy, only rent. Rentals are £4.49 for HD and £3.49 for standard-definition. A fast internet connection is recommended for streaming, although we noticed a buffering slowdown only once.

You can browse shared iTunes libraries on other computers directly from Apple TV, where music, photos and video are listed. Album covers, film information and various other details are clearly displayed.

In use the Apple TV consumed around 2.3W, and 1W in standby.

If you don't own any other Apple products, and don't use iTunes to manage your media, a device that can handle MKV, WMV and AVI formats may be a preferable option.

Verdict

If you already use an iPad, iPhone or iTunes on Windows or Mac, the Apple TV is a remarkably useful asset. It's also incredibly simple to operate. ☒ **Orestis Bastounis** and **Andrew Harrison**

MiFi offers a very clean interface, with several icons running along the top of the window to show you at-a-glance information on the Novatel's battery level, Wi-Fi and GPS status, available networks, signal strength and whether the device is online.

Five widgets – Messages, Data Usage, GeoSearch, Weather and MiFi DLNA Server – are offered. Usefully, if you're using a SIM taken from your smartphone, Messages lets you send and receive texts through MiFi.

The Data Usage widget tracks how much data you've used, and may be useful if you subscribe to Orange's meagre 500MB plan.

GeoSearch uses GPS to display a map of the local area, while the Weather widget offers the forecast in the local or a defined area.

The MiFi DLNA Server widget allows a media-sharing service. This makes use of the device's MicroSDHC slot, sharing up to 32GB of storage between wireless devices.

The Novatel's performance was less impressive than its feature set, however, and we found better results using our SIM in a smartphone.

With the SIM inside our Sony Ericsson Xperia Arc, Speedtest.net recorded a ping time of 219ms, a download speed of 4.8 megabits per second (Mbps), and 2.3Mbps uploads. Connected via the 3352, performance dropped to 396ms, 2.8Mbps and 1.7Mbps respectively.

Verdict

On the road, the Novatel's built-in battery makes sense, although its runtime is limited. At a fixed site where mains power is available, TP-Link's TL-MR3020 (page 140) gives much faster performance at a lower price. ☒ **Marie Brewis**

WorldMags.net

Price TBC

Contact
- intel.co.uk

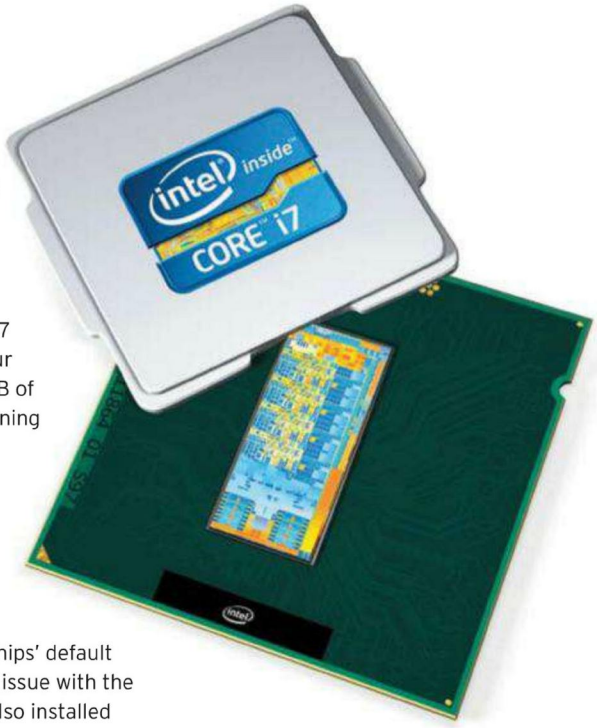
Read more
- tinyurl.com/cc7u57h

Specification
Intel third-generation Core processor; quad-core; 3.5GHz (Turbo Boost to 3.9GHz); 22nm manufacturing process; DirectX 11.0; HiDPI

★★★★½

PROCESSOR

Intel Ivy Bridge Core i7-3770K



Intel's third-generation Core processor family, known as Ivy Bridge, incorporates advanced technologies that promise faster performance and improved power efficiency over the previous Sandy Bridge line.

We pitted the flagship desktop processors from each generation head-to-head in a variety of tests designed to measure application performance, video processing and power consumption.

The new chips

Ivy Bridge marks a 'Tick' in Intel's regular Tick, Tock cadence of annual processor upgrades. With each 'Tock' a new microarchitecture is introduced; this is then refined in the following year's 'Tick'.

This particular Tick brings increased efficiency by reducing the process size from 32-nanometre (nm) to 22nm. Still greater power savings come courtesy of a new Tri-gate transistor technology, said to considerably improve the chip's low-voltage performance.

Intel has dubbed Ivy Bridge a Tick+ release, following a major upgrade to the processor family's integrated graphics. Its HD Graphics 4000 processor now supports DirectX 11.0 and HiDPI graphics.

Performance results

To evaluate the performance benefits of the new technology, we compared a Core i7-2700K Sandy Bridge chip to one of the new Core i7-3770K Ivy Bridge processors. Both chips run with a base clock speed of 3.5GHz, and can turbo boost up to 3.9GHz when required.

We tested using one of Intel's new DZ77GA-70K motherboards, which features the enthusiast-level Z77 Express chipset. Our setup included 16GB of DDR3 memory, running at 1,600MHz, and Windows 7 Home Premium 64bit installed on a 256GB Intel 510 Series SSD.

All tests were conducted at the chips' default settings. Due to an issue with the motherboard, we also installed an Asus-branded AMD Radeon HD 6850 graphics card to get the system to boot into Windows. This card played no part in the overall performance, but it does consume power even in its idle state.

Application performance

We measured general application performance with WorldBench 6. This suite tests the performance of real-world applications running day-to-day computing tasks.

WorldBench 6 revealed only a very small increase in performance using the new processor. Moving from Sandy Bridge to Ivy Bridge yielded an overall performance gain of just 2.6 percent. Some individual components of the test achieved up to 6 percent improvement.

This level of performance gain may seem unimpressive, but the ageing test applications in WorldBench 6 don't always take advantage of some of the processor's newer features.

Video transcoding

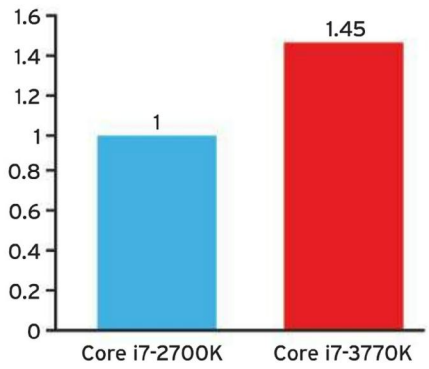
We used CyberLink's MediaEspresso application to convert 16 short clips of 1080p Blu-ray video into a format designed for viewing on an iPad. MediaEspresso takes advantage of Intel's Quick Sync Video technology, leveraging the power of the built-in graphics processor.

Here, the Core i7-3770K outperformed its predecessor by 45 percent, completing the task in 1 min 37 secs compared to the 2 mins 21 secs of the Core i7-2700K. This is a clear indicator of the improved performance of the new graphics engine found in Ivy Bridge.

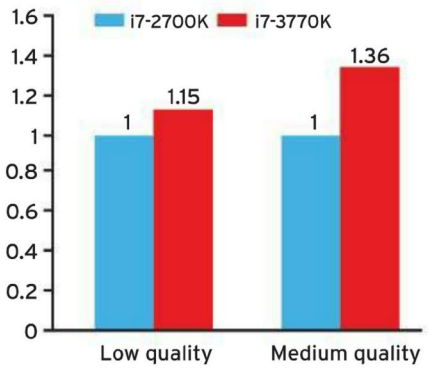
Gaming

Intel's integrated graphics aren't really powerful enough for the gaming enthusiast, but the new Intel HD 4000 graphics do deliver a significant improvement. It allows more challenging games to be played smoothly and with better graphics.

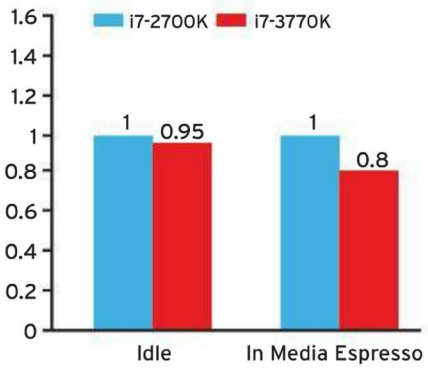
MediaEspresso performance



Crysis performance (720p, DX10)



Power consumption



WorldMags.net

We ran our Crysis benchmark at 1280x720 resolution, and measured a 15.2 percent performance boost in low-quality mode. This increased to an impressive 36 percent when we stepped up to medium quality.

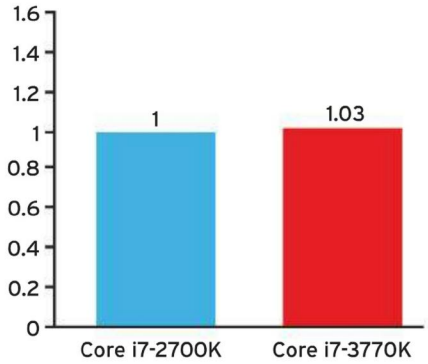
Power consumption

We also measured system power consumption with each of the chips installed, first with the system idle and then when running the aforementioned CyberLink MediaEspresso test.

There's not much to be gained when the PC is idle, but the average power consumption dropped from 58W for Sandy Bridge to 55W for Ivy Bridge.

Once the processors are put under load, the advantages of the 22nm process and Tri-Gate technology come to the fore. We measured an average power consumption of 142W for Sandy Bridge and 113W for Ivy Bridge. It's important to keep in mind that the Ivy Bridge processor achieves this lower power consumption while simultaneously performing the task 45 percent faster.

WorldBench 6 performance



WorldBench 6 breakdown	i7-2700K	i7-3770K
Overall score	195	200
Adobe Photoshop CS2	213	208
Autodesk 3ds max (DirectX)	267	262
Autodesk 3ds max (rendering)	178	168
Firefox 2.0	141	133
Microsoft Office 2003 with SP1	293	293
Windows Media Encoder 9.0	130	126
Multitasking: Firefox and WME	159	153
Nero 7 Ultra Edition	92	92
Roxio VideoWave Movie Creator 1.5	147	142
WinZip Computing WinZip 10.0	135	135

Verdict

Ivy Bridge is most certainly a improvement over its predecessor. And with prices expected to be around the same as those of their Sandy Bridge counterparts, these new chips are definitely worth seeking out. Graphics performance sees the more impressive boost, even if the results are still behind what can be achieved with existing integrated graphics solutions from AMD – albeit with significantly lower application performance.

Sandy Bridge owners need not worry too much, since the performance gains are not huge – but if you do want to upgrade, you may be able to do so without replacing your existing motherboard. Overclockers may benefit most from this type of upgrade, thanks to the lower power requirements of the Ivy Bridge architecture.

The greatest benefits of all are sure to be felt in the mobile-optimised processors in laptops, which should benefit from improved battery life and graphics. ☒ **Paul Monckton**

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Price
£199.00 inc VAT

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£108.00 inc VAT

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WorldMags.net

DESKTOP PC

CCL Elite Hawk

£480 inc VAT

Contact
- cclonline.com

Read more
- tinyurl.com/8xx5vm8

Specification
3.6GHz AMD FX-4100; Wndows 7 Home Premium; 8GB DDR3 RAM; 500GB SATA 6Gbps; AMD Radeon HD 6770 with 1GB GDDR5 RAM; Asus M5A78L-M motherboard; 802.11b/g/n; gigabit ethernet; SuperMulti optical drive; keyboard; mouse; 2x D-Sub; DVI; HDMI; 4x USB 2.0; 450W PSU; Microsoft Office 2010 Starter; 175x420x350mm

WorldBench 6 score: 108

Build: ★★★½☆
Features: ★★★½☆
Performance: ★★★★☆
Value: ★★★★½

★★★★☆

On paper, the £480 Elite Hawk offers good value. It's powered by a 3.6GHz AMD Bulldozer FX-4100 Black Edition quad-core processor, coupled with a decent 8GB of DDR3 1,333MHz RAM. But in our tests this PC's performance was disappointing.

The Elite Hawk scored just 108 points in WorldBench 6. The Nero component of our benchmark failed to complete due to an incompatibility with AMD's chipset, but even if we added 14 points to compensate the Elite Hawk would still rank poorly. We'd expect to see 150 points scored by a similar-spec Intel-powered machine.

This Windows 7 Home Premium PC is marketed as a gaming system. Its AMD Radeon HD 6770 with 1GB of GDDR5 RAM recorded 169fps in Fear at Maximum detail. It also managed 96- and 51fps in the more demanding Stalker: Call of Pripyat at 720p, Medium and 1080p, Ultra, respectively.

The Fractal Design Core 1000 is a basic black system case, and doesn't help the Elite Hawk to stand out from the crowd. But the build is to a good standard, with decent cable-management found inside. No cooling fan has been hooked up to its dedicated slot in the side panel, although the CPU features a small fan and a useful heatsink. Regardless, the amount of noise generated in use can be distracting.

A selection of ports is found at the bottom left side of the case, including two USB 2.0 and the power button. The motherboard offers four more USB connections, plus D-Sub, ethernet and more.

We logged the Elite Hawk's power consumption at 61W when idling. This rose to 186W under load in our Stalker: Call of Pripyat graphics test.

There's 500GB of storage in the form of a Seagate SATA 6Gbps drive, plus built-in Wi-Fi and an LG SuperMulti optical drive. Spare 5.25- and 3.5in bays and an empty PCI Express slot allow some scope for upgrades, although you can't expand the 8GB of RAM.

Verdict

CCL has made a good stab at a reasonably priced gaming machine with the £480 Elite Hawk. It looks rather basic compared to some similar-specced systems, and is rather noisy in use, but the framerates are fast coming. Usefully, you'll be able to upgrade this PC later down the line.

☒ **Chris Martin**

HARD DRIVE

Hitachi Deskstar 5K4000

£275 inc VAT

Contact
- hitachi.co.uk

Read more
- tinyurl.com/dy6zhgj

Specification
4TB hard-disk drive; 3.5in SATA 6Gbps; 443Gb/sq in areal density; 32MB buffer; 25dB acoustic noise (A-weighted); CoolSpin motor technology; Advanced Format 4kB sector size, with 512e emulation; 101.6x147x26.1mm; 690g

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

★★★★☆

We may be reaching the very limits of what's possible with current hard-disk technology, but that hasn't stopped Hitachi from being the first storage company to market with a 4TB desktop drive.

In fact, while other vendors claim to produce 4TB disks, only two were available to buy at press time; both are from Hitachi.

First to market was the 5K4000, a low-power version of the Deskstar that's optimised for quieter operation and reduced power consumption. Second was the Deskstar 7K4000, a regular 7,200rpm disk that appears in the G-Technology G-Raid With Thunderbolt external drive.

The slower 5K4000 drive features what Hitachi calls CoolSpin technology, which optimises the motor speed to balance performance with power requirements and acoustic noise output. Hitachi doesn't list the spindle speed, but it's likely to be around 5,400rpm – the same as most laptop drives.

The spec sheet lists a 1.5A (12V) maximum current for startup, which is typically the peak requirement. The published noise levels are unusually low, at 25dB.

We tested the 5K4000 on our standard lab machine, optimised for HDD and SSD measurements. In the basic ATTO Disk Benchmark test, performance plateaued with all test data from 8kB up to 8MB. Here we saw sequential reads reach 132MBps, and writes up to 134MBps.

Plotting read/write speeds against capacity level, the HD Tune Pro test showed how performance tails off as the disk is filled. When empty, the 5K4000 peaked at 131MBps for reads and writes. When reaching its capacity it showed its minimum, where transfers fell to just 64MBps. The average was 103MBps, and the access time was 19ms.

Turning to CrystalDiskMark, the headline speeds were 133MBps for read and writes, falling to 47- and 67MBps respectively for 512kB data, and 0.59 and 1.64MBps for 4kB.

Verdict

Hitachi's Deskstar 5K4000 isn't the fastest of full-size hard disks. But, along with its speedy sister disk, the 7K4000, it is the largest. Performance is nonetheless very good for a 'low-power' slower-spinning desktop drive, comparable in fact to the full-speed hard drives of just a few years ago. A colossal 4TB of storage in a 3.5in disk that's little louder than a laptop drive is quite a feat. ☒ **Andrew Harrison**

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POWERLINE KIT

Zyxel PLA4205 HD

£69 inc VAT

Contact
- zyxel.com/uk

Read more
- tinyurl.com/bu9rqh2

Specification
Homeplug AV powerline adaptor kit; '500Mbps' transfer rate; gigabit ethernet port; reset button; 128bit AES encryption button; Zyxel configuration software; 71x65x95mm; 130g

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★☆☆
Value: ★★★½☆

★★★★☆

Powerline technology sends network data over your mains wiring system. The Zyxel PLA4205 HD is one of several recent devices that use improved chipsets, billed as capable of 500Mbps. But there's more to this networking kit than raw speed.

The Zyxel saves energy by automatically entering standby mode when no device is connected. There's also a QoS manager for prioritising certain network traffic.

The initial setup couldn't be simpler. We sited the two adaptors at opposite sides of the house, with one plugged into a power socket near the router, and the other into a socket next to our PC. We then simply hooked up an ethernet cable and the network was ready to use.

No other configuration is required, although Zyxel has bundled some useful software. A Windows-only utility lets you view at a glance all the adaptors on your network, and set up encryption to secure the network from other computers on the same circuit.

Like many similar powerline adaptors, the PLA4205 wasn't designed with British homes in mind. The unit hangs down below mains socket level and, with the ethernet port on the bottom, it becomes unusable if your power sockets run along the skirting boards. We had to move both the computer and adaptor to another room for testing.

Although powerline is considered more reliable than wireless, our test results varied wildly depending on the wall socket in use. With the adaptor connected in a room full of computers and assorted gadgets, the best speed it could muster was a measly 42 megabits per second (Mbps). This can partly be explained by electrical interference.

We unplugged every other device, moved the adaptors to alternative sockets, and tried again. This time we measured a healthier 314Mbps. Although this is still some way off the 500Mbps claimed by Zyxel, it's significantly faster than the real-world performance of most current wireless technology.

Verdict

Wireless connections are often temperamental, and powerline networking isn't always a reliable alternative. Everyday appliances severely affect its speed – as we found with the Zyxel PLA4205 HD, which benefitted from the tweaking of our home electrical setup. At its best, however, the Zyxel exceeded half the performance promised on the box. ☒ **Orestis Bastounis**

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GRAPHICS CARD

Zotac GeForce GTX 680

£450 inc VAT

Contact
- zotac.com

Read more
- tinyurl.com/dx9t6mb

Specification
nVidia GeForce GTX 680; 2GB GDDR5 RAM; 1,006MHz core clock; 1,502MHz memory clock (6,008MHz DDR effective); 400MHz Ramdac; 256bit memory interface; 1,536 stream processors; 128 texture units; 32 ROP units; PCI Express; 2x 6-pin power connectors; DirectX 11.0; 2x DVI; HDMI; DisplayPort; 5-year warranty

Build: ★★★★½
Features: ★★★★½
Performance: ★★★★½
Value: ★★★★☆

★★★★☆

Following AMD's flagship Radeon HD 7970 (tinyurl.com/6uzrvxc) comes nVidia's top single-chip offering, the GeForce GTX 680. It would be wrong to say that the 680 is underpowered, but nVidia could have unveiled a product packing even more power.

It makes do with a 256bit memory interface at a time when its AMD rival (and its own predecessor, the 580) stretches to 384bit.

Not that the GTX 680 is by any means slow. The core clock speed of 1,006MHz is some 81MHz clear of the 7970 we reviewed, and 234MHz higher than the original 580 chips.

It has double the number of texture units of the 580, with its 128 in keeping with the 7970's complement. This is significant, as the texture fillrate is a stellar 128.8GTps – a 160 percent increase over the 580, and almost 9 percent over the HD 7970.

The memory bandwidth is less impressive, due to the 256bit restriction. A high memory clock of 1,502MHz offers some compensation, but the bandwidth remains disappointing at 192.3GBps. The 580 has 192.4GBps by comparison, while the HD 7970 a meaty 264GBps.

We tested the 2GB version. This will be enough for most purposes, although 4GB versions are available.

Rather than focus purely on raw speed, nVidia has worked to reduce power consumption and heat. The 680 consumes just 195W, while the HD 7970 and GTX 580 thirst for 250- and 244W respectively.

The Zotac came out on top in our gaming tests, and only in BattleForge was it beaten by the 7970 – and, even then, by only a single frame. Here it recorded 68fps at 1920x1200, against 68.2fps for the 7970. However, it pulled ahead at 1680x1050 and 2560x1600 resolutions, managing 80.2- and 47.7fps against the HD 7970's 80.1- and 47.4fps.

In Crysis 2 the GTX 680 scored 45.6- and 31.2fps at 1900x1200 and 2560x1600, while the 7970 managed just 39.7- and 25.9fps.

It also won out in Stalker: Call of Pripyat, where we recorded 86.4- and 62.1fps for the GTX 680 and 78.8- and 57.1fps for the 7970.

Verdict

The nVidia GTX 680 doesn't universally outclass AMD's 7970, but it was faster in our tests. It's less power-hungry and has a lower asking price. It's unlikely to be the last word in single-GPU tech this year but, for now, the 680 is the best high-end graphics card on the market. ☒ **Robin Morris**

NETWORK VIDEO RECORDER

D-Link DNR-322L

£249 inc VAT

Contact
- dlink.co.uk

Read more
- tinyurl.com/cow29qh

Specification
Network video recorder; 2-bay NAS for 3.5in SATA disks; gigabit ethernet; 9-channel recording; 1-channel playback; support for D-Link IP cameras; streams accessible from the internet via MyDlink web portal; H.264/Mpeg4/M-Jpeg compression; 2-year warranty

Build: ★★★½☆
Features: ★★★½☆
Performance: ★★★★☆
Value: ★★★☆☆
★★★½☆

Many IP cameras require a computer to be left running to store recorded video. D-Link's DCS-942L Wireless N Day & Night Home Network Camera instead includes a removable memory card, but even when recording at low resolutions it requires maintenance every seven days or so. A better approach is to combine the camera with a device such as this DNR-322L. It's a network video recorder (NVR) that can be fitted with two 3.5in hard disks dedicated to storing footage from a number of IP cameras.

The D-Link is in essence a NAS drive, with built-in software that can recognise IP cameras on a network and automatically configure itself to record their video streams. It's sold without any hard disks, but you can add two 3.5in drives in a Jbod, Raid 0 or 1 array.

Configuration

At £249, the DNR-322L is more expensive than standard NAS enclosures. For the extra outlay, we expect the NVR to work seamlessly with D-Link's cameras, requiring little effort to set up and use.

D-Link has almost achieved this, although we did run into some issues. The software wizard for the DCS-942L camera worked fine. We were able to view a video feed, set the camera to record to the memory card and change the recording time, all in less than 5 minutes. Saved video could be browsed by the hour, downloaded from the camera and then played back. The setup wizard also invited us to create an account and register our device with D-Link's video-monitoring portal, which is necessary if you want to use the Android and iOS monitoring apps.

However, things didn't go as well when we tried pairing it with the recorder. The wizard completed successfully, formatting and creating a volume on the hard disk, but we ran into problems when we tried to remotely log into the camera's web interface to check the video feed. The NVR found the camera on the network; we entered our login details and it connected successfully. But viewing a video feed from the camera proved impossible.

We discovered that, unlike the camera, the DNR-322L isn't compatible with OS X. When trying to view a live feed from the NVR in Safari, it prompted us to download a Windows plug-in. It didn't work with the Google Chrome browser on our Windows PC either.

Once we switched to using Internet Explorer, the D-Link began to behave itself. The Live Video tab worked, with our camera at the top of a list on the right. There's support for up to nine cameras, with the DNR-322L able to monitor and record a feed from each.

Viewing video

Recorded video, captured manually or from a scheduled recording, can be viewed through a timeline. Skip to a certain time, under any of the connected cameras, and it plays the video from that point. Video clips can be downloaded to a local PC or saved automatically.

We tested the DNR-322L with a single camera, but in a setup with three or more cameras we can see how this timeline would be even more useful – especially if you need to home in on a specific camera's feed, and at a certain time.

With more cameras, you'll need more storage in the NVR. Alternatively, you can drop the video resolution and bitrate to reduce file sizes.

Both the camera and NVR can be configured to begin recording when motion is detected, and Jpeg snapshots and low-storage notifications can be automatically emailed to you. There's a microphone to capture audio, too.

Multiple logins can be created, with different privileges set for viewing video. Only the administrator can adjust the DNR-322L's settings.

The playback window has various icons, with tooltips that appear when you hover the mouse over them, but it isn't particularly intuitive. We weren't overly keen on the ugly orange and brown styling of D-Link's web interface, which looks dated when compared with the efforts of other networking companies.

Despite the relative ease in setting up the DNR-322L with a DCS-942L camera, there's room for improvement with the software. The ability to work only with Internet Explorer is nothing to be admired in today's cross-platform world.

Verdict

The DNR-322L will be a good investment if you have more than one D-Link IP camera on your network, since it removes a lot of the hassle from recording video. For small companies that need a few cameras to keep an eye on their business, D-Link's cameras and NVR offer good value when compared with professional surveillance systems. The video quality is just about good enough to compete, too.

☒ **Orestis Bastounis**

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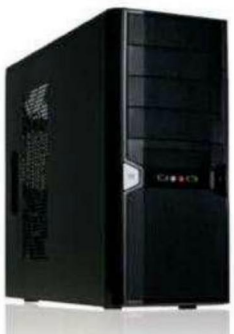

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System requirements
Intel Pentium III processor; Windows 2000/XP/Vista/7; 128MB RAM; 200MB drive space

Usability: ★★★★½
Features: ★★★★½

★★★★½

Avast has long been one of the most successful free Windows antivirus products. It provides straightforward protection, but requires you to re-register the software annually.

The dashboard shows options running down the lefthand side, and settings and display panels to the right. The main options are Scan, Real-time shields and Additional protection. There's also a Market tab, which offers a range of paid-for Avast products.

As well as comprehensive quick, full and custom scan options, Avast's tabs offer some unusual options for a free product. There are eight different shields, for example, from a file shield, to a web shield, script shield and behaviour shield. These work together to ensure miscreant code doesn't run on your machine.

Then there's the sandbox, which enables you to run new or potentially malicious software in an environment where it can't reach any important files within the operating system. It's a useful tool if you regularly download and install new programs.

One feature you'll probably want to turn off is the audible feedback whenever Avast completes an update or other housekeeping.

AVAST 7.0 FREE offers more than just bog-standard virus protection

AV-Test hasn't yet evaluated Avast 7.0, but its predecessor scored 14/18 in its analysis. This result includes scores of 4.5 out of 6 for Protection, 4.5 for Repair and 5 for Usability. It scored 96 percent or above in identifying zero-day malware, 98 percent in finding new threats, and picked up 100 percent of more established code.

Avast also managed to remove 85 percent of active malware, but could remedy only 59 percent of other malicious components. This is still above average, but not by a lot. It's no better than average on the system slow-down it causes either.

In our tests, Avast showed very good scan performance, with the scanner checking more than 18,000 files in our 50GB basket in 2 mins 12 secs. This gives a scan rate of 137 files per second, the highest we've yet recorded. To achieve this level of performance, though, the software impacts system resources. Our 1GB data transfer took more than five times as long when Avast was scanning files in the background.

Verdict

Avast 7.0 Free Antivirus is a well-designed free product that offers more than bog-standard antivirus protection, with shields and a sandbox. It can put a burden on resources when scanning, however.

☒ **Simon Williams**

ANDROID GAME

Driving Mad Golf

Free

Contact
- tinyurl.com/c6fbujt

Read more
- tinyurl.com/cc97jgf

System requirements
Android 1.6 or later; 1.2MB available storage

OVERALL

★★★☆☆

In Driving Mad Golf you're faced with a sequence of holes on which you have to hit the green in one. The challenge gets increasingly difficult: from getting two shots on the first green in 99 seconds, to three on the second in 99 secs, and so on. Complete the level in the time allowed and you win points. Fail, and you're back to the tee.

The closer you are to the hole when you do make the green, the more points you get. You lose points and time for sticking the ball in hazards. Extra time can be gained in Driving Mad Golf by hitting one of a succession of seagulls that wheel away above the tee.

The golf play itself is refreshingly simple in this Android game. You have two axes on screen: power and direction. Taking each in turn, you have to stop the fast-moving power bar at the optimum point, and correct line of attack. It's difficult enough to be moreish.

DRIVING MAD GOLF is maddening and addictive, just like the real thing

Verdict

Imagine having to go back to tee every time you blobbed. Maddening and addictive – like the real thing.

☒ **Matt Egan**

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BACKUP UTILITY

Rebit 5.0 Backup for Windows

£50 inc VAT (3 PCs)

Contact
- pxsoftware.com

Read more
- tinyurl.com/cerqmmv

System requirements
Windows XP/Vista/7; 256MB RAM; 250MB drive space

Usability: ★★★½☆
Features: ★★★☆☆
Value: ★★½☆☆

OVERALL ★★★½☆

Keeping an up-to-date backup of your data is important, but many people still put it off until after they've lost important files. It needn't be a complicated process, though; with the right software it's a set-it-and-forget-it installation.

Rebit claims its backup utility is just such an application. However, installation wasn't easy. Our test PC has two internal hard drives of 160GB and 250GB capacity, each with two partitions. Rebit demanded 250GB of external storage before it would start, without us even telling it what files we'd like to secure. We added a 320GB drive and the software then recommended using a 333GB drive. We ignored its advice.

The second time we ran the program it allowed us to select which drive we wanted to back up. Rebit took a little over 3 hours to copy 22GB of data on our 30GB C drive, which is very, very slow. Thereafter backups are incremental, however, speeding up the process. Our 22GB backup occupied 55GB. Rebit says you should allow twice as long if backing up to a network drive.

Once configured, Rebit saves to your backup drive every 25 seconds or so, to ensure it remains up to date. This happens even when you haven't saved anything to your drive in the intervening 25 secs. It takes under a second, though, and there's very little performance hit.

REBIT provides an automated backup of your important data in Windows

Rebit 5.0 hides the backup files in Windows; you'll need to launch the utility to browse and restore from its mirrored file structure. Each backed up file is marked with a Rebitted icon, so you can distinguish between the original and the backup.

Rebit creates a system backup, but one that's also accessible at the file level. Files can be copied out of the backup as needed but, if there's a system failure, the whole system can be recovered. This bootable version of Rebit can be stored on CD or a USB drive. Recovery points can be manually set, but are scheduled once a day.

As new versions of files are backed up, the amount of required storage space increases. SmartSave and NeverFull technologies delete the oldest versions of files when storage reaches 90 percent full.

In its bid for automated backup, Rebit 5.0 does very well. However, it's not possible to select specific folders or file types for backup and you can't back up to online storage.

Verdict

An inability to use online storage and an over-simplification of options make Rebit 5.0 a mixed bag. It does a good job of providing automated backup, but the initial process is slow and local storage requirements are high. ☒ **Simon Williams**

ANDROID GAME

International Snooker HD

£2.49 inc VAT

Contact
- myinteractive.co.uk

Read more
- tinyurl.com/cghx87u

System requirements
Android 1.6 or later; 4.5MB available storage

OVERALL ★★★★☆

International Snooker is a mildly addictive snooker game for Android. Gameplay is simple and intuitive. When it's your turn to play, you can change the angle of view, and the direction in which you're aiming the cueball, using simple touch gestures or onscreen controls. You then set the power of your shot and tap a button to get things rolling.

This does take away a crucial sense of jeopardy after you've lined up your play. But there is enough in the challenge of setting the angle and judging the pace to make the game a keeper.

The tighter the cut you put on the object ball the more gently you have to control the angle of the cueball. Guides show you in which direction both cue- and object ball will set off immediately after contact but, within a few inches of the collision, you're on your own. You have to line it up, hit and hope. You can select where you hit the ball as well as how hard to impart spin.

INTERNATIONAL SNOOKER HD is simple, irritating and compelling

Verdict

International Snooker can be simple, irritating and compelling. Like a proper snooker player you have to graduate from playing flashy pots to thinking ahead. ☒ **Matt Egan**

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DRIVE UTILITY

O&O Defrag 15. Professional

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- pxsoftware.com

Read more
- tinyurl.com/cerqmmv

System requirements
Windows XP/Vista/7; 256MB RAM; 250MB drive space

Usability: ★★★★½
Features: ★★★★½
Value: ★★½☆☆

★★★★☆

Files deleted from a hard drive leave behind gaps that are later filled by the operating system with fragments of new saved files. This helps it to cut down on wasted storage space, but can slow down file-access times. Defragmentation is a process in which this data is relocated on the hard drive, rejoining the various parts of individual files.

Defrag 15.0 Professional, from Berlin-based O&O Software, has one main purpose in life: to put back together these file fragments, reorganising where they're stored on a drive's surface.

On its first run the utility automatically looks at all the drive partitions on a system, internal and external. It then analyses how files are stored and presents recommendations for those drives that could benefit from defragmentation.

The program's interface is very business-like, smart and well organised. Various panels feature coloured squares that show the different states of each drive.

On our test computer, O&O Defrag showed fragmentation of our 30GB C partition at 29 percent. This is pretty high – ideally, you should aim for 5 percent fragmentation.

DEFRAG 15.0 helps to speed up file access on your hard-disk drive

It's difficult to measure the benefits of disk defragmentation. We set the program to defragment our C drive partition, which it completed in 26 minutes. O&O reportedly consolidated more than 45,000 fragments, resulting in reduced fragmentation – now 3.6 percent – on our drive.

Starting up Windows from this drive prior to defragmentation took 1 min 53 secs. There was no measurable improvement following Defrag 15.0's hard work. However, this could be because the Windows system files are rarely moved, and not severely fragmented.

We also tried running a virus scan before and after defragmentation. The time taken to scan around 450,000 files on the drive was reduced from 35- to 30 mins, showing a 17 percent improvement.

The program has its own scheduler, so you can set up regular checks and, if necessary, defragment drives automatically. A screensaver mode runs the defragmenter only when a PC's screensaver is running, fitting in between active sessions when you're away from the machine. The program also stops itself at any time it senses system resources are needed for other tasks.

Verdict

At £29 for a single-PC licence or £49 for three, this program is expensive – particularly when you consider that Windows includes its own defragmenter and free or lower-cost alternatives are available. However, Defrag 15.0 is far more thorough than free and low-priced offerings, with extensive logging, feedback and scheduling. ☒ **Simon Williams**

MOBILE GAME

Angry Birds Space

£1.99 inc VAT (iPad)
69p inc VAT (iPhone)
Free (Android)

Contact
- rovio.com

Read more
- tinyurl.com/d6te9mt

System requirements
iPad/iPhone/iPod touch/ Android

OVERALL
★★★★½

Space is a significant sequel in the Angry Birds series, with gravity effects that open up a wealth of gameplay possibilities.

Your aim is to defeat villainous green pigs by catapulting birds at their houses and mastering the intricacies of gravity and trajectory. The fun thing with Angry Birds Space, though, is that gravity has become a moveable feast.

Taking its cues from the Mario Galaxy series, Space introduces both zero-G areas (in which birds will follow an arrow-straight flight path, and untethered debris will drift around) and mini planetoids that exert their own pull on projectiles in the vicinity. This allows for intricate trick shots where you bend a trajectory round two or even three planetary bodies to pick off a pig hidden on the far side of a moon.

There's a few levels set within a single large planet's gravitational field, which could have appeared in any previous instalment.

ANGRY BIRDS SPACE is the latest instalment in Rovio's popular series

Verdict

Angry Birds Space is a proper sequel that opens up new possibilities. Not every level lives up to the promise, but there's a huge amount to like here. ☒ **David Price**

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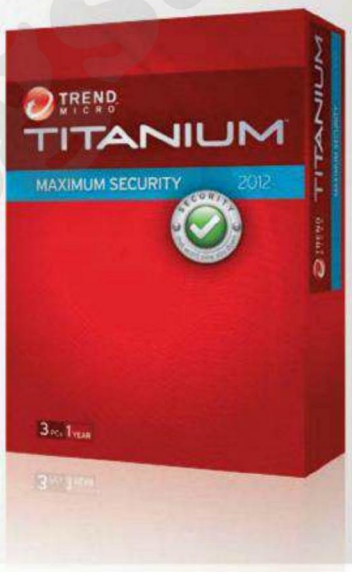

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MULTIMEDIA SOFTWARE

CyberLink PowerDVD 12.0 Ultra

£72 inc VAT

Contact
- cyberlink.com

Read more
- tinyurl.com/chrg7bw

System requirements
2.4GHz (DVD)/3-3.2GHz (Blu-ray); Windows XP/Vista/7; 1GB (512MB for XP); 300MB drive space; compatible screen for 3D

Usability: ★★★½☆
Features: ★★★★½
Value: ★★★½☆

★★★½☆

Whether you want to watch DVD, Blu-ray, 3D films, YouTube, or browse pictures and music, PowerDVD takes care of your needs.

Version 12.0 has an attractive, if busy, front end. A menu on the left lets you browse the various content categories, but those looking for a simple means of playing films may find the bewildering array too much.

Navigation can be slow, and this 300MB program feels bloated. We'd prefer to see a simpler interface that's tailored to just film play.

New to version 12.0 is the ability to convert 2D content to 3D via TrueTheater 3D. The effect isn't comfortable enough that you'd want to do so on a regular basis, but it is the best implementation we've seen.

Audio gets a potential boost through DTS-HD 7.1 decoding. Other new tools allow you to move around and zoom into movies with ease.

The PowerDVD Mobile app lets you play media on an iPhone, iPad or Android device. It's incredibly easy to use, automatically checking your PC for new additions, and synching is straightforward. Our Android phone had no problems, and formats were converted as required.

CYBERLINK POWERDVD caters for all your DVD, Blu-ray and 3D needs

You can also turn your PC into a DLNA server, sharing media with other machines and devices over Wi-Fi or USB. This worked okay with our PS3, although not all our files made the transition.

The full Ultra edition costs £72, while a Pro version without the DLNA server saves you £12. The Standard version costs £35, but is rather limited – for Blu-ray or 3D you'll need Ultra or Pro.

Verdict

Owners of recent versions may not find PowerDVD 12.0 offers enough to merit an upgrade, and the £72 Ultra version is expensive. However, the ability to communicate and run media on mobile devices is well executed. Should you want a better means of allowing your home devices to work together, it's an accomplished product. ☒ **Robin Morris**

GAME

Rayman: Origins

£14 inc VAT

Contact
- raymanorigins.uk.ubi.com

Read more
- tinyurl.com/7qowy4s

System requirements
3GHz Intel/1.8GHz AMD Athlon processor; Windows XP/Vista/7; 1GB RAM; DirectX 9.0c-compliant video card

OVERALL
★★★★½

Rayman: Origins arrives in a colourful storm of nostalgia, but it's first and foremost focused on bringing a good time.

With crisp, hand-drawn graphics, it's as much a living cartoon as anything. This mentality extends far beyond the art: joyously illogical throughout, it's a parade of unpredictable absurdity.

Jumping puzzles are the throughline, but around the next corner might lurk a sudden outburst of happy song, an insect-based shoot 'em up, violent fruits or the sudden ability to fly.

While it can devolve into traditionally exacting jump challenges that interrupt the carnival with mild frustration, Rayman is never guilty of resting upon its ever-grinning laurels.

As such, it's a tricky game to describe. The plot is something to do with Rayman and his friends annoying neighbouring zombies because they're being too noisy. Something happens and suddenly there are monsters everywhere; stopping them involves collecting lots of somethings because something something. Whatever.

RAYMAN: ORIGINS is a delightful parade of unpredictable absurdity

If there's a down side to this lunacy, it's that the game can seem to lack purpose: you just carry on until you hit a brick wall of difficulty or get distracted by something else.

It's not a game that calls to be completed, mind. It's just there to entertain you. But until you've tried it, it's impossible to get a real sense of just how joyful it is. Underneath the mayhem, there's a very careful blend of musical cues, designed to create a sense that the world is responding to you – in fact, it's delighted to see you.

Verdict

A triumph. Redeeming Rayman from the Rabbid-based minigame crimes of recent years, Origins manages to be both a deliriously happy dose of nostalgia and a careful, wonderful-looking use of contemporary games technology. ☒ **Alec Meer**

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Dell recommends Windows® 7.

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MINI PC

Shuttle XPC SH67H3

£1,098 ex VAT
£1,318 inc VAT

Contact
■ icubes.co.uk/shuttle
Read more
■ tinyurl.com/7psroyq

Specification
3.2GHz Intel Core i5-2400; Windows 7 Professional; 4GB DDR3-1,333MHz RAM; 256GB Samsung 830 SATA 6Gbps SSD; Intel HD 2000 graphics; Shuttle FH67 motherboard; Optiarc DVD ± RW drive; 4x USB 3.0; 5x USB 2.0 (one combined with eSATA); DVI; HDMI; gigabit ethernet; S/PDIF; 4x 3.5mm jacks; 300W PSU; Microsoft Office Professional 2010; 323x208x196mm
WorldBench 6 score: 161

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★½☆
★★★½☆

The XPC SH67H3 features the same space-saving design that made the name Shuttle synonymous with small-form-factor PCs. While these models are typically sold barebones, our sample from iCubes has a fast processor and SSD storage.

This Shuttle is equipped with a second-gen Intel Core i5-2400 quad-core processor, clocked at 3.2GHz, a 256GB Samsung 830 solid-state drive, 4GB of DDR3 RAM and Windows 7 Professional.

This hardware combination allows for impressive application processing; we recorded 161 points in WorldBench 6. The Shuttle also booted Windows very quickly – it took around 20 seconds to boot up and 6 secs to shut down.

The PC isn't ideal for gaming, however, and its integrated Intel HD 2000 graphics managed just 16fps in Fear (Maximum detail). The Shuttle recorded a playable framerate of 39fps in Crysis (Low detail). A spare PCI Express slot means you can add a graphics card later, of course.

Also upgradable is the Shuttle's memory allocation, up to 32GB. Two slots are free on the motherboard to accommodate such an upgrade.

A spare 3.5in hard-drive bay could also be used to expand the limited 256GB storage capacity.

And although our system arrived without wireless or Bluetooth hardware, an empty mini-PCI Express slot on the motherboard lets you add Wi-Fi internally. Alternatively, you can plug in a USB adaptor.

The build quality is generally good. The solid case looks sleek, with a black brushed-aluminium fascia. Our sample was assembled with all components and cabling neat and tidy under the bonnet. Our only concern was with a slightly loose front panel.

We found the machine to be pleasantly quiet in use, bar a quick burst from the fans during bootup. An Integrated Cooling Engine 2 heatpipe draws heat from the processor to a radiator mounted at the rear, leaving the cooling fan redundant at most times.

Connectivity is a strong point for the Shuttle, with its front panel offering two USB 3.0 ports, a headphone jack, microphone-in and a combined USB 2.0/eSATA port. Above is a tray-load Optiarc DVD ± RW optical drive.

Turn around this Shuttle and you'll find four USB 2.0, two USB 3.0, eSATA, ethernet, DVI, HDMI, S/PDIF and another headphone jack.

Film and music fans may be pleased to hear that the Shuttle supports 7.1-channel audio through four 3.5mm sockets.

The SH67H3 uses a 300W power supply unit with an 80-Plus Bronze certificate. This means it has an energy conversion efficiency of at least 80 percent. We recorded a reasonable 34W when idle, and 70W under load.

Verdict

The Shuttle XPC SH67H3 is a compact, sleek and competent PC. Our sample is expensive, but you can save around £500 simply by leaving out of the spec the OS and Office software. This PC will breeze through day-to-day applications with minimal fuss. **Chris Martin**

PORTABLE DOCUMENT SCANNER

Canon imageFormula P-215

£187 ex VAT
£225 inc VAT

Contact
■ canon.co.uk
Read more
■ tinyurl.com/c9bsgLp

Specification
600dpi; 24bit colour; duplex; 20-sheet feeder; USB 2.0; 285x257x202mm (open); 1kg

Build: ★★★½☆
Features: ★★★★☆
Performance: ★★★½☆
Value: ★★★★☆
★★★★☆

Portable sheetfed scanners such as this Canon imageFormula P-215 are ideal for mobile workers who need to keep up with the paperwork.

Stashing this scanner in a bag won't be a problem, as the device is extremely compact. The protective lid folds back to create the 20-sheet paper feed, but there are few pieces that might break off.

No external power supply unit is required; the Canon takes power from a single USB port. Scan speeds may benefit from hooking up the P-215 to twin USB ports using a Y-cable, however.

It's a little heavier than it looks, at 1kg, but not so much that it can't be carried reasonable distances.

The P-215 is designed to take up to 20 pages. This isn't a particularly high capacity for a sheet-fed scanner. We took care to line up the paper so it was straight and, even then, found that it frequently sucked in more than one sheet at a time.

Smooth and regular documents posed few problems in our tests, but pages ripped from a magazine required greater attention. Be prepared to redo some of your scanning jobs if you'll be working with varied source material.

Recovering jammed paper is relatively easy; the front of the P-215 pops open at the push of a button. There's no output tray to catch the scanned sheets, so if you need to keep source material in good condition you should place the Canon on a table.

We found the installation rather confusing. The default setup procedure installs only the scanner's drivers and the bundled CaptureOnTouch program, making it easy to miss the disc containing BizCard 6.0 SE and PaperPort 11.0.

The software is slick and highly usable, and makes it easy to create complete documents, including searchable PDFs.

PaperPort is adequate for organising files, while BizCard comes into its own when combined with the dedicated business/ID card reader built into the front of the Canon.

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DESKTOP PC

Apple Mac mini (Mid-2011) Core i5 2.3GHz

PC ADVISOR RECOMMENDED

£440 ex VAT
£529 inc VAT

Contact
■ apple.com/uk
Read more
■ tinyurl.com/cqzzk2q

System requirements
2.3GHz Intel Core i5-2415M; Mac OS X 10.7 Lion; 500GB HDD; 2GB DDR3 RAM; AMD Radeon HD 6630M with 256MB GDDR5 RAM; 802.11a/b/g/n; Bluetooth 4.0; gigabit ethernet; 4x USB 2.0; HDMI; Thunderbolt/Mini DisplayPort; FireWire 800; SD/SDHC/SDXC slot; 3.5mm audio input with Toslink S/PDIF; 3.5mm audio output/headphones with Toslink S/PDIF; mono speaker; infrared remote control receiver; HDMI-to-DVI adaptor; iLife '11; 197x197x36mm; 1.22kg
WorldBench 6 score: 117

Build: ★★★★★
Features: ★★★★☆
Performance: ★★★½☆
Value: ★★★★☆
★★★★½

When Apple refreshed the Mac mini last summer, the standout model was the £699 version with dedicated AMD graphics. This component won't be essential for most home and office users, however, who can save some cash on the entry-level model with Intel integrated graphics.

There are two other differences to our Gold award-winning Mac mini. The main processor is a 2.3GHz rather than 2.5GHz Intel Core i5, and the memory complement is 2GB instead of 4GB. The latter can be quickly and cheaply upgraded to 4GB for less than £20; you could even max out the mini with 16GB of RAM if required.

In features and facilities, the 2.3GHz Mac mini behaves just like its faster brother. It's a very well-rounded package, with dual-band Wi-Fi, Bluetooth 4.0, and Thunderbolt, USB 2.0 and FireWire 800 interfaces.

Displays can be attached to either an HDMI port (limited to 1920x1200 resolution) or the Thunderbolt port. The latter acts as a Mini DisplayPort, and is suitable for screens up to 2560x1600.

The integrated Intel graphics can drive two screens simultaneously, using up to 288MB of memory borrowed from the system RAM.

Also at the rear is a pair of audio jacks – in and out, each with Toslink digital cores – as well as gigabit ethernet and an SDXC slot.

The power supply is now built-in, so there are no unsightly bricks to hide. But the mini now lacks an optical drive.

The 200MHz shortfall in the processor and reduced RAM inevitably make this model slower than the AMD graphics version – but not by a significant amount.

In the Geekbench test – a synthetic benchmark that measures raw processor, memory and pipeline performance – the Intel-only Mac mini averaged 6,481 points. The AMD model scored 7,038, making it almost 9 percent faster.

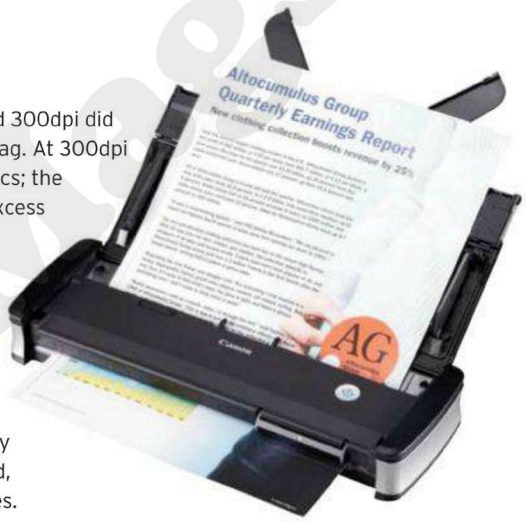
We used Boot Camp to install Windows 7 and ran WorldBench 6 test. The dearer model scored 123, while this entry-level Mac mini still recorded a healthy 117 points.

Power consumption is very low in this mini. The AMD model was already incredibly energy-efficient at just 11W – around one-third of the best results we've seen with small-form-factor Windows PCs; this model drew just 9W when idle. This translates to important savings on your electricity bills, especially if you have many computers rolled out across a large office.

When pushed with intensive computing, you can just hear a single fan as it draws air from below and vents through a rear slot. At all other times, the Apple Mac mini is virtually silent, commending its use on the office desktop or as a home media centre.

Verdict

At £529, the Apple Mac mini is the cheapest Mac in Apple's line of desktop and portable computers. Its superb build and feature set put it ahead of other compact PCs, while it still possesses the lowest running costs. It will never be found wanting in most home and office applications, and comes highly recommended. ☒ **Andrew Harrison**



In our tests it worked seamlessly with Google Docs, Evernote and other cloud-storage services.

Operating the Canon is straightforward. Click the single power button and the P-215 whirrs into life; alternatively, you can wake it up from within the software.

Performance was very decent when we hooked up the Canon to two USB ports. In its fastest mode – black and white at a 150dpi resolution – a 10-page bundle (comprising five sheets) took 26 secs to be scanned and turned into a searchable PDF.

When we added colour to the mix, the Canon required 37 secs to complete the job. Only when we went up to and beyond 300dpi did performance start to lag. At 300dpi a scan took 1 min 17 secs; the same job finished in excess of 5 mins at 600dpi.

Using a single USB port for power made a small difference. The 150dpi colour test took 40- rather than 37 secs.

We were very happy with the files produced, and found few mistakes.

Verdict

This Canon works very effectively. The bundled software is efficient, scan times are good, and there's useful cloud support and a dedicated card reader. If you need to scan on the move, the P-215 will be a useful companion. ☒ **Robin Morris**

WorldMags.net

BUSINESS LAPTOP

Dell Latitude E6420 ATG

£1,077 ex VAT
£1,293 inc VAT

Contact
- dell.co.uk

Read more
- tinyurl.com/cba725b

Specification
2.8GHz Intel Core i7-2640M; Windows 7 Professional 32bit; 4GB DDR3 1,333MHz RAM; 128GB Samsung 830 SSD; 14in (1366x768) gloss anti-reflection-coated LCD; Intel HD Graphics 3000; 802.11a/b/g/n; gigabit ethernet; Bluetooth 3.0; removable tray-load DVD ± RW drive; 3x USB 2.0; 1x eSATA/USB 2.0 combo port; VGA; HDMI; SD Card slot; smart card reader; fingerprint reader; stereo speakers; headphone jack/mic input combo; webcam; 60Wh lithium-ion removable battery; 352x241x35mm; 2.7kg

WorldBench 6 score: 155
Battery life: 384 mins

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★½☆

★★★★☆

The Dell Latitude E6420 ATG is described as a 'business-rugged' laptop. Although we wouldn't recommend that you throw it across the boardroom, you can be quietly confident that it'll withstand some rough treatment.

The construction is very sturdy, with a 'Tri-Metal' casing that conforms to military standards. The lid – made of anodised aluminium – is satisfyingly robust, offering the screen protection from behind.

There's extra protection around the edges and corners, too. And when you open the lid, which is mounted on impressively strong steel hinges, you'll see a relatively small screen set into a wide matt black bezel. A rubber seal helps to keep out dust and moisture.

The 14in screen is decent. Although it has a glossy finish, an anti-reflective coating akin to that used by the MacBook Air means reflections are rarely a problem. The colours are bright and rich, while text is sharp and clear. Dell bills this screen as an HD panel, as a nod to its 1366x768-pixel resolution. We don't regard this as an especially high resolution for a 14in display, but it performed well in our testing.

A touchscreen option is available, but the panel uses resistive rather than capacitive technology. If you're looking to buy a touchscreen laptop now, with a view to upgrading to Windows 8, then it's worth considering. But resistive touchscreens can feel decidedly clunky if you're used to the capacitive types found on most smartphones and tablets.

The keyboard is said to be spill-resistant, but it isn't backlit as standard (an upgrade is available).

It's very comfortable to use, with important keys such as Return, Backspace, right Shift and the Arrow keys all a good size and placed in predictable positions.

The touchpad is on the small side, at just 80x45mm, but performs well. There's also a trackpoint in the centre of the keyboard.

Connectivity

While there's a generous provision of USB ports, none of them supports high-speed USB 3.0. You can specify USB 3.0 connectivity at extra cost.

Around the laptop's edges are rubber dust covers for almost every other port – on the right edge are two USB 2.0 plus an eSATA/USB 2.0 combo port. On the left is another USB 2.0 and VGA, as well as a combined headphone/mic jack.

Along the back are gigabit ethernet and HDMI ports, again with rubber dust plugs. The bottom of the Latitude looks to be a weak point, resembling plastic, but it's actually a lightweight and tough magnesium shell.

A tray-loading DVD-RW drive sits in a modular drive bay, and can be completely removed from the chassis. You can also fit a handle to the body, to make an attaché case style portable that's easier to lug around when you don't have a carry case in which to stow it.

As well as being a physically strong laptop, enterprise security measures are included for locking down the Dell, in the shape of fingerprint and smart card readers. You can also select full-disk encryption for the internal hard disk. Our review sample was supplied with a 128GB SSD, which contributed to its very fast performance.

Performance

The Latitude's tough construction is offered in conjunction with fast performance. Our lab tests revealed that the Dell's 2.8GHz Intel Core i7-2640M processor and 4GB of RAM had been used to good effect, with the laptop capable of a 155-point score in WorldBench 6.

The integrated graphics provided predictably lacklustre framerates in gaming, although an upgrade to the nVidia NVS 4200 with 512MB of video memory is possible. We recorded just 18fps in Fear at Maximum detail.

A more likely usage scenario for this laptop than gaming is as a portable graphics workstation. In this case, the nVidia NVS 4200, which is based on the nVidia GeForce GT 520M, is a recommended configuration option.

The Dell has the necessary build to endure a life on the road, although its 2.7kg weight means you might not carry it around too often. Nevertheless, road warriors will be pleased with its battery life – we recorded over six hours from the 60Wh removable power pack in MobileMark 2007, a decent runtime given the quad-core CPU inside.

Verdict

Dell's Latitude E6420 ATG is solid and speedy. Its £1,293 price tag may put off some buyers, but if you need a laptop that won't object to some rough riding in your work then it should pay back its premium.

Ben Camm-Jones

WorldMags.net

PRINTER

Brother HL-3070CW

£125 ex VAT
£150 inc VAT

Contact
- brother.co.uk

Read more
- tinyurl.com/cyjue5p

Specification
Colour laser printer; 2400x600dpi resolution; 300MHz processor; 64MB memory; 802.11b/g; 100Mbps ethernet; PCL6/PS3; 250 + 1 sheets; toner cost: B=£52, C=£50 x 3; print yield: B=2,200, C=1,400; 480W (8W idle) power consumption; page costs: B=2.4p, C=10.7p; 409x466x250mm; 19kg

Build: ★★★½☆
Features: ★★★½☆
Performance: ★★★★☆
Value: ★★★☆☆

★★★½☆

Brother's HL-3070CW is a wireless network printer with a price tag that won't bring tears to your boss' eyes – but its running costs just might.

Up to 250 sheets can be stored in this colour laser's input tray, while a single-sheet additional feed lets you quickly and easily print to alternative paper stock.

The non-upgradable 100-sheet output is disappointing, given the Brother's huge depth. The paper catch works moderately well, and the printer's wide enough that most of the sheets will stay put.

Connectivity options are notable. Despite its relatively low cost, the Brother offers wired ethernet and wireless 802.11b/g (note that the 802.11n standard is not supported).

Brother has fitted just 64MB of RAM, although you can expand this up to 576MB for large-file printing.

Printer languages supported include PCL6 and BR-Script3 (Brother's version of PostScript 3).

The Brother has two main quality modes: 600dpi and 2400dpi. The difference in speed between the two is little more than 0.1 pages per minute (ppm), but the higher-resolution mode often proved too dark in our tests. We preferred the 600dpi mode, which churned out text at a competitive 13.6ppm.

Individual characters aren't the darkest or the most cleanly defined, but the quality is acceptable. In graphics, the Brother lacked a little detail in places, and the colour palette was a touch overcast.

While network printers aren't noted for their chiselled good looks, the HL-3070CW is remarkably unprepossessing. Its bi-coloured livery makes for a jarring effect that isn't eased by the printer's enormous depth – just 250mm high, it stretches back 466mm.

The front is festooned with buttons and a simple LCD, but the navigation system is logical. One useful addition is a Secure Print control, which prevents the Brother from printing out files until a PIN is entered. This enables you to ensure that sensitive documents won't fall into the wrong hands before you can collect the output.

The Brother's running costs sound reasonable, until you compare them to those listed in our Top 5 printers chart (page 139). A page of text is roughly 2.4p, while colour prints cost a staggering 10.7p each.

Verdict

The Brother HL-3070CW struggles to keep up with rival network printers, falling behind on print speed, output quality and running costs. Secure Print and wireless connectivity are welcome features at this price, however. ☒ **Robin Morris**

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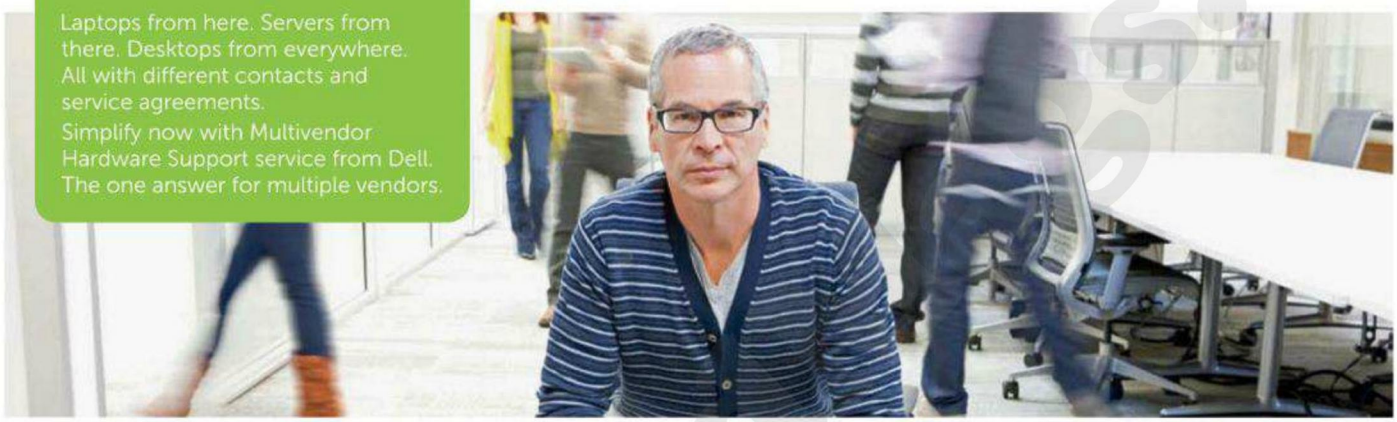

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Ver-tex (vur-teks): noun, singular.

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

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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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AVAILABLE AT overclockers.co.uk ebuyer.com dabs.com scan.co.uk

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Android antivirus

Android phones and tablets may be vulnerable to malware. Andrew Harrison and Rosemary Hattersley find out which Android security software you can trust

With Android's growing popularity in the tablet and smartphone market comes a rising wave of malware targeted at its users. A range of software promises to protect Android security, but it can be difficult to know which vendors you can trust. In conjunction with independent testing lab AV-Test, we've assessed a huge selection of Android antivirus apps.

Malware is able to get on to Android devices through the installation of malicious third-party apps. The platform's insecurities can largely be explained by its comparison with iOS. Whereas only jailbroken iPhones (see page 102) can install apps from places other than Apple's own App Store, where each app is vetted for security flaws and digitally signed by Apple, Android devices can install software from the developer's website or third-party app markets, as well as Google Play. As such, Google is unable to enforce the secure environment fostered by Apple – although this does allow app developers greater flexibility.

Even apps delivered from Google's own Android market have been found to host malicious code. Google now screens apps with 'Bouncer' technology, an automated process that looks through an app for malware-like activity. But, by its own admission, Bouncer isn't perfect: Google saw only a 40 percent reduction in the number of malicious apps hosted by Play following Bouncer's introduction last year.

Does (not) do what it says on the tin

Whatever the source of an app, there's no assurance that it will do what its developer claims. It has been known for popular apps

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to be cracked open, repackaged with additional backdoors or malware functionality, then offered for free or at a reduced price. Checking the app's required permissions and reading both expert (see tinyurl.com/cx8324t) and user reviews can help you make an informed decision over whether to download an app, but no Android app carries any guarantee of its security.

Open and shut case

While Android is touted as 'open', this term is misleading. It's true that parts of the OS are open-source, free to download and change as the downloader sees fit. But you can't download the entire source code of, for example, Android 3.0 Honeycomb. Nor can you simply update a phone or tablet with a compiled version of Google's latest code.

Android is based on an open-source Linux kernel, albeit one that's markedly forked from the likes of Ubuntu and Red Hat. It requires deep integration with specific hardware in every device. This means each build, for every phone and tablet, must be adapted from the supplied code.

HOW WE TEST

Independent testing lab AV-Test assessed the performance of each antivirus app reviewed here with various strains of malware. The apps were tested using a combination of real Google Android hardware and software emulators.

The emulator was set up with API level 10 (Android 2.3 Gingerbread), while the non-emulated testing was carried out on a Samsung Galaxy Tab running Android 2.2 Froyo and a Samsung Galaxy Nexus running Android 4.0 Ice Cream Sandwich. Both tablet and smartphone were restored to their factory settings following the installation and testing of each antivirus app.

For each security product AV-Test installed the latest available version and updated the virus signatures. It also allowed each app to connect to the internet as required during testing.

AV-Test witnessed two approaches to on-demand scanning among the apps here: while many simply scan the complete device storage, others will scan installed apps and what they consider to be important files only.

The latter type of malware scanners were unable to scan AV-Test's zoo of 618 malicious files, since these were stored on an SD Card. AV-Test instead tested their real-time protection by installing each malicious app in turn. It then uninstalled the malware if the threat was not detected by the app.

Although AV-Test didn't provide exact detection rates for each app, it grouped results into five categories based on performance. The first category shows a 90 percent-plus detection rate; the second between 65- and 90 percent; the third between 40- and 65 percent; the fourth between 1- and 40 percent; and the fifth category detected nothing at all.

Processor load and commensurate battery drain were not measured, but it's safe to assume that an on-access scanner – which monitors every incoming and opened file – will work your phone's CPU harder than when no malware security app is running.

In addition to AV-Test's lab scoring, each of the top 25 apps were evaluated by *PC Advisor* for features, ease of use and quality of interface.

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The slow-moving nature of Android updates in the real world has implications for security. Patches to fix vulnerabilities exposed in earlier versions of the OS have been slow to filter through to devices, widening the opportunity for cybercriminals to compromise Android hardware.

Should you be worried?

It's important to remember that many security stories circulated by the mass media originate as press releases issued by companies with vested interests, such as antivirus software vendors. In fact, many of us have never had the misfortune of a malware infection on our PC, laptop, smartphone or tablet. But that's not to say that we won't experience one, nor that there are no real dangers associated with using such devices.

Security researchers say Android is the most vulnerable mobile platform, with more threats targeted at the OS than iOS, BlackBerry, Symbian and Windows Phone.

The rise of the Android threat

AV-Test is an independent lab based in Germany that tests the efficacy of Windows antimalware software. Like the developers of Windows antivirus programs, it's now turning its attention to the Android security industry.

AV-Test's collection of Android malware stood at around 12,000 unique samples at press time. And the rate of growth is snowballing – AV-Test is gathering around 4,000 new samples each month.

The specific threats found in Google Android have much overlap with the malware visited upon Microsoft's Windows OS, but with some important distinctions.

For the Windows platform, a typical exploit may run as follows. A cybercriminal gains access to a PC by tricking a user into installing a Trojan horse – software that pretends to be an Adobe Flash update, for instance. The Trojan silently modifies the computer so that the attacker can remotely control it, installing further malware. The user carries on, unaware that a new owner has taken possession of their machine and is now moving in.

Once configured, the attacker logs keystrokes for passwords. These may be for social-networking sites, from which useful information can be gleaned, or online banking, allowing them to help themself to funds from your account.

Two-factor authentication means this hack isn't as easy as it once was, but access to credit-card numbers and the mark's home address is usually enough to make expensive purchases. Those goods can then be resold to generate revenue.

In the rise of handheld computing, a smartphone is a more immediate source of funds for the cybercriminal. One such method is from premium-rate texts, sent without the device owner's knowledge.

Long Lining is another technique, used to circumvent the localised nature of premium-rate phone numbers. While causing the phone to make secret calls to 098, 090, 091 and 0870 numbers is easy enough within the UK, premium international lines can't be accessed. With Long Lining the phone still rings an overseas number, but the call is rerouted, allowing the criminal to get the fee afforded by an international call.

Spyware is another category of malware found on the Android platform, and there is extra revenue to be made with malware that infiltrates your address book, text messages

ANDROID MALWARE IN THE FIELD

There are many strains of malware directed at Android, but some are sufficiently similar that they can be grouped into families. To confuse matters, Android malware often goes under several names; security vendors may also apply their own naming schemes to each threat.

ADRD: A Trojan that steals personal information. It's injected into legitimate apps, which are then made available to download. Once loaded it transmits your personal data, and also silently makes specific requests to a search engine to boost ratings for that site.

BOXER: This malware sends three premium-rate SMS messages. It's thought to originate in Russia, but Boxer has many international numbers in its database.

EXPLOIT.LOTOOR: The 'exploit' part of the name derives from this malware's operation, targeting security holes in Android up to version 3.2. Its purpose after gaining root access remains unclear.

FAKEINST: An example of an evolving threat, which changes the app's name and MD5 checksum every few days. It was once found on a site offering access to Google Music; the downloader instead received this SMS-sending app. In December 2011, Bitdefender rated this at the top of the top five most prevalent Android malware threats.

GEINIMI: Geinimi opens a back door on an Android device. It has more than 20 functions, including making calls, sending SMS messages and stealing personal info.

GLODREAM: Creates logs of your incoming and outgoing SMS messages and calls, then uploads them to a website. It's found on seemingly innocuous games apps, which have been re-packaged to include this malicious code.

KMIN: This Trojan steals personal information. It sends premium-rate SMS messages and changes your wallpaper.

KUNGFU: This malware can exploit unpatched Google Android handsets. It has backdoor functionality – once in place, the floodgates are open for all manner of malware to be silently installed.

NICKSPY: This can masquerade as a Google++ app. It intercepts incoming calls, allowing a remote hacker to hear your conversations. It exploits security holes in Android 2.2 and earlier.

OPFAKE: Is a Trojan disguised as the Opera web browser. Following infection it sends premium-rate SMS messages.

SERBG: This one is found in such apps as Android Market Security Tool. It's a Trojan that captures your personal data and sends it to a remote server. It carries a severe threat level warning.

XSIDER: This malware can arrive with legitimate apps, then change the device settings and gather information.

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and call logs. This information could be used directly against you, or sold to gangs that specialise in identity theft.

Most malware on all platforms is installed by the user, albeit unwittingly. Malware writers might disguise their programs as something you are willing to install, for example. This is the classic Trojan, just like the Trojan horse of Greek legend that contained more than the grateful recipients bargained for.

Rootkits are another category of exploit, code that installs at a very low level in the OS and is difficult to detect. The virus, in its true sense of self-replication, is unusual in today's computing world, as is the worm.

Physical theft

Malware isn't the only route a criminal can take to access your data; there's also the good old-fashioned pickpocketing approach. Whether your device was lost or stolen, the data it contains needs protecting. As such, many Android security apps offer remote wiping and GPS phone tracking features. They won't prevent your device being stolen, but they just might help you get it back or prevent the new owner getting their hands on your personal information.

Carrier IQ

Not all malware is designed to steal your data and money. Smartphone manufacturers and network operators have also been known to install spyware on devices.

Carrier IQ is an invisible rootkit typically sold to mobile operators to monitor the performance and usage patterns of their customers' phones. It's been installed on 150 million handsets.

The software offers a range of information, from the logging of network performance as you move between locations, to records of your keystrokes, browser data and texts. Carrier IQ uploads data from each phone to its own data centre, where it can monitor usage in real time.

In August 2011, the company passed the petabyte mark (1,000TB) for the amount of analytical data it had processed.

While the company's commercial standing gives it an air of legitimacy, many users might regard Carrier IQ as unwanted spyware, if not privacy-invading malware.

Because Carrier IQ is installed on Android at a low level, it isn't easily removed. Lookout has a product that aims to detect but not disable Carrier IQ. The good news for UK Android users is that, as of January 2012, only six of 1,288 Lookout-registered phones were found to have Carrier IQ spyware installed.

Given the high value of this data, it's likely that similar rootkits will infiltrate handsets until the next scandal raises questions with data-protection bodies in Europe and the US.

Screening out malware

Guarding against malicious apps isn't as simple as installing software from trusted sources only, as has been highlighted by Google's own app store. Instead, you need a program that can reveal the true character of an app before you install it. This is where Android antivirus should help.

Interestingly, while installing more than one Windows antivirus program with a real-time scanning engine is advised against, AV-Test's results suggest that you can install as many Android antivirus apps as you like. If you can't choose between our top three, there's nothing to stop you installing them all. How quickly this will drain your battery is another matter.

When AV-Test first examined a handful of free antivirus apps last autumn, it found that many were useless at spotting malware. In a major follow-up to that initial work, AV-Test has examined and lab-tested 41 Android antivirus apps. Around half were found to be as poor as the first group, detecting few or even zero malicious programs. Surprisingly, some of the more disappointing scanners were from brands familiar to Windows users.

Over the following pages, we offer in-depth reviews of the 25 best-performing apps. Note that these reviews are listed in alphabetical order, not in order of performance. We also explain how to install and run Android antivirus on page 112.

WORSE THAN USELESS

AV-Test assessed 41 Android antivirus apps in total, although we've reviewed only the top 25 here. Those nearing the bottom of its performance table were either incapable of detecting any malware, or their detection rate was so low that installing them could lull you into a false sense of security. Such apps are worse than useless, with some Android users becoming more complacent about the risks of installing random apps.

Two of our top 25 – Bluepoint Antivirus Free and G Data MobileSecurity – plus Kinetoo Malware Scan had difficulty in detecting malware from many of the 19 families installed. G Data, for instance, totally missed any variant of the Jifake riskware, which sends expensive SMS messages for the profit of its developer.

The next 13 apps in AV-Test's performance table were close enough to totally ineffectual to make them a security threat in their own right. If you rely on any of the following, the lab tests indicate that you're as likely to get infected by malware as a user without antivirus software installed: ALYac Android; Android Antivirus; Android Defender Virus Shield; Antivirus Free; BlackBelt AntiVirus; CMC Mobile Security; Fastscan Anti-Virus Free; GuardX Antivirus; MobiShield Mobile Security; MT Antivirus; Privateer Lite; Snap Secure; and TrustGo Mobile Security.

Finally, two so-called antivirus apps tested by AV-Test were unable to detect a single malicious file from the 618 thrown at them. Avoid LabMSF Antivirus Beta and MobileBot Antivirus at all costs.

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AVAST MOBILE SECURITY

FREE • avast.com • tinyurl.com/chxLrrz

PC ADVISOR RECOMMENDED

Usability	★★★★½
Features	★★★★½
Performance	★★★★☆
Overall	★★★★½

A strong performer in AV-Test's antimalware testing, Avast is a very good utility for protecting your Android device.

Avast's performance was within the top 10 of all 41 apps that AV-Test pitted against its zoo of Android malware and rootkits. And there's plenty of information given about the threats your device is potentially exposed to by Avast's largely user-friendly interface.

In all but one of the 19 malware categories thrown at it, Avast shone. The one exception, Exploit.Lotoor, foiled almost every app here (see *Android malware in the field*, page 60). Of the top 10 apps, only F-Secure, McAfee and Kaspersky detected the threat. However, we were surprised that Avast didn't spot it, given that the company maintains a Community IQ collection of malware and rootkits sent anonymously from customers' devices.

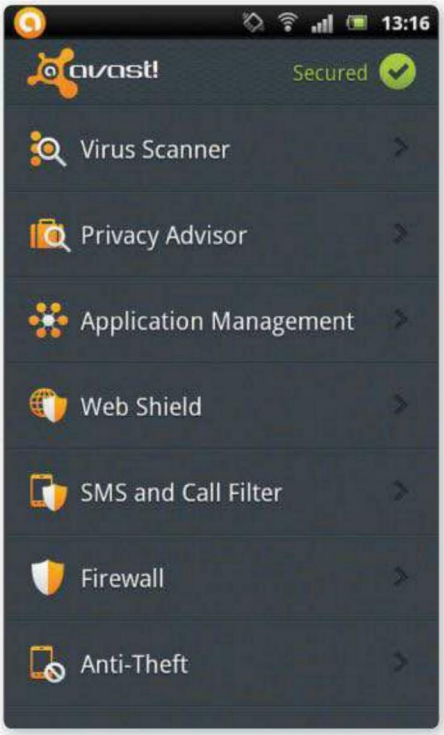
An on-demand scan took less than 20 seconds before reporting the all-clear for our device. You'll need to select the SD Card scanning option to include this check; this bumped up the scan time to around 35 secs, which is still very fast.

Avast Mobile Security's Privacy Advisor gives a useful overview of personal details that can be read by specific apps; we were relieved to find only the security apps we'd installed were checking our emails and text messages.

Avast is unique among Android antimalware apps in offering its own firewall for rooted devices. Oddly, Avast's Anti-Theft service is operable only if you specifically allow the installation of apps outside Google Play.

We tried the Anti-Theft service. The standard app is open to uninstallation by a thief savvy enough to check for such a setting. There's also a rooted install that prevents the tablet or phone being wiped and then hard-reset. A dummy app disguises Avast Anti-Theft's presence in either scenario.

VERDICT: Combining strong scanning and malware-blocking credentials with advanced tools for rooting and resetting your device (and preventing others from doing the same), Avast Mobile Security is useful for more adventurous Android fans.



DR WEB ANTI-VIRUS LIGHT

FREE • drweb.com • tinyurl.com/7bcsauo

Usability	★★½☆☆
Features	★★★☆☆
Performance	★★★★☆
Overall	★★★☆☆

Dr Web is a new name to us, but its performance in AV-Test's benchmarks makes it well worth considering. The app lists fewer permissions than some here for what it needs to check on your device. Even so, it proved adept at spotting malware from almost every family attempting to gain access to Android devices.

In all but seven of the 19 malware families included in the AV-Test procedure, Dr Web scored above 90 percent, while the remainder were in the so-so 65- to 90 percent segment. Exploit.Lotoor – a piece of malware that embeds itself on an Android device after a user unwittingly installs it and attempts to gain root access – was the notable weak point.

Unfortunately, you won't discern how effectively Dr Web is protecting your device from its interface. Even while you scan through the security messages relating to what it accesses, a worrying orange bar pops up by default to show that all is not well.

This turns out to relate to the automatic monitoring service offered by Dr Web. Clicking the orange bar has no effect; you need to click the Off/On radio button to the far right of the next option down – SplDer Guard. The screen then turns a virulent combination of green – to signal protection is now active – and turquoise.

Next down is the scanner. Quick Scan merely looks at the apps you've installed, while Full Scan checks everything, including removable media. Dr Web took 1 min 46 secs to complete an audit of 7,276 files on our tablet. There's also a custom scan option for checking specific items.

The Statistics list provides an overview of events and how recently the virus definition database was updated. The separate Update menu doesn't actually prompt you to manually check for these, but does darkly warn you it hasn't been done. Should anything suspect be detected, it will be listed in both the Statistics list as threats detected and the Quarantine folder at the bottom of the main menu page.

VERDICT: Dr Web provides solid protection against much known Android malware. But with no explanatory interface and a default warning message following installation, you may end up unnecessarily alarmed.

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F-SECURE MOBILE SECURITY

PC ADVISOR RECOMMENDED

29 (£23) • f-secure.com • tinyurl.com/cqtmLok

Usability	★★★★☆
Features	★★★★☆
Performance	★★★★½
Overall	★★★★½

F-Secure is one of the longest-established brands in smartphone security and, according to AV-Test's rigorous investigations, it's also one of the most effective. F-Secure Mobile Security detected at least 90 percent of malware in every category. It offers a great combination of protection and usability, but for phones only.

F-Secure isn't hosted by Google Play, but you can download the app from the company's website. There's no need to enter personal information here, although you will need to set your smartphone to allow the installation of non-Google Play apps.

Much of F-Secure's work is cloud-based, with links to the Real-Time Protection Network for anonymous threat reporting. It will also check for updates before scanning your handset for malware.

F-Secure provides easy-to-understand advice on what you need to configure and why. For example, it explains the benefits of setting up administrator controls. A security code can control access to your device and prevent changes to parental control settings.

In our own tests, we found F-Secure paused its scan whenever the display timed out. It wasn't particularly swift, and took around 3 mins to scan 1,747 files, but it was thorough. The app checks by default any removable memory cards, too. You'll need to remember to schedule or manually invoke scans, however.

A particular strength is F-Secure's web content filtering and parental controls. The latter can be quickly configured with child-, teen- or adult-appropriate settings. Chat, webmail, forums, blogs and social networks are allowed in the teen setting; cults, hate and violence, weapons, drugs and other items are blacklisted, but can be allowed. We tried to visit an adult site: clicking on any link produced a 'your parents have blocked access to this type of content' message. A Google Images search produced some scantily clad girls, but nothing more.

Specific installed apps can be blocked. There's a safe contacts and blocked numbers menu available for all users too, together with a history trail.

VERDICT: F-Secure looks to be a dependable anti-malware app with an excellent web filter that can be tailored to suit different users.

IKARUS MOBILE.SECURITY LITE

FREE • ikarus.at/en • tinyurl.com/dxducg6

Usability	★★★½☆
Features	★★★☆☆
Performance	★★★★☆
Overall	★★★½☆

Austrian security company Ikarus put in a strong showing when faced with 19 families of Android malware. As soon as you accept the licence and limitations, Ikarus scans your device for any current issues, showing a real-time list of what's being checked and any infections found.

Ikarus automatically updated its virus definitions as we were reviewing it, although for the first 24 hours it reported that there were no new updates since those offered when AV-Test trialled the app in March.

As with many of the Android antivirus apps on test, Exploit.Lotoor was rather an Achilles heel for this otherwise strong app, with Gonca, Geinimi and Adrd also finding small chinks in its protective shield. Nevertheless, Ikarus scored above 90 percent in 15 of the 19 categories.

This Android app doesn't have many frills, with no features for remotely wiping your handset, tracking it via GPS, setting parental controls, verifying the security of the sites you visit and so on.

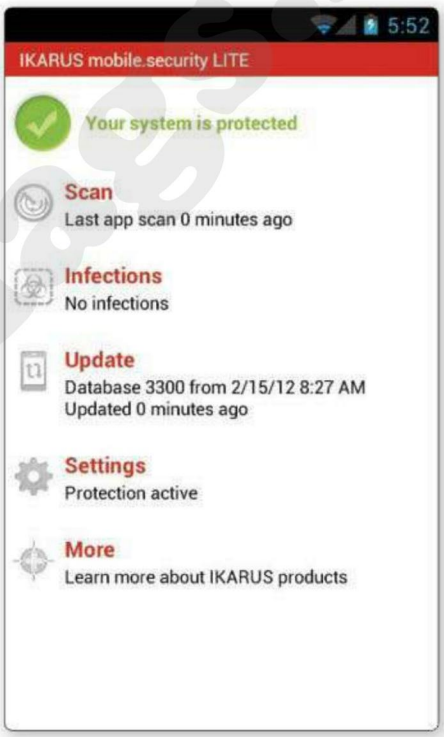
Ikarus' interface is very clean, with customisation options limited to how frequently it looks for updates and whether they should be sought during data roaming. This setting will help you avoid getting any nasty shocks with your monthly bill following a trip abroad.

Updates are set to manual by default – we'd recommend changing this to weekly, if not more frequently. An out-of-date antivirus will quickly prove ineffective in protecting against the latest threats.

The scan that starts automatically when you first fire up Ikarus is an app-only scan, so you'll need to run a full scan of your device as soon as possible – particularly if you've copied anything to your device from a removable memory card or have one inside.

The app took just over 2 mins to scan 1,599 found items on our tablet, suggesting that it isn't as thorough as apps such as Dr Web, which found 7,276. Our full-scan test with a 2GB SD Card in place took 3 mins 20 secs, but still logged only 1,599 files.

VERDICT: A no-frills security scanner that offers impressive malware-protection credentials, Ikarus focuses on this and this alone. Add a separate backup and remote wipe app to fully protect your device.



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KASPERSKY MOBILE SECURITY LITE

PC ADVISOR RECOMMENDED

FREE • kaspersky.co.uk • tinyurl.com/chce4kb

Usability	★★★☆☆
Features	★★★★☆
Performance	★★★★½
Overall	★★★★½

We were highly impressed with Kaspersky Mobile Security Lite, which we tested on a smartphone running Android 4.0 Ice Cream Sandwich. There's also a £12 app for Android tablets. As with several apps here, a numerical PIN is used to lock the handset, recoverable via a registered email address.

Kaspersky's cloud-based Security Network automatically checks against its database anything you attempt to install. This obviously helps, as its threat detection is one of the strongest here: Kaspersky scored above 90 percent in all 19 malware family categories that AV-Test used. Only two other apps achieved the same feat.

Kaspersky takes an informative approach to security, with hints that explain every element. A multitude of extra features is also available (marked with a crown), albeit in the £7.95 paid-for version only.

The phone filter can be set separately for calls and text messages. This doesn't scan your existing phone contacts, so it's best to manually enter numbers to block in the blacklist, rather than whitelisting everyone.

Should you need to, you can remotely block your handset by entering a preset SMS code and confirming the action via the email bounced your way. However, you need to set Kaspersky Mobile Security Lite as the default home screen on your handset to use this service – presumably so the 'this phone is blocked' message can appear.

The remote wipe feature can also delete your contacts, call logs and calendar items. The paid-for version of the app lets you specify folders to delete, too.

The lock and wipe features require you to set up a separate Kaspersky account from which an SMS can be sent to your handset, revealing its location. It's a clunky workaround, but the necessary links are provided. The paid-for version uses the more satisfactory email option to reveal the missing handset's whereabouts.

VERDICT: Kaspersky's strength is in its well-rated malware detection and cloud-based app filtering. Mobile Security Lite proved a match for all the other apps AV-Test analysed. There are more elegant ways of locking and wiping a missing device but, for day-to-day app security, Kaspersky Mobile Security Lite is hard to beat.

LOOKOUT SECURITY & ANTIVIRUS

PC ADVISOR RECOMMENDED

FREE • mylookout.com • tinyurl.com/cpqv8nt

Usability	★★★★½
Features	★★★★☆
Performance	★★★★☆
Overall	★★★★☆

AV-Test found Lookout very adept at ensuring rogue apps aren't downloaded and installed on your Android device. Pitted against a field of established security suites, it polled in the top 10 for performance. It also has some other tricks to share.

As well as the app scanner, denoted by the Security tab, there's a backup tool and a 'missing device' alert that locks your tablet or smartphone and has it screech to signal its whereabouts. Setup for all three is surprisingly quick and straightforward.

Lookout's malware scanner automatically checks each and every program you install, and additionally scans all the apps installed on your device weekly. Updates are delivered automatically, too.

Backups of contacts (plus photos and files in the Premium version) are saved to and restored from mylookout.com, so you'll need to create an account for this. Conveniently, the Google account used for your Android device can be used here. From the mylookout account you can locate your smartphone or tablet or set off an alarm if it gets stolen. You'll need to have the GPS Location option enabled on your device, though.

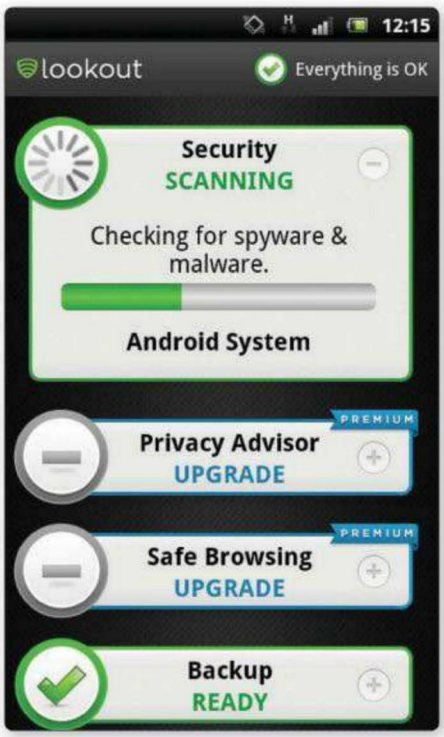
We tried to test this function on several Android devices, but couldn't get it to work. The service has potential, though: we tried the iOS version on an iPad, which Lookout eventually located and emailed to us its approximate location on a map.

More impressively, Lookout backed up our contacts and settings in a trice. As soon as we'd logged into mylookout.com on both our tablet and laptop, everything was synched and accessible.

Protection-wise, Lookout scored above 90 percent in almost every category. It scored between 40- and 65 percent with the SerBG family of Android malware, and showed a handful of weaknesses with Exploit.Lotoor, Jifake and Opfake. Reassuring status messages are given on the dashboard, which are echoed by the web console.

In the Settings menu is an option to add Lookout as an administrator. This is required if you want Lookout to be able to erase all data stored on your device if it's stolen.

VERDICT: Lookout provides solid protection and a user-friendly interface. Plus, it can look after several devices from a web portal.



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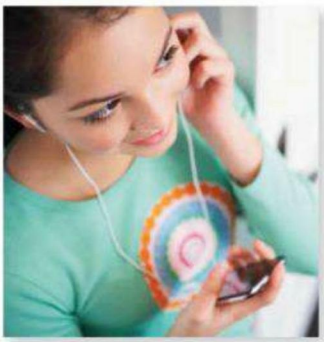

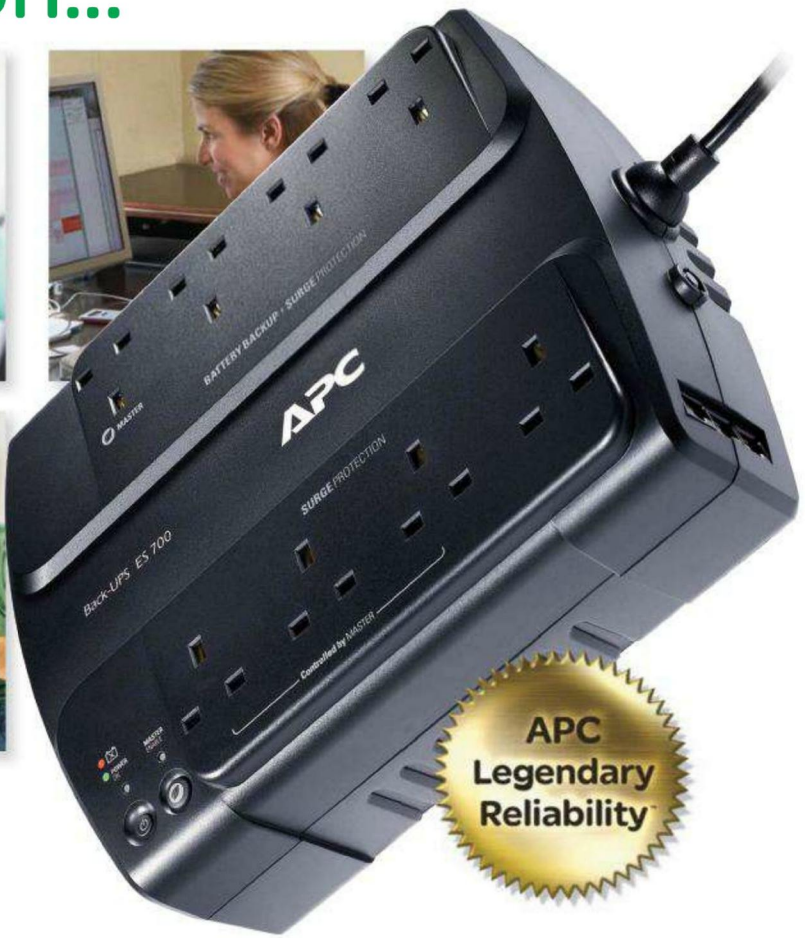

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MCAFEE MOBILE SECURITY

PC ADVISOR BEST BUY

$29 (£18) • mcafee.com • tinyurl.com/73n39f6

Usability	★★★★½
Features	★★★★☆
Performance	★★★★½
Overall	★★★★½

One of only three apps here that garnered a detection score above 90 percent with every strain of malware thrown at it, McAfee is one of the better performing Android security tools around.

You can download and immediately begin a week-long trial. On a smartphone you're registered via your SIM, while on a tablet McAfee requests an email address. It insists on you creating a device-access PIN. This also allows you to remotely access, locate and track your tablet via a web portal.

Data backup and recovery is handled just as smoothly. The online portal lets you view what your apps are accessing and change anything you don't like. A Web Protection module with blacklisted unsafe sites helps make surfing safer.

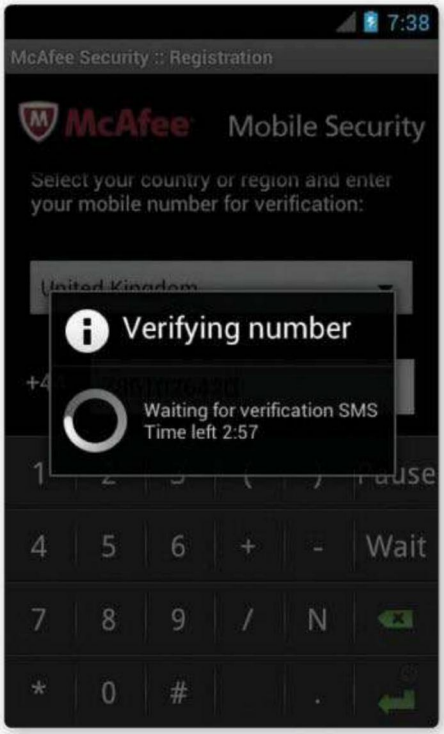
The initial scan was comprehensive, with more than 35,000 items reportedly checked in the 3 mins 23 secs it took McAfee to audit our tablet. A separate App Protection module groups installed apps by the type of information they can access on your device – a neat way of highlighting the permissions you've agreed to when installing Android apps.

Of our 102 apps, McAfee flagged 29 for us to check and either trust or remove. Risky sites, access to and the ability to make calls and share personal data, emails and contacts are described.

Media backup is supported as well as the more usual contact backup option. Clicking each photo to back up isn't ideal, but there's also an auto-backup option to sync everything once a day when your tablet is being charged. McAfee offers to restore only your contacts, excluding any archived media.

Device lock and remote wipe are offered, but there's no feature that lets you sound a siren or locate your tablet on a map. The smartphone version of McAfee Mobile Security adds call and SMS filtering.

VERDICT: McAfee impressed us with its excellent malware detection results, in-depth scanning and the way it helped us to decide whether individual apps posed a risk. The online backup options could be stronger, but McAfee's core function of Android device security, without alarming you unnecessarily, is to be applauded.



MYANDROID PROTECTION ANTIVIRUS

29 (£23) • mymobilesecurity.com • tinyurl.com/cm58eL8

Usability	★★★☆☆
Features	★★★☆☆
Performance	★★★★☆
Overall	★★★½☆

MYAndroid is designed to protect your handset, but it doesn't offer the best welcome: although listed as free at Google Play, it can't be used until you've purchased a licence code. This means you must enter your personal and credit-card details on your phone and sign up for a 30-day trial, long before you know anything about the app or how good its protection might be.

That a security app insists you enter all this information on what may be a device already compromised by malware left us incredulous. We strongly recommend that if you're going to buy MYAndroid you sign up via its myandroid.com web page while connected to a secure network.

Once you've installed your trial version of MYAndroid via a voucher code, you can finally scan the smartphone you were worried might have been hacked.

Android 4.0 isn't listed as a compatible platform, although we were able to install MYAndroid on a phone running Android 2.3. Support for Google's 2010 release of Android 3.0 is said to be 'coming soon'.

After a complete re-evaluation of this software, AV-Test ranked MYAndroid's protective qualities among the top 10 of those reviewed here. Only Exploit.Lotoor caused this antivirus app to stumble, where it detected between 65- and 90 percent of its variants. For all other malware families, MYAndroid detected 90 percent or more of threats.

Real-time scanning against an online database is included, which should ensure that MYAndroid's signatures are up to date.

MYAndroid also promises backup and recovery services, along with remote lock and a map-based retrieval setup. You can set off your smartphone's alarm if you believe it to have been stolen, too.

MYAndroid advertises the ability to delete personal data from Twitter, Facebook and other social-media sites. In reality, this feature is just the same as a complete remote wipe option.

VERDICT: A lengthy and potentially insecure setup process will have many cautious customers seeking alternatives to this app. AV-Test found solid protection credentials, along with backup and remote wipe. There are better free options available, though.

WorldMags.net

NQ MOBILE SECURITY & ANTIVIRUS

FREE • nq.com • tinyurl.com/dxp3jzc

Usability	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Overall	★★★★☆

NQ Mobile Security & Antivirus is a smartphone-only app that works well to protect Android devices from malware. It comes with a widget that sits on your home screen, but we found more often than not it appeared over the key we needed on the onscreen keyboard.

Once the app has been activated it performs a fast scan for viruses and Trojans. This trawls your installed apps and provides a star rating for each.

Interestingly, the Android version of the BBC's iPlayer app got only 3.5 stars, while Dropbox and Daily Mail Online both received a 4.5-star verdict.

According to AV-Test, NQ Mobile Security & Antivirus is primed with deadly malware-hunting capabilities: it scored above 90 percent when checking for threats in 18 of the 19 categories it was pitted against. The remaining result – for Exploit.Lotoor – also foxed many of the other solid malware scanners here. NQ got a creditable 65- to 90 percent score in detecting this strain.

Its device-location feature pinpointed our handset to the exact house within 15 secs. A neat option lets you set a passcode up to 10 digits long, then choose a phone number of a trusted friend to be alerted when someone takes your smartphone and replaces its SIM card. It can back up or restore your contacts, too.

We like NQ Mobile's optimisation tools. A fuel gauge indicates how much storage is available on the smartphone, lists running apps and then closes any that aren't actively being used. An App Manager screen provides a security overview where you can have NQ diagnose and quarantine any apps that it believes to be suspicious.

Finally, the Privacy Advisor lists which apps can access your contacts list (QR Droid and Twitter, in our case), track your location, access your messages and read details of the IMSI and IMEI numbers that identify your handset. Fortunately, all our apps had 4-star-plus safety ratings.

VERDICT: NQ offers solid protection for Android smartphones and has the best interface of all those we tested. Coupled with its comprehensive device-location and -wiping features, NQ Mobile Security & Antivirus is an impressive app.

ZONER ANTIVIRUS FREE

FREE • zonerantivirus.com • tinyurl.com/buxmxp2

Usability	★★★½☆
Features	★★★½☆
Performance	★★★★☆
Overall	★★★½☆

When AV-Test looked at the effectiveness of Android security apps late last year, it concluded that they weren't much use at finding malware. Most picked up less than 10 percent of malicious files. Zoner was one exception to the dismal report: its 32 percent detection rate and 80 percent installation blocking passed for best at the time.

Zoner now has some strong competition. In the lab, it was able to protect Android test devices from 15 of the 19 malware families AV-Test threw at it. It also did a fair job of detecting and blocking malware in the remaining four categories, making it one of the better all-round defenders.

Once a scan is complete, you get a reassuring green tick and a prominent 'status: protected' message. Zoner can provide an audit of the permissions granted to installed apps, and whether they came direct from Google Play or were downloaded via a third-party site.

We also found it useful to be able to track a missing phone using Zoner's 'Missing device' function. Zoner Antivirus Free allows you to take remote control of your handset (with most apps this is a paid-for option).

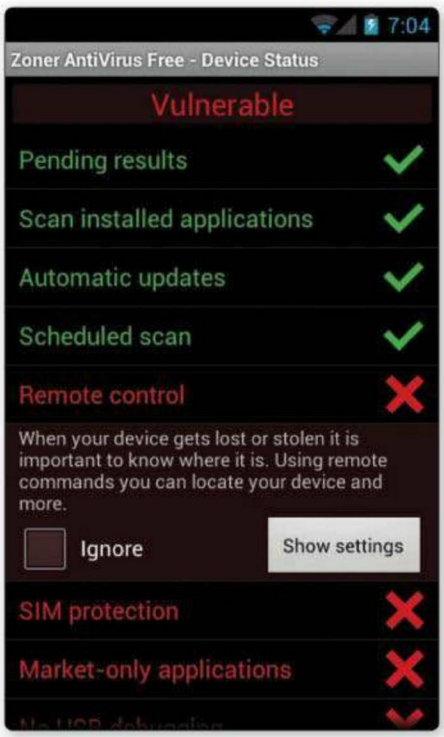
Scanning our tablet took less than 7 secs, although we needed to tell Zoner to include a scan of the SD Card. Our first scan results were worrying: Zoner told us our tablet was vulnerable. This turned out to be because we hadn't set up a scheduled scan – a rather melodramatic way to alert us.

Zoner scans by default each installed app, plus individual files when their content is changed – a common indicator of malware. It sends details of suspicious files to the LiveThreat virus lab, and reports any adware that tracks personal details.

Smartphone users will also find the call filter active by default. If you often transfer files from your PC, you would be wise to tick the 'scan on mount' option, too.

It's worth clicking through Zoner's menus. A few changes can be made here, and Zoner offers useful details of why certain configurations may pose security risks. The infamous Exploit.Lotoor Trojan is specifically listed, but Zoner immediately identified it.

VERDICT: Zoner continues to hold its head up high as a solid security defender with an intuitive user interface.



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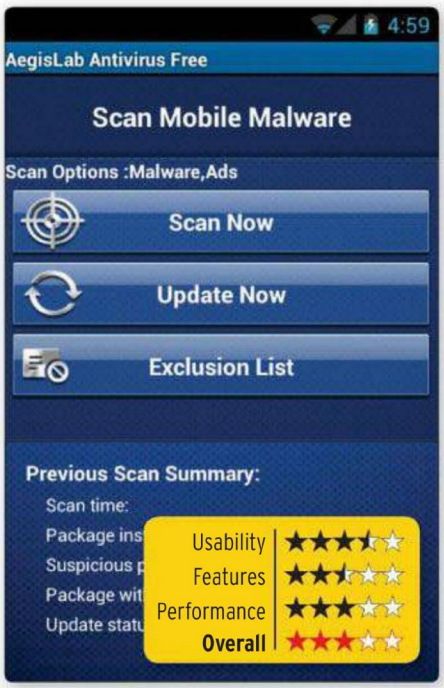

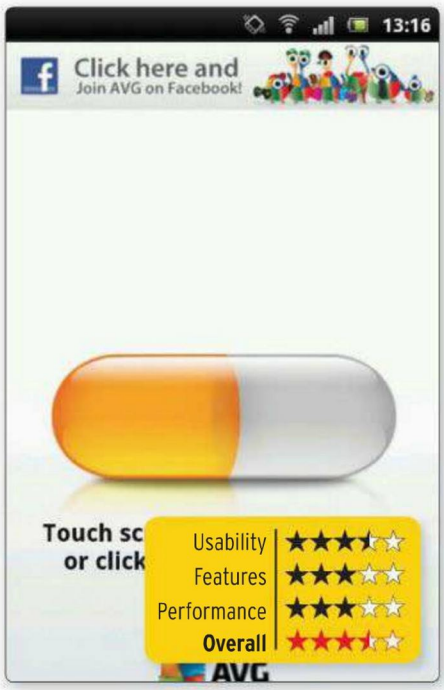

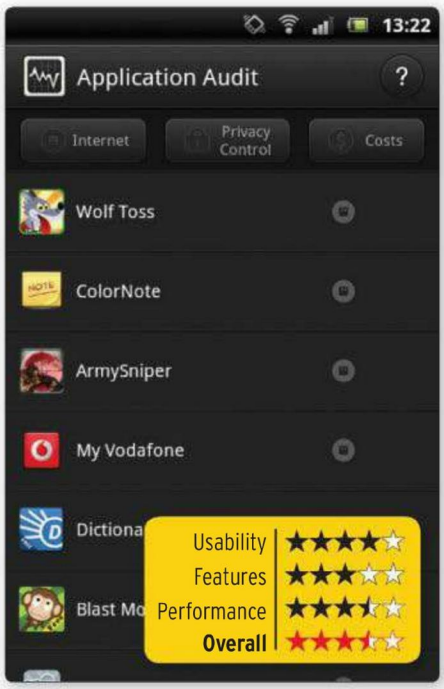

AEGISLAB ANTIVIRUS FREE

FREE • aegislab.com • tinyurl.com/d9kas73

AegisLab is a Taiwanese company that specialises in security apps for Android devices. While the company lists Windows security software, its main line is in apps that try to secure Android devices.

We say 'try to' because it successfully blocked more than 90 percent of malware in only eight of the 19 categories AV-Test threw at it. Although it proved far from the worst defender in our round-up, AegisLab failed to block any malware in the Boxer family, and clearly struggled with FakeInst.

It showed sub-65 percent detection rates with BaseBrid, DorDrae and KungFu variants. Some strains of the Exploit.Lotoor Trojan also foiled this antivirus app, as did Jiface, Nickspy, Opfake and Yzhc, where it detected between 65- and 90 percent of malware.

AegisLab Antivirus Free can be installed for free on either a smartphone or a tablet. On the latter it scales up in portrait mode, but works well enough.

Following registration, an initial scan was fast at just 3 secs. The resulting log was rather basic, simply listing four apps that included adware. There was no mention of location-tracking or contact sharing. If you value an app but expect it to be flagged, there's the option to exclude it from the scan; more sensibly, you can also uninstall it.

VERDICT: AegisLab Antivirus Free made a half-hearted attempt of protecting our Android tablet and phone. The free version is a one-trick pony, with no other security features, but that may be all you need.

AVG ANTIVIRUS FREE

FREE • avgmobilation.com • tinyurl.com/837ggdr

AVG Free is a popular Windows security program, so we had high hopes for the Android antivirus app from the same stable.

Things started off well. As soon as AVG Antivirus Free is set up, a large lozenge appears onscreen. You're urged to tap this to initiate a scan. This apparently checks installed apps and external media; we were sceptical, given that the whole process took less than 30 secs. It did, however, highlight the fact we'd earlier changed a setting to allow the installation of apps from non-Google Play sources.

AVG offers nothing else in the way of extra features, and those looking for parental controls, remote wiping, safe surfing, contacts and data backup should look elsewhere for their security needs.

AV-Test found less-than-perfect performance in its benchmarks. AVG failed to spot the Opfake Trojan, which disguises itself as an update to the Opera browser and then sends out premium-rate SMS messages.

The app also struggled with DorDrae, Jifake, KungFu and Yzhc, where it detected less than 40 percent of malware. It found between 65- and 90 percent of BaseBrid, Exploit.Lotoor, Glodream and Nickspy variants, but in only eight of AV-Test's 19 malware categories did this antivirus app detect more than 90 percent of threats.

VERDICT: Not nearly as impressive as its desktop equivalent, AVG Antivirus Free leaves several doors open to malware. Better free options are available.

BITDEFENDER MOBILE SECURITY & ANTIVIRUS

FREE • bitdefender.co.uk • tinyurl.com/876gsh8

Bitdefender consists of a malware scanner, an 'anti-theft' module, an audit tool that checks on the legitimacy of the apps you've installed, a web security checker and an event viewer.

When the program first launches, it prompts you to perform an immediate check of your hardware – on our tablet this took around 11 secs. Mounted SD Cards are scanned only if you click the option to do so. Bitdefender also crosschecks everything against its online threat list, so you'll need an active internet connection.

Its performance was better than many of its rivals in the second tier, able to detect 90 percent or more of malware in 14 of AV-Test's 19 categories. Jifake was the notable letdown for Bitdefender, where it detected less than 40 percent of malware. The app also had problems with Opfake, and found between 40- and 65 percent of threats within the family.

The audit tool produces a list of installed apps, the space they consume and whether they are set to launch at startup. Bitdefender helps you deal with the culprits accordingly.

A Web Security module is said to protect you from malicious sites when browsing the web using Google's Android browser; other browsers don't appear to be monitored.

VERDICT: Bitdefender offers a decent malware scanner with additional cloud querying support, and does virus protection relatively well. A Web Security module is included, but there's no discernible web filtering.

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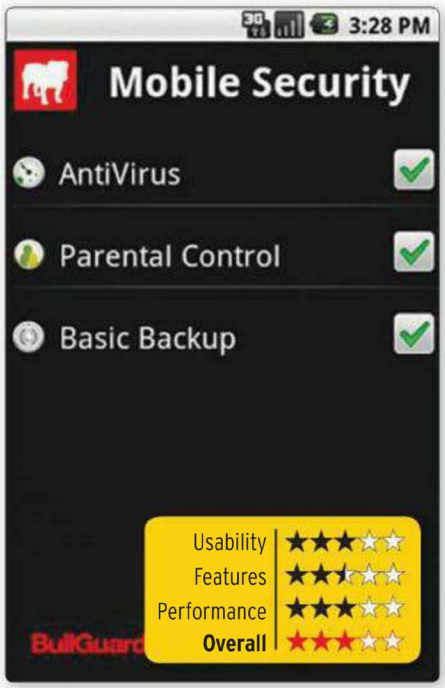

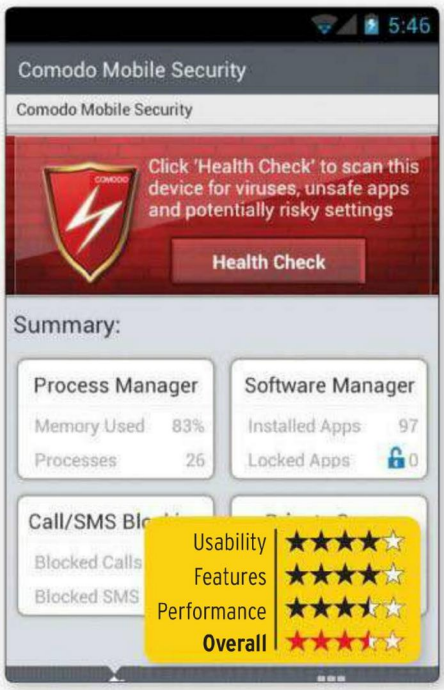

BLUEPOINT ANTIVIRUS FREE

FREE • bluepointsecurity.com • tinyurl.com/crboamg

BluePoint Antivirus Free falls into AV-Test's third tier of Android antivirus apps for performance, and was the worst performing security defender in our round-up.

With 90-percent-plus detection rates in only three of the 19 categories of malware, BluePoint proved woefully unequipped to deal with today's Android threats, let alone those yet to be discovered.

Boxer, DorDrae, Exploit.Lotoor, Glodream, Gonca, Jifake, KungFu, Opfake, Xsider and Yzhc Trojans are just as likely to get on to a device protected with BluePoint as they are a device with no security whatsoever – the app detected less than 40 percent of malware in each of these categories.

Worse, BluePoint failed to spot the Nickspy Trojan, which masquerades as a Google++ app to intercept incoming calls.

BluePoint's Cloud Antivirus scanner displays a sea of numbers and filenames as it does its work. A total of 3,425 files were reportedly scanned in 2 mins. BluePoint checks apps, the OS, files and any media cards that are presented.

Enterprise users get slightly different options from home users, with an activation code provided by the IT administrator, plus different scanning schedules.

Real-time protection and notifications are active by default, but you'll need the $4.99 Pro version to schedule scans.

VERDICT: BluePoint puts on a very good show that it's doing a great job. It's not. Look elsewhere for Android security.

BULLGUARD MOBILE SECURITY

£19 • bullguard.com • tinyurl.com/cz7gzyz

BullGuard Mobile Security is pretty basic, despite its £19 price tag. The app offers moderate protection from web-borne threats and malware acquired as an app download.

BullGuard plans to update its Android product for both Android 4.0 phones and tablets, and Android 3.x tablets.

At present, you need to download the app direct from BullGuard's site and either install the app from your device or, if on a smartphone, have the link sent by text. Since it's cloud-based, the virus definitions should be up to date and on-demand scanning takes only a second or two.

AV-Test seemed largely satisfied with how well this works. BullGuard got a good report for 11 out of 19 malware types it tested for, with other categories not far behind. However, in two cases, BullGuard failed entirely – Rooter and Xsider were missed.

BullGuard actively scanned apps we subsequently downloaded and installed, giving us the all-clear for most. It flagged Eset as spyware, however.

Contacts and calendars can be backed up to BullGuard's servers. Parental controls are the only other feature. An overview mode seemingly shows that picture messaging and texts are blocked, but calls are allowed. Settings are said to be adjustable from a web portal, but we couldn't find them.

VERDICT: BullGuard has a few holes in its malware-detection armour and little else to offer. We hope for improvements in the next version, especially given its £19 annual fee.

COMODO MOBILE SECURITY

FREE • comodo.com • tinyurl.com/bwdbtyp

Comodo Mobile Security delivered consistent, if not exemplary, performance across most of AV-Test's interrogation, scoring between 65- and 90 percent in 11 of the 19 categories, and 90-percent-plus in four. Jifake, KungFu and SerBG snuck past its defences, as they did with many other malware blockers we tested.

We have mixed feelings about the bright green and red Android character who briefly appears at Comodo's launch. But this smartphone app is a good all-rounder, offering an initial health check, plus free 'anti-theft' tools in the guise of remote lock, wipe and device location, plus an alert if someone changes the SIM in the phone. A moderately loud alarm can be activated by texting alarm#your_password to your phone.

The Health Check covers storage allocation, the status of installed apps and any blocked calls and texts received. Its 10-second scan verified that our virus definitions were up to date (automatic updates were active) and that there was no malware, but one pending app could be a risk: we'd previously installed F-Secure outside of Google Play. We were also shown a detailed breakdown of apps we'd installed.

You can create a passcode-protected 'private space' on your handset for text messages, contacts and private call details.

VERDICT: Comodo's malware-detection skills are mid-table, but we're sold on the diagnostic tools for Android handsets and the useful, easy-to-use 'anti-theft' options.

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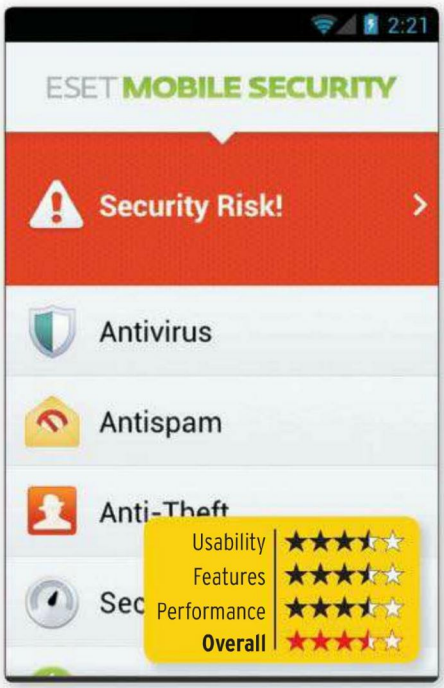
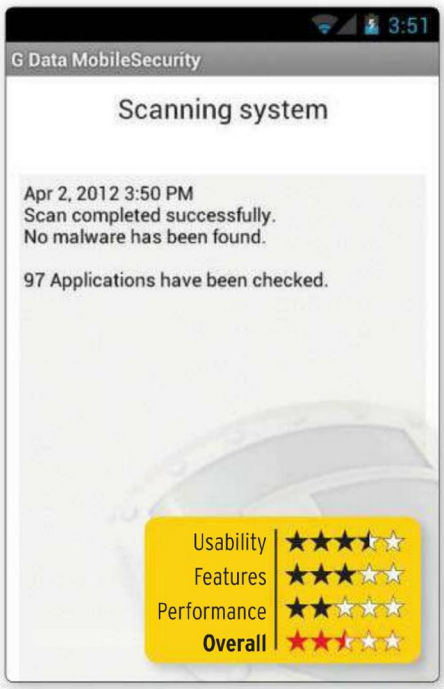




ESET MOBILE SECURITY

£16 • eset.co.uk • tinyurl.com/bwnhe5k

Eset Mobile Security is offered as a direct download from the company's website. If you look hard, you'll find a free trial after email registration; otherwise it costs £16.

With most of its malware-detection test results in either the 90 percent-plus or 65- to 90 percent categories, Eset gave a decent account of itself when faced with 19 families of Android malware. A couple of clear dips – Exploit.Lotoor went almost totally undetected – pulled it down the score table. This app also appeared to struggle with KungFu, malware with backdoor functionality that can exploit unpatched handsets.

Eset is clearly designed for smartphone use; on a tablet it works in portrait mode. On-demand device scanning took less than 10 secs, but checked only 459 of our files. Nothing suspicious was found, even though we'd allowed the installation of apps from unknown sources to load Eset itself. The Settings menu lets you specify a deeper archive scan (levels 1 to 4 are possible) and to activate 'proactive protection'.

Trusted-friend options help you recover your password if you're locked out of your device, while SMS commands are said to allow you to initiate remote locking, password changes and data wiping.

VERDICT: Combining reasonable malware detection and tools to lock your handset if it's compromised, Eset Mobile Security should guard an Android phone well. We're not convinced it does more than the free tools reviewed here, though.

G DATA MOBILESECURITY

FREE[1] • gdatasoftware.co.uk • tinyurl.com/ckrtxu4

How the mighty have fallen. G Data has previously won *PC Advisor*'s Best Buy award for its Windows security suite, so finding it in the third tier of AV-Test's league table for its Android protection was a surprise.

In seven tests it allowed through more malware than it blocked, and two Trojans – Jifake and Rooter – weren't detected at all. The app scored more than 90 percent detection rates in only two categories, and just four of its results fell within the 65- to 90 percent sector. G Data has much ground to make up if it wants to continue in the field of mobile malware protection.

That it scanned just 97 apps on our Android 4.0 smartphone – devoting a scant 10 secs to the task – was unimpressive. On our Android 4.0 Honeycomb tablet it was a similar story: 131 apps checked in 8 secs.

G Data's other party trick is to tell you about the permissions you've granted installed apps. This is useful, but it doesn't make MobileSecurity the most compelling of antivirus apps.

We were put off by G Data's pricing structure: it appears in Google Play and is marketed as free, but you'll need to pay £9.99 a year to download new signatures; without these, the poor protection it affords will only deteriorate. If you're already a G Data customer, you get these for free.

VERDICT: Given G Data's reputation as a quality desktop security software vendor, we're worried consumers will assume the same of its Android app. Avoid at all costs.

NORTON MOBILE SECURITY LITE

FREE • uk.norton.com • tinyurl.com/cdwnLps

Another big name in the Windows security field, Norton didn't do as great a job of protecting our Android gadgets. It put in a patchy performance when asked to identify families of malware with similar trademarks, identifying 90 percent or more of only nine of the 19 sets. A further four were partially blocked. The SerBG Trojan would have a field day: Norton didn't spot it at all. Exploit.Lotoor would also likely go unnoticed.

Incredibly, the app deters users from scanning the SD Card they may have inserted, for fear of slowing down the malware check. In all, the on-demand scan took 39.5 secs to scan 1,551 files, even with an SD Card to consider. This was 13 seconds longer than without scanning the card. Norton reported it had scanned just 131 files, which we found worrying.

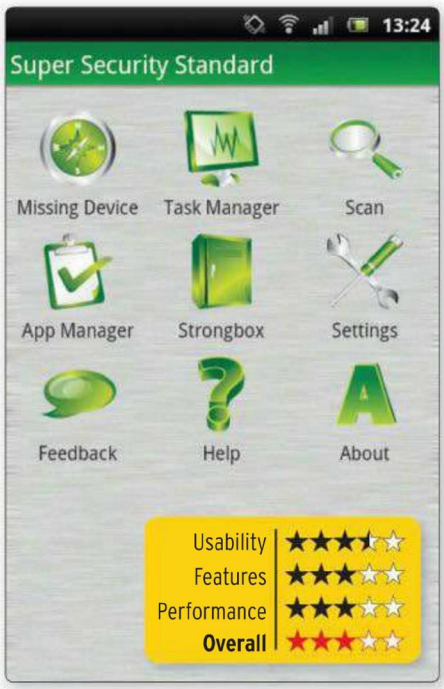
Reports to Norton Community Watch are enabled until you deselect the option; scheduled scans are weekly.

At launch Norton offers you the choice of Set Up Anti-Theft, Anti-Malware and Web Protection. The malware scanner component is available for free; the rest requires a paid upgrade. This costs £30 per year and can be bought with a single click. The in-app purchasing is easily the best implemented part of this very limited app.

VERDICT: Were Norton Mobile Security a sophisticated antimalware tool that blocked most known Android threats, we'd happily recommend it. But its protectiveness falls far short of expectations. Must try harder.

[1]£9.99 for signature updates

WorldMags.net



QUICK HEAL MOBILE SECURITY

$12 (£7) • quickheal.com • tinyurl.com/bw6frLa

Quick Heal put in a reasonable performance when its malware-detection skills were put to the test. In 10 of the 19 tests, it found between 65- and 90 percent of the infected samples. It caught 90 percent-plus of malware in a further five categories.

However, Quick Heal had difficulty in spotting Geinimi, KungFu and SerBG infections, with sub-40 percent detection rates, and it found less than 65 percent of strains in the Yzhc family.

The app scans both the Android device and any installed media cards unless you tell it not to. Our tablet was given a clean bill of health after 41 secs and 2,380 files.

Scanning and deciding what to do with quarantined files seemed to be Quick Heal's main concern. It prefers to attempt to repair damaged or infected files, although details of how it hopes to do so aren't provided. We changed the app's default settings to delete suspicious files and remove quarantined files after seven days rather than a month.

Call blocking and number blacklisting are useful additions if it's an Android smartphone you're protecting. Quick Heal will also keep a record of any unwanted SMS messages received so they can be reported and traced.

VERDICT: The Quick Heal malware scanner will probably protect your handset well while fending off unwanted callers. We're concerned that it wants to fix, rather than delete, suspected malware.

SUPER SECURITY STANDARD

FREE • superdroid.net • tinyurl.com/cprhdk8

Super Security sounds worryingly like one of those ransomware programs that catch out Windows users, offering to fix your PC having identified some issues with its settings. Thankfully, AV-Test assures us this app is not a drive-by Trojan download. In its independent tests it posted nine 90 percent and above scores. But it had a total blind spot when it came to the Opfake Trojan.

This, plus a couple of other duff scores, meant Super Security blocked not much more than 60 percent of AV-Test's malware in total – a poor showing.

We didn't like Super Security's alarmist reporting of what it found on our Android phone after its first scan. Malware and High Risk items were given top billing, although it later transpired these could simply be live wallpapers or apps that can access your contacts list to tell you who's calling.

Three of the high-risk items were other security apps, while the Met Office app was called out for using location tools to tell us the weather forecast. Our main heightened risk – allowing app installation outside Google Play – was hidden at the bottom.

An apparently useful 'Strongbox' feature proved less so when Super Security insisted on scanning our SD Card with no option to decline. Password- and PIN-protection, remote lock and a task manager that force quits system hogs are all included.

VERDICT: Super Security isn't without merit, but with a few too many holes and scary messages we're disinclined to use it.

TOTAL DEFENSE MOBILE SECURITY

£23 • totaldefense.com • tinyurl.com/bo98gsq

With 11 90-percent-plus test results and five more in the 65- to 90 percent detection rate tier, Total Defense had a fair stab at living up to its billing. It was outwitted by both Opfake and Xsider, though.

Although it's listed as a free app, Total Defence costs £23 per year. This includes six months of updates on up to three Android, Windows Phone, Symbian or BlackBerry devices.

Total Defense auto-scanned our tablet and flagged BullGuard as a potential threat, but it didn't state why.

Almost immediately after activating the software you're prompted to activate Total Defense as a device administrator. This allows the app to delete all data, alter password rules and the screen-unlock password. We think it would be far too easy to assume this is simply a part of the general setup and hand over such control without a second thought.

Unfortunately, Total Defense doesn't give you any say in the matter, refusing to perform a complete-device scan without this permission in place.

Instead, we got it to scan on a by-folder basis, for which all are automatically selected. Timings varied, but averaged 1 min 45 secs over three tests. We ensured media card scanning was selected, but nothing stored on it appeared in the scan list.

VERDICT: Total Defense gets a good report from AV-Test, but we dislike its price and insistence on becoming an administrator.

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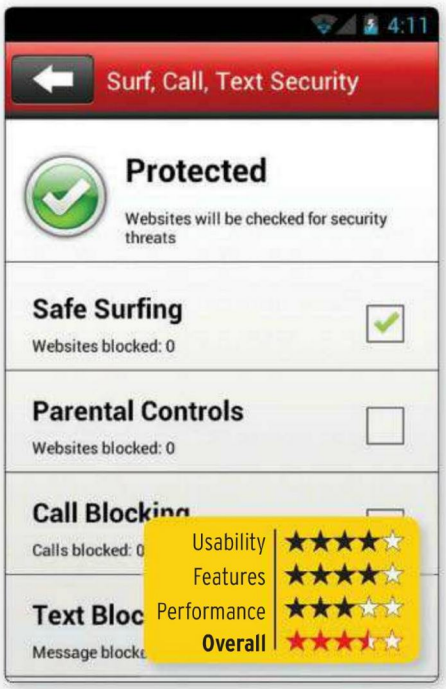

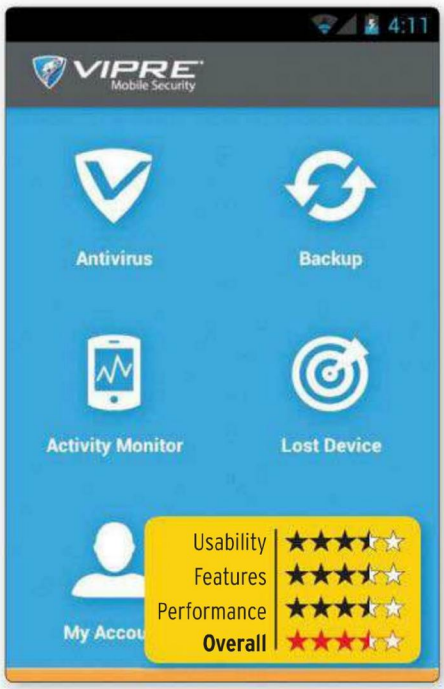

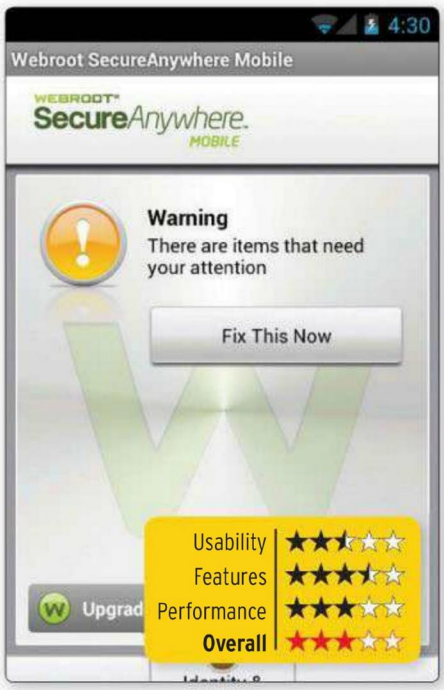

TREND MICRO MOBILE SECURITY

FREE • trendmicro.co.uk • tinyurl.com/7opou39

Trend Micro was one of the pioneers of cloud-based security scanning for Windows, so it's a surprise to find it so far down the results table for Android antivirus apps. It put in a reasonable malware-detection performance with a mix of 90-percent-plus and 65- to 90 percent scores, but several rival products got consistently better results and it struggled with SerBG.

The interface is well-designed, with sufficient information to allow you to make informed judgements about settings and actions in the event of rogue files being unearthed.

You don't have any say over what's scanned for malware. There's an initial scan of what's already installed, plus a real-time scanner that monitors what you subsequently download. Our device scan took 41 secs to check through 1,484 files.

Parental controls and website filters can be applied, although the latter's list can't be customised in the free version. We instead applied the strict web filter, but this still served up plenty of adult images. With a 'child' filter applied, the parental controls automatically blocked several sites and prompted us to delete bookmarks that were deemed inappropriate. A scan of content filters to each of three age settings gave us more than enough control for our needs.

VERDICT: Trend Micro offers reasonable web protection, coupled with solid parental controls. We'd want the reassurance of a second malware scanner, though.

VIPRE MOBILE SECURITY BETA

FREE • vipremobile.com • tinyurl.com/bsyuku2

Vipre finds itself in the same boat as Trend Micro. It put in a reasonably consistent malware-detection performance, but a few too many so-so results left it trailing the pack of familiar-name security software brands.

AV-Test found Vipre capable of detecting more than 90 percent of malware in 10 of its 19 malware categories, and more than 65 percent in a further eight. Its performance was less impressive with KungFu, a Trojan with backdoor functionality that can exploit unpatched Android handsets, where it detected between 40- and 65 percent of threats.

Setup involves creating an online account, after which you scan the whole smartphone for any rogue files. Refreshingly, you don't have to wait while Vipre does this. Installed apps can be scanned in isolation if you prefer. Activation protection checks apps as they're downloaded, while scheduled scanning is active by default.

Allowing administrator privileges lets Vipre remotely lock and wipe your phone if it goes missing. It also periodically tracks your device's whereabouts, as the Activity Monitor reveals. Call, text and browsing history can be tracked here, too.

However, Vipre lacks parental controls, a website checker, and any form of data or contacts backup options.

VERDICT: This beta software crashed while scanning, but the interface was easy to use and cleanly laid out. Vipre also needs to up the ante slightly with its malware detection.

WEBROOT SECUREANYWHERE MOBILE

FREE • webroot.com • tinyurl.com/bsvh26r

Webroot didn't give a great account of itself in AV-Test's malware-detection tests. This was largely down to the patchiness of its threat scanning engine.

In nine of the 19 malware categories that AV-Test used, Webroot struck gold, detecting at least 90 percent of the suspect files. But in three categories it picked up very little suspicious content, putting Webroot well behind the competition.

The interface wasn't our favourite either, with annoying messages about easily fixed items listed as needing our attention and putting us at risk. We thought it unlikely that we'd need to prioritise setting up remote data wiping in case we lost the device even before we'd scanned for malware.

Clicking on the nearly hidden Security tab at the bottom of the screen, we found there were no current security issues. We could optionally set up secure web browsing. This would have been much more helpful if it were displayed on the main screen.

The antivirus scanner is efficient enough. It includes a scheduler, but it's another feature that's likely to go unnoticed. The smartphone version offers a slightly clearer interface and the option to filter your calls and texts.

A paid-for version costs $19.99 per year, and adds remote wiping, SIM card lock, settings audit and an app inspector.

VERDICT: Webroot covers the basics, but misses too many rogue files for us to recommend it above others here.

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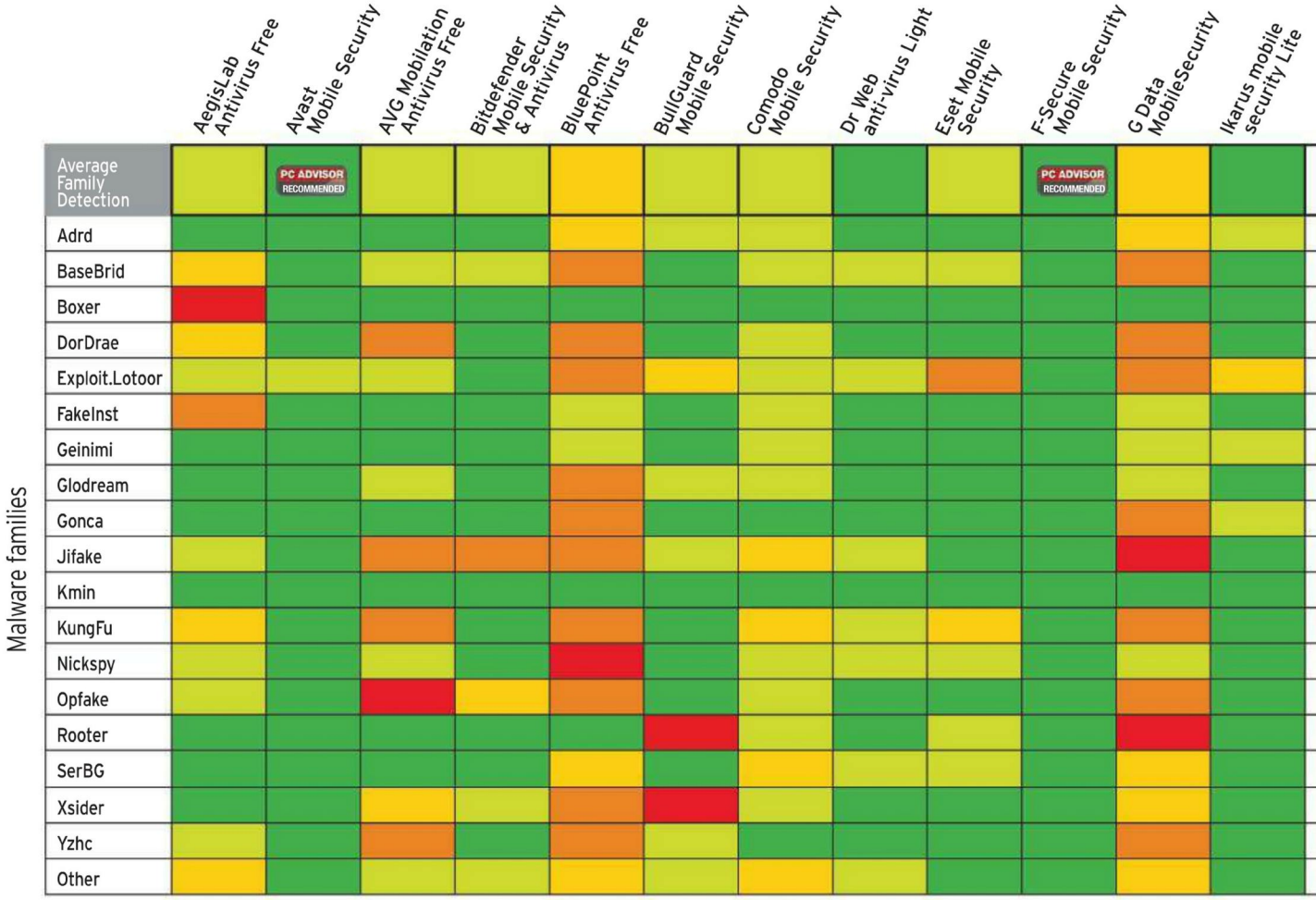
CONCLUSION

Any bedroom software developer can make an app that claims to protect your phone against Android malware. But just because you see a moving progress bar, or a list of dangerous malware names running down the screen, it doesn't mean the app is doing anything useful.

In AV-Test's extensive testing of 41 Android antimalware apps, 18 of them – nearly half – were so poor that, if exposed to any randomly selected malware family, there would be a roughly 50 percent chance of being infected. Fifteen apps had less than 40 percent success in identifying danger. And two of those apps could not detect a single instance of malware. We would suggest that these apps are worse than useless, inspiring a false sense of security.

Moving up the list, we find some names familiar to Windows users appearing in the 40- to 65 percent efficacy band. AVG, Bitdefender, BullGuard, Eset, Norton, Trend Micro and Webroot have Android apps that could more often than not spot a malicious app. But the amount they let through in AV-Test's lab routine means we wouldn't recommend relying on any of them.



	AegisLab Antivirus Free	Avast Mobile Security	AVG Mobilation Antivirus Free	Bitdefender Mobile Security & Antivirus	BluePoint Antivirus Free	BullGuard Mobile Security	Comodo Mobile Security	Dr Web anti-virus Light	Eset Mobile Security	F-Secure Mobile Security	G Data MobileSecurity	Ikarus mobile security Lite
Remote wipe	×	✓	×	×	×	×	✓	×	✓	✓	✓	×
GPS tracking	×	✓	×	×	×	×	✓	×	×	✓	×	×
SD Card scan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Parental controls	×	✓	×	×	×	×	×	×	×	✓	×	×
Website checker	×	×	×	✓	×	✓	×	×	×	✓	×	×
Contacts backup	×	×	×	×	×	✓	×	×	×	×	×	×
Data backup	×	×	×	×	×	×	×	×	×	×	×	×
Price	Free	Free	Free	Free	Free	£19	Free	Free	£16	29 (£23)	Free[1]	Free
Usability	★★★½☆	★★★★½	★★★½☆	★★★★☆	★★★½☆	★★★☆☆	★★★★☆	★★½☆☆	★★★½☆	★★★★☆	★★★½☆	★★★½☆
Features	★★½☆☆	★★★★½	★★★☆☆	★★★☆☆	★★★☆☆	★★½☆☆	★★★★☆	★★★☆☆	★★★½☆	★★★★☆	★★★☆☆	★★★☆☆
Performance	★★★☆☆	★★★★☆	★★★☆☆	★★★½☆	★★☆☆☆	★★★☆☆	★★★½☆	★★★★☆	★★★½☆	★★★★½	★★☆☆☆	★★★★☆
Overall	★★★☆☆	★★★★½	★★★½☆	★★★½☆	★★½☆☆	★★★☆☆	★★★½☆	★★★☆☆	★★★½☆	★★★★½	★★½☆☆	★★★½☆

More than 90 percent | 65-90 percent | 40-65 percent | Below 40 percent | Null

[1]£9.99 for signature updates

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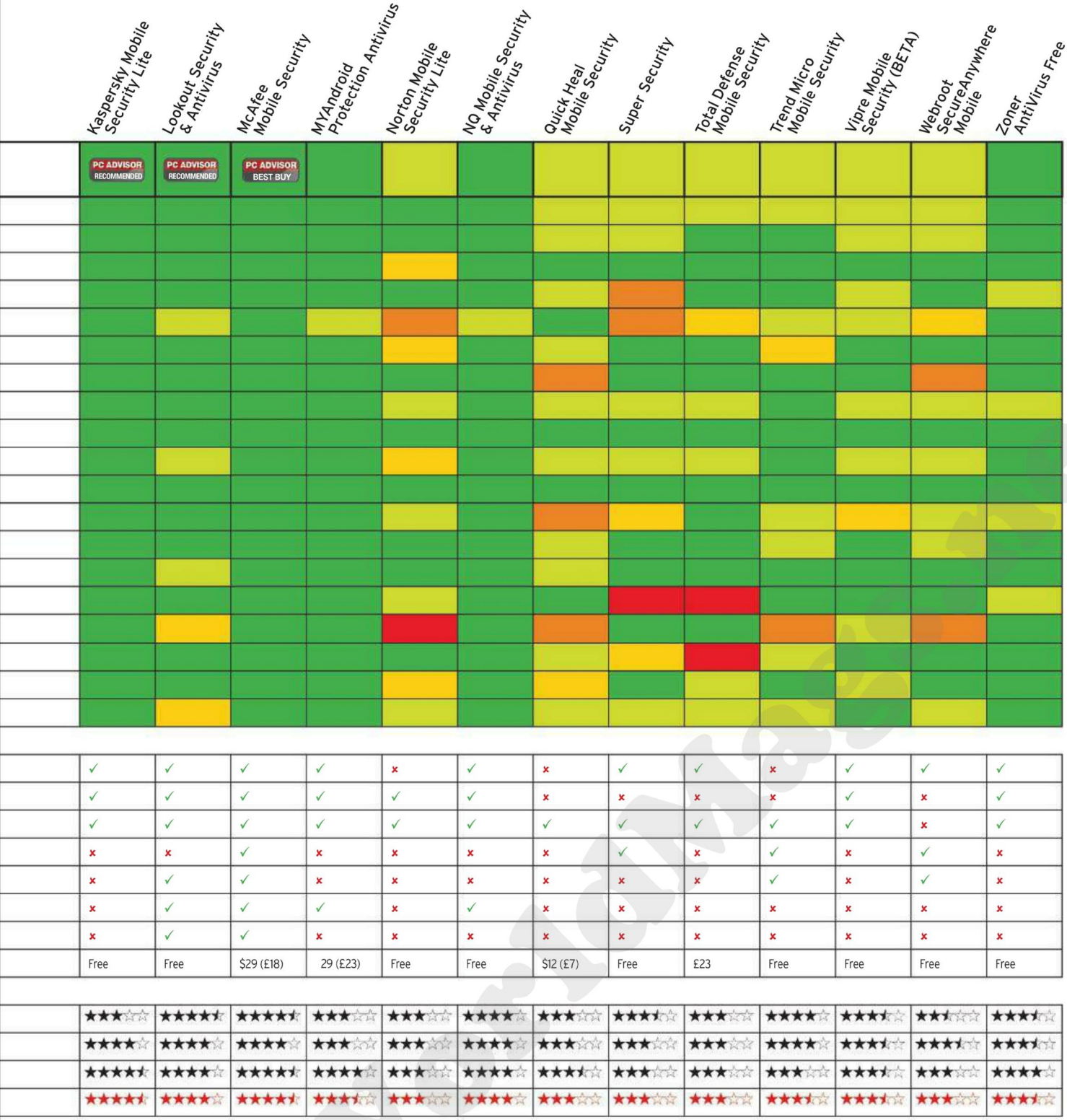
In the top band are the apps that stand the best chance of keeping out most current Android nasties. Of the free apps in this more successful group, we think Avast and NQ Mobile Security are better featured and their interfaces more intuitively designed than others – notably Kaspersky, which scored top marks for malware detection, but has a poor interface and no website scanning or backup and restore options. Do note, though, that both Avast and NQ were tripped up by the Exploit.Lotoor Trojan. Lookout is worthy of attention, though.

From the paid-for top-tier apps, we liked McAfee, followed by F-Secure. Our other choices based on lab results and user experience are Eset and MYAndroid, although the latter seemed intent on getting our money before protecting our security, asking for credit-card details to be entered on a potentially infected phone.

Even the best Android security software is another source of battery drain, a performance aspect not recorded in this group test. However, with the malware likely to keep on coming, your only alternative is to choose a more secure mobile platform. ☒



	Kaspersky Mobile Security Lite	Lookout Security & Antivirus	McAfee Mobile Security	MYAndroid Protection Antivirus	Norton Mobile Security Lite	NQ Mobile Security & Antivirus	Quick Heal Mobile Security	Super Security	Total Defense Mobile Security	Trend Micro Mobile Security	Vipre Mobile Security (BETA)	Webroot SecureAnywhere Mobile	Zoner AntiVirus Free
	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR BEST BUY										
	✓	✓	✓	✓	×	✓	×	✓	✓	×	✓	✓	✓
	✓	✓	✓	✓	✓	✓	×	×	×	×	✓	×	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓
	×	×	✓	×	×	×	×	✓	×	✓	×	✓	×
	×	✓	✓	×	×	×	×	×	×	✓	×	✓	×
	×	✓	✓	✓	×	✓	×	×	×	×	×	×	×
	×	✓	✓	×	×	×	×	×	×	×	×	×	×
	Free	Free	$29 (£18)	29 (£23)	Free	Free	$12 (£7)	Free	£23	Free	Free	Free	Free
	★★★☆☆	★★★★½	★★★★½	★★★☆☆	★★★☆☆	★★★★☆	★★★☆☆	★★★★☆	★★★☆☆	★★★★☆	★★★★☆	★★½☆☆	★★★★☆
	★★★★☆	★★★★☆	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★☆☆	★★★★☆	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆	★★★★☆	★★★☆☆	★★★★☆
	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	★★★☆☆	★★★★☆

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Family PCs round-up

Not everyone needs a multimedia centre or a super-fast PC built for playing the latest games. Paul Monckton tests six machines that offer great all-round performance and features for all the family

We've selected six desktop PCs that are great all-round performers for home and family use. Most are packaged with large flat-panel monitors, suitable for work and play, and all come with a keyboard and mouse.

We've sought out excellent build quality, a home-friendly design, and useful accessories and peripherals that let you quickly get the PC up and running out of the box. A useful software bundle is also appreciated, while novice users will benefit from the guided setup of some of these PCs.

If you're not itching to play the latest Windows games, you can save a considerable amount of money on a PC that uses integrated rather than dedicated graphics. In such systems, the CPU handles both the application- and graphics processing. These chips, available from AMD and Intel, are capable of handling full-HD video, as well as the latest games at moderate detail settings.

Introducing Ivy Bridge

Intel was gearing up to release its new Ivy Bridge processor line-up as we went to press (see pages 12, 16 and 36 for more information, analysis and an in-depth review). Only Chillblast was able to get hold of an Ivy Bridge chip in time for our review, while Quiet PC's Nofan IcePipe PC is fitted with an Intel Z77 Express chipset that's compatible with the new processors. You can expect slightly faster versions of all the machines reviewed here to be available by the time you read this.

Ivy Bridge offers better performance than the Sandy Bridge predecessors, selected here by Arbico, Eclipse and Quiet PC. The Core i5-3570K used by Chillblast will form the core of a tremendously powerful home PC, capable of chomping through whatever you throw at it – even editing HD video. By the time you read this, most PC vendors should offer Ivy Bridge as standard.

The previous-generation Core i5-2500K is still a great performer, though, and available at a good price. Its 'K' suffix means the chip can be easily overclocked, provided that your motherboard supports this feature. The i5-2500K also offers faster integrated graphics than the standard i5-2500, so it's a good choice if you're not investing in a dedicated graphics card.

For occasional gaming or to accelerate video encoding, AMD's Fusion chips offer still-faster integrated graphics. The trade-off is a reduction in application performance.

There are reported issues concerning AMD's Bulldozer processor – seen here in the FX-4100 and FX-6100 – with certain games downloaded through the Steam store. A Bios update appears to fix the problem.

You can always upgrade the graphics setup later, of course, and neither the AMD Radeon HD 6870 nor nVidia GeForce GTX 560 Ti will break the bank.

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Photography by Dominik Tomaszewski

Important specifications

For memory and storage requirements, consider 4GB of RAM and a 500GB hard drive as the minimum. All the systems here have at least 8GB of memory.

If you want a PC for watching films and video, listening to music and chatting with friends, a decent speaker set is essential. For larger rooms or simply a bigger sound, a 2.1 stereo set that incorporates a separate bass speaker or 'subwoofer' will perform better than a cheap 5.1 setup. (Note that the '5' refers to the number of speakers, while the '.1' refers to the subwoofer.)

Screen quality is crucial. Look out for in-plane switching (IPS) panels where available, which offer better colour fidelity than budget twisted-nematic (TN) monitors. These high-quality displays are seldom offered in family systems, but are well worth seeking out as a custom option – especially if you're into photography.

A good screen with decent viewing angles becomes crucial when two or more people are viewing the screen at the same time.

Consider a 24in full-HD monitor rather than a get-you-by 21.5in model, especially if you'll be using the PC to watch DVDs or video. A Blu-ray drive is finally a more affordable option, and the HD films it supports will make the most of your screen.

Listening to music or watching films is spoiled by a noisy PC. Sound-dampened cases can drastically cut down on the noise produced by fans and drives. Good-quality CPU coolers can also help. Quiet PC's Nofan IcePipe omits fans and a rotating hard drive, allowing it to operate silently.

Beginners may find the automated setup process of PCs from larger manufacturers such as HP useful. This can help you configure your machine and get online. The down side of this hand-holding gesture can be a lot of unwanted preinstalled software that can slow down your PC, but many UK vendors bundle the bare minimum of extra software – usually free open-source or obsolete versions of commercial programs.

Built-in wireless networking is useful if the PC won't be positioned next to your router, as are wireless keyboards and mice that remove unsightly cable clutter from the desk. The quality of these peripherals can often be overlooked but, as the primary interface between you and the PC, it pays to get decent, ergonomic components.

As a family PC, the system may be needed as a communications hub. To this end, a webcam is an essential asset.

Don't forget to check the warranty terms, which vary greatly between PC vendors. Some offer a two- or even three-year warranty, but beware of small print that states a parts- or labour-only guarantee. You may also be asked to pay to return the faulty product you've been sold.

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ARBICO EXCEL 2568HD

£849 inc VAT • arbico.co.uk • tinyurl.com/bus9xjp

Build	★★★½☆
Features	★★★★☆
Performance	★★★★½
Value	★★★½☆
Overall	★★★★☆

Arbico's eXcel 2568HD is a good all-round PC with a nod toward the enthusiast gamer. It comes with a powerful Intel Core i5-2500 processor, running at 3.3GHz, and a factory-overclocked ATI Radeon HD 6870 graphics card – key to its stellar gaming performance.

The system is housed in an imposing black Revoltec 67 system case, incorporating mesh side panels through which you can just make out four bright-red cooling fans. The black paint job continues inside the case, where we also found tool-free drive bays.

There's no internal cable management, but Arbico has tidied up the wiring with liberal use of cable-ties. There's ample space for any upgrades you may wish to add later.

In addition to the 8GB of RAM and 1TB Samsung hard drive, a fast 60GB OCZ SSD gives a significant performance boost, especially when booting into Windows. The plastic hard-drive mountings didn't survive the journey to our lab, however, and the hard drive had broken free and was non-functional.

You also get a DVD/Blu-ray combo drive and a pair of Logitech S120 stereo speakers, but no subwoofer. The Logitech MK260 peripheral set combines a wireless keyboard and mouse, with multimedia controls and hotkeys for launching frequently used programs. Ahead Nero and CyberLink PowerDVD are preinstalled.

The Arbico's performance was among the best of the group in our tests. While its 175-point WorldBench 6 score was beaten by the Quiet PC and Chillblast systems, this is a very fast machine.

Its gaming framerates were more impressive still, with the Arbico delivering the fastest graphics performance in the group.

VERDICT: If there's a gamer or PC enthusiast in your family then this may be the system for you. It's powerful, comes with a speed-boosting SSD and offers class-leading graphics performance. However, a separate 60GB SSD requires more attention when managing disk space. Better speaker sets and peripherals are also available with PCs that cost less.

BRAEBO MITHRAS

£799 inc VAT • braebo.com • tinyurl.com/cwL5Lt2

Build	★★★½☆
Features	★★★½☆
Performance	★★½☆☆
Value	★★★☆☆
Overall	★★★☆☆

One of two AMD processor-based PCs in our round-up, the Braebo Mithras is the only six-core system of the group. But its 3.3GHz FX-6100 chip is no match for its Intel Sandy- and Ivy Bridge counterparts available elsewhere, and scored just 128 points in WorldBench 6 – the lowest recorded here.

The Braebo is fitted with an AMD Radeon HD 6450 graphics card, although it delivered only slightly faster gaming framerates than the Intel Graphics HD 3000 integrated to the Quiet PC's processor.

While a 500GB hard drive may be adequate for many users, a family of music or video collectors can quickly fill that space. All except Quiet PC's silent system offer double this capacity.

A 21.5in AOC F22+ monitor is included, featuring a full-HD image but no digital inputs. The single analogue VGA connector results in poorer image quality, and you won't be able to easily hook up a games console. HD playback is supported by the Blu-ray/DVD combo drive, but no speakers are included with the package.

Braebo bundles a Microsoft Wireless Desktop 3000 keyboard and mouse set; the former has a built-in wrist-rest, plenty of media controls and customisable function keys.

Gigabyte's GZ-G Plus system case has some handy features, including four front-facing USB ports – two support USB 3.0. However, its aggressive styling won't suit all tastes. The case is also festooned with fans, two of which have their own power switches at the front of the case. You run the risk of a family member accidentally switching off the cooling – if it's necessary then that's a problem, and if it's not then the fans shouldn't be there.

The system comes preinstalled with antivirus software, Microsoft Office Starter Edition 2010 and 500GB of online storage.

VERDICT: This mid-priced PC may cost less than some, but it's not without its shortcomings: an outdated monitor, small storage capacity and lacklustre performance leave it wanting in key areas. However, we welcome the online storage and decent wireless keyboard.

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CHILLBLAST FUSION LONGBOW

£711 inc VAT • chillblast.com • tinyurl.com/caLep8w

The Fusion Longbow is the first Ivy Bridge-powered PC we've seen, putting it at a distinct advantage over the other contenders here.

Based on the 3.4GHz Intel Core i5-3570K, the Fusion Longbow recorded a superb performance score of 189 points in WorldBench 6. We've seen faster, but only from overclocked gaming rigs. This score was bolstered by the inclusion of 16GB of RAM, although you may not notice the benefit of this amount of memory in normal use.

To support the processor, a new motherboard design is required. Chillblast has chosen the Asus P8H77-M Pro, based on the Intel H77 Express chipset. The board supports a wealth of features, including: PCI Express 3.0 for enhanced graphics bandwidth; Intel Smart Response Technology, which enables a low-capacity SSD to boost hard-disk performance; four USB 3.0 and 10 USB 2.0 ports. It also supports overclocking of the CPU for even faster performance.

An AMD Radeon HD 6850 graphics card is installed, fitted with 1GB of memory. It runs only slightly faster than the similar card selected by Eclipse, but the Ivy Bridge processor allowed the Chillblast to take a significant lead in our gaming tests.

An LG Blu-ray/DVD combo drive is supplied, while the 23.6in Asus VS247H is an excellent display for viewing HD films. The panel includes VGA, DVI and HDMI inputs, allowing you to connect additional devices. There's also a subwoofer-equipped Logitech S220 speaker set, while a software bundle that includes Ahead Nero, CyberLink software, OpenOffice and The Gimp is optional.

The Cit Vantage system case incorporates internal cable management and comes with a built-in memory-card reader. A useful Wi-Fi card has also been fitted.

VERDICT: The Chillblast Fusion Longbow makes good use of the latest Intel components, delivering by far the best application performance in our family PC category. Gaming performance is also very good, and approaching that of Arbico's more expensive system. A decent software bundle, built-in Wi-Fi, Blu-ray and a well-specified monitor add up to make this an almost unbeatable PC, for now.

ECLIPSE MATRIX i323R685

£699 inc VAT • eclipsecomputers.com • tinyurl.com/cpjr64t

At £699, the Matrix i323R685 is the least expensive Intel-based PC of the group. Fitted with a dual-core Core i3-2310 processor it offers noticeably less processing power than the quad-core i5 systems, but still achieved a perfectly respectable WorldBench score of 151 points.

This Core i3 chip offers ample power for most users, who are unlikely to notice the difference in day-to-day performance unless they're undertaking intensive tasks such as video encoding or editing very large files in multithreaded applications. If this describes you, consider instead one of the AMD-based PCs – they perform slower in WorldBench, but have a greater number of processor cores.

The AMD Radeon HD 6850 graphics card makes even demanding games playable, provided that you keep down the resolution and quality settings. Its gaming performance falls behind that of the Chillblast, which has a slightly faster version of the same graphics card, coupled with a considerably faster CPU.

Eclipse has fitted 8GB of DDR3 RAM and a 1TB hard disk. It favours Intel's 'value' H61 Express Sandy Bridge chipset over the more advanced Z68 Express version selected by Arbico for use in the Asus P8H61-M LE/USB3 motherboard.

A 23in AOC display is slightly smaller than the largest monitors of the group, but offers the same 1920x1080-pixel HD resolution and has a power-saving LED backlight. This isn't the best display in our round-up, but it certainly trumps the 21.5in AOC supplied with the Braebo Mithras.

A Logitech subwoofer-equipped speaker set and a Blu-ray/DVD combo drive let you enjoy HD multimedia. There's also a wired keyboard and mouse, plus built-in Wi-Fi.

VERDICT: This reasonably priced PC offers lower performance than competing Intel boxes, but comes with a good display, Blu-ray support, Wi-Fi and a subwoofer-equipped speaker set. It's also a capable gaming machine, making it a good-value family PC.

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PC SPECIALIST FUSION FX-41

£649 inc VAT • pcspecialist.co.uk • tinyurl.com/cwky96a

PC Specialist's Fusion FX-41 offers a great deal of power for just £649. Its 3.6GHz AMD FX-4100 quad-core processor has fewer cores than the six-core Braebo, but each runs slightly faster. This can result in better performance in a number of applications, which explains its higher WorldBench 6 score of 134 points.

An 8GB allocation of RAM is included, along with a 1TB hard drive – double the capacity of the Mithras'. PC Specialist has also fitted a Powercolor Radeon HD 7750 graphics card with 1GB of memory. This chip is newer than the HD 6850 and 6870 found elsewhere, but slower nonetheless. The PC Specialist still beat the Braebo in our gaming tests, though.

A budget 23.6in Edge 10 M240 display offers a full-HD resolution, while a supplied Blu-ray drive lets you enjoy HD films. The ever-popular Logitech S220 speakers provide the sound output, enhanced by a subwoofer for extra bass.

PC Specialist provides 802.11n wireless networking, a card reader and a webcam. You also get a Logitech MK250 wireless keyboard and mouse; it's larger than the MK260, but lacks its row of hotkeys.

The PCS Enigma system case is very basic, but tidy and spacious. It offers a handful of useful front-facing ports.

A long, three-year warranty is reassuring, although this is merely a return-to-base, parts-only agreement.

VERDICT: It may be the least expensive PC here, but the Fusion FX-41's performance is more than adequate. It also boasts a well-rounded selection of features and peripherals.

	ARBICO £849 inc VAT	BRAEBO £711 inc VAT	CHILLBLAST £799 inc VAT PC ADVISOR BEST BUY
Model name	eXcel 2568HD	Mithras	Fusion Longbow
Processor	3.3GHz Intel Core i5-2500	3.3GHz AMD FX-6100	3.4GHz Intel Core i5-3570K
Monitor	23.6 Hanns-G HH241H (0.272mm, 1920x1080, DVI/VGA)	21.5in AOC F22+ (0.25mm, 1920x1080, VGA)	23.6in Asus VS247H (0.272mm, 1920x1080, HDMI/DVI/VGA)
RAM	8GB DDR3	8GB DDR3	16GB DDR3
Storage	1TB Samsung SATA III HDD, 60GB OCZ Agility 3 SSD	500GB Seagate SATA II HDD	1TB Seagate SATA III HDD
Power supply	500W Cooler Master	500W Alpine	700W Cit
Motherboard	Asus P8Z68-V LX	Gigabyte 970A-UD3	Asus P8H77-M Pro
CPU cooler	Standard Intel cooler	Standard AMD cooler	Standard Intel cooler
USB	2x USB 3.0, 6x USB 2.0	4x USB 3.0, 10x USB 2.0	2x USB 3.0, 6x USB 2.0
Graphics card	AMD Radeon HD 6870 OC, 1GB RAM	AMD Radeon HD 6450, 1GB RAM	AMD Radeon HD 6850, 1GB RAM
Sound/Speakers	Onboard, 2x Logitech S120	Onboard, not supplied	Onboard, 2x Logitech S220 (with sub)
Optical drive	LG Blu-ray/DVD combo drive	LG Blu-ray/DVD combo drive	Samsung Blu-ray/DVD combo drive
Operating system	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Bundled software	CyberLink PowerDVD, free utilities	Microsoft Office Starter Edition 2010	Free utilities
Case	Revoltec 67	Gigabyte GZ-G plus	Cit Vantage
Keyboard	Logitech MK260	Microsoft Wireless Desktop 3000	Logitech MK260
Extra features	None	500GB online storage	Wi-Fi, SD Card reader, switchable LEDs
WorldBench 6 score	175	128 (estimated)	189
Games score (fps)[1]	161/113	50/26	156/109
MediaEspresso time	5 mins 23 secs	10 mins 43 secs	5 mins 22 secs
Power consumption (Idle/Max)	65/184W	72/197W	70/152W
Warranty	2 years return-to-base	1 year return-to-base	2 years collect-and-return

[1]Framerates tested using Crysis (1280x720, Low/Medium detail)

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QUIET PC NOFAN ICEPIPE A40-Z77 SILENT PC

£1,124 inc VAT • quietpc.com • tinyurl.com/cfjj4j2

Build	★★★★☆
Features	★★★☆☆
Performance	★★★★½
Value	★★★☆☆
Overall	★★★★☆

Quiet PC's Nofan IcePipe is unique in our group test for its ability to operate in complete silence. This has been achieved not by sound-proofing the case or the use of quiet fans, but by removing these moving parts altogether.

The processor is cooled by a huge heatsink, which takes up the majority of the space within the Nofan CS-30 system case. The fanless power supply is similarly silent, and Quiet PC has taken the radical step of forgoing a hard drive and providing only an SSD for storage. Being devoid of moving parts, this is also silent.

Even the Microsoft Wired Desktop 600 keyboard/mouse combo has been chosen partly because of its 'quiet touch' keys.

Fanless operation means harmful dust isn't drawn into the case, while Quiet PC's thermal balancing ensures the system consumes only a fraction of the power required by the competition.

The Nofan IcePipe is fitted with a Gigabyte motherboard, which features Intel's Z77 Express chipset. Quiet PC had intended to supply the PC with an Ivy Bridge CPU, but one wasn't available in time.

Instead running the Core i5-2500K, the Quiet PC couldn't keep up with the Chillblast in our tests. Its 177-point WorldBench 6 score is still superb, however.

The enormous heatsink obscures many of the motherboard's expansion slots, although a PCI Express slot is free to add a graphics card – the Quiet PC currently relies on integrated graphics.

VERDICT: Completely silent in operation, the Quiet PC is a joy to use – but you'll have to pay a premium for this luxury. Storage is meagre for a family PC, and no monitor or speakers are supplied.

ECLIPSE £699 inc VAT ★★★★★	PC SPECIALIST £649 inc VAT ★★★★★ PC ADVISOR RECOMMENDED	QUIET PC £1,124 inc VAT ★★★★★
Matrix i323R685	**Fusion FX-41**	**Nofan IcePipe A40-Z77 Silent PC**
3.3GHz Intel Core i3-2310	3.6GHz AMD FX-4100	3.3GHz Intel Core i5-2500K
23in AOC E2350SDA (0.26mm, 1920x1080, DVI/VGA)	23.6in Edge 10 M240 (0.272mm, 1920x1080, DVI/VGA)	Not supplied
8GB DDR3	8GB DDR3	8GB DDR3
1TB Hitachi SATA III HDD	1TB Seagate SATA II HDD	120GB Zalman SSD
650W EZCool	450W FSP	400W Nofan
Asus P8H61-M LE/USB3	Asus M5A78L-M/USB3	Gigabyte GA-Z77-D3H
Standard Intel cooler	Standard AMD cooler	Nofan CD-100A
2x USB 3.0, 6x USB 2.0	2x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0
AMD Radeon HD 6850, 1GB RAM	Powercolor AMD Radeon HD 7750, 1GB RAM	Intel Graphics HD 3000
Onboard, 2x Logitech S220 (with sub)	Onboard, 2x Logitech S220 (with sub)	Onboard, not supplied
LG Blu-ray/DVD combo drive	Samsung Blu-ray/DVD combo drive	Samsung SH-S222 DVD±RW drive
Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Microsoft Office Starter 2010, BullGuard security	Microsoft Office Starter 2010, BullGuard security	None
Unbranded model 437-16	PCS Enigma Piano Black	Nofan CS-30
Microsoft Optical Desktop 400	Logitech MK250	Microsoft Wired Desktop 600
802.11n Wi-Fi	802.11n Wi-Fi, Logitech C210 webcam, card reader	Silent, fanless operation
151	134 (estimated)	177
122/84	104/68	37/19
10 mins 13 secs	10 mins 33 secs	2 mins 52 secs
56/140W	60/123W	23/51W
1 year return-to-base	3 years return-to-base (1 year parts)	2 years collect-and-return

PC ADVISOR TEST CENTRE

>> How we test and our conclusion

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Conclusion

A range of systems are available for family use, with different specifications to suit your needs. Our six review models vary wildly in price and performance.

If you don't want to be disturbed while the computer is in use there's the utterly silent Quiet PC Nofan IcePipe. We love it, but you must be willing to pay a high price for the luxury of peace and quiet.

We're pleased to see home-friendly features such as memory-card readers and webcams included in some PCs, as well as wireless keyboards with multimedia controls.

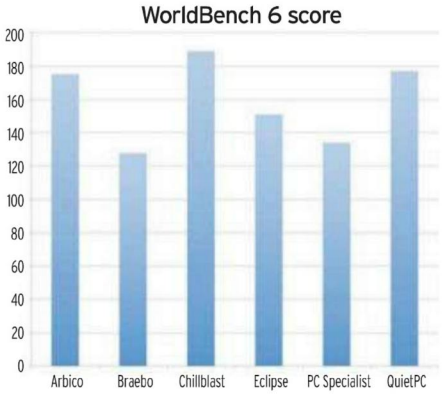
Several machines here also support 802.11n wireless networking, allowing you to site them away from the router and cut down on cable clutter.

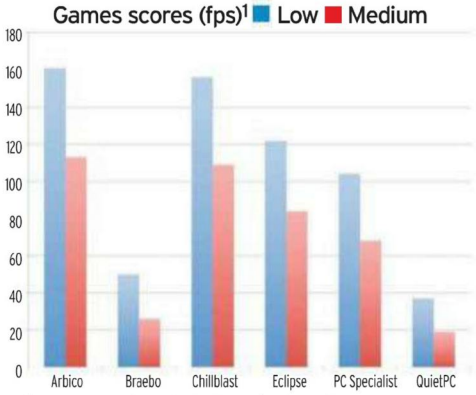
Many come with bundled software. Enthusiasts tend to find this so-called 'crapware' infuriating, but many a home user will value a suite of lifestyle-enhancing applications and pre-configured antivirus software. The combination of Ahead Nero and CyberLink utilities is usually a good starting point, and both are optional with systems from Arbico and Chillblast.

For a family PC that will potentially be placed in a living room, we had hoped to find smart, understated designs. Most PC builders are out of touch with their prospective customers, supplying systems that more closely resemble battle-ready gaming rigs. We'll leave it to you to decide if any would fit in with your home décor.

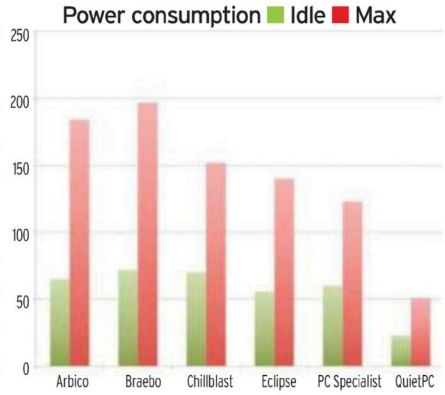
Sitting in the middle of the price range, Chillblast's Fusion Longbow is a compelling option with its future-proof Ivy Bridge architecture and excellent all-round performance. However, you could spend considerably less and still get a reasonably serviceable home PC.

If you're more interested in getting good features and a useful box of peripherals than sheer speed, PC Specialist's low-cost Fusion FX-41 may be all you need.





[1]Framerates tested using Crysis (1280x720, Low/Medium detail)



How we test

Application performance

Core system performance is measured using the WorldBench 6 real-world benchmark. This customised test suite runs actual Windows applications with a real-world workload, 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 form an additional test of the PC's multitasking capabilities. The results are then combined to produce a numerical score relative to a baseline PC.

The baseline configuration is a Vista PC running a 2.4GHz Intel Core 2 Duo E6600 processor, 2GB of DDR2 RAM, an nVidia GeForce 7900 GS graphics card, and two WD Caviar WD3200KS 320GB drives in a striped Raid 0 array. This PC scores 100 points in WorldBench 6.

Note that none of AMD's 'Bulldozer' processors has been able to complete the Nero 7.0 portion of the benchmark; scoring for these systems incorporates an estimated result for this sub-test.

Transcoding performance

Because you'll often be working with more than one video format, 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 exploited, allowing quad- and six-core CPUs to shine when compared to dual-core versions.

Gaming performance

A typical family PC is likely to be used to play a game or two in its lifetime, but pricey graphics cards tend to be outside the budget of such systems.

However, you'll be able to enjoy most modern games when run at slightly lower resolutions and quality settings. Indeed, we use the intensive game Crysis to test the graphics capabilities of each PC, configured at 720p, 'Low' and 'Medium' quality settings.

Overclocking

We allow overclocked processors only in our dedicated gaming PC reviews. All other components are run at stock speeds, with the exception of factory-overclocked graphics cards. We do, however, allow underclocking to reduce power consumption.

Subjective assessment

We pay close attention to the physical characteristics of each PC, its noise output and its build quality, delving inside the case and taking note of the cabling and airflow. Good-quality peripherals are important, and where they are supplied we note the ergonomics of the keyboard and mouse. We like PCs that are easy to set up and don't require any additional purchases. We're not so keen on gotchas such as low-capacity SSDs, which will fill up easily and cause file-management headaches.

Support

Warranty terms can impact our scoring. The longer the better, but we also look at the terms and conditions – specifically, whether faulty systems must be returned at your own cost and if parts and labour are covered. ☒

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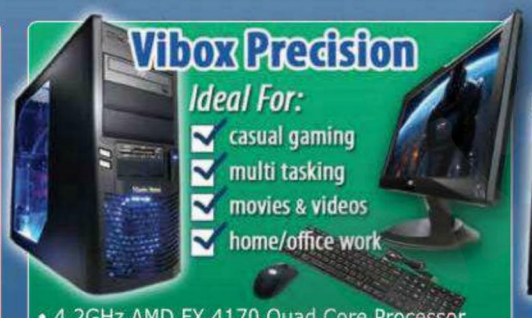

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- 16GB Corsair Vengeance DDR3 1600MHz RAM
- nVidia Geforce GTX 570 1.28GB Graphics Card
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Ultimate guide to buying a tablet

Investing in a tablet can be a confusing business. Orestis Bastounis explains your options in terms of real-world usability to help you make the right choice

The tablet computer is a brilliant innovation. For the first time, there's a category of mobile device that's powerful enough to run complex software, connects to the internet via wireless and mobile networks, and is portable enough to be taken anywhere.

Unlike a smartphone, tablets are just the right size for comfortably reading and editing text, but they're smaller, thinner and lighter than any laptop. All the functionality you might expect to find in a laptop or desktop PC has been squeezed into a device small enough to be used in places where it simply wasn't possible, or convenient, before.

High-street and online stores tempt consumers with shelves and web pages full of tablets, from dozens of manufacturers and with varying screen sizes, software and storage capacities. Prices range from as little as £100 for a 7in tablet such as the Disgo 7900, up to £660 for Apple's third-generation iPad with 4G connectivity and 64GB of storage. You can't choose a tablet based on its specification alone, though. The software it runs is just as important as the hardware it's encased in.

Google's Android and Apple's iOS have different quirks and nuances that will affect how you use a tablet. There are great variations between the way you browse the web, manage pictures and video, and synchronise contacts and email in Android and iOS.

Of course, though popular, Android and iOS aren't your only options. There's also BlackBerry's PlayBook OS and, soon, Microsoft will add Windows 8 to the mix.

Each platform has its own app store, and there's a big difference in the quantity and quality of software available in each. Without apps, you'd be stuck with the capabilities of the tablet as it ships, so it pays not to overlook this aspect.

We aim to help you find the right tablet for your needs, with an in-depth look at the operating systems and hardware available to you.

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Apple iOS

Pros
- Widest selection of high-quality apps
- Stability and high performance
- Clean and consistent structure and layout

Cons
- Available on a limited range of expensive devices
- Tied to cumbersome iTunes software

When the iPad was unveiled in 2010, it reinvented the concept of tablet computing. Apple's tablet has become the benchmark to which all rival designs are compared. The iPad is synonymous with style and quality, with a sturdy aluminium chassis and a fantastic 9.7in in-plane switching screen.

Apple has launched a new model every year since, with the iPad now in its third generation. With the iPad 2 came improved performance, especially in 3D games, while the latest incarnation adds a good-quality rear camera and a quad-resolution display. You can still buy the iPad 2, at £330 for the 16GB Wi-Fi-only model, while its successor costs from £399. Note that the Wi-Fi only versions don't have GPS receivers and can only approximate your location when connected to a hotspot.

Hardware is nothing without software, and iOS is one of the main reasons you might choose an iPad over anything else. Its user interface is incredibly responsive, allowing for smooth swiping between pages. It's rare for an iPad to crash, and there's a wider choice of apps and other content available from Apple's App Store than from Google's Play (the new name for the Android Market) or BlackBerry's App World.

Part of Apple's success is down to its control of both the hardware and software involved. This allows both Apple and app developers to provide a better user experience, since they know the exact specification of the device for which they are creating utilities.

However, this stranglehold has its down sides. For example, all content in the app store must first be approved by Apple, and Safari, the iPad's web browser, cannot display Flash content. This is still prevalent on the web, and it means you'll occasionally have to resort to a laptop to watch a video or access certain websites.

As with the iPod and iPhone, the iPad is managed via iTunes, Apple's desktop software. To put films, music or any other content on the iPad, it must be stored in your iTunes media library or purchased from the iTunes app on the device itself. You can't copy files across in Windows Explorer, nor can you download files such as music and video from an iPad. This idea takes some getting used to, but it eliminates many incompatibility headaches.

Despite this and relatively high prices, the iPad has become the most popular tablet platform by a considerable margin.

Android

Pros
- Open to user customisation
- Available on a wider range of devices than iOS

Cons
- Lacks consistency between versions and devices
- Fewer tablet-specific apps available from Google Play

Google's semi-open Android platform exists in stark contrast to Apple's tightly controlled iOS environment. The firm is responsible for the operating system and its content store, and owns many popular services that are an integral part of its setup, including YouTube, Gmail and Google Maps.

But Android hardware is produced by third parties, such as Samsung, Asus and Sony. This translates to greater choice and a range of prices. Flagship Android tablets, such as the Samsung Galaxy Tab 10.1 and Asus Transformer Prime, are about as powerful and well-built as Apple's iPad (and cost a similar amount), but there are also much cheaper options to be had.

There's a variety of screen sizes, too, in both 4:3 and 16:9 screen formats. For example, the 8.2in Motorola Xoom 2 Media Edition is lighter than an iPad, and small enough to hold in one hand, but still powerful enough to play HD video and games.

Many of the cheaper Android tablets may appear to be bargains, but can have buggy software, poor build quality and, in many cases, lack official Google apps or access to Google Play. Our advice is to avoid models that lack Google Play, and also those that have resistive, rather than capacitive, displays.

Android supports open standards, such as DLNA, and many (but not all) Android tablets have a USB port and a MicroSD card slot for expansion. When connected to a computer an Android device show up as a folder in Windows, to which files can simply be dragged and dropped. The built-in Android browser supports Flash, too.

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Android's widgets provide information updated in real time for such things as your email inbox and photo collection. One of the most appealing reasons to choose Android, however, is the freedom with which you can customise the OS. If you want to use a different browser, go ahead. If you want to try a different media player, there are plenty to choose from. Even Android's onscreen keyboard can be customised.

The version of Android you get varies depending on the tablet, and some cheaper models may run 1.x or 2.x smartphone OSes such as Donut, Froyo and Gingerbread. The first tablet-optimised version of Android is known as 3.0 Honeycomb, while Android 4.0 Ice Cream Sandwich is beginning to appear in the latest tablets.

Unlike with iOS, it's not possible to simply download and install the latest version of the code on the day of its release. Instead, hardware manufacturers must repackage the code to suit your device, then offer it for download. There is no guarantee that they will offer this service for your device, particularly once it gets beyond a certain age.

The number of Android operating system versions currently in operation is one reason tablets running Google software have proved less attractive to third-party app developers. Different hardware specifications, particularly in terms of the display, can also mean their apps will look great on one device and awful on another. You'll find more apps available for Android phones than tablets in Google Play.

On the plus side, however, it's easier for app developers to get their wares on to Google Play than it is with iOS, with fewer hurdles for them to jump.

RIM's 7in BlackBerry PlayBook is an inexpensive alternative. The cheapest PlayBook costs only £169, but is well-built and powerful enough to perform most tasks. A recent update (to version 2.0) added a much-needed email client and a bit of polish.

The smaller form-factor means the PlayBook is lighter and easier to carry than a 10in tablet. Navigating web pages is smooth, and the interface is responsive and easy to use. The screen is excellent, and the BlackBerry App World store has a decent selection of software for you to try. But the PlayBook has a long way to go to meet the success of Android and iOS, and app developers consider designing software for the platform a lower priority. There are no guarantees as to how long RIM will continue to support the PlayBook either.

BlackBerry PlayBook OS 2.0

Pros
- The PlayBook starts from only £169
- PlayBook OS is responsive and intuitive

Cons
- Small number of apps available
- Long-term support uncertain

Windows 8 tablets

Microsoft has dabbled in tablets longer than any other company. Indeed, Windows XP Tablet Edition was around back in 2005. But Windows 8 is the company's most concerted effort yet into the world of tablet computing, with a brand-new 'Metro' interface that's optimised for touchscreens.

Tablets running Windows 8 are unlikely to go onsale in the UK until 2013. Although some Intel-based tablets have been shown running the new OS, we expect tablet manufacturers to continue selecting ARM processors as they have done for Android and iOS. These are more power-efficient and allow for longer battery life.

Microsoft has hinted that the Classic desktop will co-exist with Metro in devices running ARM processors, although you won't be able to run desktop software in this environment as you might on an Intel-based Windows 8 desktop. Meanwhile, apps designed for Metro will run on both Intel- and ARM-based systems and, as with Android and iOS, Windows 8 has its own Store for their purchase.

Since Microsoft produces software for games consoles, PCs, phones and tablets, there's potential for the forthcoming OS to unify these devices and offer online services, such as Xbox Live, making them accessible from all devices. In fact, the Metro interface is already used by the latest Windows Phone handsets and the Xbox 360.

It's too early to say whether Windows 8 tablets will be a better choice than the iPad or best Android tablets. The interface looks good, but content remains king.

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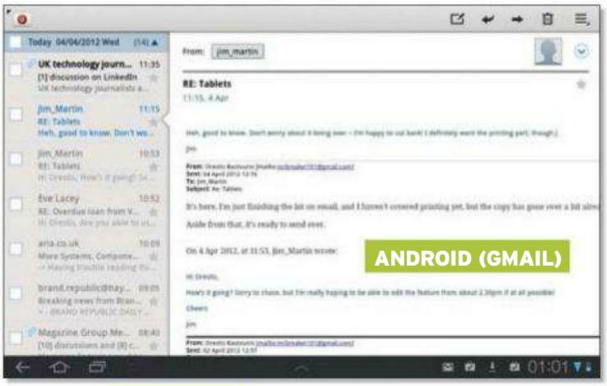
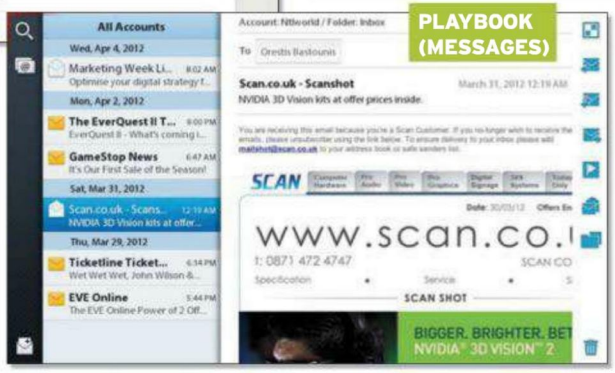
Tasks





Email

Just about every tablet has some sort of email program preinstalled. As tablets are designed to switch on instantly and be left in standby mode like a mobile phone, they're ideal for quickly checking your messages without having to wait for a PC or laptop to boot into a desktop OS.

Whether you generally use your PC's web browser, Microsoft Outlook or your tablet's built-in email app to log into a web-based email service (such as Gmail or Hotmail), any new messages, replies or flagged conversations will appear on whichever device you next use to log into the service. When an email arrives, the PlayBook, iPad and Android tablets can notify you with an alert noise, and a summary will appear onscreen.

The iPad's Mail app supports multiple email accounts. Apple assigns you an '@me.com' address when you register to use iCloud, but you can set up any number of webmail, Exchange or POP accounts, too. All can be nested in the Inbox, making it easy to quickly find your messages.

When you first turn on an Android device, it asks you to sign into a Google account which, by its very nature, means you'll also have a Googlemail or Gmail address. A single Google account can be used to log into a number of the search giant's online services, including Picasa, Google Docs and YouTube.

Different Android tablet manufacturers handle email in various ways. Samsung has its own email client on the Galaxy Tab, for instance, although you can also download the official Gmail app from Google Play.

Setting up an Exchange account (usually for your work email) on iOS is straightforward, provided that you know the server addresses. Reminders and contacts can also be synchronised with the iPad's respective apps. Even if you have a cross-platform setup, such as an Android phone and an iPad, you'll be able to access your phone's contacts, stored on Google's servers, on your tablet.

Android also works with Microsoft Exchange servers. The aforementioned Samsung Galaxy Tab's email app will automatically detect whether it's dealing with a POP3 or Exchange server, then request more details if applicable.

On the PlayBook, all communication is handled by a single app called Messages. It combines Facebook, Twitter and LinkedIn with traditional email, including Microsoft Exchange, Gmail, IMAP and POP3 accounts. You can use BlackBerry Bridge to share data such as email, contacts and BlackBerry Messenger (BBM) between the PlayBook and a BlackBerry smartphone over Bluetooth.

Photos, video & music

One of the main reasons to buy a tablet is entertainment. Movies and TV episodes take up a lot of storage, though, which has to be shared with any apps, documents, pictures and music you keep on the tablet. A tablet with 16GB or less storage can quickly fill up.

More content is available to purchase for the iPad than other tablets. The iTunes store has an enormous selection of music, TV programmes and films available, while Apple's Newsstand has a wide range of digital magazines, including *PC Advisor*.

Android, meanwhile, has the Google Play store. This offers movie rentals, apps and books; UK users will soon also be able to download music. There are alternatives, too: the Amazon Kindle store has one of the largest libraries of e-books anywhere. Zinio caters for a range of digital magazines. For music, a subscription to Spotify and its vast catalogue of songs for streaming is an alternative to storing music directly on the device. Kindle, Zinio and Spotify are also available as apps on the iPad.

You can check out reviews of the best apps available for Android and iOS on our website at tinyurl.com/cx8324t and tinyurl.com/bov6hyw respectively.

It can be tricky to put content you already own, such as DVD movies, on to an iPad. It has to be converted into a specific format, then imported into your iTunes library. A free video-encoding program such as Handbrake (tinyurl.com/bsq74om) can take an existing film then, at the touch of a button, reformat it for the iPad's screen size. But this process can be rather time-consuming.

There are fewer restrictions with Android. Such tablets can handle a wide range of media formats, and you can usually copy a movie from your computer directly on to the tablet, or on to a MicroSD card. Be warned that some of the cheaper Android tablets can't cope with HD video, though.

Another option is to wirelessly stream movies or music from your main computer to the tablet using an app such as Orb or Emit. Content no longer takes up precious storage, and can be viewed over a wireless network – even over a mobile data connection with certain apps.

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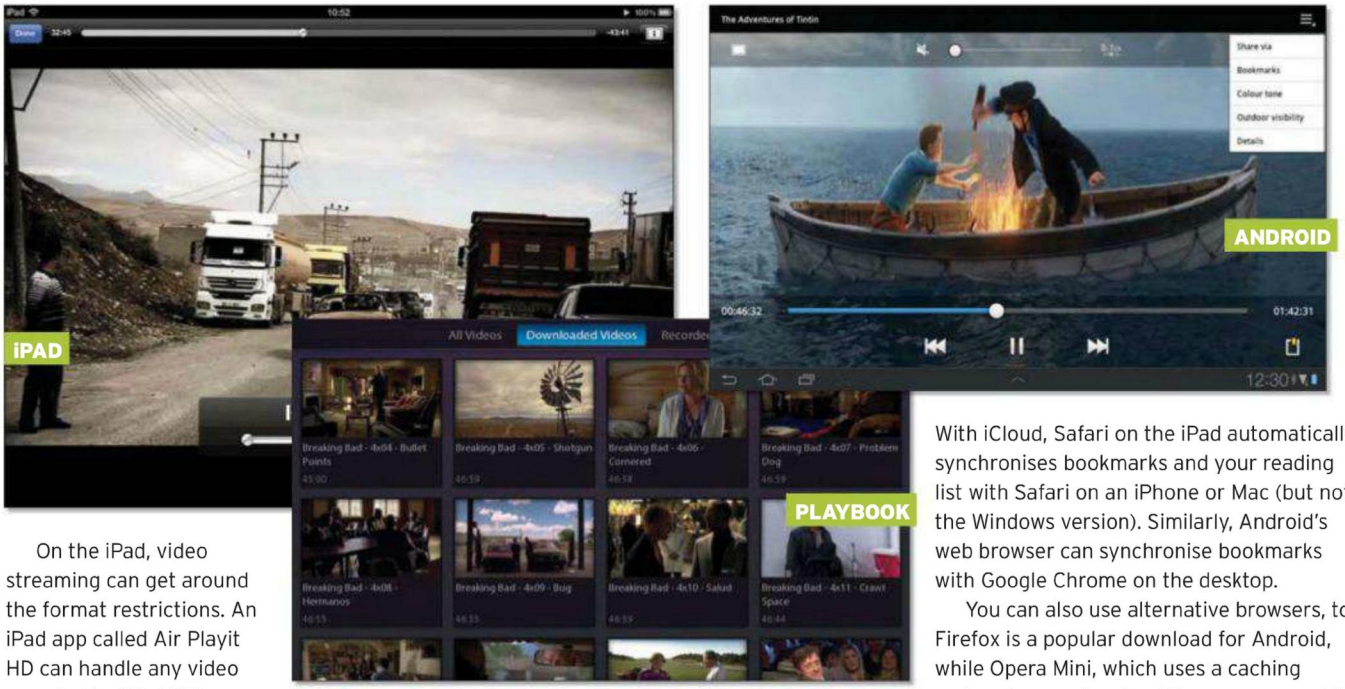

On the iPad, video streaming can get around the format restrictions. An iPad app called Air Playit HD can handle any video encoded in AVI, MKV or WMV formats, which are shared from a desktop computer. An Android version has just been released, too.

DLNA, an open technology for wireless media streaming, is supported by plenty of apps for the iPad, and is natively supported by Android. Many NAS devices come with built-in DLNA servers, so you can stream video directly to a tablet without needing to leave the computer turned on.

Web browser

Web browsing is greatly improved by modern tablets' capacitive, multitouch screens. Pinching to zoom in on a page makes text legible for comfortable reading, and is something all tablet browsers can do. Most support tabbed browsing, so you can switch between multiple web pages.

To load complex web pages that display large images in a timely fashion, a tablet needs plenty of memory and processing power. The cheapest tablets often struggle with scrolling and zooming in on web pages, but the dual-core processors in the third-gen iPad and more expensive Android tablets have no such problems.

Browsing the internet on a tablet is made simpler by bookmarks that can be synchronised with your main computer. With iCloud, Safari on the iPad automatically synchronises bookmarks and your reading list with Safari on an iPhone or Mac (but not the Windows version). Similarly, Android's web browser can synchronise bookmarks with Google Chrome on the desktop.

You can also use alternative browsers, too. Firefox is a popular download for Android, while Opera Mini, which uses a caching system to speed up load times over a mobile data connection, is available for Android and iOS. Likewise, the gesture-based Dolphin Browser can be installed on both platforms and is also available for the PlayBook.

There are few other options for the BlackBerry PlayBook, but its built-in browser is competent. Zooming in and out of pages is reasonably smooth, and most options are hidden from view on the 7in screen to maximise the browsing window.

The iPad can't display Flash content: Apple argues that poorly coded Flash can make a browser unstable, eating up processing power and battery life. As HTML5 gradually overtakes Flash in its popularity with web designers, this will become less of an issue.

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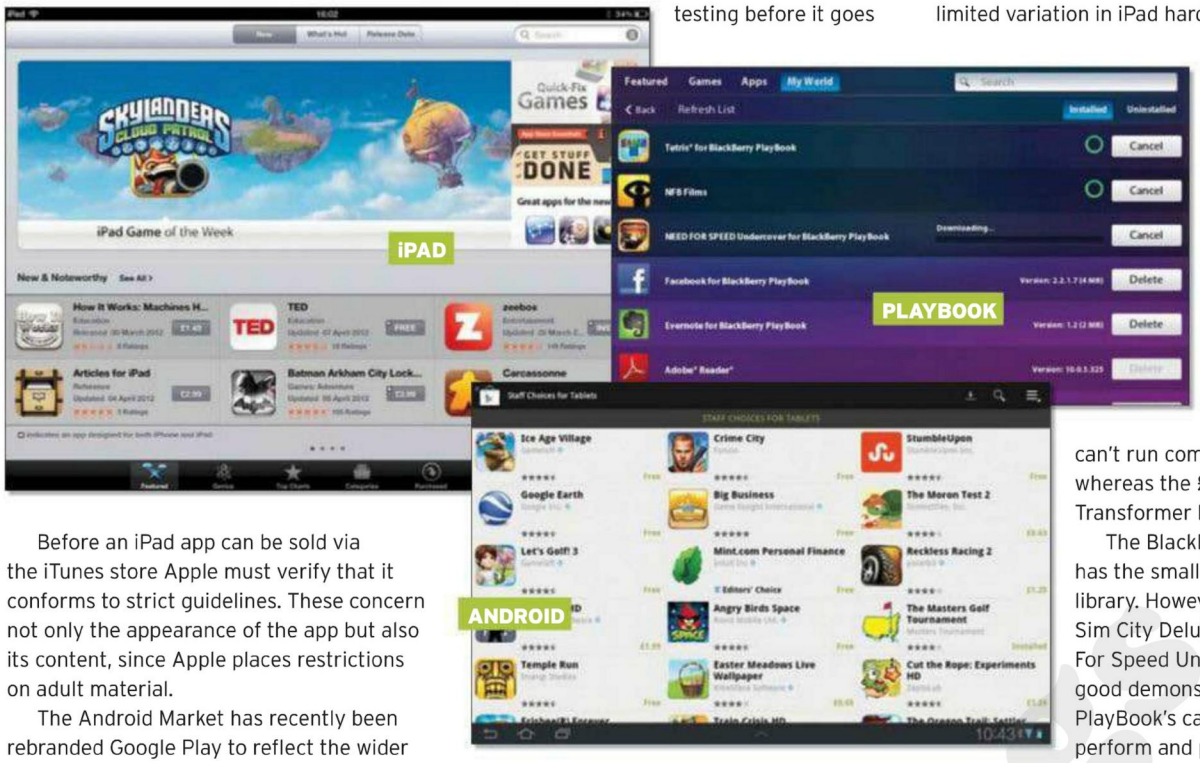
Entertainment

App stores

Apple's iTunes store isn't just a repository for apps; it's also a supermarket for digital content, with music, films, TV programmes and books for sale. There's also iTunes U, a source of free research materials on various topics, including many science courses. Lecture videos and course notes are usually free to download.



Before an iPad app can be sold via the iTunes store Apple must verify that it conforms to strict guidelines. These concern not only the appearance of the app but also its content, since Apple places restrictions on adult material.

The Android Market has recently been rebranded Google Play to reflect the wider range of content now on offer. Google has so far taken a light-handed approach to moderating the apps it hosts, forcing few restrictions upon third-party developers. This has led to more malicious apps entering Google's app store (see Android antivirus test, page 58), but Google takes prompt action in removing any reported threats.

Both stores contain free and paid-for apps, as well as stripped-down or ad-supported free versions of apps that are otherwise paid for. Compared to desktop software, apps are significantly cheaper, and more often than not are free to download.

Prices can vary between the Android and iOS platforms, and the same app isn't always offered at the same price on each. Both Google Play and iTunes have regular sales, with many high-quality apps reduced to 69p or less. You can usually expect apps that include a lot of audio or video content to cost a little more – Brian Cox's Wonders Of The Universe is priced at £4.99, for example.

The BlackBerry App World has fewer apps, but a good proportion of these are of a high quality. The PlayBook received a content boost when RIM added limited Android compatibility. Android developers can repackage their app for the PlayBook and submit it to RIM for testing before it goes onsale. Fewer free apps are available and prices are slightly higher – expect to hand over around £4 to £7 for most paid-for apps.

Games

Mobile gaming is big business, and there are plenty of games available in all the app stores. Certain types of game work better with touch-sensitive tablet displays – usually those that demand simpler user interaction. Puzzle and strategy games such as Angry Birds, plus educational titles are ever popular. There are also countless board, sports and racing games, as well as full 3D action titles that push a tablet to its limits.

As is the case with apps in general, the iPad has the lion's share of new game releases. The latest iPad is capable of stunning graphical effects, which are shown off in their best light in titles such as Mass Effect Infiltrator and Infinity Blade 2.

There are also high-quality games for Android tablets, but you won't find as many. This has nothing to do with their performance: Rockstar's port of Grand Theft Auto 3 runs as well and looks as good on high-end Android tablets as it does on iPad.

The iPad's attraction to games developers comes from its greater market share and the limited variation in iPad hardware. Developers know the strengths and weaknesses of an iPad better than they do for the range of Android tablets, which can vary in their graphical capability. A £99 Android tablet, for example, can't run complex 3D games, whereas the £399 Asus Transformer Prime can.

The BlackBerry PlayBook has the smallest games library. However, Tetris, Sim City Deluxe and Need For Speed Undercover are good demonstrations of the PlayBook's capabilities; all perform and play well, with detailed visuals.

Office productivity

Tablets are great for consuming content, but using them productively isn't usually as simple. Windows PCs and Microsoft Office dominate the majority of professional environments, so moving documents between a tablet and Office file formats needs to be straightforward if you want to use the device for work purposes.

One of the simplest options is to use Dropbox. Some word-processing apps, such as iWriter for the iPad, let you save your work directly to a Dropbox folder from your tablet. The document is synched to Dropbox's online servers and is then accessible from your PC and can be opened in Word.

Google Docs offers a different approach (see our in-depth guide next issue). This

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Productivity

web-based office suite lets you create and edit documents (including spreadsheets and presentations) in your tablet's browser. The document is stored on Google's servers, making it accessible to any web-connected computer or device.

Things become tricky when you don't have an internet connection, though. Android has a dedicated Google Docs app that lets you mark documents for offline reading, but to edit them you need a live internet connection.

Documents To Go is a dedicated office file synchronisation tool. It lets you edit documents that are shared on your main computer directly on a tablet. This privilege will cost you £12, though.

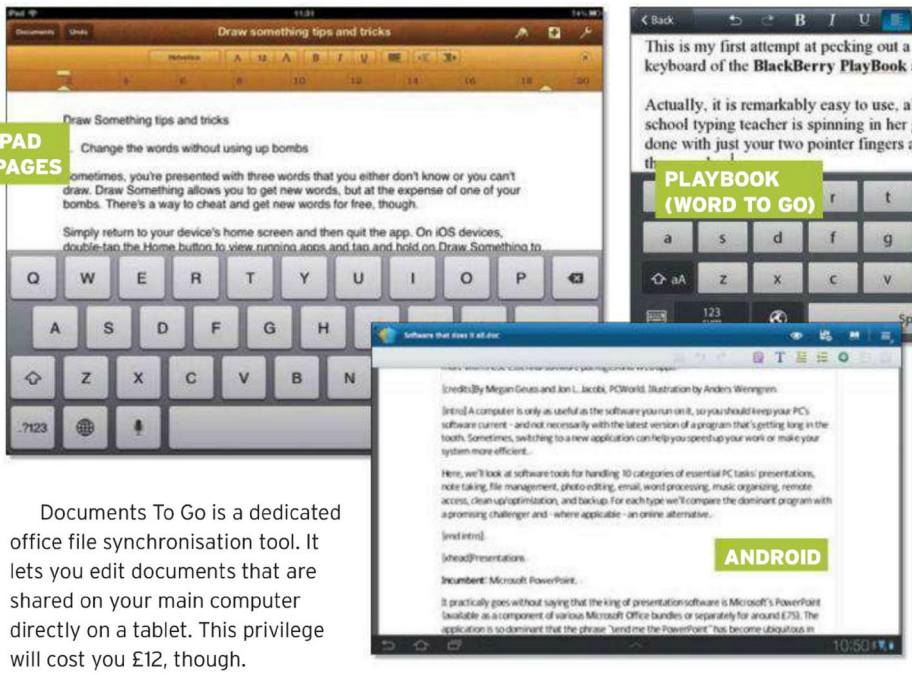
The Pages app (£6.99) on the iPad uses iCloud to synchronise documents with a desktop Mac, but this is less useful if you use a PC at work. Documents can be downloaded from the iCloud site, but not integrated with the desktop software.

Little is currently known of Microsoft's plans for Office on tablets. We expect that Office 15 will easily synchronise documents between Windows 8 desktops and tablets, but it remains to be seen whether there will be an iPad or Android version.

A tool that can make tablets a lot more useful is Evernote. It's a scrapbook of notes, images, clippings and pieces of text that's stored in the cloud and shared between smartphones, computers and tablets alike. It can be used to share all sorts of files, and to quickly make information public.

Rather than replace your word processor, Evernote compliments it, providing a way to move information between devices, via the cloud. You can capture an image using your tablet's camera and paste it into a note, or copy information from a web page. Once Evernote has synchronised with your other devices, that information is then available wherever you are.

Crucially for tablets, Evernote lets you create and edit documents offline, if you upgrade to a paid account for £4 per month or £35 per year. You can still get plenty from Evernote without paying, though, and there's a version for every platform we can think of, from the PC and Mac to Android, iOS, the BlackBerry PlayBook and plug-ins for plenty of web browsers, too.



Printing

Although tablets can be used to carry around all sorts of data, they remain less portable than old-fashioned paper. In many environments, paper is the best medium to use for sharing data, as no device can yet beat the simplicity of printing out a document and handing it to someone.

Printing a document from a PC is second nature, but things aren't as straightforward on a tablet. The iPad supports AirPrint, a wireless printing technology supported by most new printers, but not older ones. An AirPrint printer needs to be visible on a network, rather than just connected to a computer's USB port. There are very few settings to worry about, but you can print only from apps such Safari, Mail and Maps. If your iPad is connected to the same wireless network as an AirPrint-compatible printer, it should simply show up in a list when you select the Print option.

On the Android-based Samsung Galaxy Tab 10.1, selecting the print option in the browser suggests that only Samsung printers are supported. But as with many things on Android, there are alternative ways to go about this task. In the case of our HP Photosmart 6510 printer, this involved reverting to HP's own ePrint system, which has a dedicated Android app.

Google also has a service called CloudPrint that solves the problem in a different way. Instead of sending a document to a printer, you send it to Google's server, which then sends it to the printing device of your choosing.

Printing isn't the easiest task on the PlayBook, although you can print email and attachments from the Gmail app using CloudPrint. RIM also has a tool called Print To Go. When you print something from your main PC, instead of printing it on paper it arrives on the PlayBook as a PDF document.

Typing

Typing is much easier on a tablet when it's held in landscape mode, as the keyboard is wider and has larger keys.

On the iPad, an onscreen keyboard appears at the bottom whenever you tap on a text-entry field, such as a username or password box. It then disappears again when you press Enter, Search or Done. The keyboard can be switched to display numbers and special characters.

The iPad doesn't offer haptic feedback (a tiny vibration when you press a key), but instead plays a click sound. The keyboard can be split in half by literally pulling it apart at the centre, which makes it easier to enter text with just your thumbs if you hold your tablet in both hands.

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The third-generation iPad adds Siri-like voice recognition, so you can dictate long messages with punctuation rather than type them in. It's more accurate than a lot of voice-recognition software, but is still prone to the odd mistake.

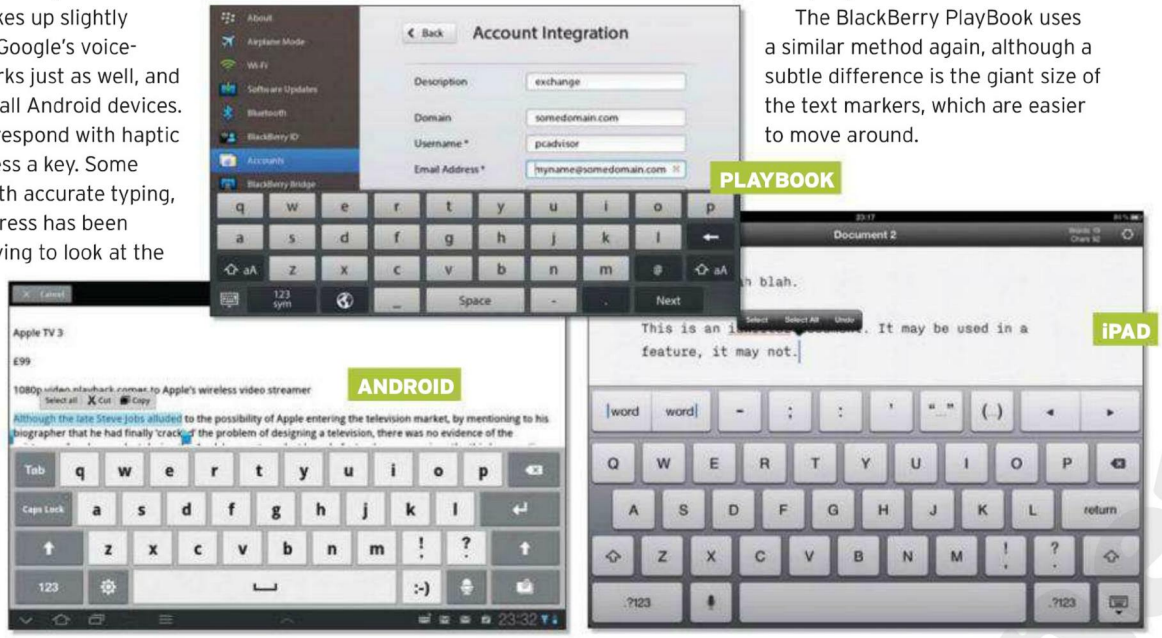
Android's keyboard is very similar to that of iOS, but it takes up slightly more space onscreen. Google's voice-recognition service works just as well, and is supported by nearly all Android devices. Some Android tablets respond with haptic feedback when you press a key. Some users find this helps with accurate typing, since you know a key press has been recognised without having to look at the text onscreen, but it can be turned off.

The keyboard is one of the few weak areas of the PlayBook. The 7in screen allows less space for each key; you'll need to type carefully to prevent spelling mistakes and ensure accuracy.

All three platforms allow you to select, cut, copy and paste text. In Android, pressing and holding at the start of a block of text highlights that copy. You can move the markers to select more or less text, then press the Copy, Cut or Select all buttons.

The process is similar in iOS. Tapping and holding your finger over a word selects it, and a magnifying glass appears above your finger so you can see what copy you're selecting. Blue handles appear at the start and end of the block of text and can be easily adjusted.

The BlackBerry PlayBook uses a similar method again, although a subtle difference is the giant size of the text markers, which are easier to move around.



Tablet vs laptop: which is best?

The question for many people isn't which tablet they should buy, but whether to buy a tablet or a laptop. As we've shown over the past few pages, tablets are capable of many tasks that were previously possible only with a laptop or PC. But that doesn't necessarily mean laptops are obsolete. There are still limitations to what you can do with a tablet.

The obvious difference is that all laptops have a physical keyboard. Typing long documents is easier and more comfortable using real keys than it is tapping away at a screen for extended periods. It's possible to add a Bluetooth keyboard, of course, and some tablets are optionally supplied with a keyboard dock.

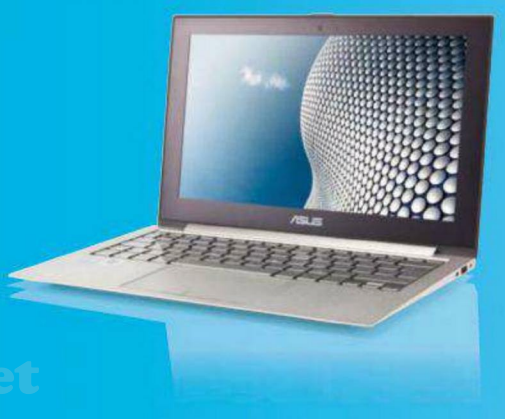
Tablets can't compete with laptops on storage, though. Most laptops have hard disks with capacities around 10 times higher than that of a tablet's flash memory. With storage restricted, you'll need to be choosy about the media you store locally.

Tablets can at times be tripped up by drop-down boxes or other web page furniture that can be fiddly to use with a touch-sensitive display. In general, personal banking and online shopping sites work better on a laptop, since they make heavy use of JavaScript. And while a laptop's browser won't have any problems displaying the content on websites using Flash, an iPad will. Apps are available for certain online services, but they often lack the full functionality of the desktop site.

Printing documents is easier on a laptop, too. Although it's possible on a tablet, it's not a simple case of selecting File, Print as it is in Windows.

Of course, few laptops can match the portability and long battery life offered by most tablets. While a laptop might be too bulky to take on holiday, a tablet adds little weight to your hand luggage and is ideal when the in-flight entertainment or company isn't to your tastes.

Ultimately, laptops and tablets are complementary devices: it's not a case of one or the other. Each has its strengths and weaknesses and is suitable for different tasks. Manufacturers are certain to come up with new ways to make data even more device-independent, with elaborate docking stations for keyboards, additional storage and online services that mean you never have to consider which device you'll need to carry with you. Tablets haven't yet made laptops redundant, but it's still early days. ☒



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Save money with software alternatives

Megan Geuss and Jon Jacobi show you how to edit photos, record notes, access your computer remotely, and do even more with these essential software packages and web apps

A computer is only as useful as the software you run on it. You should keep your PC's software current, which doesn't necessarily mean using the latest version of a program if it is itself getting rather long in the tooth. Sometimes, switching to a new application can help you increase your productivity or make your system more efficient.

Here, we'll look at software tools for handling 10 categories of essential PC tasks: presentations, note taking, file management, photo editing, email, word processing, music organising, remote access, clean up and optimisation, and backup. For each type we'll compare the dominant program with a promising challenger and, where applicable, an online alternative.

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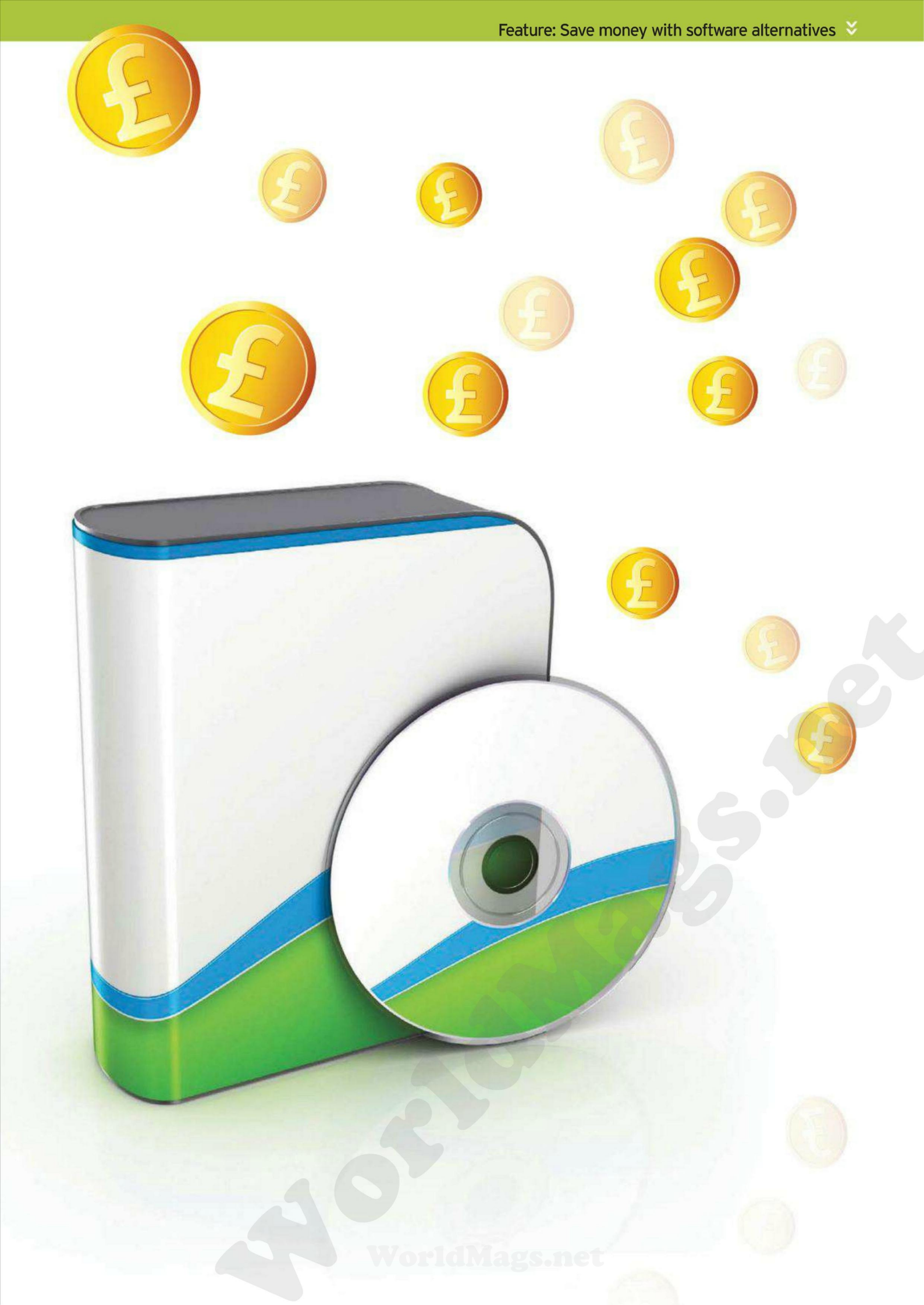

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Presentations

Software: Microsoft PowerPoint

It goes without saying that the king of presentation software is PowerPoint (available as a component of various Microsoft Office bundles or separately for around £75). The application is so dominant that the phrase "send me the PowerPoint" has become ubiquitous in business circles.

Alternative: Prezi

Easily the most interesting alternative to PowerPoint, Prezi (prezi.com) has both local and online components. The free, web-only version lets you create arguably better presentations than PowerPoint can deliver. Instead of being slide-based, Prezi uses a single-pane approach. Prezi's tutorials will get you up to speed in a hurry.

Prezi is collaborative, so multiple users can work on the same presentation simultaneously via Prezi Meeting. When it's time to give the presentation, you can play the show online (it's Flash-based) or download a Zip file, extract it, and play it locally using the included prezi.exe file.

The Pro version (around £37 per year) includes Prezi Desktop, with which you can work on presentations offline.

Web app: TransMedia Glide Presenter

Part of the browser-based Glide desktop OS (glidedesktop.com, free with 30GB of storage or £31 per year with 250GB), Presenter works in a slide-by-slide format. It's easy to use, and you can export creations as PowerPoint or PDF files. You can stream audio and video in presentations, and work collaboratively.

Note taking

Software: Evernote

Evernote (tinyurl.com/c3ofhq9) is a tool for note taking, synching, offline bookmark creation and information organising. Its latest iOS apps, Evernote Hello and Evernote Food, are designed to keep records on all the people you meet and all the food you eat.

Alternative: Microsoft OneNote

Microsoft's note-taking program comes as a free web app (tinyurl.com/cqj56fn), bundled with Microsoft Office, or can be bought on its own for around £45. It's easily the most overlooked program in the 2010 Office suite. That's a shame, because this notepad makes capturing your thoughts incredibly easy.

Press Windows, S to capture any portion of your computer screen and automatically drop the image into your notebook. It's a great way to generate web clippings if you're shopping around for something. Also, you can click anywhere in the notebook and start typing, so your notes have more visual appeal than a simple list might have. There are also free iOS and Android OneNote apps.

Web app: Springpad

Some people believe that note taking works better online, because synching is faster, notes don't take up local storage space, and sharing is easier. To exploit these advantages, Springpad's free web service (tinyurl.com/cqt9rgj) and mobile apps let you add not just notes but also links, photos, videos and files to your box of 'stuff', with a clear notebook and to-do list function. You can also share files with friends.

CYBERLINK PHOTODIRECTOR makes photo editing and slideshow creation easy

File management

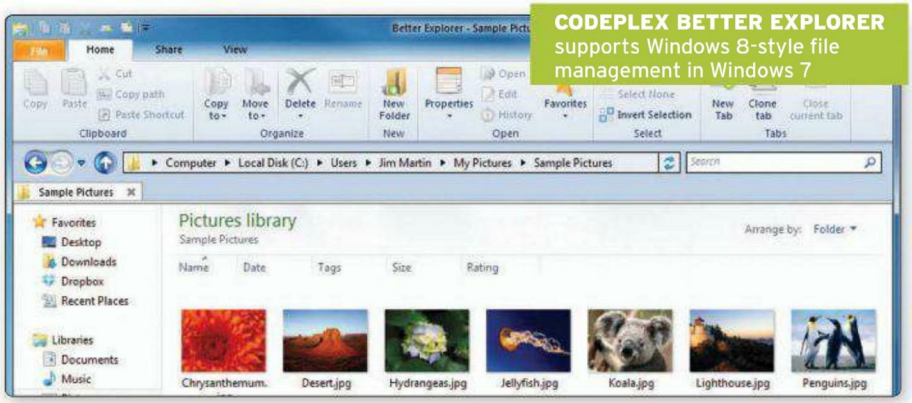
Software: Windows Explorer

The file-management utility that comes preloaded on all Windows PCs does an adequate job, and most people tend to overlook it. Generally it loads quickly if you're searching for local files (network searches are a different story); and, in Windows 7, right-clicking any file allows you to perform a multitude of actions. It's easy to use, but perhaps not the best tool for everyone.

Alternative: CodePlex Better Explorer

Better Explorer (tinyurl.com/d3bLxpy) looks and behaves the way Explorer will in Windows 8, except that it runs in Windows 7.

At the top of the file-finder window, Better Explorer adds options that behave in much the same way as Microsoft Word's Ribbon, letting you more easily arrange, copy, move and delete files. The free tool also has a button for accessing a file's properties when you're using a device that doesn't support right-clicking. Best of all, you can view folders in tabs at the top of the window, so you can see multiple folders at once without getting lost.



CODEPLEX BETTER EXPLORER supports Windows 8-style file management in Windows 7

Photo editing

Software: Adobe Photoshop

The de-facto standard for photo editing, Photoshop CS (adobe.com), which costs around £600 alone, remains in a class by itself, with a vast array of tools and plug-ins, plus an unparalleled ability to automate repetitive tasks. The free, almost-as-powerful alternative (if you can live with its slightly clunky interface) is The Gimp (available from tinyurl.com/7g48abz).

Alternative: CyberLink PhotoDirector

CyberLink (cyberlink.com) may be best known for its video-editing and disc-burning software, but it has put a lot of its tech prowess into an independent photo-editing program called PhotoDirector. It's currently on its third version and costs £90. The program is actually closer to Adobe's Lightroom than Photoshop, being a combination librarian, editor and slideshow creator, with good import capabilities.

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PhotoDirector's powerful editing and tweaking controls are easy to use, and they're readily available on a scrolling pane to the left of the main window. Compared to programs where you must endlessly open dialog boxes, windows or panes to apply settings, it's a joy to use.

PhotoDirector provides numerous presets for users who want to get creative, and the company's online DirectorZone lets you share presets and explore those made by others. You can post to Flickr and YouTube from within the program.

PhotoDirector is a bit pricier than some of the low-end competition, but the time that you'll save by working with its interface makes it well worth the premium.

Web app: Pixlr Editor

The free Pixlr (pixlr.com) is like a super-clean online version of Photoshop. Considering that it operates within a browser window, the software is amazingly robust. Pixlr's various tools have a distinctly artistic bent. For instance, the pencil tool simulates using the tip or edge of a pencil, depending on how you move the cursor. The software also comes with excellent filters galore.

Email

Software: Microsoft Outlook

Seamless support for Microsoft Exchange and integrated calendaring functions explain the dominance of Outlook (available in assorted Office bundles or separately for around £90) in the business email market. Thunderbird (tinyurl.com/6qLry7q) is a venerable free alternative that handles multiple accounts, but it doesn't offer Exchange support.

Alternative: eM Client

Although it supports only Imap and POP accounts, eM Client (emclient.com) is in other respects a virtual clone of Outlook. In some ways it handles multiple accounts better than Outlook. eM Client offers junk mail control, task management, calendaring functions and contact management. It also imports from Outlook, syncs seamlessly with Gmail, and works with various IM services.

In lieu of Exchange, eM Client relies on its own Sync2eM service, which works just like Exchange. At £31 per year, it costs much less than hosted Exchange, and there are clients for Android, iOS and Windows Phone 7. For personal use eM Client is free, but you're limited to two accounts unless you buy the Pro version. Still, even that option is a bargain compared to Outlook.

Web app: Google Gmail

The free Gmail (mail.google.com) lets you compose, read and organise email from any connected device. Conversations are arranged in threads. At the time of writing you get around 7.5GB of free storage, but this is growing.

ZOHO WRITER looks more like a desktop app than a website, and is an excellent free alternative to Word

Gmail has a variety of time-saving features, including an Important mode that puts messages from people you regularly interact with at the top of the page. A Priority Inbox mode puts unread, starred and 'important' mail at the top.

You need a free Google account to get Gmail. This also gives you access to Calendar, Contacts and Chat functions, plus Google Docs, where you can share documents.

Word processing

Software: Microsoft Word

The most widely used word-processing software around, Word is available in various Microsoft Office bundles or separately for around £85. It's expensive, whether you get it as part of an Office suite or buy it separately, but it's the word processor with which many people are most familiar.

Alternative: Pomarancha WriteMonkey

Although it can save what you write only as TXT files, this free word processor clears away distractions so you can focus on writing and worry about presentation later.

WriteMonkey (tinyurl.com/d5z3nqz) is designed to occupy your whole screen, without toolbars or spellcheck lines. The program is compact, and there's no installation process. Just download the zip file from the WriteMonkey website, unzip the file and run the application. Because it consumes little space, you can take the software with you on a USB drive and use it on different computers.

Despite the absence of a toolbar, you can change your preferences, check spelling and look up words in your text thanks to reference websites such as Reference.com and UrbanDictionary.com. You can mark up font styles (bold, italic and underlined) in the text that will become real formatting when you export or print the file.

Web app: Zoho Writer

You'd be forgiven for wondering why we haven't picked Google Docs here. It isn't always intuitive and, if your office happens to use it, your personal documents can get buried in an avalanche of shared-document spam. In contrast, Zoho Writer (zoho.com) is a WYSIWYG text editor that closely resembles an older version of Word. You can store and share documents online, and toggle between open documents by using the tabs at the top. Zoho Writer remains in beta despite having been around since 2005, so the service is unlikely to see an update any time soon. Zoho Writer is a good cloud-based alternative to Google Docs, as well as to costly word-processing software.

Music organising

Software: Apple iTunes

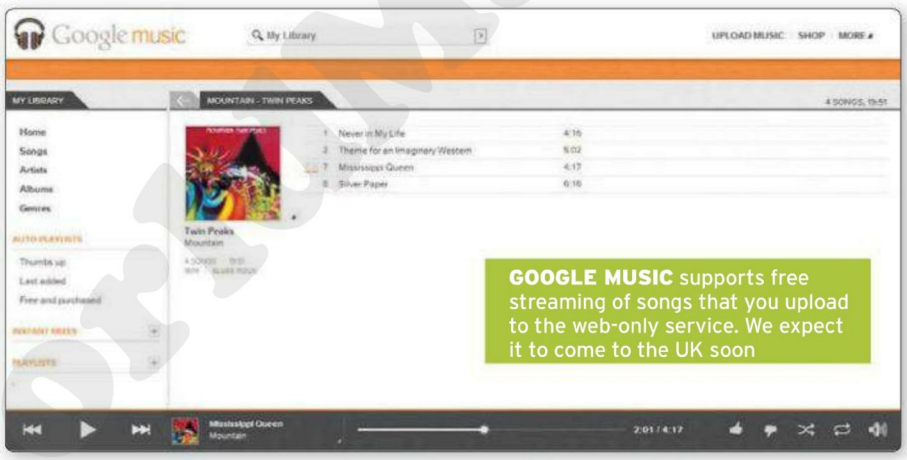
The heavyweight music organiser is free and capable, and it makes synching tunes to iOS and Windows Phone 7 devices a breeze. But its interface can drive non-Apple users crazy, and there's easy way to sync with Android.

Alternative: Songbird

If you don't use an iOS device, consider Songbird (tinyurl.com/bppfqr9). This attractive organiser's navigation largely mimics that of iTunes. The free program can sync with Android and other devices without proprietary OSes. Songbird lets you edit track information and use add-ons written by independent developers for such things as social media communication and lyrics.

Web app: Google Music

Currently available only in the US, Google Music is expected to be opened up to the UK very soon. You can transfer up to 20,000



GOOGLE MUSIC supports free streaming of songs that you upload to the web-only service. We expect it to come to the UK soon

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of your songs to the free service, from which you can access and stream them over any internet connection, anywhere in the world. The online interface permits you to categorise tracks by title, artist, album and genre, and create your own playlists. Google Music even lets you divide your music between tunes you've uploaded and those purchased from Google Play.

Remote access

Software: Citrix GoToMyPC

This program sits quietly in the background of a PC, waiting for you to log in from another device via the firm's online portal. You can then access files remotely and control the remote PC as if you were sitting in front of it. GoToMyPC (gotomypc.com) costs £6 per month or £60 per year.

Alternative: TeamViewer

Very fast, and free for personal use, TeamViewer (tinyurl.com/cnejn69) can be configured to sit ready in the background for an always-available connection to your desktop; or you can run it as needed. The program uses a connection ID and password for security, which you can pass on to a colleague if they need to view or take over your screen. TeamViewer also has a feature for moving files on and off the host machine, and it supports multiple connections and users. Prices start at £12 per month.

Web app: Join.me

For occasional use within a browser, Join.me is an even simpler option than TeamViewer, since using it doesn't involve signing up for an account. Simply browse to join.me, click Share, send the generated code to the person with which you want to share your screen, then have them enter it at join.me. You can also invite multiple users to attend ad-hoc web presentations. Performance isn't great, but viewers can request control of your PC and have remote access similar to GoToMyPC.

JOIN.ME is simple to use for occasional screen-sharing, and doesn't require you to register

Cleanup & optimisation

Software: Piriform CCleaner

CCleaner (tinyurl.com/bqe2s6j) helps you remove unnecessary programs, clear cookies from your browsers, tidy your Registry, and more. The utility is free, stable and proven.

Alternative: SlimWare SlimCleaner

SlimCleaner (tinyurl.com/bqt3t53) is a free utility that provides graphic descriptions of what's on your PC. Tabs on the left side toggle between functions: the desktop cleaner, the optimisation tool and so on.

SlimCleaner assigns ratings drawn from other users and its own antivirus scanner to most of the programs, apps and files on your PC. This can help you decide which files you should keep and which ones can be safely deleted. It can also securely erase files.

Backup

Software: Acronis True Image

Although this £30 mainstay among backup utilities has many worthy competitors, it combines drive imaging, file and folder backup, and disaster recovery in a very professional package (tinyurl.com/csox37x).

Alternative: EaseUs Todo Backup Free

Todo Backup (tinyurl.com/cwrk9t9) is a backup suite that provides 90 percent of what you'd get with paid-for software: drive imaging, file and folder backup, mounting of backup images as virtual drives, scheduling, and a lot more. Todo Backup's interface is obtuse at times, but even the least technical user should be able to set up a backup with minimal fuss. The software provides full disaster-recovery features, including a Windows PE-based recovery boot disc.

Web app: CrashPlan

CrashPlan (tinyurl.com/bnowwa6) can back up to a local destination or online, and it carries a competitive price: around £31 per year for unlimited backup. You can even let friends back up to your account. Combine that flexibility with cross-platform support, and you have a winning service.

Five reasons why desktop software is still essential

Working with online applications makes a lot of sense these days, especially when travel may take people far from their primary work PC. Nevertheless, in some situations the ability to work with software that's installed locally on a desktop system can be indispensable. Here are five advantages that come with having apps loaded and ready to run on your own PC.

Security: Although storing your information on someone else's servers is usually safe, even a seemingly stable company may fold or change its privacy standards. When handling important documents, family photos and business presentations, desktop software also lets you ensure the confidentiality of your files.

Guaranteed connection: Web apps are great when you can get online. If your connection goes down, or you can't pick up a wireless signal, desktop software lets you carry on working. Conveniently, many tools have a sync feature for matching up your on- and offline workings when web access is restored.

Speed: Even when you do have an internet connection, web services can be agonisingly slow at times. Their servers can even go down. Although offline programs can feel sluggish too, you can clean unnecessary files from your hard drive to make the software run faster, or you can upgrade your RAM. The point is that you aren't at the mercy of external conditions.

Inbox utilities: Cleanup and file-management utilities aren't the most exciting applications, but they're important. Web services can't keep your PC up and running the way local tools can.

Raw power: It's still next to impossible to edit video from a browser. Instead, you must draw on the resources of your PC.

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IN ASSOCIATION WITH:
Bitdefender

12 things to look for when choosing security software

Every PC needs antivirus, antispyware and a firewall. But what constitutes 'good' security software? Matt Egan outlines what to look for when selecting your desktop or laptop's defensive arsenal

If you have a Windows PC, especially one connected to the internet, you must run reputable security software. There's no excuse: even if you have no concern for your own computer and data, leaving a system unprotected encourages cybercriminals, and makes the computing world worse for us all.

It's also important that your internet security arsenal is kept up to date. And although some users may prefer to mix and match products to produce their perfect blend, it often makes sense to install an internet security suite that contains all the necessary elements.

The best products will offer features that go beyond the traditional antivirus, antispyware, antispam and firewall concoction of internet security suites – you might see parental controls, 'cloud' protection, anti-phishing, anti-rootkit, virtual web browsers and keyboards, link- and file scanners, gaming modes, online backup and more included. As malware develops more quickly than ever before, signature-based virus detection is no longer enough, and we suggest that any package worth its salt should have at least behavioural protection.

Installing multiple security products from different vendors is usually a bad idea, as they can conflict.

With many households now owning more than one computer, the best value is usually offered by a one-year, three-user licence. However, you can save some cash with a single-user licence if you have only one computer. If you're happy with your product and prepared to take a punt on its future performance, you could save money by signing up for two or even five years.

Not all security products are created equal, however. To help you decide which of each type of product to install, 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 be sure to check independent test results such as our Top 5 chart (page 136) to make sure that your chosen product is of the required standard.

Here are 12 key things to look for when assessing which software to choose. Not every program or suite will have all these features, and that's fine. Consider these features signs of a good setup, and try to blend together as many as possible. We've assigned each a level of importance to further help your decision.

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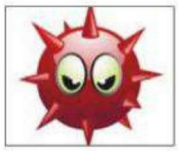

THE BASICS

Signature detection. Once upon a time, signature-based detection was the be all and end all of security software. This is the method by which malware in the wild is recognised and analysed by security experts. They then upload the signatures of viruses and their dodgy brethren, telling your PC not to allow such filth to install.

The advent of 'zero-day threats' – vulnerabilities exploited on the day they are discovered – has marginalised signature-based antivirus and –spyware. The creation of malware has been commoditised to the extent that anyone with a bit of cash and tech savvy can become a hacker: analysis simply can't work fast enough to keep up.

But we're a long way from a world in which signature-based antivirus is not required. With literally millions of pieces of malware in the Windows world, a solid virus database gives your PC a base level of protection, removing the vast majority of threats from the equation before the more labour-intensive security functions take over.

Behaviour- and cloud-based detection. These are the functions that take over when the signature database has done its thing, and both are rapidly becoming crucial to any security setup. Security vendors often append fancy names to these functions; ultimately, you're looking for features that can discern new and unknown viruses by monitoring processes' behaviour, or judge software on the basis of user experience.

Behavioural or heuristic detection judges potential malware based on what it does to your PC. But legitimate software may require access permissions very similar to those requested by malware. False positives can be a problem, so it's important to check independent reviews.

The best security software supplements behavioural detection by taking note of the choices users make when presented with a malware warning. Intelligent software can then assign a user-led rating to suspect programs, adding weight to the suspicions of the behavioural engine, reducing false positives and speeding up the whole process.

The bigger the userbase, the better the quality of its crowd-sourced information – but this doesn't mean only the biggest players are worth consideration, since vendors often share user information. Independent reviews can help you judge their effectiveness.

A robust, two-way firewall. Windows has its own perfectly acceptable firewall, and any security suite you buy will come with its own software that filters out threats before they get anywhere near your system. But not all firewalls are created equal.

The best firewalls have additional functions that, for instance, monitor your internet connection and keep strangers from accessing your Wi-Fi. They should also be just as vigorous at preventing data leaking out from your PC as stopping your system pulling down malware. You also need to make sure your chosen firewall is regularly updated. And if you are using a third-party firewall, ensure that you disable the native Windows one.

RECOVERING FROM DISASTER

Cleanup or rescue mode. It's critical that your chosen security software is as good at removing threats as it is in finding them. But discerning how successful each program is at this crucial function can be difficult to judge. As we may have said before, independent reviews from magazines such as *PC Advisor* are your friend, in this regard, but there are some features to look for that will help you make a decision.

Any security software that's serious about malware removal should have some kind of cleanup or rescue mode. This should be a function that can start your PC in a trusted environment, which is then used for cleanup and restoration with no danger to your data. It's by no means critical, but a useful addition.

Data protection, theft prevention and privacy. All malware exists for one reason: to make money. The best way of doing that is to steal your data, then spoof your persona to make purchases, sell your details to spammers, or simply dip into your bank account. As an increasing amount of our connected computing happens on laptops, tablets and smartphones, modern security software has to protect you the person, rather than just your devices.

If your laptop is stolen and it's insured, you can replace the hardware. The loss of the data held on it may be less easy to recover. And that's before you consider the sentimental and monetary cost of having to replace personal photos and purchased movies and music.

The ideal security setup should include some form of data filter that prevents critical information such as your bank details from ever leaving your computer, except for legitimate reasons. Anti-phishing, the ability to block websites supporting scams or credit-card phishing attempts, is critical here, as is encryption of email, IM and file transfer.

And the best security software offers functionality that will allow you to recover quickly from a potentially critical theft: virtual or physical. The ability to remotely locate, message and wipe your lost laptop or smartphone is key.

Secure backup. Backup is a hassle, until it's required; at which point it becomes your best friend. While not strictly a security feature, the best security software offers secure online space to protect your critical files. Look for storage options where data is encrypted using industry-standard AES algorithms, ensuring that it's never accessible to malicious third parties.

PROTECTING YOU FROM YOU

Antispam, phishing and email protection. Spam isn't just annoying, it's potentially very expensive indeed. And the havoc it spreads is exponential, potentially affecting everyone in your inbox. The weakest part of any security setup is you. It doesn't matter how carefully you build your PC protection from the outside, nothing will keep you safe if you invite cybercriminals on to your PC via email.

Email spam can take many forms, from adverts for dodgy pills and services, through phishing expeditions and poisoned links, to messages that masquerade as helpful tips or jokes, but are principally a means of spreading malware. And the people who spread such filth are getting more clever every day, creating seemingly plausible messages that are able to hoodwink even the most wary user. It's reaching the stage where anyone can be fooled, so some form of email protection is critical. Look for the ability to check links and files in emails, and a robust antispam function.

Parental control, usage rules. Other functions that, like email protection, save you from yourself. Good parental controls will block inappropriate content, restrict web access between certain hours, and help parents remotely monitor their children's online activity. More importantly, it should be simple to do so, and difficult for your

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more tech-savvy kids to hack in and reverse the rules. It's also worth looking for usage rules on a broader level: the best security software will allow you to set rules that can be disobeyed only by an administrator.

Social networking protection. Ask PC users in most households what they use their computer for, and the answer will usually include the words 'iPlayer' and 'Facebook'. All modern security software should provide social-media protection.

The best security software protects you and your friends from e-threats that attempt to exploit the trust you've built with them over social networks. After all, you never really know who's on the other side of an online relationship. Such software works by filtering the links you receive from your Facebook and Twitter friends, and monitoring your privacy settings to ensure that you aren't giving away too much in the rush to be social.

Safer search and surfing. Because you don't always want to use a virtualised browser, it's worth looking for general protection when you're out and about on the open internet. Good security software gives advance warning of risky websites in your search results. Tools such as McAfee SiteAdvisor and Web Of Trust also block sites as you click dodgy links, and send warnings of potentially dangerous territory as you download a web page. The very best security suites will include such functionality as standard.

As this information tends to be sourced from users, and web surfing is a very personal thing, false positives can be a problem. It's critical that any safer-surfing software is customisable. In essence, you want to be able to set the level of security you need, and adjust it to make exceptions.

NICE, NOT CRITICAL

Sandboxing, and a virtualised browser. A nice, if not crucial, function is the ability to test the waters of potentially dodgy software in a secure environment. A virtual browser isolates your web-surfing experience from the operating system, allowing you to block web-based threats as you surf to potentially dangerous waters. A sandboxing environment is a similar function, but for full-blown software programs.

PC maintenance functionality. Just as ticking off known virus signatures is no longer enough, simply focusing on keeping bad things off your computer is only the start of making sure everything is ship-shape. PC maintenance software is a class all of its own, and you certainly shouldn't base your security decisions on the disk-optimisation tools bundled with a suite. But the best software will take a look at your computer's performance as a means of diagnosing an otherwise undetected infestation. It's also good to have a utility that checks for missing security software, or outdated programs, as well as potentially unsafe system settings.

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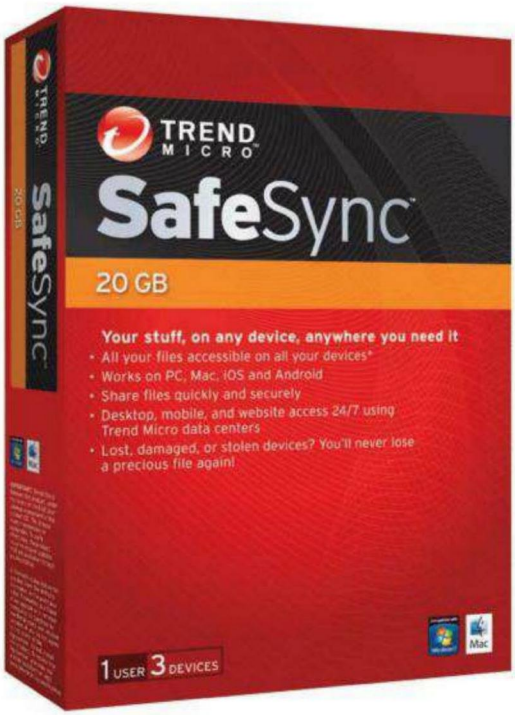

Trend Micro SafeSync™ automatically and securely backs up your files between your computers and mobile devices. It's quick, it's simple, it's safe and it's mobile, and PC Advisor has 50 of Trend Micro's 20GB SafeSync accounts to give away.

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- As soon as you save something it's backed up to Trend Micro's secure European datacentre
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Imagine traditional backup as a plain old bog-standard flimsy plastic shopping bag. Eventually it'll let you down, breaking at the most inopportune moment, or it'll get lost or stolen, and ultimately end up on a rubbish heap. The SafeSync way is a 'bag for life' – robust and ever-lasting.

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For your chance to win one of 50, one-year 20GB Trend Micro SafeSync accounts, simply head to our website at **PCAdvisor.co.uk/competitions**, and answer the question below:

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JIM MARTIN

Tech Help

Getting more done

We've made some changes to our How To section this issue, and we hope you like them. We've kept the *Troubleshooter* and *Helproom* as they were, but have reduced the length of our individual workshops in order to cover a greater range of subjects.

In *Troubleshooter* (page 102), we explain how to jailbreak an iPhone. This enables you to install non-Apple-approved apps and tweak settings in a way that isn't currently supported by the company. The same techniques also work for the iPod touch and iPad.

Helproom (page 104) answers your tech queries and deals with topics as diverse as internet connection problems in Windows 7 and 16bit Basic programming. You can also find out how to export your Gmail contacts, get old versions of Quicken working under Windows 7, and set up RSS feeds for your favourite YouTube searches.

Our step-by-step workshops guide you through installing Windows 8 (page 110), using Apple's iCloud service in Windows (page 118), and installing antivirus software on your Android device (page 112). If you're feeling creative, you can try out the polar coordinates filter in Photoshop Elements (page 114) or learn to program with Codeacademy (page 116).

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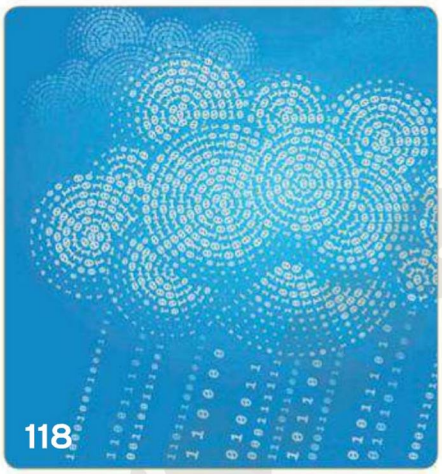


QUICK TIP: PRINT TO PDF

Sharing files with friends, family and colleagues is easy, but what if they don't have the appropriate software to view the content? The solution is to send them an industry-standard PDF file rather than Word, Excel, Photoshop or other file types.

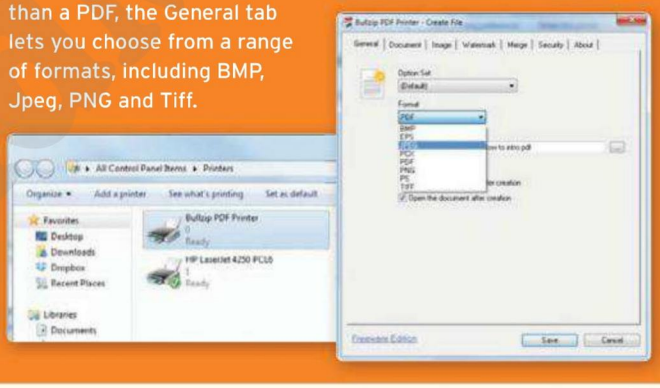
The software used to create and edit PDF files is expensive, but you can install a virtual PDF printer for free. This lets you choose the Print command in just about any application and, rather than printing to a piece of paper, you end up with a PDF file saved on your hard drive.

To install a virtual PDF printer, go to tinyurl.com/dylexs3 and click the link to download Bullzip. Unzip the file and double-click it to run the setup file. Follow the instructions, and make sure you don't disable the option to 'Download and install Ghostscript Lite'. This is required for the PDF printer to work.

A window will open showing all the printers installed on your PC. You should see Bullzip PDF Printer in the list, which will have set itself as the default printer. To restore your original printer default simply right-click it and choose 'Set as Default Printer'.

When you want to create a PDF of a document, open the file in the usual program and choose the Print command. Select Bullzip PDF Printer from printer list, then click Print. An options window allows you to alter the file name and save location. Also choose the device for which the file should be optimised under Quality.

If you'd rather export your document to an image file rather than a PDF, the General tab lets you choose from a range of formats, including BMP, Jpeg, PNG and Tiff.



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Unleash your iPhone's full potential

Jim Martin explains how to 'jailbreak' an iPhone

You may have heard the term 'jailbreaking' before, but potentially not in a positive light. Jailbreaking is the process of enabling read- and write access to otherwise locked files on an iPhone, iPod or iPad.

Jailbreaking offers several benefits, including the ability to install apps that aren't available in the App Store and customise your device in ways Apple doesn't support.

For example, Apple doesn't allow FaceTime video calling over 3G, nor will it let you install Siri on the iPhone 4. Jailbreaking your device enables you to utilise both these features, and a whole lot more.

Is jailbreaking illegal?

The short answer is no. There's nothing in UK law that specifically states that it's illegal to hack your device in this way. In fact, the Copyright and Related Rights Regulations 2003 says it's okay to break technical restraints for interoperability reasons, but not for the purposes of infringing copyright.

As with most laws, it's down to a judge to interpret exactly what the phrase 'interoperability' covers. No-one in the UK has been charged for jailbreaking an iDevice, and we doubt they ever will.

REDSNOW lets you jailbreak an iPhone 4S/4/3GS or iPod touch

A word of warning, though. Jailbreaking is an advanced technique that's best avoided by inexperienced users. If done improperly, jailbreaking has the potential to turn your phone into an expensive paperweight. You will most likely void the warranty, too.

However, we've never had a problem with jailbreaking an iPhone, and it's usually possible to restore your phone to factory settings, leaving the warranty intact.

How to jailbreak an iPhone

We'll focus on the iPhone 4 here, since the warranty will have expired on most handsets. The process is largely the same for other models in any case. Before you start, back up your device via iTunes or iCloud. To force a backup in iTunes, right-click your device in the left panel and click Back Up.

It's important to understand the difference between tethered and untethered jailbreaks. The former is something you don't want, as you'll need to connect your phone to a computer in order to reboot it. An untethered jailbreak means you can reboot the phone without consequence: everything will still work afterwards.

Don't install any new iOS updates from Apple, since this will overwrite the jailbreak and delete any custom apps you've installed and settings you've made. The following instructions work for Apple devices running iOS 5.0.1, although the RedsnOw software we're using here has already been updated to cover iOS 5.1, too.

RedsnOw worked flawlessly for us, but other tools are also available. You can download RedsnOw for Windows from tinyurl.com/bqtndsu. Extract the files to a folder, then right-click the setup file and choose 'Run as administrator'. When the application launches, click the Jailbreak button.

CYDIA offers apps not available in the App Store

Connect your iPhone to the computer and hold down the power button until the slider appears. Wait until the phone has completely shut down before proceeding.

RedsnOw looks for your device in DFU recovery mode. To enter it, press and hold the power button for 3 seconds. Still holding down the power button, press and hold the Home button for 10 seconds. The Apple logo should disappear during this step. Now release the power button but keep the Home button depressed until the device enters recovery mode. Your computer might pop up a notification that it has detected new hardware or iTunes might launch and warn you that it has found a device in DFU mode.

If you don't manage to press the buttons at the right times, close RedsnOw and start from the beginning. If your iPhone or iPod locks up, press and hold the power and home buttons simultaneously until it restarts.

Once in DFU mode, RedsnOw will interrogate your device and ensure it's

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compatible. When complete, you will be presented with some options. Tick the box to install Cydia and click Next.

The jailbreaking process is automatic, and it's normal to see commands scrolling down your device's screen and a pineapple logo. When the phone restarts, unlock it and check that the Cydia app is present: this is the only outward sign that your device is jailbroken.

Getting started with Cydia

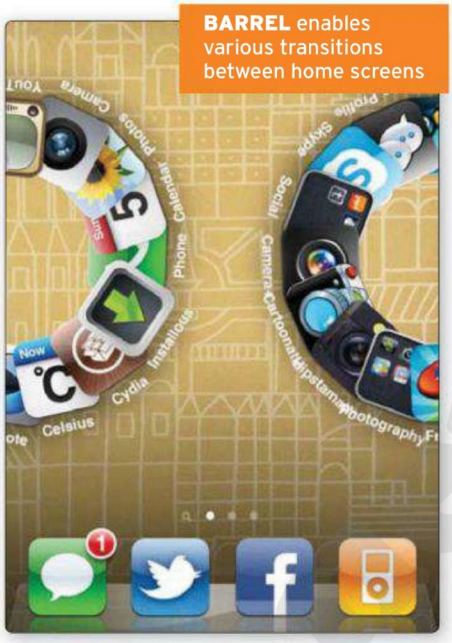
Cydia is an alternative to the App Store, and you can use both to add new apps to your iPhone. Apps installed through Cydia can be updated and removed only in Cydia. Many apps are free, but some cost a pound or two. To buy anything, you'll need to sign up for an account. Tap Manage Account and sign in with your Google- or Facebook account details. Amazon and PayPal are used for billing.

Here are our recommendations for what to install first on your jailbroken handset:

- **SBSettings** (free). Adds a selection of toggle switches to the Notification menu, giving easy access to Wi-Fi, Bluetooth, Brightness, 3G and other controls
- **Activator** (free). Lets you redefine what happens when you press buttons or use certain gestures
- **SpringFlash** (free). In conjunction with Activator, SpringFlash lets you enable the LED flash for use as a torch by pressing one of your phone's buttons
- **WinterBoard** (free). Lets you change the look of app icons and the Lock Screen with custom themes. We recommend the Elite Pro 2012 HD theme, which costs $3 (around £1.80)

SBSETTINGS adds useful toggle switches to the Notifications menu

BARREL enables various transitions between home screens



- **Barrel** ($3, around £1.80). Enables various transitions between home screens, including Pac-Man (shown above)
- **Spire** (free). Installs Siri on an iPhone 4, 3GS or fourth-gen iPod touch. ☒

GET SIRI WITHOUT AN iPHONE 4S

Spire is a legal port of Siri, which can be installed on your iPhone 4, 3GS or fourth-generation iPod touch. Search for it in Cydia, then tap the Install button. As with all Cydia installers, you'll see details of the files being copied and a progress bar.

Once installed, go to your iDevice's Settings menu. The General section should now list a Siri option. Tap this and slide the toggle to enable the voice assistant.

Return to the Settings menu and look for Spire. Enter https://connect.grwh.net:1001 as a Proxy Host. Finally, in Safari, browse to connect.grwh.net/ca.pem and click Install when prompted. You can now long-press the Home button to launch Siri, then ask it to do something.

Unlike previous attempts to get Siri working on earlier handsets, this workaround doesn't rely on procuring authentication keys from an iPhone 4S. A dedicated team has worked hard to set up its own servers, which utilise the Google rather than Nuance speech-recognition service.

Bear in mind that personal information is sent to (but not stored on) the proxy server. Also, don't expect the full set of Siri functions to be available – the GreenRiver project has only recently been made public. Reminders, for example, are still being developed. Interestingly, though, location services do work: something that even 4S owners don't have in the UK yet. For more information, visit siri.grwh.net.

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YOUR QUESTIONS ANSWERED

Expert computing advice

Paul Monckton tackles readers' hardware and software conundrums

MISPLACED VOLUME CONTROL

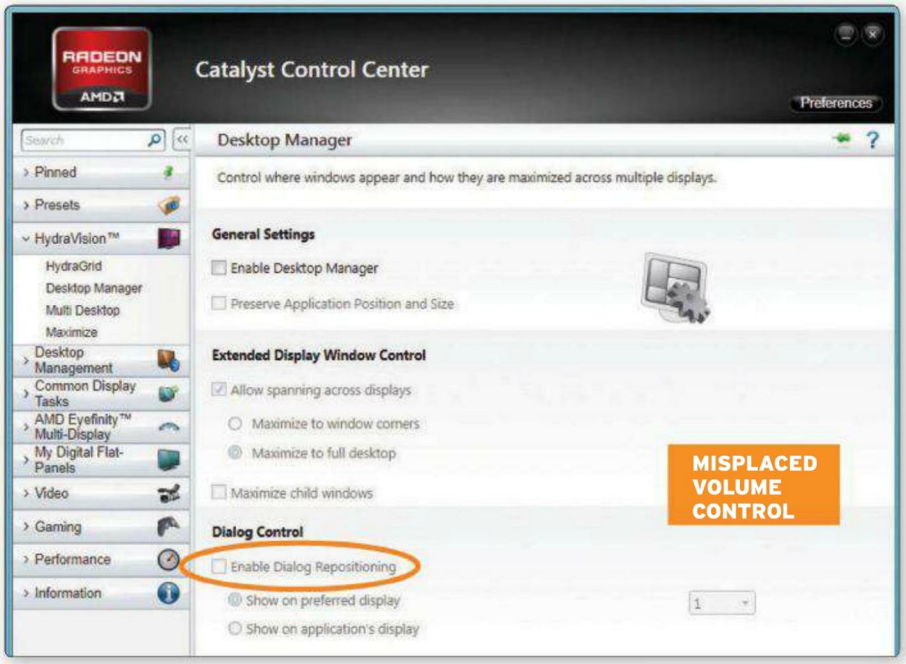
Q My Windows 7 volume control mysteriously moves to the centre of the screen every time I click its icon in the taskbar. The control works as normal, but how do I move it back to the taskbar? *Chrissy*

This rare problem is rather easily solved, Chrissy. Desktop-management software, such as AMD's HydraVision, is designed to reposition dialogs in more convenient screen locations. This can be helpful when viewing your desktop across multiple monitors, but it can also be enabled for use on a single screen. HydraVision can sometimes cause the strange behaviour you describe.

Using HydraVision as an example, we can return the volume control to the taskbar simply by disabling an option in AMD's Catalyst Control Center application.

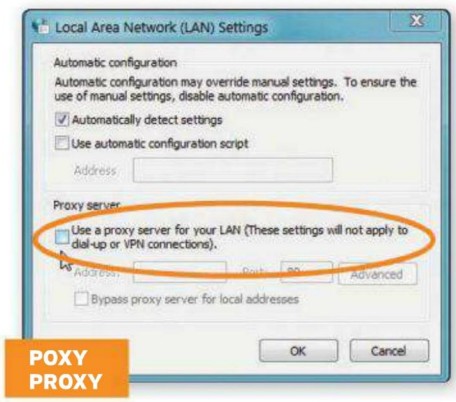
First, right-click an empty part of the desktop and select 'Catalyst Control Center'. Click the HydraVision tab on the left, then choose Desktop Manager. Disable dialog repositioning in the Dialog Control section.

Click Apply to save your changes and the volume control should return to the taskbar.



POXY PROXY

Q I recently hooked up a D-Link wireless router to my Sony Vaio all-in-one PC running Windows 7. Intermittently I receive the following message: 'Unable to connect to Proxy Server - Error 130 (net::ERR_Proxy_Connection_Failed) : Proxy server connection failed'. I don't know what this means, but my internet connection works fine. Google Chrome suggests making a change to the Wrench menu, whatever that is. *Roger Cookson*



The Wrench menu is simply Google Chrome's settings menu, accessible via an icon shaped like a spanner, found immediately to the right of the address bar. If Chrome is referring to this tool as a wrench rather than a spanner, then you aren't using the British English version of the browser.

If you aren't purposely using a proxy server to browse the web, click the Wrench icon and choose Options, 'Under the Hood', 'Change proxy settings', LAN Settings. Disable 'Use a proxy server for your LAN', then click Ok twice to save your changes. For readers who are using the British English version of Chrome, instead click the spanner icon and choose Settings, 'Under the bonnet' to find the 'Change proxy settings' menu.

MORE PORTS REQUIRED

Q Virgin Media supplied me with a Netgear router when I signed up to its internet package. I use its four ethernet ports for hooking up three PCs and a TV, but require three more for adding other TVs and a games console. I require a wired rather than wireless connection, so can I use a switch to add more ports? *Ron Williams*

Yes, you can – provided that your router hasn't been configured to prevent the use of a switch. A switch can simply be plugged into one of the router's ethernet ports.

Any modern switch should automatically detect that it's hooked up to another switch rather than a computer or TV and configure itself accordingly. All you'll have to do is plug in the required cables.

Remember that you'll need to use two ethernet ports for the switch and router to communicate with each other. With this in mind, Lindy's 8-Port Gigabit Desktop Switch (reviewed at tinyurl.com/7uohrr6) provides six additional ports. It's an unmanaged switch, for a plug-and-play installation.

If the TVs are distributed around your home, HomePlug adaptors are a good alternative to wiring long runs of cable from room to room. HomePlug (or powerline) enables your mains wiring system to carry network data between adaptors. It's also possible to combine a switch with HomePlug, allowing you to provide multiple ethernet ports in a different room. A good example is Devolo's dLAN 500 AVplus Starter Kit (reviewed at tinyurl.com/6wchprt).

64BIT VS 32BIT

Q Paul Woffindin wrote to *Helproom* in your May issue asking how he could run GWBasic in Windows 7 64bit. I was surprised that you didn't inform him of the more suitable 32bit edition. The only advantage of using 64bit is it allows for more RAM, but he doesn't need vast amounts to run GWBasic. *Ian Smythe*

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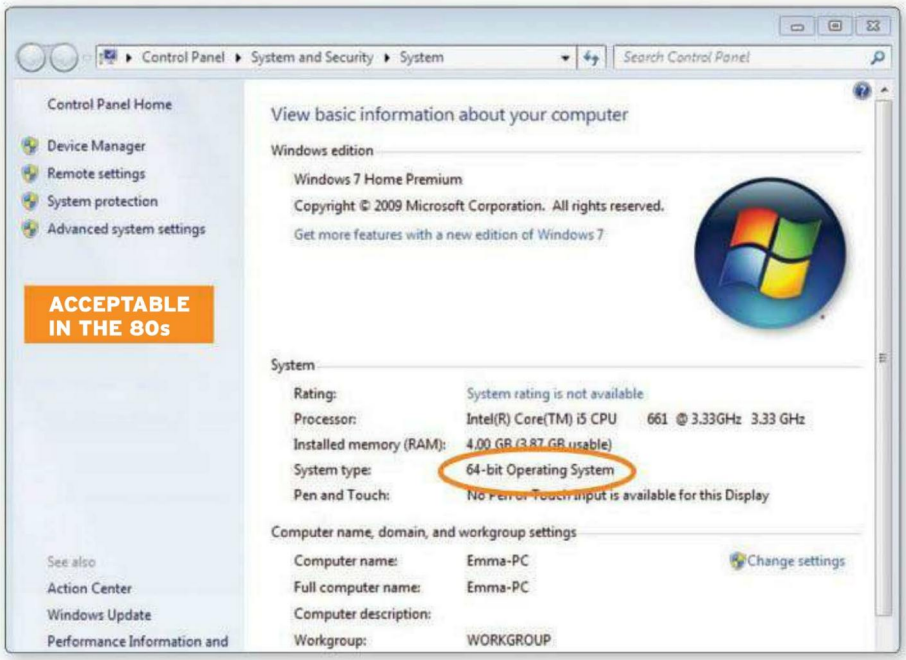

You are correct on several accounts, Ian: both 32- and 64bit versions of Windows 7 are available; the 64bit edition shipped with most new PCs allows them to access more than 4GB of RAM; and the 32bit edition lets you run 16bit software.

If you want to use older 16bit applications such as QuickBasic only, and don't need more than 4GB of RAM, a 32bit operating system is ideal. However, if access to more modern applications and additional memory is also required, there are virtualisation workarounds that let you run such programs in 64bit Windows. For example, you could take advantage of the Windows XP Mode in the Professional and Ultimate editions of Windows 7, or use a free virtualisation application, such as VirtualPC or VirtualBox, to install a 32bit OS inside your existing 64bit environment.

UK QUICKEN ON WINDOWS 7

Q I want to use Windows 7, but it isn't compatible with Quicken. The 2004 version installs fine, then produces the 'MFC70.dll missing' error when I try to launch it. I followed the link to the update noted in your April *Helproom* pages (quicken.intuit.com/support), but found only new versions for sale. It's my understanding that those produced after 2004 aren't suitable for use with Sterling. *James Leary*

Quicken XG 2004, the final version of some use in the UK market, is not supported under Windows 7. However, we found several reports online from users who have been able to get it working. We don't have a copy of Quicken with which to verify these procedures, but they are worth a try. Be sure to back up your system before you begin.

If you have a working installation of Quicken XG 2004 on Windows XP, copy the files from your Quicken folder to a USB stick. Install Quicken on the Windows 7 PC and jot down the DLL files it reports missing (most likely MFC70.dll and MSVCP70.dll). You can then copy these from your USB stick to the Quicken folder in Windows 7. Fingers crossed this will solve the problem.

Another workaround is to simply ignore the missing DLL error messages and launch the program by double-clicking the 'qw' file in Quicken's installation folder. If this works, save a shortcut to that file to your desktop for fast access to Quicken.

If you're having trouble starting the installation, try running the installer in compatibility mode. Right-click the start.exe file, then choose 'Windows XP SP3' compatibility and enable 'Run as Administrator'. Do the same for 'qw.exe'.

Head to tinyurl.com/79kwc6k to read the advice given by *PC Advisor* forum members.

QUIET COCKTAIL

Q I bought a Cocktail Audio X10 last year and successfully loaded it with around 500 tracks. A recent update caused it to stop working properly. The display and hard disk appear to be functioning correctly, but no sound can be heard from the internet radio or CD player. The volume is set to max and the mute is disabled. *Peter Grantham*

The update that was applied in late February introduced new speaker-output settings,

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according to cocktailaudio.co.uk. Specifically, a footnote directs you to section 1-5 of the firmware release notes in the case that no sound can be heard via speakers connected directly to the X10.

If your firmware updated automatically, you probably didn't get to read these instructions; you can download them from tinyurl.com/8664unt. Pay close attention to section 1-5 and, if you're unable to find a solution, contact info@cocktailaudio.co.uk for further advice.

THUNDERBIRD CRASHES

Q My email is downloaded from Gmail to Mozilla Thunderbird, but a recent update appears to have deleted all my messages. Since then, Thunderbird has also ignored my preference for messages to be downloaded to their respective folders as soon as they appear in my Gmail inbox. ***Kimtrnc***

Unless Thunderbird has done something really horrible, all your emails should remain intact in your Gmail account. The most likely scenario is that these are still safe on your hard drive, too, but Thunderbird has lost track of them during the update and set up a new empty profile.

To verify that your Gmail messages remain intact, log into your Gmail account via your favoured web browser and look for them. If you can't immediately find your messages, look in the Bin folder. Anything placed here stays put for 30 days only, so time is of the essence.

If your messages are present in Gmail, back up your email, uninstall Thunderbird from your system and start afresh. You can then configure it to download messages from your Gmail account in the same way that you had it set up previously.

A simple way to back up your Thunderbird email is with MozBackup (tinyurl.com/84hax7s). This can back up your mail and contacts stored in Thunderbird, as well as data from other Mozilla applications, such as Firefox.

Alternatively, you can manually back up your Thunderbird profile by locating and copying to a safe place your profile folder.

The location of this folder will vary, depending on which version of Windows you are running. Look under Tools, Account Settings, then scroll down the left pane and click Local Folders. The Local Directory will be displayed in the right pane.

Browse to your profile folder in Windows Explorer. You may find two folders here if Thunderbird created a new profile following the update. Back up both folders to rule out any data loss. See tinyurl.com/cnqny for detailed instructions on backing up profiles.

You'll now be able to roll back your changes should anything go wrong when uninstalling and reinstalling Thunderbird.

THUNDERBIRD SYNC

Q How do I automatically sync my Gmail contacts with Thunderbird? A recent Thunderbird update caused all the information in my address book to disappear. ***Kimtrnc***

We covered how to go about reinstating your missing Gmail messages in the previous question, Kimtrnc; the good news is that it's just as easy to make a backup of your Gmail contacts that can be imported into Mozilla Thunderbird.

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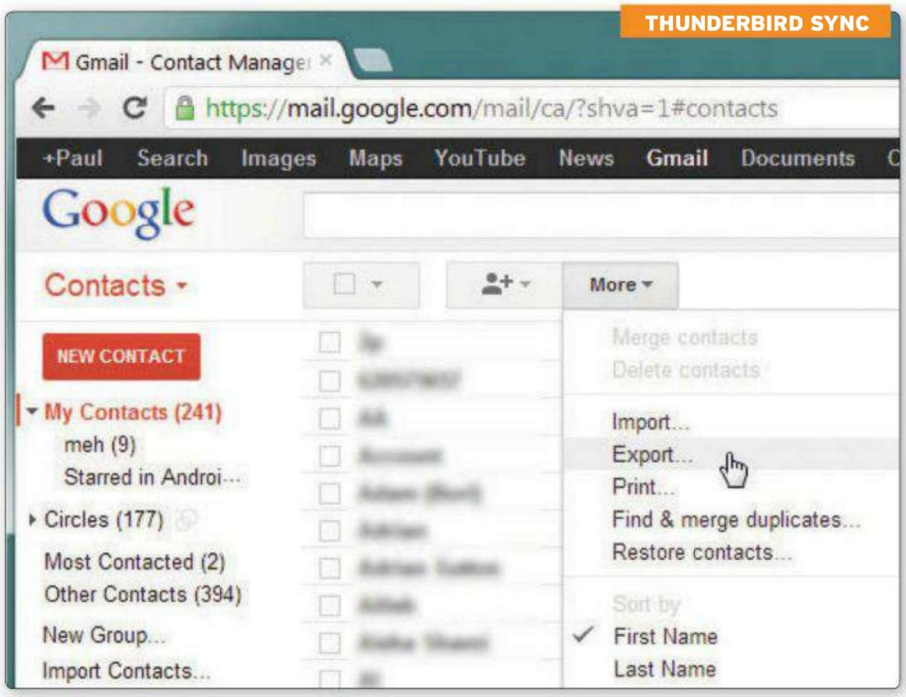

Log into Gmail via your favoured web browser and enter the Contacts view. If the word immediately below the Google logo at the top-left of the page says Contacts then you're already in it; otherwise, you'll need to select Contacts from the drop-down menu.

A few steps to the right is a More button; click this and choose Export. You can now choose to export all your contacts simultaneously or one group at a time. You can also export a selection of contacts by ticking the small boxes to the left of each of your contacts.

Select Outlook CSV as the output format to prepare your contacts for importing into a desktop email client, then click Export. Keep safe the resulting contacts.csv file.

Backing up your Gmail contacts isn't useful only for importing them into a desktop email client; it can also get you out of a sticky fix should you accidentally delete them. If you wish to back up your contacts for potentially restoring later, choose the Gmail format before clicking Export. It certainly wouldn't hurt to store two backups, with one in each format.

You can now import your Outlook format .csv file into Thunderbird. Launch the email client, select the Tools menu and choose Import. Select Address Books as the type of material you wish to import and click Next. Select Text File and click Next.

Locate and import your downloaded contacts.csv file (it's probably in your Downloads folder). If this isn't visible in the file browser, ensure that the format is set to CSV rather than LDIF.

Select 'First record contains field names' in the following dialog. Use the Move Up and Move Down buttons to match up the records in your imported data with the address book fields used by Thunderbird.

Disable any unnecessary fields. Make sure that the Last Name matches up in both columns, and that Primary Email in the first column matches up with Email address in the second.

Click Next to import the contacts into your address book under 'Imported address book contacts'. Click Finish.

This rather cumbersome procedure won't keep your contacts synchronised between Gmail and Thunderbird, so you'll have to manually duplicate any changes.

However, you can get around this with a Thunderbird add-on such as Google Contacts (tinyurl.com/6nLxwpv). Install this add-on by visiting Tools, Add-ons within Thunderbird, then dropping the downloaded file on to the Extensions panel. Thunderbird will automatically install the file, and your Gmail contacts will be downloaded when you next launch the email client. Any changes you make to Thunderbird's address book will also be reflected in Gmail, and vice versa.

You can configure the add-on via Thunderbird's Extension panel by clicking Options. We recommend enabling at least one Address book backup and to prompt for confirmation before deleting contacts.

YOUTUBE RSS FEEDS

Q How can I create an RSS feed of a YouTube search? There used to be an RSS button I could click on, but now it doesn't seem to be there. ***Sarah***

If you want to subscribe to a YouTube search via an RSS feed, you can construct the link URL yourself. This might seem like a scary

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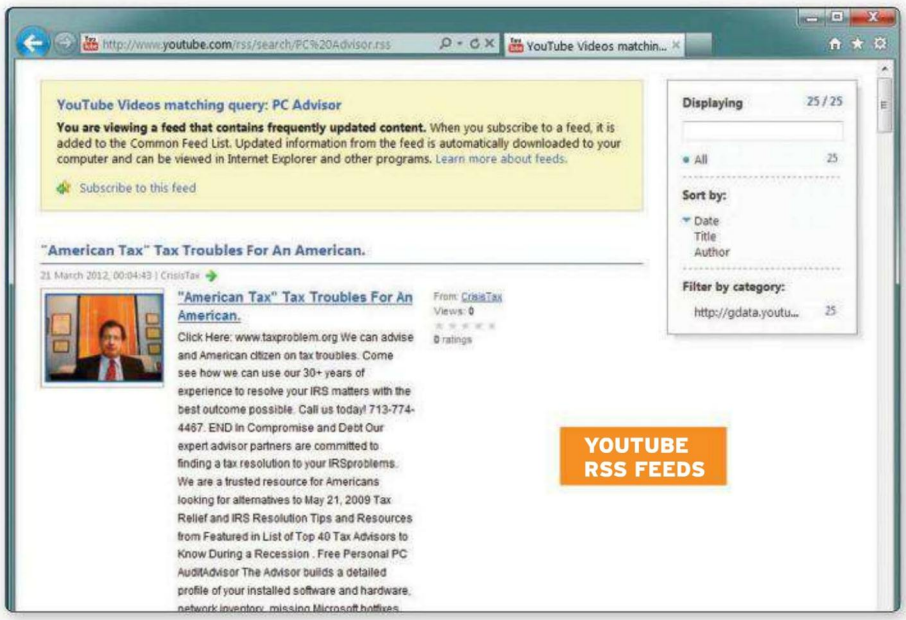


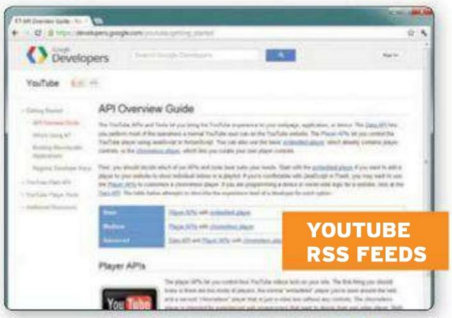
prospect if you're not used to that sort of thing, but it's actually rather simple.

The first part of your link will look like this: http://www.youtube.com/rss/search/. To this you must add your required search terms, with '.rss' at the end. Any spaces in your search term must be replaced with %20. To create an RSS feed for the YouTube search 'PC Advisor', for example, you would need to use http://www.youtube.com/rss/search/PC%20Advisor.rss.

You can use this URL in your preferred RSS reader. If you were to type this URL directly into your browser's address bar you would see that you are redirected to a different URL with a somewhat more complex version of your link.

This is because YouTube's more recent and preferred method of constructing RSS feeds is via the YouTube API, and your URL has automatically been converted into a query using the new method.

Using the API allows you much more control and flexibility over searching and how the results are sorted. You can find full information on searching for videos via the YouTube API at tinyurl.com/7t4qsjp.



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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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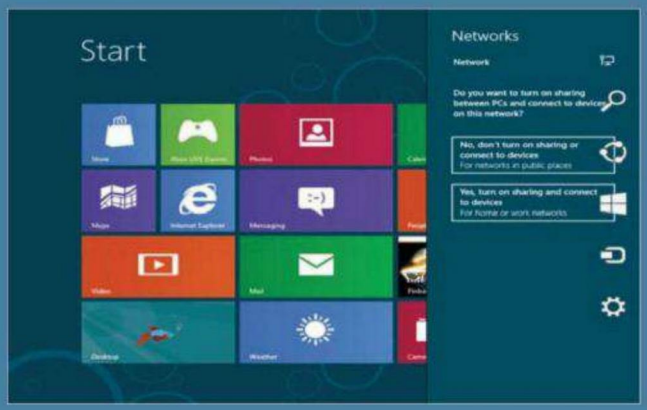
How to upgrade to Windows 8

If you can't wait for the final release of Windows 8 to take the new OS for a spin, Rosemary Hattersley explains how you can install the Consumer Preview today



With Windows 8, Microsoft has taken a radical departure from its previous desktop OS mold. Windows is no longer solely a 'desktop' OS, but one that's also optimised for tablets, with fingertip-based input.

Microsoft has dabbled in touch before but, for everyday business and home use, its software was clunky at best. Windows 8 is different. It's designed to work on tablets, laptops and PCs, with separate interfaces to differentiate between keyboard-and-mouse- and touch-based input.

The main interface is the new 'Metro' workspace, which borrows heavily from Windows Phone 7 with large tiles that contain information updated in real time. Metro is optimised for touchscreens, but you can still operate it using a mouse. For pure keyboard-and-mouse-driven input, though, Windows' 'Classic' desktop is tucked away and accessible via what used to be the Start button.

By offering two operating environments, users are able to run slimmed-down mobile apps, downloaded from the new Store, as well as programs that were written for older versions of Windows.

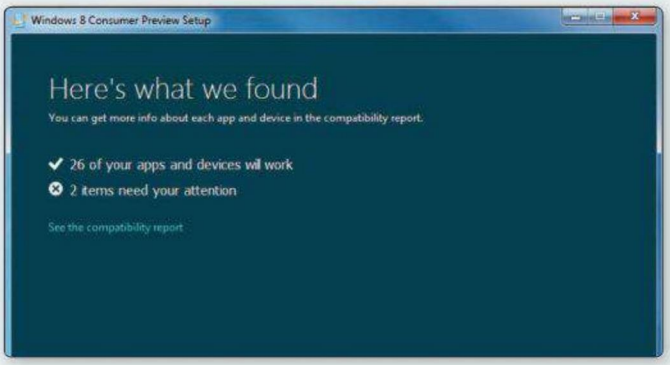
More than 10,000 changes are reported to have been made since Microsoft's first public demo of Windows 8 in September, and the OS is now almost ready for a commercial launch. In preparation, Microsoft is currently offering consumers the chance to preview and try out the new features for free.

The Windows 8 Consumer Preview is best approached as a secondary OS; we strongly advise against overwriting your existing system. If you do that and later decide the OS isn't for you, you'll need to reinstall your previous OS from a recovery DVD and will lose all your installed programs, settings, documents, photos, video and music.

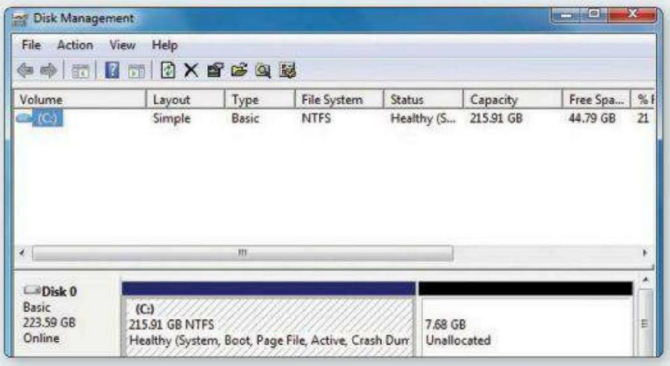
You might instead prefer to install the Consumer Preview on a separate drive partition or a second hard disk, or run it as a virtual PC within Windows 7 or Mac OS X.

Note that once the final version of Windows 8 is released the Consumer Preview will end. You will either need to buy a licence for the new OS, reinstall your previous copy of Windows or delete the partition.

INSTALLING THE WINDOWS 8 CONSUMER PREVIEW



START Browse to Microsoft.com and click the link to its Windows 8 Consumer Preview. Click the 'Download Windows 8 Consumer Preview' button to download the 5MB file, then allow it to run. The Setup program will probe your machine and determine whether your hard- and software are compatible.



4 Right-click the drive you want to partition, then choose Shrink volume and Windows will determine how much unallocated space is available. To free up more space you can also use Disk Cleanup – we gained a further 1.5GB. Right-click on the unallocated space and choose 'Create new simple volume'.

7 Reboot your computer, leaving the DVD in the drive (or insert it into the drive of the computer on to which you want to install the Windows 8 Consumer Preview). If your computer doesn't boot from the disc, reboot again and enter the Bios. Look for a 'boot priority' menu and make the CD/DVD drive the first boot device.

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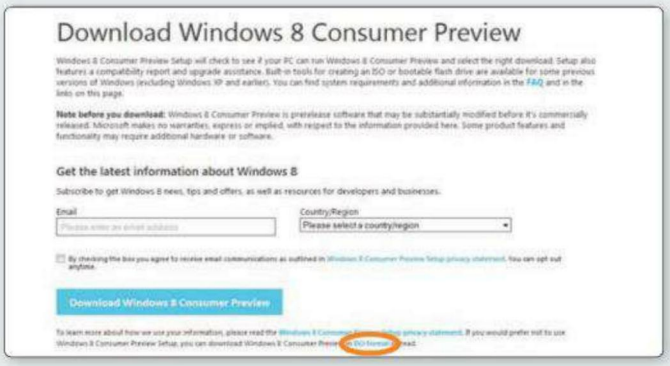
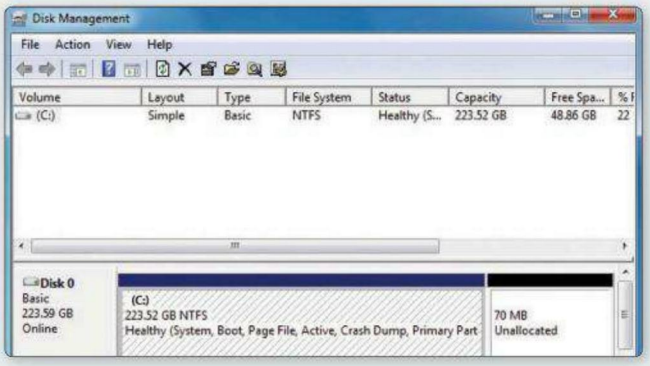
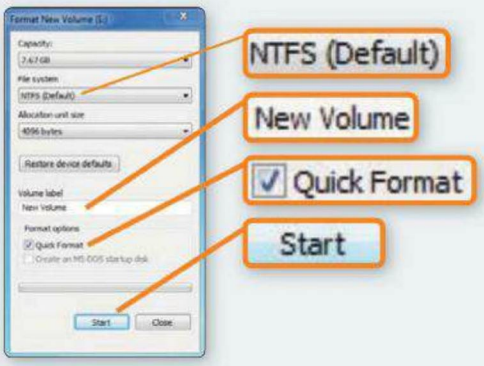


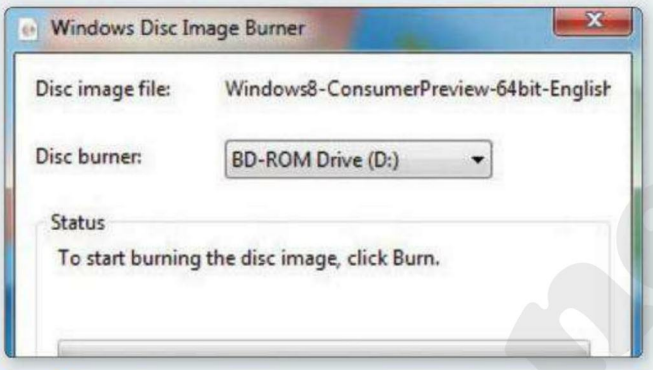
2 Return to the Consumer Preview area of Microsoft's website and click the 'ISO format' link below the 'Download Windows 8 Consumer Preview' button. Most people will be able to run the 64bit version, but those who don't have a 64bit processor or want to run 32bit programs should plump for 32bit.



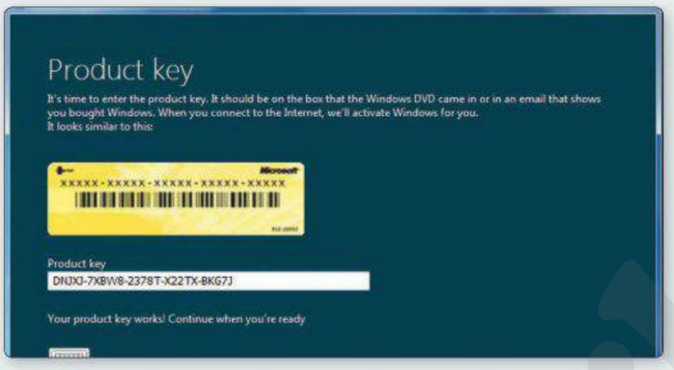
3 Next, you need somewhere to install the Consumer Preview. If you don't have a spare hard disk, create a partition of at least 4GB for a dual-boot system. In Windows XP, Vista or 7, go to Start, Control Panel and choose Disk Management to check how much free space is available.



5 Follow the setup wizard's prompts to create a new partition on your primary hard drive. Windows offers a choice of FAT and NTFS drive types; opt for the latter and click Next to proceed. Either accept the default drive name or enter your own. You'll need to allow the drive to be formatted, too. Click Start.



6 Burn the ISO image you downloaded in Step 2 to a DVD. If you're running Windows 7, you simply need to double-click the file to launch the Windows Disc Image Burner tool. If you're running Windows Vista or XP, we recommend downloading the free CDBurnerXP (cdburnerxp.de).



8 When the PC has booted from the DVD, follow the instructions and enter the product key DNJXJ-7XBW8-2378T-X22TX-BKG7J when prompted. Click Install Now to proceed. Choose Custom install rather than Upgrade installation, then be sure to choose the new partition you created or you will overwrite your existing installation.

9 During the installation process your computer will reboot itself several times. Eventually, the machine will boot into Windows' new Metro user interface, pictured above. For a guide on navigating this new and unfamiliar desktop, head to our website at tinyurl.com/8xjhpw5. ☒

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Protect your Android device from malware

Like any popular OS, Google Android is a growing target for malware makers. Rene Millman explains how to protect your smartphone or tablet for free

With every new release, smartphones get more powerful. We're increasingly using them as mini-computers for storing data and managing services, rather than simply devices on which to make calls and send texts. This makes smartphones a desirable target for malware makers.

A single piece of malware, downloaded to your handset on the back of a free app, can put your high-value personal data at the mercy of hackers, with minimal effort on their part. In future, we may also see malware downloaded to smartphones via dubious links in emails and texts, or simply through browsing the web.

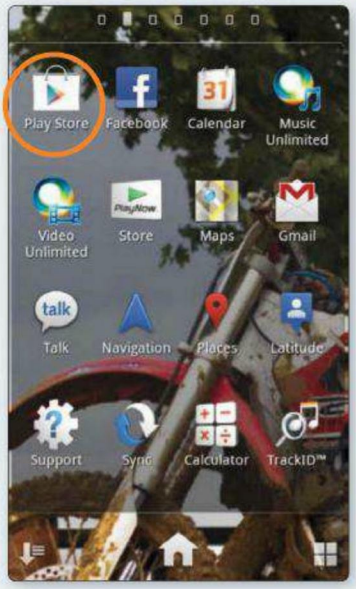
Most attractive to a cybercriminal is your bank details. If you visit online banking services through your handset, or have your card details stored in Google Play for app purchases, it's important that you take steps to protect your information.

Mac and Linux devotees have long pointed out that more malware is directed at Windows than any other desktop OS, while those who favour Microsoft's platform have countered that malware writers target the market leader to achieve the largest audience; and so it is with Google Android. While the market divide between Android and Apple's iOS doesn't mirror that of Windows and Mac, iOS is in effect a closed system, and the App Store offers for download only vetted apps. Should a dodgy app get through, Apple would pull it from its store quicker than you could download it.

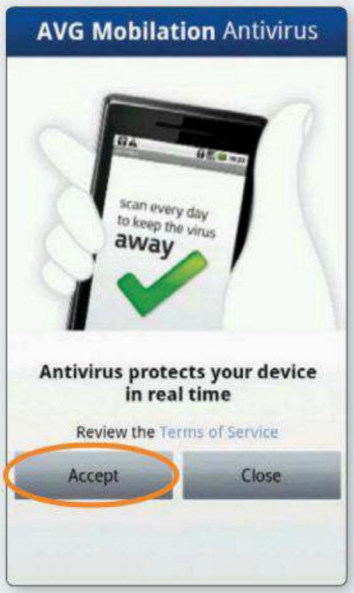
Android is an easier nut to crack, say analysts (see tinyurl.com/d8wo96e). Although Google recently introduced 'Bouncer' to its servers to root out malware, the ease with which hackers can upload malicious apps means a multi-pronged defence is required.

Installing and routinely updating your antivirus software is key to protecting an Android device. Here, we explain step-by-step how to download, install and configure AVG Antivirus Free on an Android smartphone or tablet. Turn to page 58 for in-depth reviews of more Android antivirus options.

INSTALL AND USE AVG ANTIVIRUS FREE



START Smartphone makers often apply a custom skin to Android's stock interface. If you don't have a Google Play icon on your smartphone or tablet's home screen, look for one in the Apps menu. Note that Google recently rebranded its Android Market as Google Play, and your device may still be offering the older shortcut. Either way, tap the icon to launch the content store.



4 The first time you launch the app you'll be prompted to review AVG's Terms of Service. Click Accept to signify your authorisation and move on to the app's dashboard. Click the menu button and choose Settings to begin configuring AVG. From here you can update the virus database with the latest signatures, alter the file-scanning speed, and configure the app to scan your text messages and monitor your browsing.

OTHER PROTECTION METHODS

Not only are smartphones expensive and desirable, but all sorts of personal information is stored within. This makes them a prime target for both thieves and hackers, meaning you may need more than a simple antivirus app to protect your device.

Opportunists can often be put off simply by configuring your device to request a password before access is authorised. Google Android offers three types of password-protection: PIN, password and pattern. These are accessible via Settings, Location & Security, 'Set up screen lock'. If you choose a PIN or password, make sure it isn't something that's easily guessed, such as your birth date; and

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2 Tap the magnifying glass in Google Play's top bar to open the search function. Type 'AVG Antivirus Free', then tap the magnifying glass to search for the app. Google will trawl its database of apps and offer several results; AVG Antivirus Free should be at the top of the list. Tap AVG Antivirus Free, then click Install on the following screen.

3 A third screen describes the various permissions that the app requires on your smartphone or tablet. We're usually cautious of apps that ask for a number of seemingly unrelated permissions, but security apps are the exception – AVG will need to deeply root itself in your device in order to keep an eye on things and provide complete protection. If you're happy to allow AVG unbridled access to your device, tap 'Accept & download'. Once the installation is complete, tap Open to launch AVG.

5 Tap the capsule icon at the top-left corner of the screen to begin a scan. AVG will probe the inner workings of your device, inspecting apps, media, contents and settings. AVG then logs its results, bringing to your attention anything untoward.

6 AVG Antivirus Free is more than just an antivirus app. It offers a Task Killer to close apps running unnecessarily in the background, and beta versions of its File Scanner, optimisation utility and personal-data-deletion tool. You can also try out its App Locker and App Backup features, which are available as paid-for plug-ins to the free app (each costs £1.82). Access these features by clicking the menu button and selecting Tools. ☒

if you use a pattern, ensure greasy fingerprints left onscreen don't give the game away.

Third-party apps such as APP Lock extend this protection to individual apps for convenience, allowing you to lock down only the applications that hold sensitive data. We show you how to set up APP Lock at tinyurl.com/br8nkxh.

Samsung's Galaxy Nexus smartphone ups the security ante with face recognition, meaning a thief would need a printed photo of you to gain access.

Always turn off Bluetooth when it's not in use, which will prevent nearby hackers from gaining access, and prolong battery life.

Ignore any text and multimedia messages you receive from unknown senders.

QR (Quick Response) codes printed in magazines, newspapers and on products in-store are useful means of finding out more information, but never scan a code for which you can't ascertain its origin. If in doubt, do not scan.

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Creating panoramic pictures with a twist

Panoramas look great, but we've seen it all before. Nik Rawlinson explains how to push the creative boundaries with a few simple edits in Photoshop Elements

A well-produced panorama looks great on any wall. The trouble is, we've seen it all before. However unusual your subject, there's no getting around the fact that stitching together half a dozen shots doesn't exactly push the creative boundaries.

Adobe Photoshop's Polar Coordinates tool, which is also found in the cut-down Photoshop Elements, can quickly and easily give your panoramas a twist. A few tweaks transform your images from flat, linear creations into intriguing 'mini worlds'.

As with all photo projects, your results will be influenced by the quality of your source files. It's too late to do anything about this once the files are already on your PC, so think carefully about how you compose your shot.

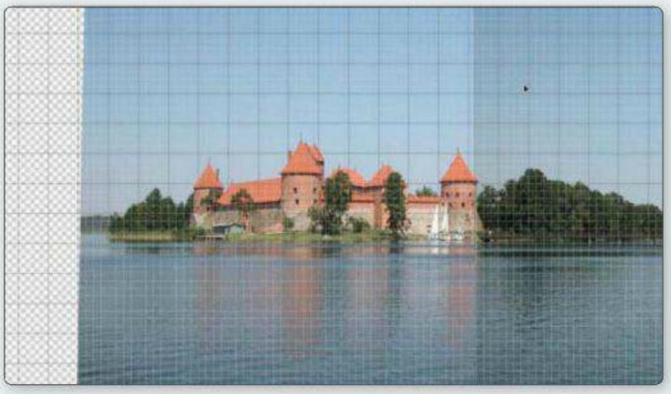
Invest in a cheap tripod (table-top models sell on eBay for around £10) to ensure the horizon is consistent throughout your snaps. If your camera has one, use its manual mode to keep constant the exposure, aperture and sensitivity for each shot.

Some subjects work better than others as mini worlds. In general, look for scenes with a central point of interest. Snap at least four frames to create your panorama, and leave some overlap between each. Our example depicts Trakai Castle in Lithuania. Rather than focus solely on the castle itself, we've also included the trees either side.

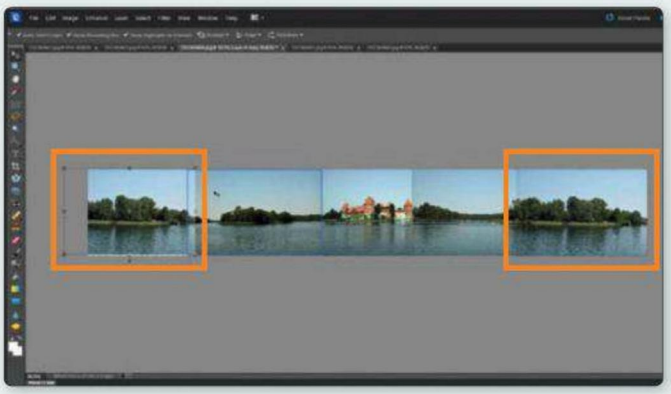
These trees offer plenty of detail, which can be sampled with the Clone Stamp tool and used to help disguise the seams between each frame. Furthermore, the irregular shape and height of each tree allows us to match up the far edges of our panorama by sliding one end of the montage over the other.

So, get shooting and warping. It's time you put up something truly original on your wall.

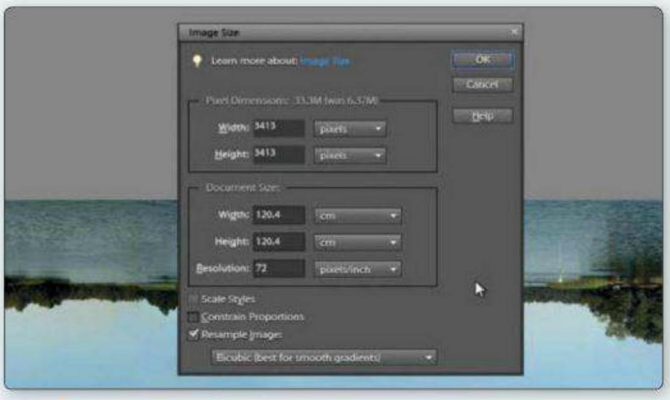
CREATE A MINI WORLD USING ADOBE PHOTOSHOP ELEMENTS



START Open the central picture. Widen the canvas five-fold by selecting it with the Crop tool (Ctrl, C) and dragging the side handles outwards. Drag-and-drop or paste the other images on to the canvas in an overlapping fashion to form a panorama.



4 Each end of the panorama will need to be identical if the image is to be rolled into a 'world'. Select and copy the far-right portion of the image and paste it to the far-left side. You may need to use the Clone Stamp and Crop tools to line up the images.



7 Our image is too wide; square proportions are necessary for creating a rounded world. Press Ctrl, Alt, I to bring up the Image Size window, then set the image height to match its width. Enable Resample Image and disable Constrain Proportions. Press Ok.

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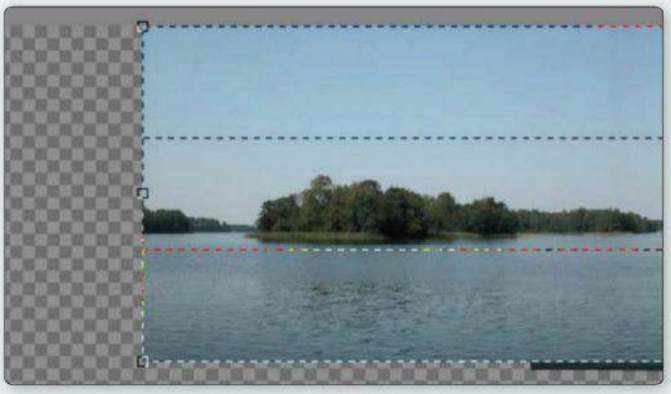
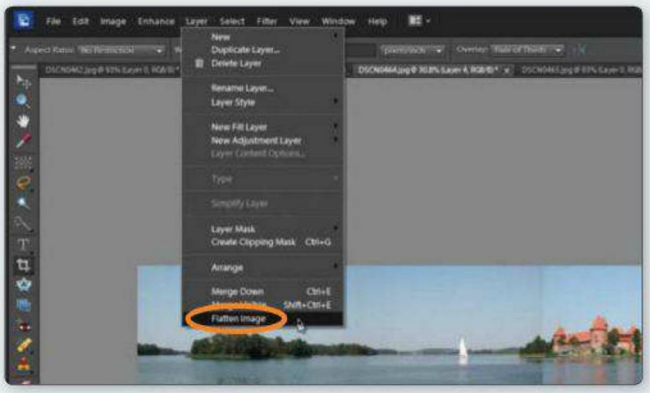
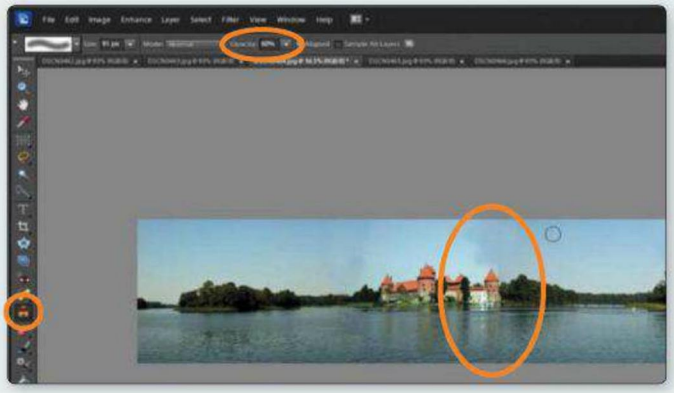


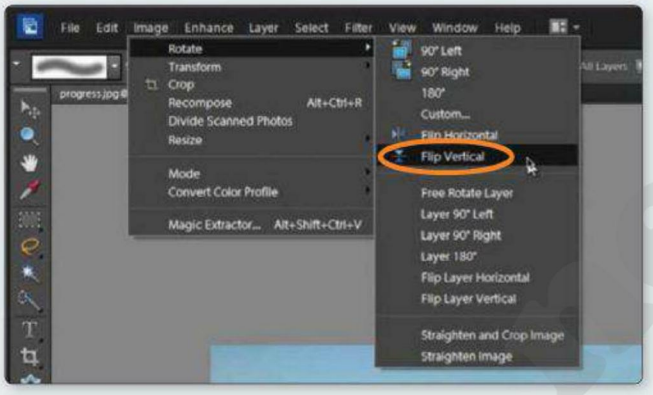
2 Still using the Crop tool, trim off any unwanted areas of the canvas so it contains only the images that form the panorama. It's important that we get rid of any empty space on the canvas, since it will leave gaps in our mini world.



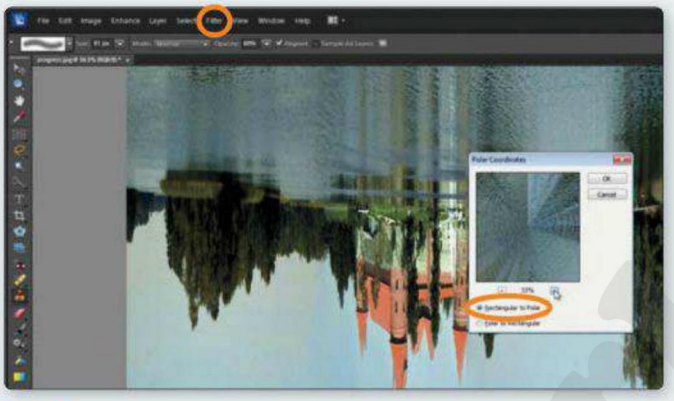
3 Each of our five images resides on its own layer, but our panorama will be much easier to work with if it's composed on a single layer. This is achieved by flattening the image. Click Layer at the top of the window and select Flatten image.



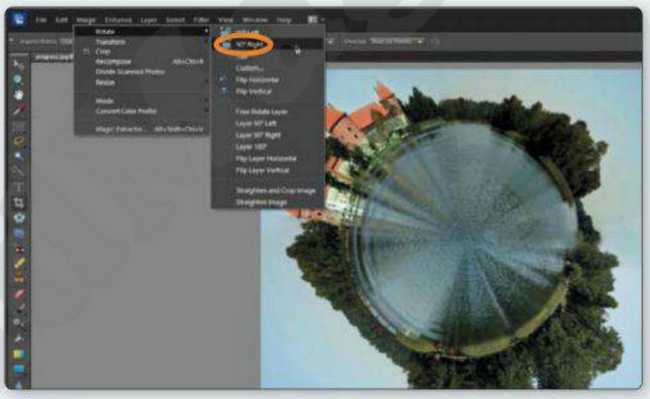
5 The seams between each image in our example are glaringly obvious. We used the Clone Stamp tool to sample parts of the sky, trees and water pictured in our panorama, then painted over the joins with 60 percent opacity.



6 The bottom of the image forms the 'atmosphere', so the whole thing must be flipped vertically to ensure the sky is on the outside and the water on the inside of our mini world. Click Image at the top of the window, then choose Rotate, Flip Vertical.



8 To warp the panorama into a mini world, select Filter, Distort, Polar Coordinates. Select 'Rectangular to Polar', then examine the preview provided. You can reduce the magnification setting to preview more of your image. If you're happy, click Ok.



9 We cropped in on our resulting mini world, and used the Clone Stamp tool to remove the seam where the left- and right edges of our panorama met. We also used the Image, Rotate menu to ensure the castle in our picture was near the top. ☒

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Learn how to program code for the web

Programming isn't as difficult as you might think. Martyn Casserly shows how to take your first steps with JavaScript using Codeacademy

Unexpected error messages that pop up onscreen are the only interaction with computer programming languages that many of us have. Graphical user interfaces and the touchscreen revolution have done an excellent job of making more intuitive our relationships with machines, while devices such as the iPad seem to be ushering in an age of elegant consumption rather than creation.

If you want to experience more than that which others have created for you, however, you'll need to learn a little code. Running a program you wrote and seeing the results play out onscreen can be extremely satisfying.

Computer code needn't be complicated, as anyone who has entered into a command prompt '10 Print "Hello World", 20 Goto 10' will attest. There are more practical applications for coding, of course.

For example, you might want to add a specific template or style to your website, but it's missing a key element. With only a basic understanding of HTML or JavaScript, you can adjust the code and get your site functioning properly.

For DIY types there are more exciting possibilities. The Raspberry Pi, a £25 basic computer that was built to encourage people to learn code, sold 10,000 units within minutes of its release. Those lucky enough to get hold of one could use it to create a media centre, a classic games device, or even a radio-controlled car. With a little code and a big imagination, the possibilities are endless.

Of course, learning a programming language continues to be for many people an intimidating prospect. Thankfully, interactive sites such as Codeacademy offer free guidance with JavaScript.

Javascript is one of the most useful languages utilised by the web; it's also ideal for newcomers to computer coding. The lessons offered by Codeacademy hold your hand as you progress from novice to veteran. Here, we aim to help you explore this brave new world and, hopefully, encourage you to take your first few steps in coding.

GET STARTED WITH CODEACADEMY

START Head to codecademy.com and set up an account to keep track of your progress. You can log in either with an email address or your Facebook account credentials; the latter will post your achievements for all your friends to see.

4 Complete the next couple of lessons as instructed. The fifth step in the tutorial concerns 'Editor and Arrays'. Enter your code into the top panel, then check that it functioned as expected in the lower panel. You can access Hints, should you get stuck.

7 Click the Courses tab to view your progress with Codeacademy. You'll be able to see how far you've progressed through the various lessons, the various badges you've been awarded, and links to any projects that you are now sufficiently equipped to attempt.

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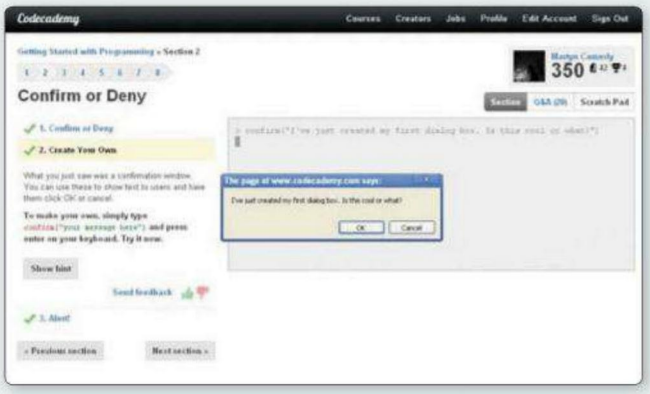
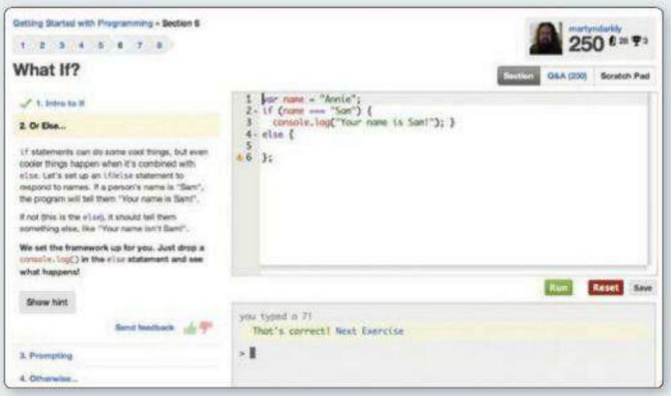
Tech Help

2 Follow the instructions given onscreen. You'll first be prompted to complete a few basic tasks, such as inputting your name and solving some simple mathematics problems, and will then be awarded your first achievement badge. Now it's time to begin the first exercise.



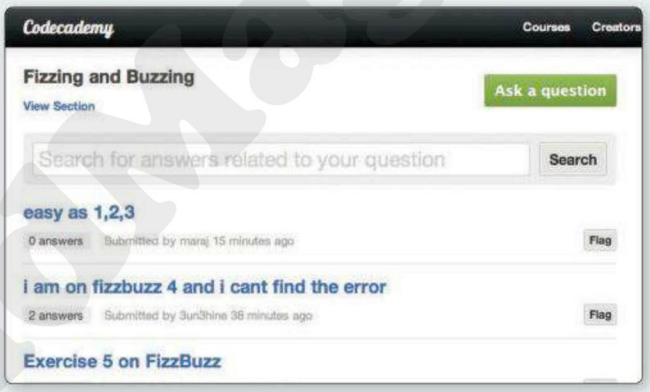
3 Codeacademy asks you to create a basic dialog box. The instructions are clearly explained, and you need to enter only a single line of code to complete the task. Your dialog box will pop up onscreen; click Ok.



5 Step 6 gets you started with 'If' and 'Else' commands. These allow you to set parameters that result in differing outcomes, depending on a user's interaction with your program. This might sound tricky, but the examples are straightforward to execute.

6 One of the final introductory exercises is a task that, if you code it incorrectly, can create an 'infinite loop'. This would normally crash your machine, but the sandbox created by Codeacademy means only the particular browser tab is affected.

8 Projects are advanced tasks for you to complete, such as building a number game. The goals are clearly defined, and all the tools you'll require are to hand. A helpful addition is error messages, which show you where any coding problems might lie.



9 Projects include several individual exercises, and a forum is available for each group. If you need help you can post a new thread relating to a particular exercise; alternatively, you can offer advice to others who are experiencing difficulties. ☒

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Storing your world in Apple's iCloud

Most iTunes users don't use Macs. Cliff Joseph explains how to use Apple's free online backup and synchronisation service on a Windows computer

If you own an iPhone or iPad then you've probably heard about iCloud, the online storage system Apple recently launched for its various mobile devices and Mac computers.

Most iPhone and iPad owners don't also use Macs, of course, so Apple has released a version of its iCloud software that runs on Windows PCs, too.

The Windows version isn't as straightforward to use as that provided for Macs, but it still offers a quick and easy way to transfer files from an iDevice to your PC. iCloud works the other way too, letting you view and edit files when you're away from the PC.

It's free to sign up to iCloud, which offers 5GB of storage space. Any music, videos, e-books and apps bought from iTunes, as well as any photos captured by your device are exempt from this allowance.

This is ample storage for most users wishing to store their documents, email, calendar and other information in the cloud. Should you need more storage, however, it costs from £14 per year for 10GB, up to £70 for 50GB.

We found some limitations with iCloud for Windows. The process of transferring photos from an iDevice to a Windows PC is automated, but you must log in online and manually upload word processor and spreadsheet documents.

And iCloud's support for contacts and calendar information could be improved. With dedicated Mail, Calendar and Contacts programs on all Apple devices, information is shared between platforms with ease; on Windows, iCloud accepts information from Outlook 2007 or 2010 only, ignoring popular free services such as Windows Live Mail.

There is a workaround to this problem if you're willing to set up a new email account, since iCloud supports Apple's free '@me.com' service. It's certainly worthy of consideration, given that the 5GB of storage offered by iCloud is more than double what you'd get from online services such as Dropbox.

MANAGE iCLOUD FROM A WINDOWS PC

START Before you can begin using iCloud you'll need an Apple ID. If you own an iPhone or iPad you probably already have one (it's what you use to make iTunes purchases); if not, navigate to Settings, iCloud on your iDevice and click 'Get a Free Apple ID'.

4 The iCloud Control Panel provides a similar set of options to the website for synching photos, email and other information, although some work better than others. Synching photos is rather straightforward, so that's where we'll start.

7 Documents created on an iPhone or iPad using Apple's iWork apps (£6.99 each) are uploaded to this site. This works with Microsoft Word and Excel documents, too. You can download them to your PC, edit them, then return them to iCloud.

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Tech Help

2 Sign in with your Apple ID to access a list of items that can be stored in iCloud. You can store and sync a variety of files and information, including photos, documents, email, contacts and calendar information. Toggle on those you wish to sync with iCloud.

3 Open the browser on your Windows PC and head to apple.com/icloud/setup. Click Windows PC, then download the iCloud Control Panel for Windows. This software is compatible with Windows 7 and Vista Service Pack 2 only.

5 Your PC's Pictures library will now contain two new folders. Any photos you take on your iPhone or iPad are automatically sent to the 'My Photo Stream' folder. You can also send photos to your iDevices by placing them in the Upload folder.

6 Synching documents via iCloud is a little more complicated, since you can't transfer them directly from an iPhone or iPad to a Windows PC. Instead, you must fire up your PC's browser and log into your iCloud account (icloud.com), then click iWork.

8 For your email, contacts and calendar information, iCloud support stretches only to Outlook 2007 and 2010. You'll also need to create an entirely new email address, since it works only with Apple's @me.com service.

9 You can still use the Mail app on your iDevice to access your Gmail, Yahoo, AOL, Hotmail and other accounts. Note, however, that your email will be stored locally on each device and won't be backed up to or synched with iCloud. ☒

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Software editor:
Letitia Austin
dvd@pcadvisor.co.uk

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Bitdefend

FULL PROGRAM

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 204\ Bitdefender Total Security 2012 and open the install file

Online registration required: follow the links during installation

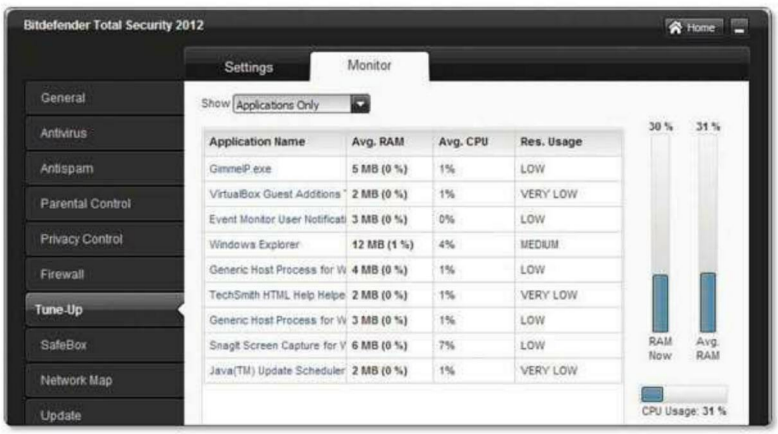
System requirements
Windows XP/Vista/7; 1.5GB RAM; 800MB hard-disk space

Bitdefender Total Security 2012 offers the ultimate silent security for the net-centric lifestyle, fighting every category of e-threat with its best-of-breed anti-malware technologies.

With Bitdefender Total Security 2012, there are no pop-ups, no configuring and no interruptions. Its award-winning antivirus, antispyware, antiphishing and a two-way firewall are just the beginning in this comprehensive security solution.

Features

- Parental Controls keep children safe online
- Social-networking safeguards filter links on Facebook and Twitter
- File Shredder wipes all traces of deleted files from your PC
- File Encryption prevents others accessing your files
- Tune-up module helps your PC to run at top speed ☒



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Incomedia WebSite X5 Smart 9.0

FULL PROGRAM (THREE-MONTH LICENCE)

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 204\ Incomedia WebSite X5 Smart 9 and open the install file

Online registration required: head to tinyurl.com/774zLc7

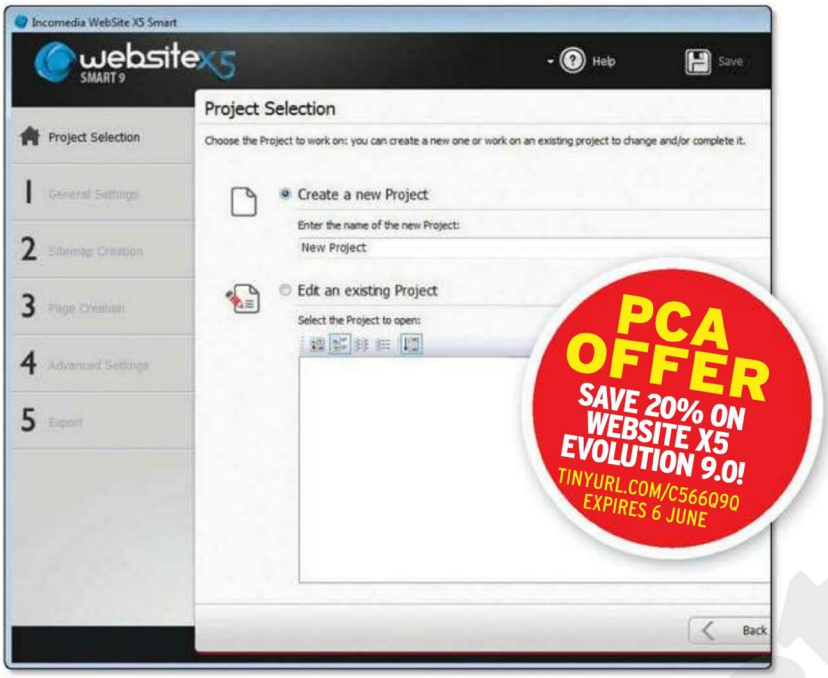
System requirements
Windows XP/Vista/7; 512MB RAM; 1024x768 screen resolution; web connection

WebSite X5 lets you create a good-looking website in five simple steps, with no programming skills required. Its intuitive graphical interface lets you check your work as you go, with previews always available and updated in real time.

WebSite X5 gives you tips and advice every step of the way. It guarantees simplicity of use, flexibility and maximum customisation of your work.

Features

- 250 templates
- Custom template editor
- Menu generator
- Embed video/sound/Flash
- Built-in FTP engine ☒



Auslogics Disk Defrag Professional

FULL PROGRAM (THREE-MONTH LICENCE)

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 204\ Auslogics Disk Defrag Professional and open the install file

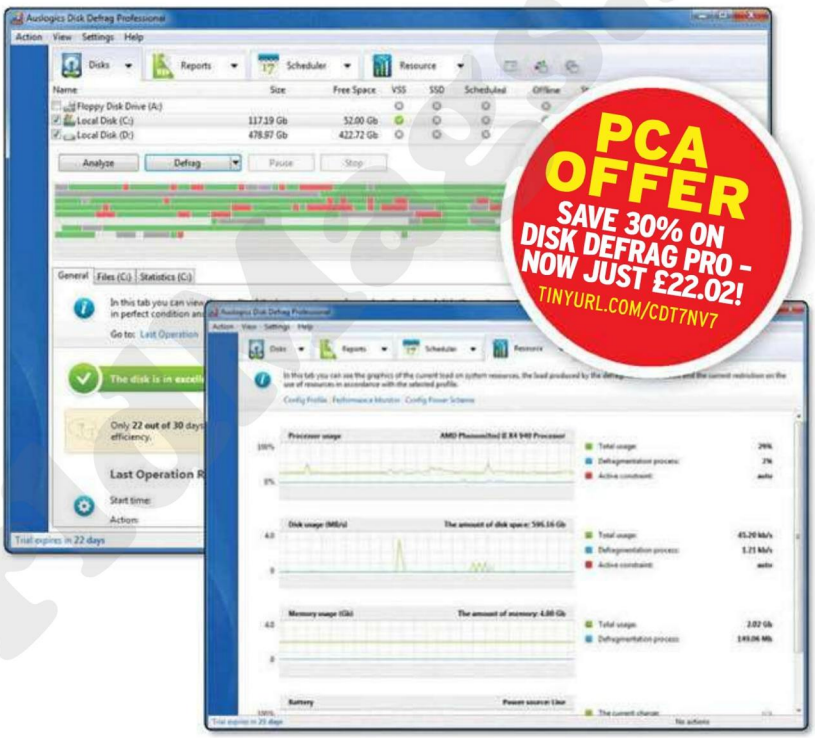
Online registration required: follow the links during installation

System requirements
Windows XP/Vista/7; 512MB RAM; 25MB hard-disk space

Advanced algorithms and new defrag technology means the Professional edition of Disk Defrag allows for even faster hard-drive performance.

Features

- Defragments system files
- Four disk-optimisation algorithms
- Not only defrags, but prevents further fragmentation
- Uses special algorithms for SSD and VSS-enabled drives
- Shows detailed reports and performance charts ☒



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Ashampoo

FULL PROGRAM

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 204\ Ashampoo Photo Commander 9 and open the install file

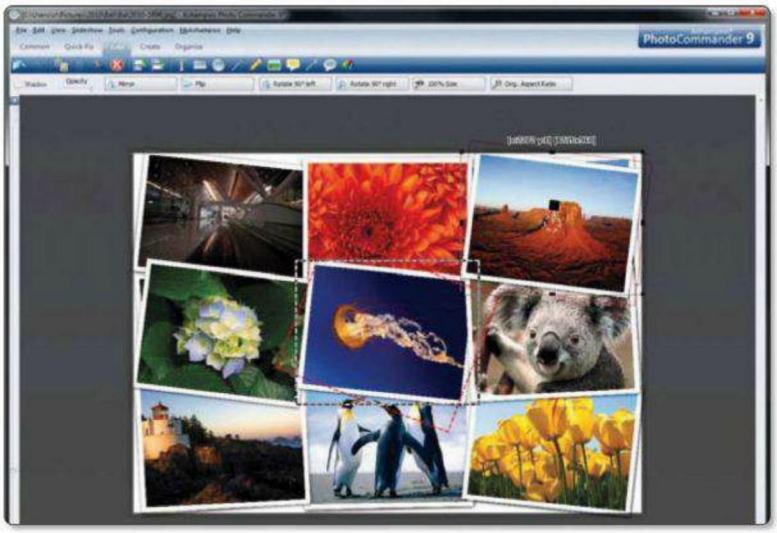
Online registration required: follow the links during installation

System requirements
Windows XP/Vista/7; 256MB RAM; 160MB hard-disk space

Ashampoo Photo Commander 9.0 offers all the features you need to manage, edit, optimise and present your digital pictures.

Features

- Miniature view with grouping function
- Tagging
- Batch processing
- Editing and optimisation of photos
- Create HTML albums, slideshows, collages and more
- Burn discs, send emails and create PDFs
- Import images from cameras and scanners
- Apply skins and plug-ins ☒



East-Tec DisposeSecure

FULL PROGRAM (10 SANITISATIONS)

ONLINE REGISTRATION REQUIRED

Installation details

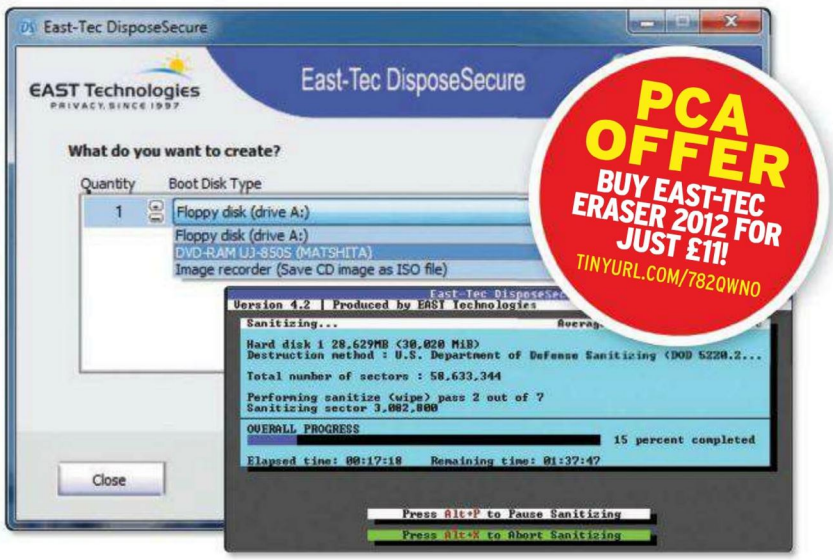
Go to My Computer. Right-click the DVD icon and open the disc. Select Files 204\ East-Tec DisposeSecure and open the install file

Online registration required: head to tinyurl.com/7tg7hex

System requirements
300MHz processor; Windows XP/Vista/7; 128MB RAM; 5MB hard-disk space

Deleting all your old files, emptying Windows' Recycle Bin, formatting the hard disk and using FDISK aren't enough to stop people armed with only basic recovery software from restoring the information you thought you'd removed. East-Tec DisposeSecure removes all traces of data from the hard disk by overwriting and destroying every bit of information. It meets and exceeds government and industry security standards for the permanent erasure of digital information.

DisposeSecure removes all traces of data from a hard disk or partition, without damaging the disk. All information is overwritten and destroyed beyond recovery. ☒



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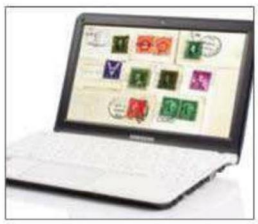
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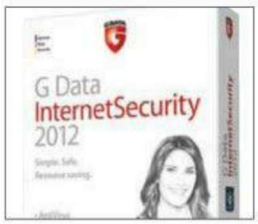

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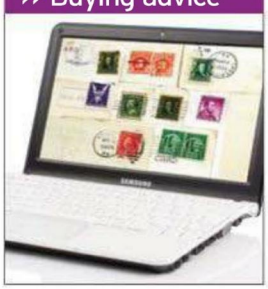
Netbooks	1	2	3	4	5
	Samsung NC110	Kogan Agora Pro	Samsung NS310	Acer Aspire One Happy 2	Dell Latitude 2120 Advanced
Price	£260 inc VAT	£300 inc VAT	£320 inc VAT	£250 inc VAT	£598 inc VAT
Website	Samsung.com/uk	Kogan.co.uk	Samsung.com/uk	Acer.co.uk	Dell.co.uk
Build rating	★★★½☆	★★★½☆	★★★½☆	★★★★☆	★★★½☆
Features rating	★★★☆☆	★★★½☆	★★★½☆	★★★½☆	★★★★☆
Performance rating	★★½☆☆	★★½☆☆	★★½☆☆	★★½☆☆	★★½☆☆
Value rating	★★★½☆	★★★★☆	★★★☆☆	★★★½☆	★★☆☆☆
Overall rating	★★★½☆	★★★★☆	★★★☆☆	★★★½☆	★★★☆☆
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	• Attractive styling • Excellent battery life • Only DDR2 RAM • Non-reflective 10in screen	• Above average screen size • 2GB RAM • Runs Ubuntu not Windows • Battery life very poor • Hi-res matt screen	• 1GB DDR3 RAM • Only 250GB hard drive • Glossy screen • Low battery life • Expensive for the spec	• Good overall build quality • Glossy screen • Adequate performance • A little hot in use • Difficult to access innards	• 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

[1]Not 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.

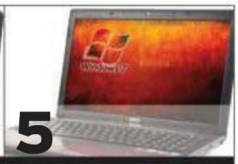
Storage: Netbooks usually come with 160GB or 250GB hard-disk drives. Some have solid-state drives instead. Smaller, less fragile and quieter, these are also expensive and you'll have to settle for far less capacity.

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.

WorldMags.net

Sub-£600 laptops



	Lenovo G570	Samsung RV511	Lenovo IdeaPad S205-1038	Lenovo ThinkPad X121e 3045	MSI CR650
Price	**£490 inc VAT**	**£520 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	★★★½☆	★★★½☆	★★★★☆	★★★★☆	★★★☆☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★☆☆	★★★☆☆
Performance rating	★★★★☆	★★★★☆	★★★☆☆	★★½☆☆	★★★☆☆
Value rating	★★★★☆	★★★★☆	★★★★½	★★★★☆	★★½☆☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★½	★★★☆☆
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	×	×	×	×	×
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	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	• Blu-ray drive • Adequate performance • Can play some games • Capacious hard drive • Heavy	• Good performance in WorldBench 6 • Large hard disk • Light gaming potential • Reflective screen	• Extremely portable • More powerful than a netbook • Glossy screen • Rather slow	• Business portable • Excellent matt screen • No optical drive • Relatively lightweight • Good battery life	• 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 lowly 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.

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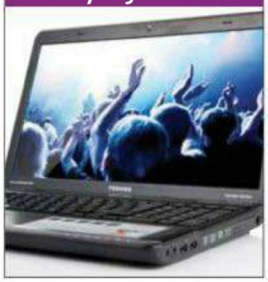
£601-£1,000 laptops

	1 PC ADVISOR BEST BUY	2 PC ADVISOR BEST BUY	3 PC ADVISOR RECOMMENDED	4	5 PC ADVISOR RECOMMENDED
	Toshiba Satellite P750	Apple MacBook Air 11in	Dell XPS 14z	Asus U46SV-WX044X	Asus Zenbook UX31E-DH53
Price	£999 inc VAT	£849 inc VAT	£949 inc VAT	£699 inc VAT	£999 inc VAT
Website	Toshiba.co.uk	Apple.com/uk	Dell.co.uk	Uk.asus.com	Uk.asus.com
Build rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★½☆	★★★★☆	★★★½☆	★★★★½
Performance rating	★★★★☆	★★★★☆	★★★★½	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★½	★★★★½	★★★★☆
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★★☆
Processor	2.2GHz Intel Core i7-2670QM	1.6GHz Intel Core i5-2467M	2.8GHz Intel Core i7-2640M	2.3GHz Intel Core i5-2410M	1.8GHz Intel Core i7-2677M
RAM	8GB DDR3	2GB DDR3	8GB DDR3	4GB DDR3	4GB DDR3
Storage	750GB hard drive	64GB SSD	750GB hard drive	640GB hard drive	256GB SSD
Screen size	15.6in	11.6in	14in	14.1in	13.3in
Screen resolution	1366x768 pixels	1366x768 pixels	1366x768	1366x768 pixels	1600x900
Graphics	nVidia GeForce GT 540M	Intel HD Graphics 3000	nVidia GeForce GT 520M	nVidia GeForce GT 540M	Intel HD Graphics 3000
Video memory	2GB	N/A	1GB	1GB	N/A
Wireless	802.11b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	100Mbps with USB adaptor	Gigabit	Gigabit	N/A
Bluetooth	✓	✓	✓	✓	✓
USB	1x USB 3.0, 3x USB 2.0	2x USB 2.0	1x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0	1x USB 3.0, 1x 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	6x BD-ROM, 8x DVD±R, 6x DVD-RW, 8x DVD+RW	N/A	8x DVD±R, 6x DVD-RW, 8x DVD+RW	8x DVD±4, 4x DVD±RW, 5x DVD-RAM, 8x DVD-ROM	N/A
Extras	Webcam	HD webcam, multitouch trackpad, backlit keyboard	Webcam	Webcam	Webcam
Operating system	Windows 7 Home Prem 64bit	Mac OS X 10.7 Lion	Windows 7 Home Prem 64bit	Windows 7 Pro 64bit	Windows 7 Home Prem 64bit
Bundled software	None	iLife 11	None	None	None
Fear (Max detail)	54fps	17fps	46fps	78fps	Not tested
Battery	48Wh lithium-ion	35Wh lithium-ion	58Wh lithium-ion	88Wh lithium-ion	50Wh lithium polymer
Battery life	3 hrs 23 mins	4 hrs 38 mins	6 hrs 46 mins	10 hrs 1 min	7 hrs 17 mins
WorldBench 6 score	131	111	143	114	119
Dimensions	381x254x36mm	300x192x3-17mm	335x234x23.8mm	333x245x27mm	326x223x18.1mm
Weight	2.6kg	1.07kg	2.1kg	2.1kg	1.4kg
Warranty	1 year carry-in	1 year return-to-base	1 year return-to-base	2 years return-to-base	1 year return-to-base
Verdict	• Good speed • 2GB nVidia graphics • Blu-ray playback • Glossy screen • Poor battery life	• Reasonable price tag • Very light and compact • Strong performance for size • Great hi-resolution, low-glare screen	• Modern and stylish looks • Impressive battery life • Good features for money • Low-resolution screen suffers from glare	• Solid business laptop • 10-hour battery life • Sharp, vibrant 14in screen • Great graphics handling	• Superb design • Nice range of connectors • Impressive battery life • MacBook Air is faster and has a better display
FULL REVIEW	TINYURL.COM/BUHW64S	TINYURL.COM/CCPOANM	TINYURL.COM/6P2AVFP	TINYURL.COM/C845T5Y	TINYURL.COM/6PG68Z3

>> Buying advice



Laptops

Processor: Intel processors remain the dominant force in our laptop charts. The best options are the Core i3, i5 and i7 processors, although budget laptops use slower Intel Celeron-branded chips. The Core i-series are very efficient, allowing speedy performance and good battery life. Some Core i7 chips are also available as quad-core processors – look for a 'Q' after their part number.

Processors in Intel's Core i3, i5 and i7 families include performance features such as Turbo Boost, for short-term overclocking, and Hyper Threading, which enables dual-core CPUs to function like quad-core processors.

Memory: The minimum offering if you're paying more than £600 should be 2GB of memory. Most laptops offer more. The more memory you have, the smoother your laptop will likely run.

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£1,001+ laptops	1 PC ADVISOR RECOMMENDED	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR GOLD	4	5
	Apple MacBook Air 13.3in	Rock Xtreme X685-i5-2540M	Apple MacBook Pro 15in	Toshiba Portégé Z830-104	Dell XPS 15z
Price	£1,449 inc VAT	£1,229 inc VAT	£1,849 inc VAT	£1,099 inc VAT	£1,199 inc VAT
Website	Apple.com/uk	Rockdirect.com	Apple.com/uk	Toshiba.co.uk	Dell.co.uk
Build rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★½☆
Features rating	★★★★½	★★★★☆	★★★★½	★★★★½	★★★★☆
Performance rating	★★★★½	★★★★½	★★★★½	★★★½☆	★★★★☆
Value rating	★★★½☆	★★★½☆	★★★★☆	★★★½☆	★★★½☆
Overall rating	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★½☆
Processor	1.8GHz Intel Core i7-2677M	2.6GHz Intel Core i5-2540M	2.4GHz Intel Core i7-2760QM	1.7GHz Intel Core i5-2557M	2.7GHz Intel Core i7-2620M
RAM	4GB DDR3	6GB DDR3	4GB DDR3	4GB DDR3	8GB DDR3
Storage	256GB SSD	500GB hard drive	750GB hard drive	128GB SSD	750GB hard drive
Screen size	13.3in	15.6in	15.4in	13.3in	15.6in
Screen resolution	1440x900 pixels	1920x1080 pixels	1440x900 pixels	1366x768	1920x1080 pixels
Graphics	Intel HD Graphics 3000	AMD Radeon HD 6990	AMD Radeon HD 6770M	Intel HD Graphics 3000	nVidia GeForce GT 525M
Video memory	N/A	2GB	1GB	N/A	2GB
Wireless	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n
Ethernet	N/A	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	×
USB	2x USB 2.0	2x USB 3.0, 2x USB 2.0	2x USB 2.0	1x USB 3.0, 2x USB 2.0	2x USB 3.0, 1x 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	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	8x BD-ROM, 8x DVD±R, 2.4x DVD-RW, 4x DVD+RW
Extras	HD webcam, multitouch trackpad, backlit keyboard	Webcam, fingerprint reader	HD webcam, multitouch trackpad, backlit keyboard	Webcam, fingerprint reader	Webcam
Operating system	Mac OS X 10.7 Lion	Windows 7 Home Prem 64bit	Mac OS X 10.7 Lion	Windows 7 Home Pro 64bit	Windows 7 Home Prem 64bit
Bundled software	iLife 11	None	iLife 11	None	None
Fear (Max detail)	17fps	275fps	98fps	Not tested	51fps
Battery	50Wh lithium-ion polymer	76Wh lithium-ion	77.5Wh lithium-ion	50Wh lithium polymer	64Wh lithium-ion
Battery life	6 hrs 20 mins	2 hrs 30 mins	5 hrs 11 mins	6 hrs 8 mins	6 hrs 49 mins
WorldBench 6 score	130	124	133	117	135
Dimensions	325x227x17mm	376x256x43mm	364x249x24mm	314x226x17mm	385x260x25mm
Weight	1.3kg	3.1kg	2.6kg	1.1kg	2.6kg
Warranty	1 year return-to-base	3 years onsite	1 year return-to-base	1 year return-to-base	1 year return-to-base
Verdict	• Thunderbolt, DisplayPort • Very strong performance • 256GB SSD • Exceptional build quality • Lengthy battery life	• Great performance • 2GB AMD Radeon graphics • Incredible gaming machine • Very poor battery life • Wonderful glare-free screen	• Multitouch trackpad • Good battery life • Thunderbolt connectivity • Solid unibody chassis • Quad-core power	• Great range of ports • Easy to carry around • Not particularly attractive • Slightly overpriced	• Fast performance score • 8GB DDR3 RAM • 2GB nVidia graphics • Awkward touchpad • Glare-prone screen
FULL REVIEW	TINYURL.COM/729FHEZ	TINYURL.COM/BTZSQ97	TINYURL.COM/6LRTACR	TINYURL.COM/6NDX26W	TINYURL.COM/5WTG6WP

Hard drive: It can be difficult to upgrade a laptop's hard drive, so get as much storage space as you can. For the best performance and increased reliability, look out for a solid-state drive. Expect lower capacity than with a hard drive, however.

Screen: If you're after a desktop-replacement machine, go for a model with at least a 15in screen. For film playback, 17in widescreen models are even better. For ultraportables, 13in or smaller is best.

Graphics card: If you need a laptop as a design workstation or for playing games, you'll need a dedicated graphics processor. AMD and nVidia make more efficient chips for the task, such as the AMD Radeon HD 6700 series and nVidia GeForce 500 series, both ending with an 'M' suffix.

The integrated graphics in Intel Core i-series processors are now usable with some games, too. Older Intel GMA 4500M graphics are sufficient only for games played at low resolutions.

Some laptops feature switchable graphics, using the integrated graphics processor to maintain battery life and the discrete card for maximum performance.

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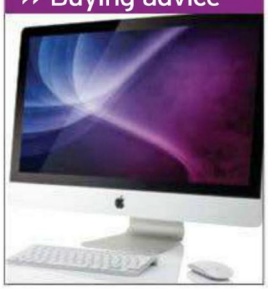
All-in-one PCs

	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	★★★★★	★★★½☆	★★★½☆	★★★★☆	★★★★☆
Features rating	★★★★½	★★★★☆	★★★★☆	★★★½☆	★★★½☆
Performance rating	★★★★★	★★★★☆	★★★½☆	★★★☆☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★½☆
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★½☆
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	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	• Peerless design and build quality • Fantastic high-quality 27in screen • Great general and gaming speed • OS X operating system	• Good-quality 27in panel • Decent performance • Rear design is ugly and impractical • Not as good overall as iMac	• Good speed • TV tuner welcome addition for multimedia • Touchscreen not as effective as it might be • Plenty of software	• Lots of memory and hard-drive space • TV tuner • Blu-ray drive • Superior sound system • Perfect for HD movies	• 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 desirable 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

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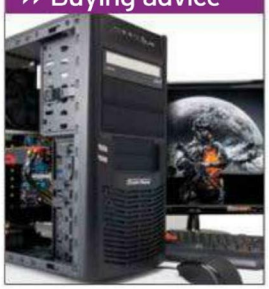
Gaming PCs

	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	★★★☆☆	★★★★½	★★★★☆	★★★★☆	★★★☆☆
Features rating	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	★★★☆☆
Performance rating	★★★★½	★★★★½	★★★★☆	★★★★½	★★★☆☆
Value rating	★★★★½	★★★★½	★★★★☆	★★★☆☆	★★★★☆
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★½☆
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	×	✓	✓	×	✓
DVI	✓	✓	✓	×	✓
HDMI	✓	✓	✓	✓	×
DisplayPort	✓	✓	×	×	×
FireWire	×	✓	✓	×	×
eSATA	✓	✓	×	✓	✓
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	Razor 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	• Maximum overclocking gives fantastic performance • High-quality 24in Asus VS247H monitor • Average system case and cooling • 8GB of RAM	• Superb gaming performance • Towering but practical case • Extremely quiet • No monitor, keyboard or mouse supplied	• Very fast WorldBench 6 performance • Gaming performance decent, but not great • Tidy casing • No Blu-ray drive	• High price tag • Very strong performance in all areas • Watercooling setup • Keyboard and mouse worth £125 alone	• 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

[1]Tested in Crysis at 1080p, High (no AA)/V High (no AA)/V High (16x AA)/Stalker: Call of Pripyat at 1080p, Ultra [2]Tested 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

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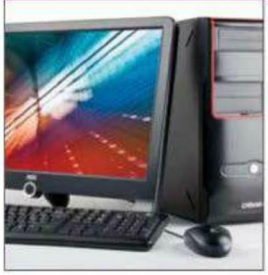
Business PCs

	Chillblast Fusion Palomino	Dino PC Plutosaur 2400	Arbico Value 210 MX	Braebo Athena	CyberPower Ultra Triton SE
Price	£499 inc VAT	£499 inc VAT	£399 inc VAT	£383 inc VAT	£499 inc VAT
Website	Chillblast.com	Dinopc.com	Arbico.co.uk	Braebo.com	Cyberpowersystem.co.uk
Build rating	★★★½☆	★★½☆☆	★★★☆☆	★★½☆☆	★★★½☆
Features rating	★★★★☆	★★★★☆	★★½☆☆	★★★☆☆	★★★★☆
Performance rating	★★★★½	★★★★½	★★★☆☆	★★☆☆☆	★★½☆☆
Value rating	★★★★☆	★★★½☆	★★★★☆	★★★★★	★★★½☆
Overall rating	★★★½☆	★★★☆☆	★★★☆☆	★★★☆☆	★★★☆☆
Processor	3.3GHz Intel Core i5-2500K	3.1GHz Intel Core i5-2400	3.1GHz Intel Core i3-2100	3GHz AMD Athlon X4 640	2.9GHz AMD FM1 A8-3850
RAM	8GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3	8GB DDR3
Storage capacity	500GB SATA 3Gbps	500GB SATA 3Gbps	500GB SATA 6Gbps	500GB SATA 3Gbps	500GB SATA 3Gbps
Motherboard	Asus P8H61-M LE/USB3	Gigabyte GA-H61M-S2P	Asus P8H61-M LE/USB3	ASRock N68C-S UCC	Gigabyte GA-A75-D2H
CPU cooler	Standard Intel cooler	Standard Intel cooler	Xigmatek Apache	Standard AMD cooler	Cooler Master cooler
Power supply	500W EZCool	Not specified	500W Ace	500W	450W WinPower
Screen	21.5in AOC F22+	22in Asus VE228T	Not supplied	18.5in AOC 931Swl	21.5in AOC F22+
Screen resolution	1920x1080 pixels	1920x1080 pixels	N/A	1366x768 pixels	1920x1080 pixels
Graphics	Intel HD Graphics 3000	Intel HD Graphics 3000	Intel HD Graphics 3000	nVidia GeForce 7025	AMD Radeon HD 6550D
Video memory	N/A	N/A	N/A	256MB	1GB
Wireless/Bluetooth	××	××	××	××	××
USB	2x USB 3.0, 6x USB 2.0	6x USB 2.0	2x USB 3.0, 4x USB 2.0	4x USB 2.0	2x USB 3.0, 4x USB 2.0
Media card slot	×	×	✓	×	×
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	Not supplied; add £4	Not supplied	Not supplied	Not supplied	Not supplied
Case	Inwin Z637 Micro ATX	EZCool N750D	Gigabyte GZ-M1	Braebo Fides Case	Cooler Master Elite 430
Keyboard	Logitech MK120	Logitech MK120	Sumvision (wired)	Braebo Black USB Keyboard	Logitech MK120
Optical drive	24x DVD±RW	22x DVD±RW	22x DVD±RW DL, LightScribe	24x DVD±RW	24x DVD±RW
Operating system	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit
Bundled software	Free utilities	None	None	Free utilities	None
WorldBench 6 score	164	150	135	100	119
Power consumption	32W	30W	43W	49W	44W
Warranty	2 years collect-and-return	3 years return-to-base	2 years return-to-base	1 year return-to-base	3 years return-to-base
Verdict	• Performance outstrips the competition • Intel Core i5 processor • 8GB DDR3 RAM • 21.6in display better than others here • Two USB 3.0 ports • Designed for easy upgrades • Over-specified for office use	• Great overall performance • 22in screen is best here • Intel Core i5 processor • Good-looking system • Poor-quality case • Rather noisy • Only 4GB DDR3 RAM • No USB 3.0 ports	• 4GB DDR3 RAM • Intel Core i3 rather than Core i5 processor • Solid overall performance • Two USB 3.0 ports • Media card slot included • Flat-panel display not included • Not ideal for future upgrades	• 4GB DDR3 RAM • AMD processor falls short • Small 18.5in flat-panel with 1366x768-pixel resolution • 256MB nVidia graphics • No USB 3.0 ports • Cheap • Relatively slow	• 8GB DDR3 RAM • 1GB graphics best of group • Middling overall performance • Two USB 3.0 ports • Solidly built • Noisy in operation
FULL REVIEW	TINYURL.COM/BM9Q39X	TINYURL.COM/CCDRSF5	TINYURL.COM/CCCKOGG	TINYURL.COM/BUOSF5V	TINYURL.COM/CF2CGZ5

>> Buying advice



Business PCs

Desktop PC prices were correct at press time for issue 203 and include delivery. Vendors often honour the price of PCs longer than our onsale date. However, changes in exchange rates and component supply issues mean that not all the PCs listed will be available as specified. These charts are intended only as a guide.

Processor: Provided you have sufficient RAM, any modern CPU will provide enough power for low-level administrative tasks. Intel's dual-core Core i3 chips should provide ample performance for general use and come with integrated graphics, saving you the cost of buying an additional card.

AMD's Llano series of processors, such as the A8-3850, offer value for money, but with performance shifted towards graphics processing rather than general-purpose computing. Our business performance benchmark scores are therefore considerably lower for AMD PCs than Intel systems at any given price.

Processor cooler: We would normally expect a standard processor cooler to be installed,

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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	★★★½☆	★★★★★	★★★★★	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★½☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★★	★★★★☆	★★★★☆	★★★☆☆	★★☆☆☆
Value rating	★★★★☆	★★★★☆	★★★☆☆	★★★★☆	★★★★☆
Overall rating	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★☆☆
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	×	×	×
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	×	✓	×	×	×
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	✓	✓	✓	×	×
LCD screen	×	×	×	✓	×
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	✓	×	×	×	×
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	None	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	• 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	• Beautifully compact • Great for graphics • Good performance • No DVD drive • Very low power consumption • Quiet and elegant	• Blu-ray drive included • Silent, fanless operation • Best multimedia playback of group • Dual digital TV tuners • Stylish Zalman case • Expensive	• Proper media-centre controls • Passively cooled, fanless design • Dual digital TV tuners • 2GB storage • Upgradable • Doubles as hi-fi when PC power off	• 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/3OPHWHD	TINYURL.COM/82XD4FQ

GLOSSARY: FW800: FireWire 800 TB: Thunderbolt WMC: Windows Media Center

but third-party cooling fans can help to keep down noise levels.

Memory: A 4GB memory setup should be fine – even 2GB should be okay.

Storage: In a typical networked business environment there will be storage available on the LAN, so you're unlikely to need a large hard drive – especially at their currently inflated prices. A 500GB drive should be ample unless your business involves storing a lot of video or other large media.

Motherboard: The motherboard won't need the latest and greatest features, although some spare memory slots may prove useful so that extra RAM can be added later. Power-management and fan-speed control can also help to save you money and create a more peaceful working environment.

Graphics: Integrated GPU solutions provide enough graphics power for business applications, so you're unlikely to need to add a graphics card to your specification.

Peripherals: Wireless keyboards and mice can cause issues in the workplace due to interference between adjacent workstations. A decent wired kit is ideal, while quiet-typing keyboards can be less distracting to others.

OS: For small businesses with just one or two PCs, Windows 7 Home Premium is cheaper but can't connect to servers. The Pro edition is a better option for businesses, especially if you need compatibility with older software designed for Windows XP.

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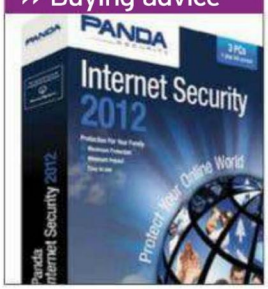
Internet security suites	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4	5
	G Data IS 2012	Norton IS 2012	Bitdefender IS 2012	Kaspersky IS 2011	Trend Micro Titanium IS 2012
Annual price	£34 inc VAT	£49 inc VAT	£29 inc VAT	£39 inc VAT	£39 inc VAT
Licence terms	1 PC, 1 year	1 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	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
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	• Excellent detection rates • Good value • Low impact on resources • Confusing interface	• Good all-rounder • Fast scan times • Clean interface • Flagged some false-positives	• Impacts system resources • Very strong malware blocking and removal • Intuitive interface	• Strong block rate • Above-average scan times • Can affect PC performance • Interface needs tweaking	• 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/7QTBAP6

GLOSSARY: • IS: Internet Security • SOS: Small Office Security

Antivirus software	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5
	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	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★½☆
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	• Smooth user interface • Large 'Fix Now' button • Moderate impact on system performance	• Very good performance for malware removal • Average scan speeds • Three interface tiers	• Strong malware detection, blocking and removal • Good user interface, but poorly translated	• Well-designed interface • Easy to use • On-demand single-file scans • Impacts PC performance	• Set-it-and-forget-it security • Cloud-based protection • Requires web connection • Good performance
FULL REVIEW	TINYURL.COM/4P5YCXP	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.

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Tablet PCs

	1 PC ADVISOR GOLD	2 PC ADVISOR GOLD	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	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	★★★★½	★★★★½	★★★★½	★★★★☆	★★★½☆
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	• Breathtaking display • Searing performance • 32GB version recommended • Supports 4G where available	• Exceptional touchscreen • Beautiful design and build • Best selection of apps • 10-hour battery life	• Fast quad-core processor • Excellent Super IPS panel • Stunning battery life • Best Android tablet	• Good real-world battery life • Impressive 10in touchscreen • Plasticky construction • 3Mp main camera	• Lightweight design • Scratch-prone chassis • Android Honeycomb 3.2.1 • 16GB memory plus SD card
FULL REVIEW	TINYURL.COM/6MTG90W	TINYURL.COM/4XV7Q4K	TINYURL.COM/7U67UBN	TINYURL.COM/3LH239C	TINYURL.COM/3TSQKP4

[1]3G available at additional cost [2]Android 4.0 available

Projectors

	1 PC ADVISOR GOLD	2	3	4	5
	InFocus ScreenPlay SP8600	Dell M110	Vivitek Qumi Q2	NEC NP43	ViewSonic PJD7383i
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	★★★★½	★★★★☆	★★★★☆	★★★★½	★★★½☆
Projection technology	DLP	DLP	DLP	DLP	DLP
Resolution (pixels)	1920x1080	1280x800	1280x800	1024x768	1024x768
Brightness[1], Contrast	1,800, 5,000:1	300, 10,000:1	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	• Smooth video playback • Full-HD resolution • Great contrast levels • Bright, colourful image	• Ultra-small and -light • Good colour • Long-life LED lamp • Remote control costs extra	• Great value portable model • Lightest model here • DLP-Link enables 3D display • Exceptional lamp life rating	• Portable business model • Strong Auto Focus • Customisable settings • Decent image quality	• 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

[1]Ansi 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/6MTMWJX

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Sub-£150 printers

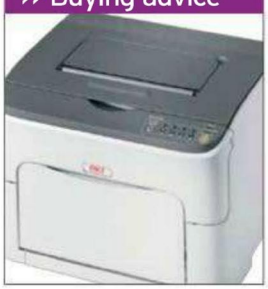
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3	4	5
	Oki C110	Brother HL-2130	Kodak Hero 5.1	Canon i-Sensys LBP-7010C	Canon Pixma MG4150
Price	£135 inc VAT	£55 inc VAT	£80 inc VAT	£115 inc VAT	£120 inc VAT
Website	Oki.co.uk	Brother.co.uk	Kodak.co.uk	Canon.co.uk	Canon.co.uk
Overall rating	★★★★☆	★★★★½	★★★★½	★★★½☆	★★★½☆
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	• Attractive pricing • Performs better than an equivalent inkjet • No duplex mode	• 20ppm mono laser printer • Crisp text output • 3p per page • Cheap for a laser printer	• Printer/scanner/copier • Lowest cost per print • Built-in Wi-Fi • Could be faster	• Great value colour laser • High-quality colour prints • Slow colour performance • Expensive replacement inks	• 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
	Kyocera Mita FS-1320D	Kyocera FS-C5250DN	Samsung ML-3710ND	HP LaserJet Pro 400 M451nw	Brother HL-5380DN
Price	£170 inc VAT	£460 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	★★★★½	★★★★½	★★★★½	★★★★☆	★★★½☆
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	• No frills business laser • Lacks Wi-Fi and ethernet • Modest running costs • Auto-duplex support	• Blistering speed • Huge paper capacity • Colour printing isn't perfect • Hefty	• Fast mono page churn • Modest running costs • Ethernet and USB ports • Generous paper trays	• Fast for its price • Smart Install feature • Strong for text • Colour costs are high	• Economical text printer • Good print speeds • PIN security • Prints are rather faint
FULL REVIEW	TINYURL.COM/6GG9UKV	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

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Blu-ray drives

	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	★★★★★	★★★★½	★★★★½	★★★★☆	★★★★½
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	• 12-speed external writer • Side-mountable • Supports eSATA, USB 2.0 • Awkward to carry	• 10-speed internal writer • Attractive front panel • Reliable performance • Very good value	• Super-slim six-speed drive • No power supply required • Portable • Slow but reliable	• 12-speed internal writer • Issues during testing • Noisy during operation • Average with 4x media	• 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

	Cisco Linksys E4200	AVM FritzBox Fon 7390	DrayTek Vigor 3200n	TP-Link TL-MR3020	Zyxel NBG4615
Price	**£130 inc VAT**	**£190 inc VAT**	**£375 inc VAT**	**£40 inc VAT**	**£60 inc VAT**
Website	Linksysbycisco.com	Fritzbox.eu	Draytek.co.uk	Tp-link.com/en	Zyxel.co.uk
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★★½
Standards supported	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Frequency modes	2.4GHz/5GHz (dual mode)	2.4GHz/5GHz (dual mode)	2.4GHz	2.4GHz	2.4GHz
Modem	×	✓	×	×	×
USB port	✓	✓	✓	✓	✓
Firewall	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI
Eco mode	×	✓	✓	×	✓
Ethernet ports	10/100 WAN, 4x gigabit	4x gigabit	4x gigabit WAN, 1x gigabit LAN	10/100 WAN/LAN	10/100 WAN, 4x gigabit LAN
Throughput (near/far)	226/92Mbps	92/38Mbps	110/40Mbps	Not tested	94/32Mbps
Dimensions	225x160x25mm	226x160x48mm	30x160x245mm	74x67x22mm	162x106x28mm
Weight	335g	not specified	400g	250g	237g
Warranty	1 year	5 years	2 years	3 years	1 year
Verdict	• Excellent wireless performance • Dual-band Wi-Fi • Guest login feature	• Supports landline and internet telephony • Dual-band Wi-Fi • USB port	• Business multi-WAN router • Firewall offers protection • Versatile USB 2.0 port • Excellent performance	• Portable 3G router • Tiny and lightweight • Mains-/USB-powered • Reliable performance	• Good-value router • Strong Wi-Fi performance • Single-band Wi-Fi • Compact design
FULL REVIEW	TINYURL.COM/6Z7BDKM	TINYURL.COM/3QUJZBX	TINYURL.COM/7Z4XTD5	TINYURL.COM/85P7R9P	TINYURL.COM/6HACKNN

>> 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/70EPYL6

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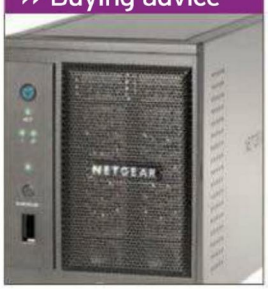
External hard drives

	1 PC ADVISOR BEST BUY	2 PC ADVISOR BEST BUY	3	4	5
	Seagate FreeAgent GoFlex	WD My Passport Studio	Buffalo MiniStation Extreme	Iomega Prestige	Freecom Mobile Drive Sq
Price	£190 inc VAT	£150 inc VAT	£130 inc VAT	£100 inc VAT	£105 inc VAT
Website	Seagate.com	Wdc.com/en	Buffalotech.com	Iomega.co.uk	Freecom.com
Overall rating	★★★★☆	★★★★½	★★★★½	★★★★☆	★★★½☆
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	• Fastest write speed • Great value for capacity • Separate storage drive and USB 3.0 dock	• Superbly built • FireWire 800 and USB 2.0 interfaces • AES encryption	• Military-grade rugged design • Lightweight 2.5in drive • Solid 256bit encryption	• Good-value USB 3.0 drive • 256bit encryption • Metal case	• Ultra-compact USB 3.0 drive • No encryption • Energy-saving button • Power-saving mode
FULL REVIEW	TINYURL.COM/BN2Z92F	TINYURL.COM/6FAWBNE	TINYURL.COM/CE4Z9YM	TINYURL.COM/D4KALCW	TINYURL.COM/BMVZW3R

NAS drives

	1 PC ADVISOR RECOMMENDED	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4	5
	Zyxel NSA325	Netgear ReadyNAS Duo v2	Synology DiskStation DS211	Qnap TS-659 Pro II	Buffalo LinkStation Pro LS-VL
Price	£145 inc VAT	£130 inc VAT (diskless)	£261 inc VAT (diskless)	£800 inc VAT	£180 inc VAT
Website	Zyxel.co.uk	Netgear.co.uk	Synology.com	Qnap.com	Buffalotech.com
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★½☆
Capacity range	Up to 8TB	Up to 8TB	Up to 8TB	Up to 24TB	Up to 3TB
Internal drives	2	2	2	6	1
UPnP	✓	✓	✓	✓	✓
DLNA	✓	✓	✓	✓	✓
Remote access	✓	✓	✓	✓	✓
USB port	✓	✓	✓	✓	✓
Raid options	0/1/JBOD	0/1/JBOD	0/1	0/1/5/6/10	N/A
Software	zPilot	ReadyNAS	DiskStation Manager 3.0	TurboNAS 3.5	NovaBackup
Dimensions	108x205x147mm	88x218x161mm	142x101x220mm	175x257x235mm	45x175x156mm
Weight	1.8kg	1kg	2.07kg	5.2kg	1.1kg
Warranty	1 year	3 years	2 years	2 years	2 years
Verdict	• Impressive feature set • Strong performance • Complex interface • No tool-free drive bays	• Suitable for small-business or home-media use • Remote access support • Low power consumption	• iTunes, uPnP, DLNA options • Takes up to 6TB total storage • Excellent security	• Max 18TB (6x 3TB) storage • Great Raid support • Expensive • Fast performance	• Stylish design • Modest price tag • Sluggish transfer speeds • Slightly noisy fan
FULL REVIEW	TINYURL.COM/7B9EPW8	TINYURL.COM/BMSDR74	TINYURL.COM/65S4V4U	TINYURL.COM/7MX6OZ7	TINYURL.COM/6W6XSWA

>> Buying advice



NAS drives

NAS drives are ideal for businesses or home users who require large amounts of dependable and secure storage, accessible to anyone logged into the local wired or wireless network.

Instead of connecting a hard disk directly to one PC, the NAS is typically connected to a network router. Many NAS drives are typically supplied without disks, letting you add your own selection.

Most NAS drives allow virtual partitions, letting you keep data such as PC backups separate from media files. Home-oriented NAS drives also include media servers to allow easy streaming of content.

To augment data integrity, access speed, capacity, or all three, individual hard disks can be combined in a number of Raid configurations. Raid 0 'stripes' data across multiple drives to increase access speeds. Raid 1 mirrors the contents of one drive on to another, providing a cloned backup. Raid 5 is available with three-plus drives and combines both advantages.

READ MORE: TINYURL.COM/7H3HCNR

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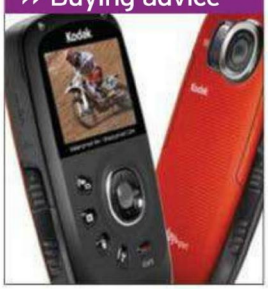
Smartphones

	1 PC ADVISOR GOLD	2 PC ADVISOR BEST BUY	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**	**£331 inc VAT**	**£500 inc VAT**
Website	Apple.com/uk	Samsung.com/uk	Htc.com/europe	Uk.blackberry.com	Samsung.com/uk
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★½☆
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	• Superb retina display • Fast graphics • Responsive touchscreen • Siri voice-recognition	• Huge 4.3in AmoLED screen • 16GB memory (expandable) • Shorter battery life • TouchWiz 'Hubs' interface	• Media-centric smartphone • High-resolution screen • Slick HTC Sense interface • HTC Watch	• Qwerty keyboard input • Media player/manager • Secure email platform • Small 2.4in screen	• Uses Android 4 • Large screen • Low performance • Can't navigate one-handed
FULL REVIEW	TINYURL.COM/62TEB9G	TINYURL.COM/3HF6GOD	TINYURL.COM/5W5KC7D	TINYURL.COM/3KJ33GS	TINYURL.COM/7JRSECH

Digital camcorders

	1	2	3	4 PC ADVISOR RECOMMENDED	5
	Kodak PlaySport Zx5	**JVC Everio GZ-HM650**	**Sony Bloggie Touch MHS-TS20**	**Canon Legria HF R106**	**Kodak Playfull ZE1**
Price	**£90 inc VAT**	**£300 inc VAT**	**£140 inc VAT**	**£275 inc VAT**	**£106 inc VAT**
Website	Kodak.co.uk	Jvc.co.uk	Sony.co.uk	Canon.co.uk	Kodak.co.uk
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★☆☆
Maximum resolution	1920x1080	1920x1080	1920x1080	1920x1080	1920x1080
Aspect ratio	16:9	4:3, 16:9	16:9	16:9	16:9
Display	2in	2.7in	3in	2.7in	1.5in
CCD sensor	1/3.2in	1/4.1in	1/2.5in	1/5.5in	1/3.2in
Zoom	4x digital	200x digital, 40x optical	4x digital	80x digital, 20x optical	4x digital
Supported formats	Mpeg4, Jpeg	Mpeg4, Jpeg	Mpeg4, Jpeg	AVCHD, Jpeg	Mpeg4, Jpeg
Storage (media card)	128MB (SD/SDHC)	8GB (SD/SDHC/SDXC)	8GB (SD/MS)	none (SD/SDHC)	128MB (SD/SDHC)
Connections	Micro-HDMI, MicroUSB	HDMI, USB 2.0	HDMI, USB 2.0	HDMI, USB 2.0	Micro-HDMI, MicroUSB
Dimensions	58x112x18mm	51x55x111mm	47x9x106mm	60x64x124mm	42x100x16mm
Weight	125g	195g	125g	319g	95g
Warranty	1 year	1 year	1 year	1 year	1 year
Verdict	• Ruggedised design • Comfortable to hold • 2in screen rather small • Takes AAA batteries	• Lightweight, easy to use • Excellent 40x optical zoom • 6.5-hour recording memory • Supports 32GB SDXC cards	• Useful 8GB memory • Awkward to hold • Ideal for video; stills less so • No built-in flash	• Excellent-value HD model • 2.7in flip-out LCD • Smooth 20x optical zoom • Great colour balance	• Simplicity itself to use • One-touch record and share • Tiny LCD • Rather toy-like
FULL REVIEW	TINYURL.COM/3U3Y2CA	TINYURL.COM/453U838	TINYURL.COM/332UOQJ	TINYURL.COM/2VFVLQX	TINYURL.COM/79HCGJC

>> Buying advice



Digital camcorders

The quality varies enormously between low-cost camcorders, and we wouldn't be surprised if your smartphone took better stills and video. Still, it can be useful to have a weather- or waterproof model, or simply something cheap you can take to the beach.

Look for an optical zoom that lets you get closer to the action. A flip-out LCD will also help you follow the action more easily.

Avoid models that don't support HD. Note that full-HD can refer to 1080i or 1080p, with the latter progressive scan preferable.

If you're paying a little more, look for some kind of image stabilisation feature and more control over your footage. A large LCD can be useful here, with the more pixels the better.

Video is usually compressed with Mpeg4, and often wrapped in AVCHD. You'll need good software and a powerful PC to edit video.

Save room in your budget for a memory card, as most camcorders have little or no memory built-in.

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Compact digital cameras

	Sony Cyber-Shot DSC-HX9V	Nikon Coolpix S9100	Panasonic Lumix DMC-TZ20	Nikon 1 J1	Samsung MV800
Price	**£220 inc VAT**	**£200 inc VAT**	**£200 inc VAT**	**£380 inc VAT**	**£180 inc VAT**
Website	Sony.co.uk	Nikon.co.uk	Panasonic.co.uk	Nikon.co.uk	Samsung.com/uk
Overall rating	★★★★☆	★★★★½	★★★★½	★★★½☆	★★★½☆
Megapixel rating	16.2Mp	12.1Mp	14.1Mp	10.1Mp	16.2Mp
Maximum resolution	4608x3456 pixels	4000x3000 pixels	4320x3240 pixels	3872x2592 pixels	4608x3456 pixels
Optical zoom	16x	18x	16x	3x	5x
Maximum aperture	f3.3-f5.9	f3.5-f5.9	f3.3-f5.9	N/A	f3.3-f5.9
LCD size	3in	3in	2.8in	3in	3in
Media card	SD/SDHC	SD/SDHC	SD/SDHC	SD/SDHC	MicroSD
Battery/life	1x lithium-ion/410 shots	1x lithium-ion/270 shots	1x lithium-ion/260 shots	1x lithium-ion/230 shots	1x lithium-ion/not specified
ISO range	100 to 3200	160 to 3200	100 to 1600	100 to 3200	125 to 3200
Dimensions	105x34x59mm	106x35x62mm	105x33x58mm	106x30x61mm	92x18x56mm
Weight	215g	214g	219g	274g	124g
Warranty	2 years	2 years	1 year	2 years	2 years
Verdict	• Superior stills and video • Great 16x optical zoom • GPS photo tagging • Doesn't support RAW	• Excellent photo quality • Longest zoom range here • 1920x1080-pixel video • Incredible 240fps slow-mo	• Comprehensive menu • Warm, natural colour range • GPS geotagging support • AVCHD or Mpeg video	• Mirrorless semi-compact • Solid construction • Good range of video modes • Deep colours	• Flip-up touchscreen LCD • Limited 5x optical zoom • Better for video than photos • Great panorama mode
FULL REVIEW	TINYURL.COM/6CLAW3D	TINYURL.COM/6E457PY	TINYURL.COM/6XNRWUO	TINYURL.COM/7ZC25FY	TINYURL.COM/83SSNQX

Compact system cameras

	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	**£575 inc VAT**	**£450 inc VAT**	**£400 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	★★★★☆	★★★★½	★★★★½	★★★★☆	★★★★☆
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	• Excellent stills and video • Suitable for novice and intermediate photographers • Plenty of lenses available	• Great dSLR alternative • Rotating touchscreen • Strong video-capture mode • Very fast autofocus	• Compact • Great performance • Great colour fidelity • Takes clean, sharp shots	• Top-notch photo results • Fully auto/manual modes • Articulated LCD screen • Strong video capture	• Compact camera • Likable art filter modes • High ISO suffers noise • No built-in flash or EVF
FULL REVIEW	TINYURL.COM/6UTE9KK	TINYURL.COM/7JCXJCR	TINYURL.COM/37XOZX5	TINYURL.COM/72STE88	TINYURL.COM/BLMYMJW

>> Buying advice

Compact digital cameras

Compact cameras are available for as little as £50. Budget models don't necessarily entail reduced image quality, but they do tend to offer fewer features.

The sweet spot is around £120. At this price you should expect great photo and video quality, but not much in the way of manual control, such as depth-of-field.

It's not uncommon to find 14Mp-plus compacts for less than £100, but cramming so many pixels into a small sensor means less light falls on to each receptor. The ISO is increased to compensate for dim lighting, which can result in noisy (grainy) images.

A large 3in LCD screen is useful for image composition and review; a viewfinder is also useful in bright sunlight. Look for a minimum 260,000-dot screen resolution.

The optical zoom is more important than a camera's digital equivalent, which merely crops in on images. Most compact cameras have a small optical zoom.

Be sure to include a memory card in your budget. Note that not all cameras support SDXC cards.

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Sub-£150 graphics cards

	1 PC ADVISOR GOLD	2	3 PC ADVISOR RECOMMENDED	4	5
	Sapphire Radeon HD 6850	Club 3D Radeon HD 7750	Sapphire 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	Club-3d.com	Sapphiretech.com	Hisdigital.com	Uk.asus.com
Overall rating	★★★★½	★★★½☆	★★★★☆	★★★½☆	★★★☆☆
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	• Powerful card for the price • Good memory bandwidth • 256bit memory interface • Single DVI slot	• Better value for money than the 6790 and 6770 • Uses some 7970 architecture • Light on power	• Playable framerates • Strong memory bandwidth • 6800-series cards faster • 256bit memory interface	• 1GB DDR5 video card • 128bit interface cuts speed • Not very power-hungry • 6790 card is better value	• 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 PC ADVISOR BEST BUY	4	5
	HIS Radeon HD 6950	Zotac GeForce GTX 680	Zotac GeForce GTX 570	XFX 7970 3GB GDDR5	Asus GeForce GTX 560 Ti
Price	£216 inc VAT	£450 inc VAT	£270 inc VAT	£480 inc VAT	£180 inc VAT
Website	Hisdigital.com	Zotac.com	Zotac.com	Xfxforce.com	Uk.asus.com
Overall rating	★★★★☆	★★★★½	★★★★½	★★★½☆	★★★★☆
Graphics processor	AMD Radeon HD 6950	nVidia GeForce GTX 680	nVidia GeForce GTX 570	AMD Radeon HD 7970	nVidia GeForce GTX 560 Ti
Installed RAM	2GB GDDR5	2GB GDDR5	1,280MB GDDR5	3GB GDDR5	1GB GDDR5
Memory interface	256bit	256bit	320bit	284bit	256bit
Core/memory clock	800MHz/1,250MHz	1,006MHz/1,502MHz	732MHz/950MHz	925MHz/1,375MHz	830MHz/1GHz
Ramdac	400MHz	400MHz	400MHz	400MHz	400MHz
Stream processors	1,408	1,536	480	2,048	384
Power connectors	2x 6-pin	2x 6-pin	2x 6-pin	1x 6-pin, 1x 8-pin	2x 6-pin
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
DirectX	11.0	11.0	11.0	11.1	11.0
Digital interface	DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	2x DVI, Mini-HDMI	DVI, HDMI, 2x Mini-DisplayPort	2x DVI, HDMI
Warranty	2 years	5 years	2 years	2 years	3 years
Verdict	• 2GB graphics memory • 5GHz DDR effective • Best overall value here • GTX 570 chip is faster	• Fastest single-GPU card • Low power consumption • Cheaper than AMD 7970 • Low on RAM	• For hardcore gamers only • Impressive detail rendering • 320bit memory interface	• Good performance • Not as powerful or as efficient as GTX 680 • Price needs to come down	• Affordable gaming graphics • Slightly overclocked • Just 1GB of memory • Smooth framerates
FULL REVIEW	TINYURL.COM/6GQS8XC	TINYURL.COM/C6C37QO	TINYURL.COM/3UB8U3G	TINYURL.COM/6UZRVXC	TINYURL.COM/43UXNP8

>> 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

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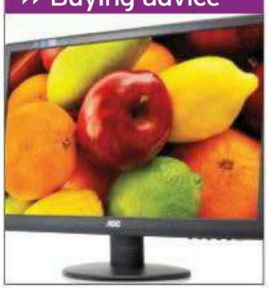
Sub-£200 flat-panels

	1 PC ADVISOR BEST BUY	2 PC ADVISOR GOLD	3 PC ADVISOR GOLD	4	5
	AOC i2352Vh	LG IPS236V	AOC i2353Fh	Iiyama ProLite XB2472HD	Hanns-G HL231DPB
Price	£138 inc VAT	£158 inc VAT	£150 inc VAT	£190 inc VAT	£119 inc VAT
Website	Aoc-europe.com	Lg.com/uk	Aoc-europe.com	Iiyama.co.uk	Hannsg.com
Overall rating	★★★★½	★★★★★	★★★★½	★★★★☆	★★★★☆
Screen size	23in	23in	23in	24in	23in
Panel type	In-plane switching	In-plane switching	In-plane switching 3D	Vertical alignment	Twisted nematic
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel pitch	0.27mm	0.27mm	0.27mm	0.28mm	0.27mm
Brightness	250cd/m²	250cd/m²	250cd/m²	250cd/m²	250cd/m²
Static contrast ratio	1,000:1	1,000:1	1,000:1	3,000:1	1,000:1
Response time	5ms	5ms	5ms	8ms	5ms
Digital connector	DVI, HDMI, VGA	DVI, HDMI	2x HDMI, VGA	DVI, HDMI	DVI
Dimensions	247x185x399mm	549x230x422mm	550x388x188mm	570x215x438mm	547x189x352mm
Weight	3.2kg	4kg	5.6kg	6.2kg	3.3kg
Warranty	3 years	2 years	3 years	3 years	3 years
Verdict	• Cheap for IPS panel • Accurate colours • Plain styling • Few extras	• Impressive overall display • Accurate colours • Wide viewing angles • Great value for IPS tech	• Wide viewing angles • Excellent colours • Attractive, slimline deign • No DVI connection	• Wonderful 24bit colour reproduction • Viewing angles not great • Height-adjustable stand	• Good-value 23in flat-panel • Decent viewing angles • Older TN screen technology • Low power consumption
FULL REVIEW	TINYURL.COM/7HXTPVV	TINYURL.COM/CWMP7M8	TINYURL.COM/7TWLB2A	TINYURL.COM/3DYX75Z	TINYURL.COM/32MGMTC

£200+ flat-panels

	1	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4	5
	ViewSonic VP2365-LED	Philips Brilliance 241P4QPYES	NEC MultiSync EA232WMi	NEC MultiSync EX231W	ViewSonic VP2765-LED
Price	£215 inc VAT	£240 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	★★★★☆	★★★★☆	★★★★½	★★★★☆	★★★½☆
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/m²	250cd/m²	300cd/m²	250cd/m²	300cd/m²
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	DVI, DisplayPort	DVI, DisplayPort	DVI, DisplayPort
Dimensions	548x433x250mm	565x220x395-516mm	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	• Premium IPS panel • Superb colour reproduction • Wide viewing angles • Lacks an HDMI port	• Very strong image quality • Excellent viewing angles • Rotate, height adjustability • Four-port USB hub	• High-calibre IPS screen • Impressive colour depth • Poor 14ms response rate • Height/tilt-adjustable stand	• Solid 23in TN flat-panel • Good viewing angles • Display tweaks required • Screen dims when not in use	• 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 bar 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.

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JIM MARTIN

Can't gift a Kindle book

Although e-book readers have been around for more than a decade, no-one took them seriously until Amazon released the Kindle in 2007. Now, in its fourth iteration, the Kindle seems to be ubiquitous.

Jump on a commuter train and you're all but guaranteed to see someone in the carriage reading on a Kindle. Chances are the owner isn't a geek either; in fact, they're probably a technophobe that's had a Kindle bought for them. That's the beauty of Amazon's setup: a relatively affordable price for the hardware, a vast library of books to choose from, and near-instant downloading directly to the Kindle via Wi-Fi.

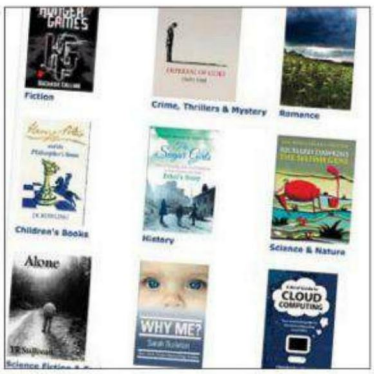
It really is revolutionary. Gone are the days when you'd have to choose

> **"It's just another example of the UK being left out"**

which books to take on holiday and which to leave behind. Even with 2GB of memory inside your Kindle, you can take more books than you could hope to read. And even if you're not vacation-bound, you'll still appreciate that the Kindle is smaller and lighter than a real book, with a screen that's just as easy to read.

There's a piece missing from the puzzle, however. It's frustrating enough for Kindle owners that they're not allowed to lend an e-book to a friend in the same way as they might with a 'real' book, but there's also no way to buy a Kindle book for someone else in the UK.

This is a problem if you don't like giving gift cards or certificates. Although we've never heard anyone complain about receiving them, plenty of people think them too impersonal to hand out at birthdays and Christmas. It's hardly the same to give a voucher with an accompanying note suggesting



that the recipient spends it on a particular book because you think it will be 'right up their street'.

It's also confusing for anyone who doesn't realise it's not possible to buy a Kindle book for someone else. We know people who have bought a book using their own Amazon account, only to realise it's locked to their Kindle. To make matters worse, it's not obvious how to get a refund on a Kindle book that you've bought by accident, since they aren't listed with your other Amazon purchases.

You have seven days to request a refund on any Kindle book, but you have to know to click the 'Manage your Kindle' link to see this option. Otherwise, you could easily believe that refunds aren't permitted.

Time to come clean: the truth is, while it does annoy us that we can't gift Kindle books, what's more frustrating is that US users can. It's just another example of the UK being left out, and there's no obvious reason why people in the US should get this luxury while it remains off-limits to the rest of the world. It isn't as if it'll hurt the company's bottom line; in fact, it will only help it grow.

But we'll just have to grin and bear it, since Amazon tells us that it "has not announced a timeline for [gifting] availability internationally". Come on Amazon, sort it out – and quick. ☒

>> Next issue

ISSUE 205 ON SALE 7 JUNE 2012

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ASUS P8Z68-V LX
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ASUS P8Z68-V
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